

Hilcorp permitting 2nd Whiskey Gulch natural gas exploration well

Hilcorp Alaska has applied to the Alaska Oil and Gas Conservation Commission for a spacing exception to drill a second exploration well at its Whiskey Gulch prospect north of Anchor River on the southern Kenai Peninsula.

In its application Hilcorp told the commission the first Whiskey Gulch exploration well, WG 01, was completed in July. WG 01 targeted the Sterling, Beluga and Tyonek formations within Whiskey Gulch undefined oil and gas pools. It is currently being tested, the company said, "in hopes to discover commercial quantities of oil and/or gas."

WG 14 will be the second exploration well the company drills in the prospect and will also target unproven reserves in the Sterling, Beluga and Tyonek formations. In 2019 and

see **WHISKEY GULCH** page 9

Oil Search looks to build 21.6 mile pipeline to connect to STP, more

On Nov. 9, Alaska's Division of Oil and Gas posted a 30-day public notice on an easement application it received on Oct. 5 from Oil Search Alaska. The company has said the easement is key to being able to move forward with its big Pikka oil development west of the central North Slope.

Oil Search is requesting a non-exclusive private easement to develop and operate a 21.6-mile pipeline system that would connect drilling operations in the Pikka unit, initially known as the Nanushuk project, with other Oil Search facilities and existing infrastructure on the North Slope.

The pipeline will be located on state lands between the Pikka unit boundary and the OSA Tie-In Pad, or TIP, which is

see **OIL SEARCH PIPELINE** page 11

Alberta releases hydrogen roadmap to create 5,600 jobs, attract C\$30B

Determined to change its national and global image as producer of the world's dirtiest crude, the Alberta government has unveiled its plan to become a hydrogen front-runner at the same time it announced a raft of emissions-reduction projects.

The hydrogen strategy aims to attract investment of C\$30 billion by 2030, create 5,600 jobs and lower Alberta's greenhouse gas emissions over the next nine years by 5% or 7 million metric tons annually.

Driving the province's hopes is an estimate that hydrogen

see **HYDROGEN ROADMAP** page 10

Canadian pipeline protests flare; First Nations stall pipeline work

The British Columbia government is again being dragged into a showdown with First Nations as work on two resource pipelines enters the home stretch.

After an extended lull, protests have again erupted at construction sites for TC Energy's Coastal GasLink line, which is the underpinning of the LNG Canada project led by Royal Dutch Shell, with two demonstrators arrested by the Royal Canadian Mounted Police for blockading a work camp.

At the same time, First Nations and various activist groups are readying themselves to battle with the Canadian government's Trans Mountain pipeline expansion as construction approaches Metropolitan Vancouver.

The RCMP said they received several complaints about

see **PIPELINE PROTESTS** page 9



JASON KENNEY

EXPLORATION & PRODUCTION

PA for Narwhal

Conoco, in preparation for production, applies for participating area

By KRISTEN NELSON

Petroleum News

ConocoPhillips Alaska is getting ready to put the Narwhal accumulation in the Colville River unit online and has applied to the state and Arctic Slope Regional Corp. for approval of the Narwhal participating area. A PA defines the area within a unit from which specific production comes.

The proposed PA is in the southeast corner of the CRU, where ConocoPhillips drilled the Putu 2 and Putu 2A wells, adjacent to Pikka, where Oil Search and Repsol are working to develop the Nanushuk. Narwhal is a Brookian Nanushuk sand,

ConocoPhillips said Putu 2 and Putu 2A were the first wells drilled in the Colville River unit "to find significant Narwhal thickness and reservoir quality."

ConocoPhillips said in its PA application.

Existing PAs at the Colville River unit, which came online in 2000, include Alpine, Fiord, Nanuq and Qannik.

In its application, filed Nov. 12, the company said it plans to begin sustained production from the Narwhal PA as early as this December, pending

see **NARWHAL PROGRESS** page 6

FINANCE & ECONOMY

Strategic tap dance

Dems: tap SPR, ban exports; Rystad: demand-focused climate policies needed

By STEVE SUTHERLIN

Petroleum News

Following four days of placid trading action, oil prices took a plunge Nov. 17. Alaska North Slope crude lost \$2.22 to close at \$81.33 per barrel, while Brent dropped \$2.15 to close at \$80.28.

West Texas Intermediate fared the worst, sliding \$2.40 to close at \$78.36 as a growing contingent of Democratic lawmakers exhorted the Biden Administration to flood the market with oil from the Strategic Petroleum Reserve to combat rising gasoline prices for U.S. consumers.

WTI dipped lower in early trading Nov. 18, while Brent fell as low as \$79.30 before returning to levels above \$80.

An annual cost of supply analysis by Rystad Energy said that upstream sector costs have fallen in 2021, making new oil more competitive and significantly cheaper to produce.

In a Nov. 17 letter to President Joe Biden, U.S. Rep. Antonio Delgado, D-New York, said working people and small businesses are "less able to absorb" soaring fuel costs, the Daily Freeman reported.

"That is why I urge you to release inventory from the Strategic Petroleum Reserve to help

see **OIL PRICES** page 8

LAND & LEASING

BOEM drops estimate

2021 assessment of Alaska OCS resources has Beaufort, Cook Inlet reductions

By KRISTEN NELSON

Petroleum News

The U.S. Bureau of Ocean Energy Management published its "2021 Assessment of Oil and Gas Resources: Alaska Outer Continental Shelf Region" in October, projecting a drop from its 2016 assessment in undiscovered technically recoverable oil and gas resources.

The 2021 assessment found undiscovered technically recoverable resources, UTRR, for the Alaska OCS region had a mean of 46.754 billion barrels of oil equivalent, down from a 2016 mean of 50.70 billion boe.

The agency said the 2021 assessment is based

The largest decline was for the Beaufort Sea, which has a UTRR of 8.608 billion boe in the 2021 assessment, down from 13.84 billion boe in 2016.

on geological work done for the 1995 "Undiscovered Oil and Gas Resources, Alaska Federal Offshore" with new well data, geological interpretations and technologies, as of Jan. 1, 2019, incorporated along with an updated economic scenario.

Undiscovered technically recoverable resources

see **BOEM ESTIMATE** page 5

● EXPLORATION & PRODUCTION

Hilcorp files 40th POD for Duck Island

By **KRISTEN NELSON**
Petroleum News

Hilcorp Alaska has filed the 40th plan of development for the Duck Island unit with the Alaska Division of Oil and Gas, a plan covering Feb. 13, 2022, through Feb. 12, 2023.

Hilcorp is operator of the DIU, one of the smaller North Slope units. DIU produces from the Kekiktuk reservoir in the Endicott participating area, the Ivishak reservoir and the Sag River reservoir in the Eider PA and the Sag River reservoir in the Minke tract operation.

For January through October of this year, production averaged 6,279 barrels of oil per day, the company said.

During the 39th POD, Hilcorp completed a number of non-rig wellwork operations: perf add at the 3-26B, 1-39A, 2-14 and 1-29 wells; re-perf at the 4-38 well; surface casing excavation at the 2-60 and 4-32 wells; and a return to service at the 3-03, which Hilcorp said was a long-term shut-in well.

On surface facilities, summer turnaround maintenance included: vessel cleaning and inspection; rotating equipment overhaul and repairs; and minor upgrades.

Hilcorp had planned a well conversion at the MPI 01-25 but said that work was delayed in favor of evaluating

For the 40th POD, under long-range development activities, Hilcorp said: "Perform tracer study to understand injector/producer response to target potential future drilling targets."

the MPI 1-21 well to gas injector.

Work during the 39th POD reflected a return to more normal operations, compared to the 38th POD which reflected impacts of the COVID-19 pandemic (Feb. 13, 2020, through Feb. 12, 2021). When it reported on that POD in November of 2020, Hilcorp told the division it "did not perform any of the anticipated workover operations as the rig and capital allocated for those projects were diverted elsewhere," but did complete a number of "non-rig wellwork operations to optimize the Duck Island Unit wellstock."

40th POD

For the 40th POD, under long-range development activities, Hilcorp said: "Perform tracer study to understand injector/producer response to target potential future drilling targets."

The company said it has no exploration or delineation plans at the unit.

