Petroleum news

page 3 BRPC begins Mustang demob; field down since November startup

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Hilcorp's Whiskey Gulch strat well tests get DNR approval

On May 15 the Alaska Department of Natural Resources' Division of Oil and Gas approved Hilcorp Alaska's lease plan of operations for the Whiskey Gulch stratigraphic well test program on the southern Kenai Peninsula north of Anchor Point.

Hilcorp, which applied for the POO on April 23, anticipates drilling up to five stratigraphic test wells, each up to 600 feet deep, on two state of Alaska subsurface leases and Kenai Peninsula Borough surface land.

The wells will be drilled using a truck-mounted air drilling unit operated by Kraxberger at locations accessible from established roads, the POO approval says.

Project mobilization is scheduled to begin June 1, with site

see **WHISKEY GULCH** page 11

Alyeska lifts flow restrictions; prorations ended: Noon, May 22

Alyeska Pipeline Service Co. eliminated the proration on North Slope connectors to the trans-Alaska pipeline system, lifting restrictions on oil throughput effective May 22 at noon.

The proration began April 24 with a 10% cut to production, increased to a 15% reduction on May 8, and was subsequently reduced to 5% percent on May 15.

"After reviewing flow rates, current and projected inventory, and vessel movements, we will be eliminating the remaining 5% curtailment of shipments (proration) imposed earlier in May," Alyeska President Brigham A. McCown said in a May 21 Twitter post.

The initial action was taken because of inventory concerns — to avoid overloading the 800-mile pipeline and its 6.6 mil-

see **TAPS FLOW** page 11

Bidding opened May 19 for state's first online lease sales

CORRI FEIGE

In a year when in-person oil and gas lease sales would have been problematic, the Alaska Department of Natural Resources had already positioned the state to hold online sales, having updated its regulations and contracted with an online sales provider.

Using the new online system, bidding opened May 19 for DNR's first online oil and gas lease sales, the Cook Inlet and Alaska Peninsula areawide sales. Bidding closes June 11 and results will be available June 17,

see **ONLINE SALES** page 11

Burying bone of contention: Alberta, Canada negotiate methane

Agreement on anything these days between the Alberta and Canadian governments is a rare event, thus the settlement of a feud that has spanned years over controlling methane emissions is a milestone.

The deal bringing emissions of the potent gas from Alberta's oil and natural gas operations into line with federal minimum standards generated praise from Canada's Environment Minister Jonathan Wilkinson for the tone of negotiations that he said were "collaborative and constructive."

Alberta Environment Minister Jason Nixon said that even "minor changes" to the initial proposal were "nothing of significance."

see **EMISSIONS PACT** page 11

EXPLORATION & PRODUCTION

Exciting outlook

Oil company interest continues in Nanushuk plays of the North Slope

By ALAN BAILEY
For Petroleum News

DAVE HOUSEKNECHT

Although the COVID-19 pandemic brought an early end to this winter's exploration season on Alaska's North Slope, there is continuing interest in oil discovery opportunities in the Nanushuk formation, the focus of major new developments at Pikka and Willow.

While new exploration drilling by Oil Search and ConocoPhillips is shedding further light on this intriguing new play, companies such as Armstrong Oil & Gas and Borealis Alaska Oil Inc. are also looking to test further opportunities of a similar character to the established finds, U.S. Geological Survey geologist Dave Houseknecht commented to Petroleum News in a recent overview of Nanushuk exploration activity. The most recent major leasing activity was Armstrong's purchase of a significant block of leases in the 2019 NPR-A leases sale, Houseknecht said.

The Nanushuk forms part of the Brookian sequence, the youngest and shallowest of

see **NANUSHUK PLAYS** page 8

PIPELINES & DOWNSTREAM

Pebble gasline plan gels

Corps of Engineers decision sets overland route from Diamond Point to mine

By STEVE SUTHERLIN
Petroleum News

The route of a subsea and overland natural gas pipeline, from the lower Kenai Peninsula to the site of the proposed Pebble Mine site in southwest Alaska, appears to be taking its final shape due to a recent decision from the U.S. Army Corps of Engineers on a preferred development alternative for the proposed copper-gold-molybdenum-silver mine.

The Corps chose EIS Alternative 3 — known as the northern transportation corridor — as the least environmentally damaging practicable alternative or LEDPA for the proposed Pebble mine.

Under Alternative 3, the subsea Cook Inlet portion of the gas line would make landfall at Ursus Cove, near the proposed Diamond Point port location on Iliamna Bay, near Williamsport, on the west side of the inlet. From Diamond Point, the gas line would follow the northern transportation corridor overland to Pebble, buried in a trench adjacent to the road.

From Ursus Cove to Diamond Point port and on to the mine site, the gas pipeline would extend 165 miles. From Ursus Cove, the pipeline would be routed overland, northward to Cottonwood Bay. A 150-foot temporary construction right of way is proposed to allow for adjustment of the final route to accommodate variations in terrain.

Access for construction would be by barge landings from each end of the ROW. The ROW

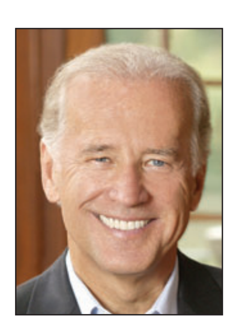
see **PEBBLE GASLINE** page 9

PIPELINES & DOWNSTREAM

XL showdown shapes up

Biden: Keystone XL will face 3rd presidential reversal if he captures White House

By GARY PARK
For Petroleum News



JOE BIDEN

If Joe Biden moves into the White House in January he could immediately find himself in a cross-border sniping exchange with Canada.

In a statement issued by his campaign office on May 17, the presumptive Democratic nominee has promised to" once and for all" end a battle that began 12 years ago when TC Energy (then TransCanada) sought approval to build the Keystone XL pipeline from Alberta to Nebraska, where it would feed into a connection to U.S. Gulf Coast refineries.

The declaration said stopping XL "was the right decision" by former president Barack Obama in 2015 and "it's even more important today" that a Biden administration should "rip up" President Donald Trump's 2017 approval of the US$14 billion project.

Biden later called the Alberta "tar sands" a resource "we don't need ... because it is a very, very high pollutant," trampling over evidence that bitumen can be produced in Alberta with lower greenhouse gas emissions than California's heavy oil and even some conventional crude from the Middle East and Africa.

He said it is not his intention to shut down all oil projects the moment he takes office, adding "we're

see **XL SHOWDOWN** page 7

● EXPLORATION & PRODUCTION

US rig count continues down: new low 318

By KRISTEN NELSON
Petroleum News

Baker Hughes' weekly count of rotary rigs drilling in the U.S., issued since 1944, continues to drop, setting a new low of 318 for the week ending May 22, down 21 from the previous week and down 665 from a year ago.

Prior to this year, the low count by the Houston oilfield services company was 404 rigs in May 2016. That record has now been broken three weeks in a row: 374 rigs on May 8 of this year, 339 rigs on May 15 and this week's new low of 318.

The count has been dropping steadily: down by 21, 35, 34, 64, 73, 62, 64, 44 and 20 rigs respectively, a total of 417, over the previous nine weeks.

