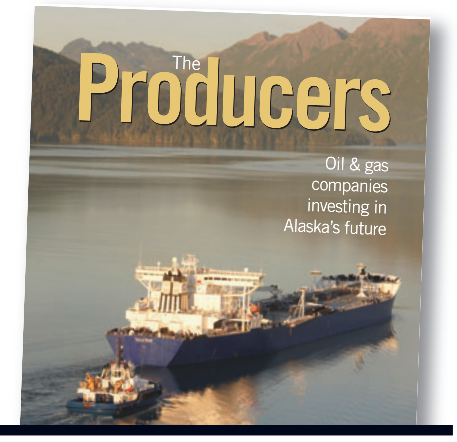
Petroleum news



page 5 ExxonMobil pursuing 2 fronts at Point Thomson; ultimate goal gas

Vol. 24, No. 38 • www.PetroleumNews.com | A weekly oil & gas newspaper based in Anchorage, Alaska | Week of September 22, 2019 • $2.50

North Slope: Renaissance or not? Jepsen: Conoco update, perspective


SCOTT JEPSEN

ConocoPhillips Alaska is moving ahead with a new drill site for Greater Mooses Tooth 2 in the National Petroleum Reserve-Alaska and with plans to produce Nuna from acreage just added to the Conoco-operated Kuparuk River unit. It has the largest mobile land rig in North America under construction by Doyon, scheduled to arrive in Alaska in the fourth quarter and begin drilling at Fiord West in the second quarter of 2020. The federal Bureau of Land Management has a draft environmental impact statement for the company's Willow project in NPR-A out for public com-

see **SLOPE RENAISSANCE?** *page 10*

Furie gets debtor in possession funding; state files bonding notice

Furie Operating Alaska LLC got some breathing room Sept. 17 as U.S. Bankruptcy Judge Laurie Selber Silverstein ruled to release the company's $15 million post-petition Chapter 11 financing, according to Law360.

Selber Silverstein said she continues to have concerns — as do some of Furie's creditors — about $5 million of the debtor-in-possession funds which the company plans to use to pay prepetition lender fees. No funds will be available to pay creditors.

State files bonding notice

Meanwhile, on Sept. 11, the state of Alaska filed notice to prospective bidders of certain bonding and assignment require-

see **FURIE BANKRUPTCY** *page 10*

Nanushuk outcrop facies story of accommodation, sediment interplay

"The Nanushuk Torok system is a world class story of the interplay between accommodation and sediment supply," said Gregory C. Wilson, manager of exploration operations and technology, ConocoPhillips Alaska, in a Sept. 17 presentation to the Alaska Geological Society.

The presentation, "A Regional look at Nanushuk Formation facies in outcrop, Brooks Range Foothills, Alaska," was featured at the AGS September luncheon in Anchorage.

Wilson has worked the rocks across the full extent of the outcrop belt from the east-central North Slope west to the Chukchi Sea.

To the west, in the Corwin Delta, there was a tremendous

see **NANUSHUK OUTCROP** *page 11*

Waiting for Arctic plan


JUSTIN TRUDEAU

Election season is in full swing in Canada, heading towards voting day on Oct. 21, when the legacy of four years in power by Prime Minister Justin Trudeau will be put to the test.

On the list of issues that will come under scrutiny one that rates high is the failure so far of the Liberal government to deliver on its promise of an Arctic Policy Framework, a comprehensive strategy for Canada's North at a time when the Arctic ice cap is shrinking in both area and intensity at a staggering rate, accompanied by economic and military threats in circumpolar regions.

The growing concern among Arctic leaders is a continued slippage of Canada's ranking among Arctic nations, notably

see **ARCTIC PLAN** *page 8*

LAND & LEASING

Opening it all

Preferred alternative in final EIS offers entire ANWR 1002 area to leasing

By KAY CASHMAN
Petroleum News


CHAD PADGETT

The U.S. Interior Department chose option B as a preferred alternative in the final environmental impact statement for the Coastal Plain Oil and Gas Leasing Program it released Sept. 12. Option B will open just the entire 1.57 million-acre ANWR 1002 area to oil and gas leasing, an official with Interior's Bureau of Land Management said in a conference call just before the EIS was made public.

The 1002 portion of the 19 million acre Arctic National Wildlife Refuge is a narrow strip of coastline that was set aside for potential development by Congress because of its hydrocarbon rich geology.

"This alternative offers the opportunity to lease the entire program area while providing protections for the many important resources and uses identified through scoping and public comments within the program area," Chad Padgett, Alaska state director for BLM, said in an introductory message in the final EIS.

B is the least restrictive of the four alternatives analyzed by BLM and several cooperating federal and state agencies. It requires only 359,400 acres to

see **ANWR 1002** *page 9*

EXPLORATION & PRODUCTION

Conoco: The time to drill

Big Alaska North Slope oil producer plans another aggressive exploration season

By KAY CASHMAN
Petroleum News


MICHAEL D. HATFIELD

In last winter's off-road season, ConocoPhillips conducted its largest exploration season on the North Slope since 2002, drilling eight wells and laying down 54 miles of ice roads for those wells. This coming winter the company plans to drill seven exploration wells and build 74 miles of ice roads for drilling, Scott Jepsen, ConocoPhillips Alaska vice president of external affairs and transportation, said Sept. 12.

The big independent will also acquire 3D seismic over Narwhal, ConocoPhillips' informal name for the geologic Nanushuk FM topset play that is also found at nearby Pikka, per the U.S. Geological Survey and Alaska's Division of Oil and Gas.

Jepsen also noted that 75% of the company's North Slope prospect inventory remains untested (see map in print and pdf versions of this story).

As to where the wells will be drilled, Jepsen mentioned the Harpoon prospect southwest of Willow and more wells in the Willow area, which the map shows contains some undrilled prospects.

In the company's second quarter earnings call on July 30, Michael D. Hatfield, ConocoPhillips president, Alaska, Canada and Europe, also talked about the upcoming North Slope appraisal and exploration season.

see **TIME TO DRILL** *page 7*

GOVERNMENT

On a high wire act

Alberta struggles with oil production cuts while it awaits new pipeline capacity

By GARY PARK
For Petroleum News

The Alberta government continues its juggling of production cuts and delays in pipeline expansions, while it endeavors to ease the challenges faced by producers.

In the latest move, Energy Minister Sonya Savage said the controversial mandatory curtailments will be extended by an extra year through 2020, adding an apologetic note to her announcement.

"I am the very last person who wants to see curtailment continue, but under the current context it's necessary," she told reporters.

"We have to do this in the short term, because we don't have the capacity to move production."

However, the government said it will raise the exemption in the curtailment formula for all producers to 20,000 bpd from 10,000 bpd, which means the curtailment program will affect only 16 of Alberta's 300 producers.

Savage said the extension stems from delays in pipeline approvals, notably Enbridge's Line 3 replacement, meaning production levels could exceed rail and pipe capacity by 150,000 barrels per day.

see **ALBERTA HIGH WIRE** *page 11*

● EXPLORATION & PRODUCTION

Conoco applies for Narwhal water pilot

By KRISTEN NELSON

Petroleum News

The Alaska Oil and Gas Conservation Commission has tentatively scheduled a public hearing on an application by ConocoPhillips Alaska for a pilot water project at the Narwhal reservoir in the Colville River unit.

The hearing is tentatively set for 10 a.m. Oct. 29, but if no request for a hearing is timely filed the commission may consider issuance of an order without a hearing.

ConocoPhillips is requesting authorization for water injection into the Narwhal reservoir through a waterflood pattern pilot.

The company said this is considered a pilot project because feasibility of injecting water into the Narwhal reservoir has not been established. “This pilot project will aid in determining the commercial viability of developing Narwhal as an enhanced oil recovery project,” the company said.

A three year pilot is being requested to allow time to drill the first injector, test injection performance, analyze results, drill the second injector, test injection performance and observe and analyze results.

The CD4-595 exploration well was drilled within the Colville River unit in June, ConocoPhillips said, “to understand the ability to drill, complete, and produce the Narwhal horizon.”

