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page Gov. Walker asks for support fromPresident Trump for AKLNG project

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This week's Mining News



Lower opinion of Alaska's mineral potential weighed on Fraser survey ranking. Read more in North of 60 Mining News, page 7.

A May 1 gas line repair deadline

The Pipeline and Hazardous Materials Safety Administration has sent a letter to Hilcorp Alaska proposing an order to set a deadline of May 1 for repairing a leaking subsea gas pipeline in the Cook Inlet. PHMSA, an agency within the Department of Transportation, regulates pipeline safety for the federal government.

If the pipeline is not repaired by May 1, Hilcorp must shut the line down until a restart is authorized, PHMSA proposes. Meanwhile Hilcorp must maintain the gas pressure in the line

see GAS LINE REPAIR page 14

Hilcorp focuses offshore in inlet

EXPLORATION & PRODUCTION

Success at Horseshoe

Repsol and Armstrong make largest US onshore oil find in 30 years

By KRISTEN NELSON

Petroleum News

A major find on Alaska's North Slope has been expanded by exploration drilling this winter.

The Horseshoe exploration well and sidetrack, drilled by operator Armstrong Energy in partnership with Repsol, both found oil in the Nanushuk, Repsol said March 9.

"Repsol and partner Armstrong Energy have made in Alaska the largest U.S. onshore conventional hydrocarbons discovery in 30 years," Repsol said. It said the Horseshoe 1 and 1A wells "confirm the Nanushuk play as a significant emerging play in Alaska's North Slope," extending the play discovered at Pikka by 20 miles.

Repsol said resources currently identified in Repsol and Armstrong blocks in the Nanushuk play

Bill Armstrong said the locations of the Horseshoe wells were determined from a Horseshoe 3-D seismic program.

amount to some 1.2 billion barrels of recoverable light oil.

Earlier this year Armstrong Energy CEO

"The successive campaigns in the area have added significant new potential to what was previously viewed as a mature basin. Additionally Alaska has significant infrastructure which allows new resources to be developed more efficiently," Repsol said.

The company said it has been actively exploring in Alaska since 2008 and since 2011 has drilled mul-

see HORSESHOE FIND page 14

ENVIRONMENT & SAFETY

Removing the pollutants

UAF research focuses on the use of microbes to eradicate spilled hydrocarbons

By ALAN BAILEY

Petroleum News

To find novel ways of dealing with spills of hydrocarbon fluids such as crude oil and diesel fuel, a professor in the University of Alaska Fairbanks has been leading a research project, investigating the harnessing of naturally occurring, oil devouring microbes.

Mary Beth Leigh, associate professor of microbiology in the Institute of Arctic Biology, is particularly focusing on how this spill response technique, referred to as bioremediation, may be applicable in the Arctic. Her research team is looking at bioremediation both for oil spills on land and for offshore spills in Arctic seas, Leigh told Petroleum News in a March 7 interview.

Using plant roots

Leigh said that she has been working on one form of bioremediation, the use of plant roots to encourage microbes to devour oil, since she was a graduate student. Currently her team is running an experiment to use the technique, known as phytoremediation, to clean up diesel fuel spilled from a tank at the village school in Kaltag, on the Yukon River in western Alaska. Diesel spills of this type are common in rural Alaska because of aging tanks, Leigh said.

The workings of phytoremediation depend on the fact that plants tend to secrete chemical compounds

After poor economics restrained activity at its offshore units in 2016, Hilcorp Alaska LLC is planning a fairly robust development program for the area this coming year.

In the waters of Cook Inlet, the local subsidiary of the Texas based independent operates the North Cook Inlet unit, the Granite Point unit, the Middle Ground Shoal unit and the associated Trading Bay unit, North Trading Bay unit and McArthur River field.

see HILCORP FOCUS page 15

AOGCC approves multiphase meter

The Alaska Oil and Gas Conservation Commission has authorized the use of multiphase flow meters for fiscal allocation of production between the West McArthur River and Redoubt Shoal units on the west side of Cook Inlet. This allows Cook Inlet Energy, sole owner and operator of the fields, to decommission the old West McArthur River facilities and process West McArthur River and Redoubt Shoal production at its Kustatan Production Facility.

see FLOW METERS page 13

NATURAL GAS

Canada LNG tide turns

British Columbia, Alberta gas producers chase sales through US LNG operations

By GARY PARK

For Petroleum News

C anada's natural gas producers may be about to take a long-range view of accessing LNG markets in response to a prediction by Moody's Investor Service that global LNG supply will far exceed demand until well into the next decade.

Cheniere Energy, owner of the Sabine Pass LNG terminal in Louisiana, opened the door to that prospect when chief commercial officer Anatol Feygin told analysts at the end of February that his company is looking for supplies as far afield as the giant Montney shale gas play that straddles the northern British Columbia-Alberta border.

He said Cheniere has already entered a supply

Moody's compounded the dismal outlook with a February report that a wave of fresh LNG supply capacity is due to come online at a time when demand from the world's largest importers is weakening.

deal for Montney gas — the first Canadian gas to be exported as LNG if the agreement is set in motion underscoring the sense of urgency among Canadian producers to find a way to compete with U.S. shale producers.

Madeline Jowdy, senior director of global gas and LNG at Pira Energy Group in New York, told

see LNG TIDE page 15

EXPLORATION & PRODUCTION

BP: Prudhoe Bay production costs down

By KRISTEN NELSON

Petroleum News

Bernard Looney, BP's chief executive, upstream, recently used Prudhoe Bay as an example of how the company is driving down its breakeven costs.

At the company's 2017 strategy update, held Feb. 28, Looney said the company had maintained its overall base decline at less than 2.5 percent over five years by improving facility reliability and focusing on well work and infill drilling.

In BP's transcript of the event Looney said that 2016 was a particularly good year for the company, with base decline of less than 1 percent, plant reliability of 95 percent and overall operating efficiency in excess of 85 percent.

Looney said the Prudhoe team "has been focused on developing the most advantaged barrels from across the field — executing well work and optimizing field activities."

"The results have been fantastic — in spite of reduced

drilling, we have reduced decline — holding production almost flat. And the result is a business whose overall breakeven is down by 40 percent," he said.

Over 2016 BP reduced the number of rigs working at Prudhoe from five to two. The company told Petroleum News in January that it held production at Prudhoe Bay, the North Slope's largest field, virtually flat in 2016, compared to annual declines averaging 4 to 6 percent in past years.

40th anniversary

Looney noted that Prudhoe is about to celebrate its 40th anniversary. The field was initially projected to have a 25year life, he said, "so the team on the ground has done an extraordinary job. We have driven the breakeven down by 40 percent and we think there is more to come."

He recognized BP Exploration (Alaska) President Janet Weiss, saying she "and the team believe there is more to come."

Weiss told the Resource Development Council's annual meeting last November that the focus at Prudhoe over the

next few years would be to improve competitiveness by reducing costs both for operations and for new developments, with a goal of making programs that used to require \$80 oil to be economically competitive, economically competitive at \$55 per barrel oil, the number BP officials noted in the strategy presentation as being their expectation for 2017.

Looney said BP believes more operating efficiency is possible and said the Prudhoe team has been down in the Lower 48 looking at the basin there and what they can take back to the North Slope with them.

"We believe that there are decades ahead of us in Prudhoe," Looney said, but that will require continuing "to drive that breakeven price in the right direction."

He also mentioned technology. "I think this is an area where the modernization and transformation agenda has got massive, massive leverage. So there is a lot to do in Prudhoe yet." \bullet

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EXPLORATION & PRDUCTION Hilcorp continuing west side studies

Committed to restarting Stump Lake unit by third quarter or plugging and abandoning wells in 2018; field shut in since 2012

By ERIC LIDJI

For Petroleum News

ilcorp Alaska LLC is planning a comprehensive study of its west side Cook Inlet fields.

The local subsidiary of the Texas based independent operates five units at the northern end of the west side of the basin: Ivan River, Lewis River, Pretty Creek, Stump Lake and Beluga River. While the first four of those are small and managed by state officials, the fifth is among the largest and most important in the region, and is federally managed.

The Ivan River, Lewis River, Pretty Creek and Stump Lake units have been in a holding pattern since Hilcorp acquired them from Unocal in early 2012. The company has devoted fewer resources to those four units than to other corners of its vast portfolio.

The holding pattern will continue this year, according to plans of development filed with the state officials earlier in March. Hilcorp did not drill or workover any wells at those four units in 2016 and is not planning any drilling or workover activities for 2017.

But the regional study could determine the direction of operations going forward.

The review would have the greatest impact on the

Stump Lake unit, which has been shut-in since 2012 due to mechanical issues. The state previously required Hilcorp to conduct a field study. After completing that assessment, Hilcorp "concluded that the conventional life of this legacy field has reached its economic limit," the company wrote in a plan of development submitted to the Alaska Department of Natural Resources on March 1.

Even so, Hilcorp is including the Stump Lake unit in the regional study and has committed to restarting production from the unit by the third quarter of this year.

"If unit production is not resumed by said date, Hilcorp commits to plugging and abandoning of SLU 41-33RD," the company wrote in its plan of development. The SLU 41-33RD well was the sole producing well at the unit in earliest years. But the well was taken offline after mechanical issues arose when Hilcorp attempted to add perforations in 2012. The plugging and abandoning work would occur during the 2018 plan year.

In its 2016 plan of development for the Stump Lake unit, Hilcorp said that its acquisition at the Beluga River unit could create new opportunities for reviving the otherwise uneconomic Stump Lake. Without such "critical mass" of projects in the region, "the economic life of the Stump Lake unit has likely passed," the company added at the time.

The state is reviewing the completeness of the plans. While the state manages the four smaller units, the U.S. Bureau of Land Management oversees the Beluga River unit. Its plan of development is typically due in early May.

Lower production

The other three west side units could also use some assistance.

The Ivan River unit produced 591,000 cubic feet of natural gas per day in 2016, down from 3 million cubic feet per day in 2015. The Lewis River unit produced 140 million cubic feet total in 2016, down from 206.5 million cubic feet total in 2015. The Pretty Creek unit produced 300,000 cubic feet total in 2016, equal to 2015 production.

Pretty Creek also includes a gas storage operation. Hilcorp injected 379 million cubic feet into the unit in 2016 and withdrew 232 million cubic feet. By comparison, the company injected 291 million cubic feet from the unit and withdrew 528 million cubic feet in 2015.

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US crude to reach all-time high in 2018

EIA projecting average of 9.7 million bpd next year led by increased Permian, Gulf of Mexico production, breaking 1970 record

By KRISTEN NELSON

Petroleum News

FINANCE & ECONOMY

.S. crude oil production averaged an estimated 8.9 million barrels per day in 2016, and is forecast to average 9.2 million bpd this year, the U.S. Energy Information Administration said March 7 in its Short-Term Energy Outlook.

That production is expected to increase.