A number of workover operations are planned:

- Rig workover on 3-11 well to install new tubing string, return well to production.
- Rig workover on 1-29 well to fix production casing leak, return well to production.
- Conversion of the 1-21 and 1-07A wells to gas injection for enhanced gravity draining recoveries.
- Increase injectivity on current water injection wells and/or convert wells to water injection.
- Perform additional workover operations as needed to enhance and maintain production.
- Perform various non-rig wellwork operations to maintain and enhance production.

Key facility projects during the 40th POD may include:

- Upgrade/repair SDI low flow test separator intervals.
- Propane turbine demister install.
- Turnaround for: vessel cleaning and inspection; LACT meter upgrades; rotating equipment overhaul and repairs; retraying condensate stabilizer; and flare inspection and repair. ●

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● EXPLORATION & PRODUCTION

Hilcorp submits 18th POD for Northstar

By KRISTEN NELSON
Petroleum News

Hilcorp Alaska, the Northstar unit operator, has submitted the 18th plan of development to the Alaska Division of Oil and Gas and the U.S. Bureau of Safety and Environmental Enforcement, which jointly manage the unit.

The NU, one of the smaller units on the North Slope, was formed in 1990 and has four state leases and three federal leases, some 20,135 acres, the division said when it approved the 17th POD in January 2021.

The 18th POD, filed Nov. 15, covers Feb. 13, 2022, through Feb. 12, 2023.

Hilcorp said there are three oil sand accumulations at Northstar: Ivishak sands in the Northstar participating area, Ivishak sands in the Fido PA and Kuparuk sands in the Hooligan PA.

The unit is produced from a five-acre, manmade island in the Beaufort Sea, 6 miles offshore and 13 miles northwest of Prudhoe Bay, the Alaska Oil and Gas Conservation Commission said in a pool description. The discovery well was drilled in 1984 and construction of the island began in the winter of 1999-2000. Regular production began in 2001.

Previous plan

For January through October of 2021, average daily production was 8,841 barrels of oil per day, Hilcorp said.

AOGCC production records — September is the most recent available — show Northstar has the highest percentage of natural gas liquids production of any North Slope field, accounting for 43% of production in September.

During the 17th POD, which covered February 2020 through February 2021, Hilcorp completed summer maintenance, installed 45 heat pipes around modules for active ground refrigeration to reduce ground settlement and continued ongoing repair of the island's coastal defenses.

The 17th POD had included a proposal to convert the NS-15 wells from a Kuparuk oil pool producer to an injector, but Hilcorp said that conversion was "delayed due to update in injection management strategy."

The NU, one of the smaller units on the North Slope, was formed in 1990 and has four state leases and three federal leases, some 20,135 acres, the division said when it approved the 17th POD in January 2021.

18th POD

For the 18th POD, Hilcorp said long-range development activities include:

- Explore opportunity to import gas from the Prudhoe Bay unit for pressure maintenance in the Kuparuk reservoir.
- Review potential candidates for coil tubing drilling. "Determine if coil tubing drilling operations are economically viable, or even mechanically feasible, on Northstar Island."
- Research economic viability of developing Sag River reservoir. Hilcorp said that "reservoir is of very low permeability and porosity, likely requiring stimulation techniques to unlock production."

Hilcorp said no workover operations are anticipated but will be performed as needed.

Work proposed on surface facilities includes:

- Installation of active refrigeration on 45 newly installed heat pipes and 41 converted thermosyphons.
- Continue ongoing repair of coastal defenses on the island. ●

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ENVIRONMENT & SAFETY

State Slope land open for snowmobile use

State lands on the North Slope are open for snowmobile use but all areas remain closed to general winter off-road tundra travel.

The Alaska Department of Natural Resources, Division of Mining, Land and Water, said Nov. 10 that snow conditions are adequate for snowmobile use in the "North Slope Oil Production District." The division noted this applies only to operators with valid off-road vehicle travel permits for state-owned lands on the Slope.

With division approval no longer required for snowmobile travel for the remainder of the 2021-22 winter season, "permit holders may designate environmental staff to approve the use of snowmobiles without contacting the DMLW Northern Regional Land Office."

The division said any such use must be reported on tundra travel completion reports for the season and said state personnel will conduct periodic site inspections to ensure compliance.

The division said Nov. 15 that snow depths and soil temperature criteria have not been met for general winter off-road travel.

All areas of the Slope remain closed to off-road travel, which requires a soil temperature of minus 5 degrees C at a depth of 30 centimeters, as well as snow cover — 6 inches in the coastal areas and 9 inches in the foothills.

Snow levels are "exceptional" for this time of year, the division said, meeting or exceeding required snow depths at all sites except for a single site in the lower foothills which missed the required depth by 1/10 of an inch.

Because of the exceptional snow conditions, the division said it is strongly recommending that operators planning to construct snow and ice roads begin prepacking operations as soon as possible.

"This year's deep snow may insulate the tundra, slowing freeze-up, which can push back the travel opening date," the division said, and prepacking will help drive soil temperatures down and also help stabilize the snow preventing it from being moved in a blow.

Send requests for prepacking approval to the division at: dmlw.north.slope@alaska.gov.

—KRISTEN NELSON



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OIL PATCH STORIES

Pump Jacks, Roustabouts and Roughnecks

“Pump Jacks, Roustabouts and Roughnecks: The Myths, Legends and Stories of Life in the Oil Field,” by John Schuelke is the latest book of short stories about the personal experiences of people who work in the oil and gas industry; many in Alaska.

Currently residing in Katy, Texas, John first came to Alaska with the military in 1980 when his father was transferred to Fort Greeley.

John attended high school in nearby Delta Junction for two and a half years before his father was re-assigned to Fort Hood, Texas.

The family returned to Fort Greely right after John graduated from high school.

John attended the University of Alaska, Fairbanks, for a couple of years and then transferred to Anchorage where he continued to pursue a degree in civil engineering from the University of Alaska, Anchorage.

After completing the degree, he went to work on the North Slope as a construction supervisor.

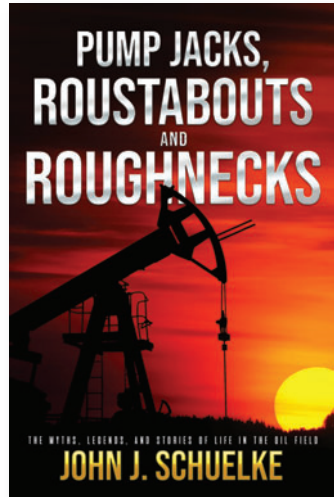
John continued a career in oil and gas construction management, primarily in Alaska, for the next 25 years.

In March 2020, he was released from ConocoPhillips and decided to pursue his dream of writing.

“Pump Jacks, Roustabouts, and Roughnecks” is based on John’s and others’ experiences working in the oil and gas industry. The stories, John said, “range in nature from heartwarming, funny, to heartbreaking.”

Currently gathering stories for a potential volume two, John is in the process of writing a fiction series about a serial killer in the oil patch.

—PETROLEUM NEWS



ENVIRONMENT & SAFETY

California officials aim to up response

By AMY TAXIN
Associated Press

California officials on Nov. 15 said better communication and detection technologies could improve the state’s response to an oil spill like October’s crude pipeline leak off the Orange County coast.

State lawmakers held an oversight hearing in Costa Mesa to review the response to the spill of about 25,000 gallons of crude. The impact of the spill was less than initially feared, but it affected local wetlands and wildlife and shut the shoreline in surf-loving Huntington Beach for a week.

Charlton “Chuck” H. Bonham, director of California’s Department of Fish and Wildlife, recommended pushing up an oil spill technology workshop from 2023 to next year and focusing on improving night-time spill detection. Initial reports of a possible spill came in late in the day Oct. 1. But federal officials said it was too dark and went out early the next morning to confirm it.

“What we haven’t done yet is crack the technology,” Bonham told lawmakers at the hearing convened by the Assembly’s Select Committee on the Orange County oil spill. “It is near impossible to figure out a dark sheen in the dark of night on the dark ocean surface.”

Bonham also said trying to find a place to host the incident command slowed the response. He added that collecting fish samples sooner could help reduce the length of fishery closures, noting more than 645 square miles off the coast are still off limits to fishing pending testing.

