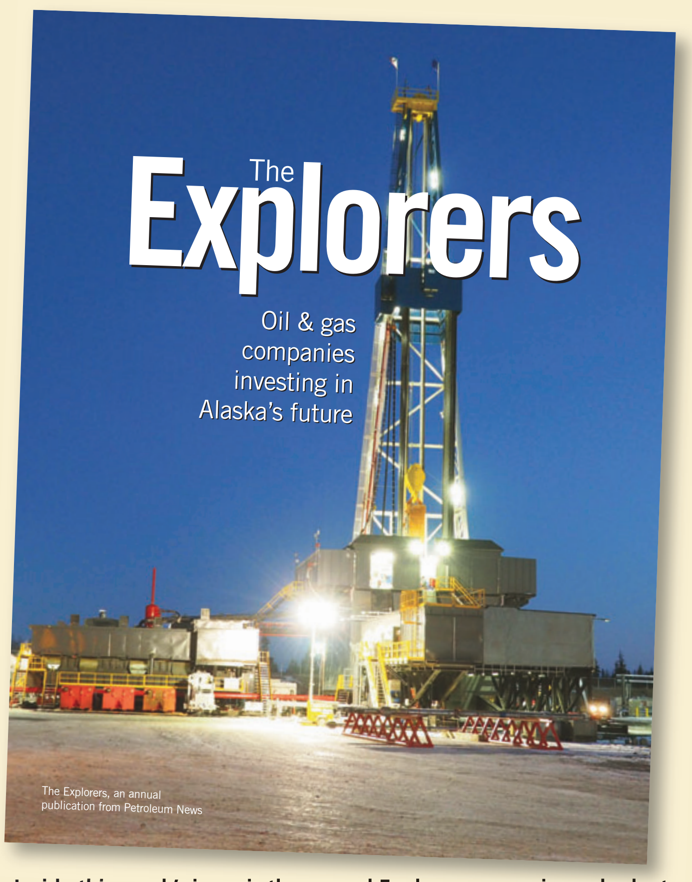
Petroleum news

Vol. 23, No. 21 • www.PetroleumNews.com | *A weekly oil & gas newspaper based in Anchorage, Alaska* | Week of May 27, 2018 • $2.50

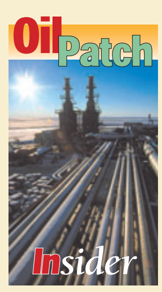
page 9 88 advances Icewine, raises $17M for Slope exploration, well testing

2018 Explorers inside



Inside this week's issue is the annual Explorers magazine, a look at oil and gas companies investing in Alaska's future.

BP/Conoco swap, Kuparuk assets? Armstrong asked how to get to Alaska



NEWS OF A POSSIBLE ASSET SWAP between BP and ConocoPhillips that might include Alaska assets (unconfirmed by either company) has been popping up in the press with Prudhoe Bay at the forefront, but they're not coming from writers with long memories.

In 1999, the two companies proposed a company-wide merger that would have given BP control of 74 percent of Alaska's North Slope oil production and 72 percent of the 800-mile trans-Alaska pipeline — a plan that was squashed in the face of federal and state monopoly laws.

But there is a different type of monopoly that could be created without resulting in ConocoPhillips gaining a legal monopoly on *current* North Slope oil production, and that is

see **INSIDER** *page 17*

LNG Canada ready to go

Royal Dutch Shell has issued the strongest message yet that it is ready to clear the barriers that have stalled Canada's hopes for exporting LNG on a large scale.

The global giant, which controls about 40 percent of the global LNG market, reaffirmed a 2016 commitment that along with three Asian energy powerhouses it is within sight of a final investment decision for the C$40 billion LNG Canada project, allowing construction to start this year.

The consortium's Chief Executive Officer Andy Caditz told a Vancouver conference that LNG Canada has seen strong progress since mid-2016 on the key elements underpinning commercial LNG — improvements in external market conditions, led by oil prices, free cash flow and the supply-demand balance.

Caditz also welcomed the incentives offered by British Columbia's minority New Democratic Party government and a resolution of the Canadian government's plan to impose

see **LNG CANADA** *page 18*

EXPLORATION & PRODUCTION

Master plan filed

ConocoPhillips indicates Willow standalone processing facilities needed

By ALAN BAILEY
Petroleum News

In what the company refers to as a proposed master development plan for its major Willow oil discovery in the northeastern National Petroleum Reserve-Alaska, ConocoPhillips has indicated that it will need to construct standalone production facilities, rather than hook Willow production into the production facilities for the Alpine field.

The company has filed the plan with the Bureau of Land Management and has asked the agency to start the process for an environmental impact statement for a Willow development. The company has yet to prepare a full-scale plan of development for the field but presumably wants to start the EIS process, given the length of time typically required for this type of environmental review. Being located in federal land in the NPR-A, any permitting for a Willow development

The company has for several years been following a policy of progressively developing oil discoveries west, stepping out from the Alpine field into the northeastern NPR-A.

see **WILLOW DEVELOPMENT** *page 19*

UTILITIES

It's a work in progress

Utilities report to RCA on forming a transmission company for the Railbelt grid

By ALAN BAILEY
Petroleum News

The Alaska Railbelt electricity utilities anticipate completing by the end of this year the decision-making process for the formation of a transmission company, or transco, to operate the Railbelt electricity transmission grid, the utilities told the Regulatory Commission of Alaska during the commission's May 23 public meeting.

There appears to be general agreement among the utilities over the need for transco formation, although there are questions relating to the timing for doing this. There is also a general perception that transco formation needs to happen in conjunction with the establishment of a Railbelt Reliability Council, an organization that would oversee policies for grid operation and reliability standards. As previously reported in Petroleum News, GDS Associates Inc., under contract with Alaska Railbelt Cooperative Transmission and Electric Co., is in the process of finalizing recommendations for the for-

There are complex business issues relating to transco formation, in particular allocation of costs between the utilities — depending on their use of the transmission system, some utilities may lose out while others may gain.

see **RAILBELT GRID** *page 15*

PIPELINES & DOWNSTREAM

Kinder Morgan bail out

Canadian government ready to cover losses to company caused by British Columbia

By GARY PARK
For Petroleum News

The Canadian government has made its strongest pledge yet to steer Kinder Morgan's Trans Mountain pipeline to completion by pledging to cover any financial losses resulting from the British Columbia government's politically motivated "attempts to delay or obstruct the project."

Federal Finance Minister Bill Morneau's offer of a financial backstop for the C$7.4 billion crude bitumen pipeline also gave a strong indication that the government believes there are "plenty of investors ... interested in taking on this project, especially knowing that (we) are willing to provide indemnity that makes sure the pipeline gets built."

While he would not identify any of those players, one likely candidate would be Enbridge, but that company said it has not engaged in discussions with the government. Other possible participants include pension funds.

Morneau would not say whether his government is prepared to invest in Trans Mountain through an equity stake.

Following three hours of meetings in Houston with Morneau, Steve Kean, chief executive officer of Kinder Morgan's Canadian division, said he

The Alberta government also stepped up its fight with B.C. by passing legislation giving it the power to restrict fossil-fuel shipments outside its borders.

see **PROJECT BAIL OUT** *page 18*

● GOVERNMENT

Coast Guard seeking icebreaker comments

Determining scope of EIS for construction of up to six polar icebreakers; looking for proposals for three heavy icebreakers

By ALAN BAILEY
Petroleum News

The U.S. Coast Guard is in the process of gathering public comments for the scoping of an environmental impact statement for the potential construction of up to six polar icebreakers. The comment period ends on June 29. In parallel, in March the Coast Guard issued a request for proposal for the advance procurement and detailed design for a heavy polar icebreaker, with options for the design and construction of up to three of these vessels. The agency then wants to acquire three additional medium icebreakers in a few years' time.

Two operational icebreakers

Currently the Coast Guard only operates two polar capable icebreakers: the Healy, a medium duty icebreaker, much used as a base for polar research, and the Polar Star, which is a heavy icebreaker but is 41 years old and nearing the end of its operational life. A third icebreaker, the Polar Sea, sister ship to the Polar Star, is laid up in port and has become a source of spare parts for the Polar Star. By comparison, Russia has 27 government owned or operated icebreakers in use, including four heavy nuclear-powered icebreakers.

The report says that the concept is to use a consistent design for the three heavy icebreakers, an approach that would spread the design costs across multiple vessels and allow lessons learned from the construction of the first vessel to be applied to the construction of the remaining vessels.

The Coast Guard has said that it needs six new icebreakers to ensure year-round access to polar regions and to provide rescue capabilities in ice-covered waters. Icebreakers enable the agency to carry out its duties in the Arctic and Antarctic, including defense readiness, treaty enforcement, coastal security, support for maritime safety and support for scientific research.

There has been a multiyear debate over whether and how to replace the Coast Guard's aging icebreaker fleet. Much of that debate has revolved around the cost and means of icebreaker acquisition.

Construction of first vessel

According to a report to Congress issued in April by the Congressional Research Service, the Coast Guard wants to start construction of the first of the new heavy icebreakers in fiscal year 2019, with the vessel entering service in 2023. The icebreaker program has received

see **ICEBREAKER COMMENTS** *page 4*

contents

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LAND & LEASING

State issues revised exploration license

The Alaska Division of Oil and Gas has issued a revised exploration license for the Houston area. An original license was offered May 1 (see story in May 13 issue of Petroleum News).

The license application dates to 2007; the original applicants were Samuel H. Cade, Daniel K. Donkel and LAPP Resources Inc. LAPP Resources principal Dave Lappi died in 2011 and Cade and Donkel assumed control of the proposal, which was for some 21,240 acres near Houston and Willow, north and east of the Parks Highway, with a $500,000 work commitment and a term of 10 years.

The exploration license offered to Cade and Donkel is for some 18,698 acres, has a five-year term and a $750,000 work commitment.

The exploration license offered to Cade and Donkel is for some 18,698 acres, has a five-year term and a $750,000 work commitment.

In the revised license, dated May 17, the division discussed the differences between the application and the license it was offering. It said that while the application requested a 10-year term, recent licenses have been shortened to four or five years "in order to encourage timely exploration and to expedite the gathering and return of data regarding the state's resources."

The division also said the shorter term is appropriate for this license because it is on the road system and close to support infrastructure and support services.

"There are fewer technical barriers to exploration that would necessitate the maximum term available, as proposed by the licensees," the division said.

On the dollar amount of the work commitment, the division said the "amount was adjusted to reflect the current economic climate and likely costs to conduct a field program sufficient to realize usable data," with proposed activities in the proposal "including remote sensing; geological, geochemical, and geophysical studies; and exploration drilling."

The division also noted that the original license application was for natural gas only and was amended in 2015 to include both oil and gas but without an increase in the proposed work commitment. "The expanded scope of the license was also a factor in the decision to increase the work commitment to $750,000," the division said.