The company said 237 rigs targeted oil, down 21 from the previous week and down 560 from a year ago, while 79 targeted gas, unchanged from the previous week and down 107 from a year ago. There were two miscellaneous rigs active, unchanged from the previous week and up by two from a year ago.

Twenty-five of the holes were directional, 285 were horizontal and eight were vertical.

West Virginia (8) was up one rig from the previous week.

Rig counts were unchanged Alaska (3), California (5), Louisiana (35), Ohio (8) and Oklahoma (12).

The rig count in Texas, which at 138 has the most active rigs, was down by 12 from the previous week and down by 343 from a year ago.

New Mexico (63) was down by three rigs.

Colorado (6), North Dakota (14) and Wyoming (2) were each down by two rigs from the previous week; Pennsylvania (22) was down by one.

Baker Hughes shows Alaska with three active rigs for the week ending May 22, down by four from a year ago.

The largest rig count drop by basin was in the Permian, which also has the most active rigs at 162. The Permian count was down 13 from the previous week and down 289 from a year ago.

Baker Hughes has issued weekly rig counts for the U.S. and Canada since 1944 and began issuing international rig counts in 1975.

The U.S. rig count peaked at 4,530 in 1981. This week's count of 318 is a new low, surpassing lows set in the previous two weeks. Prior to that the previous low was 404 rigs in May 2016. ●

contents

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● ENVIRONMENT & SAFETY

Fairbanks air quality extension denied

EPA proposes rule rejecting state request to defer attainment date by a further five years; now requires a new plan by end of year

By ALAN BAILEY
For Petroleum News

The Environmental Protection Agency has published a proposed rule rejecting the State of Alaska's request to extend by a further five years the required date for attainment of acceptable air quality standards in the Fairbanks North Star Borough. In 2017 EPA had ruled that the state had to prepare a plan for attaining the required air quality by Dec. 31, 2019. However, EPA has determined that the air quality had not improved sufficiently by that date.

EPA says that it has been in close contact with the state and that the state does not oppose this proposed new action. Essentially, the state had not met criteria specified in the Clean Air Act for the approval of a five-year extension, EPA said. Those criteria include imposing controls on emissions sources and demonstrating that those controls would enable clean air attainment within the extension period.

According to the proposed rule, the state has said that, because of sub-Arctic conditions in the region and high energy costs for the community, attainment of the required standards is not feasible until 2029. EPA says that it will now require the Alaska Department of Environmental Conservation to develop by Dec. 31, 2020, a new plan for air quality improvement. EPA says that the state is already working on developing this new plan.

A long-standing problem

Air quality in the Fairbank region during the winter has been a long-standing problem, primarily because of the widespread use of wood burning stoves to heat houses. Pollution can also result from the use of oil fired equipment and vehicle exhaust. In addition, winter thermal inversions tend to trap cold air, holding pollutants close to ground level, thus causing people to inhale polluted air.

Following EPA's 2017 directive, DEC started requiring building owners selling, leasing or conveyancing their properties within the impacted area to replace their wood-fired heating equipment with EPA-certified wood or pellet stoves — modern stoves can burn wood much more efficiently that older models. DEC also introduced measures designed to reduce the burning of wet wood, given that the burning of this type of material results in increased smoke. In a DEC plan subsequently approved by the EPA, DEC also banned the use of wood burning heaters during periods of anticipated high air pollution.

A new state plan

In November 2019 DEC published a new air quality plan for Fairbanks North Slope Borough, as part of the state implementation plan, or SIP, for achieving required air quality standards in Alaska. The plan includes measures such as more stringent criteria for curtailing the use of wood stoves during periods of high air pollution; a requirement to use low sulfur diesel in oil-fueled heaters, starting in 2022; and a deadline for the removal of coal-fired and uncertified heaters from

According to the proposed rule, the state has said that, because of sub-Arctic conditions in the region and high energy costs for the community, attainment of the required standards is not feasible until 2029.

buildings. However, the agencies involved in the planning realized that attainment of the required air quality standards by the end of 2019 was impractical. The state had already filed its request for a five-year extension to the deadline, the request that EPA is now rejecting.

Interior Energy Project

A primary purpose of the Interior Energy Project, a multi-year project sponsored by the Alaska Industrial Development and Export Authority, is to help address the Fairbanks air pollution problem by encouraging residents and businesses to use natural gas for heating buildings. The project is pursuing a significant increase in the supply of affordable natural gas to consumers in the Fairbanks region. At this stage, the project has resulted in the formation of a consolidated gas utility, Interior Gas Utility, for the region. IGU has implemented a major new liquefied natural gas storage facility in Fairbanks and is building additional storage at North Pole. The expansion of storage capabilities will enable IGU to serve more customers. The plan also involves expanding LNG production capabilities at the Titan LNG plant near Point Mackenzie on the Cook Inlet — that plan is currently on hold pending a better understanding of the impact of the COVID-19 pandemic on future Fairbanks gas demand. ●

Contact Alan Bailey at abailey@petroleumnews.com

EXPLORATION & PRODUCTION

COURTESY BRPC

Uncrating of the BRPC metering skid for installation inside of their LACT trackable module at Mustang, courtesy of NANA Construction's Big Lake fabrication facility.

BRPC begins Mustang demob

On May 20. Harry Bockmeulen, chief operating officer, Brooks Range Petroleum Corp., received approval from the Alaska Division of Oil and Gas to de-inventory pipelines and demobilize equipment and materials at the Mustang pad in the Southern Miluveach unit, as requested April 20 in BRPC's proposed amendment to its SMU plan of operations.

The approval was retroactive to May 5 when the company began de-inventory work for the Mustang pad, which is on ADL 390680 approximately 16 miles east of Nuiqsut. The North Slope's newest producing unit, operated by BRPC, came online in November, averaging 478 barrels per day for 23 days from a single well. Total production for the month was 10,999 barrels. There has been no production from the field since November.

The de-inventorying process includes installing a nitrogen blanket and pipeline dampeners on seawater and crude oil sales pipelines, as well as pigging the seawater and sales lines between module 20 and module 53 pig launcher and receiver platforms.

Activities also include draining and blow-drying the seawater and crude oil sales lines between module 20 platform and module 22 tie-in platform; removing the spool between SDV-2220 and CP-HV-31506 and installing blind flanges on ends of SDV-2220 and CP-HV-31506; draining and purging on pad piping and piping within the lease automatic custody transfer (LACT) module securing the equipment and piping within the LACT module with plugs and blinds; electrically isolating and shutting down the air handling unit and installing plywood coverings over the AHU ducts; electrically isolating and shutting down the LACT and remote electrical and instrumentation modules; removing and storing temperature sensitive electrical equipment.

Scaffolding, temporary facilities, temperature sensitive electrical equipment, and some heavy equipment will be transferred to Deadhorse or Anchorage.

BRPC drilled the Mustang discovery well, North Tarn 1A, in January 2012 in the SMU, adjacent to the southwest edge of the Kuparuk River unit.