CD4-595

The CD4-595 exploration well was drilled within the Colville River unit in June, ConocoPhillips said, “to understand the ability to drill, complete, and produce the Narwhal horizon.”

The first offset injector will be drilled in October, with injection planned to begin in January, and drilling of the second injector contingent on results from the first.

ConocoPhillips said Narwhal is expected to be developed as a line drive water alternating gas flood with horizontal producers and injectors. “The pilot results will inform whether this development concept is optimal.”

Application would be made to AOGCC for pool rules and an area injection order if commercial viability of the discovery is established and the development is sanctioned for development, the company said.

Two injectors

The pilot project would occur at the CD4 drill site. Two offset injectors would be drilled in the pilot project, the first, CD4-594, some 1,000 to 3,000 feet east of the CD4-595 well. “The optimum pattern spacing for WAG development in this reservoir is still under analysis,” Conoco said. The first injection well “will allow interference and injection testing of the Narwhal reservoir to help establish the optimal pattern spacing and justify commerciality of the reservoir.”

Drilling of the second injector would be determined by outcome of the first injection well and testing. The second well would “continue a long-term injection and production test with a fully supported producer pattern centered around CD4-595.

The Narwhal reservoir is defined by the Qugruk 3 well with true vertical depth subsea limits of 4,068 to 4,971 feet with a measured depth of 4,192 to 5,152 feet.

“The Late Cretaceous Narwhal sandstone represents a north-south elongate, eastward prograding deltaic

see WATER PILOT *page 4*

contents

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● GOVERNMENT

EPA repeals Obama era WOTUS definition

New rule would revert specification of waters of the United States to pre-2015 wording; agency plans to implement new definition

By ALAN BAILEY

For Petroleum News

On Sept. 12 the Environmental Protection Agency and the U.S. Army announced a proposed new rule, repealing a definition of the waters of the United States introduced by the Obama administration in 2015. The new rule, which is subject to a 60-day public comment period following publication in the Federal Register, would revert the definition of what is commonly referred to as WOTUS to the pre-2015 language. The move by the federal agencies follows a strategy of clarifying the scope of waterbodies subject to federal regulation under the terms of the Clean Water Act.

In late 2018 the agencies proposed a new WOTUS specification, but that specification has yet to go into effect. The agencies say that "step two" of their rework of the WOTUS regulations will involve the implementation of this revised WOTUS definition.

"Today, EPA and the Department of the Army finalized a rule to repeal the previous administration's overreach in the federal regulation of U.S. waters and recodify the longstanding and familiar regulatory text that previously existed," said EPA Administrator Andrew Wheeler when announcing the new rule. "Today's step one action fulfills a key promise of President Trump and sets the stage for step two — a new WOTUS definition that will provide greater regulatory certainty for farmers, landowners, home builders, and developers nationwide."

"Today, Administrator Wheeler and I signed a final rule that repeals the 2015 Rule and restores the previous regulatory regime exactly how it existed prior to finalization of the 2015 Rule," said R.D. James, Assistant Secretary of the Army for Civil Works. "Before this final rule, a patchwork of regulations existed across the country as a result of various judicial decisions enjoining the 2015 rule."

Critical to Alaska

The WOTUS definition is particularly important in Alaska because of the huge number of wetlands, waterways and waterbodies in the state — any project that may impact water that falls within the definition requires federal permitting. Controversy surrounds that definition, in particular because it raises issues regarding the extent of federal jurisdiction within states, and because it impacts the relative rights of federal, state and tribal authorities to manage land.

> *The WOTUS definition is particularly important in Alaska because of the huge number of wetlands, waterways and waterbodies in the state — any project that may impact water that falls within the definition requires federal permitting.*

Simple in principle but complex in practice, the WOTUS definition clearly encapsulates navigable waterways that can support interstate commerce. But waters flowing into these waterways can carry contaminants. These secondary waters can, in turn, be polluted by contaminants from other waterways and from wetlands. So, where exactly do the waters of the U.S. end and state waters begin?

Even the U.S. Supreme Court has struggled with WOTUS — in a case in 2006 the court failed to issue a clear opinion on the scope of a WOTUS definition.

The 2015 rule

The Obama administration's 2015 rule placed under federal jurisdiction tributaries to the more obvious U.S. waterbodies, wetlands adjacent to these tributaries and waters impounded behind dams. The result, a significant expansion of the WOTUS scope, was strongly criticized by Alaska lawmakers, who regarded the rule as an example of federal overreach.

The proposed definition introduced by the Trump administration in 2018 included traditional navigable waters, including large rivers, large lakes, tidal waters and territorial seas. The definition also included tributaries flowing into these waters, directly or via some other tributary. And a tributary was defined as a naturally flowing waterway that flows more than just when rain is falling.

Certain other specific types waterbodies and wetlands were also included in the definition.

Lawmakers respond

The Alaska congressional delegation has praised the Trump administration's actions.

"While the Clean Water Act is important piece of environmental protection legislation, President Obama's WOTUS rule was just one more example of the egregious federal overreach that defined his heavy-handed administration," said Congressman Don Young. "Expanding the definition of 'navigable waterway' to include tiny streams and ponds only served to ensure that every day Americans — Alaskans among them — would run afoul of the rule. President Trump has been a great partner in the fight to reign in the previous administration's outrageous expansion of federal power, and I would like to thank him and EPA Administrator Andrew Wheeler for their continued commitment to cutting red tape and reducing government bureaucracy."

"This is a big deal for Alaska that should help end years of concern, frustration, and uncertainty over a costly regulation that would have halted construction projects and other economic opportunities," said U.S. Sen. Lisa Murkowski. "This new proposal will protect water quality while providing clarity on the scope of regulation and restoring balance to the state and federal relationship. I look forward to working with EPA and the Army Corps to make sure it is effective and workable for Alaskans."

"I welcome the EPA's long awaited proposal to restore power to states and

see **WOTUS REPEAL** *page 4*

EXPLORATION & PRODUCTION

US rig count down again, by 12, to 886

Baker Hughes reports the number of rigs drilling for oil and natural gas in the U.S. continues to drop, down by 12 the week ending Sept. 13 to 886, following a drop of six the week ending Sept. 6.

In its weekly rig count, the Houston oilfield services company said the active rig count was down 169 from 1,055 active rigs a year ago.

The company reported that 733 rigs targeted oil (down five from the previous week; down 134 from a year ago) and 153 targeted natural gas (down seven from the previous week; down 33 from a year ago). There were no miscellaneous rigs active.

The company said 57 of the U.S. holes were directional, 776 were horizontal and 53 were vertical.

Pennsylvania was up by two rigs from the previous week; North Dakota and Oklahoma were each up by one.

Rig counts in New Mexico, Utah and Wyoming were unchanged from the previous week.

Alaska, California, Colorado and Ohio were each down by one rig from the previous week.

Louisiana was down by two rigs and West Virginia by three. Texas, the state with the most active rigs, 430, was down by eight from the previous week.

Baker Hughes shows Alaska with seven rigs active for the week ending Sept. 13, unchanged from a year ago.

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

—KRISTEN NELSON

LAND & LEASING

Money exchanges hands in August on buyout of Armstrong's interest in Pikka

The payout of the $450,000 million involved in Oil Search's buyout of the remainder of Armstrong Energy's working interest in Pikka, Horseshoe and nearby leases took place as planned at the end of August, Amy Burnett, Oil Search's manager of U.S. media and communications, told Petroleum News Sept. 12.

"The lease transfers were officially agreed at the closing between the parties, but the transfers have not yet been made official by DNR, ASRC, or BLM," Burnett said in an email.

The closing she is referring to occurred on June 27 when Oil Search exercised its option to sharply increase its stake in Pikka and Horseshoe leases west of the central North Slope. The company and minority partner Repsol SA are planning a Pikka development that will produce 120,000 barrels per day — initially from the big Brookian Nanushuk discovery and then later tapping into other stacked plays in the Pikka unit.

