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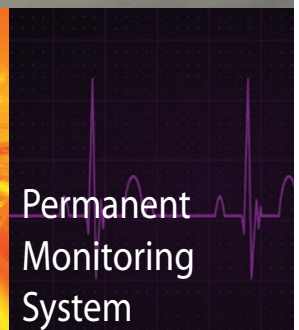
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# Trends in Alaska exploration

*A topsy-turvy year still produces some concrete themes worth considering*

By **ERIC LIDJI**

For Petroleum News

**W**hen a sample size is small, it's best to consider circumstances on a case-by-case basis.

But even in Alaska, where the sample size for exploration is relatively small compared to regions in the Lower 48 and Canada, little trends seem to inevitably emerge each year.

Here are a few themes from this edition of The Explorers.

Accumulate Energy, Great Bear Petroleum and Royale Energy have all been exploring the potential of developing source rocks and have each decided that any unconventional program in Alaska must have an associated conventional program to improve economics.

For many years, Alaska Native corporations only participated in the oil patch as landowners or service providers. Now, Ahtna, ASRC Exploration, Cook Inlet Region Inc. and Doyon Ltd. are all operating exploration programs. The Ahtna and Doyon programs are an attempt to improve the quality of life in their regions by discovering natural gas fields. The ASRC Exploration program is more a conventional search for an oil field on state land. CIRI was initially a landowner in a Nordaq exploration program in the Kenai National Wildlife Refuge, but took over after Nordaq missed work commitments. Along similar lines, Usibelli has drilled near its mine in an attempt to fuel its operations.

Shell and Apache each suspended their operations in Alaska after years of ambitious exploration goals. Both were victims of external obstacles and poor drilling results. Linc Energy suspended its underground coal gasification program and scaled back the size of its development plans for the Umiat oil field as it searches for potential partners. Miller Energy Resources Inc. was slowed by bankruptcy proceedings much of last year.

Furie Operating Alaska brought the Kitchen Lights unit into production in November 2015 and is proposing a major exploration program for the next few years. BlueCrest Energy expected to bring

the Cosmopolitan field into production in April 2016 but is hanging any future exploration activities on the future of the state tax credit program.

Hilcorp proposed its first standalone exploration project in Alaska with the Greystone pad and continued to advance projects at the Deep Creek and Ninilchik

units. Aurora ended a long hiatus by proposing considerable exploration work on the west side of Cook Inlet.

Development work seemed to be on hold when Repsol sold a majority stake of its North Slope leases to partner Arm-

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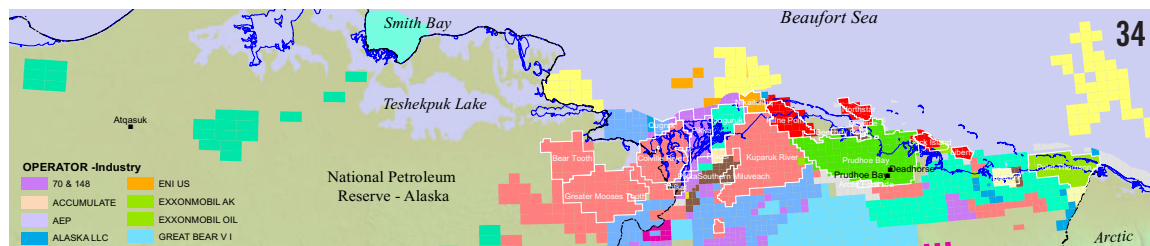
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# Licensing program draws interest to Interior, Southcentral

*Program allows companies to nominate state lands for exploration activities*

By ERIC LIDJI  
For Petroleum News

The vast majority of oil and gas exploration activity in Alaska occurs on lands or waters that companies lease from the state or federal governments or from Native tribes.

But the vast majority of Alaska is not available for leasing.

To encourage activities outside of the traditional leasing areas, the Alaska Department of Natural Resources maintains an exploration license program. Every April, the department accepts applications for areas between 10,000 and 500,000 acres. The applicant proposes a geographic area as well as a work commitment and a term limit. The process allows other companies to make competing bids, in an effort to get the best deal for the state.

As of early 2016, according to information available on the Division of Oil and Gas website, the state was overseeing five current licenses (Healy basin, North Nenana, Southwest Cook Inlet, Susitna basin V and Tolsona), two extended licenses (Susitna basin II and Nenana basin), two pending requests (Gulf of Alaska and Houston-Willow basin), two rejected applications (Susitna basin III and Susitna basin IV), one license under appeal (Holitna basin) and one expired license (Copper River basin). Many of those are discussed elsewhere in The Explorers. Others requests are detailed below.

## Houston-Willow Basin

Although the licensing program offers acreage across much of Alaska — from Bethel and Dillingham to Valdez and Fairbanks, and also patches around Nome and above the Arctic Circle — interest has tended to focus on a few areas close to existing infrastructure.

One of the two pending proposals fits this model and the other is an anomaly.

The current proposal for the Houston-Willow basin is a new attempt to arrange a program for an area along the Parks Highway, between Houston and Willow.

In April 2007, LAPP Resources Inc. requested a 10-year natural gas exploration license covering around 21,240 acres near Houston and Willow, north and east of the Parks Highway. The proposal included an initial \$500,000 work commitment. The plan was to explore for conventional natural gas and possibly shallow gas deposits, if encountered.

The state accepted comments on the proposal in early 2008 and extended the comment period later in the year. After LAPP Resources principal Dave Lappi died in 2011, investors Samuel H. Cade and Daniel K. Donkel assumed control of the proposal. In early 2016, the state once again solicited public comments for the proposed license.

The state had yet to rule on the proposal by the time The Explorers went to print.

The area between Houston and Willow has attracted exploration for decades. In the mid-1950s, Anchorage Gas and Oil Develop-

ment Co. Inc. drilled several exploration wells in the area after the U.S. Bureau of Mines discovered methane gas there, but the company suspended all the wells before the end of the decade, according to Jack Roderick's history of oil and gas development in Alaska, "Crude Dreams." Lappi began evaluating the region for shallow gas and coalbed methane possibilities in the early 1990s. He acquired leases in the area in 1993 and drilled exploration wells between 1998 and 2000.

## Gulf of Alaska

The Gulf of Alaska proposal also touches one of the earliest exploration areas in the state.

In early 2015, the state took comments on a proposal from an as-yet-unnamed applicant interested in an exploration license along the coastline of the Gulf of Alaska between the Copper River Delta and the Canadian border. The proposed area stretched from Controller Bay to Icy Bay and includes the Katalla and Yakataga area. The state originally requested comments through July and later extended the period in to August.

Oil seeps were reported in the Katalla region and the north side of Controller Bay as early as 1896, according to Roderick. Commercial activity began in 1900, when Sir Thomas Boverton Redwood encouraged a British consortium to drill an exploration well near Katalla Meadows. The next century featured numerous attempts to develop

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## TRENDS *continued from page 5*

strong, but Armstrong later announced accelerated plans. And Caelus Energy seemed to be reducing Alaska investment when it slowed plans for the Nuna development but instead commissioned a challenging program in Smith Bay.

And finally, ConocoPhillips remained one of the steady forces in the state when it announced a two-well exploration program at its Greater Mooses Tooth unit. The company has been consistently exploring the region for more than 15 years.

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# Accumulate targeting source rock

*The subsidiary of Australia's 88 Energy Inc. completed Icewine well in 2015*

By **ERIC LIDJI**  
For Petroleum News

**A**ccumulate Energy Alaska Inc. is exploring for unconventional resources in Alaska at a time when lower oil prices are adding risk to traditional conventional plays in the state.

And like Great Bear and Royale, which arrived before it, Accumulate Energy is targeting both conventional and unconventional plays to improve the economics of its efforts.

The local subsidiary of Australia-based 88 Energy Inc. completed the Icewine No. 1 exploration well in the Franklin Bluffs region of the central North Slope in late 2015 and commissioned a 2-D seismic survey over its leases west of the haul road in early 2016.

Accumulate Energy drilled the 11,600-foot vertical well from the Franklin Bluffs pad, adjacent to the Dalton Highway some 30 miles south of Deadhorse. The well targeted source rocks, particularly the HRZ shale, in addition to some conventional oil targets.

The approximately \$3 million seismic survey covered some 420 linear miles using wireless recording nodes and geophones. A chief goal of the survey was to inform a second Icewine well. The company is considering a horizontal well with multi-stage fracturing, which would provide points of comparison to the vertical Icewine No. 1 well.

As drilling was underway in December 2015, 88 Energy described the project as an attempt to "better quantify risk so that a farm-out can be achieved in 2016." In early presentations, the company estimated a gross mean unrisks prospective resource of 492 million barrels of unconventional oil to be discovered within the Icewine project.

According to the company, early analysis of the well sug-



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gested that a large portion of HRZ shale in the Icewine acreage was within the sweet spot of thermal maturity, which measures how underground temperature and pressure influences hydrocarbons production. Greater heat will "cook" oil into wet natural gas and then dry natural gas.

"The high recovery factor in all three cores taken, including the primary HRZ target and across the bottom seal for the HRZ (Pebble Shale), means that we have excellent data to use in the evaluation of the potentially huge unconventional prize on the Project Icewine acreage," 88 Energy Managing Director Dave Wall said in a Dec. 28 drilling update.

As far as conventional targets, Icewine No. 1 encountered elevated natural gas readings over a 58-foot (gross) interval of Kuparuk sands and "excellent reservoir quality and hydrocarbon shows" in a shallow Brookian sequence, according to the company.

After securing a \$50 million financing deal with Bank of America, 88 Energy outlined a four-to-five-well program in the region, starting with Icewine No. 1 in late 2015 and continuing with three to four additional wells in early 2016 to target conventional plays.

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the region, including the famous Katalla-Yakataga contract of 1951, when a group of investors and an Oklahoma oilman and senator used an obscure provision of federal law to convince the Interior Department to issue a development contract over a large area near Icy Bay.

That effort and others immediately following it were hampered by poor results. A second push in the early 2000s was delayed by challenges by environmental groups. An exclusive federal development contract held by Chugach Alaska Corp. expired in 2004.

The state had yet to advance the proposal by the time The Explorers went to print.

## North Nenana

Of the five current licenses, four are discussed

in greater detail in specific company profiles for Ahtna Inc., Usibelli Coal Mine Inc. and Miller Energy Resources Ltd.

The state issued a five-year license for the North Nenana basin to Rocky Riley of Tolovana Construction Co. in early July 2015. The license covers 25,294 acres in the Minto Flats State Game Refuge and includes a \$500,000 initial work commitment.

The region is some 35 miles west of Fairbanks and just north of the Nenana basin where Doyon Ltd. has been exploring for natural gas in recent years. According to the state, the North Nenana region has "low to moderate potential for discovery of conventional and unconventional natural gas" and the potential for oil "is also considered low."

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# Ahtna takes charge on exploration

*Alaska Native corporation commissions Copper River Basin program*

By **ERIC LIDJI**  
For Petroleum News

Several years ago, when rising energy prices were driving people from the Copper River region, Ahtna Inc. launched a search for a nearby and affordable supply of natural gas.

As *The Explorers* was going to press, the Alaska Native corporation was about to begin that effort by drilling the Tolsona No. 1 exploration well near the city of Glennallen. The company had already begun building a short gravel road that would connect a new 4-acre drilling pad to the Glenn Highway, some 11 miles west of the city of Glennallen.

"We are anxious to begin drilling on this project which began nearly six years ago with the application process," Ahtna President Michelle Anderson said in a March statement. "We are optimistic of a resource discovery that will help address the rural energy crisis in the Ahtna region. A substantial discovery would benefit not only the Ahtna region, but the state at large. It would provide a boost to the economy by putting Alaskans to work and help to alleviate the high energy costs that many residents experience."

With the well, Ahtna would become the third Alaska Native corporation to operate an oil or gas exploration program, after Arctic Slope Regional Corp. and Doyon Ltd.

As with most exploration activity occurring away from the North Slope or Cook Inlet, the Ahtna program began with an exploration license. The Alaska Department of Natural Resources issued a license for the Tolsona basin in December 2013. The five-year license covered 43,492 acres near Glennallen and required Ahtna to spend at least \$415,000.

The first year of the program focused on seismic activity. Ahtna reprocessed some 80 miles of existing 2-D seismic data and commissioned Global Geophysical Services to conduct a 2-D seismic survey covering some 40 miles. The seismic program revealed portions of a geologic structure some 14 miles west of Glennallen and gave the company a 60-to-70 percent chance in finding natural gas with a new well, Ahtna Vice President of Land and Resources Joe Bovee told the House Energy Committee in February 2015.

## Where others have trod

The Copper River basin has 11 previous exploration wells, all of which encountered natural gas. Despite that prospectivity, technical difficulties have prevented development.

The Texas-based independent Rutter & Wilbanks Corp. drilled the most recent well in the region, the Ahtna 1-19 well in 2005 through 2007. The well discovered a gas reservoir but problems associated with excessive downhole pressures and water incursion forced the company to plug and abandon the well without developing the resource.

To prevent those problems, Ahtna secured more powerful drilling equipment and planned to run casing through the entire length of the approximately 5,000-foot well, which is targeting



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the upper Nelchina and the lower Nelchina sandstones. Those upgrades will greatly increase the cost of the well, although the increases are partially offset by a convenient location that is close to the existing road system and accessible year-round.

Ahtna hired HXR Drilling Services to drill the well, possibly using the Saxon 147 drilling rig. The schedule expects drilling, testing and de-mobilization to be finished by late June.

Ahtna planned to use the existing Ahtna 1-19 well pad for staging and construct the new 3.8-acre Tolsona pad for drilling activities. The corporation was eager to complete the well in early 2016, before the expected expiration of certain tax credits for exploration.

## Economic development

Ahtna launched the program to stem population loss.

The population of the Copper River valley fell by 10 to 15 percent between 2010 and 2014 and various businesses and schools in the region closed, according to Bovee.

Although the corporation has said it would export excess supplies of a sufficiently large discovery, the primary goal of the program is to supply local communities. Before drilling, Ahtna applied to the Regulatory Commission of Alaska for permission to create a distribution utility that could deliver natural gas to homes and businesses throughout the region, figuring it would import liquefied natural gas if exploration were unsuccessful.

Even with the recent drop of oil prices, Ahtna believes gas would be an economically viable alternative to oil. When diesel prices declined to approximately \$3 per gallon in early 2015, the corporation still estimated cost savings between 40 and 50 percent.

The size of a discovery will determine the scope of the development.

With production rates in the thousands of cubic feet, the project would flop. With rates in the millions of cubic feet, the project could likely support power generation throughout the region. With rates in the billions of cubic feet, Ahtna could probably export supplies.

The specifics will determine whether the project requires a pipeline or an LNG plant.

By February 2015, Ahtna had already spent \$3 million on the program and expected to have spent between \$10 million and \$15 million by the time the well was finished.

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# Apache leaves Alaska after six years

*Oil prices, regulatory hurdles, tax credits and corporate changes doom program*

By **ERIC LIDJI**  
For Petroleum News

**A**pache Corp. arrived in Alaska with whispers and left with whimpers.

When the Houston-based independent began sniffing around the state in 2010, false rumors spread that the company might make an offer to buy the Prudhoe Bay field.

Instead, the company acquired considerable acreage across the entire Cook Inlet basin and launched an ambitious program to revitalize the region through seismic and drilling.

Between 2011 and 2014, Apache collected 1,100 miles of seismic in Cook Inlet and drilled one exploration well. And then in March 2016, the company announced that it would discontinue its exploration program in Alaska as part of companywide cuts.

"Due to the current downturn, Apache has had to significantly scale back operations and spending. We recently reduced our spending plans for 2016 by 60 percent from 2015 levels and are focusing our limited dollars on specific international opportunities and strategic testing in North America," the company said in a statement. "Operations we are suspending as a result of the downturn include our Alaskan activities."

Over the past year, Apache had been resuming its Cook Inlet seismic program and permitting three drilling pads within the Kenai National Wildlife Refuge in preparation for a potential ex-

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ploration program at some undetermined point in the future.

As of March 2016, Apache was leasing nearly 407,000 acres from the state of Alaska and at peak held some 800,000 acres altogether, including leases from federal, Native and other landowners. The company has said it would allow its acreage to expire over the coming year and has no plans for the exploration well it drilled several years ago.

## Optimism

If the "current downturn" was really to blame, it was merely the last push.

Apache faced both internal and external obstacles over the past six years, as it pursued an ambitious agenda to revive and possibly expand oil production in the Cook Inlet basin.

When Apache announced plans to enter Alaska, optimism

*continued on next page*



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**ACCUMULATE** *continued from page 10*

### Several smaller independents

The independent Burgundy Xploration acquired the initial Icewine acreage in 2012 and sold a majority interest in the prospect to Accumulate Energy Alaska in late 2014.

The two companies greatly increased their holdings in a November 2015 lease sale.

As of early March 2016, the two companies were leasing nearly 100,000 acres from the state of Alaska, with some 85,909 acres to Accumulate and some 12,272 to Burgundy.

Instead of looking directly for oil, the companies are chasing vapor. The idea is to use an increasing understanding of thermal maturity to understanding this particular resource.

The well was designed so that “you get a little bit deeper and where the oil is no longer oil in the reservoir, it’s actually a gas. But when you get it to the surface it becomes rich in liquids,” Paul Basinski,

president and founder of Burgundy, said in November 2015.

The concept is similar to exploration in the Eagle Ford shale of Texas, he said, but the geology is different. The Alaska prospect is highly porous. Rather than traditional shale, “it’s a volcanic rock and there’s not a productive play like this in the world yet,” he said.

The goal of the well was to determine the geologic properties of the acreage and technical possibility of development. “The question is can it be drilled? Can it be fracked?” he said, adding that any Alaska prospect would need to be large to justify the increased costs for operating in the

Arctic. The project is helped by its proximity to the haul road, which not only allows for some year-round work but is also close to the trans-Alaska oil pipeline.

Like other ongoing efforts to explore and potentially develop Alaska source rock, the 88 Energy project would operate on a scale much larger than current developments.

In a September 2015 presentation, the company proposed 80-acre spacing for a future development, which would mean approximately 1,200 wells across the entire leasehold.

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**APACHE** *continued from page 12*

went in two directions.

