

page 20 years ago this month: Unocal **3** drilling 5th Happy Valley gas well

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Upside in gas reserves assessed for Cook Inlet unit, capital req.

A third party engineering firm sees "a lot of upside potential for natural gas behind pipe and elsewhere" in the West Cook Inlet Nicolai Creek unit, which has been operated by

Amaroq Resources for 7 years, Amaroq President G. Scott Pfoff told Petroleum News April 22.

"They have confirmed that our existing completed wells have a significant amount of natural gas to be produced behind pipe and they've seismically identified development drilling locations," he said. "The whole reason we went to a third



G. SCOTT PFOFF

party, engineering firm was because we were going into the seventh year of operations ... we have not succeeded in returning Nicolai Creek to profitability," Pfoff said.

The company is "at a significant crossroads for the future," he added, noting "a major shift of focus for us is we're entirely focused on natural gas now," he said.

In the past Amarog produced gas but was also focused on the potential for a major oil play. We have put the oil play completely

see GAS RESERVES page 6

Glacier looks at extended reach drilling versus new pad at Badami

Glacier Oil and Gas, owner of Badami operator Savant Alaska, has been considering a second pad at the unit, which is on the east side of the North Slope between Point Thomson and Prudhoe.

But when David Pascal, chief operating officer of Glacier Oil and Gas, submitted the 21st plan of development for the Badami unit to the Alaska Department of Natural Resources' Division of Oil and Gas on April 12, he indicated that the company is now considering extended reach drilling in lieu of the East Pad.

In reviewing work planned in the 20th POD which did not occur, Glacier said it "has temporarily paused expansion efforts related to the new East Pad development at Badami pending results of the Kennicott B1-33 exploration well." The company said it is keeping options for the new pad open, "but is also evaluating the risk and execution of drilling extended reach wells from the Badami Main pad along with economics that help with the case of tie-in into existing production facilities on the Badami

see GLACIER DRILLING page 6

House O&G bills in Finance; Senate has House's carbon storage HB 50

With less than a month remaining in this legislative session, bills related to energy — specifically the impending Cook Inlet natural gas shortage — and the governor's geothermal bill from last session have reached House Finance while the governor's carbon storage bill passed the House April 17 and is being heard in Senate Resources.

House Finance Co-Chair Rep. Neal Foster told the committee April 4 that he wanted to get energy bills before the Finance Committee or on their way an introduction, whether the committee moves them or not.

Furthest along

The energy bill which has moved the furthest is the governor's carbon storage bill, HB 50, introduced last year and passed by the House April 17. HB 50 was heard and held in Senate Resources April 22 with invited and public testimony April 24; it also has a referral to Senate Finance. HB 50 would allow the Alaska

see ENERGY BILLS page 7

EXPLORATION & PRODUCTION

Fairway extends

Armstrong Oil & Gas discovers Brookian topset oil plays 65 miles to east

By KAY CASHMAN

Petroleum News

n 2013, Armstrong Oil & Gas Inc., Lalong with its partner Repsol, kicked off one of the hottest exploration plays in the world west of Alaska's central North Slope in the Pikka field.

This discovery was followed by other Pikka lookalikes: Brookian topset plays BILL ARMSTRONG such as Willow, Stirrup, Mitquq and Coyote, which are currently in the early stages of development. In aggregate the fields have projected resources in excess of 5 billion barrels.

With Armstrong's understanding of Brookian



topset plays, the company identified multiple Pikka "lookalike" prospects 70-90 miles to the east.

Lagniappe, an Armstrong affiliate company, holding a 25% working interest ownership in a 275,000-acre block of eastern North Slope leases, drilled three of these prospects during the 2024 winter exploration season as operator on behalf of partners APA Alaska LLC (50% WIO), an APA Corp. affiliate company,

and Oil Search (Alaska) LLC (25% WIO), a Santos affiliate company.

The three wells (King Street #1, Voodoo #1,

see FAIRWAY EXTENDS page 7

ANS ekes weekly gain

Cooling Middle East tensions counter massive surprise US inventory draw

By STEVE SUTHERLIN

Petroleum News

laska North Slope crude shed 38 cents April 24 to close at \$88 per barrel, squeaking out a Wednesday-to-Wednesday gain of 8 cents from its close of \$87.92 April 17. West Texas Intermediate slid 55 cents to close at \$82.81 and Brent slid 40 cents to close at \$88.02.

Prices slid despite a surprise massive drawdown in U.S. inventories reported the same day by the U.S. Energy Information Administration.

Prices were held in check in the face of a growing conviction that recent direct hostilities between Iran and Israel will not ignite all-out war in the region. The United States and its allies did announce stricter oil

"The diplomatic deal that seems to be yielding the most dividends for regional energy supplies continues to be the detente between the key Gulf producers (Saudi Arabia and the U.A.E.) and Iran," wrote RBC Capital Markets analyst Helima Croft.

sanctions against Iran, but traders are skeptical about how forcefully sanctions will be imposed, as the Biden administration is trying to avoid higher gasoline prices ahead of the 2024 elections.