—KAY CASHMAN

NATURAL GAS

FERC has approved; economics remain issue

AGDC expects to provide new cost report for Alaska LNG Project to board in June; goal to select private project sponsor by year end

By KRISTEN NELSON
Petroleum News

On May 21 the Federal Energy Regulatory Commission authorized the Alaska Gasline Development Corp. to construct and operate the Alaska LNG Project.

In addition to required permits, AGDC is still working on the project's economics.

In a presentation to the AGDC board after FERC's May 21 announcement, AGDC President Frank Richards said Fluor has concluded cost estimate reduction work with a cost estimate update to fourth quarter 2019 dollars. The Fluor work has been provided to the economic modeling team to develop a new cost of supply, and there will be a report to the board in June.

In a January update to House Resources, AGDC's Interim President Joe Dubler (who has since retired), said there were 10 major tasks in the work Fluor was doing, including modularization and sourcing of supplies.

Dubler said Fluor would be looking at all cost elements with AGDC expecting a big component of reductions to come from the contingency, because when hard costs go down, contingency goes down as well.

2015 project costs

The joint venture agreement pre-FEED, front-end engineering design, cost estimate from 2015 was $10.7 billion for the gas treatment plant on the North Slope, $13.9 billion for the pipeline and $19.6 billion for the LNG production facility at Nikiski, some $44 billion. (The JVA included BP, ConocoPhillips, ExxonMobil and the state, represented by AGDC.)

Asked about the original cost estimate, Richards, then AGDC senior vice president, program management, told House Resources in January that the 2019 review of costs reflects increasing use of modularization in large projects, allowing a significant decrease in costs because construction is done elsewhere and facilities assembled on site.

The gas treatment plant was always a modular design, Richards said, because that is how North Slope construction is done.

But the LNG facility was originally designed with less modularization — more modularization there, in line with current industry practice, would reduce costs.

Economic viability

Overheads for the May board meeting list continued work with ExxonMobil and BP "on optimized project venture structure that enhances overall competitiveness" and work with potential project participants to assess project economics.

A workshop was held May 6 to review Fluor's new cost estimates, and capex and opex cost estimate updates were provided to the modeling team May 12 and 15.

A summary of AGDC plans from the April 9 board meeting indicates the corporation formed key relationships in 2019 with "strategic parties" who have expressed interest in the project and with whom AGDC has been collaborating, with extension of those strategic party agreements planned.

The strategic parties have not been named.

The board supports AGDC continuing as project sponsor through the end of the year, with transition to a new project sponsor planned to be underway by Jan. 1, 2021.

The board passed a resolution at the April 9 meeting emphasizing maximizing the value of the state's investment in Alaska LNG: "AGDC will work with strategic third parties to improve the economic viability and feasibility of Alaska LNG," the resolution says.

Project competitiveness

AGDC is evaluating options to improve the project's competitiveness, including the role of the state and federal governments, according to materials from the May 21 board meeting. On the federal side, since Congress is looking for ways to energize the economy with stimulus, the pipeline would provide an economic backbone for Alaska.

As far as state participation, Gov. Mike Dunleavy made clear after the final environmental impact statement was issued March 6 that the state did not intend to continue as project sponsor.

"The final EIS is a milestone in the Alaska LNG permitting process — a process still with significant hurdles. … FERC licensure is an important component in determining if Alaska LNG, which must be led by private enterprise, is competitive and economically advantageous for development," the governor said.

The board was briefed in executive session April 9 on a strategic plan outlining how AGDC would take the project from state to private sponsorship, with transition to a private sponsor by June 30, 2021, based on a FEED decision support package "including a defined equity structure, defined financing structure, transition to the new Project Sponsor(s) and funding for ongoing WP&B (work plan and budget), as appropriate."

The board does not support AGDC continuing as project sponsor beyond

see **AKLNG PROJECT** *page 5*

CORRECTIONS

First Badami Killian well was B1-38

In a May 1 Petroleum News bulletin about Badami shutting in production that went out to all the newspaper's subscribers, the first Killian sands producing oil well was listed as B1-07, which was drilled by Savant Alaska after it had been purchased by Miller Energy and Miller had emerged from bankruptcy as Glacier Oil and Gas. That was incorrect. The first Badami Killian oil discovery was made in the B1-38 well in 2010 by Savant before the company was purchased by Miller.

Error in Alaska lease report in May 24 issue

The following sentence in the May 24 issue of Petroleum News was inadvertently included in the Alaska lease report story, "Pay leeway in April Alaska lease activity": And the division had the sole power to decide whether the lessee had exercised "reasonable diligence in exploring and developing the lease," considering the funds expended by the lessee, as well as the types of work that was done.

The sentence has since been deleted from the revised HTML version of the story in Petroleum News' online archive, which can found here: https://www.petroleumnews.com/pnads/593108540.shtml.

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● EXPLORATION & PRODUCTION

Division of O&G approves Prudhoe IPA development plan

BP advises division that work in 2020 POD may not be completed because of COVID-19; division has assured company of support

By KRISTEN NELSON

Petroleum News

The Alaska Division of Oil and Gas has approved BP Exploration (Alaska)'s 2020 plan of development for the initial participating areas at the Prudhoe Bay unit. The POD was received March 26, the division said in a May 13 approval, and said an April 1 letter from BP advised the division that "operations described in the 2020 POD may not be completed because of the Coronavirus pandemic."

The division approval said it "appreciates BP's candor and recognizes the possibility that operations described in the PBU 2020 POD may not be completed during the specific POD time-frame due to the global (and by implication local) impact of the pandemic" and said it "assures BP of its support regarding any plan changes necessary to protect the health, safety, and welfare of operations personnel, the physical and economic integrity of the facilities, and preservation of the surrounding environment."

The division is requiring written quarterly updates with the first due June 30.

The division said there are currently 254,235 acres in the Prudhoe Bay unit, with average ownership by BP, the unit operator, of 26.36%, ExxonMobil Alaska Production 36.4%, ConocoPhillips Alaska 36.08% and Chevron U.S.A. 1.16%.

BP reported average production of 165,030 barrels per day of oil and condensate in calendar year 2019, down from an average 174,200 bpd in 2018. The division said that production, combined with the Point McIntyre participating area, "reached full processing capacity for the facility."

Natural gas production averaged 7,031 million standard cubic feet per day in 2019; natural gas liquids production averaged 43,600 bpd in 2019.

Work at Prudhoe

The division said that in the 2019 POD period "BP completed 316 rate-adding jobs, and approximately 564 non-rate adding jobs" with rotary and coil tubing drilling resulting in 27 new wells.

The 2020 plan proposed merging 2019 3D seismic with 2015 North Prudhoe Bay survey; more than 300 rate adding well work jobs and 500 non-rate adding jobs; four to seven rotary wells; 15-20 coil tubing sidetracks; maintenance and upgrades to numerous surface facilities.

Following a positive COVID-19 test at Prudhoe, announced March 31, BP said all non-essential activity on the Slope was eliminated and development drilling was ended for 2020.

Other approvals

In other recent POD approvals, for ConocoPhillips Alaska's Colville River unit (see story in May 24 issue) and Hilcorp Alaska's Ivan River, Lewis River and Pretty Creek gas fields (see story in May 17 issue), the division said those plans were received before disruptions caused by the Coronavirus pandemic, and also assured those companies it would work with them in any plan changes necessary to protect health, safety and welfare of operations personnel, physical and economic integrity of facilities and preservation of surrounding environment.