"U.S. crude oil production is now expected to reach an all-time high in 2018, reflecting an increased forecast of domestic oil production growth," EIA Administrator Acting Howard Gruenspecht said in a statement. He said domestic oil output, driven by increased drilling in the Permian basin in Texas and New Mexico and rising production in the Gulf of Mexico, is expected to average 9.7 million bpd in 2018, "breaking the U.S. total annual production record set back in 1970."

The agency said the North Sea Brent spot price averaged \$55 per barrel in

said.

The average Henry Hub natural gas spot price fell by 45 cents per million British thermal units from January to \$2.85 per million Btu, the agency said.

"This winter's warm weather is cutting into U.S. natural gas demand, with natural gas consumption during February expected to be the lowest for the month in eight year," Gruenspecht said. "Lower natural gas demand and above-average gas inventories are putting downward pressure on U.S. natural gas prices, as the average spot price for natural gas is now revised down 12 percent for 2017," he said.

EIA said new natural gas export capabilities in the U.S. and growing domestic

natural gas consumption are contributing to the agency's forecast that Henry Hub natural gas spot prices will rise from an average of \$3.03 per million Btu this year to \$3.45 in 2018.

Crude oil markets

EIA noted that crude oil prices continued to trade in a narrow range during February, with Brent and WTI average spot prices higher by 37 cents and 94 cents, respectively, compared to January.

The agency said the oil market appears to be in "closer balance between supply and demand in early 2017," with voluntary supply reductions by members of the Organization of the Petroleum Exporting Countries and some non-OPEC members apparently "achieving a high degree of compliance."

Global oil inventories are estimated to be down almost 1 million bpd in February, "which would be the thirdlargest monthly decline rate since the beginning of 2014," EIA said, noting that oil market outlook is uncertain because of supply development.

The agency expects supply from non-OPEC countries in the second quarter of this year to be close to the fourth-quarter level from last year, with OPEC supply forecast to decline.

"Lower OPEC market share could complicate whether its members will

see **EIA OUTLOOK** page 13

Maritime Helicopters

"Rising crude oil production from non-OPEC countries, especially from the United States, is expected to curb upward pressure on oil prices for much of 2017," Gruenspecht said, with Brent forecast to average \$55 this year and \$57 next year.

"Crude oil prices are expected to remain stable over the coming months as the global oil market is forecast to be largely in balance during 2017," he said.

West Texas Intermediate is forecast to average about \$1 less per barrel than Brent.

Natural gas

U.S. natural gas production is forecast to average 73.7 billion cubic feet per day this year, up 1.4 bcf per day from 2016, and reversing a 2016 production decline which was the first since 2005. In 2018 natural gas production is forecast to rise by an average of 4.1 bcf per day, EIA



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• NATURAL GAS Walker asks Trump for help with AKLNG

By KRISTEN NELSON

Petroleum News

Citing the value of an Alaska liquefied natural gas project for the U.S. economy, Alaska Gov. Bill Walker has written to President Donald Trump asking for the president's blessing and for support with federal agencies.

Attachments from the Alaska Gasline Development Corp. list a plethora of federal statutory and regulatory changes which AGDC said would "ease fiscal and regulatory hurdles to monetizing Alaska's North Slope natural gas and create new pathways for in-state natural gas infrastructure development."

"As you seek to rebuild our country and make critical investments in our future, Alaska stands ready to assist with an ideal infrastructure project of major national and international significance," Walker wrote.

The governor said the infrastructure to bring North Slope natural gas to market "would result in greater American energy independence, provide a multi-year national economic boom during construction, and generate hundreds of good paying jobs, all while improving our international trade deficit and our strategic importance in the world as international markets become more dependent on American energy."

Walker reviewed project highlights, and told the president that Japan, "a major LNG importer ... looks very favorably on Alaskan LNG," based on imports from the state beginning in 1969. The governor noted that Alaska Native corporations support the project, as do the majority of the state's citizens, but said that because of the size of the project "and the potentially lengthy permitting and construction process, favorable financing is critical."

He said the ways the federal government can support the project are "budget neutral and can include relatively minor amendments to an existing federal loan guarantee previously passed for an Alaskan gas pipeline project" along with "some changes to regulations that would provide Alaska with greater oversight of the existing and well-established pipeline corridor."

AGDC provided a list of changes needed to the Alaska Natural Gas Pipeline Act of 2004, including revised definitions and an increase in the amount of the loan guarantee of up to \$40 billion. Additions to the





GOV. BILL WALKER

DONALD TRUMP

AGDC provided a list of changes needed to the Alaska Natural Gas Pipeline Act of 2004, including revised definitions and an increase in the amount of the loan guarantee of up to \$40 billion. guarantee of up to \$40 billion.

act are also requested, including a statement that "the Alaska Natural Gas Transportation Project qualifies for federal tax-exempt status," an exemption for the project from "all federal wetlands compensatory mitigation requirements of the Clean Water Act," and a requirement that a record of decision be issued 30 days after issuance of the final environmental impact statement for the project, and that all federal agency permits and authorizations required to begin construction be issues within 30 days of the record of decision.

AGDC has also proposed executive branch regulatory actions, including changes to Federal Energy Regulatory Commission authorities, and rescinding Environmental Protection Agency's use of the Aquatic Resources of National Importance in Alaska.

They also request the Alaska project be exempted from regulations of the Pipeline and Hazardous Material Safety Administration which might require the project to pay costs incurred by PHMSA and a direction to that agency to provide no objection to certain proposed conditions for pipeline coating and block valve spacing.

There are also numerous directions and changes aimed at the Bureau of Land Management, the U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service. ●



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State approves Northstar expansion

Allows Hilcorp Alaska to enlarge the Hooligan participating area vertically to include the Kuparuk A sands as well as the C sands

By ALAN BAILEY

Petroleum News

Alaska's Division of Oil and Gas has approved an application by Hilcorp Alaska to expand the vertical extent of the Hooligan participating area in the Northstar oil field. The participating area had previously included the oil-bearing Kuparuk C sands and, with the expansion, now encompasses the deeper Kuparuk A sands.

The field straddles state and federal leases on the border of state nearshore waters and the federal outer continental shelf of the Beaufort Sea.

Since the field first came into production in 2001, oil has come from a reservoir in the Ivishak formation, equivalent to the main reservoir of the onshore Prudhoe Bay oil field. In 2006 BP, the then Northstar field operator, began testing natural gas and condensate production from shallower Kuparuk sands. Sustained production from a single well, the NS-08, in the Kuparuk started in 2010. In 2012 the company applied for the designation of the Kuparuk as the Hooligan participating area. The Kuparuk at Northstar is equivalent to the reservoir rocks of the onshore Kuparuk River field.

But the Hooligan participating area only included the Kuparuk C sands, one of three sand intervals in the Kuparuk formation. In August 2016 another of the Northstar wells, the NS-18 well, began gas and condensate production from the deeper Kuparuk A sands: Hence the need for a participating area expansion.

Gas injected in Ivishak

The Kuparuk gas is injected into Northstar's Ivishak reservoir for enhanced oil recovery from that reservoir. Petroleum News understands from Hilcorp that the Kuparuk condensate is separated from the gas and exported from Northstar along with the liquids from the field's Ivishak production.

Given that the Kuparuk A is capable of hydrocarbon production or of contributing to production in paying quantities, the division has decided that the expansion of the Hooligan participating area is appropriate and has backdated the expansion to Aug. 1, the first day of the month when Kuparuk A production began.

Cumulative gas production from the NS-08 well through December 2016 was 78.07 billion standard cubic feet, while the well has produced about 3 million barrels of condensate during that time, the approval document says. On Dec. 17, 2016, the NS-18 was perforated in the Kuparuk C, thus initiating co-mingled production from both the A and the C sands through that well — by the end of December the NS-18 well had a cumulative production of 2.25 billion cubic feet of gas, since the

see NORTHSTAR page 13

• PIPELINES & DOWNSTREAM

Roller-coaster on Canada's rails

Signs of oil rail shipment resumptions after decline face setback; Transportation Safety Board recommends tougher regulations

By GARY PARK

For Petroleum News

A fter a year of month-over-month declines in crude oil shipments that have forced them to cut freight rates, Canada's railroads entered 2017 with some mildly encouraging news only to run headlong into a call by the federal transport regulator for the Canadian government to toughen rules for oil trains.

The latest government statistics reveal that shipments of fuel and crude oil experienced a decline of 16 percent in 2015 that accelerated in mid-2016, partly reflecting both the sharp drop in crude prices and in oil sands production following devastating forest fires in northern Alberta.

The National Energy Board estimated that rail hit a peak in October 2014 of 241,000 barrels per day before plunging to about 100,000 bpd by the end of 2015, only 10 percent of Western Canada's crude oil rail loading capacity of 1,075,000 bpd.

The federal regulator has yet to release its numbers for 2016, although industry estimates put the rail volumes at 120,000 bpd in November.

Pipeline is king

Jean-Jacques Ruest, executive vice-president at Canadian National Railway, conceded that "the pipeline really is king. It dominates the marketplace" on a costper-barrel basis.

Just before he stepped down in February as chief

executive officer of Canadian Pacific Railway, Hunter Harrison said he expected continued headwinds for crude shipments.

Dirk Lever, an energy infrastructure analyst at AltaCorp Capital, said the reason was simple — shipping costs on pipelines are about C\$5 a barrel compared with C\$10-C\$15 by rail.

The blow for Canada's two big railroads is compounded by the fact that they have embarked on expensive debottlenecking initiatives on congested stretches of track in recent years, spurred on by forecasts of a sharp rise in crude-by-rail shipments.

Crude oil producers and pipelines have also seen their investments in rail shipping capacity experience a setback, notably a joint venture by Imperial Oil and Kinder Morgan to control 210,000 bpd of rail capacity in Alberta and Cenovus Energy, which owns 100,000 bpd of capacity.

"People have been calling us, hedging their bets," said John Zahary, chief executive officer of Altex Energy, a crude-by-rail logistics firm, which moves about 20,000 bpd from three main rail offloading facilities, down 10,000 bpd from its peak.

NEB clings to growth prediction

However, the NEB is clinging to its prediction of a possible tenfold growth in crude-by-rail operations if no new major pipelines are built from Alberta to domestic and both U.S. and offshore markets to handle its project-ed growth in oil sands output to 6.1 million bpd over the

next 25 years from current levels of 3.8 million bpd.

Under its "constrained-case" model, the NEB said that if its 2040 target is achieved at least 1.2 million bpd will need to travel by rail, although the regulator's chief economist Shelley Milutinovic said that unless new pipelines are built production in 2040 could fall 500,000 bpd short of the board's forecast.

Call for study

The glimmers of hope for a turnaround in rail business may have been overshadowed in a February recommendation by Canada's Transportation Safety Board which has urged the federal government to study the factors that cause fiery train derailments, including train speed, tank car design and worker training, calling for a change of rules to prevent loss of life and environmental destruction.

The recommendation follows an investigation into a 2015 derailment in Northern Ontario of a 100-car Canadian National train, when 19 oil cars burned for five days while spilling 1.7 million liters into a nearby river and lake.