The hearing came six weeks after the leak in a pipeline owned by Houston-based Amplify Energy Corp. that ferried crude from offshore platforms to the Southern California coast. The cause of the spill is under investigation, but federal officials have said the pipeline was likely initially damaged by a ship’s anchor.

Amplify said in a statement Nov. 15 that the company expects insurance policies will cover some spill costs but “can provide no assurance that its coverage will adequately protect it against liability from all potential consequences, damages and losses related to the Incident.”

During the hearing, other speakers sug-

The hearing came six weeks after the leak in a pipeline owned by Houston-based Amplify Energy Corp. that ferried crude from offshore platforms to the Southern California coast. The cause of the spill is under investigation, but federal officials have said the pipeline was likely initially damaged by a ship’s anchor.

gested having more streamlined communications would make it easier to respond to a spill more quickly and wanted to ensure local communities have oil response plans. Huntington Beach Mayor Kim Carr said there was conflicting information in the early hours, with officials initially saying they didn’t expect oil to reach the coast for days. But it washed up hours later.

“It really is minutes, it’s hours, that make a huge difference,” she said. Carr said thankfully the city had a response plan and equipment to protect sensitive wetland areas.

Orange County Harbormaster Capt. Gary Lewellyn said he would like to see an early reporting system for coastal communities to quickly share information about potential hazardous materials on the water so local officials can assess what resources are needed. State fire officials said more can be done to inspect low-pressure pipelines, which aren’t subject to the same level of scrutiny, to prevent future spills.

Democratic Assemblywoman Cottie Petrie-Norris, who chairs the select committee, said her office will review the recommendations and see what state officials can do on their own and what requires legislation. She said improving spill-detection technology and regulations on low-pressure pipelines are critical in the short term, but in the long run California needs to phase out offshore oil operations.

“In the short term, I want to identify regulatory changes, policy changes, we can get done in the next couple of months,” Petrie-Norris said, adding the committee will meet again in January. “Alongside that, we all know that the only way to prevent this with 100% certainty is to end offshore drilling and oil production.” ●

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BOEM ESTIMATE

are “resources that can be removed from the subsurface with conventional extraction techniques,” BOEM said, while undiscovered economically recoverable resources “are those undiscovered technically recoverable resources that can be commercial extracted under specified economic and technological conditions.”

BOEM does OCS assessments of undiscovered oil and gas resources every five years as part of scoping for the National OCS Oil and Gas Leasing Program.

Planning areas

There are 15 OCS planning areas off Alaska, and BOEM does undiscovered resource estimates for 11 of them, excluding the Aleutian Arc, Aleutian Basin, Bowers Basin and St. Matthew-Hall because of negligible petroleum potential in those planning areas.

The bulk of UTRR for the Alaska OCS is in the Chukchi Sea, 29.878 billion boe, up slightly from the 2016 assessment mean of 29.04 billion boe. The largest decline was for the Beaufort Sea, which has a UTRR of 8.608 billion boe in the 2021 assessment, down from 13.84 billion boe in 2016. BOEM noted these changes, comparing the modest increase in the Chukchi Sea planning area to a significant drop for the Beaufort Sea, “due to the new risking methodology and a lowered chance of success in the Upper Ellesmerian Beaufort Sea play.”

Those two planning areas account for 82% of the Alaska OCS UTRR in the 2021 assessment, followed by the North Aleutian Basin at 5.49% (2.392 billion boe), Gulf of Alaska at 3.23% (1.434 billion boe) and Cook Inlet at 2.67% (1.252 billion boe).

Cook Inlet was up marginally, from 1.23 billion boe in 2016 to 1.252 billion boe in 2021.

UERR assessment

Results for the undiscovered economically recoverable resources tell a somewhat different story.

“The fraction of UTRR that is estimated to comprise the volume of undiscovered, economically recoverable resource (UERR) varies based on several assumptions beyond those implicit in the calculation of geologic resources, including commodity price environment, cost environment, and relationship of gas price to oil price,” BOEM said. “In general, larger volumes of resources are estimated to be economically recoverable under more favorable economic conditions.”

The 2021 assessment used \$100 per barrel of oil and \$5.34 per thousand cubic feet of natural gas, with the total UERR estimated at mean values of 5.62 billion barrels of oil and 5.68 trillion cubic feet of natural gas.

For the Alaska OCS as a whole, UERR for oil in the 2016 assessment had a mean of 17.29 billion barrels — dropping to 5.62 billion barrels in the 2021 assessment. For gas, the mean in 2016 was 33.59 trillion cubic feet — dropping to 5.68 tcf in 2021.

BOEM said many variables contribute to the UERR estimates in the 2021 assessment and attributed the overall decrease as “due to both a decrease in the estimated UTRR and changes in the estimated project capital costs (material, construction, and labor) that have occurred between the time economic data was gathered for the 2016 National Assessment and the 2021 National

see **BOEM ESTIMATE** page 10

Cook Inlet OCS development

In BOEM’s draft environmental impact statement for proposed lease sale 258 in Cook Inlet, the agency assessed what exploration and development could look like, should the lease sale take place and companies acquire leases which are explored and developed.

For exploration, mobile offshore drilling units are likely to be employed, with up to three wells per drilling rig drilled, tested and plugged and abandoned in a single drilling season with one MODU.

While a single MODU would be used as a result of sale 258, BOEM said it is conceivable that another MODU could be operating in Cook Inlet on leases acquired in the last Cook Inlet OCS sale, sale 244, although historically there has been just one rig working in the proposed sale area at a time.

Proxy pools, hypothetical pools determined by statistical analysis, were used to analyze how exploration and development might work following a lease sale, with an oil pool and a gas pool selected.

Three cases were considered: a low case which estimates activities in a 229.5 billion cubic feet natural gas field where no oil is produced; a medium case which estimates activities if a 192.3 million barrel oil field is discovered, with 72.4 bcf of associated gas also produced; and a high case involving development of both the gas field in the low case and the oil field in the medium case, for 192.3 million barrels of oil and 301.9 bcf of natural gas produced.

Scenarios

In the low case, the gas discovery, less supporting infrastructure is required for production and development, and fewer wells because gas flows more easily through rock than fluid. Only a single pipeline would be required as there are no associated fluids.

In contrast, an oil discovery would require more wells and multiple pipelines for produced oil and associated gas.

In the high case, with both oil and gas discovered and produced, a maximum of six 24-slot platforms would be required, with 108 wells, assuming separate platforms and wells required from each prospect.

This compares to a single platform in the low case and five platforms in the medium case. Production wells are estimated to range from eight in the low case to 73 in the medium case and 81 in the high case, with the count for service wells at four, 23 and 27 respectively.

Existing Cook Inlet platforms were constructed offshore and floated into place and installed, and that is what the agency expects for new platforms.

In the case of multiple platforms, the first “serves as a hub, connecting pipelines from other platforms to the main pipelines to shore.”

BOEM said that based on the average time to drill a well, a maximum of six wells per year would be drilled per platform.

Subsea pipelines are the preferred transportation method to

see **OCS DEVELOPMENT** page 10

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EXPLORATION & PRODUCTION

Baker Hughes US rig count gains 6 to 556

For the week ending Nov. 12, the Baker Hughes U.S. rotary drilling rig count was up by six rigs from the preceding week to 556, an increase of 244 from 312 a year ago.

When the count dropped to 244 in mid-August 2020 it was the lowest the domestic rotary rig count has 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, where it remained through mid-March, 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 Nov. 12 count includes 454 rigs targeting oil, up four from the previous week and up 218 from 236 a year ago, with 102 rigs targeting gas, up by two from the previous week and up 29 from 73 a year ago, and no miscellaneous rigs, unchanged from one the previous week and down by three from a year ago.

Thirty-five of the rigs reported Nov. 12 were drilling directional wells, 499 were drilling horizontal wells and 22 were drilling vertical wells.

Alaska rig count unchanged

Texas (264) was up 10 rigs from the previous week.

Ohio (12) was up by two rigs and Louisiana (49) was up by a single rig.

New Mexico (81) was down by five rigs from the previous week and West Virginia (10) was down by one rig.

Rig counts in all other states were unchanged week over week: Alaska (6), California (10), Colorado (12), North Dakota (23), Oklahoma (44), Pennsylvania (18), Utah (9) and Wyoming (15).