ConocoPhillips announced April 7 that it was demobilizing its rigs on the North Slope, ending both its winter exploration drilling and development drilling at the Colville River and Kuparuk River units.

Division activity maps updated in mid-May show Hilcorp continuing to operate two rigs at Milne Point on the North Slope and one rig in Cook Inlet. ●

Contact Kristen Nelson at knelson@petroleumnews.com

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AKLNG PROJECT

Dec. 31, 2020, the April 9 meeting overheads said.

"In the event there is not sufficient interest from Strategic Parties to lead the Alaska LNG Project, an open solicitation of interest will be made to other parties," the materials said.

The board, administration and Legislature "will define an acceptable role, if any, in the Alaska LNG Project."

If there is insufficient interest by a new project sponsor, "AGDC will put the Alaska LNG Project assets up for sale in a formal RFP process." ●

Contact Kristen Nelson at knelson@petroleumnews.com

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XL SHOWDOWN

going to transition gradually to a clean economy."

Keystone XL "is just not rational ... it does not economically, nor, in my view, environmentally make any sense," Biden said.

A Biden spokeswoman said the "denial of science (by Trump over carbon emissions from XL) will end on Day 1 of the Biden presidency" regardless of a pressing need by Gulf Coast refineries for 830,000 barrels per day of heavy crude to replace lost feedstock from Venezuela.

XL 'most strategic' of lines

Dennis McConaghy, a former TransCanada executive vice president, said that because of its size XL is the "most strategic" of the three major crude pipelines out of the oil sands — including the Trans Mountain expansion to a tanker terminal on the Pacific Coast and Enbridge's Line 3 to Superior, Wisconsin — that are under all at various stages of construction.

He said XL's potential value in higher oil prices and higher royalties for Alberta make the province's combined US$5.3 billion of equity investment and loan guarantee worthwhile, even though they have been widely portrayed as a dangerous gamble.

A spokesman for TC Energy said "no pipeline project in the history of the industry has been studied more than Keystone XL."

"More than a half-dozen (U.S.) Environmental Impact Studies have been done on Keystone XL over the past 10 years," including the latest U.S. Department of State impact findings released in December 2019, which effectively endorsed the pipeline and prompted TC Energy to resume construction in the U.S., backed by Alberta's US$1.1 billion equity investment and US$4.2 billion of loan, the spokesman said.

Jennifer Rowland, a financial analyst with Raymond James, said it is easier for TC Energy to continue with construction in the U.S. knowing it has the backing of a substantial loan guarantee from the Kenney government.

The TC Energy spokesman said that during peak construction aimed at completion of the pipeline in 2023, the project would employ 10,400 construction workers in the U.S. and 2,800 in Canada.

Keystone XL is "an important North American energy infrastructure project that will spur billions of dollars in new private sector investment and create thousands of high-quality jobs at a time of unprecedented economic uncertainty and unemployment," he said.

Trudeau: not a death blow

Canadian Prime Minister Justin Trudeau, not known for his backing of energy mega-projects, said he would not view the election of Biden as a death blow for Keystone XL, promising he would advocate for completion of the pipeline.


JUSTIN TRUDEAU

"It's long been a position of mine that we need to get our resources to new markets safely and securely and that's why I've always advocated for Keystone XL," he told reporters.

Alberta Premier Jason Kenney took an even harder line in what shapes up as a cold

see **XL SHOWDOWN** *page 12*

continued from page 1

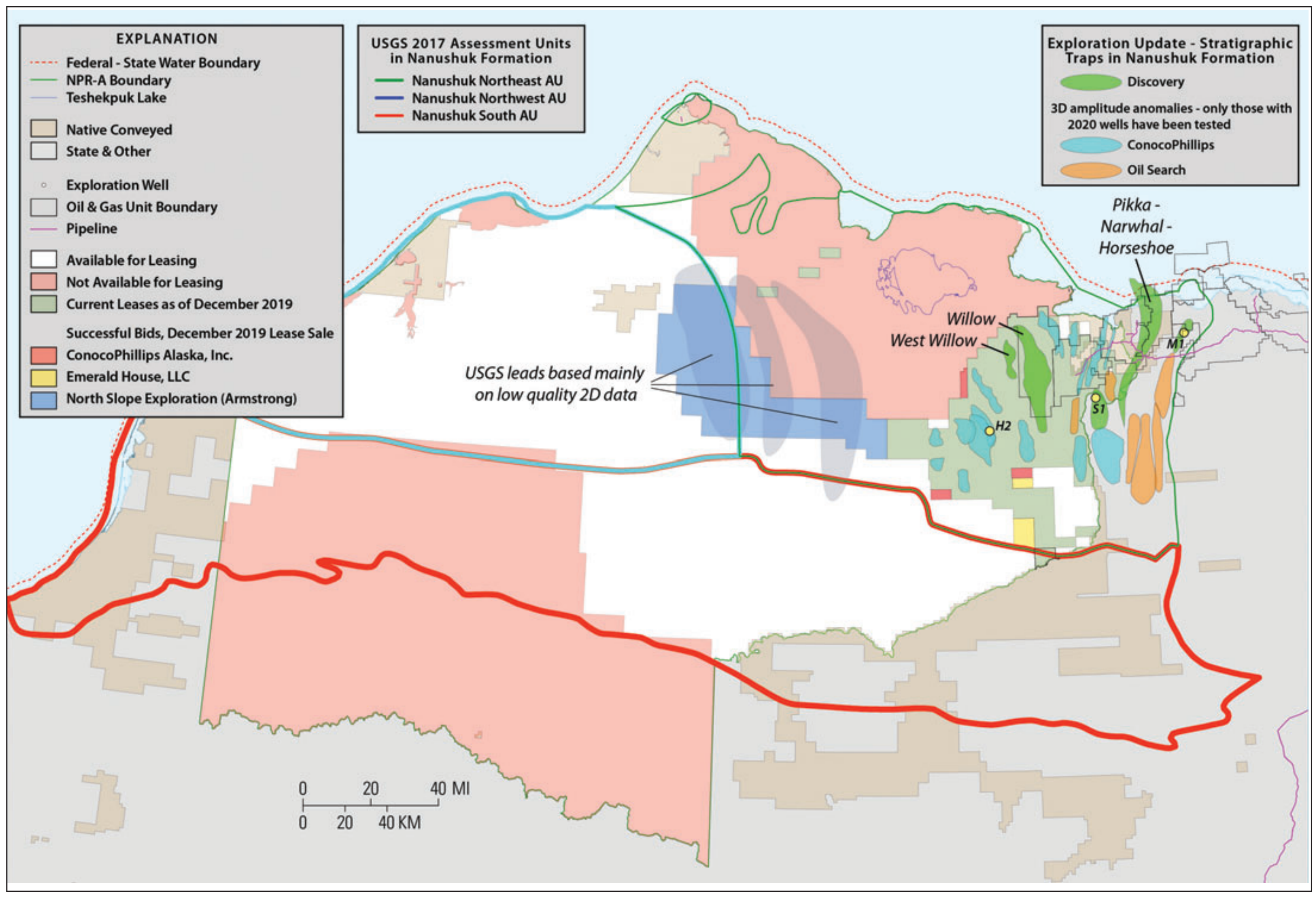
NANUSHUK PLAYS

the major North Slope petroleum bearing rock sequences. Although rocks of the Brookian are found across the entire North Slope, the Nanushuk is found mainly in the more westerly part of the region. The rocks of the formation were generated from sediment pouring from the west into an ancient marine basin. As these sediments accumulated on and down the basin margin, the margin migrated from west to east, eventually coming to a halt at what is referred to as the ultimate shelf margin, a few miles to the east of what is now the Colville River delta.