The applicants have 30 days from the issuance of the revised license to accept it.

—KRISTEN NELSON

continued from page 2

ICEBREAKER COMMENTS

about $359 million in funding through fiscal year 2018, with $300 million of this coming via the U.S. Navy's shipbuilding account and the remainder from the Coast Guard's acquisition account. The Coast Guard has requested a further $750 million in funding for fiscal year 2019.

The report says that the concept is to use a consistent design for the three heavy icebreakers, an approach that would spread the design costs across multiple vessels and allow lessons learned from the construction of the first vessel to be applied to the construction of the remaining vessels. Thus, although there have in the past been estimates of around $1 billion for the construction of a single heavy icebreaker, the Coast Guard has suggested that the average cost of each of the three icebreakers could come in at around $700 million.

Cost reduction

The report says that in April the Government Accountability Office announced that the Coast Guard had revised its estimated costs downwards, now suggesting that the first icebreaker could be built for around $900 million, a cost level that implies an average cost of $600 million for each for the three vessels. On that basis, existing funding for the program plus the additional $750 million that the Coast Guard has requested could more than pay for the acquisition of the first of the icebreakers, the report says.

The reduction in estimated costs relates to the use of existing icebreaker designs as a basis for a new design, and a higher reliance on civilian commercial shipbuilding specifications rather than military specifications, the report says. ●

Contact Alan Bailey at abailey@petroleumnews.com

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Kay Cashman	PUBLISHER & FOUNDER	
Mary Mack	CEO & GENERAL MANAGER	
Kristen Nelson	EDITOR-IN-CHIEF	
Susan Crane	ADVERTISING DIRECTOR	
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Gary Park	CONTRIBUTING WRITER (CANADA)	
Judy Patrick Photography	CONTRACT PHOTOGRAPHER	
Forrest Crane	CONTRACT PHOTOGRAPHER	
Renee Garbutt	CIRCULATION MANAGER	

ADDRESS
P.O. Box 231647
Anchorage, AK 99523-1647

NEWS
907.522.9469
publisher@petroleumnews.com

CIRCULATION
907.522.9469
circulation@petroleumnews.com

ADVERTISING
Susan Crane • 907.770.5592
scrane@petroleumnews.com

FAX FOR ALL DEPARTMENTS
907.522.9583

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CORRECTION

Willow EIS request

An item in the print edition of the June 20 issue of Petroleum News, "Conoco files BLM application for Willow," incorrectly described a request the Bureau of Land Management had received from ConocoPhillips for its Willow discovery. The company requested that BLM begin the process to develop an environmental impact statement for development of the Willow discovery. See story in this week's paper.

Petroleum News apologizes for the error.

● EXPLORATION & PRODUCTION

Division questions Alliance plan update

Says that work commitment in Guitar unit is not contingent on adding a further lease to the unit in time for exploration drilling

By ALAN BAILEY
Petroleum News

Alaska's Division of Oil and Gas has questioned statements made by Alliance Exploration LLC in an exploration progress report filed for the company's Guitar unit on the southwestern side of the Prudhoe Bay unit on the North Slope.

The company commented that complications arising from the need to add a lease into the unit were jeopardizing the drilling of a well and that the company had informed the Alaska Department of Natural Resources, prior to unit formation, that drilling a well in the unit was premised on the division assigning the additional lease. The company told the division that it had understood that this lease would be assigned in the fall of 2017.

The division's August 2017 approval of the formation of the Guitar unit required the drilling of an exploration well in the unit by March 31, 2019.

In a May 16 letter to Alliance, division Director Chantal Walsh said that Alliance's update report contains several inaccurate statements. In particular, neither Alliance's application to form the Guitar unit nor the division's approval of the unit formation makes mention of the assignment of the additional lease to the unit, nor of the lease assignment being integral to the unit plan of exploration, Walsh wrote.

Three state leases

The unit consists of three state leases, which had previously formed part of the Hemi Springs unit, formed in 1983 and terminated in 1992. Alliance has a 100 percent working interest in the leases, while Samuel Cade and Daniel Donkel have small overriding royalty interests. The additional lease, which Alliance claims is integral to its exploration plan, sits at the northwest quadrant of what, with the three Guitar unit leases, would form a square shape.

ConocoPhillips is holding that fourth lease because the Hemi Springs State No. 1 well, drilled by ARCO in the lease tract in 1984, was certified as capable of producing hydrocarbons in payable quantities from the Kuparuk C.

In Alliance's Guitar unit plan of exploration, approved by the division in 2017 in conjunction with the unit approval, the company said that it would drill a well in one of the three leases in the unit, preferably during the winter of 2018, but no later than the winter of 2019, depending on the permitting situation. The well would penetrate the Ivishak formation, the formation that hosts the Prudhoe Bay field reservoir, with a lateral well targeting a seismic anomaly in the Kuparuk C. Depending on the results from the first well, Alliance might drill a second well in the following year. And positive results from the first well would trigger a plan for delineation drilling, the plan said.

The plan did not mention access to a fourth lease.

Alliance's unit progress report, filed with the division in April, says that complications surrounding the assignment of the fourth lease to the unit had delayed the drilling of a well but that the company has taken a number of steps to enable the well to be drilled by the March 31, 2019, deadline. Those steps include moves to acquire the fourth lease, the acquisition and processing of 3-D seismic for the unit; the hiring of a consultant to evaluate drilling targets; starting the permitting for the drilling; initiating the preparation of a contingency plan; preparing cost estimates for the drilling project; identifying a contractor for the drilling; and hiring an expert for the eventual marketing of oil from the unit.

Oil potential

The division's original approval document for the Guitar unit said that Alliance had used an interpretation of the logs from the Hemi Springs well to infer the location of the oil-water contact at the base of the Kuparuk C oil accumulation and has used 3-D seismic to trace that contact into the Guitar unit leases — the seismic interpretation suggests space for a potential oil accumulation up dip of the oil-water contact. Although Alliance's well will target the Kuparuk C and Ivishak, oil shows have been demonstrated in the West Sak and Ugnu across the region, the document said.

Alliance has declined to comment to Petroleum News on the issues regarding its exploration plan status report. ●

FINANCE & ECONOMY

North Slope crude heads for $80

Rising demand, tensions over sanctions on Iran, collapsing Venezuela production all combine to put upward pressure on the price

By ALAN BAILEY
Petroleum News

The price of crude oil has been continuing to climb in recent weeks, with Alaska North Slope crude reaching $79.81 per barrel on May 21, just a few cents shy of $80. This is the highest price seen since November 2014, a few months after the price started to crash below the $100 level.

The general view is that robust oil demand coupled with supply concerns, particularly in connection with the specter of renewed sanctions against Iran, is driving the price up. The continuing collapse of Venezuelan oil production is adding to the upward pressure on the price. In parallel with oil demand moving ahead of supply, the stockpiles of crude oil have been falling.

As always, the fascinating but somewhat unanswerable question is where does the oil price go from here?

Many issues at play

According to a report in Bloomberg, Morgan Stanley has suggested that new regulations that have come into effect, forcing ships to use lower sulfur fuels, will drive a demand for fuels such as diesel and marine gasoil, triggering a higher demand for crude oil and perhaps pushing the oil price towards $90. On the other hand, the geopolitical factors behind oil market angst are inherently unpredictable. And there is the question of the price target that the Organization of the Petroleum Exporting Countries may maintain as a basis for its quotas on oil production, quotas that have been a significant factor in the oil price rise. And will Russia remain in step with the OPEC oil quota strategy?

The IEA commented that it is still too early to determine the impact on the oil market of the U.S. withdrawal from the Iran nuclear agreement, although to some extent the effect of the U.S. decision has already been factored into the oil price.

US shale oil

One prominent theory that has gained traction in recent years is the idea that U.S. shale oil production can act as a price setter in the global oil market: Unlike production from conventional oil fields, which are slow to develop and require maximum output once in operation, shale oil production can more easily be ramped up and down in response to price signals.

BP Group Executive Bob Dudley has notably espoused this concept: In 2015 he coined the phrase “lower for longer” to characterize the oil price situation. And in a recent interview with Reuters Dudley re-iterated that outlook, commenting that he sees the current oil price rally cooling off to around $50 to $65, because of surging shale oil output. Dudley also suggested that a price above $80 would impact oil demand growth.

The more bullish view

A recent article in the Financial Times took a different perspective, suggesting that the “lower for longer” syndrome is now dead. This article suggested that, in reality, U.S. shale oil production has been unable to adequately respond to rising oil demand, with the result that oil inventories have fallen. The article also points out that Brent futures are now trading above $60 as far ahead as December 2024. In the nearer term, Brent futures are currently trading in the high $60s to low $70s through to April of next year.

North Slope crude tends to track quite close to the Brent price.

Some commentators have also said that an underinvestment in oil development during the recent period of exceptionally low oil prices is now starting to feed through to a shortage of production capacity to meet growing oil demand.

IEA’s May report

The International Energy Agency, in its May report on the global oil market, said that it had slightly revised its outlook for 2018 oil demand growth from 1.5 million to 1.4 million barrels of oil per day, because of rising oil prices. The agency now anticipates total worldwide demand to average 99.2 million barrels per day in 2018.

In April, global oil supplies held steady at around 98 million barrels per day, with strong non-OPEC production offsetting a drop in OPEC output, the IEA said. Production from the United States in particular pushed up the non-OPEC output, while production declines in Venezuela and Africa reduced the OPEC delivery.

Tightening market

The IEA commented that it is still too early to determine the impact on the oil market of the U.S. withdrawal from the Iran nuclear agreement, although to some extent the effect of the U.S. decision has already been factored into the oil price. At the same time, the oil market has been continuing to tighten, as demand exceeds supply and stocks drop. And, given the International Monetary Fund’s recent bullish outlook on the global economy, the IEA remains confident that oil demand growth will remain strong. However, at some point the sharp rise in the oil price will dampen that growth, the agency thinks.

On the supply side of the market, rising U.S. oil production will somewhat compensate for lower production elsewhere. The IEA anticipates a modest increase in U.S. output in 2018, bearing in mind the current logistical constraints in transporting U.S. shale oil to market. Projects are underway to alleviate those transportation problems.