Baker Hughes shows Alaska with six rigs active Nov. 12, unchanged from the previous week and up by three from a year ago, when the state's rig count stood at three.

The rig count in the Permian, the most active basin in the country, was up by one from the previous week at 272 and up by 118 from 154 a year ago.

—KRISTEN NELSON

Baker Hughes shows Alaska with six rigs active Nov. 12, unchanged from the previous week and up by three from a year ago, when the state's rig count stood at three.

Narwhal seismic survey in works

On Nov. 15, Alaska's Division of Oil and Gas posted a 30-day public notice for SAEExploration's Narwhal Phase II seismic survey geophysical exploration permit.

The division received the permit application from SAE on Oct. 21 requesting authorization to conduct a 3D seismic survey on the North Slope during the 2021-22 winter season. SAE's joint venture partner for the survey is Kuukpik Corp.

Land ownership within the survey area includes state-owned and BLM managed lands in the National Petroleum Reserve-Alaska, as well as Kuukpik Corp. lands.

The survey will cover 59 square miles, with state lands accounting for 30 square miles.

Near the village of Nuiqsut, all the survey acreage is within the North Slope Borough.

The primary leaseholders in the survey area are ConocoPhillips and Oil Search.

Seismic operations will be conducted using approximately nine rubber tracked vibrators for source and 15,000 nodal autonomous recording channels for receivers. Each receiver point consists of a receiver unit node and geophone. Receivers will be transported to each location with the use of a low ground pressure Tucker Sno-Cat, truck or Kubota.

SAE will be using new recording methodology to image potential geologic targets.

A mobile camp will support the survey operations and remain close to the survey activities, moving every two to five days depending on the survey progress and snow cover.

Narwhal Phase II is expected to start on Jan. 15 and will end when the seismic program is complete or when conditions no longer support winter tundra travel.

Since the seismic survey area lies within the ConocoPhillips-operated Colville River unit, a gravel pad may be used for staging of the 150-man camp. A mobile sled camp will be used and located on tundra or an ice pad.

—KAY CASHMAN

continued from page 1

NARWHAL PROGRESS

approval of the PA application.

Putu 2, Putu 2A

ConocoPhillips said prior exploration activities in the area include the Putu 2 and Putu 2A, drilled in the first quarter of 2018. The Putu 2 reached total depth in the Narwhal. "A total of 751 gross feet of

Narwhal was drilled," the company said.

Putu 2 and Putu 2A met the initial well commitments required for the CRU fifth expansion area.

Putu 2A was fracture stimulated and had a test peak of 2,900 barrels of oil per day.

ConocoPhillips said Putu 2 and Putu 2A were the first wells drilled in the Colville River unit "to find significant Narwhal thickness and reservoir quality."

Based on the Putu wells, the company announced the Narwhal discovery, estimated to contain between 100 million and 350 million barrels of oil equivalent. Willow and Narwhal are different sediment deposits within the Nanushuk formation, with Willow being older.

In the fourth quarter of 2018 and the first quarter of 2019 ConocoPhillips drilled the CD4-595PH and CD4-595 wells. The CD4-595PH reached total depth in the Narwhal, penetrating 675 feet of gross Narwhal; the well was not tested.

The CD4-595 horizontal well was sidetracked from the CD4-595PH and was fracture stimulated flow tested, peaking at 3,000 bpd with 26 degree API gravity oil; a subsequent flow test peaked at 4,700 bpd and stabilized at 2,500 bpd.

The CD4-594PH1 and horizontal sidetrack CD4-594 injector were drilled in the fourth quarter of 2019.

The CD4-594PH1 found 430 feet of gross Narwhal; it was not tested.

The CD4-594 horizontal, a sidetrack from the CD4-594PH1, was flow tested at 2,500 bpd and then converted to injection.

ConocoPhillips said the Narwhal "has been penetrated in the intermediate hole section of several wells as part of exploration and development of deeper reservoir targets at CD4," with gross thickness in those penetrations from 30 to 45 feet. The Narwhal was not tested in those penetrations.

Plan of development

ConocoPhillips said the Narwhal, which the company described as a Brookian Nanushuk sand, will initially be developed from CD4, an Alpine satellite pad some 4 miles southwest of the Alpine Central Processing Facility.

CD4 was constructed in 2005 for Alpine, Nanuq and Kuparuk development and is being extended beginning in the 2021-22 winter season to add additional Narwhal well slots (see story in Sept. 5 issue of

see **NARWHAL PROGRESS** page 7

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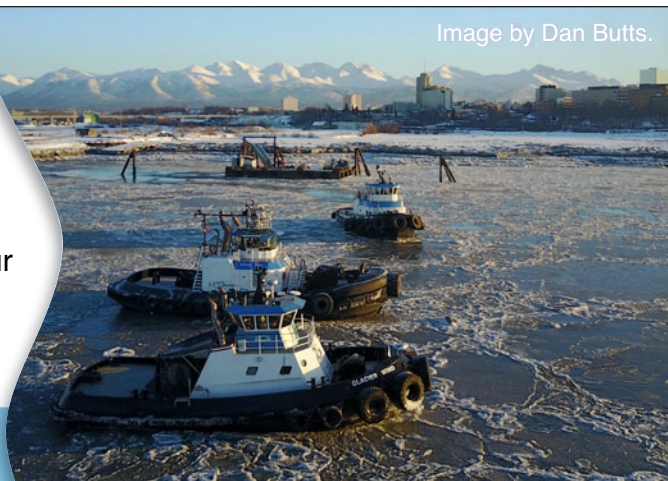


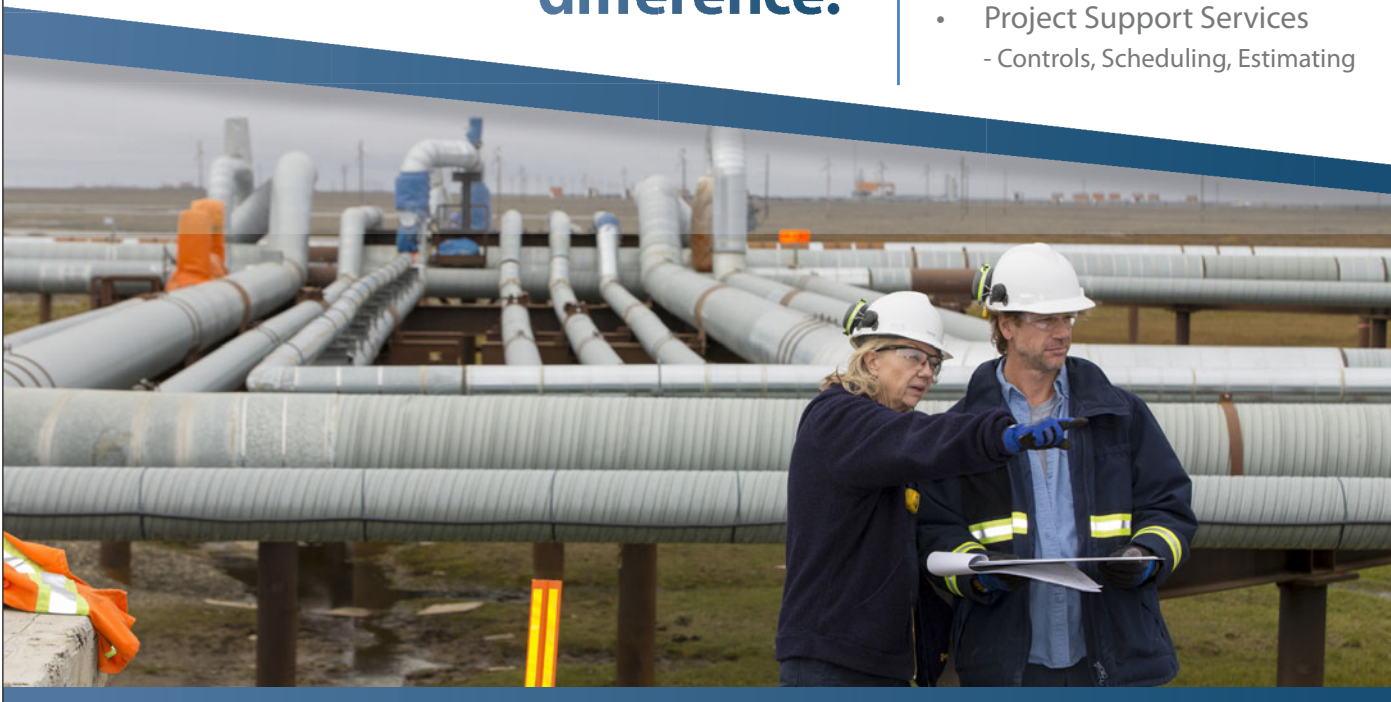
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NARWHAL PROGRESS

Petroleum News).

