ABOUT CANADA’S OIL SANDS
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The importance of Canada’s oil sands

Canada’s oil sands are important to the U.S. economy and energy security. Global demand for energy continues to rise. Canada has the third largest oil reserves in the world and 97% of these reserves are in the oil sands. Canada’s oil sands help supply America’s energy needs while also creating American jobs and strengthening our broader economic relationship.

The Canadian oil and gas industry fully recognizes that it must also continue to improve its environmental and social performance.

Handy and credible

CAPP is the voice of Canada’s upstream oil and natural gas industry – representing companies that produce more than 90% of Canada’s oil and gas.

Our research indicates North Americans want a balanced discussion about energy, the economy and the environment. This pocket book is designed to give you fast, easy access to oil sands information that will help you get in on the discussion.
Information is sourced from credible third parties or developed using CAPP data checked against other data sources, including government reports.

To order more printed copies of *About Canada’s Oil Sands*, email publications@capp.ca

**Dig deeper**

We couldn’t cover it all in this little book! So we have provided links to various sources at the end of the book. Go ahead, dig deeper.

**More information?**

Are you curious about information that isn’t covered here? Send your questions to communication@capp.ca.

**Updates**

The information provided in this book is current as of September 2012. A regularly updated online version is available at www.oilsandstoday.ca.
UNIT 1

THE RESOURCE

WHAT ARE OIL SANDS?
The Resource

Canada has the third largest oil reserves in the world. 97% of these reserves are in the oil sands.
Oil sands

Oil sands are a natural mixture of sand, water, clay and bitumen.

Bitumen

Bitumen is oil that is too heavy or thick to flow or be pumped without being diluted or heated. Some bitumen is found within 200 feet from the surface but the majority is deeper underground.

Location

Canada’s oil sands are found in three deposits – the Athabasca, Peace River and Cold Lake deposits in Alberta and Saskatchewan. The oil sands are at the surface near Fort McMurray but deeper underground in other areas.
Recovering the oil

Oil sands are recovered using two main methods: mining and drilling (in situ). The method used depends on how deep the reserves are deposited.

Both recovery methods separate the bitumen from the sand.

Steam Assisted Gravity Drainage drilling (in situ) method

20% mining

20% of the oil sands reserves are close enough to the surface to be mined using shovels and trucks.

Mining shovels dig into sand and load it into trucks. Trucks take oil sands to crushers, where it is prepared for extraction.

Mining method
80% drilling (in situ)

80% of oil sands reserves are too deep to be mined so are recovered in place, or in situ, by drilling wells. Drilling (in situ) methods create modest land disturbance and do not require tailings ponds.

Advanced technology is used to inject steam, combustion or other sources of heat into the reservoir to warm the bitumen so it can be pumped to the surface through recovery wells.

Cyclic Steam Stimulation drilling (in situ) method

Oil sands that lie more than 200 feet below the ground are recovered using drilling methods.

- **Stage 1: Steam Injection**
  - Steam injected into the reservoir

- **Stage 2: Soak Phase**
  - Steam and groundwater heat the viscous oil

- **Stage 3: Production**
  - Heated oil and water are pumped to the surface

Hot water is added to the oil sands and then transported via hydrotransport to the extraction plant.

Bitumen is extracted from the oil sands in the separation vessels.

The tailings – consisting of sand, clay, water and a small amount of residual oil – are pumped to the settling basin, where the water is recycled and reused in the process.

Bitumen is sent to refineries across North America to make products including gasoline, jet fuel and plastics.
Regulated

Canada’s oil sands industry is regulated by various entities, including:

**Government of Alberta**

PRIMARY RESOURCE JURISDICTION

<table>
<thead>
<tr>
<th>Authority</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td>Alberta Energy</td>
<td>Resource rights and Crown royalties</td>
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<td>Energy Resources Conservation Board (ERCB)</td>
<td>Project approvals and compliance</td>
</tr>
<tr>
<td>Alberta Environment and Sustainable Resource Development</td>
<td>Environmental impact assessments, air and water, conservation and reclamation, public land access management, fish and wildlife</td>
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</tbody>
</table>

