The Aspen Project
A SAGD Development
Initial Project Description | Plain Language Summary | June 2013

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PROPOSED DEVELOPMENT

The Aspen Project (Aspen) is an in situ steam assisted gravity drainage (SAGD) oil sands project in Alberta, proposed by Imperial Oil Resources Ventures Limited (Imperial). Imperial, as project owner and operator, is planning to submit the in situ regulatory application and related environmental assessment to the Energy Resources Conservation Board and Alberta Environment and Sustainable Resource Development. The figure to the right shows the lease areas for Aspen on which the regulatory application is based.

WHO WE ARE

Imperial Oil Limited

Imperial is a wholly owned affiliate of Imperial Oil Limited (IOL). IOL is one of Canada’s leading companies. As one of the largest integrated petroleum companies in Canada, IOL is a significant producer of crude oil and natural gas, Canada’s major petroleum refiner, a key petrochemical producer and a national marketer with coast-to-coast supply and retail networks. IOL has more than 5,000 employees in two operating divisions – the Resources division and the Products and Chemicals division.

Resources Division

IOL’s Resources Division manages the company’s natural resource operations and is based in Calgary, Alberta. It is one of Canada’s largest producers of crude oil and natural gas. It is a leading developer of Canada’s oil sands resources through its 25 percent ownership of Syncrude, its initial development of the Kearl mine and its long-standing in situ operations at Cold Lake, Alberta. With continued ownership in Syncrude production and additional development opportunities at Kearl, IOL has a long history of contributing to communities in the Rural Municipality of Wood Buffalo region. Imperial also holds an extensive and attractive portfolio of potential future opportunities. This includes exploration and development in areas of oil sands, Cardium tight oil, Horn River natural gas, the Mackenzie Delta and the Beaufort Sea.
Social licence to operate

Our ability to meet both stakeholder expectations as well as ensure responsible development is critical to our long-term business success.

OUR COMMITMENT

Imperial’s success depends on our ability to maintain an open dialogue with, and ongoing support from, local communities and stakeholders. Our social licence to operate and continued responsible growth as a company means we must balance the supply of rising global energy demands with the appropriate environmental protection. Imperial continues to reduce environmental impacts of oil sands development through research and the application of innovative technologies. Our near- and long-term business success depends on delivering the highest standards of integrity in all that we do. Integrity is a commitment to do the right things, every time – in safety, environmental performance, business ethics and community engagement.

PROJECT DETAILS

Estimated Production

The proposed Aspen development is an in situ steam-assisted gravity drainage (SAGD) operation. It is expected that eventual annual production capacity will be approximately 162,000 barrels of bitumen a day, based on the development of three phases each with 45,000 barrels per day of initial production. This production scenario could involve beginning construction on the initial phase of the project in 2016.

Estimated Schedule

Imperial initiated the Environmental Impact Assessment (EIA) for Aspen in May 2012. The collection and analysis of baseline data through field work and desktop studies has been ongoing since that time. Additional field work will be completed in 2013 to supplement the EIA and complete seasonal environmental data requirements.

Once this work is complete, Imperial plans to submit the regulatory applications and all supporting information. The regulatory applications will seek commercial scheme approval under the Oil Sands Conservation Act from the Energy Resources Conservation Board and environmental approvals under the Alberta Environmental Protection and Enhancement Act and the Alberta Water Act from Alberta Environment and Sustainable Resource Development.

Pending regulatory and other necessary approvals, it is anticipated that the initial phase of Aspen could begin construction by 2016 and production by 2020. Based on the resource characteristics and proposed recovery method, Aspen has an expected lifespan of about 40 years.

Potential Project Schedule*

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*represents three phases of development; schedule subject to change pending regulatory approval, corporate sanction and market conditions.
**PROPOSED IN SITU FACILITIES AND OPERATION**

**SAGD Recovery**

Aspen is Imperial’s first development project proposing to apply SAGD technology to recover bitumen from oil sands. The project proposes to recover bitumen from oil sands located in the McMurray Formation, approximately 250 metres below ground surface. The depth and characteristics of the resource are best suited for an in situ recovery method using a SAGD process.

The SAGD method proposed for Aspen uses horizontal well pairs to recover bitumen located deep below the ground surface. Two wells are drilled side by side, approximately five metres apart, into the reservoir. The production well is drilled lower than the injection well, so that it sits near the bottom of the reservoir. Steam is injected into the upper well to heat the bitumen and allow gravity to assist drainage into the lower production well. The heated bitumen requires additional assistance from electrical submersible pumps within the production wells to transport the product to surface pipelines.

**Project Facilities**

Multiple SAGD horizontal well pairs will be drilled from a single well pad. Field infrastructure for the initial development phases includes construction of 10 to 15 well pads with seven to 21 well pairs per pad. The well pads are connected to the central processing facilities through a pipeline network that delivers steam to the wells for injection into the reservoir and transports the steamed bitumen mixture to the central facilities for processing.

All phases of project development will use central processing facilities to separate the components of the bitumen, water and gas mixture that is produced from the steamed reservoir. The water and gas that is produced is used for additional steam generation. Water softening processes will facilitate reuse of as much produced water as possible. Imperial is currently evaluating on-site sources for make-up water.