The company said the CD4-595 and CD4-594 appraisal wells were drilled in 2018 and 2019 “in the Narwhal reservoir to better understand the reservoir and to test the technical feasibility of extended reach drilling at shallow depth,” with initial test production in 2019 and 2020.

Sustained Narwhal production is expected to begin in December from CD4-595.

The company said initial plans call for drilling up to 12 Narwhal wells from CD4 in addition to the two existing wells, with two Narwhal horizontal producers and two Narwhal horizontal injectors possible within two years of commencement of sustain production. But any of those wells could be moved to the 2022-23 schedule “as rig optimization/utilization dictates.”

The company said initial plans call for drilling up to 12 Narwhal wells from CD4 in addition to the two existing wells, with two Narwhal horizontal producers and two Narwhal horizontal injectors possible within two years of commencement of sustain production. But any of those wells could be moved to the 2022-23 schedule “as rig optimization/utilization dictates.”

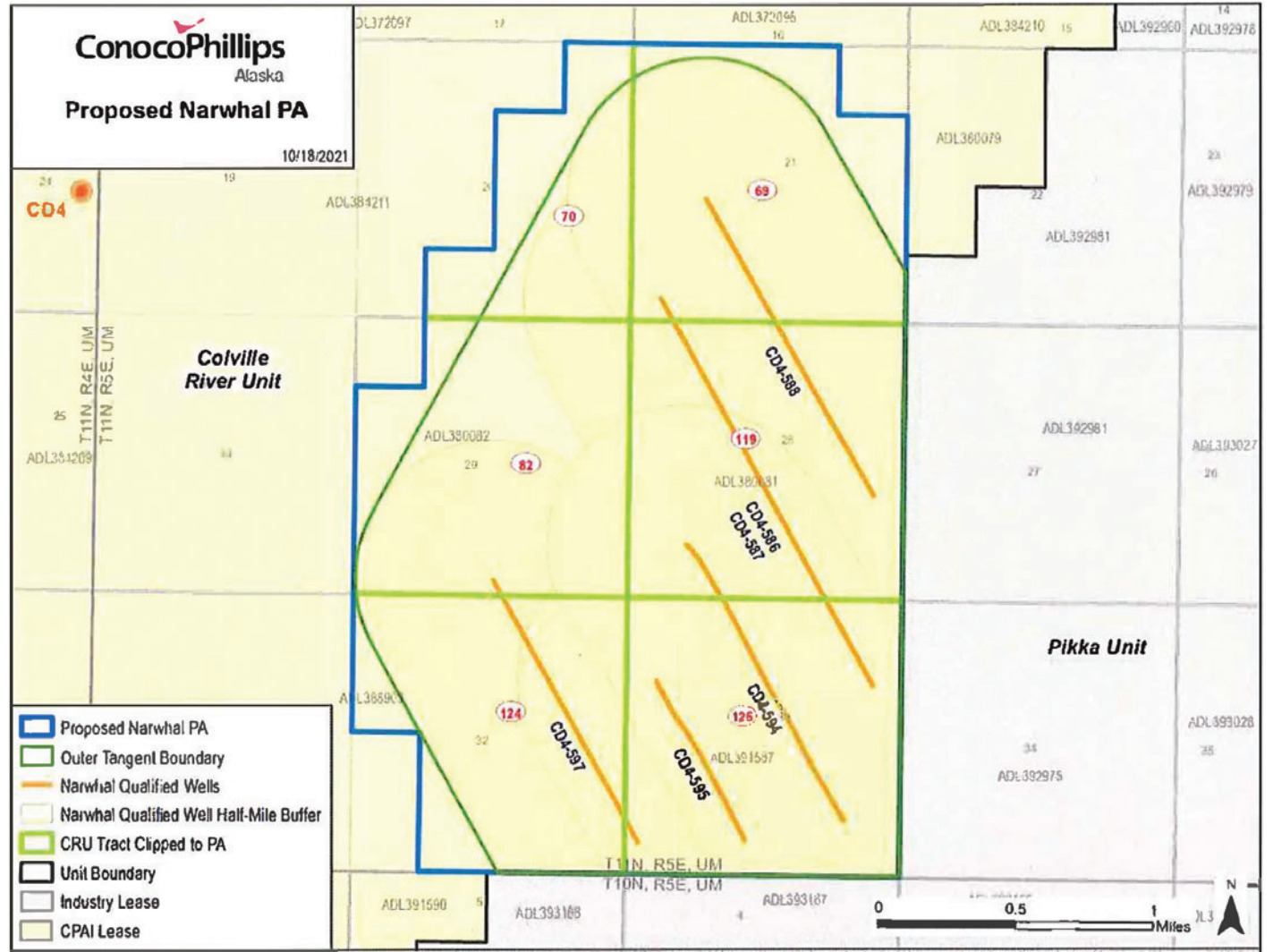
Narwhal production will go to the Alpine processing facility and sales-quality crude will be transported to the trans-Alaska oil pipeline via the Alpine Oil Pipeline and Kuparuk Oil Pipeline.

EWAG

ConocoPhillips said Narwhal will be developed using an enriched water alternating gas process.

The Alaska Oil and Gas Conservation Commission approved a pilot enhanced recovery injection project in the Narwhal reservoir in December 2019 (see story in Jan. 5, 2020, issue of Petroleum News).

ConocoPhillips told the commission in its application that Narwhal is expected to be developed as a line drive water alternating gas flood with horizontal producers and injectors.



In its order approving the pilot the commission said that since the Narwhal reservoir is still in the appraisal stage, a formal pool has not been defined.

“The Narwhal Reservoir sands are broadly age equivalent to the Nanushuk Group,” AOGCC said, and noted that ConocoPhillips’ proposed a definition of the reservoir as the accumulation of oil common to and correlating with the accumulation found in the Qugruk 3 well from 4,192 to 5,152 feet measured depth.

Since the reservoir is still being

appraised no in place or recoverable reserves information is available, the commission said, but “Modeling indicates recoveries of less than 5% without injection support and approximately 30% under waterflood.”

CD4, CD8

ConocoPhillips said Narwhal development would continue from CD4 and a future pad, referred to as CD8, targeting Narwhal in the fifth CRU expansion area.

“The current basis of design develop-

ment concept for CD8 includes a new gravel pad connected by road back to CD4, with associated production and injection piping connected back to ACF,” with 20 to 40 wells in the current concept, depending on expanded knowledge of the reservoir and learnings from 2020-22 Narwhal production.