**Government of Canada**

NATIONAL POLICIES AND STANDARDS

<table>
<thead>
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<th>Authority</th>
<th>Responsibility</th>
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<tr>
<td>Canadian Environmental Assessment Agency (CEAA)</td>
<td>Environmental assessments</td>
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<tr>
<td>Environment Canada</td>
<td>Migratory birds, air and water quality, species at risk</td>
</tr>
<tr>
<td>Fisheries and Oceans Canada (DFO)</td>
<td>Fish and fish habitat, species at risk</td>
</tr>
<tr>
<td>Transport Canada</td>
<td>Navigable waters</td>
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<tr>
<td>National Energy Board (NEB)</td>
<td>Interprovincial and export pipelines</td>
</tr>
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</table>
UNIT 2

ENERGY

WHY DOES THE U.S. NEED OIL SANDS?
Energy

The oil sands are a vital energy source for North America and the world.
Global energy demand

Global Needs
Global demand for energy is expected to increase 47%* by 2035 as economies in both developed and emerging countries continue to grow and standards of living improve.
Source: U.S. EIA 2011  *Growth from 2010 to 2035, Reference Case scenario.

Unconventional Resources
All sources of energy, developed responsibly, will be needed to meet growth in global demand. With conventional oil supply declining, the need for unconventional resources, like oil sands, will increase.

Global Energy Demand (Reference Case scenario)

*primarily gasoline
Source: U.S. EIA 2011
Supplying growing demand

Fueling North America

Canada’s oil sands are uniquely positioned to contribute to meeting the growth in energy demand. In North America, oil sands production provides secure and reliable supply, reducing reliance on foreign imports and providing economic growth in both Canada and the U.S.

The majority (80%) of world oil reserves are owned or controlled by national governments. Only 20% of total world oil reserves are accessible for private sector investment, 55% of which are found in Canada’s oil sands.

Source: CAPP 2011

169 billion barrels

Canada has 174 billion barrels of oil that can be recovered economically with today’s technology. Of that number, 169 billion barrels are located in the oil sands.

Source: ERCB and Oil and Gas Journal

Canadian Production: Barrels/day

<table>
<thead>
<tr>
<th>Year</th>
<th>1980</th>
<th>2010</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crude Oil (incl. oil sands)</td>
<td>1.5 million</td>
<td>3.0 million</td>
<td>5.6 million</td>
<td>6.2 million</td>
</tr>
<tr>
<td>Oil Sands</td>
<td>0.1 million</td>
<td>1.6 million</td>
<td>4.2 million</td>
<td>5.0 million</td>
</tr>
</tbody>
</table>

Source: CAPP 2012
World’s largest trade relationship

The U.S. and Canada have the closest and most extensive trade relationship in the world. The countries share a large volume of bilateral trade.

$1.6 billion & 300,000 people/day

The U.S. and Canada trade the equivalent of $1.6 billion a day in goods. About 300,000 people cross the shared U.S./Canada border every day.

Source: U.S. Commercial Service

Trade

Energy is a major part of the U.S./Canada trade relationship. In 2010 energy products, including oil, natural gas and electricity, accounted for $103 billion worth of trade between the two countries.

Source: NRCan
Current energy supply

Trusted neighbors

Canada is the largest supplier of crude oil and petroleum products to the U.S.

U.S. imports of crude oil and petroleum products by country of origin 2011

Source: EIA 2012

Security of supply

Canada has abundant resources, production is growing and environmental standards are high.
Imports

Canada is the largest supplier of oil to the U.S. Oil imports from Canada rose from 16% of total U.S. imports in 2000 to 24% in 2011.

Source: U.S. EIA 2012

Canada’s share of U.S. imports

Source: U.S. EIA 2012

Filling the gaps

An opportunity exists to deliver more Canadian crude oil to the U.S. Gulf Coast, filling the gap created by declining supply from Mexico and Venezuela. Alternatively, this supply gap will be filled by increasing supply from non-Canadian sources including the Middle East.

Source: U.S. Department of Energy
Canada’s oil sands industry continues to pursue opportunities for growth in exports to the U.S. and market diversification to new markets in Asia.

2011 Canada and U.S. Crude Oil Demand by Market Region

70%

Pipelines accounted for 70% of all petroleum transportation in the U.S. in 2009. Interstate pipelines transport over 11.3 billion barrels of petroleum each year.