As far as Oil Search's future relationship with Armstrong, Oil Search said in early July that the two companies would continue to work together in reviewing opportunities on the North Slope, in accordance with the area of mutual interest agreement, or AMI, that was entered into as part of the original March 2018 acquisition.

Oil Search and Armstrong are still partners in the eastern North Slope's Lagniappe lease block.

When asked about those leases, Burnett said Oil Search was "still in the very early evaluation stage for the Lagniappe leases and it is premature to discuss plans."

In the June 27 closing, Oil Search and Repsol aligned their interests across many of their shared North Slope assets, resulting in Oil Search retaining 51% in the Pikka unit and the Horseshoe block, while also purchasing a 51% interest in leases Repsol acquired in 2017, which are immediately east of Horseshoe within the prospective Nanushuk trend.

The alignment involved a net payment of $64.3 million from Repsol to Oil Search in the late August transaction.

—KAY CASHMAN

● FINANCE & ECONOMY

Strike on Saudi facilities impacts oil

Crude oil prices spike up after attacks on oil processing plant suspends 5.7 million barrels of crude, halts 5% world oil output

By KRISTEN NELSON

Petroleum News

A Sept. 14 attack on Saudi Aramco facilities at Abqaiq and Khurais resulted in a production suspension of 5.7 million barrels of crude oil per day, Saudi Aramco said in a statement. Amin H. Nasser, Saudi Aramco president and CEO, said there were no injuries, and on Sept. 17 Nasser said Saudi Aramco's production capacity would be fully restored by the end of September.

Production at Khurais resumed 24 hours after the attack, Saudi Aramco said, and Nasser said Sept. 17 that production at Abqaiq was 2 million bpd.

Oil prices surged following the strike on the Saudi Aramco facilities and then dropped, but not to prior attack levels.

The Associated press reported that prices spiked by 15% Sept. 16 after the weekend attack and called it an increase on par with the 1991 Gulf War.

The attacks on Saudi Arabia's largest oil processing plant disrupted more than half of the kingdom's daily exports, halting 5% of world crude oil output, AP reported.

Fires began at the facilities after the attacks by drones, AP reported, citing a statement carried by the Saudi Press Agency.

Brent, ANS, WTI all up

Closing prices Sept. 13, the day before the attacks, were $60.22 per barrel for Brent (down 16 cents from the previous day), Alaska North Slope crude $61.95 (down 34 cents) and West Texas Intermediate $54.85 (down 24 cents).

Sept. 16, the first weekday after the attacks, Brent was $69.02 (up $8.80), ANS was $69.59 (up $7.64) and WTI was $62.90 (up $8.05).

Bloomberg reported Sept. 17 that crude oil prices fell that day after the statement from Saudi Arabia. The kingdom pumped almost 10% of the world's oil before the attacks, Bloomberg said, adding that "Saudi Arabia's industry will remain weakened for months as it depletes oil reserves to meet

see FACILITY STRIKE page 8

continued from page 2

WATER PILOT

marine sand. The Nanushuk Group is broadly age equivalent to the Narwhal sands," the company said in its application to the commission.

"The Narwhal sands in the CRU represent a Brookian topset play in which thick deltaic marine sands (up to 800 ft gross sand) are trapped stratigraphically," ConocoPhillips said. The Narwhal extends for some 35 miles over the length of the field; it has been penetrated by some four wells in the CRU and more than 10 wells in the vicinity of the Colville River and Pikka units.

Conoco said that based on data from exploration wells the reservoir is slightly undersaturated with an initial pressure of some 1,920 psi.

"This does not leave much driving force for primary depletion," Conoco said, and estimated that recovery without injection would be less than 5% but could be upwards of 30% with waterflood based on reservoir modeling and analog data. ●

Contact Kristen Nelson at knelson@petroleumnews.com

continued from page 3

WOTUS REPEAL

protect land owners — and hardworking Alaskans — from the confusing and burdensome federal overreach of the last administration's WOTUS rule," said U.S. Sen. Dan Sullivan. "If a landowner or a farmer has to hire a lawyer for months of work against an impenetrable and glacial bureaucracy — at the cost of thousands of dollars — just to understand whether they can fill in a ditch or build a structure, it doesn't take a genius to figure out that doesn't work, especially in Alaska."

Environmental organizations have a different perspective.

"The EPA's callous decision endangers communities and threatens our environment," said Marcie Keever, oceans and vessels program director for Friends of the Earth. "Corporations will now be given free rein to pollute our waterways and put millions of American lives at risk. Clean water is essential to all life, but instead of protecting it, the Trump administration is giving big polluters another handout. Vulnerable communities who already suffer from a lack of access to clean water will be put at even greater risk by this immoral decision." ●

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● PRODUCERS MAGAZINE PREVIEW

Pursuing two fronts at Point Thomson

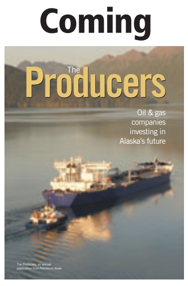
Operator ExxonMobil's ultimate goal at eastern North Slope unit is marketing the eastern North Slope field's 8 tcf of natural gas

By KAY CASHMAN

Petroleum News

One of the earliest explorers in Alaska and one of the primary working interest owners on the North Slope, ExxonMobil did not embark on the $4 billion Point Thomson development just to produce 10,000 barrels of condensate a day. Production of the technically challenged condensates was the result of a settlement agreement between the state of Alaska and ExxonMobil and its minority partners to allow the companies to retain the leases. ExxonMobil's ultimate goal was to develop and market Point Thomson's 8 trillion cubic feet of stranded natural gas.

Coming



Nov. 17, 2019

The future export of natural gas from the eastern North Slope field has always been the cornerstone of the state of Alaska's vision for a North Slope gas export project.

The Point Thomson unit condensates, a liquid hydrocarbon akin to very light oil, were particularly difficult and expensive to produce because of the exceptionally high reservoir pressure of the Thomson sands, and in part because it was a retrograde field in which condensate in the reservoir tended to liquefy as the pressure was drawn down. The need for directional drilling to reach the offshore reservoir sands from onshore drilling pads compounded the difficulties.

2012 settlement

Following efforts by the state to terminate the Point Thomson unit because of the lack of condensate field development, in 2012 the state and the field's working interest owners signed a court-approved settlement agreement, specifying terms under which the unit and its leases could be retained.

That settlement agreement spelled out a commitment by ExxonMobil and the other owners to move forward with the Point Thomson initial production system, or IPS, in which natural gas would be continuously cycled through the reservoir to enable the extraction of up to 10,000 barrels per day of condensate for export along with crude from the North Slope.

The purpose of the IPS was to test the viability of the gas cycling process. Reinjecting produced natural gas into the reservoir maintained pressure for future gas production

In 2016, ExxonMobil put the Point Thomson unit online, the only field the mega major operated in Alaska.

PHOTOS COURTESY EXXONMOBIL

The Central Pad in the Point Thomson unit. The process modules are connected by a line to the two re-injections wells, PTU-15 and PTU-16. Due to the high Thomson sands reservoir pressure, the PTU-17 wellhead is the largest in the Northern Hemisphere; standing more than 17 feet tall, weighing almost 14 tons and able to withstand pressures of up to 15,000 psi. The condensate from Module 103 is sent to the export pipeline. The gas from Module 103 is sent to Module 101, the gas injection compressor. The process is powered by Module 105, the power generation module, which consists of four turbines, two natural gas powered, and two dual diesel and natural gas powered. The utility Module 102 houses the nitrogen generators needed for equipment operation, the instrument air needed for the equipment and it has water for fire suppression and other heating and cooling fluids for the modules.

(The $4 billion was invested through the end of 2015.)

The Point Thomson unit West Pad facilities were designed to eventually produce 10,000 barrels per day of condensate a day, whereas Central Pad facilities were designed to reinject 200 million cubic feet per day of recycled gas, although each began with half of that amount.