A U.S. inventory drawdown did figure into gains see OIL PRICES page 4

GOVERNMENT

New NPR-A regulations

Rules will limit possible oil and gas development to around half of the reserve

By ALAN BAILEY

For Petroleum News

he federal Bureau of Land Management has published a final version of its revised regulations for the management of the 23-million-acre National Petroleum Reserve-Alaska in the northwestern sector of the state. In particular, by establishing new regulations that apply to five special areas that are subject to stringent environmental protections, the new regulations will likely, in effect, limit possible oil and gas development to around half of the reserve's total acreage. The regulations also set rules for the protection of subsistence resources and activities in the reserve.

"Alaska's majestic and rugged lands and waters are among the most remarkable and healthy landscapes in the world, sustaining a vibrant subsistence economy for Alaska Native communities," said President Joe Biden on April 19 in response to the publication of the regulations. "These natural wonders demand our protection. I am proud that my administration is taking action to conserve more than 13 million acres in the western Arctic and to honor the culture, history, and enduring wisdom of Alaska Natives who have lived on and stewarded these lands since time immemorial."

But, given the high level of dependence of the

see NPR-A REGULATIONS page 5

■ EXPLORATION & PRODUCTION

Baker Hughes US rig count up by 2 to 619

By KRISTEN NELSON

Petroleum News

The Baker Hughes' U.S. rotary drilling rig count was 619 the week ending April 19, up by two rigs from 617 the previous week, and down by 133 from 732 a year ago, following a drop of three rigs last week. The rig count was down in five and

up in three of the last eight weeks, with a loss of 19 against a gain of 12 over the period, following a downward trend dominant since the beginning of May.

A drop of 17 to 731 on May 12, 2023, was the steepest weekly drop since June of 2020, during the first year of the COVID-19 pandemic, when the count also dropped by 17 to 284 on June 5, following drops as

steep as 73 rigs in one week in April. The count continued down to 251 at the end of July 2020, reaching an all-time low of 244 in mid-August 2020.

For 2023, the count hit its low point Nov. 10 at 616, down from a high of 775 on Jan. 13, 2023. In 2022, the count bottomed out at 588 Jan. 1, reaching a high for the year of 784 on Nov. 23.

When the count dropped to 244 in mid-August 2020, it was the lowest the domestic rotary rig count had been since the Houston based oilfield services company began issuing weekly U.S. numbers in 1944.

Prior to 2020, the low was 404 rigs in May 2016. The count peaked at 4,530 in 1981. The count was in the low 790s at the beginning of 2020 prior to the COVID-19 pandemic, where it remained through mid-March of that year when it began to fall, dropping below what had been the historic low in early May with a count of 374 and continuing to drop through the third week of August 2020 when it gained back 10 rigs.

The April 19 count includes 511 rigs targeting oil, up by five from the previous week and down 80 from 591 a year ago, with 106 rigs targeting natural gas, down three from the previous week and down 53 from 159 a year ago, and two miscellaneous rigs, unchanged from the previous week and down one from a year ago.

Fifty of the rigs reported April 19 were drilling directional wells, 555 were drilling

Baker Hughes shows Alaska with 14 rotary rigs active April 19, unchanged from the previous week and up by four from a year ago when the count was 10.

horizontal wells and 14 were drilling vertical wells.

Alaska rig count unchanged

Texas (296) was up by two rigs from the previous week.

Louisiana (40) and Oklahoma (45) were each up by a single rig.

New Mexico (108) and Ohio (11) were each down by one rig week over week.

Rig counts in other states were unchanged from the previous week: Alaska (14), California (3), Colorado (15), North Dakota (32), Pennsylvania (22), Utah (12), West Virginia (8) and Wyoming (11).

Baker Hughes shows Alaska with 14 rotary rigs active April 19, unchanged from the previous week and up by four from a year ago when the count was 10.

The rig count in the Permian, the most active basin in the country, was up by two from the previous week at 318 and down by 40 from 358 a year ago. ●

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EXPLORATION & PRODUCTION

Coastal areas remain open for tundra travel

The Department of Natural Resources' Division of Mining, Land and Water said in an April 19 North Slope off-road travel status report that both eastern and western coastal areas remain open.

The eastern area opened Jan. 11 and the western area Jan. 16, the division said, while both lower and upper foothills areas remain closed.

In heavily trafficked areas, road dust and vegetation have produced some snowpack deterioration, the division said, "Areas of high-density roads within the oil field may no longer be suitable for off-road travel," but generally travel is appropriate in most areas.

Snowpack remains deep in many areas, and while winter off-road travel remains open, the division said, "areas of exposed tundra should be avoided."

