

Setting the context

It's important to begin with a clear picture of Alberta's oil sands today including the scope of oil sands developments, where they are located, how oil sands projects are approved for development, and what the oil sands mean for Alberta.

What are the oil sands?

The history of Alberta's oil sands dates back to 1719 when a member of the Cree First Nation brought a sample of oil sands to Fort Churchill. Explorer Alexander Mackenzie provided the first recorded description of the Athabasca oil sands back in 1790. Canada's first Geological Survey in 1875 noted an observation of water washing oil out of the oil sands and a man named G.C. Hoffman was the first to successfully separate bitumen from the oil sands.

In 1923, Dr. Karl Clark built the first oil sands separation unit in the basement of the University of Alberta power plant. Work continued on developing the technology and the first large-scale commercial plant was built in 1964 north of Fort McMurray. In 1974, the Alberta Oil Sands Technology Research Authority was established to invest in research to improve the techniques for extracting oil from the oil sands. This work was subsequently taken over by the Alberta Energy Research Institute, established in 2000.

Developments in the oil sands ramped up considerably in the late 1990s and early 2000s and today, the oil sands are recognized as an important driver of Alberta's economy.

In the past, most of Alberta's oil production was focused on conventional crude oil. But the reserves of Alberta's conventional crude oil are declining and the focus has shifted to the oil sands as the next big source of oil to meet growing international demands.

The oil sands contain the second largest oil reserve in the world, second only to Saudi Arabia. Unlike conventional crude oil, bitumen in Alberta's oil sands is a thick, tar-like substance that does not flow to a well. It takes about two tonnes of oil sands to produce a barrel of oil.

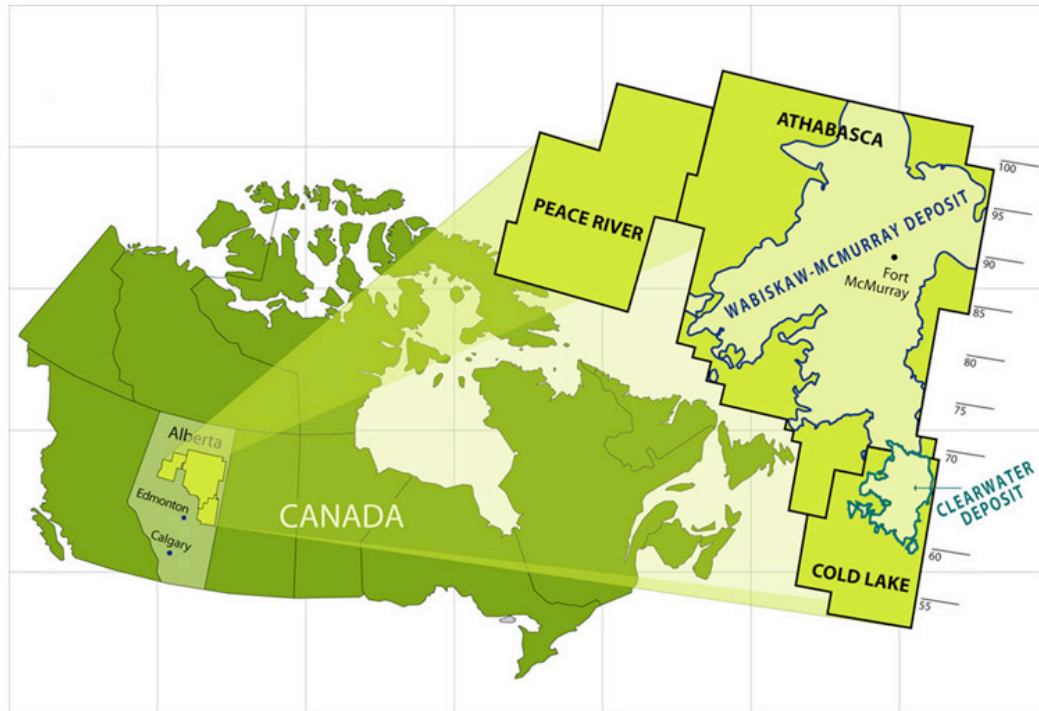
Several technologies are used to extract the bitumen from the sand. Where crude bitumen is located close to the surface, the oil sands are excavated and the bitumen is extracted from the mined materials. For oil located deeper underground, steam or solvents are injected into the reservoir to mobilize the bitumen and allow it to be pumped to the surface. New technologies are being developed to reduce the amount of water used and greenhouse gas emissions produced and also to test alternative sources of energy for powering the massive oil sands developments.

