

page 6 Resounding success at Badami well has Glacier, state officials upbeat

Work is progressing to bring the Mustang oil field on line soon

The field crew is busy with the construction and installation work required to bring the Mustang oil field on the North Slope into production, Bart Armfield, president and CEO of Brooks Range Petroleum, told the board of the Alaska Industrial Development and Export Authority on April 17.

Two pipelines are being installed — the oil line for exporting oil from the field and a line for the future carriage of seawater for injection into the field reservoir.

“We want to get the (oil) pipeline completed. I think we’re

see **MUSTANG FIELD** page 11



BART ARMFIELD

Caelus winding down in Alaska; Seeks Smith Bay investor, partner

Caelus Natural Resources Alaska is looking for an investor or partner to appraise its 2016 Tulimaniq discovery in the Torok formation in Smith Bay off the coast of the National Petroleum Reserve-Alaska, Caelus Senior Vice President Pat Foley told Petroleum News April 17.

“We have missed the planning window for the 2020 winter season for Smith Bay, but we’re hoping to drill a well there in 2021,” he said.

“We’re looking to develop Smith Bay in a similar way to what we did at Oooguruk, with 6,000-8,000-foot laterals. For the next

see **CAELUS MOVES** page 10



PAT FOLEY

BP removing massive Liberty rig planned to reach offshore field

BP is in the process of removing the Liberty drilling rig from one of the gravel islands used for the Endicott field in the nearshore waters of the Beaufort Sea. In a project that began last summer, the company mobilized some equipment to the North Slope and hired a contractor to conduct the demobilization, BP spokeswoman Megan Baldino has told Petroleum News. The rig is being completely dismantled and removed — whatever cannot be reused or recycled will be scrapped or properly disposed of, Baldino said. BP anticipates the project being completed by the end of this year.

After originally planning to develop the Liberty oil field on the federal outer continental shelf of the Beaufort Sea from an

see **RIG REMOVAL** page 11

Alberta rallies troops; Rachel Notley’s NDP party trumped

Alberta’s stunning choice in 2015 of a socialist New Democratic Party government lasted a minimum four years, the first time in 115 years that a ruling administration failed to get re-elected.

The administration of Premier Rachel Notley was sent packing on April 16, with the reins of power turned over to Jason Kenney and his United Conservative Party, reinstating conservative rule which controlled the province for 44 years up to the 2015 election.

That ended a 28-day campaign marked by insults and personal

see **KENNEY VICTORY** page 11



JASON KENNEY

EXPLORATION & PRODUCTION

Moose Pad online

Hilcorp’s new Milne Point pad producing 3,000 bpd, should peak at 22,000

By **KRISTEN NELSON**

Petroleum News

Hilcorp Alaska brought its new Moose Pad at Milne Point online in early April.

The initial production rate is 3,000 barrels per day from two wells, Hilcorp Alaska spokeswoman Lori Nelson told Petroleum News in an April 15 email.

“Drilling and facility construction activities are ongoing,” Nelson said, adding that those facilities will make additional production possible from a planned total of more than 25 producing wells.

In a presentation last November at the Resource Development Council’s annual conference, David Wilkins, the company’s senior vice president for

Hilcorp first mentioned plans for Moose Pad in 2016.

Alaska, said Moose Pad is the first new pad built at Milne Point since 2002. He said it can accommodate 50 to 70 wells. Unusually for the North Slope, Wilkins said, this pad includes processing facilities on the same pad as the wells.

Pad construction began in 2017. Processing facilities at the pad can handle 85,000 barrels of fluid per day.

\$400 million to be invested

Nelson said that Hilcorp will invest a total of

see **MOOSE PAD** page 11

EXPLORATION & PRODUCTION

Conoco steals the show

Drill bits down on seven Alaska North Slope exploration wells so far this season

By **KAY CASHMAN**

Petroleum News

ConocoPhillips said it planned to drill six to eight exploration and appraisal wells on the North Slope during the current winter season, far more than any other explorer in Alaska this year or for several years. So far, the company has drilled five — two from existing gravel pads and the rest from ice pads. Plus, there are still rigs on two other wells, putting the total well count at seven.

Six of the seven wells are west of the central



RYAN LANCE



SCOTT JEPSEN

North Slope; and one was in the Cairn prospect in the southwest corner of the Kuparuk River unit.

ConocoPhillips describes the wells as a mixture of exploration and appraisal, but all seven wells are deemed exploratory by the Alaska Oil and Gas Conservation Commission,

which, among other things, issues and tracks drilling permits.

In a presentation about the company’s 2018

see **CONOCO DRILLING** page 10

PIPELINES & DOWNSTREAM

So close ... but so far

Government sources predict Trans Mountain approval as Chinese market dries up

By **GARY PARK**

For Petroleum News

There is a growing belief that plans for tripling capacity on Canada’s Trans Mountain pipeline system are nearing final approval.

However, that shred of hope is being short-circuited by indications that the Chinese market, a vital outlet for the targeted 890,000 barrels per day of crude bitumen to flow through the C\$9.3 billion Trans Mountain expansion, is drying up.

Word leaking out of Alberta government inner circles points to a go-ahead from the federal cabinet of Prime Minister Justin Trudeau before a May 22 deadline set by the National Energy Board for a final verdict on the pipeline project.

So far this year only four crude tankers have left the Westridge loading dock, compared with the 12 tankers that set record shipments in 2018 of 6.56 million barrels bound for China, almost one-third of all crude that left British Columbia.

Even Andrew Weaver, leader of British Columbia’s Green Party, is conceding that Trudeau “has essentially been saying the pipeline will be approved.”

What troubles industry observers is evidence that Chinese demand for Canadian crude has gone

see **TRANS MOUNTAIN** page 10

• EXPLORATION & PRODUCTION

TGS delays Beaufort Sea seismic survey

Company now plans to conduct nearshore Barrow Arch 3-D survey off central North Slope during the 2019, 2020 open water seasons

By **ALAN BAILEY**
Petroleum News

Alaska's Division of Oil and Gas has approved an application by TGS-NOPEC Geophysical Co. to delay from 2018 to 2019 the start of a two-year 3-D seismic survey in nearshore waters of the Beaufort Sea. The company had hoped to conduct the first phase of the survey during last year's Arctic open water season, but now plans to carry it out this year. The survey would then be completed during the open water season of 2020. The division has also approved an increase in size of the seismic source for the surveying, coupled with larger marine mammal mitigation zones and a modified acoustic monitoring program.

Termed the Barrow Arch 3-D Marine Seismic Survey, the survey area covers 905 square miles of the Beaufort Sea, with about 620 square miles in waters of the federal outer continental shelf and 285 square miles in state nearshore waters. TGS has applied to the Bureau of Ocean

Energy Management for a permit for the OCS component of the survey. The company will also need an incidental harassment authorization from the National Marine Fisheries Service and a letter of authorization from the U.S. Fish and Wildlife Service for the unintentional disturbance of marine mammals. TGS says that it will also require a conflict avoidance agreement with the Eskimo Whaling Commission.

The survey, extending from the eastern Harrison Bay, offshore the Colville River Delta, eastward to about four miles east of Oliktok Point, will clearly encompass an area of high hydrocarbon potential.

"Results of the 3-D seismic program will be used to identify and map potential hydrocarbon bearing formations and the geologic structures that surround them," TGS said in its permit application.

The plan for the survey involves the use of cable-free ocean bottom nodes to record the seismic signals. The nodes would be tethered on the seafloor along north-south lines. Two vessels, each with a towed seismic source

array, would be available for generating the seismic signals. Source lines would run east-west, perpendicular to the recording lines. Each source vessel would tow a source system of different power, with the more powerful unit being used in deeper water.