The Point Thomson startup was a long-awaited culmination of a process that began with initial leasing in 1965, oil pool discovery in 1977 (by ExxonMobil at the Point Thomson Unit No. 1 wildcat exploration well) and confirmation in 1978 and 1979 (Point Thomson Unit No. 2 and No. 3 wells), with unitization in 1977.

By 1983, ExxonMobil and other companies had drilled 17 PTU wells.

There were technical, economic, legal and regulatory challenges to development, but the issue came down to prioritizing condensate vs. prioritizing natural gas production.

For years the state deferred pressure on the Point Thomson owners to develop the field because there was no way to get condensate or natural gas to market —

see **PRODUCERS PREVIEW** page 6

Jade to drill Sourdough in PTU


ERIK OPSTAD

As part of the 2012 settlement between the state of Alaska and the working interest owners in the ExxonMobil operated Point Thomson unit, an East Pad and associated wells were to be drilled in the unit.

That requirement will be fulfilled through a deal between ExxonMobil and Alaska independent Jade Energy, which is planning to drill a new well in the Sourdough oil prospect on a PTU lease in first quarter 2021.

The initial well, Jade No. 1, had been planned for first quarter 2020, but because Jade was not able to get into the Point Thomson unit's service pier this past summer, the appraisal well had to be deferred until early 2021.

Erik Opstad, who oversees Jade's operations, is a state of Alaska certified professional geologist who has worked the North Slope for 34 years, including a stint with BP in various roles and as a principal and general manager of Savant Alaska.

By building a 70,000 barrel per day liquids export pipeline (throughput that can be expanded) at Point Thomson that connects to the Badami unit and thus moves oil and condensate to Pump Station 1 of the 800-mile trans Alaska oil pipeline, ExxonMobil improved the development economics of other oil prospects to the east. Those prospects include Yukon Gold, Stinson and any future production from the 1002 area of the Arctic National Wildlife Refuge, none of which are owned or operated by ExxonMobil.

Jade No. 1 will be drilled in state lease ADL 343112 in area F, Tract 32, of the Point Thomson unit, which is the most southeasterly in the unit and adjacent to the western border of the ANWR 1002 area.

The lease holds two mid-1990's Sourdough oil discovery wells that were drilled by BP, which estimated Sourdough held 100 million barrels of recoverable oil.

Jade holds a 95% working interest in the lease, per a farmout agreement with Point Thomson working interest owners ExxonMobil and BP, which retained a small overriding royalty interest.

The ExxonMobil and BP assignments gave both North Slope producers some skin in the game, fully aligning them in delivering a successful Sourdough development.

Opstad says he expects Jade to have 100% working interest by the end of 2019.

Jade plans to first drill a vertical pilot hole to true vertical depth then plug it back and drill a high angle penetration into the Brookian reservoir, noting it "firmly believes … the deployment of horizontal production wells is a critical element in commercializing the PTU Brookian opportunity in Area F, as well as its adjoining areas."

Upon completion of "drilling and extended production testing, analysis of that data will be integrated into the Jade 3D Brookian seismic model," the company said in filings with the Alaska Department of Natural Resources' Division of Oil and Gas.

With those results in hand, Jade will put together a third plan of development and submit it to the division.

—KAY CASHMAN

continued from page 5

PRODUCERS PREVIEW

Prudhoe Bay and Pump Station 1 of the trans-Alaska oil pipeline were 60 miles to the west.

The Badami field came online in 1998, providing an oil pipeline covering approximately half the distance. A connecting line from Badami to Point Thomson was then built by ExxonMobil as part of its 2012 through 2017 plan of development with the state.

There was still no gas pipeline to take the field's major resource, natural gas, to market. Its problem has always been the ability to compete internationally on price given the very costly 800-mile gas pipeline that would have to be built and the easy availability of cheaper sources of gas near tidewater.

Three alternatives

The 2012 settlement had included three alternatives for expansion beyond the 10,000 bpd of condensate.

The first alternative was the sanctioning of major gas sales by June 2016, which timewise the parties agreed could not be done.

The second option was expanding liquids production to at least 30,000 bpd by 2019.

The third option was integrating Point Thomson and Prudhoe Bay operations to improve recovery, which involved building a gas line to Prudhoe for reinjection.

When ExxonMobil applied to the Alaska Oil and Gas Conservation Commission for pool rules for Point Thomson the company said it would prefer to transition from the present phase, the IPS, directly into exporting natural gas.

The company told the commission it was skeptical about increasing condensate production because of major technical challenges and the high cost of the facilities and wells.

As for integrating Point Thomson and Prudhoe Bay, ExxonMobil said while that would accelerate Point Thomson natural gas sales by two years, the acceleration would be unlikely to justify the cost of implementation.

Settlement deadline deferred

The 2012 settlement had required a plan for expansion of Point Thomson production by the end of 2019 if a major gas sale hadn't been sanctioned by June 2016.

Late in 2017, the state and ExxonMobil reached agreement on the expansion.

The settlement required either increasing production to 30,000 barrels per day of condensate or moving natural gas to Prudhoe Bay for injection there and construction of a gas pipeline between the fields. Moving natural gas to Prudhoe was ExxonMobil's choice in the 2017 agreement, but the thing that made that challenging was it would require a commercial agreement with all the Prudhoe Bay owners. Gas balancing would have been part of the challenge, especially since Point Thomson natural gas was higher quality than Prudhoe gas.

That work was deferred in the Point Thomson Unit Letter Agreement dated Sept. 10, 2018, from then-commissioner of the Alaska Department of Natural Resources Andy Mack after meetings with ExxonMobil and BP (a major Point Thomson working interest owner).

Mack said the 2019 deadline was stayed for as long as the Alaska LNG Project was progressing. The extension was to end when the Alaska LNG Project reached final investment decision or when DNR notified the parties that the project was no longer progressing.

At the end of the extension the Point Thomson owners would have 30 months to reach a final investment decision on either of the expansion projects or lose acreage in the field.

Gas sales agreement

Also Sept. 10, 2018, the Alaska Gasline Development Corp. announced that ExxonMobil and AGDC had agreed to what the state-owned corporation called "certain key terms including price and a volume basis for a Gas Sales Agreement," captured in an unbinding "Gas Sales Precedent Agreement."

AGDC and BP, with a 32% working interest in the Point Thomson unit, had agreed to key terms of a gas sales agreement four months earlier, including price and volume.

AGDC had not reached agreement with ConocoPhillips, the other significant North Slope leaseholder with a 5% interest in Point Thomson, and a company with major natural gas interests at the BP-operated Prudhoe Bay. (ConocoPhillips, which is very focused on oil development and production farther west on the North Slope, is still trying to pull out of Point Thomson. Petroleum News sources say the unit owners are still in negotiations.)

In a Sept. 10, 2018. statement on the ExxonMobil agreement AGDC said the parties anticipated finalizing long-term gas sales agreements for ExxonMobil's share of both Prudhoe Bay and Point Thomson gas. (ExxonMobil had a 62.75% share of Point Thomson and a 36.4% share of Prudhoe Bay.)