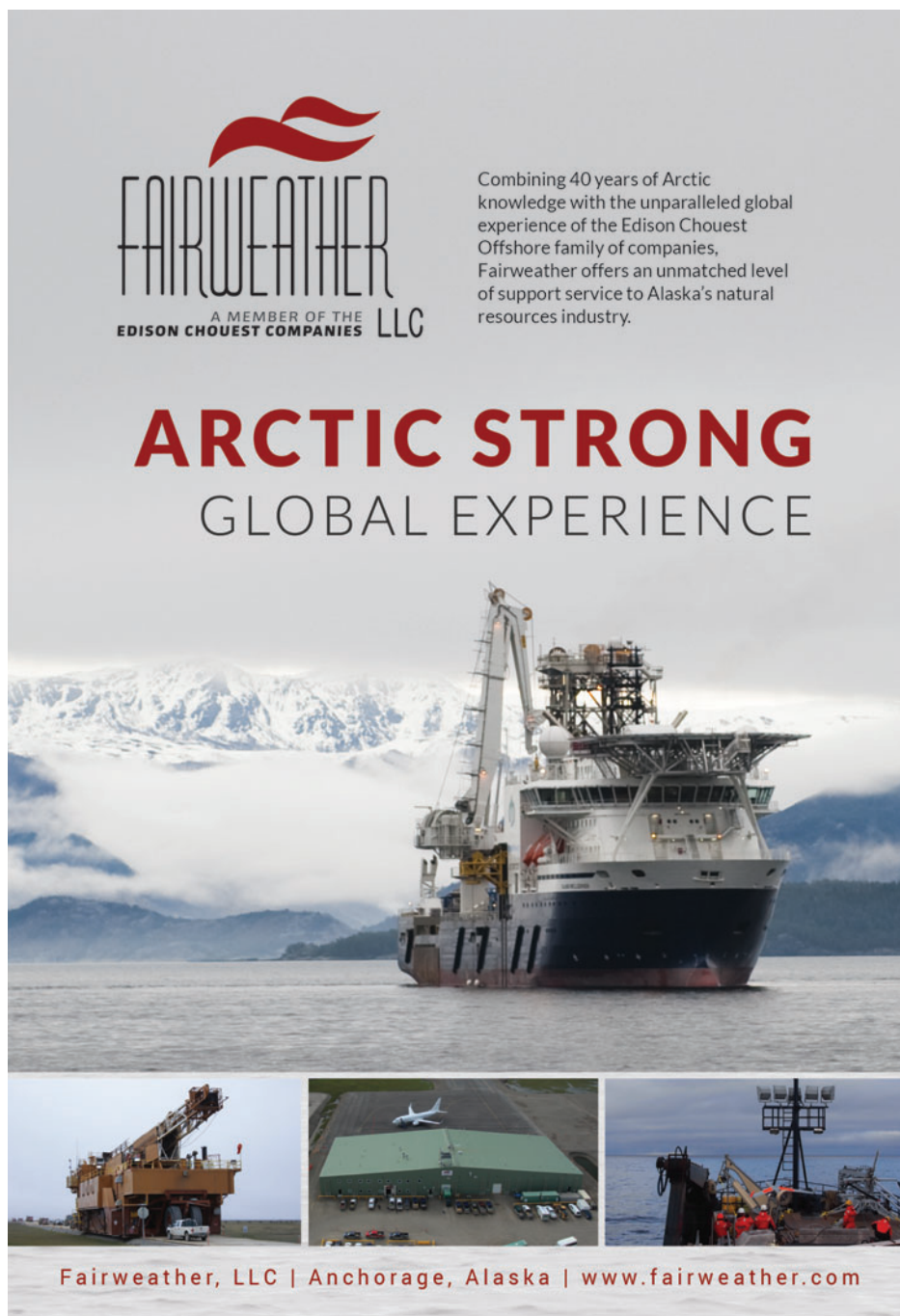
State officials were thrilled at the arrival of a company with a reputation for reviving aging oil fields thought to be past their past, such as the Forties field in the North Sea.

Instead, Apache pursued opportunities in Cook Inlet. The company acquired 196,524 acres in the region from Samuel H. Cade, Daniel K. Donkel and three other independent investors late July 2010 and gradually amassed as much as 800,000 acres from the state and other landowners before refining its holdings. The leasehold stretched across the entire Cook Inlet basin, from the southern Kenai Peninsula to Point MacKenzie and from the east side to the west side and including onshore, offshore and coastal acreage.

### Comprehensive seismic

As it had done in other mature basins, Apache launched a comprehensive seismic program in Cook Inlet. The company started with a small, preliminary 2-D seismic survey in early 2011 covering onshore, offshore and “transition zone” targets. The results intrigued the company. “It’s an exploration play but the guys

*continued on page 14*



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have wowed me enough for me to believe that it's a real opportunity," then-CEO Steve Farris said in August 2011.

By that point, Apache had commissioned an ambitious three-year 3-D seismic survey from Susitna Flats to Anchor Point. The timetable and the wireless technology would have allowed Apache to work year round: onshore from September to April, offshore from April to November and in transition zones from September to December and March to May. The first 130 square miles of seismic identified eight new leads, suggesting the potential for as many as 650 potential leads spread across the leasehold.

Apache never claimed to be interested in a short-term investment. "We're going to operate here for many, many years. We're on a 25- to 30-year plan for the Cook Inlet," Senior Commercial Advisor Paul Abokhair told Alaska lawmakers in October 2011.

In June 2012, Apache Alaska General Manager John Hendrix told Petroleum News his company expected to be operating in Cook Inlet "30 years from now." He added, "You don't come in and buy this much acreage with a short-sighted plan. We're not a one-well wonder and we don't have to bet the farm on one well. ... It's a proven basin and we think it's been underexplored. But it's not an easy basin. It's a very complex basin. It's very complex to drill and it's very complex from the geology (standpoint)."

The enthusiasm spread beyond Alaska. Around the same time, in June 2012, Apache Vice President for Exploration and New Ventures John Bedingfield told analysts, "When you go up there, it's kind of like going back into time. It's like an oil museum, is kind of how I'd describe it. It's interesting, but things have just been frozen for 40-plus years."

Intriguingly, Apache believed there was as much oil yet to be discovered in the basin as has already been produced in the 55 years since the first discovery well in the region.

And the company was continuing to amass interesting prospects, including several leases surrounding the Cosmopolitan field. Because the leases were known to contain significant accumulations, the state had offered the leases at auction with special terms.

## Pessimism

Given promises of a 30-year timetable, a change in mood took more than oil prices.

In the nearly six years since Apache arrived, the delivered price of Alaska crude oil increased from \$76 per barrel to \$114 per barrel before falling to some \$30 per barrel.

Before prices fell, the company had already lost some enthusi-

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*Intriguingly, Apache believed there was as much oil yet to be discovered in the basin as has already been produced in the 55 years since the first discovery well in the region.*

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asm for Alaska. The reason was a combination of drilling results, regulatory hurdles and corporate reshuffling.

Apache announced a two-well exploration program in April 2012, after completing an initial 3-D seismic program over onshore sections of its acreage. The company envisioned drilling as deep as 16,000 feet to test beneath the Tertiary strata of the basin.

"We don't want anybody coming back behind us and saying 'look what I've got,'" Hendrix told Petroleum News in June 2012. "You're down there. You're drilling. You might as well go the extra mile, or a thousand feet, or whatever it is."

The exploration program initially called for drilling the Aspen well on the west side of Cook Inlet in July 2012 and the Captain Boomer well on the east side of Cook Inlet in the fall or winter. As the year progressed, though, Apache decided to focus its drilling activities on the west side, where the majority of its seismic work had occurred. As the year progressed, the company cut the program in half and drilled the Kaldachabuna No. 2 well on Cook Inlet Region Inc. leases near the village of Tyonek in November 2012.

The drilling had problems. The drill bit got stuck several times as the well passed through more than 100 coal seams, many thicker than 10 feet. Apache suspended the well in April 2013 at 11,389 feet, according to Alaska Oil and Gas Conservation Commission records.

"Frankly, we were disappointed in the well results that we had there. We drilled the well and actually got too close to a fault, so we really didn't evaluate that well," Farris said in an August 2013 conference call, adding: "I am personally still very positive about the Cook Inlet. Obviously we're directing cash to different things right now. So, we've slowed down that activity but in terms of its prospectivity, I still think it has good value."

Kaldachabuna No. 2 proved to be the only well Apache drilled in Alaska.

## Regulatory delays

At the same time, the seismic program was going slower than expected.

In early 2012, as Apache prepared to move into more fragile transition zones and offshore regions, a coalition of environmental groups challenged a favorable National Marine Fisheries Service opinion about the potential impacts of the program on beluga whale or Steller sea lion populations. By the time a May 2013 court order upheld a portion of the appeal, the authorization had expired and the parties closed the case.

A delay over a different authorization for a seismic survey in the Kenai National Wildlife Refuge forced Apache to suspend its program in September 2012. Shutting down the \$50 million operation cost Apache \$10 million and delayed the overall program by at least a year, Apache Alaska General Manager John Hendrix said in February 2013. Even after Apache got the necessary approvals to continue, the company kept the Alaska survey on hold while it pursued more immediately profitable projects in other parts of the world.

Apache received a special use permit from the U.S. Fish and Wildlife Service in July 2013, which allowed the company to launch an onshore survey in the Kenai National Wildlife Refuge in February 2014. A month later, after getting new approval from the National Marine Fisheries Service, the company resumed its offshore

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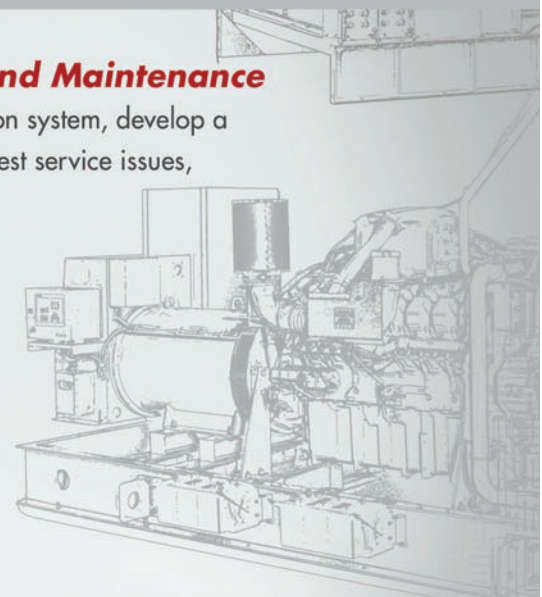
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seismic survey.

But in testimony before the U.S. House Committee on Natural Resources in May 2014, Cook Inlet Region Inc. Senior Vice President of Land and Development Ethan Schutt said that Apache had downsized a major 3-D seismic program to a smaller, discontinuous 2-D program because of a lack of coordination between federal permitting agencies.

Apache declined to comment on that announcement.

In August 2014, Apache applied for National Marine Fisheries Service authorization for a five-year offshore seismic program starting March 2015. The request covered 1,863 square miles of the upper Cook Inlet, from Kalgin Island to an area west of the northern Kenai Peninsula. The authorization was released for public comment in March 2015.

In December, the company applied for a U.S. Army Corps of Engineers permit to build three gravel pads and associated access roads within the Kenai National Wildlife Refuge.

Through its seismic work to date, combined with other geological work such as studying existing wells, Apache completed predictive regional reservoir maps for the Hemlock and Tyonek formations and was working on maps for the Beluga and Sterling formations as of September 2015, when Hendrix testified before the Alaska Senate Oil and Gas Tax Credit Working Group and advocated on behalf of the existing exploration tax credits.

### Corporate shuffles

As the Alaska seismic program was moving forward, Apache made major changes.

Over the course of 2014, at the urging of investors, Apache sold

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*Before prices fell, the company had already lost some enthusiasm for Alaska. The reason was a combination of drilling results, regulatory hurdles and corporate reshuffling.*

---

off some \$6 billion in assets and narrowed its focus to unconventional plays in the United States and Canada.

In November 2014, with oil prices having fallen below \$80 per barrel, Apache announced a \$4 billion budget for its onshore operations in North America in 2015, down from \$5.4 billion in 2014. Some analysts believed the company would spend more than its budget, but those predictions came when oil prices were still above \$70 per barrel. An Apache executive told the Houston Chronicle that the company would be "comfortable ... even all the way down to \$70." By January 2015, oil prices had fallen below \$50 per barrel.

Apache made no explicit mention of Alaska during a November 2014 event on North American activities, focusing on Canada, Oklahoma, Texas and the Gulf Coast. But executives referenced three unnamed "undercover plays" budgeted for exploration work in 2015. Alaska remained absent from most updates the company made during the year.

In January 2015, Apache replaced its longtime Chief Executive Officer G. Steven Ferris, who had been a vocal supporter of the Cook Inlet program. The company replaced Ferris with John Christmann, who it had recently hired to oversee development of its North American assets, particularly unconventional opportunities in the Lower 48 and Canada.

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Contact Eric Lidji at [ericlidji@mac.com](mailto:ericlidji@mac.com)



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# Armstrong Oil & Gas takes over North Slope project

*A late 2015 acquisition gives independent majority control of Pikka unit*

By **ERIC LIDJI**  
For Petroleum News

During its two decades in the state, Armstrong Oil & Gas Inc. has demonstrated two successful models for how a small independent company in Alaska can carry a prospect from exploration into development: find a bigger partner or find a smaller field.

Now, Armstrong is facing a third option: being the bigger partner at a bigger field.

Toward the end of 2015, the Denver-based company acquired a majority stake in the North Slope holdings of Repsol E&P USA Inc. in a deal worth more than \$800 million.

The deal followed four seasons where the two companies (and their partner GMT Exploration Co. LLC out of Denver) partnered on an ambitious exploration program focused primarily within the "billion-dollar" fairway between the Kuparuk River and Colville River units. With Repsol as operator, the joint venture drilled 16 wells.



**BILL ARMSTRONG**

**NAME OF COMPANY:** Armstrong Oil & Gas Inc.  
**COMPANY HEADQUARTERS:** Denver, Colorado  
**TOP EXECUTIVE:** Bill Armstrong, president  
**TELEPHONE:** 303-623-1821



The joint venture also held more than 750,000 acres across the central North Slope, which held out the promise of even greater exploration activity in the years to come.

In that partnership, Armstrong had a 45 percent interest in the exploration acreage and a 30 percent interest in the development acreage. Following restructuring, Armstrong has a 75 percent interest and operatorship in the exploration acreage and a 45 percent interest in the development acreage with an option to acquire another 6 percent and operatorship.

Before the deal was announced, development seemed inevitable, given that the companies had spent nearly \$1 billion in the region and were touting favorable results.

All 16 wells drilled found oil and most found oil in multiple

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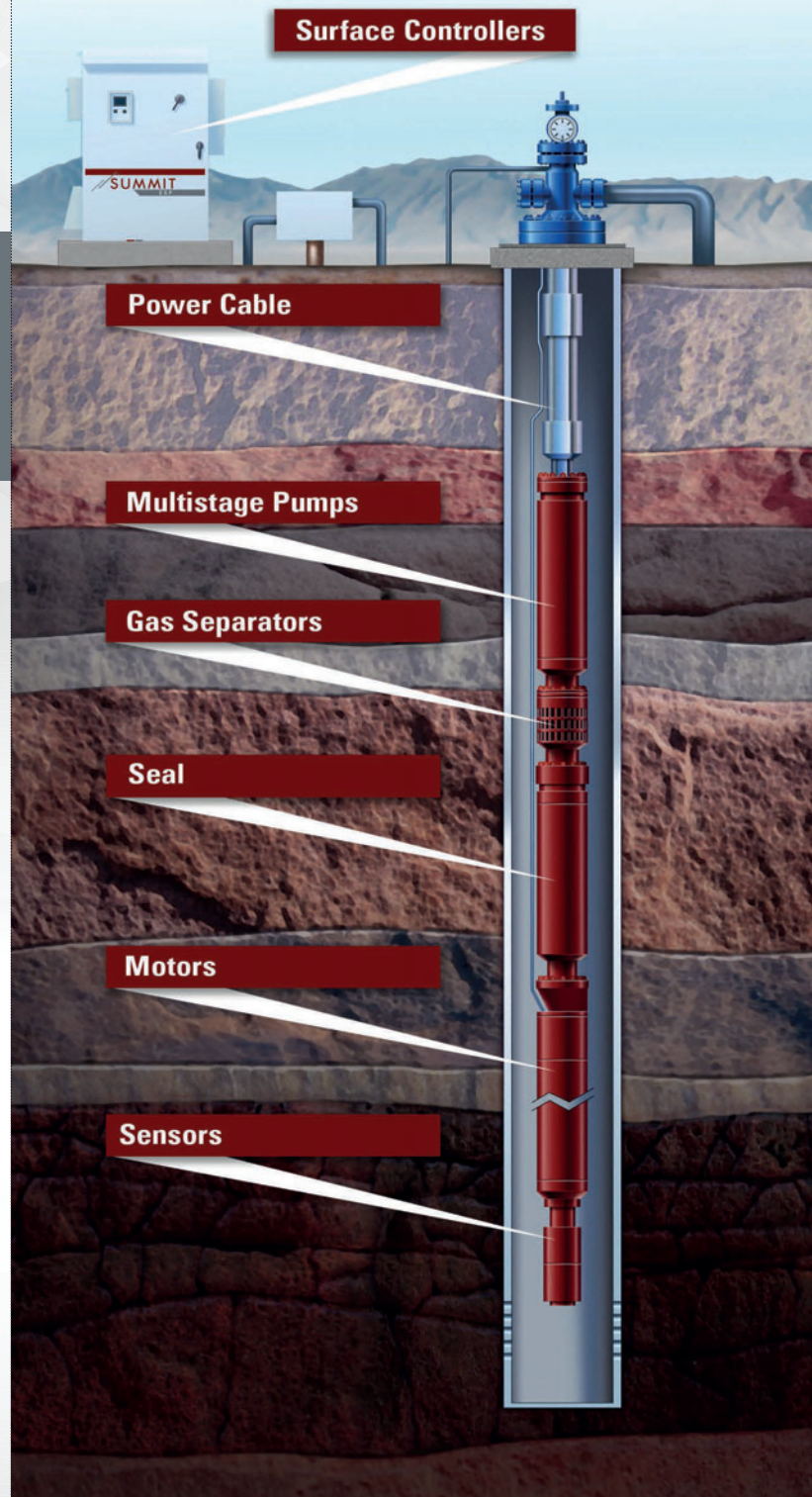
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zones, according to Armstrong. A third-party report from the engineering firm DeGolyer and MacNaughton estimated “C1” reserves of 497 million barrels of oil, “C2” reserves of 1,438 million barrels and “C3” reserves of 3,758 million barrels. The report uses “contingent” reserve classifications, which Armstrong said would be converted to more traditional Proven, Probable, and Possible figures “where appropriate upon the final investment decision.”

Mark Myers, then commissioner of the Alaska Department of Natural Resources, told Petroleum News in February: “the proven contingent oil reserve number makes the discovery the largest since the Alpine field, the probable contingent reserve number the largest since the Kuparuk field, and the possible contingent number makes the discovery the largest since Prudhoe.”

(The “discovery,” Myers was careful to note, was “multiple different reservoirs, not just one major reservoir as in the case of the original Kuparuk and Alpine discoveries.”)

Now, Armstrong is leading that project forward. In late February 2016, the U.S. Army Corps of Engineers began scoping a proposed Nanushuk project at the Pikka unit. And Armstrong is planning an appraisal well this coming winter: in late 2016 and early 2017.

## Big partners

Armstrong is responsible for the two of the most successful North Slope exploration campaigns of the last 25 years. After arriving in the state in the late 1990s, the company drilled several exploration wells in the state waters north of the Kuparuk River unit.

Those wells discovered promising oil fields. But instead of tackling development, Armstrong attracted larger partners to take the lead and eventually take over the projects.

Pioneer Natural Resources Alaska Inc. brought the Oooguruk unit into production in 2008, and Eni Petroleum brought the nearby Nikaitchuq unit into production in 2011.

Those two oil fields are the only newly producing units on the North Slope over the last decade and are also the first two units on the North Slope operated by a company other than BP Exploration (Alaska) Inc. or ConocoPhillips Alaska Inc. (and their predecessors).

In 2007, Armstrong acquired the North Fork unit, a Cook Inlet natural gas field in the southern Kenai Peninsula discovered in the 1960s but never developed. After assembling a joint venture of small independent companies and building a pipeline, Armstrong brought the unit into sustained production and later sold it to Cook Inlet Energy LLC.