A total of nine vessels would be involved in the survey operations, including the source vessels; node deployment and retrieval vessels; a marine mammal monitoring and crew housing vessel; and a crew transport vessel.

Mitigation actions in the event of sightings of marine mammals in the area of the survey include vessel speed and course alterations, and the potential shutdown of the seismic signal source. TGS says that the planned start on or after July 15 will result in minimal impacts on spring marine mammal migrations and on subsistence hunting. There will, however, be location and timing restrictions, to take account of fall bowhead whale hunting. TGS's permit application says. ●

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GOVERNMENT

Trump signs energy infrastructure orders

Aims to speed up and ease the government approval of construction of pipelines and other oil and gas transportation facilities

By **ALAN BAILEY**
Petroleum News

As part of his agenda to promote U.S. energy development and production, on April 10 President Trump signed two presidential orders aimed at speeding up and easing the government approval of facilities such as pipelines used for energy transportation.

“Under this administration we have ended the war on energy,” Trump told members of the Union of Operating Engineers in Texas prior to signing the orders. “Nobody believed this was going to happen. And we put thousands and thousands of patriotic union members like you to work building our energy future.”



DONALD TRUMP

International facilities

The first order changes the procedure for dealing with an application for a new cross international border transportation facility such as a pipeline. Under the new procedure the secretary of state must advise the president within 60 days on whether to approve an application of this type, with the president making the final approval decision. The order would in effect transfer approval authority from the secretary of state to the president while also setting a time limit for the review process. And, as part of the 60-day review, the president may require the secretary of state to seek opinions about the application from specified government agencies, and from state, tribal and local governments, and from foreign governments.

According to an Associated Press report, legal experts have suggested that, because an approval would then be a presidential order rather than a final action by a government agency, the decision would not be reviewable and could circumvent the requirements of the National Environmental Policy Act. However, there are questions over whether this new approval procedure would, in fact, be legal, the AP report says.

The order applies to various forms of transportation infrastructure, including some bridges, and border crossings for

motor vehicles and railways. However, the expeditious construction of cross-border oil and gas pipelines is an obvious target.

Energy development impediments

The second order seeks to deal with a number of issues that the president sees as impediments to energy development in the United States.

Part of the order deals with Section 401 of the Clean Water Act, the section that gives states the authority to ensure that federal agencies will not issue permits such as pipeline construction permits that violate state or tribal water quality standards. The presidential order says that outdated regulations under Section 401 are hindering the development of energy infrastructure. And the order requires the Environmental Protection Agency to consult with states, tribes and relevant agencies, to determine whether any regulations and guidance under the section should be clarified to be consistent with a federal administration policy of promoting private investment in U.S. energy infrastructure.

Within 60 days of the order being issued, the EPA must issue new guidance to address the administration’s Section 401 policies. And within 120 days the EPA must publish rules with appropriate revisions to regulations, with these rules to be finalized within 13 months of the issue of the presidential order.

LNG facilities

Another section of the order requires the Department of Transportation to review the safety regulations for liquefied natural gas facilities. The existing 40-year-old regulations were designed for small scale LNG facilities that bear little resemblance to modern, large-scale facilities, the presidential order says. DOT must finalize a rulemaking for revised regulations no later than 13 months after the issue of the order.

In addition, within 100 days DOT must propose a rule allowing LNG to be carried in the U.S. in rail tank cars — current regulations prohibit this form of LNG transportation, with LNG shipped by rail having to be carried in portable tanks.

The order also requires the Department of Labor to investigate whether retirement plans under the Employee Retirement Security Act of

1974 have policy trends relating to energy investment. The DOL must then review guidance for proxy voting relating to investment policies, to determine whether the guidance needs to be changed to ensure consistency with policies for long-term growth and the maximization of returns on the assets held under ESRA retirement plans, the order says.

The order also addresses issues relating to the expiration of rights of way for energy infrastructure assets such as pipelines. The order requires the Department of the Interior and the Department of Commerce to develop a master agreement for the renewal and reauthorization of rights of way under federal jurisdiction and, within a year, initiate a renewal or reauthorization process for rights of way, as appropriate.

Shipment bottlenecks

In response to current bottlenecks in the shipment of natural gas and other domestic energy resources to various states, the Department of Transportation and the Department of Energy must within 180 days submit a report to the president on the effects of these transportation problems, and on an assessment of the extent to which state, local, tribal or territorial actions have contributed to these effects, the presidential order says.

The order also requires federal agencies to review and report on the intergovernmental assistance that the federal government provides to state and local governments with respect to the transportation and development of domestic energy resources.

The order specifically addresses what the president sees as a need for economic growth in the Appalachian region. The Department of Energy, in consultation

with other agencies, must report to the president on opportunities, through the federal government or otherwise, for growth in the region, including the growth of petrochemical and other industries, for diversifying the economy, and for promoting workforce development.

Reactions to the orders

According to a report in the Washington Post, Washington Gov. Jay Inslee, a Democrat, has particularly criticized the proposal to challenge states’ authority under the Clean Water Act.

“No amount of politicking will change the facts — states have full authority under the Clean Water Act to protect our waters and ensure the health and safety of our people,” Inslee said. “Washington will not allow this or any presidential administration to block us from discharging that authority lawfully and effectively.”

Various regions of the American Petroleum Institute have expressed their support for the president’s actions.

“We applaud the administration for their commitment to America’s energy infrastructure, which will help ensure that Pennsylvania’s consumers have continued access to reliable and affordable energy” said API Pennsylvania’s executive director, Stephanie Catarino Wissma, referencing the Clean Water Act section of the second order. “As pipelines are one of the most environmentally friendly ways to transport energy, this executive order will help the rest of the country enjoy the abundant, clean natural gas that has provided countless benefits, like more affordable electricity, to Pennsylvanians.” ●

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• EXPLORATION & PRODUCTION

UAA research addresses energy issues

Annual presentations by university scientists cover a wide spectrum of topics relating to energy industry and energy use in Alaska

By **ALAN BAILEY**

Petroleum News

In an annual event on March 22 researchers from the University of Alaska Anchorage described scientific research projects that have been awarded funding from a ConocoPhillips endowment. Annually since 2016 researchers have proposed projects, with four or five of these projects being awarded funding each year.

Five projects were described during this year's presentation, with topics ranging from the monitoring of North Slope permafrost subsidence to developing a system to help plan the use of renewable energy by rural Alaska communities.

All climate models indicated thaw penetration to a depth of about 12 feet, the researchers found.

Permafrost subsidence

Todd Burns and Kannon Lee described a project which is using synthetic aperture radar data to measure the subsidence of permafrost at North Slope oil field well pads. The researchers are then using soil analysis and thermal modeling to predict future trends for subsidence and the thawing of the ground.

The SAR data, obtained from satellite surveying conducted in 2017 and 2018,

indicates surface subsidence of a few centimeters during the course of the summer at most sites. Subsidence data for four specific wellheads proved consistent with survey data obtained by ConocoPhillips.

The researchers used data from the soil analysis to model the vertical subsurface profile to a 25-meter depth at a drill site. They then used data from 30 climate models and the trend of historic climate data to project potential air temperatures through into the next century. By modeling the impact of future air temperatures on the subsurface temperatures it was possible to develop a range of scenarios for future permafrost thaw and subsidence. All climate models indicated thaw penetration to a depth of about 12 feet, the researchers found.

lyze the materials that are input to the tests and that result from the experiments. Ultimately, the idea is to determine the relative effectiveness of different response techniques and the impact of each technique on microbes found naturally in the seawater.