The company said production from CD8 could begin as early as 2028. ●

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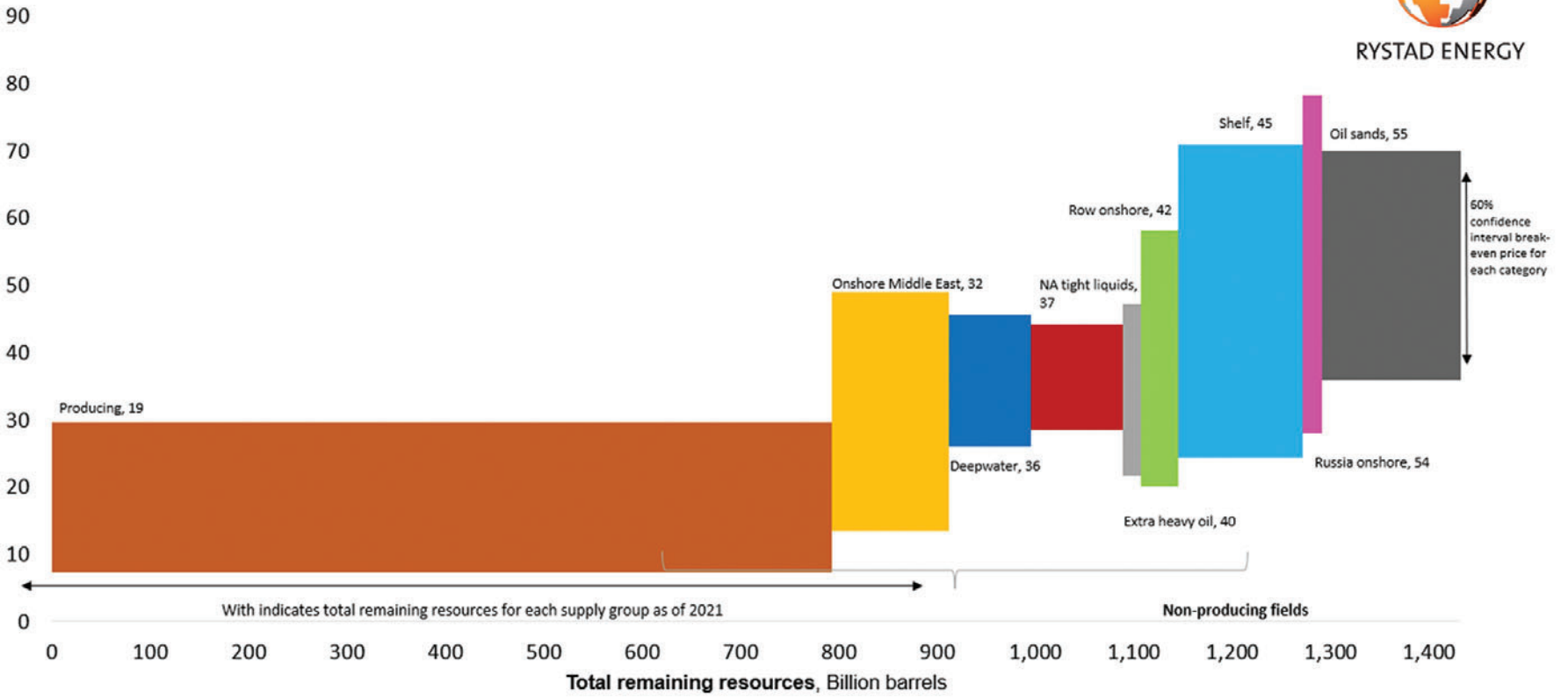
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Cost of supply curve for remaining global resources

Brent breakeven price, USD per barrel



*The breakeven price is the real Brent oil price that gives an NPV of zero given a real discount rate of 7.5%. The breakeven price only includes future costs. The boxes is an average of all fields within each category

Source: Rystad Energy UCube

continued from page 1

OIL PRICES

immediately stabilize gas prices and help those Americans in places like upstate New York who depend on heating oil, natural gas, and propane to heat their homes in the winter,” Delgado said.

Delgado echoed Senate majority leader Chuck Schumer, who stumped

Nov. 13 for a raid on the reserve.

“We need immediate relief at the gas pump, and the place to look is the Strategic Petroleum Reserve,” Schumer said according to a New York Times report.

In a Nov. 8 letter to Biden, 11 Democratic senators praised the call for lower energy prices though increased oil production from Saudi Arabia and Russia, which Biden made at the COP26 climate

conference in early November.

“We share the administration’s concerns that the decision by the Organization of the Petroleum Exporting Countries and others to purposefully manipulate gas prices by constraining supply, as well as the choice of domestic leaseholders and producers to continue to export U.S. petroleum, threaten to send already record prices even higher,” the senators said, adding that Biden should “consider all tools available” to lower U.S. gasoline prices, including a release from the SPR and a ban on crude oil exports.

Biden has asked for help from China to stabilize international crude prices by joining the United States in releasing government oil reserves, according to a report in the South China Morning Post.

“The issue was raised during the virtual meeting between Chinese President Xi Jinping and U.S. President Joe Biden” on Nov. 16, “according to a person familiar with the matter.”

The source said the energy departments from both sides are negotiating the details.

A senior energy researcher with Beijing-based Chinese Academy of Social Sciences said that for China, prices around \$80 per barrel do not necessitate immediate release of strategic reserves.

“From a technical perspective, it’s not the time for China to do so, but the U.S. indeed has the motivation because of its high inflation,” said Wang Yongzhong. “However, both countries, as big consumers, have shared common interests in curbing crude prices.”

Wang estimated that China crude reserves are equivalent to about 40-50 days of its imports.

China announced a sale of strategic crude in September, without disclosing quantities, but analysts saw the move as a normal rotation of storage facilities, according to the Post.

New oil cheaper to produce

An annual cost of supply analysis by Rystad Energy said that upstream sector costs have fallen in 2021, making new oil more competitive and significantly cheaper to produce.

Rystad said the average breakeven price for new oil projects has dropped to around \$47 per barrel — down some 8% over a year and 40% since 2014 — with offshore deepwater remaining one of the least expensive sources of new supply.

In 2014, an oil price of some \$100 per barrel was required to produce 100 million barrels per day in 2030, but in 2018 the required price was closer to \$55 per

see OIL PRICES page 10

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PIPELINE PROTESTS

alleged vandalism and theft by protesters who had set up a blockade at the Coastal GasLinks site in late October.

A spokeswoman said the arrests were made when the RCMP was called to help keep the peace as pipeline workers “evacuated” their camp.

She said one person was taken into custody on theft and mischief charges, while another was allegedly found in possession of stolen Coastal GasLink equipment.

Earlier protests

Protests last year against the pipeline set off rail blockades by other groups across Canada in support of the Wet’suwet’en Nation, but those tensions were eased after a memorandum of understanding was signed by the Canadian and B.C. governments and hereditary chiefs, who have triggered resistance to the pipeline while 20 aboriginal communities along the project right of way have taken advantage of the chance to gain employment and eventually share in revenues from the pipeline.

TC Energy, which owns the project, has disputed accusations that it has failed to properly consult the Wet’suwet’en on work that could destroy Indigenous artifacts, saying 21 items were saved in the 2015-20 period under the supervision of a trained archeologist.

LNG Canada is a C\$55 billion project that includes a tanker terminal, processing facility, pipeline and the production of gas over 30 years.

Company officials have estimated the LNG facility could be operational by late 2027 or 2028 and meet net-zero carbon emissions within three years.

The project is designed to eventually export about 14 million metric tons a year of LNG to Asian markets.

TMX

The C\$12.6 billion Trans Mountain,

LNG Canada is a C\$55 billion project that includes a tanker terminal, processing facility, pipeline and the production of gas over 30 years.

TMX, project hopes to triple capacity of a pipeline that is almost 70 years old to deliver 890,000 barrels per day of bitumen from the Alberta oil sands, also for shipment to Asia.

As work on the pipeline has emerged from the Canadian Rockies and Coastal Mountains in the final push to the British Columbia coast, TMX has insisted work is on budget and on schedule for completion by the end of 2022.

But opponents were prodded to ramp up their pressure after Swiss insurance giant Zurich decided in mid-2020 not to renew its coverage, putting pressure on other insurers to ditch what campaigners and Indigenous activists have called a “climate wrecking” pipeline.

TMX is turning up the heat by asking the Canadian Energy Regulator for permission to bypass the City of Burnaby by clearing dozens of trees and gaining access to restricted land in order to construct the pipeline.

It has accused Burnaby of using its permitting powers over the past four years to stymie the expansion.

In late 2020, the CER ruled that TMX did not need permission for some tree-clearing work, but TMX has asked for approval to increase that work by cutting down 86 more trees.

Burnaby has been the most vociferous opponent among local governments of TMX, but a legal spokesman said he doesn’t see any point in the community even participating in the latest regulatory action, given Burnaby’s consecutive losses with similar challenges.

—GARY PARK

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continued from page 1

WHISKEY GULCH

2020, Hilcorp drilled a dozen Whiskey Gulch 600-foot stratigraphic tests.

Hilcorp said the closest producing gas well is Seaview No. 8, which is south of WG 14. The company said it expects that productive sands in the WG 14 “are discontinuous channel sands” in the Sterling, Beluga and Tyonek formations “that cannot be produced by wells conforming to applicable spacing restrictions.”

Whiskey Gulch is the company’s second prospect on the southern end of the Kenai Peninsula. It brought the Seaview gas field, south of Whiskey Gulch, online last summer.