Although there has been much focus on declining oil stocks in the developed world, the IEA sees attention shifting more towards the rapidly changing geopolitical situation, with oil producers and consumers trying to figure out how dampen volatility in the oil market. ●

Contact Alan Bailey at abailey@petroleumnews.com

● EXPLORATION & PRODUCTION

AIX Energy planning compression for fall

Company expects Kenai Loop to continue meeting obligations for several months with current infrastructure; may revive KL 1-4 well

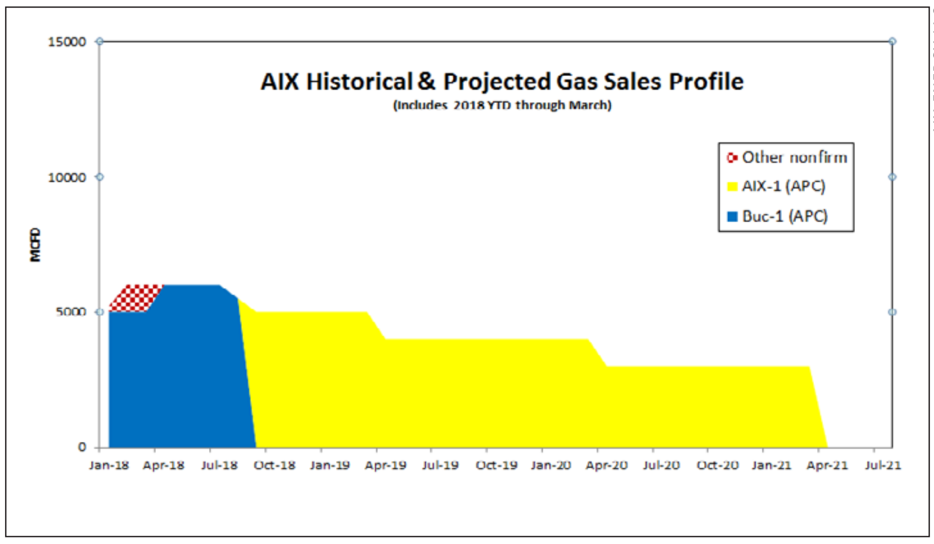
By ERIC LIDJI

For Petroleum News

AIX Energy LLC believes it can meet its production obligations at its Kenai Loop natural gas field through the coming fall before it will need to install compression infrastructure.

"Extended flowing and shut-in data was used to update nodal analysis and systems models, resulting in a high level of confidence that under current market conditions compression could be deferred until the fall of 2018," the company wrote in a recent plan of development for the onshore gas field located just northeast of the city of Kenai.

In the years since it acquired the Kenai Loop field from previous operator Buccaneer Energy Ltd. in late 2014, the Texas-based independent has met its commercial obligations without significant investments beyond those required for daily operations.



AIX ENERGY LLC

Some investment will become inevitable as the field ages. Average gas production at Kenai Loop peaked above 11 million cubic feet per day between October 2015 and January 2016, according to figures provided by the company. The field produced 2.827 billion cubic feet in the year ending March 31, 2018, down from 3.159 bcf in the year ending March 31, 2017, and down from 3.657 bcf in the year ending March 31, 2016.

In the years since it acquired the Kenai Loop field from previous operator Buccaneer Energy Ltd. in late 2014, the Texas-based independent has met its commercial obligations without significant investments beyond those required for daily operations.

AIX Energy publicly raised the inevitability of adding a compression system at Kenai Loop in its first plan of development, submitted to state authorities in May 2015. At the time, the company estimated that the field would need compression within 12 to 18 months, depending on the demand for near-term and non-firm gas sales. The company repeated the 12-to-18-month estimate in its second plan of development from early 2016.

In its third plan, from early 2017, AIX Energy pushed the estimated date of compression installation to this summer and said it would use flowing and shut-in data to assist with planning. Those efforts allowed the company to defer the project until as late as this fall.

Associated with the compression project is a proposal to connect the shut-in KL 1-4 production well into the existing system to increase both deliverability and redundancy.

Buccaneer drilled four wells during its initial development campaign at Kenai Loop. The field is currently producing from KL 1-1 and KL 1-3. The KL 1-2 is temporarily suspended and AIX Energy has expressed an interest in converting the well to disposal.

Connecting the KL 1-4 well into the system would improve operations by increasing deliverability from the field and creating a backup for the existing wells. The project could potentially increase overall recovery at Kenai Loop, according to the company. In the coming year, AIX Energy plans to perform a cost-benefit analysis of the interconnection project and a related project to recomplete the KL 1-1 and KL 1-3 wells.

The biggest infrastructure project at Kenai Loop over the past year was the decommissioning of a second, unused drilling pad in June 2017. The decommissioning allowed the company to end a surface lease with the Alaska Mental Health Trust.

These projects come at a moment of transition.

AIX Energy is entering the final months of the gas sales agreement it inherited from Buccaneer through its acquisition of the Kenai Loop field. A new gas sales agreement with Enstar Natural Gas Co. goes into effect during the third quarter of this year.

According to terms provided by the companies, the gas sales agreement includes a provision allowing AIX Energy to either increase or decrease production in the third year.

AIX Energy would provide a firm supply of 1.370 bcf between July 1, 2018, and March 31, 2019. The volume would increase to 1.464 bcf between April 1, 2019, and March 31, 2020. Between April 1, 2020 and March 31, 2021, the volume would either decrease to 1.095 bcf or would increase to 1.825 bcf. AIX Energy has until Sept. 1, 2019, to inform Enstar about the volume it intends to deliver in the third year of the contract. ●

Contact Eric Lidji at ericlidji@mac.com

● EXPLORATION & PRODUCTION

88 Energy advances Icewine project

Independent raises $17 million for Alaska North Slope exploration, appraisal drilling, well testing south of Prudhoe Bay

By KAY CASHMAN
Petroleum News

A May 21 operations update from 88 Energy Ltd. said the company, which has two exploration wells planned for the North Slope, will resume testing its Icewine No. 2 well on June 11. The company's operating arm in Alaska is Accumulate Energy Alaska, headed by Erik Opstad.

88 Energy (ASX, AIM) recently raised A$17 million to fund its Alaska exploration program, a placing that was "significantly oversubscribed," the West Perth, Australia-based company said.

Icewine No. 2 was drilled in 2017, and testing began in August but was suspended Sept. 18 for the winter. According to paperwork filed last year with the state Division of Oil and Gas, the company might drill a follow-up lateral with multistage stimulation, which 88 Energy said would be "contingent upon outcome of final flow testing."

Site work (clearing snow and ice) has already started at the Franklin Bluffs gravel pad from which Icewine No. 2 was drilled off the Dalton Highway. "Final preparations" for mobilization of test equipment are underway, 88 Energy said.


ERIK OPSTAD

The firm holds and is operator of some 475,000 contiguous acres (301,000 acres net) in its Icewine leases, which are along a year-round access road about 35 miles south of Pump Station 1 where Prudhoe Bay feeds into the trans-Alaska oil pipeline.

88 Energy also holds and operates the Yukon Gold prospect, south of the Point Thomson field and west of the Arctic National Wildlife Refuge.

Nitrogen lift units

Once site work has been completed at Icewine, pressure gauges will be retrieved from downhole and data analyzed to determine if there is any reservoir degradation, which "may require remedial action such as re-perforation of the target intervals," 88 Energy said.

Concurrently, test equipment including separators, tanks and nitrogen lift units will be moved to the site "ahead of the scheduled commencement of flow testing on the 11th June 2018."

The flow testing program has been designed to utilize nitrogen lift to assist the removal of up to an additional 4,000 barrels of fluid from the HRZ reservoir."

88 Energy said it anticipates this will "enable the hydrocarbons in the reservoir to flow naturally to surface at a representative rate. Based on modelling of the reservoir pressure and fracture conductivity," this will take 10-14 days. The well "will then continue to be flowed back to ascertain drawdown pressure and decline rate."

Two exploration wells part of plan

The company filed a lease plan of operations with the Alaska Division of Oil and Gas in 2017 to drill two exploration wells, Bravo No. 1 and Charlie No. 1 in the Icewine project.

The Icewine No. 1 and No. 2 wells were drilled from the Franklin Bluff gravel pad, but the new wells will be off-road, from ice roads west of Franklin Bluff, although where they will be located will likely depend on recent seismic survey results.

In its plan of operations, 88 Energy Alaska's operating company, Accumulate, said drilling objectives for the wells include testing and evaluating the Seabee formation, a target found in surrounding exploration wells and in production at the Meltwater pool in the Kuparuk River unit.

Seismic on schedule

88 Energy also reported May 21 that its 3-D seismic processing is on schedule, referring to two 3-D seismic surveys it completed this past winter. One, the Icewine survey, to the west of the Dalton Highway, was designed to confirm leads identified in existing 2-D seismic on the western margin of the acreage. The second survey was on the company's Yukon Gold tracts.

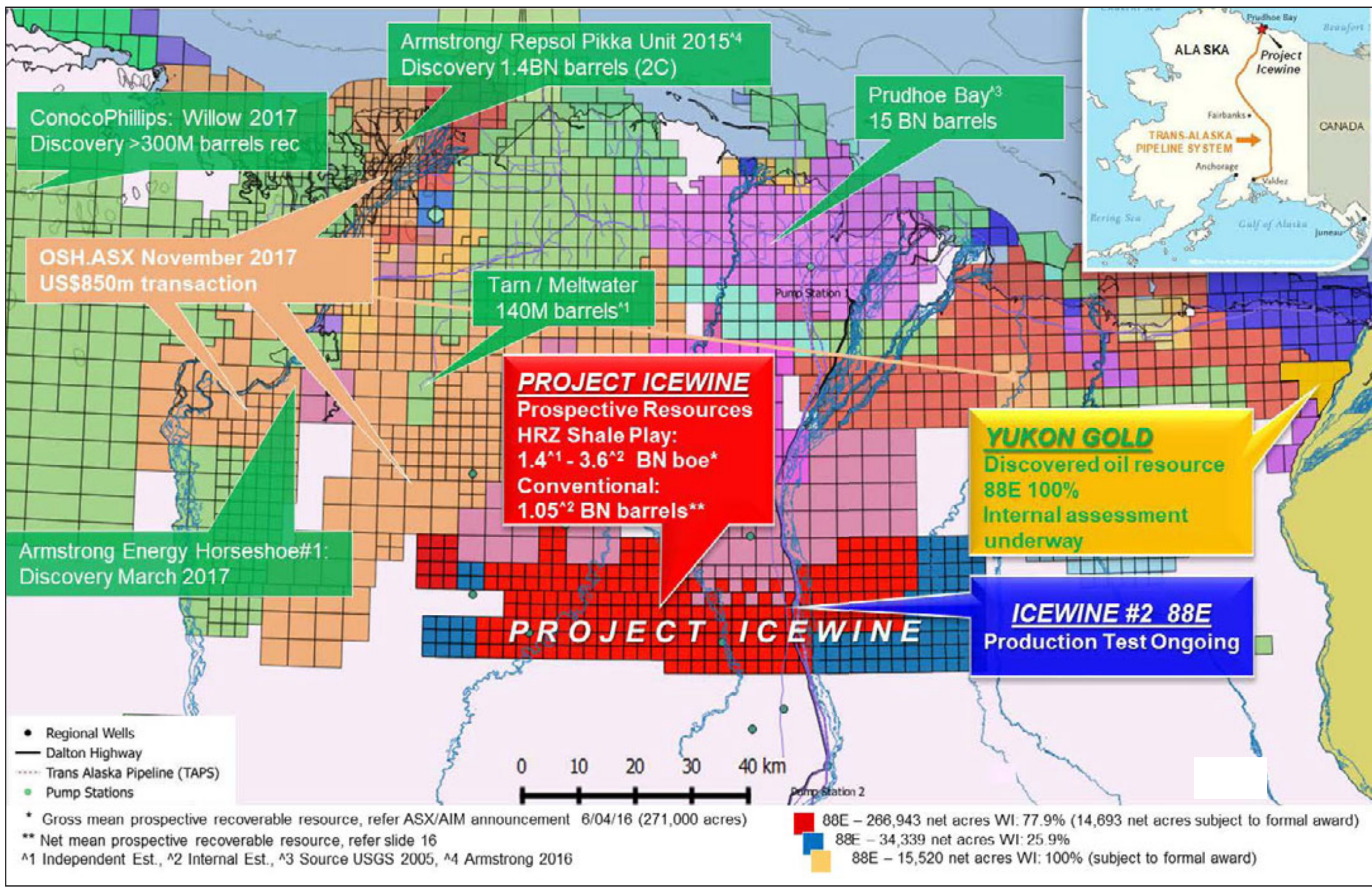
Early products from the Project Icewine 3-D survey are expected to be received mid-year prior to starting the formal farm-out process "related to the conventional prospectivity already identified over the Western Margin leases at the project," 88 Energy said.