Following the discoveries of the Prudhoe Bay and Kuparuk River fields in rock reservoirs much older and deeper than the Nanushuk, subsequent exploration mainly focused on these deeper rocks, with Brookian strata such as the Nanushuk generally being ignored. Until that is 2015, when Armstrong Oil & Gas Inc. and Repsol E&P USA Inc., taking a contrarian view of conventional North Slope exploration strategies, made the Pikka discovery to the east of the Colville delta. That discovery upended expectations for potential oil volumes in the Brookian.

The Nanushuk oil reservoirs consist of a series of sand bodies that were deposited at the top and down the upper slope of the ancient marine basin margin, as that margin migrated east. While the sand bodies can be identified in seismic cross sections, anomalously high seismic amplitudes, particularly in high resolution 3D seismic, can point to potential oil accumulations.

Houseknecht said that the potential oil reservoirs have distinctive geometries. Some, such as those of the Pikka discovery, tend to be thick but narrow, fairly elongated and generally oriented north to south. Others, such as ConocoPhillips' Willow discovery tend to be more oval in shape. These different geometries may lead to different reservoir performances.



Discoveries and seismic anomalies in the Nanushuk formation. M1, S1 and H2 are the Mitquq, Stirrup and Harpoon exploration wells drilled this winter. USGS sees significant potential for finding oil prospects in three areas (marked in grey) to the west of current exploration activity.

Continuing exploration

There has been continuing exploration drilling along the trend of that original Pikka discovery. An oil discovery by the Horseshoe well, drilled in 2017 by Armstrong and Repsol to the south of Pikka, established what became referred to as the Pikka-Horseshoe trend. Evidence of pressure communication in the oil along this trend suggests the existence of an interconnected reservoir system.

Successful nearby exploration drilling by ConocoPhillips has resulted in what that company refers to as the Narwhal trend. USGS now refers to this complete system of discoveries and associated sand bodies as the Pikka-Narwhal-Horseshoe trend.

However, although Armstrong has indicated that an oil gravity gradient suggests that the reservoirs at Horseshoe and Pikka are in communication with each other, there has been no public statement regarding possible pressure communication between Horseshoe and the nearby Putu and Stony Hill exploration wells that enabled ConocoPhillips to identify its Narwhal trend, Houseknecht said.

And the possibility of reservoir communication between these various discoveries is intriguing, given the potential for significant complexities in lease unification, development strategies and the determination of resource ownership. Moreover, with the likely need for hydraulic fracturing of the relatively low permeability reservoirs, there is the potential for pathways to open up between adjacent reservoir rock bodies, Houseknecht commented.

Also, the shelf margins that form the reservoirs tend to be more separated to the south, while tending to converge to the north, thus leading to complex reservoir geometry, he added.

To the west of the Colville River delta, in the northeastern National Petroleum Reserve-Alaska, ConocoPhillips had been conducting drilling in its Willow and West Willow Nanushuk discoveries. This winter the company drilled two further appraisal wells, leading to a total of 12 wells in the discoveries and presumably meaning that the discoveries are now well delineated, Houseknecht said.

Publicly available information suggests recoverable oil volumes of 1,000 million to 1,500 million barrels in the Pikka-Narwhal-Horseshoe trend and 400 million to 750 million barrels in Willow and West Willow, Houseknecht said.

This winter's exploration

This winter Oil Search drilled two exploration wells to the east of the Colville River: the Mitquq and Stirrup wells. The Mitquq well, to the east of Pikka, encountered oil both in the Nanushuk and in deeper Alpine sands. In the Nanushuk the well penetrated 29 feet of gas and 143 feet of oil, but no water, Houseknecht said. The absence of water is intriguing, suggesting that there could be a reasonably sized oil accumulation to the south, depending on how far the reservoir extends, he said. Curiously, the well does not appear to be associated with any seismic amplitude anomaly depicted on Oil Search's publicly published maps, he said.

The Stirrup well on the other hand, located west of the Horseshoe well and some distance southwest of Pikka, is at the northern end of a seismic anomaly that has appeared in an Oil Search publication. The Stirrup well also flowed oil from its Nanushuk target. Intriguingly, Oil Search's anomaly map for Stirrup overlaps with the northern end of an anomaly mapped by ConocoPhillips, raising questions regarding whether both anomalies represent a single reservoir, Houseknecht commented.

ConocoPhillips drilled one Harpoon well this winter, in a Nanushuk prospect in NPR-A, southwest of Willow. The company has not released any information about the results of this drilling, although there is a rumor that an oil-saturated core was recovered from the well, Houseknecht said. The drilling ended early. But was this because of COVID-19 or because of disappointing findings?

High potential farther west

Some distance west of the area where the Harpoon well was drilled, USGS has used relatively low quality 2D seismic data to identify three large north-south trending exploration play zones where the agency sees significant promise for the discovery of further Nanushuk prospects. One of the surveys, the Ikpikpuk survey, is

see **NANUSHUK PLAYS** *page 12*

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PEBBLE GASLINE

would shrink to a 50-foot permanent operations ROW following completion of pipeline construction.

The pipeline would come ashore at Diamond Point port, where natural gas would be fed to the port site power station and used for site heating.

Diamond Point is approximately 25 miles north of the Amakdedori port, which under the Alternative 1 variant of the EIS would have been the gateway to the Kokhanok east ferry terminal site. Under that scenario the gas pipeline would run overland from the Amakdedori port to the Village of Kokhanok, and from there it would continue under water across the bed of Iliamna Lake to the north shore.

The Amakdedori port would not be constructed under Alternative 3.

Alternative 3 designates an all land-based transportation route to connect the proposed mine site to a port site on Cook Inlet via an 85-mile double lane road located north of Lake Iliamna, which eliminates the need for ferry transport across the lake.

The northern transportation corridor would serve as the main access route to and from the mine for the transportation of materials, equipment, and concentrate. Truck transportation and the Diamond Point port would operate year-round.

The Alternative 3 road system would include 17 bridges that range in length from approximately 40 to 625 feet, and approximately 105 culverts — 37 of which would be designed for fish passage.

75 miles across Cook Inlet

The subsea Cook Inlet portion of the Pebble Mine gas line would originate on the east side, making connection to existing gas pipeline infrastructure north of Anchor Point on the Kenai Peninsula. The subsea line would extend 75 miles to Ursus Cove on the west side.