As Armstrong was developing North Fork, the company was also amassing a new North Slope position through an affiliate called 70 & 148 LLC — named, optimistically (and now, given its potential discoveries, a tad prophetically, too), after the coordinates of the Prudhoe Bay field. Armstrong brought the Spanish major Repsol YPF to Alaska in March 2011. Repsol acquired a 70 percent interest in 494,211 acres across the North Slope and planned to spend around \$768 million, with the vast majority going toward exploration.

The program was the most extensive campaign on the North Slope over the past five years — 16 wells or sidetracks, two 3-D seismic surveys and the formation of the offshore Qugruk unit and the Pikka unit along the Colville River Delta. In November 2014, as preliminary results of the program were becoming clear,

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*In February 2016, Armstrong President Bill Armstrong told Petroleum News that the partners would accelerate development of their Pikka unit, with production by 2021.*

---

Armstrong Vice President Ed Kerr said, “In 10 or 15 years people will talk about Repsol the same way they talk about BP and ConocoPhillips today, in terms of ... contributing to Alaska’s economy.”

In mid-2015, the partners provided more detailed results for the first time. According to Armstrong, two wells from in 2015 and two wells from previous seasons targeted the “East Alpine” field and “encountered oil productive Alpine sand in excess of 95 feet thick at a depth of 6,500 feet with porosities ranging from 15 percent to 25 percent. Well control and seismic data indicates the oil pool covers an area in excess of 15,000 acres.”

Another seven wells in the “Nanushuk reservoir” had “proven an oil pool that covers more than 25,000 acres, at a depth of 4,100 feet, with an oil column of 650-plus feet, and up to 150 feet of net pay with an average porosity of 22 percent.” While the companies said they needed more wells to “confirm the ultimate size of some discoveries, this season’s results justify moving forward with development,” according to Armstrong, which said the companies were permitting developments in the Nanushuk and Alpine.

## Accelerating development

By the time Repsol announced the sale, it was already permitting a fifth season.

In fact, on the same day as the announcement, the Alaska Department of Natural Resources began taking comments on a two-to-three-well drilling program Repsol was permitting in the Pikka unit region for this coming winter. Instead, the companies deferred those plans, while suggesting they would pursue development in the future.

According to Armstrong, even with the deferment, permitting will continue on a three-pad development with estimated production on the order of 120,000 barrels per day.

The current plan of exploration for the Pikka unit calls for Repsol — presumably through Armstrong — to license and reprocess the existing North Island 3-D seismic survey, conducting rock physics studies and performing stratigraphic analysis and special core analysis on the three exploration wells that Repsol drilled at the unit in early 2015.

In February 2016, Armstrong President Bill Armstrong told Petroleum News that the partners would accelerate development of their Pikka unit, with production by 2021. An early description calls for three gravel pads with standalone processing facilities and as many as 76 production and injection wells, in addition to associated infrastructure.

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# ASRC finally operates North Slope exploration

*After years of apprenticeship and regulatory delays, company drills Placer well*

By **ERIC LIDJI**  
For Petroleum News

Although it has been an important player in the oilfield services sector for years, and has recently been learning the ropes of Arctic exploration and production, Arctic Slope Regional Corp. officially became an explorer this year through ASRC Exploration LLC.

In early January 2016, the Alaska Oil and Gas Conservation Commission issued a permit for the subsidiary of the Alaska Native corporation for the North Slope region to drill the Placer No. 3 exploration well in the area immediately west of the Kuparuk River unit.

The well is the culmination of a decade-long apprenticeship, during which time ASRC Exploration learned the intricacies of operating in Arctic conditions. This era began when ASRC entered into a "mentoring" agreement with BP Exploration (Alaska) Inc. in March 2003. The agreement established "a framework for sharing data and technical knowledge," including information about in-unit and near-unit oil and gas investment opportunities on the North Slope, the two companies told Petroleum News at the time.

The agreement marked a change. Negotiations started in 1999 and continued in 2002, years when ARCO Alaska was divesting its holdings in the region, BP was shifting its focus away from exploration and smaller independents were establishing leaseholds.



**REX ROCK, SR.**

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TOP ALASKA EXECUTIVE: Rex A. Rock, Sr., president and CEO

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## Inheriting Placer

The current effort at Placer followed a decade of activities.

In early 2004, ConocoPhillips Alaska Inc. drilled the Placer No. 1 and Placer No. 2 exploration wells at the western edge of Kuparuk on behalf of BP, Union Oil Company of California, ChevronTexaco and ExxonMobil. The first well encountered some 17 feet of hydrocarbon-bearing sands in the Kuparuk formation. The second well delineated the Kuparuk C formation slightly to the northeast. Through its mentoring agreement, ASRC farmed in the BP acreage, gaining a 35 percent interest in Placer No. 1. But despite favorable results, ConocoPhillips never pursued development and the leases expired.

Still interested in Placer, ASRC acquired the prospect in a March 2006 lease sale. After considerable negotiations, the company acquired the Placer No. 1 well in June 2010 and had acquired a license over an earlier seismic survey of the region by early 2011.

During those years, while pursuing Placer, ASRC also gained operating experience as a minority partner in the Badami unit. At

*continued on next page*

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first, ASRC and Savant Alaska LLC acquired an interest in the BP-operated unit at the eastern edge of the North Slope. Over time, they acquired the unit and associated infrastructure outright, with Savant serving as operator.

By early 2011, the five-year leases at the Placer prospect were on the verge of expiring, leaving little time to arrange and conduct an exploration program. ASRC asked the state to form the Placer unit over four state leases covering some 8,769 acres. The Alaska Department of Natural Resources was skeptical about the size of the unit and the timeline of activities proposed, which called for reprocessing seismic by the end of 2012 and either re-entering Placer No. 1 or drilling Placer No. 3 by the end of June 2014.

Instead, in September 2011, the state approved a 1,480-acre unit covering portions of four leases — restricting the unit boundaries to the area immediately around Placer No. 1.

## Regulatory debate

After reprocessing the seismic information, ASRC asked the state to expand the unit to the original boundaries and extend the deadlines for work commitments by one year.

The company needed more time because it was struggling to secure a rig for operations and needed more area because the prospect appeared to extend beyond the unit boundaries.

Any well drilled within the smaller unit would be a “twin” of Placer No. 1, the company argued. If the prospect extended far enough to the south, it would present opportunities for partnering with Brooks Range Petroleum Corp. on a regional development plan.

After ASRC and Brooks Range Petroleum presented a “unified

position” for Placer exploration to state officials, then-Alaska DNR Commissioner Dan Sullivan conditionally approved the expansion and the extension, requiring ASRC to post a \$5.4 million bond to backstop its new work commitments.

As the two companies worked out the terms of a partnership, Brooks Range Petroleum proactively permitted a two-well exploration program at Placer. But after months of negotiations, the two companies were unable to come to terms and the program ended.

When Repsol E&P USA Inc. applied to form a unit in the region, the potential for overlapping exploration activity concerned the state. In March 2014, then-DNR Commissioner Joe Balash deferred unit decisions until the end of the season.

In November 2014, in the early days of the Walker administration, the state approved an expansion of the Placer unit, requiring ASRC to post a \$2.5 million performance bond by mid-January 2015 and meet a series of commitments culminating in a well by May 2016.

The state approved an operations plan for Placer in January 2016.

ASRC is using the Kuukpik No. 5 drilling rig to drill Placer No. 3 from a 500-foot by 500-foot ice pad. The company planned to access the pad using existing gravel roads in the ConocoPhillips-operated Kuparuk River unit and a temporary ice road from the Mustang pad in the Brooks Range Petroleum Corp.-operated Southern Miluveach unit.

If the well is successful, ASRC said it would complete the well, demobilize the rig and conduct a 30-day flow test, trucking produced liquids to existing facilities, flaring produced natural gas and storing drilling fluids for future disposal in a Class II well.

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# Aurora proposes major exploration after long hiatus

*The Alaska independent is considering as many as seven exploration prospects*

By **ERIC LIDJI**  
For Petroleum News

**A**urora is returning to exploration. The small Alaska-based company has been operating in Cook Inlet longer than any other independent and has revived many small natural gas fields ignored by larger players.


Those projects involved resuscitating fields by conducting maintenance activities on existing wells, by drilling sidetracks and by drilling grassroots wells in old fields. While the company also conducted exploration, particularly at the Three Mile Creek field, those activities have generally been less prominent than its developments at existing fields.

Now, Aurora is taking a larger interest in exploration than at any time in its history. The company is currently considering as many as seven prospects: Chickalusion, Three Mile Creek Deep, Congahbuna Lake, Nicolai Footwall, Forest Lake, West Eagle and Hanna.



**ED JONES**





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Aurora Power Resources Inc. created Aurora Gas in 2000 as an exploration and production arm. The independent operates five gas fields on the west side of Cook Inlet — Nicolai Creek, Lone Creek, Moquawkie, Albert Kaloa and Three Mile Creek. Today, the Kaiser-Francis Oil Co. affiliate Aurora-KF LLC owns a 95 percent interest in Aurora Gas. Aurora Power Resources owns 4 percent and Orion Resources Inc. owns 1 percent, according to the state corporations databases. Aurora Power Resources Inc. formed the wholly owned subsidiary Aurora Exploration LLC in 2005 as an exploration entity.

#### Persistence at Hanna

Aurora is pursuing Hanna first, although it is using other names for the effort.

The prospect is surrounded by the Lewis River, Stump Lake, Ivan River, Pretty Creek and Otter units and is one of the “white whales” of the Cook Inlet region. Aurora acquired the four-lease prospect on the west side of Cook Inlet from independent investor Paul L. Craig, who had been pursuing the opportunity for more than two decades.

As described in permitting documents, Aurora would drill the Theodore River No. 2 well on ADL 391618 using a temporary drilling pad accessed from the existing Beluga highway and would use a one-mile snow trail and a second temporary pad to drill the Chedatna Lakes No. 1 on ADL 391878. The state approved the program in late 2015.

Early on, Aurora planned to drill one well in the fall and a second well in the winter, although as of March 2016 the company had yet to receive final permits for either well.

Union Oil Company of California abandoned an exploration program at Hanna in the 1980s in light of falling commodity process. Craig first acquired the leases in 1993 through the independent Trading Bay Energy Corp. but found it difficult to raise money for Alaska exploration after Stewart Petroleum Co. filed for bankruptcy protection in 1996. Forcenergy Inc. acquired the leases in 1997 but filed for bankruptcy in 1999.

Craig acquired the leases a second time through a 2001 lease sale but once again found it difficult to organize an exploration

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# Saluting Alaska's Explorers

JUDY PATRICK

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# BlueCrest brings Cosmopolitan online

*Texas company accomplishes what five operators over 49 years could not*

By **ERIC LIDJI**  
For Petroleum News

By the time this edition of The Explorers goes to print, BlueCrest Energy Inc. will almost certainly have moved from the "explorers" column into the "producers" column.

Whether the company remains an explorer in the future remains to be seen.

The Fort Worth-based independent expected to bring the Cosmopolitan unit into production in April 2016 from existing wells. As of late March, the company was in the process of shipping a large land-based drilling rig to Alaska from a construction site in Texas. Development drilling would begin in early July, according to the company.

As operator of Cosmopolitan, BlueCrest has taken a phased strategy: developing oil directionally from an onshore pad and potentially proceeding with a shallower gas accumulation from an offshore platform. The region also includes some exploration potential, although BlueCrest has said that those activities would be unlikely in 2016.



**J. BENJAMIN JOHNSON**

## Majority interest

BlueCrest was brought to Alaska as a majority non-operating partner at the Cosmopolitan prospect, in the Cook Inlet basin off the coast of Anchor Point, and worked with operator Buccaneer Energy Ltd. to fund the 7,599-foot Cosmopolitan No. 1 well in May 2013.

When Buccaneer sold properties to improve its finances, BlueCrest acquired the remaining 25 percent interest and became operator of the program. The company held 21,476.40 acres in onshore and offshore state leases, as of early March 2016.

Like many independents operating in the state, BlueCrest arrived with no Alaska experience as a company but considerable Alaska experience among its principles: President and CEO J. Benjamin Johnson was raised in Kenai, worked in the oil patch in his youth, and, with ARCO Alaska, created the first Kuparuk full-field development model and coordinated the first water-flood surveillance plans for Prudhoe Bay.

## NAME OF COMPANY:

Blue Crest Energy Inc.

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**TOP EXECUTIVE:** J. Benjamin Johnson, director, president, and CEO

**TELEPHONE:** 817-731-0066

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Through the end of 2015, BlueCrest had spent approximately \$200 million to develop the Cosmopolitan field and expected to spend approximately \$525 million altogether before revenue from sales could fund operations, Johnson said in a November 2015 address at the Resource Development Council's annual conference. Profitability would come even later.

A second plan of development submitted in October 2015 proposed a three-well program at the Cosmopolitan unit: one single lateral well and two dual lateral wells drilled to offshore targets from the existing onshore drilling pad. One of those proposed wells would likely be called Hansen No. 2. Until those wells are active, BlueCrest said the existing Hansen No. 1A1 well would be the primary production well. Following a pilot project from a previous operator, BlueCrest planned to initially truck crude oil from the onshore production facility to the Tesoro refinery in Kenai, to the north. Any associated natural gas would be used as fuel for the operation or sold into the regional grid, using a short lateral pipeline connecting to an existing Enstar Natural Gas Co. pipeline.

The company described the three-well program as "tentative" and said plans could change "due to reservoir modeling, anti-collision, drilling optimization or other issues."

## Fiscal certainty

The future gas development depends in part on the state tax credit program.

According to Johnson, BlueCrest has been waiting for some certainty in the fiscal system before it decides whether to proceed. A joint venture with the liquefied natural gas company WesPac Midstream LLC calls for drilling this year with production starting as soon as 2018. WesPac would fund the entire development program and would control all of the natural gas production from the field, although BlueCrest would operate the program and would gradually increase its stake in the project to as high as 80 percent.

As of December 2015, BlueCrest intended to use the Spartan 151 jack-up rig for its proposed natural gas development. "It's parked in Seward now, with the intention of drilling these Cosmo wells in 2016, 2017 and 2018," Johnson said at the time. Without some certainty, Alaska could risk losing the rig, he said. A few weeks after the speech, Furie Operating Alaska LLC announced plans to bring Shelf Drilling's Randolph Yost rig to Cook Inlet. While the rig would be tied up at the Kitchen Lights unit, it would



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*continued on next page*

## BLUECREST *continued from page 24*

mean Alaska would have at least one jack-up in Cook Inlet, if the Spartan 151 departed.

BlueCrest made the gas development a lower priority than the oil development in part because the local market was satisfied by existing production through early 2018. The company claims to have several supply contracts pending but is unwilling to finalize those deals without an assurance that the state production tax program will be continued.

In testimony before the House Resources Committee in early March 2016, Johnson reiterated that the gas development was too expensive to pursue without the tax credit program.

### Other leases

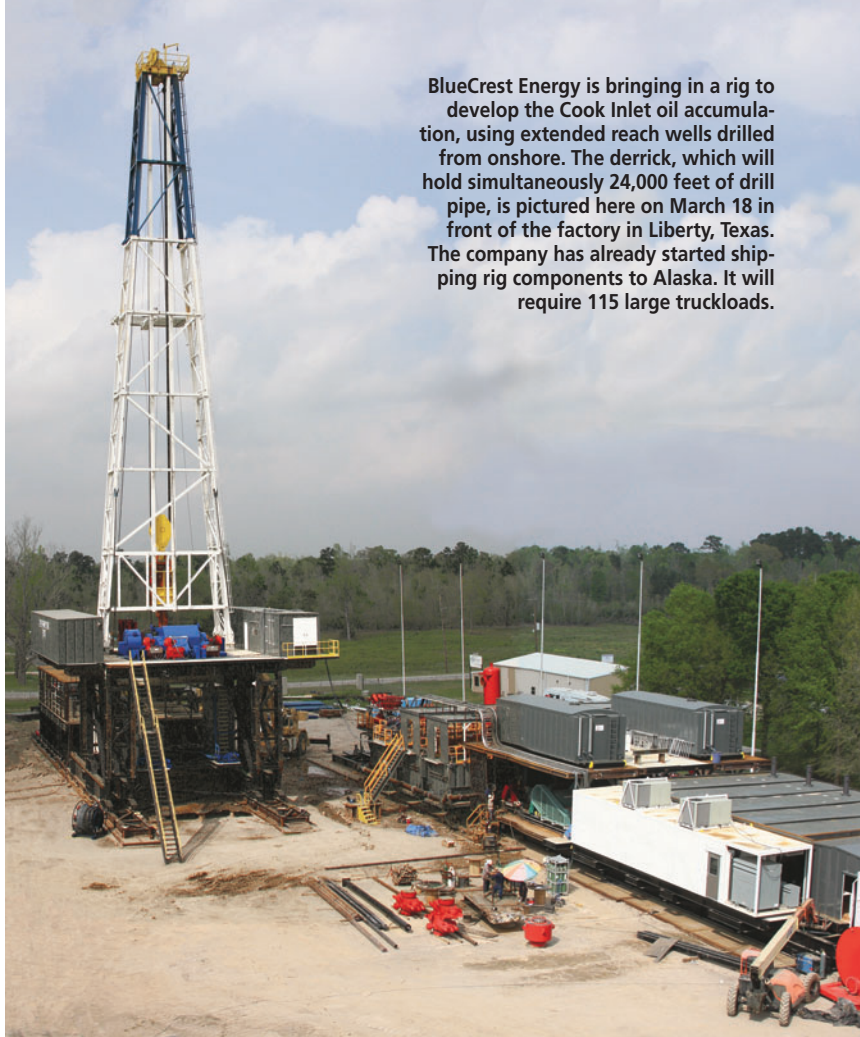
Far down the list of priorities is the potential exploration acreage at Cosmopolitan.

According to the company, a 3-D seismic program from 2005 "suggests that the southern exploratory blocks potentially have producible hydrocarbon deposits at a deeper depth," which would require some "additional evaluation" to determine if the deposits are economically viable. Both the oil and gas developments are focused on leases near the center of the unit, leaving areas to the north and the south for future exploration work.

In particular, the company has identified a prospect worth exploring in the south, located predominately within ADL 391899 and potential extending into two neighboring leases.

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COURTESY BLUECREST ENERGY



BlueCrest Energy is bringing in a rig to develop the Cook Inlet oil accumulation, using extended reach wells drilled from onshore. The derrick, which will hold simultaneously 24,000 feet of drill pipe, is pictured here on March 18 in front of the factory in Liberty, Texas. The company has already started shipping rig components to Alaska. It will require 115 large truckloads.

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## AURORA continued from page 22

program. A proposed deal with U.S. Petroleum Corp. fell apart in 2002 and a farm-out with Pelican Hill Oil and Gas Inc. fell apart in 2005.

Aurora acquired the prospect later that year but suspended all drilling operations in late 2006 while it resolved ongoing litigation with Enstar Natural Gas Co. In early 2009, Aurora arranged a partnership and even received an Alaska Oil and Gas Conservation Commission drilling permit for a Hanna No. 1 exploration well. This time, the delays were regulatory. The Alaska Department of Fish and Game refused to allow the company to build a drilling pad through a marshy section of the Susitna Flats Game Refuge.

After the leases expired again, Craig acquired the prospect for the third time in a 2010 lease sale. Escopeta Oil & Gas Co. expressed an interest in exploring the prospect, believing it could sidestep the regulatory problems by drilling in winter. This time, Craig attached performance requirements to the leases. After two years, Escopeta had missed its deadline. In March 2013, Escopeta

transferred the leases to an affiliated independent called Galena Energy Corp., which also missed the deadline. In May 2013, Galena Energy transferred the prospect to Craig. The leases currently expire on Feb. 28, 2018.