TSB Chair Kathy Fox said it was only lucky the accident occurred on an isolated stretch of rail, but the factors involved — inadequate track maintenance and personnel training, the train speed and tank cars that were not sufficiently robust raise concerns about the outcome of a similar accident in an urban area.





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AOGCC reduces Hilcorp fine to \$200,000

Cites changes in company's behavior, losses while commission had rigs shut down, some duplication of fines in proposed action

By KRISTEN NELSON

Petroleum News

The Alaska Oil and Gas Conservation Commission has reduced a civil penalty it charged Hilcorp Alaska from \$720,000 proposed in November 2015 to \$200,000. AOGCC imposed the fine for regulatory violations during operations at Milne Point unit well J-08A in September 2015. During a workover operation on the well, three workers on Automated Service Rig. No. 1 were overcome by nitrogen in an enclosed mud trailer.

The commission said approved workover operations on MPU J-08A included replacement of a failed electric submersible pump and the use of seawater to perform a well cleanout. Use of nitrogen during the workover operations was not authorized, AOGCC said.

"Hilcorp has a significant history of noncompliance with AOGCC regulaHilcorp said in a March 3 release that the company has worked closely with regulators, done its own investigation and applied lessons learned.

tions," the commission said in its March 3 order, but also said Hilcorp has taken steps to improve regulatory compliance. It said Hilcorp took a considerable financial hit when the commission shut down the company's four workover rigs in the state for most of October 2015 and said it partially agreed with Hilcorp's argument that some of what it proposed consisted of multiple penalties for a single act.

Hilcorp's response

Hilcorp said in a March 3 release that the company has worked closely with regulators, done its own investigation and applied lessons learned.

The company emphasized its focus on safety, environmental preservation and adherence to regulatory requirements. "Personal health and safety is of the utmost importance to Hilcorp and we are doing everything we can to ensure responsible operations," the company said. It also said it has reviewed procedures "and has taken steps to make sure we do not have a similar incident occur."

The company said that over the past 12 months it has worked to improve regulatory compliance, and said while it has more than doubled its Alaska workforce in the last five years, its "Occupational Safety and Health Administration performance in Alaska has remained above the national average."

"Although Hilcorp disagrees with some of the findings in this order, the company does not plan on appealing this decision," the company said.



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Potential severity of outcome

When the commission imposed the \$720,000 civil penalty in November 2015 it cited "the potential severity of the outcome of Hilcorp's actions, Hilcorp's ongoing history of performing work outside of approved permits or managementof-change protocols, its history of compliance issues and the need to deter" in setting the amount of the proposed fine.

Most seriously, the three ASR1 workers were overcome by nitrogen in the process of the workover operation, lost consciousness and the event "would have been fatal for three ASR1 personnel except for one worker's good fortune to collapse into the fresh air environment outside of the enclosed trailer. Exposure could have been prevented," the commission said in its November 2015 notice of proposed enforcement.

The commission said Hilcorp was not authorized to use nitrogen in the operation and had applied only to use seawater in the well cleanout portion of the work. Nitrogen was used, a valve was left open during the workover and nitrogen displaced oxygen "to a deadly level" in an enclosed mud trailer.

Reduced fine

In discussing the reduction of the fine to \$200,000 the commission said "during the past twelve months, Hilcorp has taken initiatives that have improved their overall regulatory compliance." AOGCC also said that after its initial investigation it had stopped work on all four Hilcorp workover rigs in Alaska from Oct. 1 to Oct. 26, 2015, until the company could demonstrate compliance with the commission's conditions for restarting work, and said it "recognizes that this shutdown of well workover operations had a significant financial impact to Hilcorp."

And the commission said it found "some merit in Hilcorp's claim that AOGCC has issued multiple penalties for a single act," with some penalties overlapping, but said it "does not agree the entire incident comprises a single act and finds that Hilcorp has violated three distinct regulations in the conduct of workover operations at MPU J-08A." ●

Contact Kristen Nelson at knelson@petroleumnews.com

continued from page 5



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She said the TSB believes currently permitted speeds — 50 miles an hour outside urban areas and 40 mph in densely populated areas — are "too high" for trains hauling flammable goods.

The TSB is still haunted by the 2013 explosion of a runaway train carrying Bakken crude that killed 47 people in the Quebec town of Lac-Megantic.

Canadian National said it has improved the training of 100 track inspectors following the Ontario derailment and expanded the use of digital imaging and other technology to identify track wear and fatigue, adding it has budgeted C\$2.5 billion this year to enhance safety.

The Canadian government did not offer a response to the TSB recommendations. ${\ensuremath{\bullet}}$

Contact Gary Park through publisher@petroleumnews.com





Page Newmont moves into Yukon, agreesto C\$58M deal with Goldstrike

www.MiningNewsNorth.com

The weekly mining newspaper for Alaska and Canada's North



Situated within five miles of deep tidewater on the Alaska Peninsula, CopperBank Resources' Pyramid project hosts an estimated 1.34 billion pounds of copper, 74.4 million lbs of molybdenum and 488,000 ounces of gold.

CopperBank hires DOWL for early Pyramid infrastructure planning

CopperBank Resources Corp. March 7 said it has hired DOWL, an Alaska-based engineering firm, to provide initial infrastructure planning for Pyramid, an advanced exploration project on the Alaska Peninsula that hosts 172.8 million metric tons of inferred resources, averaging 0.35 percent (1.34 billion pounds) copper, 0.02 percent (74.4 million lbs) molybdenum and 0.09 grams per metric tons (488,000 ounces) gold. "Three very important components of any copper project of merit are geology, location and access to infrastructure," explained CopperBank Executive Chairman Gianni Kovacevic. Pyramid is situated less than five miles from deep tidewater on the Pacific Rim, a great location for shipping copper to Asia or the Americas. In February, CopperBank strengthened its geological team by adding Brigitte Dejou to its board of directors and Colin Burge as a technical advisor. Dejou has 25 years of experience in mineral exploration, including 18 years with Teck Resources and two years of evaluating new projects for Osisko Mining. She has managed a variety of exploration projects from grassroots to pre-feasibility across North America. This includes time at the Red Dog Mine in Northwest Alaska, where she was instrumental in the discovery of the Aktigiruk zinc deposit. Burge is a discovery oriented exploration geologist with 30 years' experience in project development with First Quantum Minerals and predecessor companies. He was part of a corporate development team at Inmet Mining that discovered and delineated more than 30 billion pounds of copper at the Cobre Panama project, leading to First Quantum Minerals' \$5 billion dollar acquisition of Inmet. Dejou and Burge's geological experience will be helpful as CopperBank advances exploration at Pyramid and San Diego Bay, an early stage copper prospect about four miles southwest of Pyramid. "We have established a strong technical team to further assess the geological opportunity at the still open Pyramid deposit, and the San Diego Bay prospect seven kilometers to the west," said Kovacevic. "As for infrastructure, it is never too early in the life of a project to begin to understand how critical components, namely power and port facilities, would look like and potentially be situated." DOWL will assist CopperBank in developing an early stage understanding for key infrastructure components such as potential port site locations, on-site power generating options, and a supporting road network. "This is a great opportunity to leverage DOWL's infrastructure expertise in Alaska," said DOWL President and COO Stewart Osgood. "Working at the very early planning stages of any project is a great fit for DOWL's depth of project experience, and clearly demonstrates CopperBank's commitment to partner with Alaskan firms."



Building a mine at the 39-million-ounce Donlin Gold deposit, which is about 250 miles west of Alaska's road system, would demonstrate that world-class mines can be permitted and developed in remote reaches of the Last Frontier.

MINING POLICY

Falling from favor

Lower opinion of Alaska's mineral potential weighed on Fraser survey ranking

By SHANE LASLEY

Mining News

A laska fell from favor with the 350 mining executives who responded to the Fraser Institute's Survey of Mining Companies 2016, published on Feb. 28. This group of miners, explorers and consultants ranked the Far North State as the 14th best jurisdiction on Earth to seek and develop a mine.

To gather information for its report, the Fraser Institute asks mining executives to rank the mineral potential and mining policies of mining jurisdictions around the globe. The Canada-based thinktank compiles this data into the Investment Attractiveness Index, a measure that weighs miners' perceptions of both the mineral endowment and mining policies of 104 mining jurisdictions.

Though this survey is subjective, it provides valuable insight into the views of global mining executives and what parts of the world they see as good places to get a healthy return on their investments. rounded out the top ten mining jurisdictions on the 2016 Investment Attractiveness Index.

Efficient and open permitting is one area in particular that set Saskatchewan apart in the minds of mining executives.

"In Saskatchewan, the policy of staged and set time periods for getting permits is the one that the entire country should adopt," said the president of and mineral exploration company.

Lower mineral potential?

Interestingly, it was a lower opinion of Alaska's mineral potential that pulled the Far North State down six places on the 2016 Investment Attractiveness Index.

Each year, the Fraser Institute asks mining executives to ignore current policies that may sway investment decisions and rank global jurisdictions strictly on their geological endowment. Referred to as the Best Practices Mineral Potential Index, this portion of the survey is meant to level the playing field in terms of policy and measure each jurisdiction's pure mineral potential in the

see NEWS NUGGETS page 10

"A richness of mineral reserves, coupled with competitive tax regimes, efficient permitting procedures and certainty surrounding environmental regulations can still attract significant investment—even with slumping commodity prices," explained Kenneth Green, senior director of the Fraser Institute's energy and natural resource studies and co-author of the mining survey.

Alaska drops from 6th to 14th place

Considered the second richest mineral district on the planet with decent mining policies, Alaska ranked a respectable sixth place on the 2015 Investment Attractiveness Index. In the latest edition, however, mining executives consider 13 of the state's mining competitors as better places to spend mining dollars.

Where did these miners consider the most attractive place to invest mining dollars? That honor went to the Canadian province of Saskatchewan, followed by its eastern neighbor, Manitoba. Western Australia, Nevada, Finland, Quebec, Arizona, Sweden and Republic of Ireland

eyes of survey participants.

While it would take a literal earth trembling event to change the actual mineral potential of any, or all, of the jurisdictions on Earth over the course of a year, more subtle forces can sway the perceptions of those who are seeking them.

The mining executives that responded to the 2016 Fraser survey ranked Alaska as the 15th richest minerals jurisdiction on the planet, down 13 spots from a year earlier and the lowest such perception of state's mineral potential since 2007.

Neighboring Yukon Territory experienced a similar fall in the opinion of its mineral potential, dropping from fourth for 2015 to 16th on the latest survey. Similarly, Nunavut dropped from eighth to 18th. Northwest Territories bucked this trend, climbing ten spots to 11th on the mineral potential index.

The ten jurisdictions viewed to have the highest mineral potential on Earth are Western Australia, Manitoba, Saskatchewan, Queensland, Quebec, Arizona, Democratic Republic of Congo, Nevada, see **FRASER SURVEY** page 8

NORTH OF 60 MINING

NORTHERN NEIGHBORS

Compiled by Shane Lasley





Discovered by Goldstrike Resource geologists in 2016, this outcrop at Bonanza zone is rich in coarse visible gold, a tendency of numerous discoveries made across the Plateau property in the Yukon.