Modeling a village microgrid

Ahmed AbuHussein talked about a project that uses data from the electrical grid in the village of Igiugig, near the southwestern end of Lake Iliamna, to model the integration of renewable power generators into a microgrid of this nature. The research is enabling the development of a modeling tool that can assess the stability and economics of integrating generators into a village grid. The idea is that people will be able to test the potential impact of a renewable energy system on a microgrid, before implementing the system. In the case of the Igiugig system, the researchers validated their model by matching the model results with measured data from the grid.

Structural history of North Slope

Triffon Tatarin and Shuvajit Bhattacharya talked about research into the tectonic history of the North Slope using seismic data that are available to the public through the state tax credit program. The purpose is to gain insights into the structural evolution of northern Alaska and how this evolution impacts the North Slope petroleum system. The research particularly uses the Storms 3-D survey, shot by ConocoPhillips to the south of the Prudhoe Bay and Kuparuk River units in 2005.

As one outcome of the study the researchers have identified three different fault sets, each with characteristic orientations, Tatarin explained. And different fault sets have different seismic attributes. Bhattacharya said that, by applying "deep learning" computer algorithms to the seismic data, it is possible to use an automated process to identify faults in a particular area, thus saving significant amounts of time in interpreting the seismic data. The results turned out to be more than 90 percent accurate, he said. ●

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EXPLORATION & PRODUCTION

US drilling rig count drops 3 to 1,022

The number of rigs drilling for oil and natural gas in the U.S. dropped by three the week ending April 12 to 1,022.

A year ago the count was 1,008 active rigs.

Houston oilfield services company Baker Hughes reported that 833 rigs targeted oil (up two from the previous week) and 189 targeted natural gas (down five).

The company said 78 of the U.S. holes were directional, 889 were horizontal and 55 were vertical.

Among major oil and gas producing states, Texas, the most active state with 502 rigs, was up three from the previous week.

Rig counts in Alaska, California, Colorado, Louisiana, North Dakota and Wyoming were unchanged.

West Virginia was down one rig and New Mexico was down two.

Oklahoma and Pennsylvania were each down three rigs.

Baker Hughes shows Alaska with eight active rigs, unchanged from a year ago.

The U.S. rig count peaked at 4,530 in 1981. It bottomed out in May 2016 at 404.

—PETROLEUM NEWS

Corrosion monitoring

In another project Aaron Dotson talked about the development of visual and infrared imaging techniques, coupled with machine learning, for the rapid identification of areas of steel infrastructure impacted by corrosion. The idea is to quickly locate situations where further corrosion investigation and remediation may be required. Images of the infrastructure are obtained using conventional cameras, infrared cameras and a 3-D imaging device, with drones being used for the rapid capture of imagery from difficult to access locations. By merging images captured using the three techniques, it is possible to obtain greater insights into the corrosion situation than can be obtained from each technique individually.

In-situ burning of offshore oil spill

Patrick Tomco talked about research into the potential results of dealing with an offshore oil spill using chemical herding agents and in-situ burning. Experiments involve simulating oil spills in a laboratory vessel, measuring the natural degradation of the oil and the impact of burning the oil, with and without chemical herders. A herder causes an oil slick to contract into a relatively small area, thus potentially making the burning of the oil more effective.

The researchers use a variety of techniques including mass spectrometry to ana-

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• EXPLORATION & PRODUCTION

Doyon drops Nenana exploration, leases

Regional Native corporation judiciously pursued geologic ‘idea’ with five wells in Cook Inlet-look-alike Interior Alaska basin

By **KAY CASHMAN**
Petroleum News

Petroleum News has reported on Doyon Ltd.’s search for oil and gas in the Nenana basin since the Native regional corporation for Interior Alaska partnered with others in 2004, took over as operator in 2009 and drilled what would prove to be its last well in the summer of 2018.

All in all, five wells were drilled — three in the basin’s central saddle, and two wells in the deeper more northerly part of the basin, above the presumed oil and gas kitchen.



AARON SCHUTT

Doyon’s exploration, encouraged by pervasive evidence of oil and gas throughout the program, was carefully planned and executed, targeting potential traps identified from 2-D and 3-D seismic and related data (gravity, magnetics, lake-bed geochemical survey, etc.).

But Doyon has decided to halt the program, as evidenced by the fact it is allowing its state leases in the area to expire, with the last of the group set to terminate in June.

Aaron Schutt, Doyon president and CEO, confirmed this in an email to PN on April 15. “Doyon is not pursuing further work in the Nenana basin at this time. As with all investments, a time comes when you have to make a decision to go forward or not. Following Totchaket #1, we decided not to continue.”

Letting leases expire

In January, Alaska’s Division of Oil and Gas terminated 20 Doyon leases, which in 2012 had converted from a state oil and gas exploration license to leases. The division’s current summary of acreage shows Doyon still holds 141,733 acres of state land in the Nenana basin. (A sample lease from those terminated was 5,042 acres; if the 20 leases were all in that size range the total acreage would have been more than 100,000 acres.)

A Doyon shareholder who asked not to be identified told PN, “our geoscientists were pursuing an idea we had for the area. ... We’ve given it a good try, but ... perhaps someone with a new idea will come in and see what they can find.”

Doyon’s focus, he said, was returning to a more typical approach, that of a lessor, referring to the subsurface rights the Native regional corporation holds for approximately 400,000 acres in the Nenana basin.

Nenana basin

The Nenana basin is conveniently located close to the Parks Highway, to the southwest of Fairbanks. Recently Doyon has



DOYON LTD.

In the winter of 2017-18 Doyon Ltd. constructed the gravel pad for the drilling of the Totchaket No. 1 well. A short gravel access road linked the pad to the nearby Tanana River for transportation to and from the drill site.

been particularly focusing on making an oil discovery, although the basin is also highly prospective for natural gas.

The corporation had indicated that, given the convenient location of the Totchaket project site, a development could be viable at an oil price of around \$50 per barrel, even with a relatively small discovery of perhaps 40 million to 60 million barrels. If a workable oil resource had been discovered last summer, production could have begun around 2023 to 2025, or perhaps earlier if oil were to be shipped by truck or rail to the oil refinery at North Pole, or to a trans-Alaska oil pipeline pump station.

One of a number of Alaska basins formed by the pulling apart of the Earth’s crust, the Nenana basin is filled with a huge thickness of non-marine Tertiary sediments. Coal seams and shales within the rock sequence have the potential to source both oil and gas, depending on the extent to which they are heated at depth. There are sands with excellent hydrocarbon reservoir potential, interlayered with shales that could form hydrocarbon traps.

In broad terms, the basin has a northeast to southwest trending hourglass shape, with a deep basin in the north and a central saddle in the narrower, central part of the basin, immediately west of the town of Nenana. The depths reached in the northerly section of the basin are thought to be sufficient to have raised the temperatures in the potential source rocks to levels conducive to oil formation.

“The prospective sedimentary section ... consists of sands, gravels, conglomerates, shales and coals ... thought to be time-equivalent to the productive Kenai Group in the Cook Inlet (basin), the division said.

CIRI still saw potential

The fifth well drilled last summer in the northern part of the basin, the Totchaket No. 1, encountered multiple gas shows but did

not find commercial oil or gas, Doyon partner Cook Inlet Region Inc. reported following drilling and testing.

CIRI said that, based on drilling results so far, it continued to view the Nenana basin as holding considerable resources.

According to data published by the Alaska Oil and Gas Conservation Commission, the Totchaket well, which was on the east side of the Tanana River, about 20 miles north of the town of Nenana, had been drilled with Nabors 105 rig to a vertical depth of 11,225 feet.