Coastal areas were sampled by the division April 18.

Ambient air temperatures have varied, and the Alpine ice road was temporarily closed when temperatures reached the mid-30s.

The division said that during its current trip to the Slope temperatures were in the teens with 10-15 mile per hour winds.

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20 years ago: Production from field in Deep Creek unit expected in November; company may also drill step-out at field



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THIS MONTH IN HISTORY

Unocal drilling 5th Happy Valley gas well

20 years ago this month: Production from field in Deep Creek unit expected in November; company may also drill step-out at field

Editor's note: This story first appeared in the April 25, 2004, issue of Petroleum News.

By KRISTEN NELSON

Petroleum News

nocal Alaska is drilling a fifth natural gas well at its Happy Valley pad in the Deep Creek unit southeast of Ninilchik on the Kenai Peninsula and will

connect the field by pipeline to the Kenai Kachemak Pipeline at Ninilchik this fall.

Petroleum Unocal Alaska's onshore gas exploration and development is focused at the Deep Creek and Nikolaevsk units, Chuck Pierce, vice president of Unocal

Alaska, told Petroleum News April 19, 2004, and the company continues to "invest at Ninilchik with our partner Marathon as well, and we're drilling two to three wells there this year" as development continues.

Two wells were drilled at the Happy Valley pad in the Deep Creek unit last year, two more have been completed this year and a fifth is underway. One more well will probably be drilled there this year, Pierce said, bringing the total to six wells at that field.

"By the time we're finished, we'll have five to six development wells on the pad. Then we'll have facilities and a pipeline, and the pipeline will come right back down Oilwell Road, essentially using a DOT right of way that goes beside the road."

Nov. 1 is the scheduled startup for gas delivery from Happy Valley, and Pierce said Unocal is "on schedule to get started on or before Nov. 1 right now, and that way we'll have gas before the winter ... which we need to meet our Enstar contract requirements."

Three units on same trend

The three units, Ninilchik, Deep Creek and Nikolaevsk, are all on the same geologic trend, Pierce said.

"The Nikolaevsk unit is just the next step to the south, same trend," he said. At Nikolaevsk Unocal has permitted an exploration well called Red, which the company plans to spud in June.

And Unocal is "evaluating drilling another exploration well in the Deep Creek unit to the south of Happy Valley," he said, depending on how other work goes, "so in the second half we might do a step-out away from Happy Valley inside the Deep Creek unit."

The Ninilchik, Deep Creek and Nikolaevsk developments are all targeted to providing gas under Unocal's contract with Enstar, he said.

Traditional gas business

The company's older gas fields are dedicated to supplying gas to the Agrium fertilizer plant.

There is ongoing work at Swanson River, Pierce said, "and we're looking at drilling two new wells there."

These are infield wells, he said, part of ongoing development. The field was discovered in the late 1950s, and so this is just getting "the last bit of the development done there," he said.

On the west side of Cook Inlet Unocal has two small gas fields, Lewis River and Stump Lake. "All the gas from the west side properties, and from Swanson, and from

Steelhead (in Cook Inlet)," goes to the Agrium fertilizer plant.

As at Swanson River, Unocal is doing work at Steelhead. "We're looking at some compressor work there," just typical ongoing work, he said. "And we may drill another well out there ... that's under evaluation."

The oil piece

The oil piece of Unocal's Cook Inlet business is primarily offshore, although Pierce said "we have a little bit of oil production from Swanson River." The oil comes from the McArthur River field and the Granite Point field on the west side, and that oil goes to the Drift River terminal and then across the inlet to the Tesoro refinery.

Unocal's oil business is "fully developed and what we're focused on there is opti-



mization," he said: projects to optimize the wells, de-bottleneck the facilities. "So we really aren't looking at new wells, we're focused on optimization."

North Slope and Foothills

On the North Slope Unocal has about a 5% interest at ConocoPhillips operated Kuparuk and about a 10.5% interest at BPoperated Endicott.

The company has exploration acreage in the Foothills area, "we took it back in May of 2001, and it's more gas-oriented than oil and it doesn't make sense to drill any exploration wells until such time as there's a pipeline so we can get the gas to market,"

While the company isn't interested in frontier exploration in areas such as the National Petroleum Reserve-Alaska, "we are interested in what I'd call close-in exploThe oil piece of Unocal's Cook Inlet business is primarily offshore, although Pierce said "we have a little bit of oil production from Swanson River." The oil comes from the McArthur River field and the Granite Point field on the west side, and that oil goes to the Drift River terminal and then across the inlet to the Tesoro refinery.

ration, step outs from the existing field structure. ... So we are looking for satellite-type opportunities adjacent to the existing infrastructure and fields."

And, of course, he said, Unocal continues to participate in exploration within the Kuparuk unit.