Goldstrike attracts Newmont to Yukon

Goldstrike Resources Ltd. March 3 reported that Newmont Mining Corp. has agreed to invest as much as C\$53 million to earn up to a 75 percent stake in Goldstrike's Plateau gold property in the Yukon. The agreement includes a C\$6 million private placement financing under which Newmont will purchase 12.71 million Goldstrike shares at C47.4 cents each. As a result, Newmont will have the right to earn an initial 51 interest in Plateau by paying C\$8 million to Goldstrike; investing C\$17.4 million on exploration at Plateau: and completing a NI 43-101 resources estimate on the property. If Newmont decides to up its ownership of Plateau to 75 percent, it must invest another C\$21.4 in exploration and complete a feasibility study for Plateau by the end of 2027. If it does not complete either phase of the earn-in, its interest in Plateau will revert to 49 percent. After earning 75 percent interest in Plateau, Newmont must fund all costs until it delivers a program and budget for the development of the first mine on the property. At this point, Goldstrike has a financing option under which Newmont would fund all costs relating to Plateau, including all mine development costs, and Goldstrike would pay back its share of the costs from 80 percent of the exploration company's share of cash flow from the mine. "Goldstrike is now fully funded to move forward and unlock the full potential of the district-scale Plateau gold project," said Goldstrike President and CEO Terrence King. In recent years, Goldstrike has identified numerous zones with pervasive visible gold along a trend that stretches some 50 kilometers (31 miles) across the 350-square-kilometer (135 square miles) Plateau property. With Newmont now leading the exploration at Plateau, Goldstrike will focus on Lucky Strike, a gold property in Yukon's White Gold district.

IDM raises C\$15.25M, Osisko major investor

IDM Mining Ltd. March 7 announced it has closed a C\$15.25 million private placement with Osisko Gold Royalties Ltd. This financing involved the issuance of 29.4 million common shares at C17 cents per share and 41 million flowthrough shares at C25 cents per share. As a result of the financing, Osisko now owns about 19.9 percent of the IDM shares on a non-diluted basis. The roughly C\$5 million raised from the sale of the regular shares will be primarily used for advancing the development of IDM's Red Mountain gold project in northern British Columbia and for general corporate and working capital purposes. The C\$10.25 million raised through the sale of flow-through shares will be used for requisite Canada exploration expenses. Under Canada tax law, a mineral exploration company that does not generate revenue is able to transfer the income tax benefits generated from the exploration it carries out at qualified Canada projects

see NORTHERN NEIGHBORS page 10



of the weekly newspaper, Petroleum News.

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Ivory Coast and Philippines.

Steady mining policy

While miners' views on Alaska's mineral potential dimmed over the past year, their perceptions of the Far North State's mining policies held firm.

Considered a report card on the mining policies of governments, the "Policy Perception Index" section of the Fraser survey is a compilation of responses on a broad range of policy topics important to miners.

At 23rd on this index, Alaska falls among a group of mining jurisdictions that are found primarily in Europe, Canada, United States and Australia.

For the fourth year running, participants of the Fraser Survey ranked the mining policies of Ireland as the best in the world, giving that country perfect marks in this category.

"The Republic of Ireland is a pragmatic and pro-exploration jurisdiction staffed by individuals with a keen interest in promoting and developing exploration and mining in the country," a manager of an exploration company said.

Saskatchewan, Sweden, Finland, Nevada, Manitoba, Wyoming, New Brunswick, Western Australia and Northern Ireland rounded out the top 10 on the Policy Perception Index.

Infrastructure weighs heavy

Miners' views of Alaska's infrastructure, more precisely the lack thereof, are a heavy weight on the policy perception side of the equation for Alaska.

Known as the Last Frontier for good reason, Alaska hosts several undeveloped world-class mining camps - Pebble, Donlin Gold and the Ambler Mining District, to name a few – that have yet to be tapped due partially to their remote locations.

When asked about the quality and availability of power and roads, mining executives ranked Alaska 76th out of the 104 mining jurisdictions considered.

This low opinion of infrastructure is something that extends to the Canadian territories, Alaska's neighbors to the east.

Mining executives ranked Yukon's infrastructure at 63rd; Northwest Territories at 81st; and Nunavut's at 89th.

While all of these Arctic mining regions are renowned for their mineral riches, the lack of infrastructure increases the costs of realizing this potential.

"The inability of the government of Northwest Territories to ... agree on major infrastructure such as connecting to the southern power grid or building a road into the Slave Geological Region, either of which would greatly reduce the costs of exploration, deters investment in the territory. Power would also reduce the cost of living and attract employees," explained the vice president of an exploration company.

molybdenum project could even file for permits as a reason for being skeptical of the regulatory climate in Alaska.

In fact, the uncertainty over environmental regulations in Alaska was so bad that executives ranked the state 97th in this category on the 2014 survey. Out of the 25 jurisdictions that were ranked worse that year, seven - Michigan, New Mexico, Colorado, Minnesota, Montana, Washington and California - were U.S. states.

While global mining leadership continues to have some anxieties about mining regulations in Alaska this year, they have a much higher regard for state regulators to fairly administer the rules that are on the books.

On the topic of administration, interpretation and enforcement of existing regulations, the miners responding to the Fraser survey ranked Alaska 28th overall and third among U.S. states.

This seems to be largely the result of the Alaska Large Mine Permitting Team, a process enshrined in state law, to help companies hoping to develop a large mine in Alaska coordinate the numerous permits needed to do so.

"Availability of the Large Mine Permitting Team to provide guidance helps attract investment to Alaska," the manager of an exploration company explained.

Lifting Pebble restrictions, Donlin key

Though Alaska slipped a few spot as an attractive place to invest in mining and mineral exploration, a number of events could see the state regain favor in the eyes of mining executives.

One such event that would assuage many of the environmental policy anxieties is the lifting of EPA's restrictions on Pebble, allowing the enormous copper project to enter permitting.

Pebble Partnership, the company formed to develop Pebble, and EPA are nearing an out of court settlement on this matter. It now falls on the Trump Administration to decide whether to pursue the settlement, lift the limitations proposed by the previous administration, or see the court case to its end.

The issuance of permits to develop a mine at the world-class Donlin Gold deposit could also allay a number of concerns about Alaska.

The U.S. Army Corps of Engineers is in the final stage of considering an environmental impact statement for a mine at Donlin Gold that is expected to average of 1.1 million ounces of gold annually over an initial 27-year mine life.

Novagold Resources and Barrick Gold, equal owners of Donlin Gold, have not yet committed to developing this nearly 40-million-ounce gold mine but are expected to make that decision by the time the EIS is finalized, currently slated for early in 2018. About as far off the grid as you can get in Alaska, the success in permitting Donlin and the decision to develop this world-class gold deposit would address both environmental and infrastructure concerns. Alaska's support for the Ambler Mining District Industrial Access Road, a proposed 211-mile transportation corridor that would provide surface access to the copper-rich Ambler Mining District in Northwest Alaska, could bolster confidence in the willingness and ability to develop needed infrastructure in the state. The state began studies on the potential of building the Ambler Road in 2009 and the Alaska Industrial Development and Export Authority took over the project in 2013.

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Uncertain environmental policies

Environmental policies continue to weigh on the minds of executives considering whether they should invest in Alaska's rich mineral potential.

When asked about uncertainty concerning environmental regulations, the respondents ranked Alaska 61st, which falls between China and Nicaragua in this category.

In recent years, miners have cited the U.S. Environmental Protection Agency's attempt to veto or place cumbersome restrictions on Pebble before owners of the Southwest Alaska copper-gold-

see FRASER SURVEY page 10

NORTH OF 60 MINING

Mining Directory

Mining Companies

Kinross Fort Knox/Fairbanks Gold Mining Inc.

Fairbanks, AK 99712 Contact: Anna Atchison – External Affairs Manager Phone: (907) 490-2218 • Fax: (907) 490-2250 E-mail: anna.atchison@kinross.com

Website: www.kinross.com

Located 25 miles northeast of Fairbanks, Fort Knox is the largest gold producing mine in Alaska. During 2016, Fort Knox celebrated two milestone events, the seven-millionth-ounce of gold produced and the 20-year anniversary of commercial operations.

Usibelli Coal Mine

100 Cushman St., Suite 210 Fairbanks, AK 99701 Contact: Lisa Herbert, Vice President Public Relations Phone: (907) 452-2625 • Fax: (907) 451-6543 Email: info@usibelli.com

Website: www.usibelli.com

Usibelli Coal Mine is headquartered in Healy, Alaska and has 700 million tons of coal reserves. UCM produces an average of 2 million tons of sub-bituminous coal each year.

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continued from page 8 FRASER SURVEY

AIDEA, which is well-suited to arrange public-private partnerships, has an agreement with Trilogy Metals that paves the way for the quasi-state-owned authority to investigate various ways to fund the construction and maintenance of the Ambler Road and create the framework by which Trilogy would repay the investment from mines developed at the road's terminus.

AIDEA initiated the permitting process in 2014 and the U.S. Bureau of

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Kinross, Millrock eye Tetlin-style skarn gold deposit at Liberty Bell

Millrock Resources Inc. March 2 announced that an affiliate of Kinross Gold Corp. has entered into an option to joint venture Liberty Bell, a road-accessible project about 70 miles south of Fairbanks, Alaska, that is prospective for copper-gold porphyry and associated gold deposits. Previous work on the property has identified a gold-bearing skarn that shows striking similarities to those being delineated by Contango Ore and Royal Gold at Tetlin. Kinross has an option to earn a 70 percent joint venture interest in Millrock's Liberty Bell project by investing US\$5 million in exploration over a five-year period; paying US\$145,000 in advanced royalty payments over the same timeframe; and paying Millrock an additional US\$145,000 in management fees if the project generator manages the programs over the duration of the agreement. Upon Kinross earning a 70 percent interest in Liberty Bell, further exploration and development costs will be shared pro-rata. Millrock will acquire a 1 percent net smelter return royalty when the joint venture is formed. "We are pleased that Kinross will enter another joint exploration effort with Millrock," said Millrock President and CEO Greg Beischer. "This will be the third such collaboration between the companies. We are hopeful that this one will result in the discovery of a gold ore-body."

Land Management is currently moving ahead with an environmental impact statement for the mining road.

"Having the BLM initiate the permitting process is a major accomplishment and milestone for developing the Ambler Mining District," Trilogy Metals President and CEO Rick Van Nieuwenhuyse said on March 6.

According to the latest resource calculations, the Arctic and Bornite deposits on Trilogy-held lands in the Ambler District t host roughly 8.4 billion pounds of copper; 2.6 billion lbs of zinc; 610,000 oz of gold; 45.3 million oz of silver; as well as significant quantities of lead and cobalt.