While much of the focus is on oil sands located in the Fort McMurray area, in fact, Alberta has three designated oil sands areas:

- Athabasca Wabiskaw-McMurray – contains about 80 percent of the oil reserves
- Cold Lake Clearwater deposit – contains close to 12 percent of the reserves
- Peace River deposit – contains about eight percent of the reserves

In total, these three oil sands areas underlie about 140,800 square s of land in northern Alberta.

Figure 1: Alberta's Three Oil Sands Areas



Source: AEUB ST98 - 2006

The subsequent chapter provides more detailed information about the scope and size of the oil sands, but the following key points provide an important perspective.

- While conventional oil has been an important driver of the provincial economy in the past, and will continue to be in the future, non-conventional oil will be vital to our province's future growth and prosperity.
- In 1996, conventional oil accounted for about 70 percent of total production in Alberta and non-conventional production accounted for only 30 percent. By 2011, conventional crude will make up only 20 percent of production and bitumen will account for 80 percent.
- Current estimates are that 178 billion barrels of oil can be extracted from Alberta's oil sands under today's economic conditions and using existing technology. But this represents only 11 percent of the total reserves in the oil sands. About 315 billion barrels of oil are ultimately recoverable from the three oil sands regions.
- Production of oil from the oil sands has increased substantially. In 2004, production reached one million barrels per day. Estimates are that production will increase to 3.8 million barrels per day by 2020.
- Close to 70 oil sands projects are currently underway and more are in the planning and development stages.

Upgrading oil from the oil sands Opportunities in the Industrial Heartland

There is tremendous opportunity to not only extract bitumen from the oil sands but also to transform it into higher-value products such as synthetic crude oil, gasoline, diesel and other transportation fuels, lubricants, and petrochemical products. Currently, most of this 'upgrading' is done in the Fort McMurray area. In the future, an increasing portion will be done in the area northeast of Edmonton in what is called the "Industrial Heartland." The area includes the counties of Strathcona, Sturgeon and Lamont and the City of Fort Saskatchewan.

All indications are that the Industrial Heartland represents a major opportunity for upgrading and value-added activities in Alberta. Seven different companies have announced plans for construction or expansion of upgraders. The provincial government is actively promoting other secondary and tertiary industries in the area.

Potential upgraders include Shell Scotford, BA Energy, Northwest, Synenco, Petro Canada, Total, and North American Oilsands. The Shell Expansion and BA's plant are already under construction. There are opportunities for other companies to focus on the recovery of ethane/ethylene and propane/propylene liquids for petrochemical feedstocks, recycling and treatment of spent catalyst, diluent, metallurgy, fertilizer, and more.

The Industrial Heartland has some advantages over Fort McMurray when it comes to attracting these upgrading and value-added industries. Because labour is more readily available from all parts of metropolitan Edmonton and people can live in permanent rather than temporary housing, the necessary labour supply will be easier to access and more stable. Construction logistics and access to manufacturers and other suppliers are simpler in the Industrial Heartland. And other infrastructure such as rail transportation and some pipelines already exist and can be more easily expanded.

These advantages point to substantial investment and developments in the next few years.

Although the Industrial Heartland is not included in the terms of reference for this study, it will have a significant impact on Alberta's economy, rapid growth is anticipated, and the area may benefit from lessons learned in the three oil sands regions. As it stands today, industry does not believe that the province has been sufficiently active in planning and responding to infrastructure requirements to support such a massive development.

According to the Alberta Industrial Heartland Association:

- Current planning and funding mechanisms do not meet Heartland needs
- The resource road program is not equipped for the scale of development and multiple projects
- The traditional three – five year planning horizon will not meet the needs for traffic build up for projects already started.³

³ Meeting with the Alberta Industrial Heartland Association November 9, 2006.

The province has no provisions in the current capital plan for developing provincial roads concurrently with Strathcona and Sturgeon county municipal road plans.