Doyon and its partners had previously drilled one other well in 2016 in the northern part of the basin, Toghothele No. 1, and three wells to the west of Nenana in the basin’s central saddle, targeting potential

A Doyon shareholder who asked not to be identified told PN, “our geoscientists were pursuing an idea we had for the area. ... We’ve given it a good try, but ... perhaps someone with a new idea will come in and see what they can find.”

traps identified from seismic data. The hope was that hydrocarbons migrating up into the saddle from deeper parts of the basin would have become trapped. Although these wells failed to discover viable pools of oil or gas, the wells did encounter evidence of an active petroleum system. For example, the Toghothele well, one of five prospects identified from a 3-D seismic survey conducted in 2017, found multiple oil shows, as well as natural gas. Some of that gas was “wet gas,” containing natural gas liquids that must have formed through the application of heat rather than through microbial action on organic material. But it seems that what appeared to be a trapping structure had formed after the oil had migrated through the rocks.

The Nunivak No. 1 well, drilled in 2009, also encountered some oil shows. And the Nunivak No. 2 well, drilled in 2013, found a 400-foot thick section of gas-bearing rock that also contained too much water to be commercially viable. ●

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● EXPLORERS PREVIEW

Resounding success at Slope Badami well

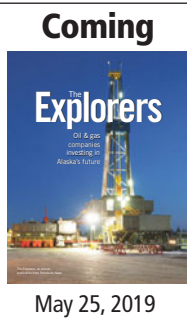
Glacier Oil & Gas and state officials upbeat on Badami; Starfish prospect one of several new promising pods in Killian sands

By KAY CASHMAN
Petroleum News

Glacier Oil & Gas Corp. spent most of 2016 through 2018 methodically performing maintenance and well work at its four producing Alaska oil and gas units, as well as executing one of two exploration programs that might guide work in the years to come. The company's 2018 capital budget for Alaska was a conservative \$20 million, representing Glacier's net working interest investment. (ASRC Exploration LLC, owned by the Native regional corporation for northern Alaska, Arctic Slope Regional Corp., holds a minority working interest in the Badami unit and surrounding leases.)

The first of those two exploration programs, the drilling of the B1-07 Badami well in early 2018, took the majority of its 2018 capex and resulted in an oil discovery in the undeveloped Starfish prospect southwest of the Badami development area in the Cretaceous Killian interval.

A turbidite sandstone reservoir slightly older than the Badami's Brookian reservoir, the Killian is immediately above the oil source rock and below the Badami sands that form the main reservoir for the Badami field. In early testing the B1-07 well produced 2,500 barrels per day.



JUDY PATRICK

By January 2019, Badami was producing 2,323 bpd, with B1-07 accounting for 1,604 bpd. It came as no surprise when Glacier President Phil Elliott told Petroleum News in an April 10, 2019, email that "The B1-07 well was an economic success and proved the prospective value of a Killian-focused drilling initiative," noting the well was expected to "pay out in less than 15 months."

Through its subsidiary Savant Alaska, Glacier Oil and Gas drilled the B1-07 Badami exploration well with Nabors Rig 27E in early 2018 and has since announced the discovery in the Starfish prospect. In early testing the well produced 2,500 barrels per day, tapering off to a steady 1,600 bpd by 2019.

Production of the eastern North Slope Badami unit, which is just west of Point Thomson, between it and Prudhoe Bay, was 879 bpd in November 2015 prior to Glacier assuming operatorship in January 2016.

By January 2019, Badami was producing 2,323 bpd, with B1-07 accounting for 1,604 bpd. It came as no surprise when Glacier President Phil Elliott told Petroleum News in an April 10, 2019, email that "The B1-07 well was an economic success and proved the prospective value of a Killian-focused drilling initiative," noting the well

was expected to "pay out in less than 15 months."

Describing the Starfish project in September 2017, a Glacier official said, "If this well works close to what we think it will, it should open five to seven more prospects similar to it."

In its 2017 plan of development, or POD, filed with the Alaska Department of Natural Resources' Division of Oil and Gas, Glacier described Starfish as one of "several new target pods of interest" identified through a recent geologic and geophysical review of the Badami and Killian sands.

In her May 2018 approval of the Badami unit's 15th POD, then-Director Chantal Walsh said the division was "encouraged by the efforts undertaken" by Glacier "as shown through its continued production from Badami, its efforts to enhance production from existing wells, and its exploratory drilling."

A new POD that Glacier will file in mid-April 2019 (after the deadline for this edition of Explorers magazine), "speaks for itself," Elliott said in his April 10, 2019, email. The "basic plan calls for investing nearly \$200 million (gross) to prosecute a Killian-focused drilling program over the next 3-4 years."

Elliott did not indicate whether the company would be open to partners in that venture.

But it is interesting to note that within a year of the Starfish discovery, major North Slope exploration and development partners Oil Search and Armstrong Energy headed to the eastern North Slope to search for missed oil in a 195,000-acre block south and southwest of the Badami unit.

Fulcrum for development

Badami could serve as a fulcrum for

future development in the area because its processing facilities were designed for production rates of up to 38,500 barrels of oil per day.

The Badami pipeline could transport oil from the region to the trans-Alaska oil pipeline — Hilcorp has already anticipated that crude production from its proposed Liberty field could use that pipeline. Hilcorp's plans for Liberty development include a small artificial gravel island in the Beaufort Sea, some five miles offshore, about 15 miles east of Prudhoe Bay, with a buried subsea pipeline carrying sales grade oil to shore to connect with the existing Badami pipeline between Prudhoe Bay and Point Thomson.

New pad at Badami?

On Feb. 1, 2019, Glacier applied to the U.S. Army Corps of Engineers for a permit to construct an additional gravel pad for the Badami field to accommodate the drilling of up to 10 new wells.

The pad would be located inland 1.3 miles from Mikkelsen Bay.

The application said that pad construction would involve excavating a 9.2-acre gravel pit, constructing an 800-foot access road and a 2.5-mile pipeline connecting the new pad to the existing Badami facilities. The pad itself would be square, with 660-foot sides, and would be within the Badami unit, due east of the existing Badami pad.

The Mikkelsen Bay pad proposal dates back to a unit expansion effort in late 2012, when Savant, then the Badami operator, asked the state to add seven leases to the Badami unit, including six leases held by Alaska Venture Capital Group. Since that time AVCG has sold most of its interest in those six leases, with six companies now holding them, Caracol Petroleum being the largest leaseholder. Brooks



PHIL ELLIOTT

see EXPLORERS PREVIEW page 7

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• FACILITIES

Nome seeking support for port expansion

Officials talk to Legislature about the benefits of establishing a regional transportation hub that can support marine operations

By **ALAN BAILEY**
Petroleum News

On April 16 officials from Nome talked to the Alaska House Committee on Arctic Policy, Economic Development and Tourism about plans for deepening and expanding the port of Nome. The U.S. Army Corps of Engineers is finalizing a new feasibility study on the port expansion. The report will go to Congress. The expansion project would need public and private funding, Nome Mayor Richard Beneville told the committee.

The proposed expansion involves deepening the port, to enable it to handle deep draft vessels. The existing port causeway would be extended 3,500 feet, with a new arm for protection from southerly winds and tides. Three new piers would allow people to disembark from ships visiting the port, Beneville said. There are also plans to expand the shore-based facilities.

Nome is situated on the south side of the Seward Peninsula, just south of the Bering Strait.

Joy Baker, Nome port director, told the committee that one specific benefit of expanding the port would be the ability to support national security efforts through the resupply of national security cutters, icebreakers and navy vessels.

Transportation hub

Beneville said that, in an era when the Arctic is opening up for marine transportation, Nome can act as the main transportation hub for Alaska's west coast. The port has been becoming increasingly active over the past 30 or 40 years, with the number of vessels visiting the region increasing rapidly. The port is used by the U.S. Coast Guard and the National Oceanic and Atmospheric Administration. It has become a stopping point for cruise ships that have started to traverse the Northwest Passage during the sum-

mer. Nome is a regional hub for communities on the Seward Peninsula, and is also a source of gravel used in projects farther north in the Arctic.