The Yukon Gold 3-D data is expected in fourth quarter and "will assist in assessment of the potential of the Yukon Gold oil discovery as well as delineation of any additional potential on the leases."

Yukon Gold history

88 Energy's Yukon Gold acreage south of Point Thomson and west of ANWR was acquired in the state's late 2017 North Slope

see ICEWINE PROJECT page 10



88 ENERGY

● EXPLORATION & PRODUCTION

State approves four PODs for Inlet, Slope

By KRISTEN NELSON
Petroleum News

The Alaska Division of Oil and Gas has recently approved four annual plans of development, one for the North Slope and three for Cook Inlet.

Badami

On the North Slope, the division approved a POD from Savant Alaska LLC, a Glacier Oil and Gas company, for its Badami unit on the eastern side of the Slope. In its decision the division noted that Savant recently completed the B1-07 well to its Starfish prospect as a Killian Sands well. The company also completed well and facility maintenance to manage natural field production in decline, including replacement of one of its two power generation turbines and maintenance-workover operations on a disposal well, the B1-01.

Through the end of 2017, 8.06 million barrels have been produced from the Badami unit.

Savant has committed to putting the B1-07 well on pilot production prior to the end of the 14th plan period, and pending results, to apply for a new participating area for the Starfish prospect.

Under the new plan, the 15th for Badami, which covers July 16 through July 15, 2019, results of the B1-07 well will be analyzed and future drilling targets developed. If the well results are favorable and economic conditions warrant, the company plans to drill up to two additional wells at Badami during the winter of 2018-19.

This in addition to continuing well and facility maintenance and optimization.

Cannery Loop

In Cook Inlet, the division approved Hilcorp Alaska's 2018 POD for the Cannery Loop unit, the 39th POD for that unit, which was formed in June 1978 and began sustained gas production in April 1986. The CLU is producing from the Beluga undifferentiated sands participating area and the Upper Tyonek formation undifferentiated gas sands PA.

The former Sterling gas sands PA was terminated in 2011 and the PA area contracted from the unit to facilitate the reservoir's transition to gas storage for Cook Inlet Natural Gas Storage Alaska.

Average gas production in 2017 was 10.1 million cubic feet per day, an increase from 9.36 million in 2016. Cumulative gas production at the end of 2017 was 201.24 billion cubic feet.

Hilcorp has no planned exploration or delineation activities for 2018, it anticipates continued production from existing wells to remain steady during the 2018 POD period.

Deep Creek

The division approved Hilcorp's 2018 POD for the Deep Creek unit, the 15th for that unit, which was formed in 2001. Sustained production from the Happy Valley PA began in late 2004 and the unit was acquired by Hilcorp from Union Oil Company of California on Jan. 1, 2012.

Gas production from the Happy Valley PA and the undefined Sterling formation declined in 2017 with average production of some 5 million cubic feet per day; cumulative production through 2017 was some 34.6 bcf.

Hilcorp drilled two stratigraphic test wells in October out of the four to six it committed to drill. "Based on those results, however, Hilcorp commits to new exploratory drilling plans during the 2018 POD period by drilling at least two and up to four more stratigraphic wells targeting the Sterling and Beluga formations," the

see **POD APPROVALS** page 12

continued from page 9

ICEWINE PROJECT

areawide lease sale by 88 Energy subsidiary Regenerate Alaska Inc. and included the existing Yukon Gold well.

Drilled by BP in 1993-94, the well was an oil discovery that the state estimated contained recoverable reserves of some 120 million barrels.

The state approved an SAExploration application for the Yukon 3-D in February. The permit said the project included some 251 square miles of 3-D acquisition.

Icewine project history

In November 2014, 88 Energy entered into a binding agreement with Burgundy Xploration to acquire a working interest (87.5 percent, reducing to 77.5 percent on spud of the first well on the project) in a large acreage position on a multiple objective, liquids-rich exploration opportunity onshore Alaska.

The Icewine project is on an all-year operational access road with both conventional and unconventional oil potential. The primary term for the state leases is 10 years with no mandatory relinquishment and a 16.5 percent royalty.

The HRZ liquids-rich play (Brookian sequence) has been successfully evaluated based on core obtained in the Icewine No. 1 exploration well (completed in 2015), marking the completion of Phase I of Project Icewine, per 88 Energy.

Phase II began with drilling the follow-up appraisal well, Icewine No. 2 in second quarter 2017. Large conventional prospectivity was identified on acquired 2-D seismic across the project acreage.

Recouping of exploration incentives promised by the state of Alaska with up to 35 percent of net operating loss refundable in cash are expected to be more than $20 million, per Petroleum News sources.

The Brookian conventional play is proven on the North Slope, with recent multiple Armstrong/Repsol and ConocoPhillips oil discoveries totaling several billion barrels recoverable.

Additional conventional potential exists in the in the Icewine project's Brookian delta topset play, deeper Kuparuk sands and the Ivishak formation, 88 Energy has reported. ●

Contact Kay Cashman at publisher@petroleumnews.com

EXPLORATION & PRODUCTION

US drilling rig count rises by 1 to 1,046

The number of rigs drilling for oil and natural gas in the U.S. increased by one the week ending May 18 to 1,046.

At this time a year ago there were 901 active rigs.

Houston oilfield services company Baker Hughes reported that 844 rigs drilled for oil (the same as the previous week) and 200 for natural gas (up one). Two were listed as miscellaneous (no change).

Among major oil- and gas-producing states, New Mexico added three rigs and Texas tacked on two. Kansas gained one.

Alaska, Colorado, Louisiana, North Dakota and Ohio each shed one rig.

Arkansas, California, Oklahoma, Pennsylvania, Utah, West Virginia and Wyoming saw their rig levels unchanged this week.

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

—ASSOCIATED PRESS

PIPELINES & DOWNSTREAM

Average price of US gasoline jumps 10 cents

The average price of regular-grade gasoline in the U.S. jumped 10 cents a gallon over the past two weeks to $3.00.

Industry analyst Trilby Lundberg of the Lundberg Survey said May 20 that the price has spiked 41 cents over the past three months.

Lundberg says the increase is largely driven by higher crude oil costs and the phasing-in of summer-grade gasoline, which is used to prevent smog.

The highest average price in the contiguous 48 states was $3.79 in the San Francisco Bay Area. The lowest was $2.54 in Baton Rouge, Louisiana.

The average price for diesel fuel rose 9 cents, to $3.23.

GasBuddy said May 21 that average retail gasoline prices in Anchorage have risen 3.3 cents per gallon in the past week, averaging $3.27 per gallon May 20, according to a daily survey of 86 gas outlets in Anchorage.

According to gasoline price website GasBuddy.com, the national average rose 4.3 cents in the last week to $2.92 per gallon.

Price changes in Anchorage in the week ending May 20 were 56 cents per gallon higher than the same day one year ago, and 11.2 cents higher than a month ago, with local prices over the past five years ranging from a low of $2.44 per gallon in 2016 to a high of $3.97 in 2013, GasBuddy said.

—ASSOCIATED PRESS AND PETROLEUM NEWS

LAND & LEASING

Great Bear appeals lease extension bonding

Great Bear Petroleum has appealed the state's bonding requirements for extending the terms of some of the company's North Slope leases. As previously reported in Petroleum News, Alaska's Division of Oil and Gas has agreed to extend by three years the terms of four blocks of Great Bear leases that had been due to expire on April 30. Subsequent to that decision, Great Bear decided to only continue its exploration program in two of the leases blocks, allowing the leases in the other two blocks to expire.

All of the lease extensions were predicated on exploration drilling commitments by Great Bear. However, lease extension in three of the blocks, including one block in which Great Bear plans to continue its exploration efforts, came with substantial bonding requirements. The lease extensions required Great Bear to post the bonds by April 30. And the bonds would be forfeited if the exploration commitments are not met.

The bonding requirement for the block of leases that Great Bear wants to continue to hold is $6 million. The bonding for the two blocks that the company is dropping is $3.5 million and $2.6 million.

In April 10 letters to Alaska Department of Natural Resources Commissioner Andy Mack, Patrick Galvin, Great Bear chief commercial officer and general counsel, said that his company views the bonding requirements as arbitrary and as excessively high in relation to the associated exploration drilling commitments. Galvin also questioned the required timing of the bonding, saying that posting of bonds by April 30 is not necessary to protect the state's interests. Moreover, the imposition of a performance bond unnecessarily puts planned exploration drilling at risk by diverting funds from the drilling program, Galvin wrote.

Galvin asked that the amount of the bonding be reduced and that the required date of the bonding be delayed.

—ALAN BAILEY

● ALTERNATIVE ENERGY

Alaska's nuclear plant to be decommissioned

One challenge the Army Corps of Engineers faces is the steam plant is still in use, although today it's powered by a diesel plant

PETROLEUM NEWS & PRESS REPORTS

U.S. Army officials have initiated the process of decommissioning of Alaska's first and only nuclear power plant at Fort Greely in the Interior south of Fairbanks.

The SM-1A plant was built during the height of the Cold War, operated off and on for 10 years, and then shut down in 1972. Much of the facility was dismantled and disposed of, with the radioactive components of the reactor encased in concrete, essentially placing the facility into safe storage instead of formally decommissioning it. The enriched uranium fuel and waste were shipped out of the state.

The Corps now plans to remove most, possibly all, of what remains.