Goldrich forecasts higher gold production at Chandalar in 2017

Goldrich Mining Company March 7 said it anticipates higher gold production and potential resources expansion at the Chandalar gold mine in northern Alaska. Goldrich NyacAU Placer LLC, a joint venture between Goldrich and NyacAU to mine the various placer deposits at Goldrich's 23,000-acre Chandalar gold property, forecasts total 2017 production will be approximately 14,100 ounces of fine gold at a cost of roughly US\$700/oz. In 2016, this operation produced 8,227 oz of fine gold at a cost of US\$960/oz. Goldrich cautioned that 2017 forecast and the 2016 costs may change as the partners are currently in discussions concerning certain accounting items. Goldrich's 2017 forecast assumes 120 days of plant operation, 19 hours a day, with a processing rate of 308 bank cubic yards per hour. This compares to about 15 hours a day at 183 bcy per hour in 2016. Goldrich NyacAU Placer is making modifications to the recovery plant that are expected to increase its capacity to 400 bcy per hour. Additionally, Goldrich said the partners plan to carry out a 122-hole sonic drill program targeting areas of potential resource expansion at Chandalar. Past drilling has delineated a non-NI 43-101 resource of roughly 10.5 million cubic yards averaging 0.025 oz/cy (250,000 oz) gold. A recent survey by Goldrich NyacAU Placer has identified an area of potential resource expansion that will be the target of this year's drilling.

continued from page 8 **NORTHERN NEIGHBORS**

to individual investors that purchase the flow-through shares. IDM's Red Mountain project hosts 2.07 million metric tons of measured and indicated resource averaging 8.75 grams per metric ton (583,700 ounces) gold and 25 g/t (1.66 million oz) silver. A feasibility study for developing a mine here is expected to be completed this spring.

Skeena eager to test mine targets at Snip

Skeena Resources Ltd. March 6 said it is planning to complete 15,000 meters of surface and underground drilling during the 2017 field season at the historic Snip gold mine in northwestern British Columbia. The underground mine at Snip, which Barrick Gold operated from 1991 to 1999, produced 1.1 million ounces of gold from 1.25 million metric tons of ore averaging 27.5 g/t gold. Skeena optioned this project from Barrick last spring and went on to complete roughly 7,180 meters of drilling in 2016. In total, Skeena spent more than C\$3 million on exploration and data review. This exceeds the C\$2 million requirement to gain full ownership of the high-grade gold property. Once full ownership of Snip has been transferred to Skeena, restrictions on entering the mine or drilling within 25 meters of historic mining workings will expire, allowing the company to drill from underground this summer. After an extensive review of historical drilling and mine development data, in combination with the results from last season's drill program, Skeena's technical team has modeled high-grade gold veins that were left unmined when Barrick shutdown Snip due to low gold prices. With this data, the company has identified targets for the 9,000 meters of underground and 6,000 meters of surface drilling planned for 2017.

Peregrine to explore Chidliak underground

Peregrine Diamonds Ltd. March 6 reported that a recently completed internal study indicates that development of adding underground mining to the proposed development of an open-pit mine at the company's CH-6 kimberlite pipe may enhance the economics of this diamond project on the Chidliak property in Nunavut. A preliminary economic assessment completed last summer by JDS Energy & Mining Inc. envisioned an openpit diamond mine with a life of roughly 10 years. Production would start at the CH-6, a kimberlite with 4.64 million metric tons of inferred resource averaging 2.45 carats per metric ton (11.39 million carats) diamond to a depth of 260 meters, followed by CH-7, a kimberlite with 5.99 million metric tons of inferred resource averaging 0.85 c/t (4.23 million carats) diamonds to a depth of 240 meters. The internal study, completed in consultation with JDS, indicates the potential to substantially enhance the economics of Chidliak by incorporating an underground mining operation below 260 meters at CH-6. As a result of this conceptual study, Peregrine has planned a 4,000- to 5,000-meter drill program targeting the potential underground resource to depths up to 500 meters. Drilling is scheduled to begin in June and the company anticipates the completion of an updated resource estimate that includes the deeper underground resource before the end of the year. If the deeper resource is of sufficient size and diamond grade, a new PEA that includes underground mining could be completed in the first quarter of 2018. In addition to drilling, the 2017 program will include geotechnical work for the open-pit portion of the proposed mine, and environmental studies to support permitting of a mine and supporting infrastructure at Chidliak. This program is expected to cost around C\$7.5 million.

Nighthawk launches drilling at Indin Lake gold

Nighthawk Gold Corp. March 3 announced the start of a 25,000-meter drill program at its Indin Lake gold project in the Northwest Territories. Roughly 125 miles north of Yellowknife, Indin Lake hosts a number of deposits, including the historical Colomac open-pit mine, which produced 527,908 ounces of gold during the 1990s. In 2013, Nighthawk reported an inferred mineral resource of 39.8 million metric tons averaging 1.64 grams per metric ton (2.1 million oz) gold. Roughly 2 million ounces of this gold is found at Colomac and Goldcrest, parallel trends of dikes and sills. The objectives of the 2017 drill campaign, Nighthawk's largest program to date at Indin Lake, are to better define and expand the dimensions of higher-grade gold mineralization, test for the possible convergence of zones previously delineated, and explore areas surrounding the resource areas and across the districtscale property. Winter drilling has begun at Colomac Zone 1.5, where drilling in 2016 cut broad zones of high-grade gold mineralization. Highlights for the 2016 drilling at Zone 1.5 include: 52.07 meters of 7.72 grams per metric ton gold in hole C16-03; and 72.65 meters of 5.58 g/t gold in hole

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and high-grade Zone 2.0, another highgrade zone immediately to the south. Drilling is also planned for Goldcrest, a parallel trend about 250 meters west of Colomac. Extensive prospecting and mapping programs are planned for the summer field season and are directed at generating drill targets within the Nice Lake sill, a recently discovered trend about 1,500 meters east of Colomac, and to advance a number of regional showings and deposits to a drill ready status. "We are confident that our new understanding of the Colomac system will lead to additional discoveries of magnitude, even beyond those ounces that will be delivered into the planned 2017 resource update," said Nighthawk President and CEO Michael Byron.

C16-03B. The 2017 drilling will test for depth and strike extensions of this zone. The initial phase of 2017 drilling will also test for a possible link between Zone 1.5





The need for heavy-weather experience

PWSRCAC officials argue for drills in near closure conditions for tug crews when new contractor takes over Valdez marine services

By ALAN BAILEY

Petroleum News

Some members of the Prince William Sound Citizen's Advisory Council board have expressed concern over what they see as a need for heavy-weather drills for tug crews after Edison Chouest Offshore takes over the marine services for the Valdez Marine Terminal in 2018. Alyeska Pipeline Service Co., the operator of the trans-Alaska pipeline and the Valdez terminal, is transitioning the marine services contract to Edison Chouest from Crowley Marine, the company that has provided the services for several decades.

Edison Chouest is building a fleet of powerful new tugs for providing the services. At this point it is unclear who will crew the tugs and what training and drills the crews will undergo. But, although Edison Chouest will presumable employ experienced and qualified crew members, the worry is that this experience may not extend to the challenging sea and changeable weather conditions of Prince William Sound and the Hinchinbrook Entrance from the Gulf of Alaska.

Escort tugs, a vital component of Valdez and Prince William Sound oil spill prevention arrangements, accompany loaded oil tankers across Prince William Sound and through the Valdez narrows, ready to provide assistance in the event of an emergency such as an engine or steering failure.

The closure limit

Amanda Bauer, board president of PWSRCAC and an experienced mariner in the Prince William Sound region, has told Petroleum News that the closure limit, the limit above which tankers are not permitted to cross the sound, consists of wind strengths of 45 knots and seas of 15 feet. Unless tug crews have practiced operating in these conditions in the sound, the crews will not have experience in how to safely conduct a rescue during an emergency that takes place close to the closure limit, Bauer suggested.

Bauer said that she would like to see a commitment from Alyeska and Edison Chouest that new crews will be

trained in severe weather.

"We'd like a commitment from them that they will take the escort tugs out to near closure conditions and at least see how the tugs and the crews perform," Bauer said.

Given the potential risks to crew members of operating in severe conditions, the suggestion is to first do drills in straightforward conditions, before stepping up into more difficult scenarios.

"They would certainly do it in increments, get comfortable at various levels of various seas before they get out there," Bauer said. "But I think it's important, especially for the crews, to be able to experience that weather prior to there being any sort of emergency in the sound."

2004 drill

PWSRCAC board member Robert Archibald, who worked as chief engineer on one of the existing tugs, recalled his involvement in a 2004 drill conducted in near closure conditions. His tug had to maneuver close to a tanker that was simulating a distress situation. The idea was to approach the ship's stern, to pick up a line thrown from the ship, while both vessels were pitching in the heavy seas. The tug crew had to work as a team, positioning the tug close enough to the stricken vessel to affect a rescue, while at the same time confidently handling the tug in challenging conditions.

"If you never do it, you'll never know what to expect," Archibald said.

Both Bauer and Archibald have questioned the validity of the tanker closure limit, if the tugs and their crews have not been able to safely conduct drills at the limit and demonstrated that an effective rescue would be feasible.

"If you can't rescue a tanker leaving Alaska, don't let them leave until the weather gets better," Archibald said.

Archibald also commented that, although the Valdez escort tugs do not normally perform their duties in the Gulf of Alaska, outside the Hinchinbrook Entrance to Prince William Sound, a tug does remain at the entrance until a departing tanker reaches a point 17 miles into the sound. Should the tanker run into difficulties during that first 17 miles of open ocean the tug would need to conduct a rescue operation, he said.

Alyeska response

Alyeska spokeswoman Michelle Egan has told Petroleum News that mariners participating in the Valdez terminal marine services require training and experience to qualify for their roles in the fleet, and that Alyeska also requires specific training for the company's Valdez ship escort and emergency response system. Mariners will participate in drills and exercises, including escort, tether and towing drills, and including simulator training. Some of the drills and exercises go beyond what the company is required to do, Egan said.

But Alyeska views exercises at near closure condition as presenting too high a risk to be justified.

"Undertaking an exercise in closure/near closure conditions poses an unacceptable risk to the people who work on TAPS (the trans-Alaska pipeline)," Egan said. "To conduct such an exercise would put people in harm's way unnecessarily and is entirely inconsistent with our safety culture."

Moreover, mariners coming into Alyeska's marine support system have experience of operating in inclement weather in other parts of the world, Egan said.

Egan also commented that, following the 2004 drill in near closure conditions, Stan Stephens, a then member of the PWSRCAC board who had been on board one of the tugs during the exercise, had advised against conducting further drills in these conditions.

In an article published in the March 2004 edition of The Observer, the PWSRCAC newsletter, Stephens commented that, given that the drill had demonstrated the feasibility of a successful rescue in severe weather, further drills in such conditions were not warranted because the risks outweigh the disadvantages. He commented that drills should be conducted in seas of four to five feet, at most. \bullet

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• EXPLORATION & PRODUCTION Hilcorp continues southern Kenai work

Company planning development activities at Deep Creek and Ninilchik; Nikolaevsk remains in holding pattern

By ERIC LIDJI

For Petroleum News

Hilcorp Alaska LLC is continuing to propose sizeable development programs at its onshore units in the southern Kenai peninsula, particularly Deep Creek and Ninilchik.