This points to a clear need for the province to play a more active role in anticipating and planning for developments in the Industrial Heartland, along with the three counties involved and industry partners.

What do the oil sands mean for Alberta?

Economic benefits

The provincial government, communities and individual Albertans benefit directly and indirectly from developments in Alberta's oil sands.

The oil sands industry is a major driver of economic activity in the province and the pace of investment has been accelerating since the mid 1990s. From 1995 to 1999, investment averaged \$1.47 billion per year but from 2000 – 2004, that jumped to an average of \$5.75 billion per year. In the past two years (2005 and 2006), investment averaged \$10.3 billion per year. As explained in the subsequent section, that level of investment is expected to continue for the next five years.

Developments in the oil sands translate into a number of benefits for the province. In terms of royalties, the provincial government received close to \$4.45 billion in royalties from 1995-96 to 2005-06.⁴ In addition to royalties, the provincial government also receives tax revenues from corporate income taxes, personal income taxes from people working in the oil sands, and indirect corporate and personal income taxes. Municipalities in the oil sands regions and elsewhere also receive property tax from industries located within their jurisdiction.

The oil sands, and spin off industries related to the oil sands, are one of the largest sources of employment in the province. As a result, Alberta's unemployment rate is among the lowest in the country and the supply of skilled and unskilled labour is not sufficient to meet demands. This challenge will become even greater when major projects in the Industrial Heartland begin to increase the pace of construction.

Industry contributions

Over the years, industry has provided significant support to the infrastructure in and around Fort McMurray. In the 70s, Syncrude built entire neighborhoods and other infrastructure for its employees, including the construction of the Thickwood Heights Arena. They built the Ralph Steinhauer Bridge that spans the Athabasca River. This construction activity represented some \$300 million at the time and would be valued at over \$1 billion dollars today. Syncrude has continued its contributions in more recent times, the latest being a \$2.5 million Syncrude Canada contribution to the Athletic Park.

Suncor's predecessor, Great Canadian Oil Sands, supplied homes for its employees, support for recreational infrastructure and some contributions toward roads. Suncor's recent community investments include more than \$9.7 million to charitable organizations

⁴ Alberta Oil Sands Consultations fact sheets available at www.oilsandsconsultations.gov.ab.ca

in the Regional Municipality of Wood Buffalo and \$7.2 million pledged to 2010 for recreational, educational and medical causes. Suncor has also committed to the construction of an overpass on Highway 63. The overpass is expected to cost between \$30 and \$40 million and will serve their mine and upgrader facilities.

In 2005, total corporate donations to support community projects amounted to \$6.3 million, of which \$3.8 million came from Suncor. Cumulative contributions since 1996 exceed \$40 million.

While recent corporate donations are commendable, they don't approach the value of industry contributions made in the early days of oil sands development. And the majority of the recent contributions are still being made by two companies. "Newcomers" to oil sands development in the Athabasca oil sands area, although they are now beginning to contribute to the community, have not stepped up to the plate in the same way that Syncrude and Suncor have done over the years.

Environmental impact

While the benefits are enormous, the impact on the environment is undeniable. The key issues relate to the amount of surface and ground water used in the extraction process, the overall impact on the quality of surface and ground water, levels of greenhouse gas and other air emissions, land disturbance and the size of the footprint on the land base, land reclamation, and impacts on wildlife and endangered species. While these issues affect all three oil sands regions, the biggest challenges are in the Athabasca oil sands region due to the current and anticipated level of development in the area. The environmental impact, and how it is being addressed, is discussed in greater detail in section five of this report.

How are projects approved?

Extensive processes are in place to review oil sands projects before they can proceed. The processes involve the following steps:

- Securing a lease from the provincial government
- Assessing the environmental impact of proposed projects
- Obtaining approval from the Alberta Energy and Utilities Board
- Obtaining approval from Alberta Environment.

Securing a lease

The provincial government owns 81 percent of the province's mineral rights in Alberta. The remainder is held by individuals and companies ('freehold mineral rights') or by the federal government either in national parks or on behalf of First Nations.⁵

Alberta Energy administers mineral rights on behalf of Albertans. Every two weeks, Alberta Energy holds a public offering for companies who are interested in bidding on

⁵ Information about leases is taken primarily from background information prepared for the Alberta Oil Sands Consultation. Further information is available at www.oilsandsconsultations.gov.ab.ca.