Source: EIA, Statistics Canada

Source: AOPL 2012
Canada has infrastructure to move crude oil from western Canada to eastern Canada, the U.S. and some offshore markets.

Pipelines are more cost-effective, efficient and have a much lower carbon footprint than alternative transportation options.

Small amounts of oil are also shipped by rail.

**Diluted**

In order to flow, the bitumen – which was separated from the sand at the source – is diluted with condensate or upgraded light crude oil.

**Not more corrosive**

Oil sands crude is more acidic than average conventional crude but is not more corrosive. Pipelines do not operate at a temperature greater than 150°F and crude oil acidity can only become a factor at 450°F.

Source: Comparison of the Corrosivity of Dilbit and Conventional Crude Report
As a result of strong growth in both U.S. and Canadian oil production, pipeline capacity is expected to be constrained in the next few years, requiring timely expansions to provide market access. In addition to the extensive network already in place, a number of pipeline projects are being proposed to connect the growing supply with the demand.

Current lack of pipeline market access costs the Canadian economy approximately $40 million/day. Source: CAPP 2012
Crude Oil Exports

Canadian crude oil sent to the U.S. is mainly refined in the U.S. In 2011, only 0.0458% of the total crude oil produced from imports into the Gulf Coast was exported.
Source: EIA

Montana Refining Company, Inc
Refineries in Montana have significant ties to the Canadian oil sands. According to Dexter Busby, Director Government and Regulatory Affairs of the Montana Refining Company, Inc., easy access to a secure supply of heavy crude is critical. “Our refinery is set up to process heavy crude, and 95 per cent of its feedstock is Canadian heavy crude, which includes oil sands oil. We probably couldn’t survive without it.”

Read more Industry in Action stories: www.capp.ca/innovation
“[Oil] will remain an important part of our energy portfolio for quite some time, until we’ve gotten alternative energy strategies fully in force. And when it comes to the oil we import from other nations, obviously we’ve got to look at neighbors like Canada and Mexico that are stable and steady and reliable sources.”

Barack Obama, President of the United States of America

“The United States and Canada have a longstanding history of being trusted neighbors and friends. This is no more evident than in the deep energy relationship between our two countries and given the continuing global uncertainties a relationship that is poised to grow even deeper, to our mutual benefit.”

Gordon Giffin, former U.S. Ambassador to Canada

“As our country continues to need oil, common sense tells me I’d rather buy it from our friends in Canada, not countries around the world that seek to do us harm. I’d rather buy from our closest ally and create jobs in America.”

Joe Manchin, U.S. Senator
UNIT 3

ECONOMY

How does oil sands development and production contribute to the U.S. economy?
Canada’s oil sands industry provides economic benefits across North America.
Canada and the U.S. share the world’s largest trading relationship. As a result, Americans benefit economically from increased economic activity in Canada. When investment and production ramps up in Canada’s oil sands, the pace of economic activity quickens and demand for U.S. goods and services increases.

$45 billion/year

On average, U.S. output of goods and services will increase by $45 billion/year from 2011 – 2035 due to increased demand from oil sands activity.

Source: CERI 2011

465,000 jobs

U.S. employment resulting from new oil sands developments is expected to grow from 21,000 jobs in 2010 to 465,000 jobs in 2035.

Source: CERI 2011
Jobs Across the U.S.

For every two oil sands jobs created in Canada, one job will be created in the U.S. Source: CERI 2011

Every U.S. state will benefit economically* from oil sands development and production. Induced impacts to the economy provide significant ripple effects, creating employment in numerous U.S. industries not directly related to the energy sector.

Source: CERI 2011

“The energy relationship between Canada and the U.S. is mutually beneficial economically. The money our country spends on Canadian oil is regularly reinvested through the purchase of American goods and services for oil sands projects. American citizens also benefit through their pension and retirement fund investments.” David Wilkins, former U.S. Ambassador to Canada
Economic benefits are direct, indirect and induced.

“The oil sands are a national treasure for Canada and the U.S. The resource is secure and comes from a friendly neighbor. In addition, much of the U.S. dollars spent on Canadian oil come back to America in trade.”

U.S. Senator Lindsey Graham

Incremental Employment by State 2010 – 2035
(Thousand jobs)

Source: CERI 2011

*Economic benefits are direct, indirect and induced.
Businesses

Examples of American companies supplying Canada’s oil sands

Over 2,400 American companies supply goods and services to Canadian oil sands and pipeline companies.

