

BLACK GOLD RUSH

Open shop contractors are proving their worth on in situ projects in the previously hard-to-crack oilsands industry.

BY JOEL THOMPSON

MANY BELIEVE THE OILSANDS INDUSTRY TO BE A NEW development but extracting oil from the oilsands deposits in northeastern Alberta actually has a relatively long history. Oilmen first began the effort to produce oil from the sands early in the last century and pilot plants were being built in the Fort McMurray area in the 1950s. The first large commercial operations, built by Suncor and Syncrude, are now over 25 years old and four years ago Syncrude celebrated producing its billionth barrel of oil.

Awareness of the value of the oilsands as a resource might have been limited five years ago but a virtual explosion in the number of oilsands projects has raised the profile of the industry everywhere. Even American politicians, famous for their ignorance of all things Canadian, have become aware that oil reserves in our oilsands are greater than those in all of Saudi Arabia.

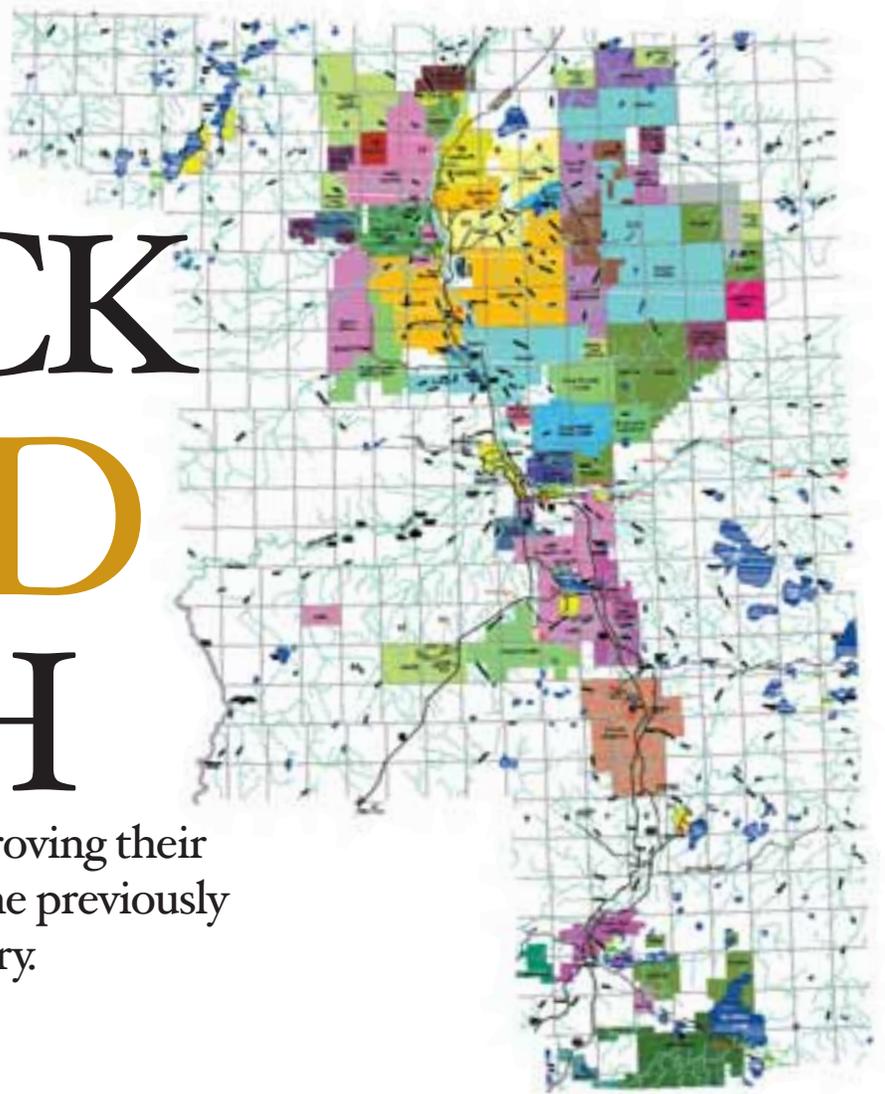
Any graph illustrating the history of oilsands development would show a very steep rise beginning in the late 1990s. Prior to that, stretching all the way back to 1788 when Alexander Mackenzie first reported sticky black sand on the shores of the Athabasca River, entries were few and far between. Now, in 2004, oilsands projects are so numerous that it is difficult to keep abreast of all that is happening.