"This precedent agreement is good for Alaska and ExxonMobil and represents a

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TIME TO DRILL

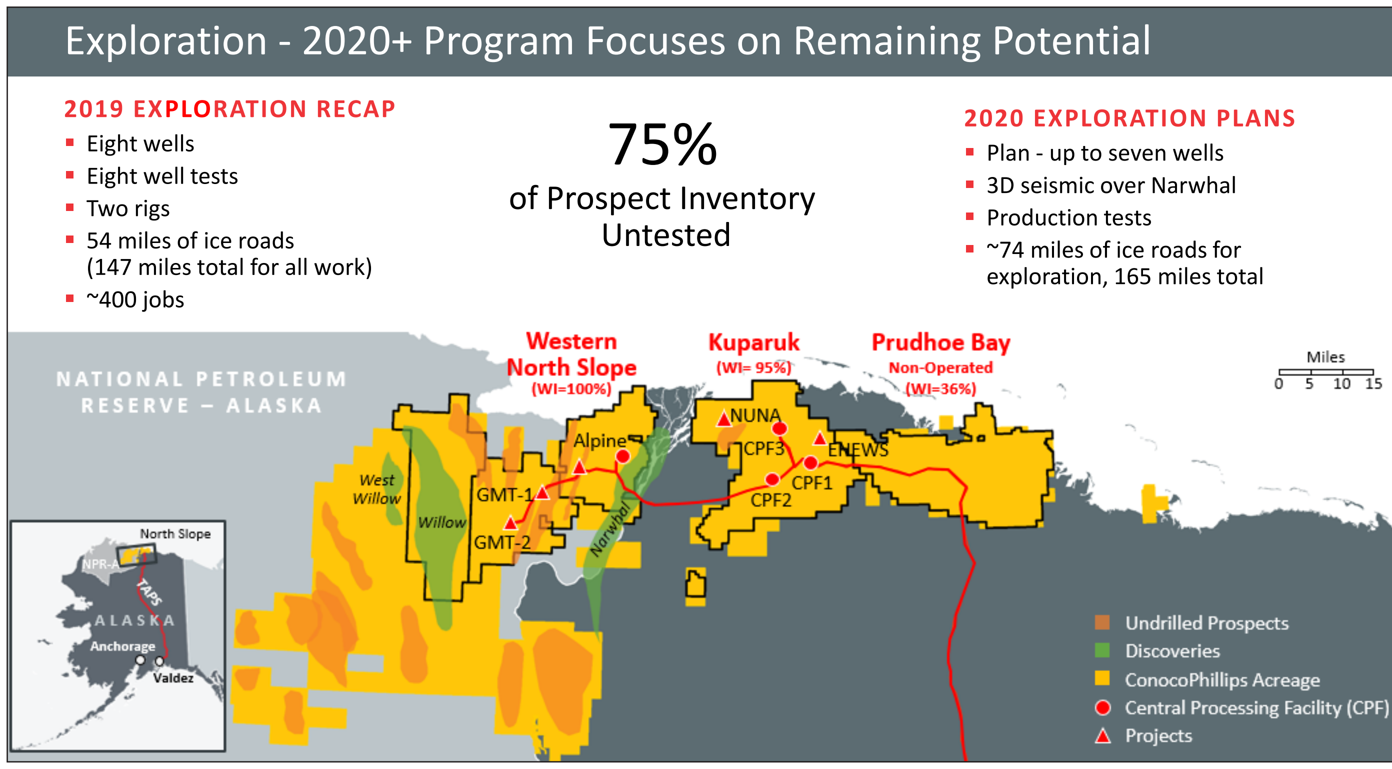
"We're going to be drilling in Willow and the primary focus is on understanding the extent of Willow, so that we can fully size the facilities," he said, which likely means most of those wells will be appraisal or development holes.

"We're also going to be drilling a prospect to the southwest called Harpoon. We'll drill several wells in Harpoon," Hatfield said, promising to provide more information on both Willow and Harpoon in November.

Having recently discovered approximately 1 billion barrels of light, sweet oil west of the central North Slope, ConocoPhillips execs said the company was in the process of planning another aggressive exploration and appraisal season on the North Slope for the coming winter, with more emphasis on exploration versus the appraisal drilling that was largely the focus last winter.

Alaska capex substantial

During that same conference call, ConocoPhillips executives and supporting financial information reported that out of a company-wide capital budget of $3.4 billion for the first half of the year, ConocoPhillips had already spent approximately $700 million in Alaska, which excluded planned and completed acquisitions.



COURTESY CONOCOPHILLIPS

Having recently discovered approximately 1 billion barrels of light, sweet oil west of the central North Slope, ConocoPhillips execs said the company was in the process of planning another aggressive exploration and appraisal season on the North Slope for the coming winter, with more emphasis on exploration versus the appraisal drilling that was largely the focus last winter.

Matt J. Fox, executive vice president and chief operating officer of ConocoPhillips, provided a brief overview of the company's year-to-date Alaska operations, as well as the outlook for the remainder of 2019 and into early 2020.


MATT J. FOX

"The results have been encouraging for both Willow and the Narwhal trends," Fox said. "Based on these positive results, we're also taking the opportunity to drill an additional unbudgeted horizontal well from an existing Alpine drill site into the Narwhal trend later this year."

Willow, West Willow and Harpoon are in the National Petroleum Reserve-Alaska, at the western end of the company's planned developments. ConocoPhillips has said it expects Willow's peak oil production will be about 100,000 barrels per day, although in a mid-March Bloomberg interview Fox said the company was "unsure," and still trying to determine just how much oil can be produced from the area, mentioning volumes as high as 140,000 bpd. ●

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PRODUCERS PREVIEW

significant milestone to help advance the state-led gasline project," said ExxonMobil Alaska President Darlene Gates at the time. "As the largest holder of discovered gas resources on the North Slope, ExxonMobil has been working for decades to tackle the challenges of bringing Alaska's gas to market," she said.

Then-AGDC President Keith Meyer was equally upbeat, as was then-Alaska Gov. Bill Walker, who had made a gas export project a priority of his administration.

Agreement details

The Point Thomson Unit Letter Agreement said that for purposes of the settlement agreement an Alaska LNG Project meant a fully integrated natural gas project producing LNG for export and natural gas for in-state delivery being advanced by the state, a state-owned entity such as AGDC "or an entity in which a state owned entity holds a controlling equity share."

The letter said the June 30, 2017, plan of development, or POD, for Point Thomson, as supplemented in October of that year and approved in August and December 2017, would remain in place until the effective date of a major gas sale POD, an expansion project POD or Dec. 31, 2019, "if an MGS POD or Expansion Project POD has not been submitted."

The agreement called for submittal of Point Thomson PODs on a biennial basis beginning with the 2020-21 period. Those PODs would address IPS work or other exploration or development, including activities in support of the Alaska LNG Project.

Regarding the extension period, a final investment decision was defined as "a decision by the Alaska LNG Project owners to construct the Alaska LNG Project, following securing the necessary financing arrangements to construct and operate the Alaska LNG Project."

In the meantime

ExxonMobil continues working on the technical challenges at Point Thomson.

From the start in April 2016, condensate output from the IPS has fluctuated from less than 100 bpd to a high of 10,725 bpd in December 2018, although something closer to 5,000 bpd is more common.

In its 2017 POD, ExxonMobil told the state that "production to date has been impacted by gas injection compressor availability and reliability," referring to the compressors as "industry-first," which likely explains their serial numbers, 001 and 002.

Development of the Point Thomson field requires handling reservoir pressures upwards of 10,000 pounds per square inch, a pressure corresponding to "the effect of an elephant standing on the end of someone's thumb," an ExxonMobil executive said right after the field came online.

Advanced technology, the company has said from early on, has been key to producing the field.

Since each compressor allows the field to produce 5,000-6,000 bpd, one is presumably often offline for maintenance.

Hans Neidig, ExxonMobil's public and government affairs manager for Alaska, told Petroleum News in late July 2018 while the field was in a warm shut down for maintenance, that the "advanced equipment at the facility requires rigorous inspection and maintenance protocols to ensure safe operation."

Without referring directly to the compressors, he said, because of "the equipment's unique nature, more time is needed to replace some components compared with standard, off-the-shelf equipment."

A state official who asked not to be identified told Petroleum News that summer, "Point Thomson would be tough for any other major to deal with, but ExxonMobil keeps whittling away at the problem. We're fortunate they're operating that field. I doubt it would ever have been developed otherwise," he said, citing "ExxonMobil's deep pockets and technical savvy."●

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ARCTIC PLAN

the United States, Russia and Denmark, and what has happened to Trudeau's pledge to develop an Arctic Policy Framework, a document that was supposed to be made public this summer.

Amid reports that a scheduled announcement has been scrapped it is unclear whether the policy will be released before the election.

Even though Arctic leaders and polar policy experts have credited the Trudeau administration with making significant investments in the region some warn that those moves could be undermined unless they are supported by an overall strategy.