But the port cannot currently handle deep draft vessels. Cruise ships, for example, have to moor offshore and ferry passengers ashore in small vessels.

National security support

Joy Baker, Nome port director, told the committee that one specific benefit of expanding the port would be the ability to support national security efforts through the resupply of national security cutters, icebreakers and navy vessels. In particular, resupply operations at Nome could eliminate the need for vessels to transit south to Dutch Harbor for resupply, thus enabling the vessels to spend more time on site, engaged in their missions. Nome can also play an important role in search and rescue missions, and in oil spill response. The port expansion could enable the port to act as port of

see **PORT EXPANSION** page 8

continued from page 6

EXPLORERS PREVIEW

Range Petroleum Corp. currently operates the leases.

The proposed lease expansion, which straddled the Beaufort Sea coast, would have extended the Badami unit east, closer to ExxonMobil's Point Thomson producing unit, the eastern-most producing unit on the North Slope, just to the west of the ANWR 1002 area.

1971 well tested at 700 bpd

The concept behind the lease expansion was to enable exploration drilling in the East Mikkelsen prospect that at the time underlay a combination of Savant and AVCG leases.

The prospect included the site of the East Mikkelsen Bay No. 1 well, drilled by Humble Oil (predecessor to ExxonMobil) in 1971. Using outdated technology, that well encountered oil in the Killian sands, above the Hue shale source rock, with a tested flow rate of 700 bpd of 24 degree API oil.

In March 2013 the division approved inclusion of parts of two of the leases into the Badami unit but declined to expand the unit across the remainder of the seven leases: The approved expansion included the Mikkelsen well. The state argued that only those lease portions met the qualifications for a lease expansion.

In April 2013, Savant appealed the state's decision, claiming that effective exploration of the prospect required access to all seven of the leases that had been included in the unit expansion application.

The appeal remained in limbo until July 2, 2018, when then-DNR Commissioner Andy Mack sent a letter to Glacier telling it the department had reviewed Savant's appeal and was remanding the matter to the division for reconsideration.

As of April 5, 2019, the division had not yet made a decision.

The filing of Glacier's application for a Mikkelsen Bay pad does not represent any firm commitment as to when, or whether, the company will build the pad, Elliott told Petroleum News Feb. 6, 2019.

He said his company was still in the process of formulating future plans for Badami, noting a permit of this type would typically run for around five years.

Glacier's latest approved Badami POD, filed in April 2018, indicates the potential for further drilling at Badami, with an additional drilling pad likely to be needed to

fully explore and delineate the unit.

Looking for Sabre partners

In addition to exciting Badami prospects on the eastern North Slope, Glacier's most interesting Cook Inlet exploration prospect is Sabre at West McArthur River in an offshore corner of the unit.

Identified by both former Cook Inlet operators Unocal and Marathon Oil Co., Sabre was given different names by each company and finally named Sabre by Forest Oil. (Forcenergy Inc. acquired West McArthur River in 1997. Forest Oil Corp. became the operator in late 2000 after acquiring Forcenergy. In 2007, Forest sold the unit to Pacific Energy Resources Ltd., which sold the unit to Cook Inlet Energy in 2009.)

Glacier subsidiary Cook Inlet Energy first discussed plans for a Sabre exploration well as early as late 2013 but delayed the project due to the logistics and the approximately \$25 million cost and difficulty of drilling an extended reach well from onshore facilities.

The arrival of a jack-up rig in Cook Inlet after decades of failed attempts improved the economics of the well by allowing for vertical drilling from an offshore site, so Glacier has included Sabre as a potential target for 2017, 2018 and 2019 activities in various government filings.

The current plan calls for using the Spartan 151 jack-up rig.

Glacier said it is seeking partners in the Sabre prospect.

A former Cook Inlet basin operator, Forcenergy, shot 3-D seismic survey over Sabre, describing it as a 50-100 million barrel prospect.

The Alaska Department of Environmental Conservation issued a key permit for the Sabre project in mid-May 2018. The pollutant discharge elimination system individual permit allows the company to discharge certain waste fluids from the Spartan 151 into upper Cook Inlet during its operations. The permit expires June 15, 2023.

Taking more methodical approach

Glacier Oil was created through the bankruptcy of former Miller Energy Resources Ltd. Through Miller's subsidiary Cook Inlet Energy LLC, Glacier operates the Cook Inlet basin's West McArthur River unit and the Redoubt unit on the west side of Cook Inlet and the North Fork unit in the southern Kenai Peninsula. Through subsidiary Savant

Alaska LLC, it also operates the eastern North Slope Badami unit, making Glacier the only operator aside from Hilcorp Alaska with production in Alaska's two major basins.

Unlike its predecessor Miller Energy, which had acquired multiple prospects throughout Alaska and eventually became overextended when commodity prices dropped, Glacier has been taking a gradual, more cautious approach by focusing on maintenance and workover activities to improve operations at existing wells. The company has reserved its larger resources for targeted projects such as drilling the B1-

07 exploration well and taking on one of the largest infrastructure projects in the history of the West McArthur River unit by shifting processing to the Kustatan Production Facility.

Kustatan was newer and larger than the West McArthur River Production Facility and capable of handling greater production volumes. Glacier also discontinued use of high-pressure oil injection jet pumps at West McArthur, simplifying operations and increasing overall field safety. ●

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FINANCE & ECONOMY

Chevron buying Anadarko for \$33B

Companies have long histories in Alaska; Chevron still has working interests on the Slope; Anadarko shed Alaska interests last year

By KRISTEN NELSON
Petroleum News

Chevron announced an agreement April 12 to acquire Anadarko for \$33 billion, a move Chevron said would significantly enhance its upstream portfolio “and further strengthen its leading positions in large, attractive shale, deepwater and natural gas resource basins.”

This merger doesn’t impact Alaska, since Anadarko sold its western North Slope interests, including its working interest in the Colville River unit, to ConocoPhillips Alaska last year, and Chevron has just modest nonoperating interests in the state.

At one time Anadarko had extensive North Slope holdings. In addition to those it held in partnership with ConocoPhillips

(formerly ARCO), Anadarko had a large Arctic Slope Native Corp. lease position but had dropped everything except the nonoperating interests it held with ConocoPhillips on the western North Slope.

Anadarko’s exit from its western North Slope partnership with ConocoPhillips left it without lease acreage in the state.

Anadarko was also active in Cook Inlet at one time but had also dropped that acreage.

Chevron, Unocal

Chevron was the major Cook Inlet producer after it acquired Union Oil Company of California in 2005 but sold its Cook Inlet interests to Hilcorp in 2011. Chevron retained its nonoperating interests on the North Slope.

Current Chevron North Slope interests come from the company’s acquisition of Union Oil, which held a working interest of 4.95% at the Kuparuk River unit, and also from positions it held at Duck Island and Prudhoe Bay, some of which date from the company’s merger with Texaco in 2000. At one time Chevron also held a 25% interest in the Point Thomson unit, as well as Foothills acreage.

Permian, Gulf, LNG

“The combination of Anadarko’s premier, high-quality assets with our advantaged portfolio strengthens our leading position in the Permian, builds on our deepwater Gulf of Mexico capabilities and will grow our LNG business,” said Chevron Chairman and CEO Michael Wirth.

Chevron said the combination would “create a 75-mile-wide corridor across the most attractive acreage in the Delaware basin, extending Chevron’s leading position as a producer in the Permian.” In the deepwater Gulf of Mexico, where Chevron “is

already a leading producer,” the combination will enhance the company’s position, Chevron said, “and extend its deepwater infrastructure network.”

And “Chevron will gain another world-class resource base in Mozambique to support growing LNG demand.”