Source: CAPP 2012
Industry in action

The Caterpillar 797 is one of the world’s largest trucks with the capacity to haul up to 400 tonnes* per load. As of 2011, over 240 of these trucks had been purchased for use in Canada’s oil sands, giving an economic boost to four U.S. states.

- Engine made in Indiana
- Cab is fabricated and engine installed in Illinois
- Largest frame component is cast in Louisiana
- Giant Michelin® tires made in South Carolina

Canadian Natural Resources Limited

Canadian Natural, a large oil sands producer, owns and operates the Horizon Oil Sands facility in Fort McMurray, Alberta. The company has 283 contracts with American suppliers valued at more than $515 million, with 31 contracts valued in excess of $1 million each.

* All tonnes in this booklet are metric.
Helicopters are commonly used in the Fort McMurray oil sands region for activities such as exploration, surveying and transporting employees to remote areas. Helicopters also assist in wildfire suppressions and medical evacuations. Phoenix Heli-Flight has served the region for 19 years. Its fleet of helicopters uses equipment and services from Texas, Massachusetts, Colorado and North Dakota. “Vendors in the U.S. provide us with 100% of our high-tech equipment, 75% of our support equipment and 60% of our maintenance and overhaul services. The innovative and amazing folks we deal with in the U.S. are a key part of our success,” said owner Paul Spring.

Flint Hills Resources
More than 80% of Minnesota’s crude oil is delivered via pipeline from Canada. Flint Hills Resources owns and operates the Pine Bend Refinery in Rosemount, Minnesota. Decades of investment at Pine Bend have helped develop the expertise and necessary infrastructure to process oil sands crude in an efficient and environmentally responsible manner. Today, Pine Bend is a world-class refinery and the upper Midwest’s leading producer of transportation fuels, with a capacity of approximately 320,000 barrels daily.

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UNIT 4.1

ENVIRONMENT:

AIR

HOW ARE AIR AND GHG EMISSIONS AFFECTED BY OIL SANDS?
Air

Canada’s oil sands industry continues to reduce GHG emissions intensity.

Since 1990, GHG emissions associated with every barrel of oil sands crude produced have been reduced by 26%.
GHG emissions

Canada, with 0.5% of the world’s population, produces 2% of global greenhouse gas (GHG) emissions.

Global Energy Related Emissions by Region - 2009

- OECD Europe: 17%
- Non-OECD Europe & Eurasia: 9%
- China: 24%
- Japan: 4%
- India: 5%
- United States: 18%
- Canada: 2%
- Australia/New Zealand: 2%
- Other: 19%

Source: EIA

48 megatonnes

Oil sands’ total GHG emissions in 2010 were 48 megatonnes. Source: Environment Canada 2012

6.9% of emissions

Oil sands account for 6.9% of Canada’s GHG emissions and 1/600th (or 0.16%) of global GHG emissions. Source: Environment Canada 2012
Carbon dioxide (CO$_2$) is a GHG. CO$_2$ is emitted into the air by burning fossil fuels for electricity generation, industrial uses, transportation and for heat in homes and buildings.

**Wells-to-Wheels**

Measuring CO$_2$ emissions from the start of oil production (wells) through to combustion (wheels) is called a wells-to-wheels or life-cycle analysis.

**Intensity**

Oil sands crude has similar CO$_2$ emissions to other heavy oils and is 6% more intensive than the U.S. crude supply average on a wells-to-wheels basis. Source: CERA 2010

**Wells-to-Wheels CO$_2$ emissions from various sources of crude**

<table>
<thead>
<tr>
<th>Country</th>
<th>CO$_2$ Emissions from Production and Refining</th>
<th>CO$_2$ Emissions from Gasoline Consumption</th>
<th>Source: Jacobs Consulting 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>98 g CO$_2$/MJ gasoline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>102 g CO$_2$/MJ gasoline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iraq</td>
<td>102 g CO$_2$/MJ gasoline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td>102 g CO$_2$/MJ gasoline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td>106 g CO$_2$/MJ gasoline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US Gulf Coast</td>
<td>104 g CO$_2$/MJ gasoline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>California Thermal</td>
<td>114 g CO$_2$/MJ gasoline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil Sands Wtd. Avg</td>
<td>107 g CO$_2$/MJ gasoline</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

About 70% of oil-related CO$_2$ comes from combustion – including automobile exhaust.
GHG emissions – Coal-fired power and oil sands 2010

Note: The area of each circle is proportional to each jurisdiction’s greenhouse gas emissions.