Politicians in Canada's three territorial governments — Yukon, Northwest Territories and Nunavut — and leaders of indigenous communities have not made things easy for the federal government because of rifts within their ranks over economic development.

Arctic road study

But not all hopes for Canada's North have been dashed, starting with a pledge from Transport Minister Marc Garneau to provide C$50 million for preliminary studies and planning for an all-weather road from Yellowknife in the NWT to a deepwater port on Nunavut's central Arctic coast.

The total cost of a road, covering 420 miles, and port has been estimated at C$1 billion.

NWT Industry Minister Wally Schumann said the move will "change the economy of Canada," allowing construction materials to be carried more cheaply and easily by trucks.

It will also bolster Canada's claims to sovereignty in the High Arctic.

Currently, goods and materials are either flown in or shipped on barges that arrive only once a year.

A new road would also open up the Slave Geological Province that is estimated to hold C$45 billion worth of natural resources.

The road would also provide cheaper, more environmentally friendly power to industrial projects and communities.

50 years of lobbying

Lobbying for an overland connection to Nunavut has lasted more than 50 years, gaining its greatest boost when a 90-mile connection from Inuvik to Tuktoyaktuk on the Beaufort Sea — the first year-round route from southern Canada to the Arctic coast — was opened two years ago.

John Higginbotham, a senior fellow at Ottawa's Carleton University, said in a Globe and Mail a national Arctic investment plan with a strong maritime emphasis could enable communities and regional governments to flourish in a new, tough, competitive environment.

Instead, he said in a blunt assessment there has been no Arctic leadership from Trudeau, Foreign Minister Chrystia Freeland or other senior cabinet ministers.

Higginbotham said the Trudeau administration has "lacked the vision, discipline and machinery to produce a long-term plan for serious Canadian Arctic economic development and security policy. The current approach is just not proportional to the challenges Canada will face in the Arctic."

—GARY PARK

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FACILITY STRIKE

supply commitments and operates without its usual buffer of spare production capacity."

Prices fluctuated as the Saudis brought production back online. By Sept. 18, the most recent prices available when this issue went to press, Brent was at $63.58 and WTI at $58.63. The latest price for ANS, from Sept. 17, was $65.88 per barrel.

Potential impacts

IHS Markit provided insights Sept. 17, categorizing potential market impacts in what it called three time dimensions — limited, seven to 14 days; extended but manageable, 30-120 days; and structural, 120 days plus.

"What was a risk scenario has become a reality," said Daniel Yergin, vice chairman, IHS Markit. "The amount of Saudi oil offline is equivalent to one third of what passes every day through the strait of Hormuz. Two things will jangle the oil market in coming days — how long the recovery and what comes next."

A limited impact (one to two weeks) has a low likelihood, IHS Markit said, given the extent of the attack suggesting at least some level of sustained damage. In this scenario there is initial restart in week one followed by a measured ramp up in the second week, leading to a gross disruption in the 30 million to 60 million barrel range "and should be manageable through any combination of Saudi stocks and global commercial inventories, with Saudi Arabia ostensibly surging post return to offset the net tightening caused by its temporary decline."

IHS Markit said the extended but manageable scenario of one to four months is most likely, with Saudi Arabia able to manage a partial return from the peak disruption of 5.7 million bpd but "unable to address the full extent of the damage on key facilities for as long as four months," leading to disruption in the 150 million to 300 million barrel range, exceeding the ability of commercial inventories to meet the shortfall and resulting in higher prices.

"Global markets will likely look to extraordinary measures to mitigate the physical shortfall caused by the disruption, including a coordinated SPR stock release from the IEA, a potential call on China to ease market pressure through inventories, and call for increases in production from within the Vienna Alliance."

The worst case scenario, IHS Markit said, would mean Saudi output would be out for longer than four months, with the physical shortfall rising to the 350 million to 500 million barrel range. Prices would spike in this scenario and extraordinary measures would be insufficient and eventually reactive supplies such as from the United States, via higher prices, would be needed to correct the structural imbalance.

But, IHS Markit said, given the importance of the facility to Aramco and prioritization of repairs regardless of cost by the company, it would be unlikely that a full shutdown would endure beyond four months "unless damage is more extensive from the attacks than anticipated, or a large-scale conflict breaks out."

"Under any scenario, the heightened risk premium marks a stunning reversal for the market," said Rogen Diwan, vice president, IHS Markit. "The combination of weak demand fed by macroeconomic fears and the potential for a U.S.-Iran détente unlocking significant volumes of oil currently under sanction had weighed on the market. Now an enduring increase in the market's risk premium is justified." ●

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ANWR 1002

be designated for no surface occupancy restrictions. Option A, the no-action alternative was rejected because it would not have allowed any leasing and so it was out of compliance with the 2017 federal Tax Cuts and Jobs Act that mandated oil and gas leasing in the ANWR 1002 area.

Release of the final EIS starts the clock for a lease sale that the Trump administration wants held before the end of the year. BLM will next prepare a Record of Decision, which can be published 30 days after the official Notice of Availability for the final EIS is published in the Federal Register.

That accomplished, BLM will be able to schedule the actual lease sale.

After the final EIS was released, opponents of an ANWR 1002 lease sale promised a legal battle.

The most critical of the agencies that evaluated the draft EIS last October and was part of the group that put together the final EIS with BLM was the U.S. Fish and Wildlife Service. Included in Interior's press release about the final EIS was a statement from Fish and Wildlife's principal deputy director, Margaret Everson, who was quoted as saying "A large and diverse team including Tribes, partners, the state of Alaska and experts from across the Service worked with BLM on the range of alternatives contained in the EIS, as well as the protective mitigation measures that would apply to oil and gas activities in this unique area. The team's work forms the scientific and conservation foundation that will protect high-value wildlife habitats and important uses in this area, while advancing the President's agenda on energy independence."

Representatives of the regional Native corporation for the ANWR 1002 area, Arctic Slope Regional Corp., made the following comment Sept. 12: "We are encouraged the Department heard our voices and incorporated our concerns into the final EIS. We look forward to a successful lease sale and strongly believe exploration and production can incorporate cultural and environmental protections while providing for the nation's energy security. This economic driver will provide opportunities for our people and our region, as well as the rest of the state and nation for years to come."

"A large and diverse team including Tribes, partners, the state of Alaska and experts from across the Service worked with BLM on the range of alternatives contained in the EIS, as well as the protective mitigation measures that would apply to oil and gas activities in this unique area. The team's work forms the scientific and conservation foundation that will protect high-value wildlife habitats and important uses in this area, while advancing the President's agenda on energy independence." —Margaret Everson, U.S. Fish and Wildlife Service

The 1002 area is part of the North Slope Borough, and borough mayor, Harry K. Brower Jr., issued this statement Sept. 12: "We applaud the Department's work to ensure that all development companies put in place the best practices and mitigation standards because we all have to make sure that responsible development will protect the environment, protect the wildlife, protect the land. That is our responsibility and we owe that to future generations."

All three members of Alaska's congressional delegation welcomed the release of the final EIS and indicated support for preferred alternative B.

Congressman Don Young, R-Alaska, has worked the longest on getting the coastal plain opened for oil and gas leasing.

"Alaskans are committed environmental stewards," Young said, "and they know how to balance environmental protection and resource development — we did it in Prudhoe Bay and we'll do it again in ANWR. I want to thank President Trump and his administration, particularly Secretary of the Interior David Bernhardt, the former Assistant Secretary (Joe Balash), and Alaska BLM State Director Chad Padgett for their tireless work in completing this EIS and getting us closer to fully-realized resource development in the 1002 area of ANWR."

The eastern North Slope ANWR 1002 oil and gas lease sale will likely be scheduled for December.

Also, that month and possibly in conjunction with the 1002 sale if it's not held up by environmental lawsuits, BLM will offer more leases on the western North Slope in the National Petroleum Reserve-Alaska.

As reported in the Aug. 18 edition of Petroleum News, Interior will publish a draft environmental impact statement in October on changes to its land management plan for NPR-A, Padgett said in an Aug. 13 briefing on BLM's Alaska activities.