We are clearly entering a new era of oilsands development. It wasn't that long ago that two companies and one location described the oilsands industry - Suncor, Syncrude and Fort McMurray. Now it's a varied, even bewildering, list of players, project names and locations that are populating the sector. Who are the players? The list includes Imperial Oil, Petro Canada, EnCana, Canadian Natural Resources, Shell Canada,

Opti/Nexen, Black Rock Ventures, Enerplus Resources, Deer Creek Energy, Devon Energy, Suncor, Syncrude, Synenco Energy, Japan Oil, Petrobank Energy, ConocoPhillips, TotalFinaElf and Husky Energy. Where are they operating? In addition to Fort McMurray, there are projects running at or planned for McKay River, Cold Lake, Conklin, Anzac, Wolf Lake, Jackfish, Dover, Christina Lake, Joslyn Creek, Fort Hills, Primrose, Hangingstone, Whitesands, Mahkesses, Mahihkan, Nabiye, Foster Creek, Tucker Lake, Surmont, Kearl and Long Lake.

The roster of projects also morphs over time according to oil prices, capital availability, technology and regulatory issues. Named projects may fall anywhere in a line from basic research to pilot plant, to commercial production.

While keeping track of the projects and their proponents may be complicated, it is not hard to understand that this burst of development represents huge capital investment and an immense amount of construction activity. The specs for oilsands projects always contain a lot of zeroes - billions of dollars, hundreds of thousands of barrels of oil and millions of construction man-hours. Even the smallest of these projects are significant and will continue to be a big



part of the construction marketplace in Alberta.

For open shop contractors, new opportunities are appearing in the oilsands sector because of the expanding market and because the owner community is actively seeking more participation from the non-union side of the construction industry.

To simplify the scene, it is possible to break the oilsands sector into two locations – Fort McMurray and Cold Lake – and two different extraction methods – mining and in situ. Both methods have proven technology and economics. Billions of dollars have recently been invested in both mining and in situ projects and billions more are committed. For a variety of reasons, it is the in situ projects that hold the most promise for open shop contractors.

Oilsands deposits vary in their grade or richness of the ore and in how deep the oil bearing sands are buried. Shallow deposits can be economically developed as surface mines but deeper ore bodies must have their oil extracted in place or, in situ, through wells drilled through the ore body.

There are currently three oilsands mines in operation; all in the Fort McMurray area. The oldest is operated by Suncor, the largest by the Syncrude consortium, and the newest by Shell/Chevron/Western Oil Sands. Like mining for any other mineral, oilsands mining requires economies of scale to be profitable. Alberta's oilsands mines are gigantic, multi-billion dollar operations that employ gargantuan equipment to move mountains of material (Syncrude's stripping operation moves 300,000 tonnes per day) and have production capacities of hundreds of thousands of barrels of oil per day. All three have expansions either underway or planned.

In situ projects vary somewhat in their technology but the current production methods all employ steam injection to enable the collection of bitumen in horizontal well bores. In situ projects have been located mainly in the Cold Lake region but there is now in situ production in the Fort McMurray area as well.

Leading players in this field have been EnCana with their Foster Creek development, Imperial Oil at Cold Lake, PetroCanada at McKay River and Suncor with the Firebag project.

The expertise to produce bitumen from deeply buried deposits was developed over many years of research and pilot projects dating back to the 1960s. The ability to exploit these deposits owes much to expertise gained from many years of conventional production of heavy oil in the Cold Lake and Lloydminster areas as well as advances in drilling technology that has enabled the precise placement of horizontal well-bores.