## The other prospects

Aurora announced the other six prospects in one permitting document.

Aurora included Chickalusion, Three Mile Creek Deep, Congahbuna Lake, Nicolai Footwall, Forest Lake and West Eagle in an application for an oil discharge prevention and contingency plan with the Alaska Department of Environmental Conservation.

Chickalusion, Three Mile Creek Deep, Congahbuna Lake and Nicolai Footwall are all located on the west side of Cook Inlet, where Aurora has the most experience to date.

Chickalusion includes as many as two wells at a proposed site near the Aurora-operated Moquawkie and Lone Creek units, approximately four miles due west of Tyonek. The region includes lands managed by the Tyonek Native Corp. and Cook Inlet Region Inc.

Three Mile Creek Deep includes as many as two wells at a proposed site to the north of Chickalusion, some eight miles north of Tyonek and west of the Beluga River unit.

Congahbuna Lake includes one well each at two proposed sites approximately 10 miles west-northwest of Tyonek and west of the Moquawkie and Lone Creek units.

Nicolai Footwall includes one well each at two proposed sites 10 miles southwest of Tyonek, in an area with State of Alaska, Alaska Mental Health Trust and federal lands.

Forest Lake and West Eagle are on the east side of Cook Inlet.

Forest Lake includes one well each at two proposed sites some 12 miles northeast of Kenai, in an area managed by the state, U.S. Fish and Wildlife Service and CIRI.

The West Eagle program would follow an unsuccessful exploration program by Buccaneer Energy Ltd. in the southern Kenai Peninsula, some 20 miles north of Homer.

Aurora said it would use the Aurora Well Service No. 1 rig or similar rig for every program except West Eagle, which would use Cook Inlet Energy's Rig No. 37.

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# Caelus taking a risk on Smith Bay

*Company slows Nuna development but takes a chance on remote exploration*

By ERIC LIDJI  
For Petroleum News

Caelus Energy LLC offers a reason for concern and a reason for hope.

A local subsidiary of the Texas-based independent is slowing its development of the Nuna satellite at its Oooguruk unit because persistently low oil prices and the resulting political uncertainty have challenged the economics of that North Slope project.

At the same time, the company proceeded with a two-well exploration program in an even more remote and challenging region of Smith Bay farther west — a region that could only be developed economically if oil prices rise considerably over the near future.

Caelus is the descendant of a string of small independent exploration and production companies led by President and Chief Executive Officer Jim Musselman. In the 1990s, Musselman and his colleagues led a struggling independent called Triton Energy to discoveries in Colombia, Southeast Asia and offshore West Africa before selling to Amerada Hess. After the sale, Musselman and his investors founded Kosmos Energy, which used a discovery offshore Ghana to justify an initial public offering in 2011.

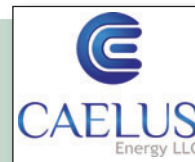
Through a new company called Caelus, the team acquired the assets of Pioneer Natural Resources Alaska Inc. for \$300 million in early 2014, after months of negotiations.

The acquisition made Caelus the operator of the Oooguruk unit. The company was eager to develop the associated 75 million to 100 million barrel Nuna satellite but later asked the state to improve the economics of the project by changing the royalty structure.



JAMES MUSSELMAN

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COMPANY HEADQUARTERS: Dallas, Texas  
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The state reduced the rate on five leases to 5 percent until Caelus recovered costs, and the company officially sanctioned the project in March 2015. Later in the year, Caelus postponed installation and fabrication planned for this winter. "All of our facilities are designed," Caelus Senior Vice President of Alaska Operations Pat Foley said in late 2015. "Our plan right now is to come back next winter and install the flow lines and get going full speed on facilities fabrication and still try and make our late 2017 oil start."

## Smith Bay

At the same event, though, Foley praised the Smith Bay project.

"It's a very exciting exploration play. Every person that I've seen exposed to this project, their eyes, they just light up. These are two wells that just need to get drilled," he said.

Caelus acquired a 75 percent working interest in the 26 leases of the Tulimaniq prospect in Smith Bay from the independent NordAq Energy Inc. in June 2015. The company created a new subsidiary to manage the venture: Caelus Energy Alaska Smith Bay LLC.

The prospect is roughly 150 miles from Kuparuk River unit Drill Site 2P and some 70 miles from Barrow, making it the most remote exploration project this winter. By the end of 2015, Caelus had already brought the Doyon Arctic Fox rig and 35 barges of material to Cape Lonely, to the east of Smith Bay, in preparation for the start of the season.

The acquisition allowed Caelus to piggyback on permitting activities NordAq had underway for the first well and jump quickly to permitting activities for the second well.

*continued on next page*

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The Doyon Arctic Fox rig on site at the Caelus Energy's Smith Bay exploration program.

COURTESY CAELUS ENERGY

## CAELUS *continued from page 28*

By late February 2016, Caelus had completed the first well in the program and was in the process of drilling the second, according to testimony that Division of Oil and Gas Director Corri Feige presented before the Alaska House Resources Committee. By the time *The Explorers* went to print, Caelus had yet to publicly release any results.

Both the Caelus venture and the earlier NordAq venture are building upon a previous seismic campaign conducted by the Talisman Energy subsidiary FEX in the 2000s.

Using those references, Caelus is seeking oil in turbidites, which consist of sandstone layers and channels created by submarine sand flows in ancient marine basins. The target intervals are in the Brookian, which is the youngest and shallowest on the North Slope.

Even with this history of prior work, Caelus plans to conduct a tight program and release few results. "Success will be if you see us back out there the next year," Foley said.

Any discovery in Smith Bay would

*The prospect is roughly 150 miles from Kuparuk River unit Drill Site 2P and some 70 miles from Barrow, making it the most remote exploration project this winter.*

need to be large to justify the cost of developing the remote region. The company has described the project as a 1 billion barrel opportunity.

## Other exploration

Prior to the Smith Bay acquisition, Caelus was compiling a 350,000-acre position at the eastern end of the central North Slope, between the Prudhoe Bay and Badami units.

The company recently commissioned a 3-D seismic survey in the region.

"It's phenomenal data. We're really excited," Foley said.

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# CIRI takes over Shadura exploration

*Cook Inlet landowner proposes Kenai National Wildlife Refuge seismic*

By **ERIC LIDJI**  
For Petroleum News

Over the past year, NordAq Energy Inc. has handed over control over its two most advanced exploration ventures to other companies in the region. The Alaska-based independent sold a 75 percent interest in the Smith Bay program to Caelus Energy Alaska Inc., while Cook Inlet Region Inc. took over operations at the Shadura project.

Earlier this year, the state Division of Oil and Gas issued a permit for SAExploration Inc. to conduct a 2-D and 3-D seismic survey on state land in the Shadura region of the northern Kenai Peninsula on behalf of CIRI.

The permit marks a transition for the project. NordAq announced "a significant natural gas discovery" after drilling an exploration well in the Shadura region in 2011 and permitted an appraisal well over the next three years. But the company never drilled the second well, according to Alaska Oil and Gas Conservation Commission records.

According to CIRI spokesman Jason Moore, the Alaska Native corporation revoked the Shadura leases because NordAq missed work commitments associated with the leases.

NordAq spud the Shadura No. 1 exploration well in February 2011 using the Glacier No. 1 drilling rig. The prospect was within the Kenai National Wildlife Refuge, west of the Swanson River field. A provision in the Alaska National Interest Lands Conserva-

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tion Act allowed for CIRI to allow access to lands within the refuge for resource development. The well primarily targeted natural gas objectives in the upper and middle Tyonek formation between 11,000 and 14,500 feet, and included a secondary target in the shallower Beluga formation between 6,000 and 11,000 feet, according to state filings.

After completing the well, NordAq suggested the prospect could produce up to 50 million cubic feet per day over 30 years. A subsequent announcement clarified that the figure measured the "facility design volume," rather than the actual production volume.

In early 2012, NordAq proposed a flow test and an appraisal well to assess the discovery, which would be followed by a potential six-well development program if successful.

The company expected the appraisal program to take as long as two years to prepare, in part because of the need to secure a rig powerful enough to drill a 16,000-foot directional well and partially because the federal environmental program was time consuming.

The process of conducting an environmental impact statement for the program proved to be tricky. The company and federal agencies disagreed over the best development plan.

NordAq proposed a two-phased development. The company would build a short gravel access road and a "minimal" pad to support a single appraisal well in June 2013. If successful, the company would expand the pad for full development, with the goal of bringing the field into production by June 2014 and selling the gas supply into the pipeline connecting the Tyonek A platform to the Kenai liquefied natural gas plant.

The final EIS proposed five alternative development schemes, including plans for accessing the prospect from the south or the east out of the Hilcorp-operated Swanson River unit. NordAq believed that those two options were economically or logistically unfeasible, which would have violated the ANILCA provision allowing development. But the U.S. Fish and Wildlife Service believed both alternatives were "feasible."

The agency finally approved the NordAq plan in July 2013. The company said it intended to start building the gravel road in mid-July and spud the appraisal well in mid-September. The AOGCC issued a permit for the Shadura No. 2 (23-19) in late September 2014. As of early 2016, the well had yet to appear as "completed" in AOGCC reports.

The CIRI program includes 16 square miles of 3-D seismic and about 42 linear miles of 2-D seismic located predominately within the Kenai National Wildlife Refuge. CIRI is looking for gas, although the company said it would decide whether to operate an exploration and development program or find a partner after processing the seismic.

Contact Eric Lidji at [ericlidji@mac.com](mailto:ericlidji@mac.com)



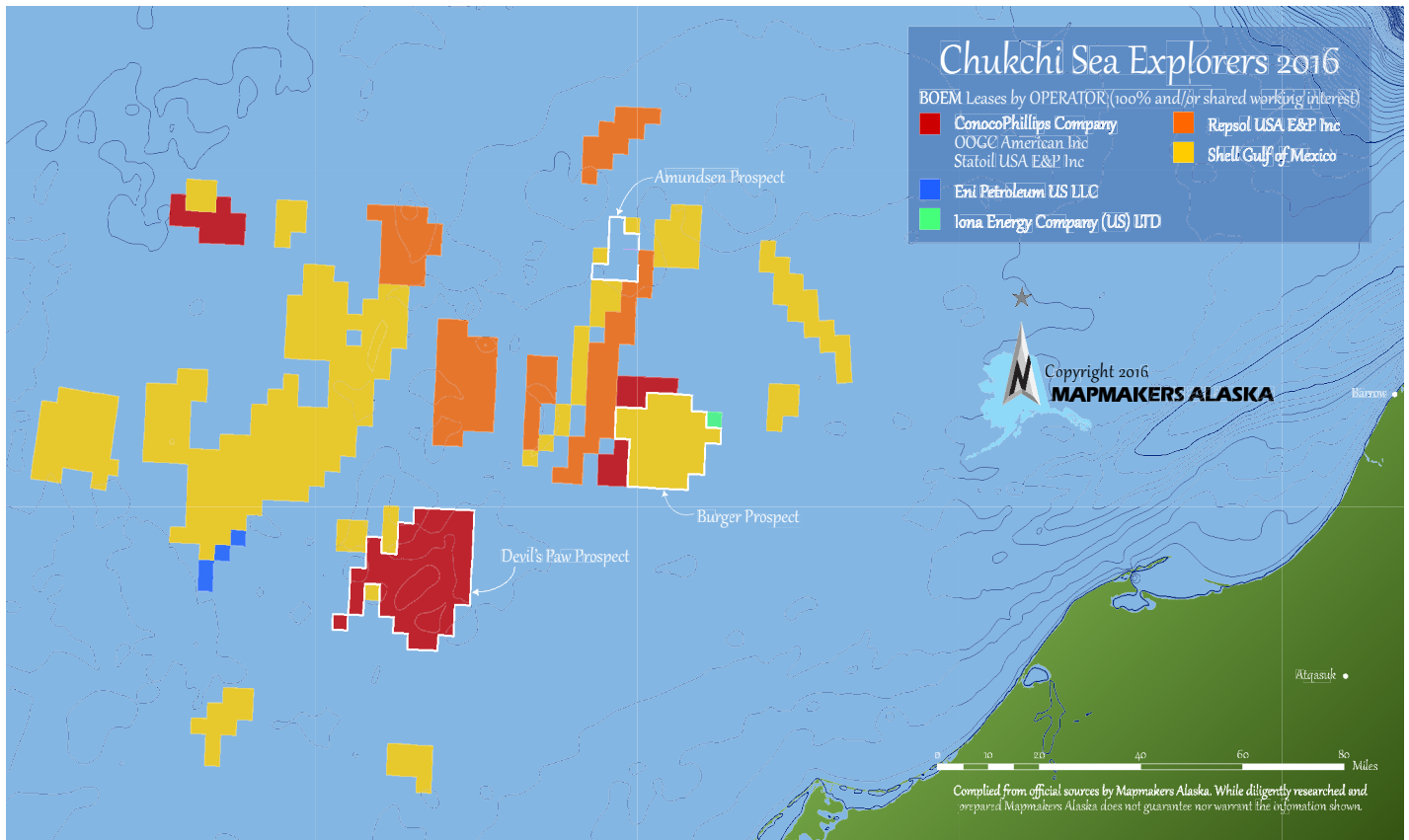
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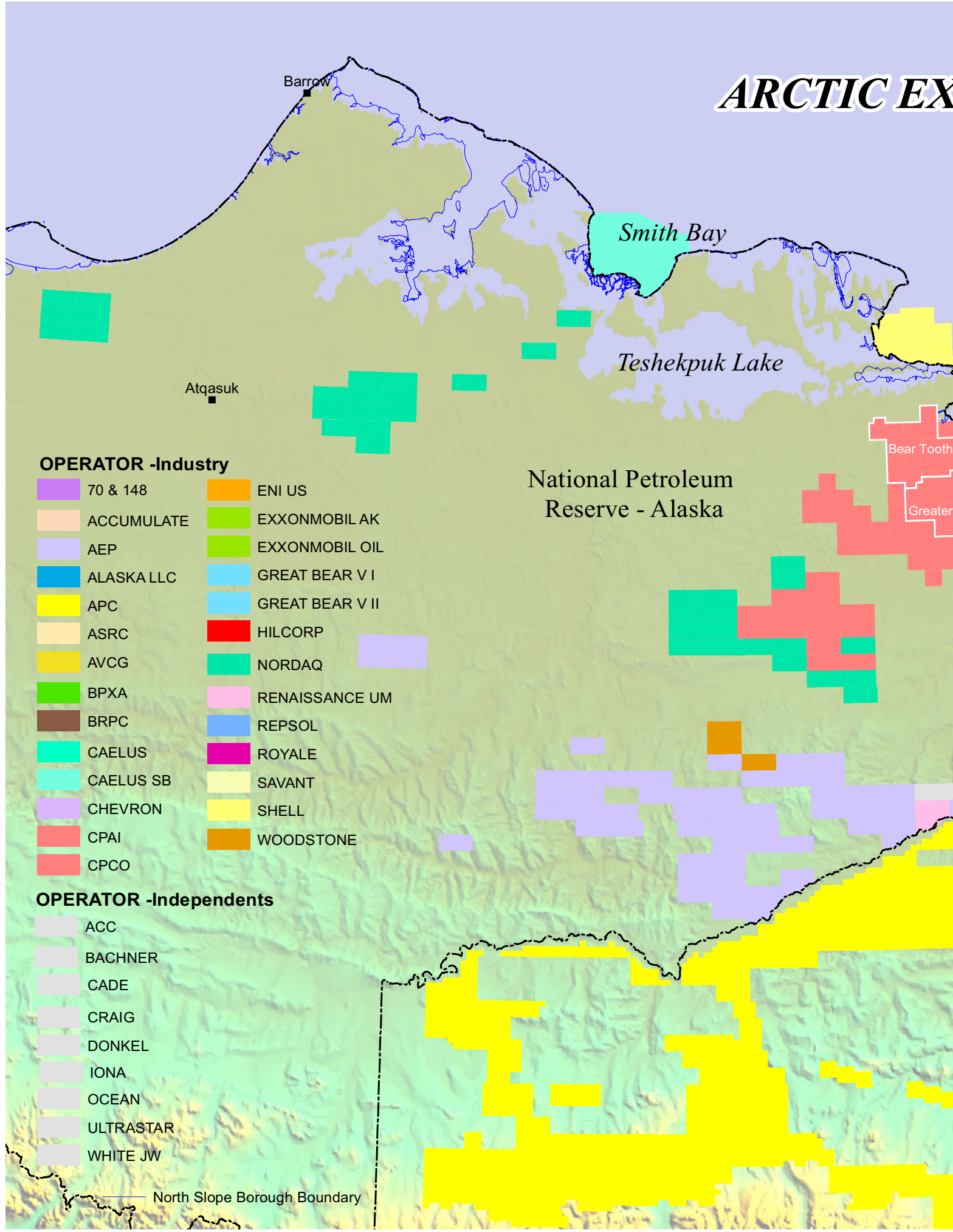