- 100 million tonnes
- 50 million tonnes
- 15 million tonnes

Sources: U.S. DOE/EIA & Environment Canada 2010
GHG regulations

Regulated

Of the top five sources of imported oil to the U.S. (Canada, Mexico, Saudi Arabia, Nigeria and Venezuela) Canada is the only country that currently has GHG regulations in place.

Source: U.S. EIA

12% mandatory reductions

The Government of Alberta implemented GHG regulations in 2007 (the first jurisdiction in North America to do so) requiring a mandatory 12% reduction in GHG emissions intensity for all large industrial sectors including existing oil sands facilities, or a payment in lieu (current carbon price is $15/tonne).

Since 2007, these regulations have resulted in GHG reductions of 23 million tonnes, the equivalent of taking 4.8 million cars off the road for one year.
Carbon price

Alberta’s carbon price can be compared to European daily futures carbon credit system. The current carbon price in Alberta is $15/tonne. Oil sands producers are required to pay into a technology fund if they do not meet the emissions reduction targets.

![Carbon Price - Europe and Alberta](chart)

Source: ICE Futures Report

CCS

The Federal and Provincial governments are investing approximately $3 billion to help make Canada a global leader in carbon capture and storage (CCS) technology. Industry and government are cooperating to demonstrate the commercial and technical viability of CCS in Canada.

Source: AESRD
Air quality

24 hours/365 days

The Wood Buffalo Environmental Association (WBEA) monitors the air in the oil sands region in and around Fort McMurray – the centre of oil sands production – 24 hours a day, 365 days a year. Monitoring is science-based, transparent and credible. WBEA’s air quality monitoring network is one of the most extensive in North America. Air monitoring information is available in real time at www.wbea.org.

Improving or static

Data collected over the past 10 years at monitoring stations across Alberta indicate an improving or static trend in air quality across the province. Source: WBEA and CASA

No deterioration

Based on analysis of average concentrations of common air pollutants, air quality has generally not deteriorated in the Wood Buffalo region even with an increase in emissions-associated activities and population growth. Source: WBEA and CASA
Canada’s Oil Sands Innovation Alliance

Canada’s Oil Sands Innovation Alliance (COSIA) is an alliance of oil sands producers focused on accelerating the pace of improvement in environmental performance in Canada’s oil sands through collaborative action and innovation. Launched on March 1, 2012, the alliance will bring together leading thinkers from industry, government, academia and the wider public, building on previous collaborative successes. COSIA is made up of 12 companies.

www.cosia.ca

Read more Industry in Action stories: www.capp.ca/innovation
UNIT 4.2

ENVIRONMENT:

WATER

HOW DOES OIL SANDS PRODUCTION IMPACT WATER RESOURCES?
Water

Canada’s oil sands industry recycles water and continues to look for ways to reduce fresh water use.
Water Use

The Alberta Government closely regulates the use of water. Large water users must apply to divert fresh water from its original source. The amount of water allocated is based on sustaining Alberta’s groundwater and surface water.

Each sector applies for their water needs and the government allocates water based on these applications. In 2010, the oil sands industry represented 7% of total provincial allocations. But not all of that water was actually used. The oil and gas industry uses less than 1/3 of its total water allocation per year.

Alberta Water Allocations – 2010

- Irrigation/Agriculture: 44%
- Commercial: 29%
- Municipal: 11%
- Oil Sands: 7%
- Conventional Oil & Gas: 2%
- Other: 7%

Source: AESRD
The Athabasca River is the main source of water for oil sands mining projects. Drilling (in situ) projects do not source water from the Athabasca river.

Less than 3%

In 2010, 85% of the water withdrawn for oil sands mining was from the Athabasca River (total of 130 million m³). This is 0.6% of average annual river flows and less than 3% of the lowest weekly winter flow in 2010.

Source: AESRD

Water supply

Northern Alberta, where oil sands operations occur, has over 86% of Alberta’s water supply located in this region.