The Fairbanks Daily News-Miner reported in mid-May that Fort Greely's nuclear plant provided steam and electricity intermittently to the Army post near Delta Junction between 1962 and 1972 but was mothballed because it was more expensive to operate than a conventional diesel power plant.

It was one of eight experimental projects testing the use of small nuclear power plants at remote locations, the report said.

The Corps said it expects to take about 10 years to plan, contract out and clean up the site.

The decommissioning planning contract for the reactor was recently awarded, per the Corps' Baltimore District website, although the contractor was not named.

"The project team is working with our contractor and will be working with the external stakeholders and interested parties as we proceed with our planning efforts. Additionally, the project team has started the contract acquisition process for the next phase of work, which would be the actual decommissioning implementation," the website said.

One challenge the team faces is that the steam plant previously powered by the nuclear reactor is still in use, although it's powered by a diesel-fired power plant operated by Doyon Utilities.

"As we go through the planning process and ultimately through implementation, safety of the workers is a No. 1 priority," Chris Gardner, a spokesman for the Corps told the News-Miner in a telephone interview from Baltimore.

In an Alaska Public Radio report out of Fairbanks, Brian Hearty who manages the Corps' Deactivated Nuclear Power Plant Program was interviewed.

Initially, Hearty said, the objective was to reduce significant fuel-transportation costs by having a nuclear reactor that could operate for long terms with just one nuclear core.

The Army hoped "the facility could provide power reliably at remote radar sites around the Arctic that would scan the skies for incoming missiles from the Soviet Union — which at that time, was America's archrival.

"Because of the Cold War, the Air Force and Army were looking at the potential for a lot of the defense radar sites to be located up there," Hearty said.

The program worked, but maybe not in the way Pentagon officials had hoped, he said. They learned the SM-1A could be built and operated in a cold and remote locale, but found its upfront costs were much higher than anticipated, and that it cost more to maintain than a diesel power plant.

"One of the big things that shut down the program overall was the creation of the ICBMs that go up over the

see **NUCLEAR PLANT** page 13

continued from page 10

POD APPROVALS

division said, and also plans on exploratory drilling targeting the Sterling and Beluga formations in 2019 based on results of the 2018 stratigraphic wells.

The division said Hilcorp has been granted a series of delays of a mandatory unit contraction, with an extension application due by May 31. Union Oil was told when it submitted its eighth POD in late 2010 that the ninth POD must provide for exploration of the unitized area and drilling necessary to determine areas capable of producing in paying quantities. As early as 2004 the division said in another decision that "Unocal's initial interpretation indicated that the unit area may encompass several potential hydrocarbon accumulations and exploration to date has confirmed the presence of the Happy Valley reservoir in the northern unit area." The potential areas were south of the Happy Valley reservoir.

Kenai gas field pool 6 storage

The division has also approved a 2018 POD for the Kenai gas field pool 6 storage lease, the 14th POD for the gas storage lease.

Hilcorp has continued to conduct storage operations and optimize gas production wells throughout the field, the division said, with 14 wells on the gas storage lease, 10 gas producers, three gas injectors and a monitoring well.

Storage capacity in the gas storage formation is limited to 50 billion cubic feet at the end of any month. The division said all recoverable native gas in the reservoir, 32.51 bcf as of August 2005, has been produced.

Hilcorp injected 9.2 bcf of gas during 2017 and withdrew 5.072 bcf.

The division said no facility work was conducted in either 2016 or 2017 and none is planned for 2018, with no new wells or major well work planned.

Injection for 2018 is projected to be between 1 bcf and 9 bcf of gas with extraction in periods of high demand. The company has no plans for changes in long-term storage. ●

Contact Kristen Nelson at knelson@petroleumnews.com

INTERNATIONAL

Iran signs deal with UK group; Total exits

Iranian state TV is reporting that the country has signed an agreement with a British consortium to develop an oil field, just as another major company, France's Total, says it will withdraw from Iran because of the renewed U.S. sanctions.

The new agreement is the first between Iran and a company from a key Western ally of the United States since Washington announced it will pull out of the landmark 2015 nuclear deal between Iran and Western powers. The U.S. said it was reinstalling sanctions against Iran.

Managing Director of Pergas International Consortium Colin Rowley, and Bijan Alipour, managing director of National Iranian South Oil Co., signed a preliminary deed on the partnership in the presence of British Ambassador Rob Macaire in Tehran May 16.

The project, if the agreement turns into a contract, will require more than $1 billion to produce 200,000 barrels of crude oil per day during the next decade in the 55-year old Karanj oil filed. The oil field is located in the country's oil-rich province and currently produces 120,000 barrels of crude per day.

The U.S. sanctions aim to limit companies from any country from dealing with Iran by prohibiting them from using American banks in their operations. Pergas seems to do little business in the U.S., potentially giving it more freedom to operate in Iran.

Its move contrasts with the decision by French oil and gas producer Total to not continue a multibillion dollar project in Iran unless it is granted a waiver by U.S. authorities.

The group said in a statement May 16 that it "cannot afford to be exposed to any secondary sanction" including the loss of financing by American banks.

Total wants U.S. and French authorities to examine the possibility of a specific project waiver.

The 2017 contract for new development at the vast South Pars gas field was the first major gas deal signed with Iran following the 2015 nuclear deal.

Major European powers and Tehran have committed to keep working together to save the Iran nuclear deal.

—ASSOCIATED PRESS

EXPLORATION & PRODUCTION

DEC issues APDES permit for Sabre

The Alaska Department of Environmental Conservation has issued an Alaska pollutant discharge elimination system individual permit for Cook Inlet Energy's Sabre oil and gas exploration project.

The permit was issued May 16, is effective June 16 and expires June 15, 2023.

The permit allows discharges from the Sabre exploration project in the West McArthur River lease area in upper Cook Inlet, just north of West Foreland.

Subject to conditions in the permit, Cook Inlet Energy, a Glacier Oil and Gas Corp., subsidiary, may discharge fluids including drilling fluids and drill cuttings; deck drainage; graywater; blowout preventer fluid; fire control test water; noncontact cooling water; uncontaminated ballast water; excess cement slurry; fluids, cuttings and cement at the seafloor; completion fluids; well treatment fluids; and test fluids.

DEC said the permit was developed based on characteristics of wastewater represented by the Spartan 151 jack-up drilling rig, the mobile offshore drilling unit proposed in the application — but the permit would allow discharges from other MODUs as long as discharge characteristics were consistent with the Spartan 151.

The Sabre project is on the west side of Cook Inlet, some three miles offshore in Trading Bay. DEC said the project will include moving a MODU to the site, using support vessels and aircraft activities during drilling, evaluating the presence and extent of hydrocarbon resources — including flow testing if successful — and suspending or abandoning the well once drilling is complete.

"Pending results of gas reserves evaluation, CIE may install a subsea wellhead and tree on the drilling fluid line to enable production at a later time," DEC said.

—KRISTEN NELSON

continued from page 12

NUCLEAR PLANT

defense early-warning systems," Hearty said.

So the SM-1A, built at a cost of about $17 million, was shut down in 1972.

"All of the fuel in the reactor core was removed and shipped back to the Atomic Energy Commission for them to either reprocess of dispose of," he said. "The highly activated control and absorber rods were also removed and shipped back" to AEC.

The power plant produced 1.8 megawatts of electricity and 20 megawatts of thermal energy, including steam, which was used to heat the military post.

Because that part of the facility was still needed, Army officials removed most of the nuclear-power system and hooked the heat and steam components to the diesel-fired boiler. But they left several parts of the nuclear system in place, including the highly radioactive reactor pressure vessel and reactor coolant pumps.

"Those were either kept in place or they were cut off and laid down in the tall vapor-containment building there … then they were grouted and concreted in place," Hearty said.

That is what remains to be cleaned up, along with other remediation, in order for the SM-1A to be declared fully decommissioned, he told public radio.

The Corps wants to remove everything, but Hearty said it's not yet known whether doing so is feasible. Meanwhile, monitoring for radioactivity around the facility shows it remains at acceptably low levels.

"It would be safe to say there's no threat to human health in the environment," Brenda Barber project manager for the decommissioning, told public radio.

Barber said the Corps awarded $4.6 million contract to a Virginia-based firm to develop a long-range plan for the project, but also did not name the firm. Among other things, the contractor will help Corps officials decide how much of the SM-1A will remain after it's decommissioned. ●

ALASKA INVESTOR Corner

Looking to invest in Alaska O&G leases?

Veteran investor, independent Paul Craig offers advice to individuals, groups, firms interested in making money in Alaska's oil patch

By KAY CASHMAN
Petroleum News

The most common advice received from current and former state and federal officials asked to offer guidance to private and public individuals or groups looking at oil and gas leases and prospects in Alaska and/or considering operating in the state was to seek help from an experienced Alaska investor or independent. Most of them named several individuals they felt were trustworthy, with the most votes cast for Bill Armstrong of Armstrong Energy (see Oil Patch Insider in this issue for latest from Armstrong) and Paul Craig of Trading Bay Energy, both of whom have proven credible sources of news for Petroleum News.


PAUL CRAIG

Dr. Paul Craig, a board-certified neuropsychologist who practices in Anchorage, was first to respond to a questionnaire circulated by Petroleum News to a select group of investors and independents. He was encouraged to talk about his own learning experiences in Alaska.

In answer to the first two questions — "What advice do you have for individuals and private groups interested in investing in Alaska leases and prospects (including overriding royalties), but do not know how to go about it? What do you think the greatest challenge will be for them?" — Paul Craig said the following:

Sunfish becomes Deadfish

In January 1993 I participated in my first state of Alaska oil and gas lease sale. I was young, naïve and blindly enthusiastic.

Nonetheless, I was successful beyond my wildest imagination securing four square miles of leases in the middle of

Needless to say, on the heels of Stewart's demise raising investment capital from Alaskans was slightly harder than extracting teeth from an irritable mountain lion.

ARCO's Cook Inlet Sunfish prospect. As fate would have it, the Sunfish became the Deadfish after ARCO brought in two jack-up rigs and drilled two dry holes in 1994.

My wild success quickly became an abysmal failure. Paradoxically, I view failure as a key ingredient of success.

During the same 1993 lease sale, I acquired other Cook Inlet leases from which I developed an independent oil and gas company — Trading Bay Energy Corp.

Trading Bay acquired permits to drill three onshore gas wells and registered a public offering with the state of Alaska Division of Banking and Securities. The registration for this public offering was granted on precisely the same day that Stewart Petroleum filed for Chapter 11 bankruptcy protection in 1996 (see editor's note at end of article).

Needless to say, on the heels of Stewart's demise raising investment capital from Alaskans was slightly harder than extracting teeth from an irritable mountain lion.

Then, along came Forcenergy, which bought all of the assets from Trading Bay in 1997.