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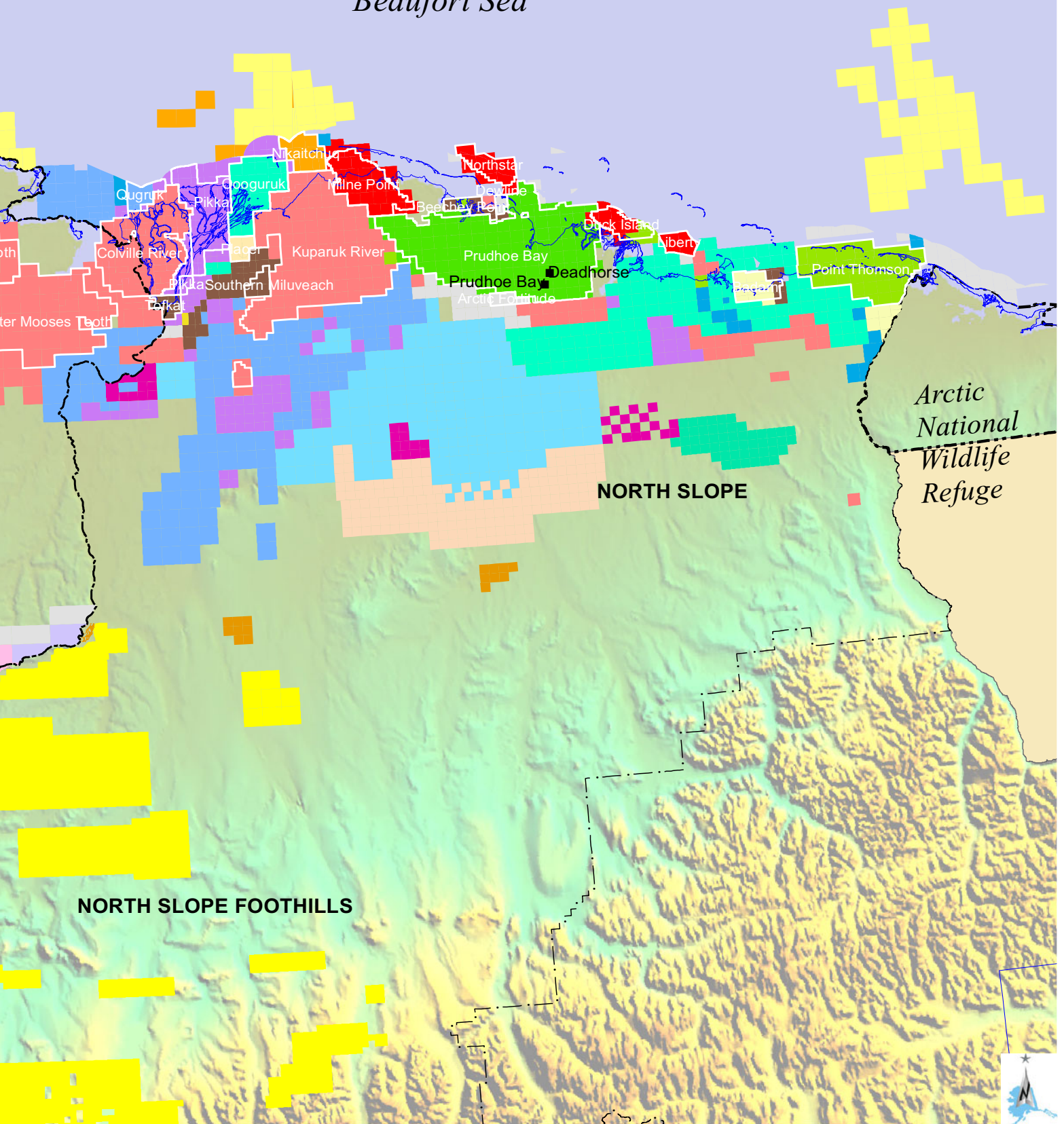
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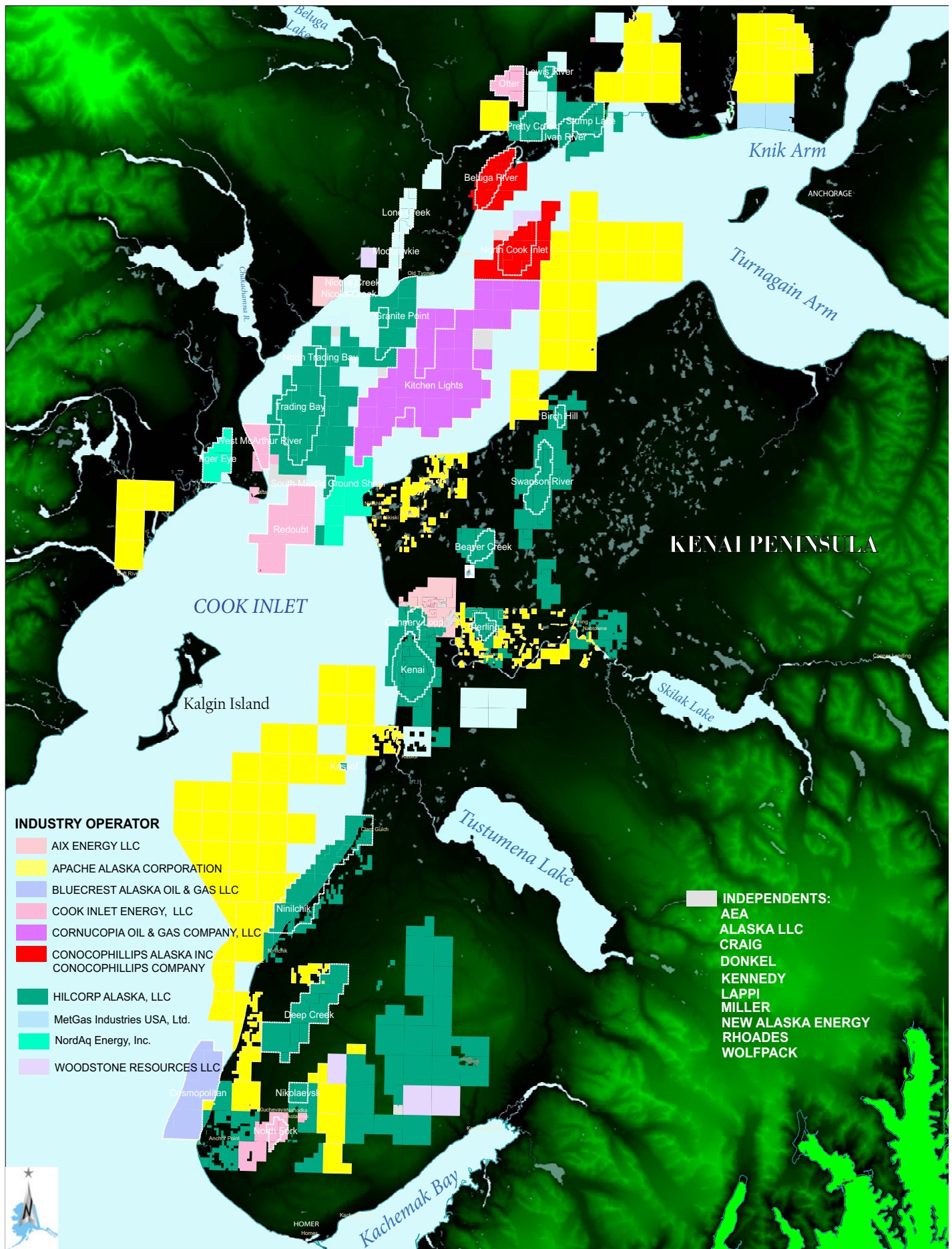
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# ConocoPhillips presses deeper into NPR-A

*Current effort involves development and exploration at Greater Mooses Tooth*

By **ERIC LIDJI**  
For Petroleum News

Even though Alaska is an expensive place to work, with a history of quick political changes and a resource base generally thought to be in decline, ConocoPhillips Alaska Inc. has become increasingly enamored by the North Slope region over the past few years.

The largest oil company in Alaska believes it can more or less offset production declines from aging fields through improved technologies and a conservative exploration strategy.

"Over the past couple of years, we've been able to change the profile of our Alaska business," ConocoPhillips Chief Executive Officer Ryan Lance said at the end of 2015, as he unveiled the 2016 capital budget and operating plan. "We've transformed the declining production base into one that can deliver stable production for a decade."



**JOE MARUSHACK**

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**ConocoPhillips**

This optimism even surprised analysts. Considering recent history, Paul Sankey of Wolfe Research asked, "What changed there? It's being perceived obviously to be a decline area." ConocoPhillips' Executive Vice President for Exploration and Production Matt Fox attributed the change to improved technology, successful exploration and a favorable fiscal regime before summing up the company's outlook for Alaska: "a slight increase in production next year for less capital and we believe that we can sustain that for 10 years."

The promise of a decade with little or no production decline comes as the falling oil price has forced companies large and small to reconsider their recent trajectories. But while ConocoPhillips slashed its current budget by 25 percent over 2015 levels, the company cut Alaska spending by only 5 percent to \$1.3 billion. Given that the company completed two major capital projects in Alaska in 2015, those cuts are negligible.

## Chukchi disappointments

The current strategy can be seen in two recent incidents: ConocoPhillips abandoned its Chukchi Sea exploration program and permitted a two-well exploration program at the western end of its Greater Mooses Tooth unit in the National Petroleum Reserve-Alaska.

*continued on next page*

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After spending some \$504 million on 98 tracts in a federal lease sale in the Chukchi Sea in early 2008, ConocoPhillips sold a 25 percent working interest in its Devil's Paw prospect to Statoil of Norway and farmed out a 10 percent working interest in its leases in the Chukchi to the U.S. subsidiary of the Chinese National Offshore Oil Corp.

ConocoPhillips subsequently conducted fieldwork in the region but never successfully arranged a drilling program and eventually cancelled its efforts for the time being. "While we are confident in our own expertise and ability to safely conduct offshore Arctic operations, we believe that more time is needed to ensure that all regulatory stakeholders are aligned," ConocoPhillips Alaska President Trond-Erik Johansen said at the time.

A discovery in the Chukchi Sea would have needed to be massive in order to justify the considerable expense of bringing those resources to market by pipeline or by tanker.

### Greater Mooses Tooth

By comparison, the NPR-A is cheap.

This winter, ConocoPhillips permitted a two-well exploration program in the reserve. In early January, the U.S. Bureau of Land Management and the Alaska Oil and Gas Conservation Commission issued drilling permits for the Tinmiaq No. 2 and Tinmiaq No. 6 exploration wells in the federal unit extending due west from the village of Nuiqsut.

Tinmiaq No. 2 would be at the southern end of lease AA 81807, northwest of the Grandview No. 1 well. Tinmiaq No. 6 would be at the north end of lease AA 81808, west of the proposed Spark No. 7 well. Both wells would be vertical holes, targeting oil.

The Tinmiaq wells are farther west than any previous drilling in the unit. In May 2001, before forming the unit, Phillips Alaska Inc. announced oil discoveries from the Spark No. 1, Spark No. 1A, Moose's

*continued on page 39*

COURTESY CONOCOPHILLIPS ALASKA



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Tooth C, Lookout No. 1, Rendezvous A and Rendezvous No. 2 wells. Except for the Lookout well in the northeast corner of the unit, all of those wells were clustered in the center of the unit. In subsequent years, the company drilled various exploration wells in the east and south of the unit, including Pioneer No. 1 and Grandview No. 1 in early 2009 and Rendezvous No. 3 and Flat Top No. 1 in early 2014.

ConocoPhillips recently sanctioned a \$900 million GMT-1 development at the eastern end of the unit, at lease AA 81798. The project includes construction of a drilling pad, a 7.7-mile road and associated facilities and pipelines and an initial nine-well drilling program with the capacity for 33 wells. The timeline calls for production by late 2018.

At the same time, ConocoPhillips is permitting the GMT-2 development in the south-central portion of the unit, near lease AA 81781. In late August 2015, the company applied for a federal permit to drill the GMT2-R112 oil well on lease AA 81800. While the projects are prone to change over time, ConocoPhillips previously outlined a GMT-2 project with a base plan of 10 wells and the potential for as many as 19 wells.

### Cook Inlet sale

All the exploration funding in ConocoPhillips' budget is focused on the North Slope.

After ConocoPhillips spent more than \$155 million drilling seven wells at the Beluga River unit and the North Cook Inlet unit between 2008 and 2010, and another \$60 million dispersing compressor stations at Beluga River, the company reduced its spending at the two legacy Cook Inlet fields to standard operational and maintenance activities.

In late summer 2015, ConocoPhillips put those assets on the auction block.

"While historically significant to the company's investment in Alaska, the North Cook Inlet and Beluga River units are mature fields that are no longer considered core to Alaska operations. The focus will be on the company's current North Slope operations, including the Alaska LNG project," the company said in a statement on July 28.

In early February 2016, the Anchorage-based electric utilities Municipal Light & Power and Chugach Electric Association announced that they would jointly ac-

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*The Tinmiaq wells are farther west than any previous drilling in the unit.*

---

quire ConocoPhillips' stake in Beluga River for \$152 million. ConocoPhillips transferred 70 percent of its stake to ML&P and 30 percent to Chugach Electric, which gave ML&P a 56.67 percent interest and Chugach Electric a 10 percent interest. Hilcorp Alaska LLC would continue to hold the remaining one-third interest, but would become the operator.

The deal was expected to close in the spring, as The Explorers went to press.

As of late March, ConocoPhillips had yet to announce plans for North Cook Inlet.

The sale only covers the two fields. ConocoPhillips decided to keep its pioneering liquefied natural gas export terminal in Nikiski. The terminal was on the verge of closure several years ago, until changing markets conditions both in Alaska and in East Asia gave the company a reason to continue export operations from the facility on a reduced basis.

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Contact Eric Lidji at [ericlidji@mac.com](mailto:ericlidji@mac.com)



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# Doyon drilling third Nenana well this summer

*Alaska Native corporation sees a high probability for finding gas and oil too*

By ERIC LIDJI  
For Petroleum News

**D**oyon Ltd. has shown great persistence in its search for natural gas.

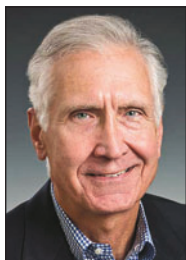
The Alaska Native corporation for the Interior region has been exploring within its territory for nearly 15 years and is actively continuing the program this year.

The company completed a fourth seismic survey in the Nenana basin during the first quarter and is planning to drill a third exploration well in the region this coming summer.

The 2-D seismic survey covered approximately 172 line miles of state, Native and Mental Health Trust leases in the area northwest of the city of Nenana. The goal was to eliminate gaps from 2-D seismic surveys in 2005 and 2012. The company might also commission a 3-D survey in the future to upgrade promising leads into viable prospects worth pursuing, according to Doyon Vice President for Lands and Natural Resources James Mery.

A 3-D seismic survey in the central part of the basin in the winter of 2014 and 2015 added enough detail to a previous 2-D survey to inspire the current drilling program.

"We are very excited to begin the next



JAMES MERY

phase of our exploration program," Doyon President and Chief Executive Officer Aaron Schutt said in late August 2015. "Building on promising results from each of our earlier programs, we have substantially reduced exploration risks to a point that we estimate the chance of success for a developable gas find is one in two, and one in five for oil. An oil or gas discovery would be great news for our companies, shareholders, residents of Interior Alaska and the state."

Doyon plans to drill the Toghothle No. 1 well this summer, after completing a short road to extend existing infrastructure. "We're looking at multiple zones of interest, starting around 7,000 feet and going down a little deeper than 9,000 feet," Mery said.

"Toghothle" is the name of the local Native village corporation at Nenana and comes from an Athabascan word for "hill on the water," a reference to a nearby topography.

In recent permitting documents, Doyon said it would drill the well between June and September and would either test the initial well or drill a second well, depending on timing. The company was considering two sites — one on Toghothle Corp.

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PHONE: 888-478-4755 • COMPANY WEBSITE: [www.doyon.com](http://www.doyon.com)



surface lands, the other on state lands — located between the two previous Doyon wells.

Between 2005 and 2014, Doyon spent approximately \$68 million on the program, according to the company. The current seismic and drilling program was expected to cost \$30 million to \$35 million. The company relies heavily on tax credits to fund its work.

## Early interest

The prospect of a commercial development between Deadhorse and Anchorage has long intrigued those Interior communities dependent on energy "imports" from north or south.

Unocal drilled the 3,062-foot Nenana No. 1 well in 1962. ARCO drilled the 3,590-foot Totek Hills No. 1 well in 1984. "Except for minor amounts of gas associated with coal beds no hydrocarbon shows were observed in the wells," the Alaska Division of Oil and Gas reported in 2002. "Reports of oil seeps in the basin are unconfirmed." Given the considerable coal quantities in the region, the state expected the basin to be gas-prone.

As private industry began losing interest in exploring the region in the late 1990s, Doyon began organizing an exploration program. The company saw the potential for a low-cost energy supply for the region and, with a large enough discovery, perhaps profits as well.

In late 2001, Doyon formed a joint venture with the Houston-based independent Andex Resources LLC to explore the Nenana basin using an exploration license. The program allows companies to propose



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*continued on next page*

exploration on lands excluded from annual lease sales.

The Alaska Department of Natural Resources issued a seven-year license to Andex Resources in August 2002. The license covered 482,942 acres in the Nenana basin and required Andex to post bonds and spend at least \$2.525 million exploring. The joint venture grew its land position several months later when the Alaska Mental Health Land Trust leased it 9,500 acres adjacent to the exploration license area in January 2003.

At the time, Doyon estimated that the Nenana basin contained 250 million barrels of recoverable oil and between 250 billion and 1 trillion cubic feet of recoverable natural gas, enough to meet the needs of Fairbanks with potential leftovers for Anchorage.

The partners intended to start by commissioning a seismic survey in late 2002 and drilling a well in early 2004. Overall, Andex expected to spend \$18 million to drill three exploration wells and \$6 million for seismic activity over an initial exploration program.

"When industry explored the basin in the early '80s, their focus was oil but they knew it was a gas-prone basin and thought there was also a good shot at oil. Andex's focus is gas," Andex Resources Executive Vice President Jim Dodson told Petroleum News in August 2001. "We'd be happy if we found oil, but our focus is traditional natural gas."

### Optimism

After seeking and receiving an extension of tax credits for exploration activities in the Interior, Andex and Doyon partnered with the Usibelli Coal Mine affiliate Usibelli Energy LLC and the Alaska Native corporation Arctic Slope Regional Corp. in late 2004.

The enlarged joint venture commissioned a 2-D seismic survey from PGS Onshore for early 2005 with the intention of drilling as soon as 2006. The \$3 million campaign covered some 218 square miles of the region. Andex said it planned to spend another \$3 million acquiring information from previous seismic surveys over the region.

Even before the program was complete, Andex was growing optimistic. Measuring just the thermogenic gas, Andex believed the basin could contain 3 trillion cubic feet of recoverable reserves and 10 trillion cubic feet of total reserves. "That number was based on some very, very conservative inputs," Andex Vice President of Exploration for the Northern Region Bob Mason told Petroleum News in March 2005. In addition to the thermogenic supplies, he said, "We know that there's biogenic gas in this basin."

The U.S. Geological Survey had estimated that central Alaska contained some 500 billion to 7.3 trillion cubic feet of technically recoverable reserves with a mean of 2.8 tcf.

Early wells were shallow. The joint venture planned to drill deep, at least 10,000 feet. "I want to take a look at structures that preserve a very thick layer for my initial well," Mason said. "We are evaluating structures deeper in the basin where we don't have to worry about flushing, we don't have to worry about section missing — that sort of thing."

### Drilling

Political matters stalled the program for several years.

Andex postponed its 2006 and 2007 exploration programs because of the Petroleum Profits Tax and commercial negotia-

*continued on page 42*

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tions for producing and marketing North Slope natural gas. Both excluded Interior basins from incentives and tax credits. By the time Alaska's Clear and Equitable Share was approved in late 2007, and Cook Inlet tax credits were expanded to include any gas produced for use within Alaska, Andex had lost interest.

With the seven-year exploration license set to expire in September 2009, Doyon and its remaining partners sought and received a three-year extension, through mid-2012.

Denver-based independent Babcock & Brown Energy became the operator of the joint venture in early 2009 and announced plans to drill at least one 10,500-foot well that summer. Babcock & Brown later changed its name to Rampart Energy Co. A fifth company, Cedar Creek Oil and Gas Co., also joined the joint venture during this time.

The joint venture drilled the Nunivak No. 1 well about three miles west of the town of Nenana in July and August 2009 to a total depth of 11,100 feet. The roughly \$15 million well failed to find commercial volumes of gas, but information collected during the drilling suggested that the basin was much deeper and cooler than previously expected and offered tantalizing clues about high resource potential in the basin, Doyon said.

To get a wider understanding of its large license area, Doyon commissioned a seismic survey over the northern end of the basin. "Other than a few gravity measurements at the northern end of the basin, there really isn't any exploration," Mery said in April 2010.

With state officials now looking to truck liquefied natural gas from the North Slope to the Interior and considering plans to unite the Railbelt utilities, Doyon postponed its seismic program

until it had more certainty about its position in the statewide energy market.

As Doyon waited, its four joint venture partners lost interest in the program.

Ultimately, Doyon decided to go it alone. The company commissioned its 2-D seismic survey in the northern end of the basin in the winter of 2011 and 2012 and announced plans to drill the Nunivak No. 2 exploration well some seven miles west of its first well.

The state helped by approving an incentive program specifically for "frontier basins" in early 2012. The program included exploration credits and lower production taxes. With its exploration license expiring, Doyon converted sections of the area into regular leases.

### Going it alone

Doyon drilled the 8,667-foot Nunivak No. 2 well in mid-2013.