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LAND & LEASING

Spring sales begin May 20, close June 6

Online bidding for spring state areawide oil and gas lease sales will begin May 20 and close June 6, the Alaska Department of Natural Resources' Division of Oil and Gas said in an April 22 notice of sale, with bidding results available to the public on the division's website at 9 a.m. June 12.

Sales are conducted online for the state by EnergyNet.

Spring sales include Cook Inlet and Alaska Peninsula areawide.

Bids on Alaska Peninsula tracts are cash bonus with fixed royalty, with a minimum bid of \$5 per acre and a 12.5% royalty.

Alaska Peninsula areawide leases have a 10-year term. Rental is \$1 per acre for year 1; \$1.50 per acre for year 2; \$2 per acre for year 3; \$2.50 per acre for year 4; and \$3 per acre for years 5-10.

For the Cook Inlet sale, the bid method is net profit share bidding with a fixed cash bonus. The minimum net profit share bid is 5%; the fixed per-acre cash bonus is \$40 per acre. The Cook Inlet leases have a 5-year term, although the division said that under certain conditions the leases may receive a one-time extension. Rental is \$1 per acre for year 1; \$1.50 per acre for year 2; \$2 per acre for year 3; \$2.50 per acre for year 4; and \$3 per acre for year 5.

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OIL PRICES

on April 23, having factored into a \$1.31 leap which took ANS to a close of \$88.37. WTI rose 51 cents to close at \$83.36 and Brent leapt \$1.42 to close at \$88.42. American Petroleum Institute data released that day signaled a drop in U.S. supplies, while a weakening U.S. dollar added to the bullish sentiment.

The EIA report April 24 said U.S. commercial crude inventories for the week ended April 19 — excluding Strategic Petroleum Reserve levels — fell 6.4 million barrels from the previous week to 453.6 million barrels, 3% below the five-year average for the season.

Analysts polled by The Wall Street Journal had predicted inventories to rise by 500,000 barrels.

The SPR added 0.9 million barrels to hit 365.7 million barrels on April 19.

Total motor gasoline inventories fell by 0.6 million barrels for the period to 226.7 million barrels — 4% below the five-year average for the time of year. Distillate fuel inventories increased by 1.6 million barrels for the period.

ANS dropped 79 cents April 22 to close at \$87.07, as WTI and Brent each lost 29 cents to close at \$82.85 and \$87 respectively. ANS rose 28 cents April 19 to close at \$87.86, while WTI gained 41 cents to close at \$83.14 and Brent rose 18 cents to close at \$87.20

ANS was off 25 cents April 18 to close at \$87.58, but WTI gained 4 cents to close at \$82.73 and Brent shed 18 cents to close at \$87.11.

On April 24, ANS traded at a \$5.19 premium over WTI, while Brent traded at a 2-cent premium over ANS.

Middle East triad mutes prices

Iran and Israel have recently kept aggression in check, but Iran's relationship with Saudi Arabia and the United Arab Emirates is key to moderation in crude prices during Middle East tensions, according to an April 22 Barron's report.

"The diplomatic deal that seems to be yielding the most dividends for regional energy supplies continues to be the detente between the key Gulf producers (Saudi Arabia and the U.A.E.) and Iran," wrote RBC Capital Markets analyst Helima Croft. "It is far from an easy truce and could be tested once again as the broader Middle East backdrop remains fraught, even if the worst outcome did not come to pass."

Earlier conflicts between Iran and Saudi Arabia often juiced crude prices. In 2022, Houthi-fired missiles striking oil infrastructure in Saudi Arabia pushed oil prices briefly above \$120.

Total motor gasoline inventories fell by 0.6 million barrels for the period to 226.7 million barrels — 4% below the five-year average for the time of year. Distillate fuel inventories increased by 1.6 million barrels for the period.

Last March, Iran and Saudi Arabia resumed diplomatic relations under a deal brokered by China — Iran's primary oil buyer, Barron's said, adding that Saudi Arabia wants peace because it seeks to diversify into areas like tourism.

"Tehran and Riyadh have taken steps to ensure that their dialogue continues without the March 2023 diplomatic deal becoming another victim of the Gaza war," Giorgio Cafiero, CEO of Gulf State Analytics wrote in March.

Don't drain the SPR!

When the Biden Administration drew down the SPR by more than 280 million barrels during the pandemic, the maximum draw was some 1 million barrels per day for five months, meanwhile OPEC+ had some 4 million bpd of spare capacity.

"It could be argued that the draw was unnecessary," Michael Lynch, senior Forbes contributor said in an April 24 missive.

With an election looming, a further SPR release might lower global prices, but "given how far the SPR has already been reduced, there are clear limits to how much more can be released," Lynch said, adding, "Of course, lower prices for a few months would satisfy Biden's political needs."

The history of petroleum economics reveals failed efforts to calculate a sustainable oil price, which pleases both consumers and producers, and enables the market to balance, he said.