Since those early days, I have learned a tremendous amount about the oil patch, and I continue to learn. The school of hard knocks is an unforgiving but important classroom.

Today, my company owns one-third of Amaroq Resources LLC. Amaroq is the owner and operator of the Nicolai Creek Unit gas wells.

Partners and I also own about 56 square miles of Nanushuk/Torok leases in NPR-A.

I have experienced a lot of failure during the past 25 years — but enough success to keep me in the game.

The greatest challenge

In short, the greatest challenge for any independent attempting to do business in Alaska is being capable of financially and emotionally tolerating the risk of total loss of investment capital.

Some of the sources of economic risk for independents include the ever-changing Alaska fiscal policies (e.g., tax regimes, investment credits etc.); the elastic pricing for oil and gas reserves that constantly changes the commercial viability of any oil and gas prospect; governmental policies; and a laundry list of other man-made challenges — not to mention the geological risk posed by dry holes.

If you lack tenacity and are not willing to look down the loaded barrel of failure while moving forward toward success, the upstream Alaska oil patch is probably not a business you should consider entering.

Do you have nerves of steel and the tenacity of Edison who developed more than 1,000 prototype bulbs that each failed before he invented the first successful lightbulb? If so, you may be a candidate for joining the small cadre of independent upstream oil and gas investors in Alaska.

What NOT to do

In answer to, "Is there anything in particular investors should NOT do?" Craig said:

Do not buy any oil and gas leases without first doing three things: homework, homework and more homework.

You need to know the geology, the 'nearology,' the economics, and the probability of complete loss of investment.

After a lot of homework, I bought the north half of the Umiat Oil Field in 2002 when oil was at about $22 a barrel. Umiat was not a commercial deposit at that price but I projected that oil prices would increase during the coming 10 years — the term of the lease.

I could have been wrong about oil prices, but I got lucky

see INVESTOR CORNER page 16

continued from page 1

RAILBELT GRID

mation of an RRC.

Fragmented grid management

The transmission grid, which runs from the southern Kenai Peninsula north through the Anchorage region to Fairbanks in the Interior, supports six independent utilities operating in the region. Currently ownership and operation of the grid, a consequence of the manner in which the electrical power system has evolved, is divided between the utilities. The state of Alaska owns a section of the transmission intertie between the Anchorage and Fairbanks regions.

In June 2015 the RCA issued a series of recommendations for a more unified approach to the operation of the Railbelt electrical system. Those recommendations included the formation of a transco. The commission also said that there should be a unified governance structure for the grid, a single set of unified, enforced reliability standards, and the establishment of merit order economic dispatch, an arrangement whereby continuous use is made of the cheapest available electrical power. The commission has been encouraging voluntary efforts by the utilities to meet the commission's requirements. The overall objective is to minimize the cost of electricity for Railbelt consumers while maintaining acceptable levels of supply reliability. There are also issues relating to the use of renewable energy in the system.

The transco project

American Transmission Co., a Wisconsin transco, has been assisting the six Railbelt utilities in figuring out how a transco could be implemented in the Railbelt. The idea is that the transco would operate the transmission infrastructure, set a unified tariff for transmission system usage and act as a conduit for investment in the transmission infrastructure. Currently, the grid fragmentation leads to the stacking or "pancaking" of fees for the transmission of power across the grid, and there is difficulty in an individual utility justifying an investment in a system upgrade, if the benefits from the upgrade involve multiple utilities.

There has been concern among some stakeholders in the electrical system over the length of time that the various voluntary grid unification efforts are taking. In August of last year the utilities told the RCA that they anticipated having an application to the commission for a transco certificate of public convenience and necessity during the first half of this year. That timeframe has clearly slipped. There are complex business issues relating to transco formation, in particular allocation of costs between the utilities — depending on their use of the transmission system, some utilities may lose out while others may gain. And utilities have to be able to recover the costs of their own assets.

Areas of agreement

During the May 23 public meeting, Eric Myers, manager for business development for the American Transmission Co., outlined those aspects of transco formation where there is substantial agreement, and those areas where decisions are still needed. There is general agreement that the utilities would continue to maintain the sections of the transmission grid within their service areas, but that they would do so under contract to the transco, Myers said. Essentially, to avoid organizational duplication, the transco would operate through a series of service agreements with the utilities.

And the transco would be governed by a board of directors that include utility representatives and independent board members. Reliability standards and grid planning protocols would be administered by the Railbelt Reliability Council and approved by the RRC. The transco's service area would encompass transmission assets within the service areas of the existing utilities. And the transco would operate a transmission tariff that would provide non-discriminatory access to the system for any entity requiring the use of transmission services.

Cost allocation is a challenge

However, the utilities have yet to decide on the transmission tariff structure and how transmission costs would be allocated between the utilities. There is continuing discussion regarding specific responsibilities and service agreements within the transco operation. Individual utilities' equity participation in the transco remain under discussion. And the proposed structure of the transco management team has yet to be finalized.

There are a number of critical factors, such as the cost and benefit of transco formation, that need to be taken into account in any final transco decision. One factor that has been progressing is the linkage between the transco and a Railbelt Reliability Council, as the RRC concept takes shape, Myers commented. There is now a general understanding that there will be a separation of powers between the RRC and the transco, with the transco operating under reliability standards maintained by the RRC.

Taking into account the issues remaining to be resolved, the utilities hope to present a final transco decision to the RCA by the end of this year, Myers said. There is much going on in the Railbelt at the moment, with the utility managers involved in several initiatives, all of which are very important, he commented. And each utility has its own, individual circumstances and conditions for transco formation that need to be considered. There are complexities over cost allocation, especially when future trends for shipping power across the system are unknown, as are the potential impacts of unknown future capital projects. But the utilities are close to figuring out an approach to the cost allocation problem, Myers said.

Are transmission upgrades needed?

There was discussion during the RCA meeting over the need or otherwise for upgrades to the transmission system, especially in the light of past Alaska Energy Authority recommendations for major upgrades. Tony Izzo, CEO and general manager of Matanuska Electric Association, commented that he had not seen sufficient benefit to justify the high cost of the AEA recommendations and that he is not aware of any major transmission upgrades envisaged in the next three to five years. Lee Thibert, CEO of Chugach Electric Association, commented that efficient operation of economic dispatch across the Railbelt grid requires a more robust transmission system but that any upgrades to the system must pay for themselves in terms of benefits gained. There are also questions over the timing of any upgrades, he said. The optimum means of coming to a common agreement on transmission upgrades would be through the RRC, with the AEA involvement also being through that organization, he said.

In the absence of planned transmission system upgrades in the near future, the timing of the implementation of a transco is not particularly critical, Izzo commented, while also emphasizing that he believes the transco to be a valuable construct. In terms of timing, the RRC should be established first, to act as an organization that sets reliability standards and conducts long-range regional planning for the grid, Izzo said. Other utility managers appear to see value in the transco and RRC going into operation concurrently. Mark Johnston, general manager of Municipal Light & Power, commented that, by eliminating the pancaking of transmission rates, a transco would improve the efficiency of power pooling, regardless of whether any grid upgrades are carried out. Moreover, the proposed structure of the transco would involve minimal cost to the system, he suggested. The RRC and transco would be mutually dependent, he said.

Commissioner Robert Pickett commented that, while the days of state appropriations for transmission system upgrades are past, some of the transmission system assets are aging. There is currently no organizational structure for effectively dealing with this situation, but there are understandable challenges in establishing such an organization, he said.

The commission has scheduled public meetings on June 13 and June 27 to review progress towards economic dispatch and the implementations of enforced reliability standards. Pickett commented that, given the length of time since the RCA originally made its recommendations for reform of the Railbelt electrical system, the commission needs to make a status report to the Legislature prior to the next legislative session. ●

continued from page 14

INVESTOR CORNER

and was right.

Armstrong proved Craig's thesis correct

A few years later, the lease was purchased from me at a substantial profit and I was able to retain a modest overriding royalty interest on oil produced at Umiat.

My theory based upon my homework regarding the Umiat Oil Field was that the big oil would be discovered deeper and to the north in the Nanushuk group and Torok formation north of Umiat Mountain. Bill Armstrong proved my thesis to be correct several miles to the north. On the same Umiat lease I purchased in 2002, there is a Torok structural feature that could be charged with oil. Regarding this possibility, the drill bit is the only truth serum in the oil patch.

Pursuant to my 'go deep, go north' thesis, partners and I picked up 56 square miles of Nanushuk leases north of the Umiat Oil Field (20 miles south of Armstrong's Horseshoe wildcat well) in 2013.

Bad luck ensued with the collapse of oil prices in late 2014, but I have tenaciously held onto those NPR-A leases waiting for better days ahead. With Armstrong's recent announcements about the Nanushuk discoveries to the north and with oil prices strengthening, my ship may be coming into port.

Pursuant to my 'go deep, go north' thesis, partners and I picked up 56 square miles of Nanushuk leases north of the Umiat Oil Field (20 miles south of Armstrong's Horseshoe wildcat well) in 2013.

Of course, what I perceive to be my ship's mast on the horizon could be a shark fin coming straight at me!

In the meantime, I'll keep my nerve, stand firm and be tenacious. Extensive homework leads to informed tenacity.

Risk tolerance

When asked, "Is there anything in particular they should do?" Craig responded as follows:

Assess your risk tolerance.

It takes all types of risk tolerance profiles to make the world go around. If we all had to have the security of employment with monthly salaries and benefit packages, there may be no jobs available for anybody to occupy.

Jobs exist because entrepreneurs are able to tolerate the risk required to start businesses, some of which become the companies where the security of long-term employment can be enjoyed by those who cannot tolerate the risk of failing in business.

Likewise, if we all had the risk tolerance of entrepreneurs that could lead to its own set of problems. Where would the employees come from?

Alaska grossly underexplored

Assess your risk tolerance and then pursue business or employment goals consistent with your tolerance for risk.

If you cannot stand the heat, do not enter the kitchen.

When Richfield Oil (predecessor to ARCO, later ConocoPhillips) came to Alaska in the 1950s it was a small independent that developed into one of the majors after first discovering the Swanson River Oil Field and then Prudhoe Bay.

Given the grossly under-explored basins of Alaska, there is still a lot of room for one or more of today's tiny Alaska independents to become tomorrow's major.

Unless the state's regulators understand the actual history of the Alaska oil patch, the regulatory environment may exclusively focus on encouraging the majors to harvest yesterday's discoveries rather than encouraging small independents to judiciously deploy capital to discover tomorrow's elephant fields.

Assess your risk tolerance and develop your plan accordingly. And if you decide to move forward with acquiring and exploring Alaska leases, pray that the bureaucratic powers-that-be do not abruptly change policies or impose sanctions that block you from moving forward with your plans.

Without small independents taking on the risk of exploration, there may not be elephants fields from which majors can harvest tomorrow's oil.