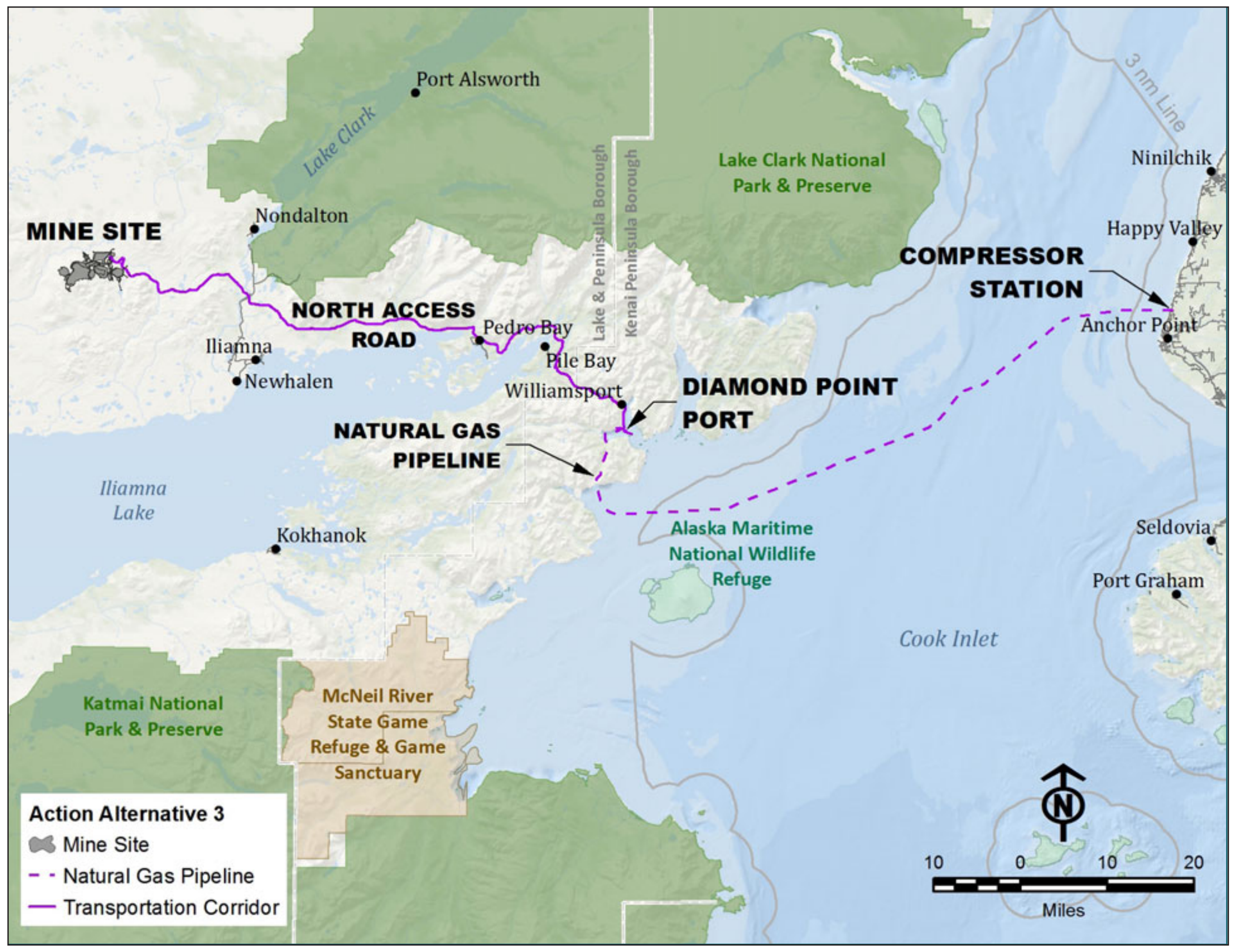
The main compressor station for the line would be located on the east side at Whiskey Gulch.

Pebble Limited Partnership LLC drew a land use permit in April 2019 from the Alaska Department of Natural Resources State Pipeline Coordinator's Section to cross state owned tidelands from the Whiskey Gulch access road off the Sterling highway, to conduct borehole drilling for geotechnical data collection.

The data is needed "to evaluate ground conditions for a proposed horizontal direction drill located near the point of origin of the proposed gas pipeline from the Kenai Peninsula."

The total depth estimated for each borehole ranged from 120 feet to 300 feet, depending on geology encountered.

Two boreholes sites and work areas were designated; Site A is located along the Sterling Highway, and Site B is located along the beach at Whiskey Gulch. Site A access is directly from the southbound shoulder of the Sterling Highway. ●



U.S. ARMY CORPS OF ENGINEERS

The subsea Cook Inlet portion of the Pebble Mine gas line would originate on the east side, making connection to existing gas pipeline infrastructure north of Anchor Point on the Kenai Peninsula. The subsea line would extend 75 miles to Ursus Cove on the west side.

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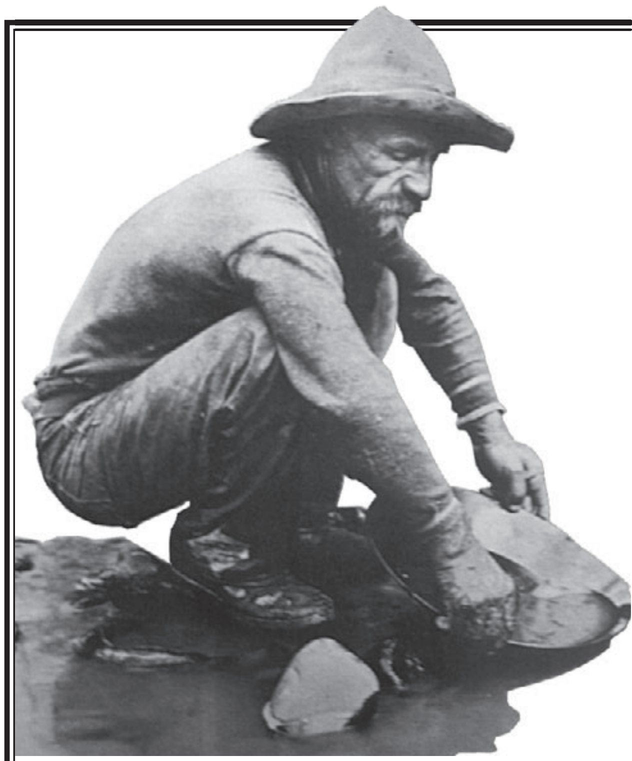

PAID MESSAGE TO GOV. DUNLEAVY & ALASKA LEGISLATORS FROM OILMAN JIM WHITE

THE TRUE BACKBONES OF ALASKA ARE THE ALASKA NATIVES, PRE-STATEHOOD RESIDENTS AND HOMESTEADERS THAT VOTED AND CREATED THIS GREAT STATE OF ALASKA. THEY ARE THE FORGOTTEN REAL HEROES OF ALASKA.

"RESULTS ALWAYS DEFINE INTENT"

Alaska has been a state the last 60+ years. Since Alaska became a state some 60 years ago, not one sole resident Alaskan has been able to explore or produce a single drop of oil or gas from his or her property. As a result, the immense wealth generated by Alaska's oil and gas has gone outside the state rather than staying in the hands of individual Alaskans.