"There is no reason now to think that anyone has a better idea of what the 'appropriate' oil price should be," Lynch said. "But frankly it's not clear if the Biden Administration is even considering that in its efforts to manipulate prices, as opposed to simply wanting them 'lower' for political reasons."

Historic fears of an Iranian attack on Saudi oil fields have passed without a major catastrophe, leading to complacency about future threats, he said, adding, "The growing politicization of oil, and increased instability in places like Russia, means a future supply disruption cannot be ruled out."

"Oil from the SPR is our first line of defense against the economic havoc that a disruption would wreak," he said. ●

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NPR-A REGULATIONS

Alaska economy on the oil industry, Alaska lawmakers have expressed vehement objections to the new regulations.

"The Biden administration may be focused on short-term political gains, but at the expense of Alaska's long-term future, limiting jobs for Alaskans, revenues for our state, and the future energy and mineral security of our nation," said U.S. Sen. Lisa Murkowski. "Once again, the president and his team are making unjustifiable decisions that hurt us while allowing some of the worst regimes in the world — in nations like Iran and Russia — to stay in power, enrich themselves from resource production, and then use those revenues to finance terror and war. At this point, the Biden administration is undermining the rule of law, ignoring the voices of Alaska Natives, and punishing Alaska despite our strong environmental record."

"The Biden administration sanctions Alaskans, while terrorists in Iran and communists in China get off scot-free and are strengthened. It's no wonder, with such anti-American policies, that authoritarian regimes in Russia, China and Iran are on the march," said U.S. Sen. Dan Sullivan. "The Biden administration is deliberately undertaking policies to punish Americans and undermine our strengths while continuing to help our adversaries."

The economies of North Slope communities are also highly dependent on the industry.

"The federal government has once again chosen to overlook the legitimate concerns of elected indigenous leaders from Alaska's North Slope," said Nagruk Harcharek, president of the Voice of Arctic Inupiat. "This is a continuation of the onslaught of being blindsided by the federal government about unilateral decisions affecting our homelands ... economic development projects, which have taken place with the engagement and inclusion of the North Slope Inupiat for over 50 years, are essential to the survival of our communities and culture."

Support from environmental groups

Environmental organizations, on the other hand, strongly support the new regulations.

"The Biden administration's actions for America's Arctic show a commitment to conservation that meets the needs of the region's outsized vastness and ecological

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Ph| 907-644-4522 Fx| 907-644-4523 services@Computing-ALT.com www.Computing-ALT.com 5701 Silverado Way, Ste. J203 Anchorage, AK 99518 value," said Kristen Miller, executive director at Alaska Wilderness League. "Our nation's public lands are an essential part of addressing the climate and biodiversity crisis, and this decision could not come at a more critical time. Under this rule, the western Arctic's special areas will start to receive the protections they deserve for the sake of local communities, the region's biodiversity, and our global climate."

Governed under the NPRPA

Congress assigned BLM oversight of the NPR-A under the National Petroleum Reserves Production Act, passed in 1976. BLM maintains regulations that spell out how it manages the NPR-A under the terms of the NPRPA. And the NPRPA specified three overarching mandates for managing the reserve: the conducting of an oil and gas leasing, exploration and development program; the protection from the impacts of that program of environmental, historic and scenic resources; and the assurance of maximum protection of surface values within highly sensitive areas of the reserve, referred to as "special areas."

The regulations have included three special areas: Teshekpuk Lake, the Utukok River Uplands and the Colville River Special Area. In 1999 BLM expanded the

Teshekpuk Lake and Colville River Special Areas.

BLM maintains an integrated activity plan for NPR-A. The IAP specifies what areas within the reserve are available for oil and gas leasing, as well as rules for where oil and gas infrastructure can be located. The IAP now includes special areas that are not specified in the regulations: In 2004 the department designated a fourth special area, the Kasegaluk Lagoon Special Area, and in 2013 added a fifth special area, the Peard Bay Special Area. In 2013 the agency also expanded the Teshekpuk Lake Special Area by a further 2 million acres while also expanding the Utukok Uplands Special Area.

Two special areas move into regs from the IAP

A core change in the newly issued regulations involves incorporating the two additional special areas into the regulations, rather than having them just in the IAP. And, under the new regulations, the maintenance of an IAP is now mandatory. In addition BLM has added to the regulations specific rules regarding how the natural environment must be protected within the special areas. The new regulations also include standards and procedures for designating and amend-

ing special areas.

Under the new regulations BLM can decide to remove land from three of the special areas, if there is some change in the resource values within those areas. However, the agency cannot remove land from the Teshekpuk Lake and Utukok River Uplands Special Areas unless directed to do so by statute.