For access to the data room: www.nanushuk.com. Or contact: Paul L. Craig, Ph.D. President, Trading Bay Oil & Gas, LLC. +1-907-830-1151. drpaulcraig@gmail.com ●

Editor's note: Bill Stewart, founder of Stewart Petroleum, was a flamboyant independent oilman and globe trotter, making oil and gas discoveries in seven states, including notable finds in Alaska's Cook Inlet basin that garnered international press coverage for Cook Inlet, including a May 24, 1993, article in World Oil that reported, "Almost 36 years after the Cook Inlet basin gave Alaska its first significant oil discovery, the basin is bounding back with a burst of exploration and development. Players in the renaissance are ARCO Alaska Inc., Phillips Petroleum Co., Unocal Corp., Shell Western E&P Inc., and Anchorage independent Stewart Petroleum Co.")

Petroleum news

Oil Patch Bits

Kantishna Roadhouse awarded Gold LEED certification

Doyon Ltd. said it is proud to announce that Kantishna Roadhouse, a wholly owned Doyon subsidiary, has officially been awarded the prestigious Gold Leadership in Energy and Environmental Design certification.

The LEED rating system, developed by the U.S. Green Building Council, is an internationally recognized green building certification system aimed at improving the metrics that matter most to building owners and the community: energy savings, water efficiency, carbon dioxide emissions reduction and improved environmental effects.

Purchased by Doyon in 1995, Kantishna Roadhouse has undergone numerous improvements and building additions. As part of the recent certification process, the Roadhouse implemented a recycling program and installed new windows, LED lighting and low flow appliances. These improvements and many others provided ways to maximize efficiency and environmental sustainability of the building to help achieve Gold certification.

"Our goal for operations at the Kantishna Roadhouse has always been to uphold Doyon's mission of protecting and enhancing our land and resources and to practice the Doyon value of being socially and culturally responsible in how we do business," said Kantishna Roadhouse General Manager Marie Monroe. "The Gold LEED certification validates our hard work and acknowledges that we are on track with our efforts to be good stewards of the land. We are proud of this accomplishment, and we will continue to strive to do more and do better."

Doyon Ltd. offers visitors the opportunity to experience the splendor of the Denali National Park through the Kantishna Roadhouse and Kantishna wilderness trails.

Companies involved in Alaska's oil and gas industry

All of the companies listed above advertise on a regular basis with Petroleum News

continued from page 1

INSIDER

control of the prolific western North Slope, starting with the Greater Kuparuk River area, west to the recent huge Nanushuk oil discoveries at Pikka by Armstrong and Repsol, south and 100 miles-plus farther west to related Nanushuk discoveries by ConocoPhillips on both state and federal land and into the National Petroleum Reserve-Alaska, where there are many more Nanushuk pockets of oil. The western North Slope may very well hold another Prudhoe Bay.

In addition to recently buying Anadarko out of its western North Slope percentage of ConocoPhillips-operated assets, the company is rumored to be in the process of trying to buy controlling interest in the Oooguruk unit from Caelus (unconfirmed by either company).

What's more, if ConocoPhillips is looking to swap North Sea assets for BP's 39 percent ownership in the Greater Kuparuk Area and BP's 38 percent ownership in the Kuparuk Pipeline, which carries all western North Slope oil to the trans-Alaska oil pipeline, the company would have a convincing argument for concerned state of Alaska officials because ConocoPhillips has shown itself to be very willing to make investments in Alaska. Taking BP out of the equation might increase those investments and therefore production, which would be good for all concerned.

But then ConocoPhillips would be close to controlling most of the western North Slope with the area's incredible, newly discovered oil reserves.

Still, a win-win could come out of approval of a Kuparuk asset swap between ConocoPhillips and BP: State and federal officials — joined at the table by Oil Search (new operator of the Pikka and Horseshoe Nanushuk discoveries), Armstrong, Eni (owner and operator of the Nikaitchuq oil field), and other major developers/producers and soon-to-be producers on the western North Slope — could design an agreement that guaranteed ConocoPhillips received and offered a fair deal to other area developers and producers for access to key items such as facilities, pipelines, roads, water and gravel.

As far as trading for Prudhoe Bay assets, unless something has changed, a chunk of Prudhoe Bay's daily oil sales of about 260,000 bpd still goes to the Prudhoe Bay Royalty Trust, an independent entity traded on the New York Stock Exchange.

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Created in 1989, the trust holds an overriding royalty interest that entitles it to a royalty on 16.4 percent of the first 90,000 barrels of the average daily net production of crude oil and condensate per quarter from BP's working interest in the field. Not the best scenario for a company looking to acquire BP's interest and operatorship of Prudhoe Bay because the obligation would accompany such a sale.

—KAY CASHMAN

Armstrong asked repeatedly after lecture: How do I get to Alaska?

ON MAY 21, ALASKA DIVISION OF OIL AND GAS GEOLOGIST Paul Decker gave a technical presentation as part of the "Awakening Sleeping Giants" series at the American Association of Petroleum Geologists' annual convention in Salt Lake City on the Nanushuk formation discoveries confirming world-class exploration potential in a newly proven stratigraphic play on Alaska North Slope.

An hour later the man who made the first such discovery, Bill Armstrong, spoke to a packed room.

Armstrong, owner and founder of Armstrong Oil & Gas and Armstrong Energy, was this year's Michel T. Halbouty Lecture speaker.

"It was perfect, following Paul's technical presentation about the Nanushuk formation discoveries because I could concentrate on the human side of the story," Armstrong said.

BILL ARMSTRONG

Following the lecture, "dozens and dozens of people stood in line to talk to me. They all asked basically the same thing: 'How do I get to Alaska?'" Armstrong said.

After attending AAPG's annual Super Basins' conference in Houston at the end of March, Armstrong decided to revise his speech for the upcoming Halbouty lecture.

"Lots of people came up to me at the Super Basins' conference," he said, possibly because David Houseknecht, supervisory research geologist for USGS, gave a speech about Alaska's North Slope and Armstrong's Nanushuk discovery at Pikka and ConocoPhillips at Willow. "They wanted to know if I was the guy who had made the first Nanushuk discovery. Most of them said the same thing with several variations — 'There's no way a field like that was hiding in plain sight.'"

So Armstrong re-told his entire story of coming to Alaska from Denver in October 2001 and winning his first leases in the state's Beaufort Sea areawide lease sale, ending with the giant discoveries at Pikka and Horseshoe and bringing in his latest partner, explorer and developer Oil Search.

Armstrong's story brought it home, made it real to listeners.

Editor's note: In the introduction of Bill Armstrong in Salt Lake City, attendees were reminded that in 1982 Michel T. Halbouty authored the AAPG Memoir "The Deliberate Search for the Subtle Trap," noting that 35 years later a new chapter could be added to the memoir describing the search and discovery of the Pikka field on the North Slope of Alaska.

—KAY CASHMAN

Contact Kay Cashman at publisher@petroleumnews.com

EXPLORATION & PRODUCTION

North Dakota gas production hits record

North Dakota natural gas production hit another record in March even as oil production dropped, illustrating the need for more gas infrastructure, state officials said.

The state produced more than 2.1 billion cubic feet per day of natural gas, with companies flaring about 12 percent, according to the Mineral Resources Department. The state restricts flaring because it's considered wasteful.

Oil production dropped about 1 percent in March to about 1.16 million barrels per day, the Bismarck Tribune reported.

With increased oil activity anticipated for the summer, crews are expected to be busy building infrastructure needed to keep up with the growing volumes of natural gas, said Lynn Helms, director of the Mineral Resources Department.

"We're going to see another surge of workers from out-of-state laying pipelines, and building compressor facilities and building gas plants," Helms said.

Gas production is expected to exceed processing capacity starting this summer until projects under construction start to come online, said Justin Kringstad, director of the North Dakota Pipeline Authority.

The state Public Service Commission granted approval May 15 for energy company Oneok to proceed with the Demicks Lake natural gas processing plant, a McKenzie County facility that officials approved three years ago but halted when commodity prices dropped.

The Demicks Lake plant is permitted to process up to 400 million cubic feet per day. The plant is expected to be completed late next year. It's one of five such plants under development in North Dakota.

—ASSOCIATED PRESS

continued from page 1

PROJECT BAIL OUT

appreciated Morneau's recognition that a private company "cannot resolve differences" between the Canadian, Alberta and B.C. governments that have effectively brought work on the pipeline to a halt.

Kean said Kinder Morgan is still seeking "clarity on the path forward, particularly with respect to the ability to construct (a pipeline) through British Columbia and ensuring adequate protection for our shareholders."

May 31 deadline

But he said negotiations between the company and the Canadian government "are not yet in alignment," while the company's May 31 deadline for a resolution of the dispute remains firm.

Morneau said his financial guarantee covers only obstruction caused by the B.C. government and that resulting from the activities of protesters or legal challenges.

He declined to say how the indemnity would work, or how much it might cost taxpayers beyond insisting the payments would be "commercially appropriate" and would not clash with international trade treaties.

B.C. Premier John Horgan rejected Morneau's accusations as "rhetoric and hyperbole. I'm not causing any risks. I'm issuing permits (for Trans Mountain) as they are asked for."

Alberta could turn off taps

The Alberta government also stepped up its fight with B.C. by passing legislation giving it the power to restrict fossil-fuel shipments outside its borders.

Premier Rachel Notley said that if the "path forward" for Trans Mountain is "not settled soon, I am ready and prepared to turn off the taps. It could happen ... within 24 hours" of that decision being taken.

Alberta Energy Minister Marg McCuaig-Boyd said the law would require companies shipping energy products from Alberta to get a license — covering products such as crude oil and refined fuels — that previously was not needed.

Those licenses could then be throttled back to reduce the volumes of fuel being exported, she said.

If Alberta does make such a move, the result would be an immediate increase of 30 to 45 cents per liter in the wholesale price of gasoline in Vancouver, which is already averaging about C$1.60, said Dan McTeague, senior analyst with GasBuddy.

B.C. Attorney General David Eby tried to downplay Alberta's right to reduce shipments, arguing the likelihood of Alberta using its legislated power "is highly speculative."

He said Alberta could have to "convince a court" it was acting within the Canadian Constitution, as well as "grappling with the impacts on their own industry."

Otherwise he said B.C. would backfill any shortages of gasoline and diesel from the United States, saying negotiations are already underway to identify additional reserves that could be accessed from Washington state refineries, which rely for much of their feedstock on raw crude from Alberta.

Tim McMillan, president of the Canadian Association of Petroleum Producers, said the legislation is recognized "by most people in the industry as one of the few tools that Alberta has to increase the pressure on B.C.," but added he hopes the law "never gets used." ●

Contact Gary Park through publisher@petroleumnews.com

continued from page 1

LNG CANADA

anti-dumping duties of up to 45.8 percent on imports of steel components, primarily targeted at China and South Korea.