Something is terribly wrong with this "result." So, let's try to get to the heart of how we got here and what we can do to change it.
After buying Alaska from Russia coaxing more citizens to come to the new territory of Alaska to homestead became a strategic necessity for the defense of the lower 48 states of America.

Following world war II, the US government desperately needed to have more new settlers to come, reside and settle in the new territory of Alaska to attempt to provide needed local civilian contract personnel in Alaska and produce fresh food and milk to service the thousands of soldiers and sailors who were being stationed in the territory of Alaska that were providing the 1st line of defense to protect the lower 48 states from any threats of any foreign nation.

Since Alaska's gold rush, the US had been trying to entice new citizens to come to the territory of Alaska. The US government promise to any new settler was that they could come pick a new homestead in the territory of Alaska. The US Interior Department rules were clearly understandable by any new Alaskan homesteader. If he or she lived on that homestead for two years and made certain improvements on the land, then they could keep the land and all the oil or gas that might be produced beneath it. That was how the Katalla Oil Field, Alaska's first oil field, was developed and was the enabling fact that allowed the Kennecott Copper mine to profitably produce and sell Alaska's copper for the next 30 years. To this day, this shallow oil field of wells less than 1000 feet deep is still owned by private citizens.

Many lower 48 citizens came up to the frigid new territory of Alaska to attempt to prove-up a new Alaskan homestead. These new folks soon found out living in the Alaskan brush was an arduous task that required some cash, but a whole lot of extreme physical work, extreme privation, and a lot of ingenuity just to prove up his new homestead and survive for the two year requirement. To be awarded a homestead they had to live in an area having few if any roads, few neighbors, a lot of big bears, and no electricity or running water. But they knew if they toughed it out, they would end up owning the land and everything below it to call their own.

This all changed when Swanson River Oil Field was discovered on the Kenai Peninsula in 1957. Suddenly there was a major push to stop any homesteader anywhere in Alaska from being able to own their oil and gas beneath their property. It took an act of congress to ensure that the pre-1957 homesteaders got to keep their oil and gas, but everyone else was out of luck. Those that homesteaded their property after 1957 did not even get to keep the gravel, much less the oil and gas beneath their land. The state government could clear the trees off their property and take the gravel if they needed it to build a road.

But the pre-1957 homesteaders were different; they owned the oil or gas beneath their lands **ONLY IF** they could get it to the surface and could cash in on it. The bottom line is this, if you cannot get the oil or gas beneath your property to the surface, you don't frickin own it.

In the 1970's the federal government only required a $10,000 bond to drill on federal lands. On homesteader's land, the state of Alaska in its infinite wisdom set a bonding requirement that was ten times higher. Before any homesteader could even think about drilling even a shallow oil or gas well on their own land they would have to come up with $100,000 cash bond. How many homesteaders do you know had an extra $100,000 laying around in 1970? It is important to note that there are thousands of oil and gas wells in the lower 48 that produce from less than a couple hundred feet below the surface.

But wait, it gets even better. The state of Alaska has now raised the homesteader's bonding requirement from $100,000 to $400,000! Even though the homesteader or their heirs technically own their oil and gas if they can get it to the surface, the high bonding requirements deprives them of their ability to get it to the surface where it can actually be sold and put into their bank account.

Another thing, the high $400,000 drilling bond cost is just another form of state-imposed taxation. Unfair taxation was the premise that caused the 1770-settlers of Boston to dump all its English tea into the Boston Harbor.

This is a double whammy! The land is already required by law to be pledged as collateral to pay all well plugging costs beneath his own homestead regardless, even if someone else had drilled the well. Even though there are only a couple of hundred of pre-1957 homesteaders, the state of Alaska bureaucrats who are pushing for higher bonding amounts are effectively throwing the homesteader who helped create this great state of Alaska under the bus.

The end result of these unreasonable excessive drilling bonds is that not one Alaskan resident has ever been able to produce or sell a single drop of Alaska's oil or gas since Alaska became a state some 60 years ago.

You might be thinking, "But what about the environment? If we let people drill on their own land, won't they trash it?" This land is their life. The homesteaders love their land more than anyone. They and their heirs know the tremendous sacrifice and effort they had to put in to get this land. It is preposterous to say they don't care about what happens to their land.

This writer believes that the current elected governmental officials are trying to do their best to restore equity back to the individual citizens of Alaska. We just need to make sure they do the right thing by lowering the bonding requirements so that individual Alaskans can be capable to rightfully explore for oil or gas on their own property.

Please again carefully remember, it is only when the oil or gas has come to the surface of the homestead can any homesteader be able to convert this produced oil and gas to cash-in-hand, and be deposited in the homesteader's own bank account.

The state should be compelled to disclose all its findings for these drastic measures penalizing and depriving pre-statehood homesteaders of the option to convert any or all of their oil and gas beneath their pre-statehood homestead to the homesteader's ownership.

-Jim White

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ONLINE SALES

DNR said in a May 21 press release.

The state began holding lease sales in the 1960s and has relied on in-person auctions and sealed-bid openings.

DNR changed its regulations to allow for online lease applications, bids and lease payments, changes which went into effect the end of last year.

"The changes contained in these new regulations will empower the Division of Oil and Gas to apply modern digital and technical solutions to provide efficient leasing services to the oil and gas industry," DNR Commissioner Corri Feige said Dec. 2 when the regulatory changes were filed with the lieutenant governor.

Prior to last year's changes, bids for oil and gas leases on state land had to be submitted as paper bids, with a bid deposit, sealed by the bidder, delivered to the division and opened in public. The procedure had been the same since statehood.

EnergyNet Services

DNR said the division contracted with EnergyNet Services LLC last year to use the company's Internet platform for the spring sales, inaugurating what Feige said promises to be a relationship which will enhance the state's ability to make its hydrocarbon resources available to broader markets.

"Our department, like all of Alaska's state government, is working to find new ways to do business more safely, efficiently and effectively in the days of social distancing due to concerns over COVID-19," Feige said May 21. "Our new relationship with EnergyNet will bring our leasing program into the 21st century, while making our outstanding hydrocarbon opportunities more visible and attractive in a global marketplace."

A preview of the state's spring sales went live on EnergyNet in late April.

DNR said EnergyNet has more than 20 years of online oil and gas sales experience and hosts sales for many state governments, trust land offices, the federal Bureau of Land Management and private companies.

Sale details are available on the division's website.

Information on the online bidding process is at http://www.energynet.com/.

—KRISTEN NELSON

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EMISSIONS PACT

Regulations signed off by the Canadian government and the other nine provinces have been in effect since Jan. 1.

Wilkinson said stumbling blocks that surfaced during negotiations included mostly technical disagreements over testing and monitoring emissions.

Canada's fossil fuel industry has made some headway in lowering what are known as "fugitive" emissions from 70 million metric tons in 1998 to 54 million mt in 2009, at which point progress was stalled.