Regulations for managing special areas

The new regulations spell out lists of natural resources that require protection in each special area. The regulations require a BLM official who is responsible for authorizing activities within a special area to take steps to protect these resources, including, but not limited to, setting conditions for activities, delaying actions, and denying proposed activities in whole or in part. However, the presumption is that oil and gas activities will not be permitted, unless it is clear that the activities can be carried out with no or minimal impacts on significant resource values.

Given the extent of land within the special areas, the special areas regulations apply to around 13 million acres of the 23-million-acre reserve.

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GLACIER DRILLING

main pad."

Glacier had planned to drill two Badami sands wells from the Badami Main pad, but those wells were postponed because of drilling of the Killian B1-33 exploration well. The company is now calling this well Kennicott B1-33 although permits issued by the Alaska Oil and Gas Conservation Commission on Jan. 26 of this year refer to this exploration well as the Badami B1-33.

Glacier is currently drilling the B1-33 and said it expects the well to be brought online around June 15. It will be the longest well drilled at Badami, with a measured depth of some 21,500 feet. Work on the B1-33 involved a 27-mile ice road and ice bridge to mobilize Doyon 19 and support equipment.

21st POD plans

The 21st POD covers July 16, 2024, through July 15, 2025.

Glacier said it plans to continue exploration and development for new Badami and Killian sand prospects, "pending favorable economic conditions and the ability to raise capital at reasonable terms," and depending heavily on results from the Kennicott exploration program, with the pilot hole drilled and logged and the well expected to be completed, fractured and brought online around mid-June.

The two Badami sand wells planned for the 20th POD are expected to be drilled during the 21st POD, subject to economic conditions and results from the B1-33 (Kennicott/Badami) well.

Also possible are a workover on the B1-01 Class 1 injection well and a possible conversion or workover on a low productivity well for either gas storage or injection or for conversion to a Class I or II well.

A third Killian exploration well from the Main pad will be evaluated for drilling during the 2025-26 ice road season, targeting a new Killian reservoir sand pod, pending Kennicott well results. Glacier said that well would prove up Killian sand beyond the

existing participating area "and aid in securing capital for overall development."

Glacier also said it would keep its options open for a new Badami East pad, considering risks related to extended reach drilling and other economic factors.

The company will also prepare and participate in the Pipeline and Hazardous Materials Safety Administration audit on the Badami Oil Pipeline in the third quarter of 2024.

20th POD work completed

During the 20th POD, Glacier progressed planning and development for new Badami and Killian sands, identifying targets which can be drilled from the Badami Main pad and the proposed Badami East pad, along with evaluating options for new processing of seismic data.

In the winter of 2023 the Thunderbird Rig was mobilized via snow road to workover the B1-07 after a stuck fish took the well offline. AOGCC production data show B1-07 was offline between November 2022 and April 2023, and since coming

back online has accounted for 38.6% of the field's production.

Preliminary G&G work was done on newly acquired acreage — 1,280 acres south of the unit; 2,560 acres to the west; and 427 acres to the north.

AOGCC approved an application for downhole commingling of B1-38 Killian and Badami reservoir sands in July 2023, with perforations added and the newly perforated zones expected to add to the reserves base for the well.

Glacier participated in the PHMSA audit of the Badami Gas Pipeline in August 2023 and engaged with DNR in the 30-year renewal of the right-of-way leases for the Badami Oil and Gas Pipelines, also completed in August 2023.

Badami unit production volumes included with the POD show 2021 production of 431,590 barrels, dropping to 282,812 barrels in 2022 and to 281,060 barrels in 2023.

—KRISTEN NELSON

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GAS RESERVES

on the shelf," Pfoff said.

"We see a much more reasonable pathway to profitability in pursuing natural gas," he said.

Biz model change

"Our business model has been to outsource geology, geophysics and engineering since neither Paul Craig or I are a geologist, geophysicist or an engineer," Pfoff

"So we're pursuing either a sale of the company or a partnership that can bring those resources to the table," Pfoff said.

Amaroq is also exploring third party financing.

All of those options, he said, required an independent engineering report to get off the ground.

VDR set up

Amaroq has set up a Virtual Data Room, or VDR.

The company has several confidential agreements in place with various E&P companies, as well as one utility, Pfoff said, but they're open to working with additional firms.

"The last thing we want to do at this time is plug and abandon a field with the potential natural gas upsides that the Nicolai Creek unit has, especially with the gas shortages anticipated in the next couple of years in Southcentral Alaska," Pfoff said.

Under the gun

Amaroq is also "a little bit under the gun" with the conditions in the latest plan of development, or POD, approved by the Alaska Department of Natural Resources' Division of Oil and Gas, which requires work to be completed by the end of 2025.

Amaroq had to commit to completing its plans for the workover of the NCU 3 well in order to restore production by the end of 2025; or since the company has identified 1 billion cubic feet of proven undeveloped gas reserves in the NCU 10 well, Amaroq had to commit to conducting a workover of, or redrilling of, the NCU 10 before the end of 2025.