As with the first well, Nunivak No. 2 encountered encouraging geology but no commercial volumes. "The Nunivak No. 2 drill program was only the second deep test of this basin," Schutt said in a November 2013 statement. "Despite the disappointment of a non-commercial effort, other results from the well clearly indicate the potential for significant commercial discoveries of oil and gas and we consider it a success. Follow-on studies are underway which will assist us in the development of our forward program."

According to the company, drilling results suggested "excellent potential reservoirs, competent top seals, source rocks actively expelling wet gases and similar shows of likely migrated

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**DOYON** continued from page 42

gas which are indicative of an oil and/or gas-condensate system.” In March 2015, Mery said the two wells had encountered propane, butane and pentane, which typically indicate a petroleum system conducive to oil. “We have all the elements of an active and prolific wet gas, condensate and hopefully oil system,” he said. “Through modeling we really believe that the basin, given the thick packages of source rock, really could have produced billions of barrels of oil and trillions of cubic feet of gas.”

At that point, Doyon launched the 3-D seismic program to illuminate aspects of the previous 2-D seismic program, which eventually created confidence in a third well.

### Yukon Flats

Although focused on Nenana, Doyon also wants to explore the Yukon Flats region.

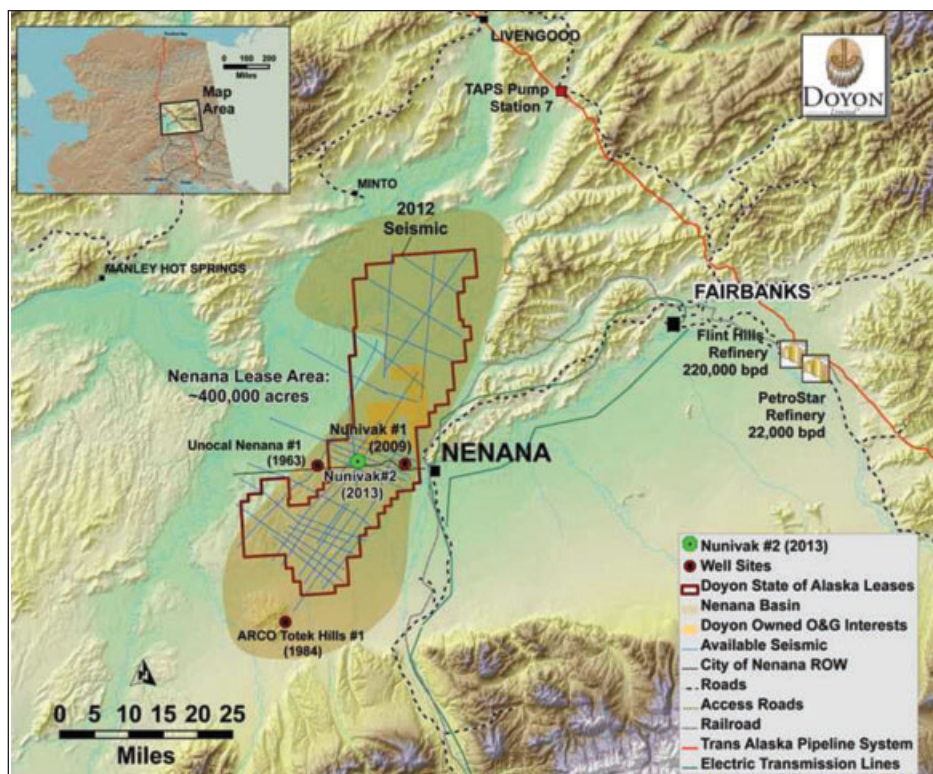
The program was stalled for five years as Doyon and the U.S. Fish and Wildlife Service negotiated and eventually dropped a proposal to swap resource-rich acreage in the Yukon Flats National Wildlife Refuge with nearby Doyon acreage. After the setback, Doyon reassessed its acreage and decided the land was more prospective than originally thought.

With no license or leases in the region, and none of the associated deadlines, any exploration in the Yukon Flats is hypothetical at the moment. A successful development in the Nenana region would improve the economics of a Yukon Flat program.

SAExploration conducted a 3-D seismic survey in the Stevens Village region of the Yukon Flats in the winter of 2012 and 2013, on behalf of Doyon. As of December 2013, Doyon was studying the results of the survey to determine potential drilling locations, although those plans are currently on hold while Doyon pursues its Nenana leases.

A 2004 USGS study of the 13,500 square mile lowland between the trans-Alaska oil pipeline and the Canadian border estimated mean technically recoverable resources of 173 million barrels of oil, 127 million barrels of natural gas liquids and 5.5 trillion cubic feet of natural gas, which exceeded earlier estimated for the entire central Alaska region.

Contact Eric Lidji at [ericlidji@mac.com](mailto:ericlidji@mac.com)



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# Furie planning major exploration effort

*With Kitchen Lights in production, company is covering its leasehold*

By **ERIC LIDJI**  
For Petroleum News

**F**urie Operating Alaska LLC became the newest producer in Alaska in late November 2015, when natural gas production started from the offshore Kitchen Lights unit.

But given that the unit is the largest in the Cook Inlet region, exploration activities will remain a priority even as development drilling progresses, according to the company.

In a plan of operations submitted to the state in March 2016, the company proposed a schedule for drilling as many as 10 exploration wells at the unit in the next five years.

The program would come on top of existing plans for development drilling.

To support the exploration program, Furie contracted the Randolph Yost jack-up drilling rig, which completed the trip from Singapore to Kachemak Bay in Alaska in March.



**BRUCE WEBB**

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The exploration program is a vast expansion over previous proposals.

Previously, Furie planned to complete a second development well in 2016, which would allow the company to meet supply commitments should anything happen to the existing KLU No. 3 well. The company said it would complete a third well in 2017 and a fourth well in 2018, when many of the largest existing sup-

*continued on page 46*

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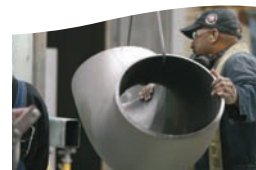
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ply contracts in the region expire.

As far as exploration, Furie had planned to re-enter and deepen the KLU No. 4 well this year and drill a new well in 2017, according to Senior Vice President Bruce Webb.

Under the new plan, Furie would first re-enter the KLU No. 4 well and then drill two additional exploration wells each year over the next five years. The KLU No. 4 project would target oil and natural gas in the Tyonek, Hemlock and deeper Jurassic formation.

The other wells would be spread across the entire unit and target numerous formations.

### Previous work

After the Houston-based independent Escopeta Oil & Gas Co. spent more than a decade arranging an exploration program in the upper Cook Inlet, a 2009 settlement agreement between the state and various independent operators created the Kitchen Lights unit.

The 83,394-acre unit combined 40,733 acres from the Escopeta-operated Kitchen unit, 15,930 acres from the Renaissance

Alaska LLC-operated Northern Lights prospect and 26,721 acres from the Corsair prospect that had previously been owned by the bankrupt Pacific Energy Resources Ltd. The settlement prevented a legal battle over missed work commitments while simultaneously prompting exploration and development activities.

A corporate shuffle in 2011 divided the Kitchen Lights unit. Through its subsidiary Furie Operating Alaska LLC, the German company Deutsche Oil & Gas became the new unit operator. Cornucopia Oil and Gas Co. became the primary working interest owner.

Given the patchwork nature of the unit, the state required the operator to spread its exploration activities across four blocks: North, Corsair, Central and Southwest.

The five exploration wells to date have favored the Corsair block.

Furie drilled the 15,298-foot KLU No. 1 well in 2011 and 2012, the KLU No. 2 and KNLU No. 2-A sidetrack in 2012 and the 10,391-foot KLU No. 3 well in 2013. All three wells were drilled in the Corsair block and formed the basis for a development program.

Toward the end of the 2013 open-water

season, after completing KLU No. 3, Furie began drilling KLU No. 4 well in the northern block. In 2014, the company completed KLU No. 4 and completed the 11,800-foot Kitchen Lights Unit No. 5 well in the central block.

KLU No. 5 was a dry hole, but KLU No. 4 "encountered potential oil and gas reserves," according to the company. In a plan of development from October 2015, the company proposed deepening KLU No. 4 to penetrate the Sunfish Channel of the lower Tyonek formation.

"We've invested \$700 million in the state of Alaska over the last five years," Chief Financial Officer David Elder told the House Resources Committee in March 2016, in testimony to preserve tax credits. "Depending on where the tax credits stay, we've got a planned additional \$300 million investment to make over the next two to three years."

### New plans

The more recent proposal calls for drilling KLU No. 4 between May 2016 and October 2017. A target depth of 17,858 feet would reach the deeper Tertiary rock sequence.

Previously, Furie discussed a KLU No. 6 well targeting the southwest block, which would complete the circuit of exploration activities required to target each of the four exploration blocks. But the company had said that a final decision would depend on the results of a 3-D seismic survey Furie commissioned in 2015, according to Webb.

The updated plan calls for drilling the KLU No. 9 and KLU No. 12 wells at the northern end of the unit in the 2017 season, the KLU Osprey and KLU Deep Jurassic wells in the 2018 season, the KLU No. 10 and KLU No. 11 wells in the 2019 season, the KLU No. 6 and KLU No. 8 wells in the 2020 season and the KLU No. 7 well in the 2021 season.


The progression of the wells moves southward over the five-year program.

The wells also vary in depth. The KLU No. 9 and KLU No. 12 wells would be approximately 17,000 feet deep. The KLU Osprey well would be approximately 7,230 feet deep. The KLU Deep Jurassic well would be approximately 24,000 feet deep.

Those wells would allow Furie to retain the vast acreage within the unit boundaries but outside the existing development. The development only accounts

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# Great Bear turns to seismic for source rocks

*Company now searching for conventional and unconventional targets*

By **ERIC LIDJI**  
For Petroleum News

To date, Great Bear Petroleum Operating LLC has drilled three exploration wells and commissioned five 3-D seismic surveys on a patch of acreage in the central North Slope.

That disparity highlights the challenges the company has faced as it tries to understand the potential for developing source rocks in the region south of the Prudhoe Bay unit.

The Alaska-based independent only completed one well in a three-well program planned for 2015. This year, after Gov. Bill Walker vetoed tax credits in 2015, the company postponed a re-entry of the well until 2017 and instead commissioned more seismic.

Great Bear hired Geokinetics Inc. to collect seismic data from about 450 square miles immediately south and southwest of Deadhorse. The program targeted potential "sweet spots" for source rock development as well as conventional oil prospects in the area.



**MIKE MASON**

## Two goals

Those two objectives reflect an expanded strategy. When Great Bear purchased its initial 500,000-acre leasehold dur-

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**FURIE** *continued from page 46*

for about 300 acres, which leaves more than 83,000 acres at stake in the current exploration campaign.

## A second jack-up

To date, Furie has relied on the Spartan 151 jack-up rig for conducting drilling operations in the region. Going forward, the company is using Shelf Drilling's Randolph Yost rig.

The Randolph Yost rig is bigger and more powerful than the Spartan 151 and can more easily be cantilevered over the Julius R platform for development drilling, according to Webb. The larger rig will allow the company to eliminate costly supply runs by accommodating more materials on site. It will also allow the company to target potential oil accumulations below the Tertiary strata, where most Cook Inlet fields are located.

The decision creates the potential for Cook Inlet to once again have two jack-up rigs in operation, which had been the case until the Endeavour rig departed for foreign waters.

BlueCrest Energy Inc. has expressed an interest in using the Spartan 151 rig for conducting a gas development program at its Cosmopolitan field. As of early 2016, the company was waiting for greater political certainty before making a final decision.

---

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ing a state sale in 2010, the company was eager to bring Lower 48-style shale development to Alaska. The oil contained in prolific North Slope reservoirs had to originate somewhere and studies had suggested it might be the stacked source rocks to the south. The company planned to use horizontal drilling and hydraulic fracturing to develop all three source rocks at once.

Using the year-round access provided by proximity to the Dalton Highway, Great Bear identified six locations and drilled two wells in the summer and fall of 2012. The smaller program was the result of

*continued on page 49*

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# Hilcorp stepping beyond development

*Greystone project would be first exploration project outside units*

By **ERIC LIDJI**  
For Petroleum News

**H**ilcorp Energy Co. came to Alaska to develop and has only drilled exploration wells when it needed to expand the size and scope of its existing development operations.

But in March 2016, Hilcorp Alaska LLC began permitting a standalone exploration project in the southern Kenai Peninsula. If the subsidiary of the Houston-based independent proceeds, it would be its first exploration venture outside of existing units.

The proposed Greystone pad would be on Cook Inlet Region Inc. leases between the Deep Creek and Nikolaevsk units, which are both producing fields operated by Hilcorp.

A public notice from the Alaska Department of Environmental Conservation said Hilcorp would begin construction on Greystone in the second quarter and drill at least one well.



**DAVE WILKINS**

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Aside from Greystone, Hilcorp has continued to pursue exploration opportunities at two southern Kenai Peninsula properties: the Deep Creek unit and the Ninilchik unit.

In both cases, Hilcorp has been pursuing exploration activities outside of existing participating area to prevent the state from contracted un-used acreage from the units.

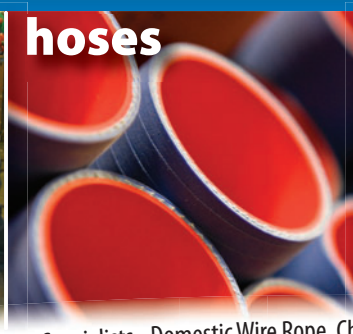
Hilcorp also operates the Milne Point, Northstar and Duck Is-

*continued on page 50*

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**GREAT BEAR** *continued from page 47*

a later than expected start and the end of a rig contract.

The program yielded some 650 linear feet of rock core collected from source rocks. The company also collected 3-D seismic, which was intended to identify the best places to drill into source rock but also found some conventional opportunities worth pursuing.

Because the company was working in a region with relatively few prior exploration activities, Great Bear prioritized additional seismic activities that would expand and screen its inventory of high-impact prospects across the leasehold, Great Bear Executive Vice President Patrick Galvin told the Alaska Oil and Gas Congress in September 2015.

Great Bear completed a second, third and fourth 3-D seismic survey in 2012, 2013 and 2014. The company also assembled a team of geoscientists to compile a massive database of geologic data to help identify potential sweet spots for source rock development. The company has also been using light detection and ranging, or LIDAR, surveys to develop detailed topographic maps for the planning of surface developments such as ice roads.

### New approach

The current goal is to organize a multi-well drilling program that would achieve some economies of scale. The end result might be several development projects, Galvin said.

Some aspect of that program seemed to be the intention behind a three-well program Great Bear proposed in late 2014. The wells — Alkaid No. 1, Phecda No. 1 and Talitha No. 1 — were explicitly targeting both conventional and unconventional opportunities.

By the time Great Bear started drilling the Alkaid No. 1 well in mid-February 2015, completing the full program seemed to be unlikely by the end of the winter season. The company first reduced the program to two wells and later reduced it further to just one.

(The Alaska Oil and Gas Conservation Commission proposed a \$20,000 fine against the company for failure to pressure test the casing of the well. The company appealed.)

With an uncertain program, and no development to provide cash flow, Great Bear has been particularly reliant on tax credits and has been a vocal advocate for the program.

Even with that dependence, Great Bear

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*The company has spent some \$220 million, of which \$140 million will be reimbursed through tax credits and \$80 million can only be recovered through development.*

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claims there is a myth that explorers are freeloading. The company has spent some \$220 million, of which \$140 million will be reimbursed through tax credits and \$80 million can only be recovered through development.

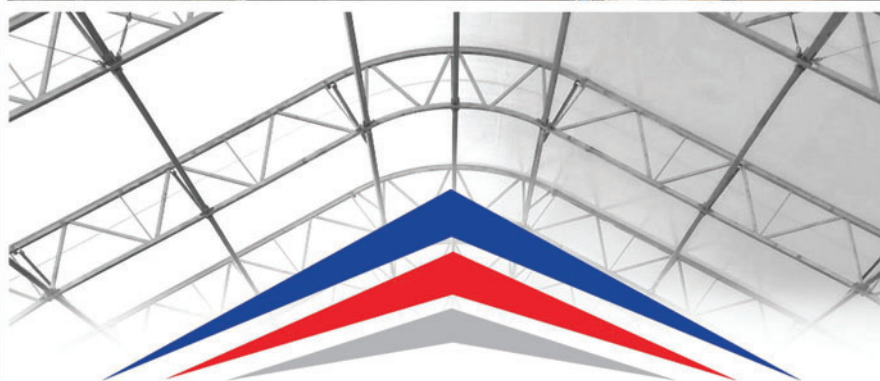
That leads to an economic puzzle.

Great Bear has described an “Alaska Shale Play Catch 22,” where source rock exploration activities are prohibitively expensive but will only get cheaper if enough companies conduct similar work to create economies of scale among providers. By conducting a multi-well program, Great Bear hopes to achieve those efficiencies.

Alongside the strategic changes, Great Bear had an administrative change in 2015 when Ed and Karen Duncan left the company and Mike Mason took over the leadership spot.

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land units on the North Slope, although its program to date has not yet included any exploration activities.

## Deep Creek

The Deep Creek exploration program has partially been an attempt to avoid a long-threatened contraction of the unit by proving up resources at its southern leases.

Following up on a 1958 exploration program by Standard Oil Company of California, Union Oil Company of California brought the Deep Creek unit online in 2004 at 3 million to 4 million cubic feet per day and drilled some 13 wells between 2003 and 2009.

Investment subsequently flagged. In a December 2010 plan of development, Unocal announced plans to farm out acreage in the south of the unit. The state required any future development plan to propose exploration activities outside the Happy Valley participating area. By the time Hilcorp acquired the unit in January 2012, the state and fellow landowner Cook Inlet Region Inc. were on the verge of contracting the unit to make the southern leases available to other players. Instead, the landowners extended the existing plan of development to give Hilcorp more time to determine its plans.

A three-well exploration program targeted opportunities in shallower formations within the physical outline of the participating area and an associated 3-D seismic survey covered more than 40 square miles of the region. The program increased natural gas production at the unit and convinced the state to defer contraction until November 2014.

The successful program convinced Hilcorp to expand its exploration activities into 2015 and ask the state to defer any contraction of the Deep Creek unit until the end of 2015.

A 2014 plan of development called for drilling two exploration wells from a newly constructed C pad in 2014 and drilling the Middle Happy Valley No. 1 well in 2015 to target prospects in the southern end of the unit, beyond the participating area borders.

Hilcorp began permitting a Happy Valley C pad and an accompanying four-well appraisal program in June 2014 to target a shallow gas accumulation. By early 2015, the project had yet to move into operation. In a 2015 plan of development, Hilcorp said it would extend the program. The state deferred contraction until May 31, 2016, but only if Hilcorp completed the Middle Happy Valley exploration project during that time.

The state approved a plan of operations for the Middle Happy Valley well in November 2015 and CIRI provided associated permits for operations on its land. But Hilcorp ultimately deferred the program earlier this winter, "in part due to delays associated with permitting," the company told state officials in a March 2016 plan of development.

"Hilcorp remains committed to building the road and pad required to drill the Middle Happy Valley well, but cannot commit to drilling this exploratory prospect under the current economic and market climate," the company said the plan of development.

Instead of drilling, Hilcorp plans to commission a 2-D seismic survey in the southern end of the unit for the second quarter of the year. Combined with existing 3-D seismic, the survey could allow Hilcorp identify other opportunities in the southern end of the unit.

The company has asked the state and CIRI to defer contraction until June 2017.