Diluent is used to help the bitumen flow through the pipeline. Different diluent blending options are still being considered for Aspen’s recovered bitumen. The product is then transported through a pipeline network system to refineries and market distributors.

The Aspen project plans to use energy-saving cogeneration. Cogeneration is an efficient method of capturing waste heat to produce steam and electricity at the same time.

The central processing facility areas will include:

- bitumen processing facilities;
- produced and process water recycling;
- gas turbine for power and steam cogeneration;
- operations buildings; and
- waste management facilities.
**ENVIRONMENTAL MANAGEMENT**

Imperial is committed to environmental management as a key part of their business. This includes integrating environmental considerations in business planning, facilities and project design, operating processes and training programs. The company’s current development projects and operations incorporate extensive environmental design and protection measures to mitigate effects on water, land and air quality. Currently, Imperial is in the process of completing an EIA for Aspen that will assess the potential impacts of the project on surface water, aquatic resources, groundwater, air, soil, wildlife, vegetation, biodiversity, historical resources and traditional land use. Stakeholder input is important to adequately assess potential environmental impacts and develop appropriate mitigation measures for the project. Imperial strongly encourages stakeholder feedback throughout the consultation process in order to properly identify and address comments and concerns. In addition, a variety of ongoing public forums provide all stakeholders with opportunities to review and provide input to the company’s environmental performance and future developments.

**Reclamation**

The construction and development of the in situ project facilities for Aspen will require changes to the on-lease landscape and it is anticipated that access to the lease area will change and current use will be affected. As such, Imperial is committed to completely understanding the local land use of the project area and working with community members to reduce impacts and plan for timely reclamation. The reclamation approach proposed is to restore the areas on lease that are considered surplus during the life of the project. It is Imperial’s intent to engage stakeholders in reclamation planning so that, to the extent practical, reclaimed lands will have land use capability and available access.

**SOCIOECONOMIC BENEFITS**

Imperial will continue to utilize and build upon regional socioeconomic information for baseline assessment purposes for Aspen. Consultation with community members in proximity to the proposed development is essential in understanding potential socioeconomic impacts and benefits of this project. We expect benefits to include:

- **Support of local and regional business development** by preferring to use, on a competitive basis, qualified local and regional materials and service suppliers with high safety and environmental performance standards.
- **Continued business and employment advertisement** through the Regional Economic Development Link (RED Link) and Northeastern Alberta Aboriginal Business Association (NAABA) internet posting services.
- **Training and capacity building opportunities** to support local employment and long-term workforce development.
- **It is estimated that the size of the workforce required** for construction of the three phases will average approximately 450 people per year. During project operations, the workforce needed will be about 200 people per year.
- **Revenue, taxes and royalties will provide additional benefits** to the municipal, provincial and federal government (estimates will be determined through the socioeconomic impact assessment).
CONTACT INFORMATION

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All other inquiries are welcome, and should be directed to:

Imperial’s Media Information Line: 403-237-2710

For more information, please visit our website at www.imperialoil.ca/aspen

GLOSSARY

Aspen
A proposed in situ oil sands development project located about 45 km northeast of Fort McMurray.

Barrel
The traditional measurement for crude oil volumes. One barrel equals 159 litres. There are 6.29 barrels in one cubic metre of oil.

Bitumen
A naturally occurring viscous mixture of hydrocarbons containing sulphur and nitrogen compounds. In its natural state, it is not commercially recoverable through a conventional well because it is too thick to flow.

Cogeneration
An energy efficient method of using heat that would otherwise be wasted to produce electricity and steam at the same time.

Diluent
A light hydrocarbon product that, when blended with bitumen, allows bitumen to flow more easily through pipelines.

In situ
A Latin term that means “in place.” In situ operations are used to recover bitumen that is buried too deeply underground to be surface mined.

Kearl
Imperial Oil and ExxonMobil’s operating oil sands mine located about 70 km northeast of Fort McMurray.

Make-up water
The water for steam generation that is required to replace water lost (through injection in the oil sands formation, evaporation and disposal of wastewater) in the recycling process.

Process water
Water that is used for the SAGD process, including the utility systems that support the process.

Produced water
Water that accompanies bitumen from the production wells. It is a combination of water found in the oil sands deposit and water (condensed steam) from the SAGD process.

Reclamation
Returning disturbed land to a stable, biologically productive state. Reclaimed property is returned to the province at the end of operations.

Steam Assisted Gravity Drainage (SAGD)
An in situ production process using two closely spaced horizontal wells: one for steam injection and the other for production of the bitumen/water emulsion.

Purpose
The Plain Language Summary is formatted to provide an initial overview of proposed plans for the Aspen project, to identify the project location in relation to oil sands projects and communities in the region and to capture a current understanding of potential environmental impacts and socioeconomic benefits. Additional information will be shared as the Environmental Impact Assessment, stakeholder consultation and detailed engineering and design of the project progresses.

Disclaimer
This document contains forward-looking information on future production, project start-ups and future capital spending. Actual results could differ materially due to changes in project schedules, operating performance, demand for oil and gas, commercial negotiations or other technical and economic factors.