The company expects to drill six stratigraphic test wells in the vicinity of the Deep Creek unit over the coming 18 months. The first four would be drilled before June 2017. The remaining two require the public winter trail system and are currently being planned for a brief window in the late third quarter of 2018 after freeze-up but before snowfall. The company outlined its plans for its onshore east side Cook Inlet units in a series of plans of development submitted to the Alaska Department of Natural Resources in early March. The state is still reviewing the completeness of the plans. The federal government manages the Beaver Creek, Birch Hill, Kenai, Sterling and Swanson River units.

The proposed 2017 program for Deep Creek once again defers activity at the As proof of its commitment, Hilcorp noted that it completed seismic programs in 2013 and 2016 and a remote sensing data program in 2015 in the southern end of the unit.

The state had previously threatened to contract the unit unless Hilcorp explored the area.

Hilcorp deferred plans to drill the HVB-18 well in 2016. The well would

have delineated a target in the Tyonek formation discovered in the previous HVB-17 well. The company decided it had no need to delineate the prospect. The company plans to keep the HVB-18 well as a potential for further exploration, in addition to the proposed C Pad program. The Deep Creek unit produced 6.25

Based on the results of the program, Hilcorp intends to prepare a new round of exploration drilling in 2018 and 2019, targeting the Sterling and Beluga formations. proposed Middle Happy Valley pad and the proposed C Pad. The company initially proposed the project in its 2014 plan of development and even began permitting portions of the program in recent years. "Hilcorp continues to progress plans to drill at Middle Happy Valley and C-Pad (within the Happy Valley PA), but cannot commit to drilling until the operational and economic risk associated with such exploratory efforts is reduced."





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Oil Patch Bits

Calista Corp. declares \$5.9 million spring dividend

Calista Corp.'s board of directors approved recently the first dividend for 2017. This spring dividend totals \$5.95 million, an increase of more than 5 percent from the previous year. Calista has declared two dividends each year since 2014, for a total of 15 dividends since inception. The total distribution of all Calista shareholder dividends is \$47.1 million, with 58 percent of that total declared since 2014.

Dividends are distributed by share, with the average shareholder owning 100 shares. Calista has one of the largest populations of shareholders among the Alaska Native corporations, with approximately 13,000 individuals. This spring dividend equates to \$4.47 per share. The distribution is expected to be released for direct deposit and mailed out by the close of business April 15.

The spring dividend is based on shareholders' equity for the prior three years. The fall dividend is from the Akilista investment portfolio, which made its first distribution in 2014. This is an investment account created to provide a perpetual source of dividends not reliant on business operations. Elders' benefit distributions are for original shareholders at least 65 years old. The first distribution was made in 2008 and distributions have been declared yearly in December.

Enrollment for eligible descendants of original Calista shareholders is currently underway. Calista currently estimates that in October the board will consider a resolution to accept verified enrollment applications. Beginning Dec. 1, shares will be issued and the new shareholders will be eligible for voting, dividends and board candidacy. For enrollment details go to www.calistacorp.com/enroll.

SunCoke Energy awards services contract to Fluor

Fluor Corp. recently announced that SunCoke Energy Inc. has awarded Fluor a contract to provide certain maintenance support and capital project services at SunCoke coke facilities in the United States. Fluor will book the undisclosed contract value in the first quarter of 2017.

Under the five-year contract, Fluor will provide maintenance and capital project services at SunCoke's U.S. domestic coke facilities, which produce high-quality coke for use in steelmaking. Fluor will transition onto the sites in early March 2017 and work alongside SunCoke employees.

"With a detailed transition plan, we are partnering with SunCoke on a seamless transi-

tion to the sites with no disruption to current operations," said Dale Barnard, vice president of North American maintenance, modification and asset integrity operations for Fluor. "We will implement our asset performance management process and identify specific opportunities to reduce SunCoke's total ownership costs."

Fluor, along with its Stork division, delivers maintenance, modification and asset integrity services at more than 200 sites in North America, with extensive experience in multi-site execution.

BELL announces trio of executive promotions

BELL & Associates is proud to announce three large promotions in its Anchorage office and firm headquarters. BELL's three new executives include: Frank "FT" Bell as its chief operations officer; Kyle Griffiths as its chief financial officer; and Chris Burt, PE, as its chief technology officer. Together, they have more than 25 years of combined professional services in finance, operations, and engineering.

Bell has more than 10 years of experience of land surveying with BELL in the Prudhoe Bay office as a head chainperson, instrument person, occasionally as a party chief and most recently operations manager in the Anchorage office. He hopes BELL can remain an enjoyable place to work and foster successful and competitive careers for its employees. Bell has a bachelor of arts in psychology from Alaska Pacific University, and a master of science in psychology also from Alaska Pacific University.

Griffith brings more than 10 years of experience in financial services in Oregon and Alaska. Before becoming BELL's business manager, Griffith served as a financial analyst and cost accountant in the structural division for Precision Castparts Corp., as well as a financial analyst and operations analyst for Encore Senior Living LLC. He has a bachelor of science in business administration from Portland State University, and a master of science in business administration with a concentration in finance from the University of Memphis.

Burt has served more than 18 years with BELL in many different roles including office technician, civil engineer and 3D laser scanning manager. As one of the prime playmakers in all our equipment and technology advancement, he has brought on many projects in 3D modeling and scanning all over the world. Burt is also in charge of managing the engineering department and leading the firm in all platting projects within the state of Alaska.

BELL is pleased to recognize the talents of these three distinguished professionals. Congratulations!

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continued from page 1 FLOW METERS

The commission said in a Feb. 28 order that Cook Inlet Energy requested permission to use multiphase flow meters in May 2016. The company's goal was to replace processing at the aging West McArthur River facilities with processing at the newer, and underutilized, Kustatan facilities, which have been processing only Redoubt Shoal production.

Currently produced fluids from the West McArthur River field are processed and sales quality oil is temporarily stored at the company's West McArthur River production facility before being transported to custody transfer meters at the Trading Bay production facility. Redoubt Shoal is produced from the Osprey platform and fluids are processed and sales quality oil temporarily stored at the company's onshore Kustatan production facility. Those fluids are also transported to custody transfer meters at the Trading Bay production facility.

Remaining oil

Cook Inlet Energy plans to decommission West McArthur River production facilities due to end-of-life considerations including corrosion associated with increasing concentrations of hydrogen sulfide gas. The company estimates that as much as 2 million barrels of economically recoverable oil remain at West McArthur River, but production facilities at the field would require extensive repairs. The company told the commission that use of the Kustatan production facility for processing and intermediate storage of commingled sales quality oil would extend the life of both fields.

Kustatan also is the central hub for

continued from page 5 **EIA OUTLOOK**

renegotiate voluntary supply reductions for the second half of 2017," EIA said. The agency said it expects increases in non-OPEC supply, particularly from the U.S., to limit upward price pressure through most of this year.

Natural gas

With mild weather across much of the Lower 48 in February, EIA said initial data indicate heating degree days were the lowest on record for the month, contributing downward pressure on natural gas prices.

Natural gas prices for February were higher than in the previous year because of higher exports and lower U.S. natural gas production, but inventory levels remain above the previous five-year average, the agency said.

Liquefied natural gas exports are forecast to average 1.8 bcf per day this year and 2.8 bcf per day in 2018, up from the February forecast "based on updates to commercial in-service dates and ramp-up periods of LNG facilities currently under construction," EIA said.

The forecast for Henry Hub natural gas spot prices is lower this forecast by 40 cents per million Btu in 2017 and 25 cents per Btu in 2018, reflecting mild winter temperatures which reduce the use of natural gas for space heating, contributing to natural gas inventory levels which are higher than previously expected for the end of February. ●

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continued from page 11 **KENAI WORK**

million cubic feet of natural gas per day in 2016, down from more than 6.9 million cubic feet per day in 2015. The 2015 production rates were split relatively evenly between the Happy Valley participating area and tract production. The 2016 rates production came entirely from the participating area.

Ninilchik

Hilcorp is focusing its 2017 program at the Ninilchik unit on the Kalotsa pad.

The company drilled the Kalotsa No. 1 and No. 2 wells in late 2016 and early 2017 and plans to complete both wells in The first stage in that effort began in 2016 with the expansion of the Falls Creek participating area. The company expects to continue the process this year at the Susan Dionne participating area and potential at the Grassim Oskoloff participating area.

The Ninilchik unit produced between 23.2 million and 27.5 million cubic feet of natural gas per day in 2016, down from approximately 40 million cubic feet per day in 2015.

On March 2, the Alaska Department of Natural Resources agreed to expand the 25,869-acre Ninilchik unit to include portions of three fee mineral lands leases totaling some 40 acres.

The expansion is associated with activities around the Falls Creek partici-

power generation and natural gas handling for west side Cook Inlet production operations.

Kustatan, more modern and efficient than West McArthur River, was designed to process some 25,000 barrels of fluid per day and store 50,000 barrels, but Redoubt Shoal currently produces only some 1,000 bpd. The company told the commission that in addition to handling West McArthur River and Redoubt Shoal, Kustatan is capable of handling current and anticipated production from offset Cook Inlet Energy developments in the area.

The commission said the company's application and testimony indicate that consolidating production facilities for the fields would reduce the operating expenses for each unit and thus extend the economic life of the units, which should lead to greater ultimate recovery than if the units continued to operate separate production facilities.

"Evidence provided by CIE shows the only long term economic option for continuing to produce the WMRU and RU fields is to use the multiphase flow meters at each location for fiscal allocation before commingled processing and temporary storage at the Kustatan Production Facility," the commission said in its decision.

While the individual processing facilities could be kept running in the short term, AOGCC said, "eventually both units would no longer be able to produce enough to keep the facilities economical-

continued from page 5 **NORTHSTAR**

start of production from the A sands in August. NS-18 is currently producing condensate at the rate of 1.13 barrels per day, the approval document says.

Delineated from well penetrations

The approval document also says that the more than 30 exploration and development wells that pass though the Kuparuk on their way to the deeper Ivishak have enabled a delineation of the Kuparuk hydrocarbon accumulation. The hydrocarbons lie in an area bounded by geologic faults to the north, west and south, while the structural dip or inclination of the reservoir limits the extent of the accumulation to the east. The gross thickness of the Kuparuk formation in the Northstar unit ranges from less than 200 feet to 400 feet. Oil found in the Kuparuk is relatively light, having an API gravity of 30, the approval document said. Diane Hunt, the Division of Oil and Gas external relations coordinator, told Petroleum News that the oil was encountered in sub-commercial quantities by the Northstar No. 1 well, outside the Hooligan participating area. The Kuparuk C member, within the Kuparuk formation, ranges in thickness from 30 feet to more than 100 feet, with a highly variable ratio of net pay thickness to gross thickness. The rock unit includes sandstones, siltstones, shaley sandstones and shales. Deposition took

ly viable and would thus need to shut in production. By consolidating production operations, the operational expenses will be reduced and shared by the two fields and the fields' economic lives would be extended, which will lead to increased economic recovery."