A good part of current in situ production comes from a method called Steam Assisted Gravity

Drainage. (SAGD) uses paired horizontal well bores where steam, injected into the upper well, causes bitumen to flow from the deposit to a lower well bore, where it is pumped to the surface. Foster Creek, Firebag and McKay River are all SAGD projects.

Imperial Oil at their Cold Lake operations uses Cyclic Steam Stimulation or as it is commonly called, "huff and puff". This method alternates cycles of steam injection with production from the same well bore.

Both the mining and in situ models are proven technology. The explosion of interest in developing oilsands leases can be linked directly to the simple math of production costs versus oil prices. Even at prices considerably less than the current \$30 plus a barrel, these projects are profitable.

While the margins may not be as big as those from production elsewhere, clearly, when investment decisions are being made, oilsands projects are getting the nod over more risky areas. The political stability and modern infrastructure that Canada offers and its proximity to the American market, mean that our oilsands are still an attractive choice to bring on new production when compared to Africa, the Middle East or Russia. That advantage of being located in Canada is coupled with the immense size of the reserves – billions of barrels in both the Cold Lake and Athabasca deposits. While the cost of production may be high, there is none of the expense and risk of exploration that is required to find new conventional deposits.

Development and construction strategies for the mining and in situ projects have followed different paths. The mining developments are megaprojects. The most recent mine-based project was lead by Shell Canada. Their Muskeg River project included development of a mine and extraction facilities north of Fort McMurray, expansion of their Scotford refinery outside of Edmonton and pipelines between the two sites. The final price tag was in the \$8 billion range. Even though recent projects at Suncor and Syncrude were expansions to existing operations, they also were multi-billion dollar investments.

To date, the construction strategy for these huge facilities has been union-only closed sites governed by special project agreements negotiated with the international building trade unions. The rationale offered for this model has always been the need to secure labour peace and an adequate supply of tradespeople.

These recent oilsands megaprojects all experienced huge cost overruns. Those results have triggered intense scrutiny of all aspects of the projects in an attempt to identify and eliminate the source of the price shocks. Two proposed projects, a mine by True North Energy and an upgrader by PetroCanada were subse-

quently shelved with costs concerns cited as the reason.

As all the players search for solutions to the problems experienced on recent projects, it is certain that the delivery model for these major mine/upgrader projects will see changes.

The in situ projects have followed quite a different construction and project delivery model. These projects, while not small, are not at the scale of the mining projects – tens or hundreds of millions of dollars as opposed to billions, construction crews of several hundred men as opposed to several thousand. They also lend themselves to incremental expansion and that is how most of the in situ production is being put in place. Operators move from pilot projects to small commercial development to phased expansion.

Imperial Oil's operations at Cold Lake are a good illustration of the model of incremental expansion that has characterized the development of the in situ side of the oilsands industry.

Imperial first began researching production methods in the 1960s and had commercially viable technology by the late 1970s. By 1985, they were producing 25,000 barrels per day. Today, their Cold Lake operations produce about 130,000 barrels per day from nearly 3,000 wells and their total investment to date is approaching \$3 billion. Their latest project, Mahkeses, consisted of 500 wells along with processing facilities and a co-gen plant.

At a cost of \$650 million and with a construction workforce peaking at close to 700 people, the Mahkeses plant was certainly a major project but it was far smaller than those associated with the mining operations. As opposed to the union-only closed sites of the megaprojects, Imperial used an open site approach at Mahkeses and a large number of contractors participated, with Ledcor Industries and Flint Energy Services as the major players.

Darrel Butchko of Imperial explains that their construction strategy has always involved seeking “the best deal we can get. To date, that has meant being open shop and we have been satisfied with open shop performance.”

He also adds that their long history in the Cold Lake region and their almost continuous expansion has meant that a large portion of their contractors are local and much of the workforce lives in the area.