Chevron said the acquisition is based on 75% stock and 25% cash. The transaction has been approved by the boards of both companies and is expected to close in the second half of the year, subject to Anadarko shareholder approval, regulatory approval and customary closing conditions.

Wirth will continue to lead the company which will remain headquartered in San Ramon, California.

One of big 4

The Associated Press cites data from Wood Mackenzie showing that the acquisition of Anadarko makes Chevron one of the four largest publicly traded oil companies.

ExxonMobil had the most 2018 production of the four, with 3.834 million barrels of oil equivalent per day, followed by combined production from Chevron and Anadarko at 3.639 million boe, BP at 3.633 million boe and Royal Dutch Shell at 3.604 million boe.

The production forecast for 2019 puts BP at the top with 4.003 million boe per day, followed by Chevron/Anadarko at 3.913 million boe, Shell at 3.888 million boe and ExxonMobil at 3.884 million boe.

2018 revenue and profit show: BP at \$303.7 billion in revenue, \$12.7 billion in profit; Shell at \$295.2 billion in revenue, \$21.4 billion in profit; ExxonMobil at \$290.2 billion in revenue, \$20.8 billion in profit; and Chevron/Anadarko at \$179.7 billion in revenue, \$15.4 billion in profit. ●

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GOVERNMENT

Court allows ConocoPhillips intervention

The federal District Court in Alaska has allowed ConocoPhillips to intervene in a case in which the Native village of Nuiqsut and several environmental organizations have sued the Bureau of Land Management over the agency’s approval of ConocoPhillips’ 2018-19 winter exploration program in the National Petroleum Reserve-Alaska. The lawsuit claims that BLM did not fulfill the requirements of the National Environmental Policy Act when it approved the exploration program.

The plaintiffs in the case have asked the court to determine that the approval of the exploration program was “arbitrary, capricious, and/or not in accordance with law,” and have requested that the court vacate the record of decision approving the program, and put a halt to further exploration activities until BLM has complied with NEPA.

Having been allowed to participate in the court case, on April 12 ConocoPhillips filed a brief challenging the plaintiffs’ case. Among other points, the company argues that the plaintiffs have not stated a claim that can be granted relief and that plaintiffs lack standing to bring their claims. The company has also questioned whether the court has jurisdiction over some of the claims.

—ALAN BAILEY

LAND & LEASING

Beaufort BIF out; call for NS, Foothills

The Alaska Department of Natural Resources, Division of Oil and Gas, has issued a preliminary best interest finding for proposed Beaufort Sea areawide oil and gas lease sales from 2019-28, and a call for new information for the North Slope and North Slope Foothills areawide sales.

Once a preliminary BIF becomes final, it is good for 10 years; the division then puts out annual calls for substantial new information.

The most recent North Slope areawide final BIF was issued in 2018 and the most recent Foothills final BIF in 2011.

New information for the North Slope and Foothills BIFs is due by 5 p.m., May 17. The division describes this as “substantial new information that has become available over the past year concerning these areas,” and says that, based on the information it receives, it will either issue supplements to the findings or decisions of no substantial new information for the sales.

Comments on the Beaufort Sea preliminary BIF are due by 5 p.m., June 12.

The North Slope, Beaufort Sea and Foothills areawide sales are typically held in the fourth quarter; the call for new information says the North Slope and Foothills sales are “tentatively scheduled for the second half of 2019.”

The preliminary BIF for the Beaufort Sea is available on the division’s website, as are findings and supplements for the North Slope and Foothills sales. Lease sale and BIF information is under the Services tab at: <https://dog.dnr.alaska.gov/Library/>.

—PETROLEUM NEWS

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PORT EXPANSION

refuge for large vessels during the severe storms that can impact the Bering Sea, Baker said.

Beneville also commented that, in addition to acting as a supply base, Nome could provide waste disposal services for ships transiting the region.

And, having looked at some 13 locations for a deepwater Arctic port, the Corps of Engineers has identified Nome as the best

location, he said.

Beneville emphasized that in a rapidly changing world, with the Arctic opening up, Nome can become a hub of local, Alaska, national and international importance. There are only two ways for ships to transit between the Pacific and Atlantic oceans in the northern hemisphere: through the Panama Canal and the Bering Strait, he said.

“Where we are is incredibly important. What we are is also important,” Beneville said. ●

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• NATURAL GAS

Boosting LNG proposal for Kitimat in BC

Chevron-Woodside files application to double LNG; First Nations group bids for ownership stake in pipeline linked to Shell LNG

By **GARY PARK**
For *Petroleum News*

A partnership of Chevron Canada and Australia's Woodside Energy has generated a glimmer of hope for British Columbia's LNG sector by applying to almost double the size of its proposed Kitimat LNG operation to 18 million metric tons a year.

In an application to the National Energy Board, the coventurers, in addition to raising their proposed capacity from 10 million metric tons a year, are seeking a 40-year export license.

Dinara Millington, vice president of the Canadian Energy Research Institute, said the filing is a "positive signal to natural gas producers specifically," coming on the heels of a string of abandoned projects.

No cost or construction deadlines were released, although Chevron said it hopes to commission the facility no later than 2029.

Ian Archer, associate director of North American natural gas for the consulting firm of IHS Markit, said the plans show a revival of public interest in Canadian LNG, while BMO Capital Markets analyst Ray Kwan said the new application could "represent a nice source of long-

The announcement by Chevron comes only six months after the Shell-led LNG Canada consortium got corporate endorsement to start construction on its C\$40 billion development.

term demand for domestic gas in Western Canada."

Any Mah, chief executive officer of Advantage Oil & Gas, welcomed the LNG Kitimat move as recognition that "Canada is a major natural gas supply source on the world stage."

C\$40 billion development

The announcement by Chevron comes only six months after the Shell-led LNG Canada consortium got corporate endorsement to start construction on its C\$40 billion development.

LNG Canada, which includes four Asian-based energy powers in its ranks, has permission to export an initial 14 million metric tons a year from two trains and eventually to double that volume.

That project also received a lift this month from a newly-formed group representing 20 elected First

Nations councils.

The First Nation Leadership Group, FNLG, has submitted an offer to buy what would translate into a 22.5% stake in TransCanada's C\$6.2 billion Coastal GasLink, CGL, pipeline, the transportation link from gas fields in northeastern British Columbia to LNG Canada's planned liquefaction plant and tanker terminal in Kitimat.

The FNLG made its bid in the wake of TransCanada's decision to hire RBC Dominion Securities to manage the sale of up to 75% of CGL.

CGL President David Pfeiffer met with elected First Nations leaders in Vancouver in March to open preliminary talks on indigenous investment, however the company cautioned that it is still "early in the process and we are exploring all our options in securing project financing."

FNLG said its proposal will "not inhibit CGL's ability to raise capital for the initial phases of the project in 2019, (but) it provides a genuine opportunity for the FNLG to explore mutually beneficial partnership and investment opportunities with CGL." ●

Contact Gary Park through publisher@petroleumnews.com



Oil Patch Bits



DAVID KARP

Saltchuk names Karp Alaska SVP, managing director

Saltchuk said April 15 that it has named David Karp, SVP, managing director for Alaska.

Karp has been in his new role since Jan. 1 and is focused on working with Saltchuk companies to promote their capabilities to communities and industries throughout the state. In addition to business development, Karp will help facilitate community engagement, charitable giving and public policy issues across the family of companies.

Karp previously served, for the past 11 years, as the president and CEO of

Northern Aviation Services, Saltchuk's air cargo line of business, which in Alaska includes Northern Air Cargo and Northern Air Maintenance Services.