In defense of the partnership's case for removing the import duties, a spokeswoman for LNG Canada said the partnership "believes the facts speak for themselves … large, complex modules cannot be constructed in Canada."

She also expressed strong hope that the governments recognize the importance of LNG and project investments that support jobs and investment opportunities for First nations, along with contributing to a lower carbon economy.

B.C. Premier John Horgan unveiled measures two months ago to reduce risks for LNG proponents, notably by offering tax relief for construction and eliminating a specific income tax on the industry.

Shell has a 50 percent stake in LNG Canada, with Petro-Canada holding 20 percent and South Korea's Kogas and Japan's Mitsubishi each with a 15 percent stake.

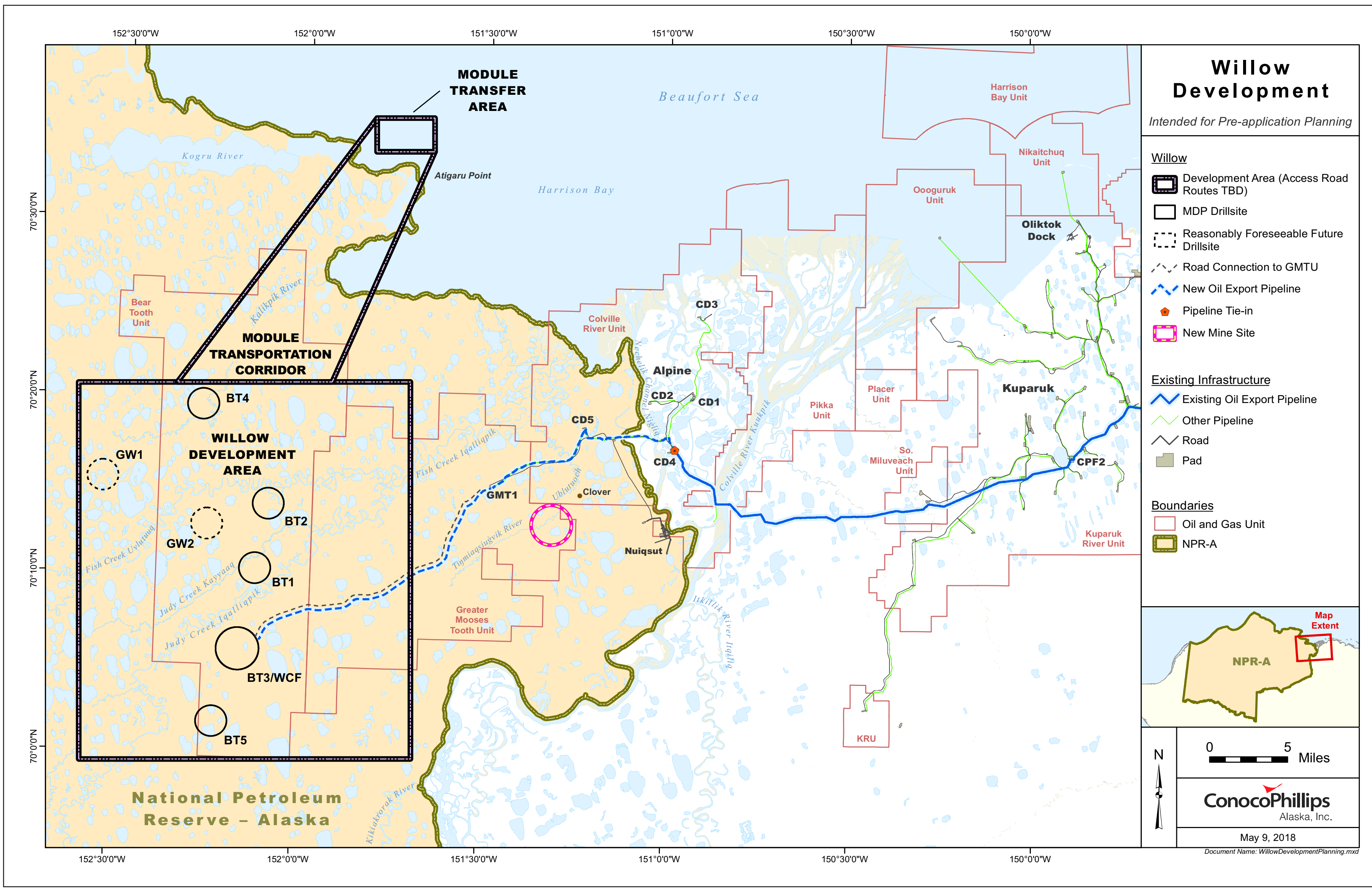
The natural gas feedstock for conversion to LNG will come initially from Cutbank Ridge in northeastern B.C. that is owned 60 percent by Encana and 40 percent by Mitsubishi, and Groundbirch.

The first phase at the tanker terminal in Kitimat will have two trains designed to handle 13 million metric tons a year of LNG shipments to Asia.

Key elements in place include a partnership of Fluor Corp. and JGC Corp. which landed the C$14 billion contract for engineering, procurement and construction that is expected to take about five years to complete.

—GARY PARK

Contact Gary Park through publisher@petroleumnews.com



Map of a potential development scenario for the Willow prospect in the northeastern NPR-A. ConocoPhillips does not yet have a firm development plan for the field but envisages the need for a Willow Central Facility (WCF) for processing the Willow production.

continued from page 1

WILLOW DEVELOPMENT

would inevitably trigger an EIS.

Scale of discovery

ConocoPhillips has made little information publicly available about the scale of its Willow find in the Bear Tooth unit, beyond saying that the prospect holds at least 300 million barrels of recoverable oil. The company has previously said that it could tie the field into the Alpine field processing facilities in a manner analogous to the Greater Mooses Tooth 1 and 2 developments, also in the northeastern NPR-A. Alternatively, if the field is large enough, standalone Willow production facilities could be justified. Standalone facilities, while much more expensive than the Alpine tie-in option, would enable much higher oil production rates — peak production from standalone facilities could reach as much as 100,000 barrels per day, the company has indicated.

The Willow discovery involves reservoir sands in the Nanushuk formation, in a near identical geologic setting to the huge Pikka/Horseshoe field that Oil Search plans to develop, east of the Colville River.

Successful appraisal

Following a successful appraisal drilling project this winter, ConocoPhillips has sounded increasingly optimistic about its Willow find. In April, during a ConocoPhillips earnings call, Al Hirschberg, the company's executive vice president of production, drilling and projects, indicated that the company was leaning towards a standalone development. Statements in the new master development plan appear to indicate that the standalone option has now been chosen, a decision that suggests that the find is towards the larger end of the size estimates.

"The existing processing facility at Alpine is not feasibility for a tie-in of the Willow development due to geographic and technical constraints," the plan says. "The Willow master development plan would require construction of a new processing facility, the Willow Central Facility."

Infrastructure construction

ConocoPhillips' Willow plan envisages the construction of an infrastructure pad with a camp, located separately from the processing facility. A road and pipeline corridor would connect to existing infrastructure in the Greater Mooses Tooth unit. The plan says that the anticipated size of the Willow Processing Facility would be similar to a hypothetical facility evaluated in the 2004 Alpine Satellite Development Plan Final EIS — that EIS envisaged the possibility of the

see **WILLOW DEVELOPMENT** *page 20*

continued from page 19

WILLOW DEVELOPMENT

future development of a processing facility in the NPR-A, similar in size and footprint to the central processing facility for the Alpine field.

The plan anticipates the possibility of Willow-related infrastructure construction over a period of around 10 years, with the possibility of up to five drill sites, in addition to the central facility, the infrastructure pad, gravel access roads, a 5,400-foot airstrip, pipelines and a gravel mine.

The plan also anticipates the possibility of more future drill sites, depending on the results of future exploration activities.

The larger modules for the Willow infrastructure would be transported by barge and likely offloaded from a location

The Willow development would leverage existing infrastructure by constructing a Willow pipeline that would carry sales-quality crude from the Willow processing facility to a tie-in with the Alpine pipeline near the CD-4 pad.

in state waters of Harrison Bay, near Atigaru Point, for transportation by ice road to the Willow site. Alternative module transfer locations will also be considered, the plan says.

Existing infrastructure

The Willow development would leverage existing infrastructure by constructing a Willow pipeline that would carry sales-quality crude from the Willow processing facility to a tie-in with the Alpine pipeline near the CD-4 pad. Seawater and diesel pipelines would run from the Kuparuk River unit to Willow using existing and new transportation corridors.

The plan also says that a newly discovered gravel source near the Tinmiaqsiugvik River is the closest known gravel resource for the development. There are, however, alternative possible sources of gravel.

ConocoPhillips told the BLM that a Willow development would support the agency's mandate to develop petroleum resources from the NPR-A, while also protecting important surface resources. The development will also increase oil exports through the trans-Alaska pipeline while generating NPR-A environmental impact mitigation funds, generating federal state and local revenues, creating jobs and increasing U.S. energy independence, ConocoPhillips said.

Announced in 2017

The company first announced its Willow discovery in January 2017, following the drilling of the Tinmiaq No. 2 and Tinmiaq No. 6 wells. However, it appears that the company actually found the Willow oil pool in 2002 through the drilling of the Hunter A well — the company kept the results from that well highly confidential. It is likely that the company did not immediately decide to pursue the development of Willow following the Hunter A discovery, because at that time the company was fully occupied with development activities in the Colville River unit, and because the oil infrastructure did not then extend far enough west to render a Willow development viable.

This winter ConocoPhillips further appraised the find through the drilling of the Tinmiaq Nos. 7, 8 and 9 wells.

The company has for several years been following a policy of progressively

And the Willow discovery appears large. A scientist from Alaska's Division of Oil and Gas has suggested that, based on an interpretation of publicly available seismic data, the prospect could be 25 miles in extent, with a net pay thickness of 40 to 70 feet and a reservoir depth a little over 4,000 feet.

developing oil discoveries west, stepping out from the Alpine field into the northeastern NPR-A. As each new development comes on line, another development further to the west starts to become viable.

A large prospect

And the Willow discovery appears large. A scientist from Alaska's Division of Oil and Gas has suggested that, based on an interpretation of publicly available seismic data, the prospect could be 25 miles in extent, with a net pay thickness of 40 to 70 feet and a reservoir depth a little over 4,000 feet. As in the Pikka/Horseshoe discovery, the reservoir is in sand that was deposited on the margin of a marine basin, as that margin migrated from west to east. The sediments that formed the Nanushuk would have settled in the nearshore region of the margin, while the underlying sediments, forming the underlying Torok formation, would have been deposited in deeper water.

The oil found in the Nanushuk reservoirs tends to be relatively light, a factor that is likely to help with production from reservoir rocks that can have somewhat variable reservoir quality. ●

Contact Alan Bailey at abailey@petroleumnews.com