Multiphase meters at Oooguruk

The commission noted that it has authorized multiphase flow meters at the Caelus Energy Alaska-operated Oooguruk unit, and said that approval provides the framework for proceeding with the Cook Inlet Energy request.

The commission required, and Cook Inlet Energy provided, an operations and maintenance guidelines for the multiphase flow meters. AOGCC is requiring that the company sample production streams from the two fields every six months, and oftener under certain circumstances, providing data for flow volume and correction calculations for the meter.

The commission is also requiring an audit team with members from the flow meter company, Cook Inlet Energy and AOGCC with an independent third party recognized as an expert chairing the team. The team will audit the multiphase flow meter performance after the first 12 months and then every 24 months, unless the commission requires a more frequent audit.

-KRISTEN NELSON

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The Kuparuk gas is injected into Northstar's Ivishak reservoir for enhanced oil recovery from that reservoir.

place on a rift margin in an offshore marine or marine shelf environment. Faulting that took place at the same time that the sediments were laid down makes it difficult to correlate sandstones between wells. For the most part porosity and permeability in the reservoir rocks are good, the approval document says.

Production from anticline

An interpretation of 3-D seismic data indicates that the Kuparuk C reservoir forms a northwest-to-southeast trending anticline, split into three segments by large faults and with a relatively unfaulted central segment. Faults to the south also separate Northstar from the rocks in the Prudhoe Bay unit. The NS-08 and NS-18 wells produce from the crest of the anticline, the approval document says.

The Kuparuk A member consists of three to five sand packages, separated from the Kuparuk C by 10 to 50 feet of shale. The A sands tend to show more consistent thicknesses than the C sands and appear to have been deposited from the north on a marine shelf as a results of ancient storms, the approval document says. \bullet

the second quarter. The company expects the wells to have initial completions in the Tyonek and "significant" Beluga potential. The company plans to continue the program in the third quarter with the Kalotsa No. 3 and No. 4 wells.

The program took precedence over others planned for the unit. In a previous plan of development, Hilcorp said it would drill the Kalotsa No. 1 and GO No. 9 wells in 2016.

Hilcorp eventually replaced the GO No. 9 well with the Kalotsa No. 2 well. The company said it still might drill the GO No. 9 well this year or might defer it for other projects.

Although the Ninilchik unit has been online for more than a decade, Hilcorp launched a major exploration program within the unit boundaries after acquiring it from Marathon in 2013. The goal is to expand existing participating areas vertically and geographically.

pating area.

Nikolaevsk and Cannery Loop

The Nikolaevsk unit remains in a holding pattern.

As in recent years, the Red Well No. 1 will produce as weather or demand allows.

Hilcorp is not planning any additional drilling activity at the unit this year. But it does plan to hydraulically fracture the Tyonek formation in the well and expects that the workover project will increase productivity by 1 million to 3 million cubic feet per day.

To the north at the Cannery Loop unit, Hilcorp plans to sidetrack the CLU-10 well this year to the Upper Tyonek and workover the CLU-05RD well to the Upper Tyonek. ●

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continued from page 1 GAS LINE REPAIR

at as low a level as possible. And, within two weeks, the company must file a pipeline leak inspection and repair plan.

The leak was discovered on Feb. 7 by a Hilcorp helicopter at a location between Nikiski on the Kenai Peninsula and the offshore Middle Ground Shoal field's Platform A. The pipeline, which lies in a water depth of 80 feet, supplies dry processed fuel gas to the A, C, Dillon and Baker platforms. According to the PHMSA letter, Hilcorp conducted the helicopter surveillance flight in response to observed anomalies in pipeline flow data.

Diving hazards

Recognizing the very high danger associated with diving operations in the neighborhood of the leak in current sea ice conditions, especially given the extreme tides in the inlet, PHMSA is giving Hilcorp until May to effect a repair. Hilcorp has estimated that it will not be possible to conduct safe diving operations until at least late March, and possibly the end of April. The company has assessed that the use of divers is the best approach to safely fixing the pipeline breach.

The PHMSA deadline also recognizes the environmental risks associated with shutting down the pipeline until the repair is completed. A shutdown of the pipeline could result in the leakage of some residual crude oil in the line — the line had previously been used to carry oil. Moreover, the cessation of the fuel gas supply would require a shutdown of the transportation of produced crude oil from an offshore platform through another undersea line. And, given the subsequent possibility of that line freezing in current cold conditions, a breach in the oil line and a subsequent oil spill could result, the PHMSA letter says.

Hilcorp has, however, minimized gas flow through the line by shutting down non-essential operations on the offshore platforms that the line supports.

Installed in 1965

The PHMSA letter says that the broken gas line is eight inches in diameter and is encased in concrete. It was installed in 1965.

The pipeline has suffered leaks twice in the past: in June and August 2014, the letter says. These leaks, which occurred in ice-free conditions, were determined to have been caused by abrasion from rocks contacting the pipeline at locations where the seabed did not support the line, the letter said. Conducting repairs involved installing bolt-on, split-sleeve clamps. The leaks were 42 yards apart and about two-thirds of a mile from the current leak.

The abrasion is thought to be caused in part from the relative movement of the pipeline and rocks under the effect of vortex-induced vibrations of the pipeline. And, with these vortex-induced vibrations have been a known threat for years, Cook Inlet pipeline operators typically monitor subsea pipelines annually, to identify sections of lines unsupported by the seabed. If necessary, additional support may be added to these sections, the letter says. The design of the damaged gas line does not allow the use of in-line inspection tools. Pressure testing was conducted on the line in 2005. And, although Hilcorp conducts annual side-scan sonar or multi-beam echosounder surveys, these surveys do not provide enough information to be able to determine whether there are problems such as eroded pipe, rock impingements, dents, gouges or missing concrete coating, the letter says.

The U.S. Coast Guard has been notifying mariners of the leak but has not at this point implemented a safety zone around the leak location. Currently the agency sees the risk to life and property to be low, although the risk could increase when the sea ice dissipates. The Federal Aviation Administration has enforced restricted airspace one nautical mile around the leak, to an altitude of 1,500 feet, the PHMSA letter says.

In a March 8 press release, Hilcorp said that to date no significant impacts to wildlife or the environment have been observed and that the gas release does not pose a threat to the general public. The company said it is maintaining a lower pressure in the pipeline and that the escape rate of gas is about 229,000 cubic feet per day. A response team is ready, with equipment staged, to commence repairs as soon as it is safe to do so, the company said. Hilcorp also said that it has been conducting air and water sampling and is working with the Alaska Department of Environmental Conservation on a more comprehensive plan for the monitoring of fish and wildlife; air and water quality; sound; and ice conditions. —ALAN BAILEY

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continued from page 1 HORSESHOE FIND

tiple consecutive discoveries on the North Slope along with partner Armstrong. The base of the acreage position was assembled by Armstrong beginning in 2008 and 2009; the company brought Repsol in as a majority partner in that acreage in 2011. The companies have added to their acreage base in subsequent lease sales and by purchases from other leaseholders.

Repsol: 'multiple reservoir discoveries'

Repsol operated earlier wells in the exploration program. The company said prior to Horseshoe it was operator on 13 exploration and appraisal wells on the North Slope, which led to "multiple reservoir discoveries" currently included in the Pikka unit.

In August Armstrong transferred a 25 percent working interest in the lease on which Horseshoe is located, and two neighboring leases, to Repsol. The permit for the

original well, issued in December, shows the well some 1,500 feet east of the Colville River unit and some 12 miles southwest of Nuiqsut.

The well is on one of a package of leases east of the Meltwater satellite of the Kuparuk River unit which Armstrong Energy acquired from Royale Energy in late 2015.

Earlier this year Armstrong Energy CEO Bill Armstrong said the locations of the Horseshoe wells were determined from



a Horseshoe 3-D seismic program.

The Pikka discoveries were made in 2014 and 2015 and development permitting with Armstrong as operator is underway in that area.

Bill Armstrong told Petroleum News in February 2016 that Pikka is possibly a multibillion barrel resource in just two of at least six horizons. Mark Myers, former commission of the Department of Natural Resources, called the original Pikka discovery "amazing."

Armstrong said last year that peak output from three Pikka pads was estimated at 120,000 bpd, which is the volume Repsol said could come from preliminary development concepts for Pikka, with first production anticipated in 2021.

A draft EIS being prepared by the U.S. Army Corps of Engineers will be released in the middle of this year, the agency said.

Repsol said the Horseshoe 1 discovery well was drilled to a total depth of 6,000 feet and encountered more than 150 feet of net oil pay in several reservoir zones in the Nanushuk section. The Horseshoe 1A sidetrack was drilled to a total depth of 8,215 feet and encountered more than 100 feet of net oil pay in the Nanushuk interval as well, Repsol said.

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continued from page 1 LNG TIDE

Bloomberg there is "great potential" for Canada to take advantage of U.S. Gulf Coast export outlets.

She said the LNG projects planned for the British Columbia coast now "look like they are going to be a long time coming, if ever."

Desperation for new markets

The desperation among Canadian producers to access new markets is reflected in the fall off in exports to Lower 48 buyers, which the U.S. Energy Information Administration said dropped by 39 percent to 7.38 billion cubic feet per day last year from its peak in 2007.

Moody's compounded the dismal outlook with a February report that a wave of fresh LNG supply capacity is due to come

continued from page 1 HILCORP FOCUS

Hilcorp recently submitted plans of development for all those units to the Alaska Department of Natural Resources. The state is reviewing the plans for completeness.

North Cook Inlet

Hilcorp is in the early stages of planning for its newly acquired North Cook Inlet unit, although what little the company has offered in its plan of development is intriguing.

ConocoPhillips Alaska Inc. submitted its most recent a plan of development for the unit in September 2016, around the time it was finalizing a deal to sell the unit to Hilcorp.

Hilcorp recently submitted a revised proposal, which has yet to be approved.

Under the program, Hilcorp would not drill any wells or sidetracks nor would it perform any workover operations at the North Cook Inlet unit this year. But the company would conduct a comprehensive field study for future activities, including oil production.

The North Cook Inlet unit is a legacy natural gas producer in the Cook Inlet region and has historically been the most important supplier of the semi-idle Kenai liquefied natural gas export terminal. But several operators have considered the possibility of pursuing deeper oil targets at the unit, most recently the independent Buccaneer Energy Ltd.

In suggesting the possibility of oil development, Hilcorp noted that the Tyonek platform currently includes no oil processing facilities, nor any oil pipeline to shore. As such, any oil development would not only be expensive, but would also be fairly timeconsuming. online at a time when demand from the world's largest importers is weakening.

The firm said strong LNG demand growth from China, India and new markets will not be enough to absorb the growing capacity as demand slides in the leading import countries, Japan and South Korea.

Japan's consumption to fall

Japan, which consumers more than onethird of global LNG, will fall to 80 million metric tons per annum by 2020, down 9 percent from the 2014 record year, as nuclear power production slowly restarts.

Tomas O'Loughlin, a senior vice-president at Moody's, said that as the LNG market rebalances investment returns for Australia's well-advanced projects will be weak and U.S. LNG offtakers "will struggle to recover all of their liquefaction costs."