Over the years Saltchuk's family of independently operated companies in Alaska has grown to include Northern Air Cargo, Northern Air Maintenance Services, Cook Inlet Tug & Barge, TOTE Maritime Alaska, Delta Western Petroleum, Inlet Energy, Northern Oilfield Services and Carlile.

Editor's note: Some of these news items will appear in the next Arctic Oil & Gas Directory, a full color magazine that serves as a marketing tool for Petroleum News' contracted advertisers. The next edition will be released in September.

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CONOCO DRILLING

earnings strategy early this year, Ryan Lance, chairman and CEO, said ConocoPhillips had already drilled two of the wells in December from existing gravel pads, testing the Cairn well in the southwest corner of the Kuparuk River unit from Drill site 2S, and testing the seismic anomaly in the Putu prospect in a well drilled from CD-4 in the Colville River unit.

In last winter's off-road season, ConocoPhillips conducted the largest exploration season on the North Slope since 2002.

Using the Doyon 141 rig, the company said four wells were drilled in and near its behemoth Willow discovery at the western end of its recent finds: Tinmiaq 7, Tinmiaq 8, Tinmiaq 9 and West Willow 1.

Using the Kuukpik 5 rig, one slant and vertical well was drilled at the Putu prospect, Putu 2 and Putu 2A, directly south of the Colville unit.

At the Stony Hill prospect, straight south of Putu 2, Stony Hill 1, a vertical exploration well, was drilled with the Arctic Fox rig.

The Putu 2 and 2A wells successfully targeted two distinctive seismic amplitude anomalies, Scott Jepsen, ConocoPhillips Alaska vice president of

external affairs and transportation, said in September. There was a third anomaly in the Putu prospect, he said, immediately west of the two tested anomalies, which is the anomaly that was drilled into this winter from CD-4.

Building on last year

As of April 7, Rig 141 was on the West Willow 2 well and Rig 142 was on Tinmiaq 13.

As of April 15, AOGCC showed ConocoPhillips having completed three other exploration wells west of the central North Slope, including: Tinmiaq 10, completed March 4 (total depth 7,635 feet and true vertical depth 3,762 feet); Tinmiaq 15, completed Feb. 21 (total depth 4,052 feet and true vertical depth 4,052); and Tinmiaq 16, completed March 7 (total depth 3,950 feet and true vertical depth 3,950).

Again, it appears the company will complete five exploration wells from off-road ice pads, plus the two wells it drilled from gravel pads.

All seven except the Cairn well are in the same trend as the nearby Pikka and Horseshoe finds in the prolific Nanushuk formation that were discovered by Repsol and Armstrong Energy, and are currently operated by their partner Oil Search. ●

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CAELUS MOVES

well we'll drill a pilot hole, orient a 2,000-foot lateral and frac it and flow test it. Reservoir engineers will be able to extrapolate how much flow an 8,000-foot lateral would deliver. It may not be not exactly four times as much but that would be the simple math," Foley said.

Caelus holds a 75% working interest in the Tulimaniq prospect; NordAq Energy and L-71, a Dave Cruz company, hold the remaining 25%.

Winding down in Alaska

The Alaska subsidiary of the privately held Dallas-based Caelus Energy is "in the process of winding down" its Alaska business, he said.

"We've sold all our Oooguruk unit producing assets to Eni, as well as our eastern North Slope acreage, which consists of 350,000 onshore acres between the Prudhoe Bay and Point Thomson."

Caelus, Foley said, has probably also sold its proposed Nuna development: "Nuna, the onshore component of the Oooguruk unit, will likely be transferred to an undisclosed North Slope party later this summer. The potential buyer has asked to remain confidential at this point."

As far as the producing North Slope Oooguruk field is concerned, "we'll turn the keys at Oooguruk over to Eni to operate later this summer. Right now Caelus is still the operator of record, through a transition period set to end around August first. We're happy with the way they've been treating our people. Many are being considered for permanent positions within Eni's Alaskan team and I am sure that they will each be great additions to their staff."

When asked when the local office was closing, Foley said, "well, it's not immediate. We'll likely keep a small group to manage activities at Smith Bay. It may be run exclusively from Dallas but we may continue to have a small Alaska based presence."

And why is the company backing off Alaska, especially after having said it made one of the largest recent oil discoveries in Alaska or elsewhere with its two Tulimaniq wells?

"We're winding down our business here because the state hasn't paid the tax credits that we've earned as we develop, explore and appraise the state's resources. This puts us in a cash flow crunch, which really hurts small guys like us. Eventually we should see all of our credits paid, on a discounted basis, and much slower than we expected when we made the investments. We're getting some of the money, but it's coming in slower than what was promised," he said.

Tulimaniq development

Development costs for Tulimaniq will be hefty, which is likely behind the Caelus decision to look for a partner or investor.

The company has estimated \$8 billion to \$10 billion development costs for the project.

A big chunk of that price tag would be transportation — \$1 billion for a road from the Colville River unit and \$800 million for a pipeline traversing that same expanse of coastline.

Independent processing facilities would also add to the cost.

The project is also expected to require some 400 wells, according to Caelus. By comparison, ConocoPhillips has drilled some 200 wells at the Colville River unit.

Tulimaniq exploration

In 2016 Caelus drilled the CT-1 and CT-2 stratigraphic test wells near the mouth of the Ikpikuk River, some 59 miles southeast of Barrow. A primary goal of the Tulimaniq exploration program was to collect rock samples and to conduct vertical seismic profiling in the wellbores.

Company officials dropped optimistic hints about the program at industry conferences throughout the spring of 2016.

In October 2016, Caelus revealed that the two CT wells and earlier seismic data suggested the possibility of 6 billion barrels of oil in place at the Smith Bay leases, with the possibility of 10 billion barrels or more across the complete Smith Bay area.

A field of that size could add some 200,000 barrels per day to the trans-Alaska oil pipeline, which moved approximately 537,000 barrels of North Slope crude in January.

In a presentation in 2017, Caelus Senior Vice President Matt Musselman described Tulimaniq as a light oil discovery in a Brookian fan complex (Torok) covering a 300 square mile area on the North Slope.

A chart included in the presentation provided an estimate of 6.257 billion barrels of light, sweet oil in place at Tulimaniq and broke the estimate into seven geologic sections: Western Channel 1, Western Channel 2, Central Channel, Lobe 4, Lobe 3, Deep Fan 1 and Deep Fan 2.

The thickest, largest and most prolific was Deep Fan 1, which accounted for 3.345 billion barrels. The next was the Central Channel, which accounted for 948 million barrels.

The chart assumed a 38% recovery rate for all seven sections, leading to recovery of 2.378 billion barrels. In previous presentations, the company noted that enhanced oil recovery using natural gas from the field could push recovery rates to 60 or 70 percent.

—KAY CASHMAN

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TRANS MOUNTAIN

into a sharp tailspin this year as the price of Western Canadian Select — the blended product from Alberta — has rebounded from a record low of C\$10.29 a barrel from a peak of C\$58.37 a year ago. The latest reported price for WCS was C\$53.75.

Only four tanker shipments

That resurgence is mirrored in tanker shipments out of Vancouver.

So far this year only four crude tankers have left the Westridge loading dock, compared with the 12 tankers that set record shipments in 2018 of 6.56 million barrels bound for China, almost one-third of all crude that left British Columbia.

David Huntley, a professor emeritus of physics at Simon Fraser University, said he believes a "significant amount of oil was sent to China near the end of 2018 when the (WCS) price was very low."

That trend stopped the moment Alberta Premier Rachel Notley curtailed production in her province by 325,000

bpd, helping to reduce the price differential between WCS and West Texas Intermediate.

Kevin Birn, vice president of IHS Markit in Calgary, suggested there is too much fixation on crude volumes destined for China, when markets in Korea, Japan, India, California and the U.S. Gulf Coast are just as important.

