



Oil sands

Capability Statement



A new era for oil sands

All over the world, demand for oil and gas continues to grow. At the same time, the whole industry is realizing it must come to terms with new pricing levels, ever-increasing environmental consciousness, and the loss of market share to new, greener forms of energy.

Our approach

In business for over six decades, Hatch has partnered with clients all over the world to tackle their complex mining and oil and gas challenges. This has meant working in remote areas, developing new processes, and creating innovative technologies to help our clients adapt to an evolving world.

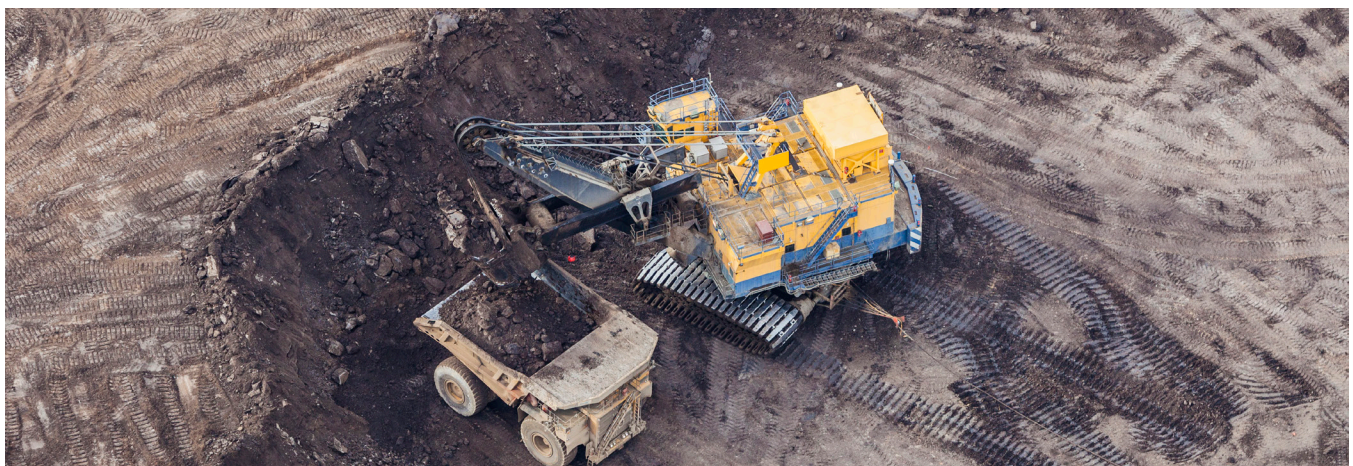
Oil sands are part of our core expertise. With decades of experience in both in-situ and mineable extraction for bitumen recovery, we are equipped with a deep understanding of technologies utilized for the treatment of difficult tailings, including clarifiers, screw conveyors, and separators. We can also assist you in providing the design for pilot plants for extraction and tailings prior to engaging in a full-size commercial plant.

You need innovative solutions, in-depth industry knowledge, and new technologies that will not only

decrease capital intensity and your environmental footprint but will also save on energy consumption. We're here to help and your bottom line is always top of mind.

Extracting more value from your assets

Canada's oil sands deposit is the third largest reserve in the world. Its responsible development is key to the industry's sustainable growth. Efficient bitumen recovery, minimization of environmental impacts, and effective project management and execution strategies are key drivers for growth. Our team of engineers and geoscientists are experienced in all areas of in-situ and surface mining recovery and processing. We provide expertise from mining and ore preparation to upgrading and tailings management—ready to solve the oil sands industry's toughest challenges.



At the forefront of technology development

We know the lay of the land in the oil sands industry. Hatch has a proud history of partnering with our clients to help develop and commission groundbreaking technology for the extraction of bitumen.

From the mining pit to the extraction process, to tailings management and emissions reductions, all the way to the pump at the gas station, our engineers have been involved in all aspects of the technology development lifecycle. These technologies continue to make unconventional oil resources more economically viable and strategically attractive.

Extraction and processing

The development and successful commissioning of several pilot plant facilities—for both extraction and froth treatment—has allowed us to gain vital knowledge that will ensure the efficient and timely development of full-scale operations. This includes effective sequencing of engineering deliverables, materials, and coordination of permits.

Bitumen paraffinic solvent extraction

Oil sands operators are challenged with recovering a bitumen product more sustainably and less energy-intensively. Paraffinic froth treatment is one way to achieve this result. Utilizing less heat and steam, while eliminating the upgrading step entirely, will significantly reduce GHG emissions for each barrel of oil produced. Having worked with Total Canada, we've developed a non-aqueous solvent bitumen extraction concept along with the associated tailings roadmap. As a result, our project experience includes engineering design of various paraffinic froth treatment projects including floating storage units (FSUs), Sulphur recovery units (SRUs), and tailings solvent recovery units (TSRUs).