Source: AESRD
Drilling (in situ) currently requires an average 0.4 barrels of fresh water for every barrel of oil produced. Source: CAPP 2010

Mining currently requires between 3.1 barrels of fresh water for every barrel of oil produced. Source: CAPP 2010

Oil sands producers recycle 80 – 95% of water used. Source: AESRD

Oil sands fresh water use in 2010 was approximately 1.1 billion barrels. Drilling (in situ) operations use more saline (non-fresh) water than fresh water and continue to work toward improved recycle rates and replacing fresh water with saline water where possible. Source: CAPP 2010

1.1 billion barrels is equivalent to about 84% of the City of Seattle’s annual water consumption.
Water quality

Regulated

Alberta Environment and Sustainable Resource Development prohibits the release of any water that does not meet water quality requirements.

Assessment

In 2010, the Royal Society of Canada (similar to the U.S. National Academy of Sciences) commissioned an Expert Panel of Canadian Scientists to review and assess evidence relating to several perceived environmental impacts of the oil sands, including the impact of the oil sands on regional water supply.

Results

“Current evidence on water quality impacts on the Athabasca River system suggest that oil sands development activities are not a current threat to aquatic ecosystem viability.”

Source: The Royal Society of Canada
Tailings ponds

**Tailings**

After the oil sands have been mined, oil is separated from the sand and sent for further processing. “Tailings” are the leftover liquid mixture of mostly water and clay, some sand and residual oil.

**Settling ponds**

Settling or tailings ponds are large engineered dam and dyke systems designed to store tailings.

**Recycling**

Tailings ponds are also used as settling basins that enable water to be separated and recycled. Oil sands producers recycle 80–95% of water used, reducing use of fresh water from the Athabasca River and other sources.

**Seepage**

Several methods are used to limit and manage seepage from tailings ponds. For example, ditches around tailings facilities capture seepage that is pumped back into the tailings ponds.
**Fine tailings**
After separation, the middle layer has the consistency of yogurt. This combination of water and clay can take up to 30 years to separate and dry out. New technology accelerates this drying time to months instead of decades which speeds up reclamation.

**Reclamation**
Regulations require all oil sands operators have plans in place to convert fine tailings to reclaimable landscapes. This will speed up the process of reclaiming tailings ponds.

**Birds**
Residual oil can be found floating on the surface of most tailings ponds. This poses a threat to waterfowl that land on the pond. Several mechanisms are in place to deter birds from landing, including air cannons and radar/laser deterrent systems.
**Devon Canada**

Devon’s Jackfish drilling (in situ) project doesn’t use any water suitable for human consumption or agriculture for steam generation. 100% of water used is drawn from deep formations and is too salty to be used for other purposes. More than 80% of the water is recycled back through the process.

**Imperial Oil Limited**

Imperial’s Cold Lake drilling (in situ) operation has reduced its per barrel water use from 3.5 barrels in 1985 to 0.5 barrels today by recycling more than 95% of the water it uses.

Read more Industry in Action stories: [www.capp.ca/innovation](http://www.capp.ca/innovation)
UNIT 4.3

ENVIRONMENT:

LAND

HOW DOES OIL SANDS PRODUCTION IMPACT THE LAND?
Canada’s oil sands industry is committed to reducing its footprint, reclaiming all land affected by operations and maintaining biodiversity.
Land impacts

Alberta’s oil sands lie under 54,900 sq. miles of land. Only about 3%, or 1,850 sq. miles, of that land could ever be impacted by the mining method of extracting oil sands.

The remaining reserves that underlie 97% of the oil sands surface area, are recoverable by drilling (in situ) methods which require very little surface land disturbance (drilling (in situ) facility shown in above image).*

Oil Sands Land Use

*For more information on how oil sands are extracted, see pages 6 and 7.

Source: Alberta ERCB 2012
Some organizations claim the oil sands are destroying an area the size of Florida (approximately 58,670 sq. miles). In fact, the total mining footprint covers an area about 0.5% the size of Florida and 10% of that land has been or is being reclaimed. The total area that could be impacted by mining is about 3% the size of Florida.

Source: AESRD
Land reclamation

Law

Alberta law requires all lands disturbed by oil sands operations be reclaimed. All companies are required to develop a reclamation plan that spans the life of the project.