The Mahkeses project stands out at a time when so much attention is being paid to cost overruns on industrial construction. As Tim Hearn, Imperial Oil's chairman, said, “It's worth noting that the Cold Lake expansion was the only recent major oilsands project to be completed without major delays or cost overruns.” Mahkeses was chosen as the Alberta Construction Association project of the year.

It is difficult to avoid making tortoise and hare comparisons when looking at in situ versus mining and Im-

perial's Cold Lake operations make that case. The recent work at Mahkeses was expansion phases 11 to 13 of the ongoing development of their reserves. Approximately \$1 billion is committed to further expansion. Nabiye, now awaiting regulatory approval, will be phases 14 to 16. More well pads are to be developed to feed the existing Mahikan North plant.

These projects will push Imperial's in situ production to 200,000 barrels per day. To equal that rate of production would require a \$5 billion investment in a mine. That scale of expenditure would demand an intense construction effort to have a producing asset up and running as quickly as possible – a process subject to much risk and uncertainty. The incremental increase of in situ production gets you to the same end result without having to manage a megaproject. Small mines aren't viable

but in situ operations of 10,000 barrels per day or 200,000 barrels per day are. It is possible to ramp up in situ production in a way that maximizes planning and minimizes risk – every phase of expansion brings the ability to apply lessons learned in previous projects.

Suncor's Firebag project northeast of Fort McMurray also illustrates the differences between in situ and mining projects. Firebag uses the SAGD method of extracting bitumen. For Suncor, the company with the longest history of oilsands mining, this was their first venture into full scale in situ production.

Firebag was launched at a time when Suncor was deeply concerned with the cost overruns that they were experiencing with the multi-billion dollar expansion of their existing mine and upgrader, Project Millennium. Like Imperial's Mahkeses, the \$610 million Firebag was not a small project but was still considerably smaller than Millennium. For Firebag, Suncor ran an open site for the first time, a departure from their past practice in Fort McMurray of closed sites with work done exclusively by the building trade unions. Firebag also stood out for being on time and on budget.

Don Mousseau, construction manager for Suncor, says, “Our construction strategy will continue to evolve. We want to develop a supplier of choice model



Imperial Oil:
THE MAHKESES PLANT

which will allow continuous improvement and involve long term relationships, partnerships with contractors. This is part of the effort to control costs all along



Imperial Oil:
THE MAHKESES PLANT SITE
UNDER CONSTRUCTION

our supply chain.

“We want an open site, we’ve moved away from the closed-shop, union-only model,” Mousseau goes on to explain. “We want to see competition and we want to see the value that we have seen in our Firebag project. We are still going to need all sectors of the industry, CLAC, non-union and building trades but we are looking for value and safe project execution. We’re also looking for flexibility. Shift flexibility is currently not available to us through the building trades. While there is no sense in working extended hours now when it’s dark and 30° below, in the summer when we have daylight and better conditions, we want the flexibility to be able to work extended shifts.”

Mousseau is quick to point out that no one is blaming the workforce for cost overruns but that labour costs and productivity are just one part in the whole supply chain. He says the owner has “a huge role” in making sure they receive the best value from every link in that chain.

Flint Energy Services was the lead contractor on the Firebag project. Flint’s HR director Wayne Olmstead reports that, despite a tight manpower market in the industrial sector for most of Firebag’s construction, they were able to assemble a crew that delivered the productivity and safety performance that their client was seeking.

Design capacity at Firebag is 35,000 barrels per day and even as initial production is coming on stream, work is already underway for phase two. Mousseau says that they have approval for eight phases at Firebag. The expansion projects, while similar to phase one, “are not cookie cutter” and Suncor will be making improvements wherever they can be identified. With this first expansion, most of the changes will involve water treatment and waste water re-injection.

Without question, there is an exciting future ahead for the oilsands industry and prospects are especially bright for open shop construction contractors who work in this sector.