Tailings treatment

The biggest challenge in the tailings management of mineable oil sands is to reduce the legacy of mature fine tailings (MFT) volume and to minimize tailings area. Our experts are familiar with the Alberta Energy Regulator Directives and Directive 85 (which replaced Directive 74), tackling fluid tailings management for oil sands projects. We have provided engineering and operational support to oil sands operators including CNRL, Shell, and Suncor (Petro-Canada) to address this issue through various non-segregated tailings (NST) and MFT projects in conceptual, prefeasibility, feasibility, and detail design phases. Our experience also consists of tailings impoundment upgrades—having delivered the complete EPCM for the Albion Sands Musket River mine tailings upgrade project—chemical injection in tailings, and evaporative methods of tailings drying technology.



Technology development

Technology development is in our DNA. In mining, our furnace technologies, high pressure autoclaves, and industry-leading tube digestion are just a few examples of our out-of-the-box thinking. In oil and gas, we partnered with Red Lead resources in the development of Eco shale technology—extracting oil from ore.

Responsible development, efficient recovery, minimization of environmental impacts, and effective project management and execution strategies are key drivers for the oil and gas industry's sustainable growth. Developers involved in extracting and producing unconventional oil products need cutting-edge technology to maximize returns and minimize impacts on the ecosystem. Tools such as computational fluid dynamics and finite element analysis help prove the viability and efficiency of our clients' projects. From mining through to ore preparation, hydro transporting, extraction, tailings, and upgrading, we work with our clients to provide value-added solutions.

Solvent based in-situ extraction

Nsolv[®], a proprietary technology, lets you access hard-to-produce heavy oil reservoirs in situ for a fraction of the traditional cost of a thermal recovery scheme. A CAD\$70-million pilot plant in Fort McMurray, Canada, has produced hundreds-of-thousands of barrels of oil using Nsolv[®]'s proprietary technology at its bitumen extraction solvent technology (BEST) pilot facility. In today's low-price environment, Nsolv[®] offers a higher return on investment and produces better quality oil.



Services-at-a-glance

Our services range from design to operations, covering everything in between. From conceptual design and mine planning, to mine development, bitumen processing and utilities, and offsites—our mineable oil sands team can deliver the full suite of upstream oil recovery services. We take it a step further, adding value to your operation and maximizing project efficiency.

Our diverse team of engineers are experienced in all areas of mineable oil sands projects including Kearl initial development (KID), Kearl expansion project (KEP), Kearl fine tailings treatment project (KFTTP), Kearl paraffinic tailings treatment (KPTT), and Kearl power generation (KPG). Hatch is also familiar with CNRL's in-pit extraction plant project (IPEP) and their patent.

Specialized services

- Conceptual and DBM design
- Bulk material handling
- Tailings management and disposal
- Primary and secondary extraction
- Integrated water management
- RAM modeling
- Process design, simulations, and optimization services
- Technology development for unconventional oil and gas resources
- Pit and mining design
- Water management and treatment
- Ore preparation and materials handling
- Initial extraction for froth generation
- Froth treatment
- Pipeline and transport facilities
- Slurry pipeline and hydro transport design





Selected project experience

Nsolv BEST Pilot

Nsolv | Canada

Design basis memorandum through detailed engineering, project and construction management, and operation of the Nsolv pilot plant—a new oil sands bitumen extraction technology using warm solvent injected underground to dissolve and mobilize bitumen and allow for extraction and recovery of the valuable resource. This is a low GHG, low energy intensity, and no water use extraction technology.

ESEIEH Phase II Small Scale Pilot Project

Suncor Energy Oil Sands Limited Partnership | Canada

Completion of FEL 3 services. The project was to design the ESEIEH pilot plant to demonstrate the ESEIEH technology—a new in-situ bitumen recovery strategy that combines electromagnetic formation heating with enhanced solvent vapor extraction, independent of steam injection.

OPP and HT Train 4 and 5

Canadian Natural Resources Limited | Canada

Design basis memorandum, engineering design specifications and review of design and technology for the dry-side material handling and wet-side slurry preparation of the ore preparation plant, hydro transport, utility pipelines and associated equipment of the Horizon Oil Sands project, trains 4 and 5.

Albian Full Spectrum NIR Analyzer

Albian Sands Energy | Canada

Installation of full spectrum NIR analyzer in oil sands feed application for feed forward process control.

Mature Fine Tailings (MFT) De-Watering Pilot Plant

Canadian Natural Resources Limited | Canada

Engineering and procurement services from concept through construction, commissioning, and start-up of this MFT dewatering pilot facility. A cost estimate was developed to remove MFT from an existing tailings pond, treat it with chemical injection, and deposit it into a dedicated disposal area. The scope of facilities included a floating barge, floating pipeline to shore, pipeline with booster pump stations, power supply, and controls.

Fort Hills Ore Preparation Plant

Suncor | Canada

Review and validation of the DBM and front-end engineering design for phase 1, a class III cost estimate and stage gate review for the ore preparation plant. This is one of nine silos which form the bitumen production plant, designed to increase the bitumen feed to the upgraded 165,000 bpd.



About Hatch

Whatever our clients envision, our engineers can design and build. With over six decades of business and technical experience in the mining, energy, and infrastructure sectors, we know your business and understand that your challenges are changing rapidly.

We respond quickly with solutions that are smarter, more efficient, and innovative. We draw upon our 9,000 staff with experience in over 150 countries to challenge the status quo and create positive change for our clients, our employees, and the communities we serve.

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