The land plan, called the NPR-A Integrated Activity Plan, will revise the 2013 plan by former Interior Secretary Ken Salazar that greatly expanded areas restricted from leasing and drilling near coastal areas of the petroleum reserve that were considered to have high oil potential by state and federal geologists.

One of the purposes of the revised plan will be to revisit the expanded protected areas set by Salazar and to revisit the boundaries of coastal areas specified to be off limits in the 1975 Naval Petroleum Reserve Production Act, BLM's Alaska spokeswoman Lesli Ellis-Wouters said.

"The 1975 act never defined the boundaries of the protected areas," along the coast, Ellis-Wouters said.

In practice BLM has withheld areas of sensitive wetlands, such as around Teshekpuk Lake, from leasing or at least from surface entry over the years, but industry and state officials objected to Salazar's order expanding the protected zone south, away from the coast, into areas of upland tundra not particularly sensitive but which still hold good potential for discoveries.

"The effect of Salazar's action was to put the best acreage off limits," said Richard Garrard, an industry exploration geologist familiar with the NPR-A, in past interviews.

A draft EIS is typically followed by the final EIS and the record of decision issued within 30 days of the final document. The Record of Decision then allows Interior to publish the revised plan.

While this will be too late to include areas of high potential in the December federal lease sale, the revised plan would allow the acreage to be in a 2020 lease sale. ●

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FURIE BANKRUPTCY

ments that any successful purchaser of debtors' assets must satisfy.

The Department of Natural Resources, Division of Oil and Gas, and the Alaska Oil and Gas Conservation Commission must approve any sale of the debtors' leases and operation.

Any potential buyer of the debtors' leases must qualify with DNR by showing that it is qualified to do business in Alaska, the state said, while a new operator of the debtors' operations must supply a $500,000 statewide bond.

In addition, a potential new lessee must post an additional bond for each lease assignment, to be determined on a lease-by-lease basis, which factors in the estimated amount of the dismantling, removal and restoration obligation; the amount of recoverable oil and gas; and other considerations.

The total amount of the DR&R obligation will be driven by a number of factors, including but not limited to the cost of removing the existing drilling platform at the end of the Kitchen Lights Unit's life.

"Based upon DNR's experience, but subject to input from any new purchaser, that total cost could be in the $40 to $60 million range," the state said.

"AOGCC must approve any change of unit operator," the state said. Among other things, AOGCC requires bonding for plugging and abandonment of any wells located on state leases being acquired. Purchasers must secure $2.8 million in bonding for the seven wells located within the KLU.

Further, the state said bidders interested in bidding on the debtors' assets must factor in two major aspects of such regulation: (1) bonding requirements; and (2) approval requirements.

"Interested persons should also consider the time necessary for the State to process the necessary applications," the state said.

The state cautioned that the notice "is an overview only, and prospective bidders should independently investigate federal, state, and local regulations relating to the assets and operations of Debtors' business."

—STEVE SUTHERLIN

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SLOPE RENAISSANCE?

ment. And after drilling eight exploration wells this last winter, the company plans to drill up to seven in 2020 and shoot a 3D seismic program. (See story this issue.)

North Slope production is up compared to an earlier state estimate.

What could go wrong?

The proposed oil tax initiative is a serious threat to future investment, Scott Jepsen, ConocoPhillips Alaska's vice president of external affairs and transportation, told the Alaska Support Industry Alliance Sept. 12.

That initiative is a headwind the company sees coming, he said.

The safety focus

Jepsen discussed workplace safety, ConocoPhillips' focus on making the next step change in safety.

Ten years ago, he said, the company determined to reduce its total recordable incident rates — accidents and injuries at work.

The rate was 0.59 in 2009 and rose to 0.67 in 2010. The recordable incident rate reflects the number of injuries requiring treatment per million hours worked. In 2012, when the company began an "incident-free" program, the rate dropped to 0.22, climbed back above 0.3 and then dropped to 0.21 in 2016. It is rising again, and as of August the year to date rate is 0.29.

Jepsen said the company wants to get that incident rate back down, reflecting a safe workplace for all, and is asking for contractor help with a safety focus.

GMT2, Nuna

ConocoPhillips has a lot of North Slope work underway or in the planning stage.

It got Greater Mooses Tooth 1, the first pad at the first of its NPR-A units, into production in October 2018, and is working on the second drill site, Greater Mooses Tooth 2, with a goal of first oil in 2021.

Estimated peak gross production is 35,000 to 40,000 barrels per day, Jepsen said, from up to 48 wells.

Gravel is in place and being reworked for the pad and an 8-mile road, he said, along with preparation for pipeline installation, which will begin next year, as will completion of module and fabrication work.

In 2021 pipeline installation between GMT1 and GMT2 will be complete, modules and pipe racks will be installed.

Drilling will begin, with commissioning and startup of GMT2 in that year.

Estimated gross capex for the product is $1 billion-plus, with some 700 winter construction jobs, Jepsen said.

ConocoPhillips purchased Nuna, adjacent to the Kuparuk River unit, from Caelus earlier this year for $100 million and expanded the Kuparuk River unit to include the new acreage. Nuna oil will be processed through Kuparuk facilities and development will use existing drill sites.

There will be a single construction season with some 400 winter construction jobs, Jepsen said, with first oil planned for 2022.

Extended reach drilling rig

Doyon has been building an extended reach drilling rig for Conoco, Jepsen said, and the rig, which will be Doyon 26, is on its way.

It will be the largest mobile land rig in North America, has a 247 foot mast and weighs 9.5 million pounds. It will arrive on the North Slope in the fourth quarter from Nisku, Canada, in 267 truck loads.

The build was announced in 2016 and allows ConocoPhillips to develop the Fiord West accumulation in the Colville River unit, where the rig will begin drilling in the second quarter of 2020. Production is expected to peak at 20,000 bpd. Jepsen said Fiord West is a known accumulation but development has been problematic because it is along the coast in wetlands.

Fiord West will be developed from the CD2 pad, where some gravel has been added, Jepsen said.

The ERD rig will allow development from a 14 acre pad of 154 square miles of reservoir, compared to 55 square miles today.

Coiled tubing drilling record

Progressing drilling technology has allowed ConocoPhillips to set recent drilling records.

Jepsen said the company set a coiled tubing drilling record at West Sak, 8,183 feet. The well was also the first application of CTD in West Sak.

It has also set an onshore North America rotary drilling record — this one for combined footage on two laterals. The record was set in July at the CD5-98 well, which had total footage of 47,828 feet — combined footage for the well and laterals.

The longest single well, at 32,468 feet, is an Alaska record — also set at the CD5-98.

In May 2018, with another CD5 well, CD5-25, ConocoPhillips set the record for the longest lateral onshore North American well at 21,748 feet.

Jepsen said the 10 longest wells in Alaska have all been drilled by ConocoPhillips at CD5.

Willow draft EIS

The federal Bureau of Land Management has released the draft environmental impact statement for ConocoPhillips' Willow project in NPR-A, with BLM aligning with the alternative proposed by ConocoPhillips as its preferred alternative.

Jepsen provided an overview of the project, which will require sealifts to bring the modules up and an ice road in the winter to move the modules from a module transfer island some 80 miles to the Willow development site.

The resource is estimated at 400 million to 750 million barrels with peak production greater than 100,000 bpd, first oil in 2025-26 and an estimated cost of $4-$6 billion.

Headwinds

In discussing what ConocoPhillips sees as headwinds, Jepsen said Alaska has tough competition in the Lower 48, where Permian drilling leads U.S. production growth, drilling efficiency is up steeply compared to 2010 and there are more than 7,000 drilled but uncompleted wells. And if oil prices drop, Lower 48 wells can be shut in.

ConocoPhillips' outlook on Alaska has changed substantially since 2013, he said. In 2013, the company assumed declining production — but the current view, he said, shows continued production growth out through the next 10 years.