Moody's said global oversupply could reach 55 million metric tons per annum in

The Granite Point unit produced 780.6

million cubic feet of natural gas and

948,200 barrels of oil from its three plat-

in 2016. Those are declines from 825.7 mil-

lion cubic feet of gas and 968,100 barrels of

Under previous operators, the current

In a similar fashion, Hilcorp recently

Granite Point unit had been two separate

consolidated the North Middle Ground

Shoal field, Middle Ground Shoal field and

South Middle Ground Shoal unit into the

new Middle Ground Shoal unit. The com-

pany argued that consolidation would max-

imize operations at platforms A and C and

promote opportunities at the shut-in Baker

lion cubic feet of natural gas and 680,900

barrels of oil in 2016. The two platforms

produced 47 million cubic feet of natural

gas and 219,700 barrels of oil in 2015 — a

sharp rise in gas production and a steep fall

workover projects. The company added per-

forations at the A11-01, A12A-01 and A24-

01LE wells at platform A, and performed a

variety of projects at C21-23, C22-26RD,

C13-13LN, C31-26RD and C42-232 at

program last year and plans to continue ana-

Hilcorp processed a 2015 3-D seismic

The increase can be traced to eight

Platforms A and C produced 158.4 mil-

forms - Granite Point, Anna and Bruce -

oil in 2015.

fields.

Middle Ground Shoal

and Dillon platforms.

in oil production.

platform C.

2019, forcing U.S.LNG exports to divert their sales efforts to Europe.

The prediction further undercuts Canada's hopes of becoming an LNG player as it pays the price for lagging behind regulatory approvals for new projects in Australia, the U.S. and elsewhere.

A missed opportunitiy?

Mihoko Manabe, a Moody's analyst, reinforced what others have repeatedly warned — that Canada may have missed its opportunity by getting bogged down in political squabbles and opposition from environmentalists and aboriginal communities at a time when companies were open to making major investments in gas exploration and production, pipelines and construction of LNG terminals and liquefaction facilities.

"In the last few years, I think the tide has turned (against the industry) ... and a lot of beyond the cyclical ups and downs of com-

lyzing the results this year with the plan of identifying future drilling or workover projects.

The company is planning no drilling or workover activities at platform A this year but could sidetrack three platform C wells — C23-26RD, C33-26RD and C34-26RD — later this year or in 2018. The company is planning no work at the Baker or Dillon platforms.

Trading Bay

Hilcorp operates a third cluster of fields immediately west of Middle Ground Shoal — the Trading Bay unit and McArthur River field and the North Trading Bay unit.

At the Trading Bay unit, Hilcorp plans to sidetrack the A-04RD well from the Monopod platform into the nearby North Trading Bay unit. The sidetrack would target the Hemlock and Tyonek G-zone. If successful, it would restore North Trading Bay to production.

The plan would require some administrative changes, such as a revision of the unit boundaries or metering requirements. The plan leaves open the question of what to do with the shut-in Spark and Spurr platforms at North Trading Bay. There were discussions in previous years of dismantling the platforms. Hilcorp does not believe it is economic to restart production from the two platforms, but does believes that they have value "to support ongoing evaluation and analysis" of potential development opportunities.

In 2016, the company sidetracked the A-

modity prices," she told the Financial Post. Manabe said she doubted demand for

large-scale LNG facilities will return to former levels, even after markets rebalance, although investors are likely to be attracted to smaller, more incremental projects that have signed contracts with buyers.

"It's a lot more economic to expand an existing plant," she said.

Manabe also said that floating storage gasification units, which offer cheaper, more versatile supplies of LNG, are allowing the market to diversify into untapped markets, such as the Middle East.

Jihad Traya, an analyst with Solomon Associates in Calgary, said the improving economics of renewable energy sources are also posing a challenge to LNG in "ways that weren't necessarily conceived of or understood before." ●

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27RD2 well but deferred plans for drilling the A-20RD2D and A-26RD wells pending a further review of seismic information. The company also deferred three of the four workover projects it had planned for 2016.

The Trading Bay unit produced 866,000 barrels of oil and 1.336 billion cubic feet of gas in 2016, down from 1.33 million barrels of oil and 2 billion cubic feet of gas in 2015.

At the McArthur River field, the company is planning to drill as many as three grassroots wells and four sidetracks this year. The three wells — M35, M36 and M37 — would target the upper West Foreland formation from the Steelhead platform. The four sidetracks — K-06RD2, K-24RD3, K-03RD2 and K-26RD2 — would be at King Salmon platform wells.

In 2016, the company sidetracked the shut-in K-10RD well, the K-06RD well and the K-10RD well. A plan to sidetrack the K-25RD well was cancelled due to low quality rock.

The company also worked over one well at the Dolly Varden platform, four wells at the Grayling platform, two wells at the Steelhead platform and three wells at the King Salmon platform. The work mostly involved replacing electric submersible pumps.

The field produced 1.797 million barrels of oil and 8.54 billion cubic feet of gas in 2016.

-ERIC LIDJI

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This coming year, Hilcorp also plans install new compression at the unit.

North Cook Inlet produced 13.8 million cubic feet of natural gas per day in 2016.

Granite Point

To the southwest of North Cook Inlet, Hilcorp operates the Granite Point unit.

While the company did not drill any wells at the unit in 2016, it plans to drill three sidetracks this year — the GP-11-24RD, GP-24-13RD2 and MUCI-02RD sidetracks.

All three sidetracks would target the Tyonek C7 sands from the Granite Point platform.

The company performed a workover on the AN-11RD well in 2016 but was unable to return the well to production. The company is planning no workovers at the unit this year. ALASKA DREAMS INC. INDUSTRIAL BUILDING SOLUTIONS

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continued from page 1 **MICROBE RESEARCH**

for deterring the attentions of herbivores, but which have similar chemical structures to those of petroleum hydrocarbons. These compounds tend to leak from the plant roots into the soil, where they attract naturally occurring microbes that feed on the compounds. Thus, by growing plants in soil contaminated by petroleum products, the roots stimulate the microbial community. Then the microscopic organisms will chomp on, not just the plant-based chemicals, but also the polluting petroleum materials.

In Alaska, in particular, one of the microbe attracting compounds, salicylic acid, is particularly prevalent in willows and birch, plants that are commonly seen in the state. Scientists know that this chemical especially switches on genes in bacteria for aromatic hydrocarbon degradation, Leigh said.

Study in Fairbanks

About 20 years ago the U.S. Army Corps of Engineers initiated a phytoremediation study in Fairbanks, growing plants on a crude oil contaminated gravel pad and on diesel contaminated soil. The Corps found higher rates of petroleum degradation in the planted areas than in unplanted sections but abandoned the experiment after two or three years when funding of the project ended. Leigh's team went to the site 15 years later and found that, by then, the petroleum contamination had dropped to below regulatory levels.

The university researchers found that shrubs and trees had been more effective than grass in hydrocarbon removal, although it appears that the cultivation of grass is a useful first step, to have a quick, short term impact on the pollution and to stabilize the soil.

Kaltag experiment

So, in their experiment at Kaltag, the researchers are testing different plant combinations: willows alone, grasses alone, and a combination of willows and grasses. The researchers are also testing the use of fertilizer, to determine if that impacts the effectiveness of the remediation technique.

At this stage the plants are faring well, but it will probably be another year or two before the impact on the contamination can be determined, Leigh said.

The established means of dealing with this type of soil contamination is to remove the soil to a suitable site and then repeatedly till it, to stimulate the petroleum consuming microbes. But this technique is expensive, given the need for a local person with heavy machinery to conduct the repeated tilling operations. And, in the event of high rainfall, the tilling site can turn into an unproductive mud pit.

The phytoremediation technique, while relatively slow, would be cheaper, could perhaps be conducted in situ at the spill site and stabilizes the soil. And the willow, a suitable plant for the treatment, is easy to cultivate and is ubiquitous in Interior Alaska, Leigh said.

Arctic offshore spills

Leigh's team has also been investigating the bioremediation of oil spilled offshore Arctic Alaska. There is heightened interest in this topic because of offshore oil exploration and increased Arctic shipping, she commented. Her team has collected Arctic seawater samples and conducted experiments using North Slope crude oil, incubating the oil with the water in bottles to assess the impact of oil consuming microbes that are known to exist in the Arctic seas. The tests have been conducted using water at a temperature of around minus 1 to minus 2 C, Leigh explained.

Perhaps surprisingly, the researchers found that at these low temperatures the biodegradation of the oil was almost as rapid as has been observed at the temperatures of more temperate regions. However, in those temperate regions oil does tend to disappear more quickly from the ocean because of higher rates of evaporation, Leigh commented.

Dispersant effectiveness

In a collaborative effort with analytical chemists at Oregon State University who developed methods for analyzing the Corexit 9500 oil dispersant used in the Deepwater Horizon response in the Gulf of Mexico, the University of Alaska Fairbanks team has been investigating the fate and effectiveness of Corexit in Arctic conditions. Through incubations in bottles at Arctic temperatures the researchers have found that the Corexit itself undergoes biodegradation, as it does in warmer climes.

Dispersants work by breaking up the spilled oil into tiny droplets which spread through the water column, where they are consumed by microbes more rapidly than in a surface slick. Despite questions that have been raised over whether the dispersants may also tend to slow the biodegradation, the Fairbanks research team has found that simulations of dispersed oil in Arctic conditions demonstrate that, if anything, the dispersant speeds up the biodegradation process, Leigh said.

Leigh also said that one of her students had conducted some research in conjunction with a joint industry project and had found that the toxicity of Corexit 9500 is fairly low, comparable to the toxicity of domestic dish soap. However, a major toxicity concern with oil dispersal is the toxicity of the oil itself, as the oil droplets permeate the seawater. The use of dispersants thus becomes a question of what presents the bigger risk: dispersing the oil for a faster rate of bioremediation, or leaving the oil as a surface slick.

The University of Alaska Fairbanks team now has funding from the Oil Spill Recovery Institute and the federal Bureau of Ocean Energy Management to investigate the bioremediation of spilled marine diesel in seawater, using a variety of commercially available dispersants. The team is about to launch an experiment using Prince William Sound seawater and also anticipates using Arctic water.

Remediating sulfolane

Another intriguing potential use of bioremediation is in the treatment of sulfolane, a water-soluble solvent sometimes used in oil refining. Sulfolane has achieved a certain level of notoriety in Alaska because of major groundwater sulfolane contamination around a now closed refinery at North Pole, near Fairbanks.

There are naturally occurring microbes that will rapidly biodegrade sulfolane, but the biodegradation process requires oxygen, Leigh said. Unfortunately at North Pole the oxygen levels in the subsurface are very low and, with the contamination having now spread wide and deep, bioremediation is not an option. However, sulfolane bioremediation could prove effective in a situation where the pollution is caught early. And it may be possible to use the bioremediation technique to treat sulfolane contaminated water recovered from construction sites, Leigh suggested. The water would need to be aerated, and lab tests suggest that nutrients may be needed to speed up the process, she said.

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