At that stage, Alberta (the source of 33 million mt), Saskatchewan (15 million mt) and British Columbia (4 million mt) opted to make their own rules, while the federal government set a goal to slash the emissions by 40% from 2012 levels by 2025, that would have been the equivalent of shutting down all of Canada's oil refineries.

The Boston-based Clean Air Task Force estimated that Alberta's rules would have yielded a 32% cut, or 80% of Canada's minimum target.

On methane Alberta said its rules were "stronger and cheaper" than those of the federal government.

In agreeing to further tighten its standards, Alberta won over the senior government, yielding a win-win-win for Alberta Premier Jason Kenney, Prime Minister Justin Trudeau and the environment.

Releasing methane directly into the atmosphere is rated as worse for climate change than end-use combustion because when the gas is burned it turns into less harmful carbon dioxide.

Jan Gorski, a senior analyst at the independent Pembina Institute, said that if Alberta would go beyond the current methane targets it would demonstrate "global leadership" and help improve the tarnished image of its oil and gas sector.

Tim McMillan, president of the Canadian Association of Petroleum Producers, said the Alberta "framework supports a flexible, results-oriented approach to reducing emissions while stimulating technology and innovation essential to meeting our environmental performance goals at this critical time."

Releasing methane directly into the atmosphere is rated as worse for climate change than end-use combustion because when the gas is burned it turns into less harmful carbon dioxide.

As the principal component of natural gas, methane is highly valuable, thus limiting leaks is also seen as a cost-effective way to cut greenhouse gas output.

—GARY PARK

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TAPS FLOW

lion barrel tank farm at the Valdez marine terminal.

Occasional prorations are routine; the flow reductions this spring were not connected to the drop in oil prices and the coronavirus pandemic.

In an April 24 interview, Michelle Egan, chief communications officer for Alyeska told Petroleum News the 50,000 barrel-per-day reduction that began earlier that day was simply part of the day-to-day management of the pipeline.

Egan said the pipeline system is not a storage facility. If inventory in the pipeline system rises above 75%, Alyeska adjusts by altering tanker schedules, or by proration — requesting producers to send less oil.

"This time of year, high inventory is not uncommon," Egan said.

Alyeska seeks to avoid prorations

"Prorations are something we work hard to avoid," Betsy Haines, Alyeska senior vice president of operations and maintenance told the Alaska House Resources Committee at a meeting in Anchorage May 8.

Alyeska looks at several factors for analysis — the upstream, the capacity of the terminal and the vessel movements, she said.

"Believe it or not, (the factors) do change almost daily." Haines said. "We will certainly be looking at the information that's provided to us from all connectors as we go into the month of June."

Haines said that a COVID-19 related 100,000 bpd North Slope production cut announced April 30 by ConocoPhillips was not factored into Alyeska's proration research in April, which determined an equal cut to all the connectors.

"We've used the same basis because this has been a constant proration that is occurring though April now into May, and the information that is coming in from the Kuparuk connections is information that is independent from the prorations," she said.

Alyeska will continue working closely with connectors and marine shippers to manage inventory, the company said in a May 21 press release.

"Delivering every barrel possible is good news for TAPS, and great news for Alaska, the North Slope and domestic energy supply," McCown said. "We're committed to doing our part in getting the country back on its feet."

—STEVE SUTHERLIN

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WHISKEY GULCH

preparation, drilling and well evaluation to start June 18, and project demobilization to get underway on Aug. 1 and be finished by Aug. 5.

Each well will be plugged and abandoned consistent with regulatory requirements.

Strat wells WG-4 and WG-6 will affect ADL 392666 and wells WG-5A, WG-9A and WG-11 will affect ADL 392496.

First batch of Whiskey Gulch wells

According to Alaska Oil and Gas Conservation Commission records Hilcorp previously drilled four 600-foot stratigraphic wells at Whiskey Gulch, plugging and abandoning them late last year — WG-7, WG-10, WG-2 and WG-1B.

WG-7 was on lease KPB ROW; WG-10, WG-2 and WG-1B show in AOGCC records as on unidentified "Fee Private" land.

A fifth strat well was permitted with AOGCC at that time, also on Fee Private estate, but was not drilled.

The confidential results of the four strat test wells that were drilled will be released at the end of December 2021, as will more information on the undrilled fifth well, per AOGCC.

According to Alaska Oil and Gas Conservation Commission records Hilcorp previously drilled four 600-foot stratigraphic wells at Whiskey Gulch, plugging and abandoning them late last year — WG-7, WG-10, WG-2 and WG-1B.

No new roads, structures

No new roads, airstrips or other facilities are planned as part of the five-well program to begin in June. There are also no buildings or structures, solid waste sites or utilities. No fuel and hazardous substances or related storage of such, are planned. All water necessary for operations will be acquired from an approved source.

Cuttings generated by drilling activities will be captured in a tank and transported to an approved disposal facility.

The area required for each stratigraphic test well will be approximately 35-foot by 70-foot. Should ground conditions require, rig mats will be set in place to provide the drill rig unit and support vehicles a firm and stable work surface.

—KAY CASHMAN

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XL SHOWDOWN

war by promising he will go to court and file a free trade lawsuit under the newly ratified United States-Mexico-Canada agreement that supplants NAFTA.

He said his government will "use every legal means at our disposal to protect our fiscal and economic interests" and will intensify his lobbying of U.S. lawmakers.


JASON KENNEY

Kenney said Biden will have a tough time answering to unions, especially when the U.S. emerges from the COVID-19 pandemic anxious to create jobs and investment and to separate the U.S. from its dependence on OPEC crude.

Many legal observers note that whoever wins the U.S. presidential election in November wields decisive power over the fate of XL.

"There's not really any legal limit on a president's ability to get rid of a pipeline, even if it's been built," said James Coleman, an energy law professor at Southern Methodist University in Dallas.

He said Biden could even force TC Energy to dig up and remove any or all sections of XL that had been completed.

But Coleman also said TC Energy has the legal right to sue the U.S. government if Biden scraps the permits issued for XL.

Legal and political analysts view XL as the ultimate symbol in the U.S. and Canada of the climate change debate and believe Biden will exploit the issue to win over followers of Senator Bernie Sanders. ●

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NANUSHUK PLAYS

modern, does contain really good quality data and is available from the Alaska Department of Natural Resources through the state tax credit program.

Houseknecht said that he is aware that a few companies have been reprocessing the old data. Armstrong's lease blocks intersect all three USGS play zones and the company is planning 3D surveying next year. As previously reported in Petroleum News, Armstrong has also bought into some of the Borealis acreage, to the west of Harpoon, thus confirming the company's bullish view of the exploration outlook in the area.

One impediment to exploration in this part of the NPR-A is the withdrawal from oil and gas leasing of lands to the south, west and east of Teshekpuk Lake. Because of environmental concerns the Department of the Interior withdrew the area around the lake from leasing as part of an NPR-A integrated activity plan issued in 2013. When in 2017 then Interior Secretary Ryan Zinke ordered USGS to conduct updated oil and gas assessments of the North Slope, he also directed the Bureau of Land Management to reevaluate that integrated activity plan. However, a revised plan has yet to emerge.

There are some wells drilled by FEX prior to 2013, and some lease blocks, in the closed area to the west of the lake. ●

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