It said geologic analysis of WG 01 drilling data “along with data from surrounding fields suggests that the Whiskey Gulch Undefined Gas Pool consists of a series of thin, discontinuous, stacked channel sands with a low net-to-gross ratio.” Those channel belts, Hilcorp said, are too narrow for efficient drainage based on current gas well spacing.

Hilcorp said it owns 100% of the working interest in the affected oil and gas leases; the state owns 100% of the mineral interest in the affected state lease, ADL 392666, with the remaining affected tracts have 100% privately owned subsurface.

The company said it has made and continues to make attempts to lease all landowners with the Whiskey Gulch prospect, but has not obtain all the leases either because it cannot locate or contact the landowner or any surviving heirs or the landowners is unwilling to participate

in exploration efforts at this time.

Whiskey Gulch is the company’s second prospect on the southern end of the Kenai Peninsula. It brought the Seaview gas field, south of Whiskey Gulch, online last summer.

Unit application upcoming

Hilcorp told the commission that upon successful completion of the WG 14 well, and prior to bringing that well online, it plans to submit an application to the Alaska Department of Natural Resources’ Division of Oil and Gas for unit and initial participating area formation.

Royalties will be allocated to all leased owners based on tract allocation percentages, mineral ownership and lease royalty in the approved PA allocation schedule, Hilcorp said, and it will establish a single, interest-bearing escrow account for nonparticipating owners, and provide documentation to the commission showing that the escrow account has been established and maintained.

The company said it plans to perforate and test WG 14 in all potential gas bearing sands between 1,500 feet measured depth and 8,519 feet MD.

The commission said it has scheduled a virtual public hearing on this matter for Dec. 22 at 10 a.m. via MS Teams. The audio call-in information is 907-202-7104 conference ID No. 586 167 352#.

It said anyone wishing to participate remotely using MS Teams video conference should contact the commission’s special assistant, Grace Salazar, at 907-793-1221 or grace.salazar@alaska.gov at least two days before the scheduled hearing to request an invitation to MS Teams.

—KRISTEN NELSON

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OIL PRICES

barrel, and in 2020 it dropped to \$45 per barrel, according to a Rystad cost of supply curve.

Rystad said its estimate remains unchanged this year at \$45 per barrel for 100 million bpd of production in 2030 — despite the declining average breakeven price of new oil projects — because the potential supply for 2030 has decreased year over year due to delays in sanctioning activity and conservative capital allocation to shale.

“In 2014, we estimated that the total 2030 liquid potential was 104 million bpd, while in 2018, this jumped considerably to 135 million bpd mainly driven by increased potential volumes from North American tight oil,” Rystad said. “However, low activity levels in 2020 and 2021, due to the Covid-19 pandemic and a general focus on the energy transition, led to a downward adjustment in the overall liquid potential.” Rystad said.

In 2020, Rystad revised the potential 2030 supply estimate down to 116 million bpd, and in 2021 revised it further to 113 million bpd.

“As the theoretical supply in 2030 exceeds the demand trajectory by more than 10 million bpd, climate policies should be more demand-focused rather than supply-focused,” said Espen Erlingsen, Rystad head of upstream research. “Supply cuts enacted within one country will largely be countered by supply increases from other countries, while demand cuts are not met with new sources of demand.” ●

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BOEM ESTIMATE

Assessment.”

For the Chukchi, the 2016 mean UERR for oil was 9.25 billion barrels, dropping to a mean of 2.8 billion barrels in 2021, with both those assessments based on \$100 per barrel oil.

Oil in the Beaufort planning area went from a mean of 6.08 billion barrels in 2016 to a mean of 1.67 billion barrels in 2021.

In Cook Inlet, the 2016 mean was 0.98 billion barrels dropping to 0.72 billion in 2021, while gas in Cook Inlet dropped from 0.77 tcf in 2016 to 0.28 tcf in 2021.

The Cook Inlet OCS planning area is offshore Southcentral Alaska between the Kenai Peninsula on the east and the Aleutian Range on the west, extending southward through Shelikof Strait just past Kodiak Island. Since the federal portion of Cook Inlet and Shelikof Strait waters begins 3 miles from shore, the northern part of the inlet is entirely within state jurisdiction. ●

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OCS DEVELOPMENT

move production to shore and the nearest landfall would likely be the southern Kenai Peninsula near either Homer or Nikiski, “depending upon where the first commercial oil discovery is located.” The agency said that based on the location of pipelines already in place in upper Cook Inlet, “it is not anticipated that any of the production platforms from any new discoveries in the lower Cook Inlet will be able to utilize any existing pipelines.”

In the low case, gas only, an onshore gas pipeline would be required and up to 40 miles of offshore gas pipeline. In the medium case, up to 80 miles of onshore oil pipeline would be required, along with an onshore gas pipeline, and up to 80 miles of offshore oil pipeline along with up to 80 miles of offshore gas pipeline. The high case would require up to 80 miles of onshore oil pipeline and a gas pipeline, along with up to 80 miles of offshore oil pipeline and up to 120 miles of offshore gas pipeline.

BOEM said existing onshore infrastructure — boat harbors, airports, onshore pipelines, roads, etc. — are considered sufficient to support activities without major expansion or modification.

Following discoveries, with exploration assumed to take three years, an environmental analysis process would follow, estimated at three years per discovery. Potential litigation time is not included in the scenario, the agency said.

The development and production phase requires platform installation and drilling. The high case scenario estimates 13 years to install the six production platforms, with platform construction assumed to take three years before installation.

Total oil production in the medium and high cases would be 192.3 million barrels. Total gas production would be 229.5 bcf in the low case, 72.4 bcf in the medium case (gas associated with oil) and 301.9 bcf in the high case.

—KRISTEN NELSON

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HYDROGEN ROADMAP

could account for 24% of global energy demand by 2050.

Release of the 50-page hydrogen report coincided with word that Alberta will put C\$176 million of provincial and federal funds into 16 projects, taking advantage of funds collected from the province’s largest emitters. That follows a C\$750 million investment last year from the Alberta Technology Innovation and Emissions Reduction fund.

Environment Minister Jason Nixon used his chance to blast the Canadian government for what he described as a lack of concrete action on climate change, claiming that Alberta is outperforming its federal counterpart when it comes to shrinking carbon emissions.

“The federal government should stop talking about climate commitments and actually do something,” while Alberta is “focused on real emissions reduction,” he said.

Hydrogen plant

Alberta Premier Jason Kenney said the new funding should pump C\$2 billion into the economy through projects that include a hydrogen plant in Edmonton, the first soil reuse facility and technology that prevents emissions from entering the atmosphere.

“We see the results of this home-grown, made-in-Alberta approach as a way to lower carbon emissions (and introduce) practical innovations that protect the environment in tangible and measurable ways, through technology, not taxes” he said.

Outlining the hydrogen strategy, Associate Natural Gas Minister Dale Nally put the potential prize in the same realm as the early days of developing Alberta’s oil sands deposits.

“This is an opportunity for Alberta to create genera-

tional wealth for the province. We have an opportunity to be a leader in clean affordable energy,” he said.

But Nally said hydrogen will not replace the oil sands even though it could have a similar impact in terms of investment, jobs and royalties.

Labelled the Alberta Hydrogen Roadmap, the strategy focuses on expanding carbon capture, de-risking investment and creating market demand, although the government has yet to disclose its fiscal contribution.

Accelerating timeline

With demand for hydrogen on the rise as the world chases net-zero carbon emissions by 2050, the plan underscores Alberta’s determination to secure as much of the global hydrogen market as it can.

The roadmap builds on a proposal released last year, accelerating the original 2040 timeline by 10 years to establish domestic and foreign sales outlets.

“We’ve already been taking concrete actions and that is being noticed,” said Kenney, noting that his province is already producing about 2.4 million metric tons a year.

He said a combination of current expertise, abundant natural gas feedstocks and carbon-capture projects which are vital to remove emissions from gas-based “blue” hydrogen are proof that Alberta has some building blocks in place.

Nina Lothian from the Alberta-based Pembina Institute said she is pleased the strategy does not completely rule out pursuing “green” hydrogen, which is based on using renewable power to split water molecules into hydrogen and oxygen via electrolysis.

The roadmap says hydrogen gas five key markets — heating, power generation and storage, exports, transportation such as buses, trucks and trains, and industrial processes such as fossil fuel refining, bitumen upgrading and making ammonia and fertilizers.