Huntley's records show that tankers loading up at Westridge peaked at 71 in 2010, slumping to 15 in 2016.

Birn also noted that crude exported out of British Columbia is only a fraction of the 4 million bpd that Alberta sends, mostly to the U.S.

In a statement on the shipping fluctuations, the B.C. Ministry of Environment said the provincial government maintains the Trans Mountain expansion is "unnecessary and continues to recommend the federal government (which has owned Trans Mountain since last year) abandon the project."

"We continue to argue that an oil spill could seriously impact B.C.'s environment, economy and the coast." ●

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MOOSE PAD

\$400 million “to fully develop Moose Pad and its facilities.”

Peak production from Moose Pad is expected to be some 22,000 barrels per day.

Hilcorp acquired a 50% interest in Milne Point as part of its 2014 acquisition from BP of properties on the North Slope; BP had been the field’s operator since 1994 and retains a 50% interest. The Milne Point discovery was made in 1969 by Standard Oil Company of California and the field was initially delineated and then developed by Conoco Inc. beginning in 1980, with regular production beginning in 1985 from the Kuparuk River oil pool.

The most recent production data available for Milne Point from the Alaska Oil and Gas Conservation Commission is for February, prior to startup of the Moose Pad and shows Milne Point production at 23,108 bpd.

Moose Pad is on the western edge of the Milne Point unit. The western half of the unit is undeveloped, although previous operator BP explored it with the Pesado No. 1 well and sidetrack at ADL 25515 and the Liviano No. 1 well and sidetrack at ADL 25514 in early 2007. BP plugged and abandoned those wells.

After taking over Milne in 2014, Hilcorp spent much of 2015 doing some 54 workover operations on existing wells. At the end of the year, Hilcorp began a new development program at Milne, drilling three wells at L Pad and eight wells spread across B Pad, C Pad, J Pad, K Pad and L Pad. Hilcorp first mentioned plans for Moose Pad in 2016.

The initial target from the Moose Pad is oil in the Schrader Bluff formation on leases ADL 25514, ADL 25515 and ADL 25509, the company said in permitting submitted in 2016. Both production and injection wells are planned. ●

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RIG REMOVAL

offshore gravel island, in 2005 BP decided to instead use ultra-extended reach drilling from shore. Ultimately, the company settled on a plan involving the installation of a special purpose drilling rig on the satellite drilling island for the Endicott field. Parker Drilling Co. built a huge rig for the project at a cost of more than \$200 million. And the rig was delivered to the island in the summer of 2009.

Project cancelled

But the planned field development did not happen. In 2012 BP suspended the Liberty development, following an assessment that the project would have required significant changes, including substantial changes to the drilling rig, to meet the company’s standards. The even-

tual result was an impairment loss of nearly \$1 billion following cancellation of the project.

In 2014 Hilcorp Alaska announced a new development plan for the field, having acquired a 50 percent interest in the Liberty field from BP and become field operator. That plan, which essentially involves BP’s original concept of constructing an offshore gravel island, has since been moving forward: In October the Bureau of Ocean Energy Management issued a record of decision for the project, opening the way for the development to proceed.

Meanwhile, the massive rig, installed for ultra-extended reach drilling, has become redundant and has sat unused at Endicott. It is now being removed.

—ALAN BAILEY

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KENNEY VICTORY

attacks leading to a sharply divided electorate.

Kenney’s UCP won 63 of 87 electoral districts, with 54% of the vote, while the NDP’s standing in the legislature was slashed in half to 24, although the numbers could change after a final vote count.

Now the prospect of a real bare-knuckles brawl between Alberta and the provinces of British Columbia and Quebec and especially the Trudeau federal administration looms large.

The fight with Trudeau will probably start with Kenney’s promise to quickly wipe out a federal carbon tax, and quickly extend to a test of wills over pipelines to tanker terminals on the Pacific and Atlantic coasts, regulatory reviews of major natural resource projects and moves by Trudeau to ban crude tanker traffic off the northern British Columbia coast.

Trudeau up for re-election

The full-frontal attack will hit Trudeau as he loses ground in British Columbia, Alberta, Saskatchewan, Manitoba, Ontario and New Brunswick ahead of his own bid for re-election in October.

It reminds many Albertans of the epic showdown between them and the Canadian government of then-prime minister Pierre Trudeau — the father of Justin — over the National Energy Program which targeted lower oil prices, grants for frontier exploration and increased government revenues

from oil sales.

It resulted in large U.S.-based companies pulling out of Canada, tens of thousands of layoffs and bankruptcies and cost Alberta an estimated C\$100 billion in the 1980-85 period that the NEP lasted.

Kenney, who scorned what he described as an alliance between Notley and Justin Trudeau, has pledged to scrap Alberta’s existing carbon tax of C\$30 per metric ton on greenhouse gas emissions that is scheduled to reach C\$50.

The tax is rated by Kenney as the “most hated” NDP policy, which he argues is killing investment and jobs, while being defended by Notley and Trudeau as a critical underpinning of their climate change strategy.

Currently, the tax generates C\$1.3 billion a year, representing 2.5% of Alberta’s C\$50 billion in revenues.

“We think it’s all economic pain and no measurable environmental gain,” Kenney said.

The Canadian government has imposed its own price on carbon of C\$20 per metric ton, rising by C\$10 a year until 2022, with 90% of the money being returned to Canadians through rebates.

Kenney has also declared he will no longer sit back while activist groups, many of them funded by U.S. money from trusts that are heavily invested in the U.S. petroleum industry, spread “misinformation” about the oil sands in particular.

—GARY PARK

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MUSTANG FIELD

about a week and a half away from that being done,” Armfield said. The “hot tap” and valve for connecting the line to the nearby Alpine oil are already in place. Crude will be delivered into the Alpine line for shipment to the trans-Alaska pipeline.

The field crew has installed a remote electrical and instrumentation module on the field’s gravel pad and is connecting it up. Electrical work, trenching and other work are in progress on the pad. The crew also needs to install what is referred to as “the early production facility,” a small-scale temporary production facility that will enable field startup.

The workforce at the site has peaked at about 90 people. Overall, 59 Alaska companies have been involved in the Mustang project, Armfield said.

An evolving plan

Brooks Range had originally planned to start the field using permanent 15,000 barrels per day production facilities. However, that plan was based on a \$120 oil price in 2014, Armfield told the board. Following the subsequent oil price crash, Brooks Range had to put the project into “warm standby” mode before coming up with the plan to install the modestly priced temporary production facility. The idea is to start production at relatively low rates and, then, as production ramps up, use the resulting revenue to upgrade the production facilities to a larger scale.

Production will start at about 1,000 barrels per day, using a single well that

Brooks Range flow tested in 2017. Then, during this year, the company will drill a 6,000-foot lateral sidetrack from a partially completed well, thus enabling an additional 2,000 to 3,000 bpd of production. The drilling of two more wells should then elevate total production to about 6,000 bpd by the end of the year, Armfield said. Total eventual field development would result in about 17 injection and production wells, he said.

Total capital requirements from this point forward, inclusive of drilling and facility upgrades, would amount to \$350 million, Armfield said.

AIDEA assistance

AIDEA has been providing financing assistance for the project. Armfield particularly commented on the value of the agency’s assistance with the construction of the field’s gravel pad and the gravel access road to the pad. With gravel infrastructure a key to accessing relatively undeveloped areas of the North Slope, a number of companies have been able to make use of the Mustang gravel infrastructure. For example, Oil Search has been using the infrastructure for access to its work sites in connection with the neighboring Pikka development.

Armfield feels particularly proud that his company is now on the verge of bringing Mustang into production.

“We will be the first small, independent to go from actual discovery to production on the North Slope of Alaska,” he said.

—ALAN BAILEY

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