With Middle Happy Valley on hold, Hilcorp instead spud the Happy Valley B-17 well in late November 2015. The directional well started within the participating area but extended beyond its northern boundary. The company expects the well to sustain commercial production, although final testing and completion depend on administrative matters currently under review with the Alaska Oil and Gas Conservation Commission.

If the well is commercial, Hilcorp might drill a B-18 well to further delineate the region.



## Ninilchik

The exploration program at Ninilchik has been much larger than the one at Deep Creek. And the Ninilchik program increasingly resembles development drilling.

After acquiring the unit in 2013, Hilcorp proposed exploration wells from existing drilling pads and proposed several additional pads in under-developed areas. The company drilled at least 10 exploration wells at the unit between 2013 and 2014.

The proposed drilling program for 2015 included three wells: a

*continued on next page*



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**HILCORP** continued from page 50

12,000-foot GO-8 well from the existing Grassim Oskoloff pad, a 12,000-foot Blossom No. 1 well from a new Blossom pad just north of the Grassim Oskoloff pad and a 9,000-foot Kalotsa No. 1 development well from a new pad between the existing Paxton and Susan Dionne pads.

Hilcorp completed the GO-8 well and drilled the Blossom No. 1 well, although the latter still requires "further testing and analysis" before the company can bring it into service.


Unspecified "permitting issues" delayed construction of the Kalotsa pad, which was pushed into 2016. The company is also planning a GO-9 well, which is being described as a "high angle development gas well" targeting the Upper Tyonek formation.

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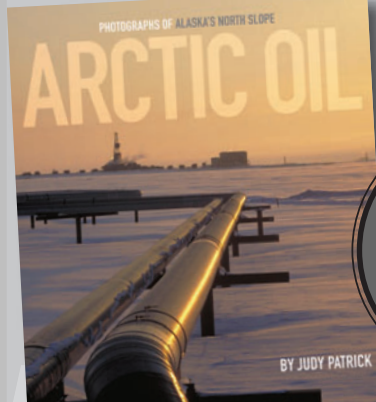
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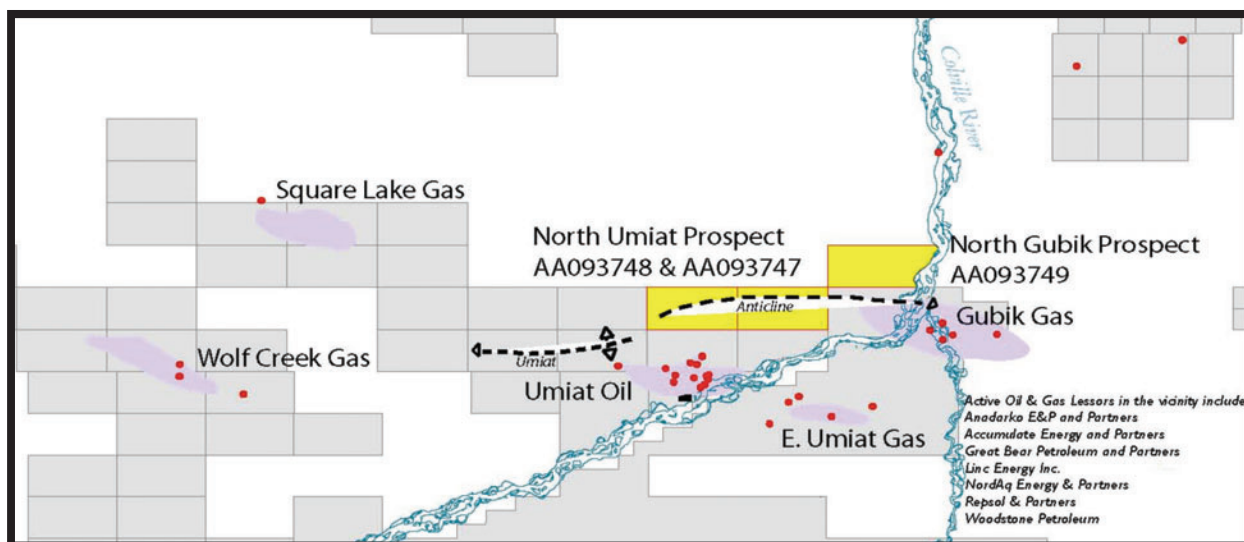
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NOTE: See USGS Professional Paper 1399; Plate 9.1 for a more precise regional structure map. The 12 miles of east-west anticlinal high under the North Umiat leases is deep and to the north of the Umiat Oil Field. This undrilled structure is thought to be prospective for oil. The North Gubik lease is thought to be prospective for gas and/or an oil rim associated with the Gubik gas reservoir

### **For further information contact:**

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# Markets challenge two Linc Energy projects

*Low oil prices slow Umiat project while gas contracts slow UGC development*

By ERIC LIDJI  
For Petroleum News

Economics have quickly altered Linc Energy Alaska Inc.'s exploration efforts.

As global oil prices fell and local natural gas supplies increased, the local subsidiary of Australian independent Linc Energy Ltd. scaled back its development plans for the Umiat oil field and suspended its underground coal gasification program in the Tyonek region.

When Linc Energy arrived in Alaska in March 2010, it planned to use conventional natural gas exploration to fund a more complex underground coal gasification exploration program. The company initially acquired 123,000 acres in the Cook Inlet region from San Francisco-based GeoPetro Resources. The acreage included a block near Point MacKenzie along Knik Arm and a block at Trading Bay on the west side of the inlet.

The following year, the Alaska Mental Health Trust land office issued an exploration license for Linc Energy to conduct underground coal gasification exploration on 181,414 acres in three areas: on the east side of Cook Inlet near Nikiski, on the west side of Cook Inlet near the Beluga Power Plant and in the Interior region around Healy and Nenana.

Also in 2011, Linc Energy gained control of the Umiat oil field in the foothills of the Brooks Range Mountains by acquiring the small independent Renaissance Alaska LLC.

Through various expirations and relinquishments, Linc Energy no longer owns any state leases but still holds the exploration license and federal leases at the Umiat prospect.

## Early exploration

By summer 2010, Linc Energy had drilled the 6,323-foot LEA No. 1 well near Point MacKenzie using information from seismic surveys and exploration wells going back to the 1960s and building upon preliminary permitting activities undertaken by GeoPetro.

Even though the well encountered gas-bearing horizons and coal seams, the company determined the structure was "too tight" to be developed without "swabbing" the well with large amounts of formation water. "The conclusion from the testing is that although gas is trapped within the coal, there is not sufficient natural fracturing in the coal to allow for the recovery of commercial quantities of gas," the company announced at the time.

Statements from company officials suggested enthusiasm for re-

### NAME OF COMPANY:

Linc Energy Ltd.

### COMPANY HEADQUARTERS:

Brisbane, Australia

PHONE: 61-07-3229-0800

COMPANY WEBSITE: [www.lincenergy.com](http://www.lincenergy.com)



turning to its leases to drill more exploration wells. Unfortunately, the company lost a large portion of the Cook Inlet leasing position through expiration and lost more when the state rejected a request to form the Angel unit over state and Alaska Mental Health Trust leases around LEA No. 1.

## Umiat

Instead, Linc Energy turned its attention to the Umiat field.

Umiat is among the largest discovered and undeveloped oil fields in Alaska. The U.S. Navy discovered the field in 1946, during an exploration campaign in the National Petroleum Reserve-Alaska to increase domestic oil supplies after World War II. The Navy commissioned 11 wells by 1952 and returned in 1979 to drill a deeper test well.

That deeper well was the last exploration work at Umiat for decades. Even though the field was known to be large, it was far from existing infrastructure and the unusual geology in the region stymied existing technologies. In the early 2000s, private companies including Arctic Falcon Exploration, Renaissance Alaska and Rutter and Wilbanks began taking an interest in the project, and state officials considered building a road to the area as a way to improve the economics of remote resource development.

By the time Linc Energy acquired the prospect in June 2011, the various challenges appeared to be surmountable. The company was eager to develop the field, oil prices were near record highs, the state-sponsored road project was progressing and improved drilling technologies suggested a way to overcome the difficult geology of the region.

The persnickety nature of Arctic exploration upset many of those advantages.

"Logistical and weather issues," including "low snow levels which affected snow road development," superseded a five-well program planned for early 2012. Then, light snowfall and extreme cold snaps shortened a four-to-five program in early 2013.

Instead, Linc scaled back the program to two wells and only completed one — Umiat No. 18. The vertical well collected 300 feet of core and encountered 100 feet of net oil pay in the Lower Grandstand. Mechanical problems prevented a flow test and forced the company to suspend operations and cold stack the Kuukpik No. 5 rig on location.

The shallow Umiat reservoir is partially embedded in permafrost. One of the curiosities of the initial Navy-led program was

*continued on page 54*

## BREAKING NEWS

*On April 15, Linc Energy Ltd. entered "voluntary administration," an aspect of Australian law allowing a company to temporarily hand over control to outside entities. The company has appointed Stephen Longley, Grant Sparks and Martin Ford of Australian advisory firm PPB Advisory.*



the vast difference in productivity between relatively nearby wells. A federal petroleum engineer suspected that drilling mud was thawing the permafrost and allowing water to enter the formation, which would freeze the sand and plug the wells. As a precaution, Linc used a chilled mineral oil drilling mud and a "progressive cavity pump" for its flow test "in order to prevent heat in the borehole from establishing a 'thaw bubble' in the permafrost and potentially destabilizing the well bore and surface facilities," as President of Oil and Gas Operation Scott Broussard put it.

After its mechanical difficulties, Linc Energy decided to use an open-hole completion technique in the future, just as the Navy did originally. By drilling without casing or lining, an open-hole technique allows reservoir fluids to flow directly into a well bore.

The company completed its exploration program in early 2014 with the 4,100-foot Umiat No. 23H well, the first horizontal well ever drilled at the field and the first successful flow test at the field in decades. The well produced at a sustained rate of 250 barrels per day and a peak rate of 800 barrels per day, according to the company. With a gas drive installed, the company estimated production as high as 2,000 barrels per day.

Even though the mechanical difficulties complicated a side-by-side comparison, the results gave Linc Energy some direction about its drilling and completion strategy.

"We have now proved that the oil flows easily from the Umiat reservoir with very good permeability and that the drilling process of utilizing horizontal wells with slotted liners with ESP down well pumps as per our commercial design has been a success," then-CEO Peter Bond said in a statement at the time. "And with this success and the knowledge gained from last year's drilling program, Linc Energy now has clear a path for the commercial development of the billion barrel (original oil in place) Umiat field."

### Offer for Umiat

In September 2014, Linc Energy announced "unsolicited expressions of interest" to sell the Umiat field and conventional assets in Wyoming to an unidentified buyer.

The company launched "a formal process to work with additional parties who have expressed an interest in the potential acquisition of the company's entire USA based oil and gas portfolio" and planned to make a decision by the end of the year. In April 2015, the company remained "in discussions with a number of interested parties" but had yet to make a decision and blamed the delay on "the recent oil and gas market downturn."

The status of those discussions was unchanged in updates released in September and November 2015, even as Linc Energy advanced preliminary development work.

As engineering and design activities progressed, Linc Energy changed the scope of its program. In October 2014, the company proposed an initial Umiat development with as many as 70 wells. By June 2015, the program had grown to include approximately 13 drilling pads to accommodate some 150 wells, with drilling to begin as early as 2021.

In an October 2015 annual report, the company greatly scaled back those plans. The updated program included five drilling pads with approximately 35 development wells targeting the Upper and Lower Grandstand formations. The program would use horizontal wells with lateral sections measuring approximately 5,000 feet. Wells would be arranged in an 80-acre drainage pattern, and well spacing would be 900 feet.

Under a revised timeline, the company would conduct environmental fieldwork through the end of 2016, advance permitting through late 2019 and continue permitting activities and front-end

engineering through 2019 and 2020. Drilling would begin in late 2020 or early 2021. Production would begin as early as late 2022 and increase to a peak of approximately 45,000 barrels per day by 2025 before gradually trailing off through 2047.

The company later revised its peak production estimates down to 30,000 barrels per day, which seemed to represent a change in processing capacity rather than anything geologic.

The smaller development program, combined with persistently low oil prices, led Ryder Scott Company LP to reduce its estimate of the probable (2P) oil reserves at the field by 36 percent and the probable and possible (3P) oil reserves at the field by 25.4 percent.

The updated report estimated 2P reserves of nearly 99 million barrels of oil equivalent (down from some 154.6 million barrels in the previous report) and 3P reserves of some 144.7 million barrels of oil equivalent (down from more than 194 million barrels).

Generally, "probable" means the estimate has at least a 50 percent chance of actual recovered volumes meeting or exceeding the P2 estimate, and "possible" meaning at least a 10 percent chance of actual recovered volumes meeting or exceeding the P3 estimate.

With the state having since abandoned plans to build a road in the face of economic and political pressures, Linc Energy also began addressing transportation logistics at Umiat.

Based upon allowable road grades, environmentally sensitive areas and a desire to be near the Toolik Research Station, the company narrowed 12 potential routes down to six and then to three. The Toolik East route would lead northwesterly from the Dalton Highway north of Pump Station 4 and the Toolik Research Station. The Franklin Bluffs route would head south-southwest from the Franklin Bluffs staging area north of Pump Station 2. The Meltwater route would use existing roads through the Prudhoe Bay and Kuparuk River units and continue south and then southwest along a newly built road.

### UCG suspended

While Umiat advanced, Linc Energy was also pursuing underground coal gasification.

Initially, the company proposed a three-phase program: a single gasifier on a 90-day trial monitored for one year, a panel of three to six gasifiers on a one-year trial and finally a working underground coal gasification project combined with surface gas-to-liquids technology to produce some 20,000 barrels per day of various synthetic diesel products. The process synthesizes "natural" gas by injecting air and water into an ignited coal seam. The carbon in the coal and the hydrogen in the water combine to form methane.

Linc Energy appears to have drilled four stratigraphic core holes in the Tyonek region and one in the Kenai region. By late August 2015, the company said commercial discussions with "existing and new participants" in the Cook Inlet region were "well progressed." And by early October, the company was estimating local demand for synthesized natural gas at 35 billion cubic feet with additional demand overseas through exports. The company said it was finalizing a commercial pathway for constructing a proposed synthesized natural gas hub in the region as well as "several supplier agreements" that would allow it to sell synthesized natural gas and carbon dioxide.

But in November, Linc suspended the program: "The Alaskan UCG project has been paused with the intention to reconsider this endeavor when market conditions recover and a more sustainable long-term outlook can be determined. The team is presently exploring options to limit our ongoing exploration liabilities via assignment of the tenements."

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Contact Eric Lidji at [erclidji@mac.com](mailto:erclidji@mac.com)

# Bankruptcy slows Miller Energy's pace

*Ambitious explorer and producer was undercut by falling oil prices*

By **ERIC LIDJI**  
For Petroleum News

**A**s The Explorers was going to press, Miller Energy Resources Inc. was in the final stages of bankruptcy proceedings that will dramatically change its operations in Alaska.

The Houston-based independent is the parent company of two Alaska operators — Cook Inlet Energy LLC and Savant Alaska LLC — as well as transportation subsidiaries.

One of the biggest changes is that Miller Energy will emerge from bankruptcy proceedings as a privately held company after nearly two decades of trading publicly.

Miller Energy was founded in 1967 to focus on the Appalachian basin of Tennessee. The company came to Alaska in December 2009, when it acquired the Cook Inlet operations of California-based Pacific Energy Resources Ltd. through bankruptcy proceedings.

Through its Anchorage-based subsidiary, Cook Inlet Energy LLC, Miller Energy rehabilitated the onshore West McArthur River oil field and the offshore Redoubt unit and its Osprey platform, leading to a large percentage increase in production rates.



**CARL GIESLER**

**NAME OF COMPANY:**  
Miller Energy Resources  
**COMPANY HEADQUARTERS:**  
Houston, Texas  
**TOP EXECUTIVE:** Carl Giesler, CEO  
**COMPANY WEBSITE:** [www.millerenergyresources.com](http://www.millerenergyresources.com)



Starting in late 2013, Miller Energy increased its focus on Alaska. First, the company acquired the North Fork unit and associated infrastructure from Armstrong Cook Inlet LLC. Then the company acquired Savant Alaska LLC, which operates the Badami unit on the eastern North Slope. Finally, the company divested its Lower 48 holdings.

Each of those four development properties also included exploration opportunities nearby. Additionally, Miller Energy held several exploration licenses in regions away from the traditional development basins of the North Slope and the Cook Inlet.

The expansion occurred as global crude oil prices were drastically declining. Combined with some poor drilling results, low prices stressed company finances to a breaking point, which came when Miller Energy filed for Chapter 11 bankruptcy in Oc-

*continued on page 56*



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tober 2015.

Prior to the proceedings, Miller Energy was discussing various exploration opportunities across its properties. That portfolio might be important for the reorganized company.

## West side projects

In addition to its existing developments, Cook Inlet Energy acquired a bundle of leases scattered across the west side of Cook Inlet. The leases contained numerous prospects, including Tutna, Tazlina, North Alexander, Stingray, Olsen Creek and Otter.

Of those, only the latter two culminated in drilling.

Cook Inlet Energy drilled the 5,680-foot Otter No. 1 exploration well in mid-2012 at the north end of the west side of Cook Inlet, near the Pretty Creek and Lewis River units.

Although the company expressed excitement about the results, and a third-party engineering reserve report estimated 45 billion cubic feet of natural gas at Otter, the state initially rejected an application to form an Otter unit, saying that the company had failed to prove it had a viable reservoir and should proceed with exploration lease-by-lease.

After some negotiations, the state formed the four-lease Otter unit and required Cook Inlet Energy to post a \$1.2 million bond and provide drilling dates, surface locations and bottom-hole locations. Cook Inlet Energy met those requirements by November 2013.

An initial plan of exploration called for two wells. The first could be either a new exploration well or a deepening of the existing well by March 31, 2014. Cook Inlet Energy met the requirement by completing the 7,021-foot Otter No. 1A sidetrack in December 2013. The second well was a delineation well due by March 31, 2016.

That second well was initially delayed by logistical problems, as Cook Inlet Energy sought a larger drilling rig and a pad expansion to accommodate the larger rig. With the bankruptcy proceedings, Cook Inlet Energy missed the March 31, 2016, deadline.

The fate of the Otter unit remains unclear.

The Olsen Creek prospect is some seven miles northeast of Otter, on a combination of state acreage acquired in the purchase and new Alaska Mental Health Trust acreage.

Cook Inlet Energy initially planned to drill an exploration well at Olsen Creek in late 2012 but pushed the schedule to mid-2013. The company drilled the 7,500-foot Olsen Creek No. 1 well in June 2013 and the Olsen Creek No. 2 follow-up well in late 2014.

Although the company had previously touted the potential for a 24-well development program at Olsen Creek that could produce as much as 84 billion cubic feet of gas, the actual wells proved to be disappointments and required a \$13.4 million write off.

## Sword and Sabre

Otter and Olsen Creek were wildcat wells near infrastructure operated by other companies. Cook Inlet Energy was also pursuing exploration prospects near its existing operations at the West McArthur River unit, specifically the Sword and Sabre prospects.

The company already held a 70 percent interest in the prospects and farmed in the remaining 30 percent interest from Hilcorp Alaska LLC in September 2012.

Cook Inlet Energy drilled the 18,475-foot Sword No. 1 well in June 2013. The extended-reach directional well targeted an offshore structure adjacent to the West McArthur River unit thought

to contain some 800,000 barrels of recoverable oil, according to the company. After bringing the well online in November 2013, the company proposed developing additional intervals and perhaps even drilling a Sword No. 2 follow-up well.