Certification

Reclamation is an ongoing process during the life of a project. Companies apply for government reclamation certification when vegetation is mature, the landscape is self-sustaining and the land can be returned to the Crown for public use.

Process: it takes time

The reclamation process involves monitoring, seeding, fertilizing, tree planting, seed collecting, topsoil salvaging and replacing. It also involves significant landform creation and contouring.

Source: OSDG

It can take up to 80 years for a conifer tree to grow to maturity.
94%

An Alberta Biodiversity Monitoring Institute (ABMI) report states that the Lower Athabasca region’s living resources are 94% intact.
Source: AESRD 2010

0.02%

0.02% of Canada’s boreal forest has been disturbed by oil sands mining operations over the past 40 years.
Source: AESRD 2011

10%

Since operations began in the 1960s, approximately 10% of the active mining footprint has been or is being reclaimed by industry. Reclaimed land will be certified by government when it can be returned to public use.
Source: AESRD 2011

34,750 sq. miles

In Alberta alone, approximately 34,750 sq. miles (or about 24%) of the boreal forest is protected from development (includes National Parks, etc.)
Source: CAPP 2010
Syncrude Canada Ltd.

In 2008, Syncrude received the first reclamation certification in the Canadian oil sands industry for the 257 acre area known as Gateway Hill. This area was planted in the early 1980s. To date, Syncrude has reclaimed 22 per cent of its total disturbed land.

ConocoPhillips Canada

Trees take a long time to grow from seed. A really long time. ConocoPhillips’ Faster Forests program is speeding up the reforestation of oil sands mining sites. Based on recommendations from a University of Alberta study, the company is planting spruce, birch and aspen seedlings with a 4 inch plug of soil and established roots. The program started in 2009 and continues to evolve with plans to include other types of vegetation. Several companies are piloting similar aggressive reclamation programs.

Read more Industry in Action stories: www.capp.ca/innovation
Learn more about the oil sands industry.

Alberta Biodiversity Monitoring Institute (ABMI)  
www.abmi.ca

Alberta Chamber of Resources  
www.acr.alberta.com

Alberta Energy  
www.energy.alberta.ca

Alberta Environment and Sustainable Resource Development (AESRD)  
www.environment.alberta.ca

American Petroleum Institute (API)  
www.api.org

Association of Oil Pipelines (AOPL)  
www.aopl.org

Cambridge Energy Research Associates (CERA)  
www.cera.com

Canadian Energy Research Institute (CERI)  
www.ceri.ca

Canadian Environmental Assessment Agency  
www.ceaa.gc.ca

Canadian Association of Petroleum Producers (CAPP)  
www.capp.ca  
www.canadasoilsands.ca

Centre for Energy  
www.centreforenergy.com

Clean Air Strategic Alliance (CASA)  
www.casahome.org
Comparison of the Corrosivity of Dillbit and Conventional Crude Report

Department of Fisheries and Oceans
www.dfo-mpo.gc.ca

Energy Resources Conservation Board (ERCB)
www.ercb.ca

Environment Canada
www.ec.gc.ca

International Energy Agency (IEA)
www.iea.org

National Energy Board (NEB)
www.neb-one.gc.ca

Natural Resources Canada
www.nrcan-rncan.gc.ca

Oil Sands Developers Group (OSDG)
www.oilsandsdevelopers.ca

The Royal Society of Canada
www.rsc.ca

Transport Canada
www.tc.gc.ca

U.S. Energy Information Administration (U.S. EIA)
www.eia.doe.gov

Wood Buffalo Environmental Association (WBEA)
www.wbea.org

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The Canadian Association of Petroleum Producers (CAPP) represents companies, large and small, that explore for, develop and produce natural gas and crude oil throughout Canada. CAPP’s member companies produce more than 90 per cent of Canada’s natural gas and crude oil. CAPP’s associate members provide a wide range of services that support the upstream crude oil and natural gas industry. Together CAPP’s members and associate members are an important part of a $100-billion-a-year national industry that provides essential energy products.

CAPP’s mission is to enhance the economic sustainability of the Canadian upstream petroleum industry in a safe and environmentally and socially responsible manner, through constructive engagement and communication with governments, the public and stakeholders in the communities in which we operate.

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