There is an impressive list of pending new in situ

developments and ongoing expansions to existing operations. An open shop construction model has proven successful in this sector and will likely continue to be the method of choice. The in situ sector has now reached a point where it is accurate to say that ongoing development is continuous. The next major project on the horizon, and the biggest in situ development yet, is the OPTI/Nexen proposal for their Long Lake site south of Fort McMurray.

On the mining side, despite the recent cost overrun problems, investor interest is still there. The next megaproject, an \$8 billion mine and upgrader proposed by Canadian Natural Resources for a site north of Fort McMurray is moving closer to construction start-up. The intense scrutiny of the cost and productivity problems experienced on earlier projects will likely result in increased open shop participation on jobsites that were traditionally closed to open shop contractors and non-union workers.

It is hard to envision a more positive picture than what we have now but technological advancements in both extraction and upgrading may make future prospects for oilsands development even brighter. On the in situ side, there may soon be commercial production using processes quite different from the current steam injection. Those new techniques include injection of vapourized solvents, hot air, propane or CO₂.

The current mine/upgrader operators – Shell, Syncrude and Suncor – are all putting intense effort into driving down their costs per barrel and that effort will result in continuous improvement to their processes. While technological breakthroughs are less likely in mining and at the upgraders, constant R&D efforts will improve efficiency there as well. Twenty years from now, we may be describing 2004 methods as primitive and costly.

With all the new projects and expansions being announced, one can already detect a kind of gold rush mentality developing around the oilsands industry. There may be a pot of gold in the offing but there are also lots of problems and challenges to confront.

Energy prices are always an issue. Current production is still viable at substantially lower crude prices but a prolonged dip in oil prices will slow or halt the present rush of new developments and expansions. On the other end of the scale, high natural gas prices have serious impact on netbacks from synthetic crude as gas is the energy source for the substantial heat input that all current extraction processes require. Environmental issues are important. The industry requires large volumes of water and that usage is receiving closer scrutiny. The mining projects must manage very large tailing ponds and reclamation is a substantial ongoing responsibility. Alberta has favourable development policies and royalty regimes in place but new

regulatory issues such as Kyoto-mandated controls on emissions could be key concerns in the future. Interest and exchange rates are also critical in both attracting new investment and determining the return from current production.

Perhaps the most important challenge facing the oilsands industry right now is the construction component. Can new projects be built within budget? That question is closely related to the construction labour market and the supply of skilled labour. Even if only a portion of the proposed projects become reality, it appears that by 2005-2006 construction activity and labour demand is going to equal or exceed the 2001-2002 peak which occurred when Shell, Suncor and Syncrude had overlapping projects. While the industry was able to meet those demands, it was not without considerable problems and many attribute the major cost overruns to the overheated construction market. Will the lessons learned there foster changes that will allow that volume of construction to be exceeded while still delivering projects on time, on budget?

There are indications that the traditional closed shop, union-only model is giving way to open sites with more participation from non-union work forces. With the amount of work pending however, there is concern that the open shop sector of the construction industry does not have the capacity to meet the demand. At the same time, deadlocked contract negotiations in the union sector seem to indicate that the building trade unions are not able or willing to make the changes that the owner community has identified as necessary for their projects to be viable.

Construction people, who experienced a painful market meltdown in the 1980s, may become nervous when they start hearing the word "boom" again, but it is difficult to not to have those thoughts when confronted with the long list of proposed oilsands projects and the price tags attached. Many will not proceed past the feasibility study stage but even if only a small portion become reality, we are about to see a huge amount of development. The possibility exists that if new extraction technology proves viable, the already crowded ranks of project proponents will swell even further.

For open shop contractors, there are nothing but positives in the growth of the oilsands industry. The on-time, on-budget track record on in situ projects will help ensure even more work arising from the long list of pending developments. It also appears that open shop contractors will be invited to participate in areas where they were once shut out. The new era in oilsands development may usher in a new era in industrial construction in Alberta. ☐



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