That changed outlook, Jepsen said, is based on the improved fiscal framework provided by passage of Senate Bill 21 in 2013, technological advancements and innovations, a comprehensive effort to capture value from legacy fields and infrastructure, renewed focus on exploration and a company-wide focus on lower the cost of supply, which has made Alaska competitive within the ConocoPhillips portfolio.

But the tax initiative threatens future investment, Jepsen said, as it targets Prudhoe Bay, Kuparuk and Colville River — major fields already in production which provide economies of scale and base infrastructure for new developments.

The initiative more than doubles the minimum 4% tax to 10%, and that scales up by 1% each $5 over $50 per barrel, capped at 15%.

Jepsen said the minimum tax really applies at lower oil prices. He said it puts planned investment for both new developments and drilling in existing fields at risk: Nuna, further West Sak development and Putu would all be subject to a higher tax rate.

—KRISTEN NELSON

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NANUSHUK OUTCROP

amount of accommodation, but also a tremendous amount of sediment supply to keep up with, Wilson said.

"In the east, we certainly see evidence of first the marine facies where the marine topsets down in the Tuktu Bluff area were struggling with the accommodation space that they had, but then near the top they had a significant surface and all the sudden were just overwhelmed with clastics out of the south," he said, adding that there was an interplay between the Corwin Delta and the Brooks Range deposition in the central part of the National Petroleum Reserve Alaska.

"I think there's quite a story that can go with the subsurface story here, from outcrops," Wilson said, "But we always have to be careful when we're looking at subsurface too, to separate some of that deposition coming directly out of the Brooks Range from the appropriation that we see on the Corwin Delta off to the west."


DAVE HOUSEKNECHT, USGS

A USGS geologist stands on an outcropping in the Tuktu Bluffs.

A very interesting surface

Wilson has, over the years, worked sections from the neighborhood of the North Slope haul road in the east, to the Chukchi Sea in the west.

"At Tuktu Bluff, you can see just about 1,000 feet, it's actually topset facies in the Nanushuk here, nearshore marine to shelfal, and up the Chandler river, you have facies of the Torok slope deposits … and then what you call the Chandler River turbidites," he said. "You can kind of see that this is a relatively complete section of the topsets, so if you start sections at the bases of the outcrop, you're fairly near the bases of the topsets, at least near the base of the Nanushuk."

"At the very top, by chance, you have preserved a very significant surface there, where you have a more or less a lower shore based package, incised by a significant surface layer overlain by a discrete grit lag, and the crop cross-strata by sandstone," Wilson said. "You may find this by a distributary channel or intertidal setting — maybe something a little more proximal — but this is right at the very top of the section."

At Ninuluk Bluff, on the Colville River, the top of the Nanushuk formation is visible near the bottom of the outcrop, Wilson said.

"You don't find anything coarser than maybe a medium grained sand for the most part for 1,000 feet of section until you get to this grit lag at the very top," he said. "A very interesting surface."

Outcrops to the east

To the east, at Slope Mountain, Wilson encountered a "very gross stacking pattern." Below was Torok formation more or less, with a shelfal cross thick section of soapy mudstone, and the top of the outcrop was nonmarine.

"What we looked at this past summer was the stacked sequences shore based to deltaic," he said, adding that there were some rocks of interest near the bottom of the stack.

"That stratigraphic position is where the Willow discovery lies, and so that looked a little bit different," he said. "You can see a thick section of very mottled looking but bioturbated sandstone, primarily sedimentary structures for the most part and towards the top, you get into some very sedimentary structures so that implies probably a little slower sedimentation rates here and critters were able to bioturbate."

At Rooftop Ridge, north of Arc Mountain, Wilson and Bill Morrison measured about 1,800 feet of section along the Nanushuk River,

"What you've got is all marine section overlain by the Seabee, none that's nonmarine in this case," Wilson said, adding that there is a peculiar surface at the top of the outcrop, with a much coarser grain size fraction than anything seen in the rocks beneath it.

At Ninuluk Bluff, on the Colville River, the top of the Nanushuk formation is visible near the bottom of the outcrop, Wilson said.

Outcrops to the west

To the west, the terrain features topsets and outcrops, Wilson said

A number of camps in the area, including Deadfall, Akulik and Eagle Creek, provide a base to reach outcrops, he said. "I've stayed at each of those."

At Igloo Mountain, just north of Eagle Creek, the outcrop is marine facies of the Nanushuk, Wilson said.

"It doesn't give up the secrets quite as easily as Tuktu bluff; you have a lot of North Slope rubble crop here and things, so it's harder to see the primary sedimentary structure," he said. "But you can kind of wish in your parasequences here based on the erosional nature of the outcrops and things."

Akulik "was the site of one of the wells drilled out here on the western North Slope, so there's a big gravel pad, airstrip, and you get to camp right on one of the topsets of the Nanushuk," Wilson said. "You can see the Chukchi sea out there in the distance."

"A lot of the rock around here kind of transitional," indicating a lower coastal plain, he said

At Corwin Bluff, along the beach of the Chukchi Sea, "what you have are multi story channel complexes in the outcrop," 500 feet or so, Wilson said. "Really thick accumulations of sand … fluvial systems are very different, capped by a coaly sequence; you can step around to the side to see what it looks like in cross section.

"It's in this area that the old steamers used to pull in and mine the coals before they move on north to the whaling fields," he said.

Davis Creek outcrops, inland of Corwin Bluff expose the Corwin formation of the upper Nanushuk, Wilson said.

"This would look a little bit reminiscent of the rocks that we saw in the Chandler River region," he said. "This is where I first met Gil Mull in 1994."

"You can see a lot of pebble and cobble conglomerate in that part of the section," he said. "These rocks are fairly proximal; we're probably seeing rocks coming off of the Brooks Range ... not so much from western terrain."

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ALBERTA HIGH WIRE

She said there could be a return to widening price discounts between West Texas Intermediate crude and Western Canada Select heavy crude unless the government prolonged the curtailments, which were first imposed in January when 29 producers were ordered to trim their volumes by 9%, or 325,000 bpd, to 3.65 million bpd.

However, the government said it will raise the exemption in the curtailment formula for all producers to 20,000 bpd from 10,000 bpd, which means the curtailment program will affect only 16 of Alberta's 300 producers.

In October, output will rise slightly to 3.79 million bpd from 3.76 million bpd in September, Savage said.

She also said the curtailment might be lifted earlier than the end of 2020, depending on market conditions, but the extension will give the government greater flexibility.

Some see advantages

Tristan Goodman, president of the Explorers and Producers Association of Canada, speaking for mid- to small-range producers, was pleased with the extension of the curtailment deadline.

He said it will give certainty to producers while protecting the government's interests.

"It's a difficult balancing act and the government has tried the best it can to hit that in a positive way," Goodman said.

For now, the government does not want to choke back production by more than is deemed necessary, nor to make the price gap so tight that companies stop shipping oil to market by rail, which happened earlier this year.

Kevin Birn, an oil analyst with IHS Markit, told the Calgary Herald that the decisions are "incredibly difficult (as the government) tries to find the sweet spot on the pricing side. The other side is what will happen (to oil patch) investments."

Others in opposition

From the outset, Suncor Energy, Husky Energy and Imperial Oil opposed the curtailment program which they argued interfered with an open energy market.

Suncor and Canadian Natural Resources urged the government in July to loosen the restraints on production as increased rail capacity became available, while Suncor and Cenovus Energy want the province to let producers raise their production above curtailment levels if they add incremental crude-by-rail capacity.

Savage said she had not rejected that option, although she was not ready to make a decision.

She said it was her intention to announce monthly revisions to curtailment levels 60 days in advance, instead of the previous 30 days, giving producers a better chance to plan.

A spokesman for the Canadian Association of Petroleum Producers said extending curtailment is "absolutely limiting any growth investment plans."

Jackie Forrest, senior director with ARC Energy Research Institute, said that introducing a policy that would provide incentive to carry more crude by rail "would be positive," ensuring that the highest possible price for crude was secured, along with the highest volumes. ●

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