The goal by 2030 is for Alberta to assess export levels of the fuel, economic factors such as job creation and rev-

enue, and how well hydrogen has been integrated into provincial energy systems.

David Layzell, a research director at the Transition Accelerator, a nonprofit organization leading a push for development of a hydrogen economy in Alberta, said the roadmap “marks a pivotal moment in the evolution of Alberta’s energy sector” that matches the government’s push 50 years ago to develop the oil sands.

Kenney urged the Canadian government to expand its promised carbon-capture tax credit for hydrogen development calling for “a partnership which is where the feds really do need to come to the table.”

Projects underway

Currently, utility company ATCO and Suncor Energy have launched a project to produce 300,000 metric tons a year of hydrogen, while Air Products has started a C\$1.3 billion net-zero production and liquefaction complex.

Malaysia’s Petronas and Japan’s Itochu have unveiled their plans for a C\$1.3 billion facility in Alberta that would export ammonia to markets in Asia.

A month ago, Calgary-based pipeline giant TC Energy said it will work with electric truck manufacturer Nikola to co-develop and operate low-carbon hydrogen production hubs in North America.

The outlook for hydrogen has also been bolstered by Canadian National Railway, which expects hydrogen in tanker cars could match the volume of crude-by-rail shipments.

“I am most enthusiastic about our new green carloads related to Alberta’s massive growth in hydrogen energy projects, as evidenced by the slew of recent announcements,” said Canadian National Senior Vice President James Cairns.

—GARY PARK

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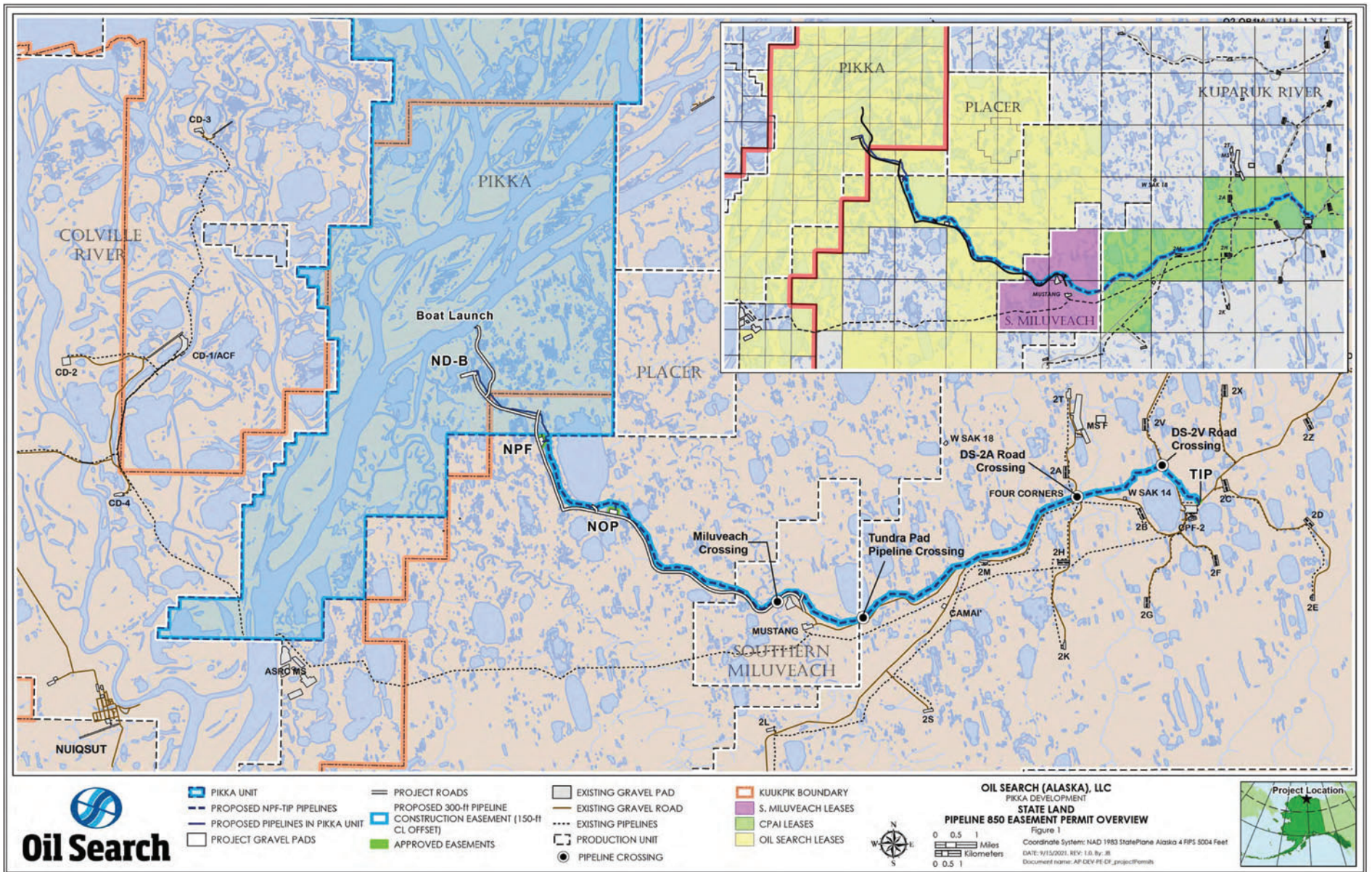


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OIL SEARCH PIPELINE

just northwest of the ConocoPhillips-operated Kuparuk Central Processing Facility 2.

This segment of pipelines is a continuation of the previously authorized Oil Search pipelines private non-exclusive easement issued on April 5.

The proposed easement will cover 770 acres during the initial construction phase and 261 acres during the operations phase.

The purpose of the project is to provide transportation of liquids and gas that is important to optimizing production in the Pikka unit and also provide a power and fiber-optic connection to the unit.

The proposed easement crosses over Kuparuk River unit and Southern Miluveach unit leases. The pipeline system will include an 8-inch gas pipeline, a 16-inch seawater pipeline, and a support rack between the Nanushuk Processing Facility, or NPF, and the TIP. Power and fiber optic cables be laced between the NPF and the Nanushuk Operations Pad, or NOP.

Parallel to Mustang Road

The easement for the pipeline system will be parallel to the Pikka Access Road, the Mustang Road and the Spine Road for most of its length.

Near CPF-2 the pipeline will deviate from the road and extend north of Lake K214 before connecting with the Seawater Treatment Plant, or STP, pipelines and existing infrastructure near CPF-2. This segment of the proposed easement includes a tundra pad pipeline crossing south of Lake K210 that will allow access to the lake during winter.

Additionally, this segment includes two road pipeline crossings, the DS-2A road crossing and DS-2V road crossing. The tundra pad pipeline crossing will be built before or during pipeline installation.

The power and fiber optic cables for

the Pikka development will connect ND-B with NPF and NOP. The ND-B infield pipelines will connect the NPF to ND-B, however, the easement will end at the Pikka unit boundary. This segment of easement is approximately 1,000 feet long.

The ND-B infield pipelines include a gas injection pipeline, a gas lift pipeline, a multiphase fluid pipeline, a water injection pipeline and the power and fiber optic cables.

The ND-B infield support rack reserves space for future activities.

The Pikka Sales Oil Pipeline will also be located within the easement but permitted separately as an Alaska Statute 38.35 right of way.

In its application Oil Search listed other easements the division had issued on state land for the Pikka development, including:

- Pikka Development Access Road — ADL 421218
- NOP — ADL 421228
- NPF — ADL 421229
- TIP — ADL 421348
- STP Facility — ADL 421488
- STP Pipeline — ADL 421526

Work to begin Feb. 1

The easement duration will be 35 years.

Construction is expected to begin Feb. 1 and end May 1, 2024.

It will involve the installation of vertical support members, or VSMs, and horizontal support members, or HSMs, referred to as the pipe support rack, installing pipelines and cables, trenching, excavating, placing gravel fill and building ice roads and ice pads.

Oil Search said in its application that the project is “within the scope of the Final Nanushuk Environmental Impact Statement (USACE 2018) and permit application evaluated by the U.S. Army Corps of Engineers.”

—KAY CASHMAN

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