"We are not opposed to the conditions — we see most of the potential in the No. 10 well, but it's a matter of funding," Pfoff said.

And when Amaroq comes up with the funds, "we already have the infrastructure, the gathering lines, tied into the gas grid.

We'd just have to lay a small amount of pipe," he said.

Deep oil, coalbed methane, gas storage

The third party engineering study only dealt with natural gas reserves. But there are other upsides to the Nicolai Creek unit, Pfoff said.

Although Nicolai Creek has only produced natural gas, there has been talk for many years of developing deep oil rights, which Amaroq finished acquiring from Apache Corp. in 2021.

The transaction involved approximately 5,000 net acres of "deep rights" on the Kenai Peninsula and the west side of Cook Inlet, underlying the Nicolai Creek gas producing unit.

All of the acreage acquired from Apache was onshore and covered depths below the Upper Tyonek formation.

The deal included a geophysical data license agreement granting Amaroq access to Apache's proprietary 3D data shot over the Nicolai Creek unit.

At the time, Amaroq said it planned to "process these data to evaluate the upside potential" at the Nicolai Creek unit; "particularly the Nicolai Deep and Nicolai Footwall prospects that target oil pay in the Lower Tyonek G and Hemlock formations."

"This transaction is very significant for Amaroq," Pfoff said at the time. "We are now well positioned to high grade several exploratory oil prospects that lie directly beneath Amaroq's shallow gas zones in addition to identifying potential development drilling locations for gas."

There is also a gas storage opportunity in the West Nicolai Creek unit, Pfoff said.

The gas storage opportunity involves the NCU 2 and is described in detail in the Alaska Oil and Gas Conservation Commission's Storage Injection Order No. 8 approved by the commission on April 16, 2010. AOGCC SIO 8 expired in April 2012, more than 7 years before Amaroq acquired the Nicolai Creek unit. The same storage reservoir proposed in 2010 could be revisited by Amaroq or a related company.

"And there is resource potential within coalbed methane," Pfoff said. "We see coal seams in our well logs."

Finally, the third party engineering firm only looked at 2,000 onshore acres; the rest of the 8,000 offshore acres were not part of their study.

—KAY CASHMAN





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ENERGY BILLS

Department of Natural Resources' Division of Oil and Gas to lease land for carbon storage projects, establish a regulatory regime within the Alaska Oil and Gas Conservation Commission and allow AOGCC to pursue primacy for Class VI carbon dioxide injection wells.

A goal of the bill is to establish another source of revenue for the state, but CCUS, carbon capture, utilization and storage, would also allow oil and gas companies to meet financing requirements that they capture carbon dioxide.

Another governor's bill introduced last year, HB 74, now in House Finance, would change how geothermal is licensed, basing it on the existing exploration licensing program used for oil and gas. It would allow more time for companies to identify a geothermal resource and convert it to leases. The current geothermal program requires a company to prove a commercial discovery; under HB 74, the requirement to convert to leases would be based — as with exploration licensing — on completion of a work commitment.

The bill also increases the amount of acreage available for a geothermal permit.

HB 394, by Rep. Tom McKay, would allow the Regulatory Commission of Alaska to regulate third-party natural gas storage. In the sponsor's statement McKay said HB 394 would provide a regulatory framework to encour-

The energy bill which has moved the furthest is the governor's carbon storage bill, HB 50, introduced last year and passed by the House April 17.

age expansion of natural gas and liquefied natural gas storage facilities "but also ensures these critical pieces of energy infrastructure operate efficiently and remain economically viable." In addition to CINGSA, Cook Inlet Natural Gas Storage Alaska, a facility which RCA regulates and which provides commercial storage, producers have storage in the Cook Inlet basin which they use for their own gas. The bill had hearings in both House Finance and House Labor and Commerce and went to the House Rules Committee April 22.

In House Finance

HB 223, by Rep. George Rauscher, was passed out of House Resources March 11. It would eliminate state royalty on gas produced outside of the North Slope, if explored for or produced after June 3, 2023, and if that gas is first offered for sale to an in-state electric or heating utility. The royalty would be reduced by 50% if the gas doesn't meet the offered for sale criteria.

HB 257, by McKay, out of Resources Feb. 14, would make Cook Inlet seismic and geophysical data available without cost to qualified individuals — unless that data is

required to be held confidential under state statute. Cook Inlet data currently accounts for less than 5% of statewide sales of such data, at an estimated revenue loss of \$35,000 per year.

HB 387, a Resources Committee bill, out of Resources March 25, would create a tax credit to support bringing a jack-up rig to Cook Inlet by July 1, 2026. The credit would cover the total cost of purchasing and transporting a jack-up to Cook Inlet. Offshore prospects require a jack-up, and the one currently in Cook Inlet is tied up doing development work.