Crown leases on specific parcels of land. The company with the highest bid wins the right to “drill for, win, work, recover and remove” minerals that are owned by the Crown.

Companies that bid on mineral rights must be registered to do business in Alberta. The names of winning bidders and the amount paid for each parcel of land are published on the department’s website after each sale.

The department holds an average of 24 public offerings a year and, over the past five years, an average of 220 oil sands agreements have been issued each year.

Currently there are close to 3,000 oil sands leases in place covering approximately 47,000 square km of land. Close to 70 percent of possible oil sands areas are still available for exploration and leasing.

Environmental assessments

In Alberta, an extensive environmental assessment process is required before major projects can proceed. For oil sands projects, an environmental assessment is mandatory. For other projects, steps are taken to decide whether or not an environmental assessment is necessary. Routine or small projects are generally exempt from the process.⁶

The purpose of the Environmental Assessment Process is to:

- Support the goals of environmental protection and sustainable development
- Integrate environmental protection and economic decision making at the earliest stages of development
- Predict the environmental, social, economic and cultural consequences of a proposed activity and assess plans to mitigate any resulting adverse impacts
- Involve the public, proponents and government departments and agencies in the review of proposed activities.

The process involves four stages:

- **Stage 1 – Initial review**

The process begins when the proponent for the project informs Alberta Environment of the proposed development. The location, size and nature of the project are examined as well as other factors to determine whether or not an environmental assessment is required. If an environmental assessment is not required, the proponent can apply for approval and the project can proceed. If an environmental assessment is required, as is the case for oil sands projects, the proponent of the project must provide public notice of that decision.

- **Stage 2 – Screening**

Based on a screening report, a decision is made about whether an Environmental Impact Assessment (EIA) is required for projects where an EIA is not mandatory.

⁶ Further information about the Environmental Assessment Process is available on the Alberta Environment website at www.gov.ab.ca.

This report is public. If an EIA is not required, the proponent of the project can proceed. If an EIA is required, that work begins.

- **Stage 3 – Preparation of an Environmental Assessment Report**

The proponent of the project proposes the terms of reference for what will be included in the EIA and this is made public for review. After allowing time for public comments, the Alberta Environment Director issues the final terms of reference which the proponent must use. This is also made public. The information to be included in an EIA can vary, but it typically includes potential positive and negative environmental, social, economic and cultural impacts of the proposed activity as well as plans to mitigate potential adverse impacts and to respond to emergencies, information on public consultation programs, and identification of health issues. The EIA must be submitted to the Director for review.

- **Stage 4 – Final review**

The Director and staff of Alberta Environment, in conjunction with other relevant government departments, review the EIA report and may request additional information. Because of the extensive amount of work involved in evaluating and assessing EIAs, a third party contracting approach has recently been developed by Alberta Environment to undertake some EIAs. This involves industry paying for independent, third party consultants to conduct EIA reviews, attend hearings, and review approvals for some applications. Alberta Environment will continue to oversee all applications and make the necessary decisions related to applications. The final EIA report is made public.

If concerns are filed by an adversely affected party, a public hearing may be triggered, in which case, other parties may also participate in the hearing process. The AEUB then makes a decision about whether the project is in the public interest. This decision is made after considering social, economic and environmental impacts associated with the proposed project. If approval is granted by the AEUB, Alberta Environment then decides whether environmental approvals should be granted. If environmental approvals are granted, they will include conditions to mitigate potential negative impacts of the project.

In summary

Some key points are obvious from the overall context for oil sands developments in Alberta.

- The oil sands are, and will continue to be, an important driver of economic development in the province.
- The financial and economic benefits to the province are enormous. Without the oil sands, it's fair to say that Alberta would be in a much less prosperous position and less able to provide key investments in important areas such as health, education and infrastructure.
- In spite of the benefits, there are negative impacts on Alberta's environment – on our air, land and water – that will need increased attention and action in the coming months and years.

- There are clear and deliberate processes in place for reviewing and approving oil sands projects and expansions. Those processes involve both mineral leases and environmental impact assessments.
- Planned developments in the Industrial Heartland will require careful planning to anticipate and prepare for the impact on infrastructure, communities and the environment in the region.