Instead, Cook Inlet Energy turned its attention to the nearby Sabre prospect, which the company has described as a potential six-well development program with the first extended reach well costing as much as \$30 million. The program never came to fruition.

An administrative change in early 2015 brought the Sword and Sabre prospects into the West McArthur River unit boundaries. Since then, plans for the two prospects have been repeatedly delayed. As of a January 2016 plan of development, Cook Inlet Energy said it would drill a second Sword well by April 30, 2018, "if appropriate to increase recovery, and if economic conditions warrant." The company also said it was currently focusing on lower risk developments targets and would be more likely to resume grassroots exploration work such as Sabre after it had "more fully developed its proven prospects."

## North Fork

Through Miller, Cook Inlet Energy acquired the North Fork unit from Armstrong Cook Inlet LLC and its four independent partners for nearly \$65 million in late 2013.

Despite the interest of various players over the decades, North Fork remained undeveloped after Standard Oil of California discovered gas at the southern Kenai Peninsula field while searching for oil in 1965. Armstrong and its partners acquired the property, completed a drilling campaign, built a pipeline to Anchor Point, arranged a supply contract with Enstar Natural Gas Co. and brought the unit online in March 2011.

With North Fork, Cook Inlet Energy acquired six wells and 15,465 associated acres, the transmission subsidiary Anchor Point Energy LLC and the existing Enstar contract.

Both short-term and long-term programs for North Fork focused predominately on working over existing wells and drilling new wells to increase gas production. But Cook Inlet Energy also saw the potential for oil exploration and claimed to have had "encouraging preliminary results" from an evaluation of the oil potential in the deeper Hemlock formation at the field, conducted while working over an existing gas well.

The NFU No. 41-35 discovery well tested minor amounts of oil in the Hemlock but not enough to convince Socal to develop the reservoir. Armstrong came up empty-handed when it extended one of its natural gas wells to test the oil potential of the Hemlock.

Since taking over, Cook Inlet Energy has drilled two new North Fork wells and permitted two additional wells, but all four were classified as development wells targeting gas.

## Exploration licenses

Cook Inlet Energy inherited a 471,474-acre Susitna Basin Exploration License No. 2 when it acquired its initial package of properties from Pacific Alaska Energy LLC.

Looking to expand its opportunities in the Susitna region, the company subsequently acquired the Susitna Basin Exploration License No. 4, a 10-year license covering 62,909 acres with a \$2.25 million work commitment, and the Susitna Basin Exploration License No. 5, a five-year license covering 45,764 acres with a \$250,000 work commitment.

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# Royale sells portion of Alaska acreage

*Plans for source rock exploration delayed by legal and market obstacles*

By **ERIC LIDJI**  
For Petroleum News

A year ago, Royale Energy Inc. hoped to resolve a legal dispute with a partner and resume plans to explicitly target North Slope source rocks sometime in early 2016.

While the San Diego-based independent resolved the legal dispute toward the end of 2015, the exploration campaign was delayed again, in part because of market conditions.

In September 2015, Royale announced that it had reached an agreement with former partner Rampart Alaska LLC to repurchase a 30 percent interest in a western block of leases. With the purchase, Royale once again owned 100 percent interest in its 96,000 acres on the North Slope and secured an exclusive right to proprietary seismic data.

In November, Royale sold its entire working interest in the western block — some 39,500 acres — to an un-named buyer for \$2 million and was evaluating alternatives for the remaining 57,000 acres “including similar de-risking, sale or joint venture.” In late December 2015, the state approved a series of transactions where Rampart transferred its working interest in 20 leases south of Nuiqsut, between the Colville River and the Meltwater satellite of the Kuparuk River unit, to Royale, which in turn transferred the working interest in those same leases to the Armstrong subsidiary 70 & 148 LLC.

At the time, Royale described the sale as “a key step in its plan to strengthen its balance sheet and regain compliance with Nasdaq listing requirements.” Royale had previously received a letter

NAME OF COMPANY: Royale Energy Inc.  
COMPANY HEADQUARTERS: El Cajon, CA  
PHONE: 619-383-6600  
TOP EXECUTIVE: Jonathan Gregory, CEO  
and vice chairman of the board  
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from the Nasdaq listing qualifications staff notifying the company that it was non-compliant with the stockholders' equity, majority independent director and audit committee requirements for continued listing. In January 2016, Royale announced plans to move to the Over-The-Counter QB, a “quality controlled segment of the OTC market.”

## Seeking source rocks

As has been the case with other small independents in Alaska, Royale Energy arrived in the state with decades of institutional memory and a clear vision for its activities.

Royale Energy Vice President for Exploration and Production Mohamed Abdel-Rahman initially came to Alaska in the early 1980s, as a geologist for Sohio. He eventually became the company's district geologist for the entire state. Among his assignment was working on a post-mortem investigation for the Mukluk well in Harrison Bay, which was the most expensive dry hole in history at the time. His research connected the “missing”

*continued on page 58*

## MILLER ENERGY *continued from page 56*

All three licenses remain current, according to Alaska Division of Oil and Gas records, although as of early 2016 Cook Inlet Energy had yet to drill in any of the three areas.

In early 2013, Cook Inlet Energy proposed a two-well exploration program at the Kroto Creek prospect in Susitna Basin Exploration License No. 2 and later expanded the program to include a third well at the Moose Creek prospect, farther west. Having met its spending requirements through road and pad construction, Cook Inlet Energy converted some of the license area to leases. The following year, the company expanded the program again to include a fourth well at the Kahiltina prospect in Susitna Basin Exploration License No. 4. The state approved the Kahiltina exploration program in early 2015 but as of early 2016 the company had yet to drill any of the four exploration wells.

Through a relatively rare auction, where one company can propose better terms for an exploration license proposed by another company, Cook Inlet Energy made a \$1.5 million work commitment in return for an exploration license over 168,581 onshore and offshore acres in the Iniskin Bay region of the Alaska Peninsula in August 2014.

The currently undeveloped area is among the earliest sites of exploration activity in Alaska, with observable oil seeps

recorded as early as 1853 and a well drilled in 1902.

As of early 2016, the state had yet to finalize the license. With the fall in oil prices, Cook Inlet Energy moved the project to its list of “long-term” exploration opportunities.

## Badami

In early 2014, Miller acquired Savant Alaska LLC for some \$9 million.

The acquisition gave Miller a 67.5 percent working interest in the Badami unit and its associated pipelines as well as an assortment of nearby exploration acreage.

“We’re excited about that acquisition,” then-Cook Inlet Energy CEO David Hall said at the time. “I think it gives us a good launch pad for the North Slope. We’ve been eying that field for a while and think there’s lots of room for growth within the Badami field and also, too, some of the exploration acreage that comes along with the acquisition.”

The initial work program called for sidetracking existing wells in the unit. The company was also touting exploration acreage south of the ExxonMobil-operated Point Thomson unit to the east, although the decline in oil prices scuttled those plans in the near term.

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**ROYALE** continued from page 57

oil at the Mukluk prospect with the prolific oil reservoir at the Kuparuk River field, which led to a larger theory about the nature and location of North Slope source rocks.

Although Royale would have preferred to create some "internal infrastructure" before acquiring a lease position in Alaska, circumstances dictated otherwise. After Great Bear Petroleum LLC took some 500,000 acres of source rock prospective acreage in an October 2010 lease sale, Royale sped up its plans. In December 2011, the company spent \$2.7 million on nearly 100,000 acres of source rock prospective acreage in the Franklin Bluffs region, south of Kuparuk and south of Nuiqsut along the Colville River.

The company claimed that all three of its blocks were prospective for all three of the stack shale formations present beneath the North Slope: the Triassic-age Shublik formation, the Jurassic-age Kingak shale and the Cretaceous-age Hue, or HRZ, shale.

After a yearlong search for a joint venture partner, Royale signed an agreement with Australia-based Rampart Energy in early 2013. Rampart agreed to spend \$43 million on exploration in return for a large stake in the Royale land position on the North Slope. The deal allowed Rampart to acquire between 10 percent and 75 percent working interest in the western block of leases and a 75 percent working interest in the Central Block by making various payments and funding various seismic programs by specific deadlines.

A 3-D seismic survey over a portion of the acreage identified a large conventional target and suggested the opportunity for a source rock exploration as well. The results convinced Rampart to commit \$50 million to "conduct a regional, multi-year onshore oil and gas exploration drilling program during the winter months on the North Slope."

An August 2014 oil discharge prevention and contingency plan for the Aki and Central Exploration Drilling Program covered exploration in two regions. The plan included eight potential well locations at the Aki prospect along the Colville River south of Nuiqsut and six potential well locations at the Central prospect south of the Kuparuk River unit.

In the document, Royale said that it intended to "drill up to four exploratory well locations during the two winter seasons between 2014 and 2015; with potential additional locations drilled within the lease blocks in future years." The Aki and Central prospects have "both conventional and unconventional formations," according to Royale.

The program never came to fruition. In late July 2014, Royale cancelled a contract with Kuukpik Drilling after its partner, Rampart Energy Inc., declined to fund a cash advance on the rig, according to the companies. After Royale cancelled the contract, Rampart launched an effort to find additional partners to help fund the program and said it wanted to perform additional technical work "to present the true potential of the opportunity to prospective industry and financial partners, and secure favorable commercial terms."

By the end of the year, Royale and Rampart were unable to find a way forward, which led to claims and counterclaims. The legal challenges prevented the exploration program from occurring until early 2016, at the earliest. With the legal dispute only reaching a resolution toward the end of 2015, Royale was unable to coordinate a program this year.

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# Shell ends Alaska exploration after a long uphill climb

*A decade-long push to develop Arctic OCS ends with the Burger J well*

By **ERIC LIDJI**  
For Petroleum News

This is Shell's last appearance in The Explorers — at least for the foreseeable future.

After more than a decade of operations costing approximately \$6 billion and spawning a series of legal challenges, regulatory delays, logistical problems and technical flubs, the company officially ended its offshore Alaska exploration campaign in September 2015.

Shell made the announcement after drilling its Burger J well in the Chukchi Sea to 6,800 feet without finding enough oil or natural gas to justify the high cost of development.

## Leaving and returning

The decision ended the second chapter in the history of Shell in Alaska.

Shell was one of the original North Slope explorers during the initial wave of activity leading to the discovery and development of Prudhoe Bay, and it remained active across Alaska until it officially left the state 1998.

During those four decades, the company gained a reputation as a pioneering explorer with a penchant for offshore activities in the Beaufort Sea, the Chukchi Sea, the Gulf of Alaska, the Bering Sea and Cook Inlet.

The departure was big news at the time. In retrospect, the decision to leave feels more like a hiatus for the purposes of developing a new strategy. Shell acquired Alaska leases in 2001, relinquished those in 2004 and then launched its current campaign through acquisitions at a Beaufort Sea lease sale in 2005 and a Chukchi Sea lease sale in 2008.

The Beaufort and Chukchi exploration campaigns typified the frontier oil exploration in the 21st century. They were ambitious, difficult, costly, exciting and controversial.

And in both cases, activities fell far short of plans.

Initially, Shell planned a four-well program for the Beaufort Sea during the open water season in 2007. The program was particularly focused on the Sivulliq prospect, which had been known as Hammerhead when Shell explored in the late 1980s and early 1990s.

A legal challenge from local groups scuttled those plans for 2007 and 2008. By scaling back its exploration program, Shell was able to gain federal approval in late 2009.

A federal moratorium on outer continental shelf drilling operations after the Deepwater Horizon oil spill in the Gulf of Mexico in April 2010 thwarted the program that year, and a subsequent appeal against an air quality permit prevented the program again for 2011.



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## Chukchi program

Similar obstacles were occurring in the Chukchi Sea.

After a seismic program, Shell proposed a one-well program in 2010 with three potential targets starting with the Burger prospect, which the company had previously explored.

That program was also delayed by legal challenges, this time to the validity of the entire Chukchi lease sale, which effectively prohibited any drilling activities in 2010 or 2011.

All those obstacles seemed to have been surmounted by early 2012, when Shell announced a three-well program in the Chukchi and a two-well program in the Beaufort.

This time, the delays were internal. A barge bringing a containment dome to the Arctic was running late, leaving Shell without enough time to make sure the dome would properly lessen the impact of a potential oil spill. As the season progressed, Shell only had time to drill the top-hole section of one Beaufort well and one Chukchi well. At the end of the season, the Kulluk drill ship ran aground and was damaged beyond repair.

Recovering from those problems prevented Shell from exploring in 2013 and additional lawsuits forced the company to cancel its plans for 2014, too. After Shell acquired the large natural gas firm BG Group in April 2015, the company decided to reduce exploration spending. Shell also cut capital costs in response to falling crude oil prices.

That precluded any additional work in the Beaufort Sea. Instead, Shell planned a small program in the Chukchi, in the hopes of finally determining the size of the resource.

In mid-2015, after a decade of work on its Arctic OCS program, Shell finally completed an exploration well in the Chukchi Sea only to be stumped by economics. Given the weak results, the high costs of Arctic exploration and "the challenging and unpredictable federal regulatory environment in offshore Alaska," the company cancelled its program.

## Aftermath

The decision was the first in a series of setback for Alaska OCS exploration.

Just three weeks after Shell announced the end of its Alaska

*-continued on page 61*



# Usibelli remains quiet after 2014 exploration

*A one-well coal bed methane program yields few public results*

By **ERIC LIDJI**  
For Petroleum News

After a decade-long path through regulatory and legal delays, Usibelli Coal Mine Inc. launched a coalbed methane exploration program in the Healy region in 2014.

What comes next is uncertain.

The coal-mining firm drilled the 1,265-foot well HC No. 1 in mid-2014 in search of a nearby source of natural gas to power its industrial operations. With a large enough discovery, the company suggested it might also sell supplies into the Alaska market.

The company has been quiet since completing the well, providing neither drilling results from the initial well nor any forecast about whether or not it would continue the program.

In a plan of operations from September 2014, the state approved a one-well program in the Healy region. If the initial well was successful, the plan called for Usibelli to permit as many as three additional wells for 2015 to increase its understanding of the region.

To date, it appears Usibelli suspended the program after drilling the HC No. 1 well.

Usibelli pursued the project through the state exploration license program, which allows companies to nominate areas of the state for exploration activity outside of the traditional leasing program available only in certain regions on the North Slope

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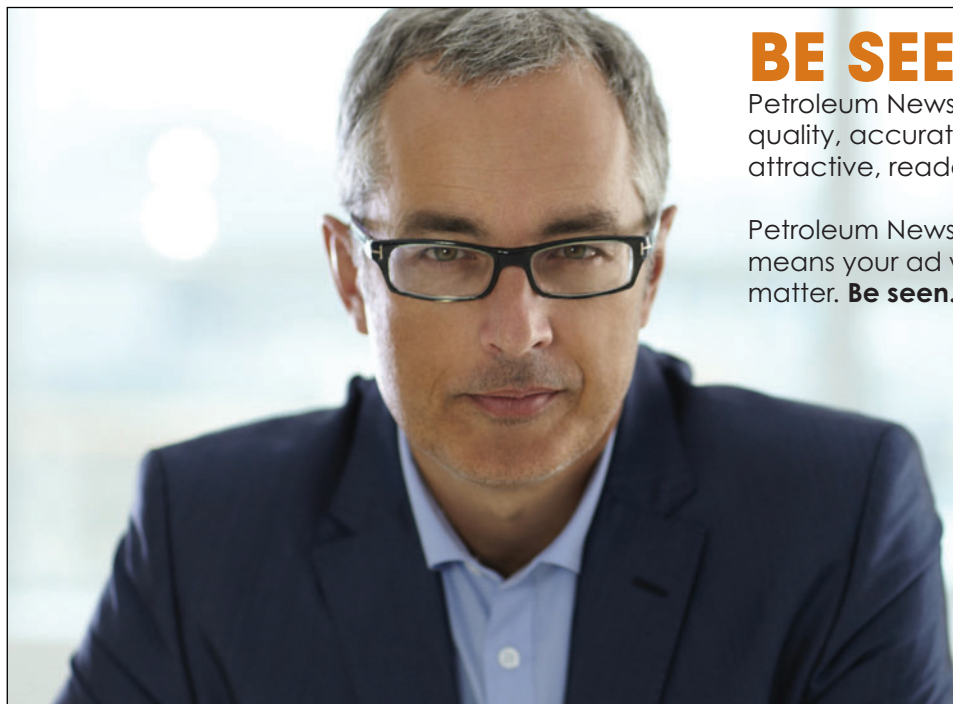
The Healy basin exploration license covers 204,883 acres and runs for a 10-year term beginning Jan. 1, 2011. The license requires Usibelli to spend at least \$500,000 on explorations activities. The one-well program almost certainly hit that spending target.

## A legal matter

The coalbed methane exploration program was a new venture for Usibelli.

The company has been engaged in coal mining operations since Emil Usibelli and his partner T.E. Sanford began operating in the region in 1943 to supply Ladd Army Air Field, now known as Fort Wainwright. Over the decades, the company has expanded beyond the Alaska market to include exports to Chile, South Korea and other countries.

*-continued on page 61*



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**USIBELLI** *continued from page 60*

The current search for gas started more than a decade ago.

The early days of the program went slowly but generally followed the timeline for exploration licenses, which are less streamlined than the traditional leasing program.

Usibelli applied for the Healy exploration license in April 2004. In an August 2005 preliminary best interest finding, the Alaska Department of Natural Resources determined the potential benefits of exploration outweighed the possible adverse impacts.

That determination came as concerns over the potential environmental threat of coalbed methane exploration and development were increasing in Alaska. A different program by a different company in the Matanuska Valley was abandoned in the face of opposition.

In 2006, the Denali Borough Assembly banned natural gas exploration over approximately 40 percent of the proposed license area. Even though the state considered the action illegal, the ordinance delayed the program. Additionally, the Denali Citizens Council asked the state to exclude all lands west of the Nenana River from the license.

When the Department of Natural Resources approved the program under its original specifications — and even easing some mitigation measures — in June 2010, the Denali Citizens Council appealed the

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*Usibelli conducted the program on lands mined in the 1950s and 1970s and utilized existing roads to reach the Healy Creek Site No. 1 pad, according to permitting documents.*

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ruling to the Alaska Superior Court. The appeal challenged the efficacy of the mitigation measures in the license and argued that the state had failed to show how shrinking the license area would hamper the economics of the project.

The court rejected the appeal in Febru-

ary 2014, which allowed Usibelli to proceed.

Usibelli conducted the program on lands mined in the 1950s and 1970s and utilized existing roads to reach the Healy Creek Site No. 1 pad, according to permitting documents. The 150-foot by 150-foot pad was built on an area previously used as an airstrip for mining operations. The pad was smaller than most gas exploration pads because shallower coalbed methane wells require smaller rigs, according to the company.

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**SHELL** *continued from page 57*

OCS program, the U.S. Department of the Interior cancelled upcoming lease sales in the Chukchi Sea and Beaufort Sea. "In light of Shell's announcement, the amount of acreage already under lease and current market conditions, it does not make sense to prepare for lease sales in the Arctic in the next year and a half," Interior Secretary Sally Jewell said in a statement.

And a month later, Statoil relinquished its federal Chukchi Sea leases and closed its Anchorage office, citing poor the results from exploration activities on nearby leases.

With those developments, and a prior decision by ConocoPhillips to cancel immediate exploration plans for the Chukchi Sea, Alaska OCS development is currently dormant.

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