HB 388, a Resources Committee bill, out of Resources April 9, would establish a reserve-based lending fund at the Alaska Industrial Development and Export Authority. The bill does not allocate monies to that fund. The amount of the loan would be based on the oil and gas reserves held by the borrower. The bill is meant to address the high capital cost of new projects in Cook Inlet.

HB 393, another Resources Committee bill, out of Resources April 9, would reduce royalties on Cook Inlet wells drilled after July 1, 2024, to zero for gas wells and to 5% for oil wells; oil and gas from wells drilled before July 1, 2024, would pay 5% royalty. The bill also provides for deduction of capital expenditures for oil or gas development from the royalty burden, excluding the North Slope.

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FAIRWAY EXTENDS

Sockeye #1) each targeted large 3D-defined opportunities.

King Street #1

The King Street #1 well was drilled to a total depth of 10,241 feet. Hydrocarbons were found in two separate hydrocarbon zones at depths of 8,130 feet and 9,850 feet.

Wireline evaluation, sidewall cores and MDT data from the well indicate pay in both lower and upper zones in high-quality late Cretaceous clastic reservoirs.

Further evaluation will be undertaken to determine the scope and focus of future appraisal drilling necessary to determine the size and extent of the King Street #1 discoveries.

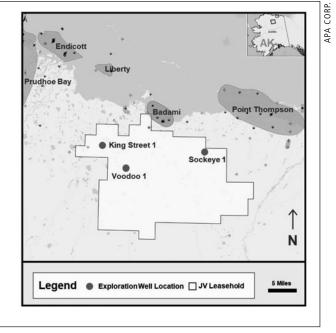
The Sockeye #1 well and the Voodoo #1 well were unable to reach their targeted depths due to a number of operational and weather-related challenges. Both wells were plugged before reaching the targeted formations as it was determined there would not be sufficient time to drill and evaluate prior to the end of the drilling season.

Bill Armstrong, president of Armstrong Oil & Gas, said, "Wildcatting is a challenging endeavor. The wells we drilled this year were located 70-90 miles east of older Brookian topset discoveries. Only two wells had ever been drilled on our 275,000 acre land position (one well/215 square miles)."

Despite the lack of well control, "our regional geologic studies indicated evi-

Exploration Joint Venture (North Slope, Alaska)

- Established Joint Venture between APA Corp (50%), Lagniappe Alaska, LLC (25%) and Santos Ltd (25%)
- 275,000 gross acre position situated on state lands
- Three exploration wells expected to spud in the first quarter of 2024; operated by Lagniappe Alaska, LLC



Wireline evaluation, sidewall cores and MDT data from the well indicate pay in both lower and upper zones in high-quality late Cretaceous clastic reservoirs.

dence for connectivity to a working petroleum system, and our objectives have potential for very favorable (porous and permeable) rock properties," Armstrong said

"Additionally, the seismic geometries of our prospects looked similar to older Brookian topset discoveries. Our King Street discovery well proved all that to be accurate," he said.

"All that said, we need to do a complete analysis of all the data accumulated

this year," Armstrong said.

"Operationally, this year proved to be quite difficult, and a late start to the drilling season coupled with multiple shutdowns due to high winds shortened the drilling window considerably preventing us from reaching the targeted formations at Sockeye and Voodoo. We will make the proper drilling adjustments and determine implications on future drilling seasons," he said.

Any successful campaign on the North Slope is the result of extensive cooperation among local, state, and federal stakeholders.

"Armstrong would like to thank its partners in Lagniappe and all the agencies involved in the 2024 campaign that helped ensure safe operations. In particular, the support of the North Slope Borough, the State of Alaska, Department of Natural Resources Division of Oil and Gas, and the Alaska Oil and Gas Conservation Commission were paramount to Lagniappe's progress in 2024," said Nathan Lowe, vice president, Armstrong Oil & Gas.

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Little something extra

Lagniappe is a Cajun word that loosely translates into "a little something extra" or "a good unexpected surprise" — apropos for the Nanushuk play on the North Slope, which Armstrong and a partner first drilled and identified as a huge oil reservoir in 2013 (Qugruk 3 well). The discovery led to the Pikka oil field. ...

"The Nanushuk discoveries at Pikka were a big surprise to the industry as it was a shallow horizon in and amongst deeper developments in the Alpine and Kuparuk River field areas," Bill Armstrong said.

"The size of the Nanushuk fields was the biggest surprise with several of the new fields estimated to be in excess of 1 billion barrels of recoverable oil."

Armstrong said the Nanushuk play is still in its infancy and Pikka-size oil discoveries are likely repeatable across Alaska's North Slope, stretching 350 miles from the western edge of the state near the Chukchi Sea, through the bourgeoning Pikka/Willow complex, all the way to the eastern edge of Alaska state lands.

—Reprinted from The Explorers magazine, June 2023



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