

North Slope Oil & Gas Update

House Resources Committee



Presented by Derek Nottingham & John Crowther
Division of Oil & Gas
Alaska Department of Natural Resources
January 30, 2023



OUTLINE



- **Introduction**
- **North Slope Resources and Activity**
- **Project Update and Production Forecast**
- **Natural Gas Trucking**
- **Willow and ANWR Updates**
- **Net Zero Goals and Carbon Capture, Utilization, and Storage**

NORTH SLOPE POTENTIAL



United States Geologic Survey (USGS) estimates that Alaska's North Slope has more oil than any other Arctic nation:

- **Produced Oil:** >18.7 billion barrels
 - Significant oil production continues from existing and developing fields
 - Recent large discoveries
- **Undiscovered Oil:** >48 billion barrels
- **Discovered Gas:** ~ 50 trillion cubic feet
- **Undiscovered Conventional Gas:** ~194 trillion cubic feet
- **Unconventional Gas:** ~125 trillion cubic feet of methane hydrates and shale gas

Compared to most basins, Alaska is relatively underexplored.

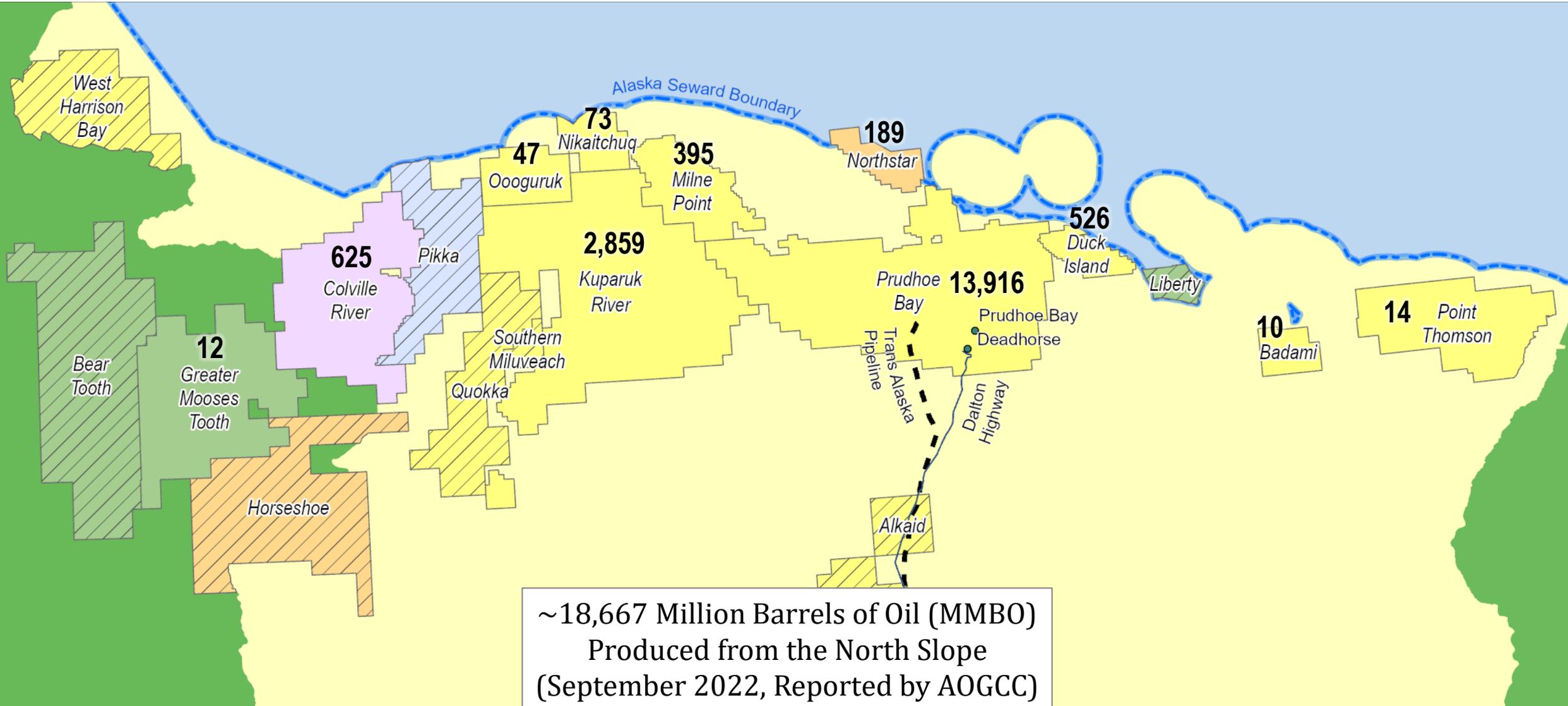
Interest in North Slope has been in steady incline in the last several years:

- **Recent finds** on state lands demonstrate great potential
- **Nanushuk and Torok** formations are driving renewed interest (new data suggests enormous potential)
- **Legacy fields** including Prudhoe Bay and Kuparuk have exceeded internal expectations through infield work



NORTH SLOPE OIL PRODUCTION

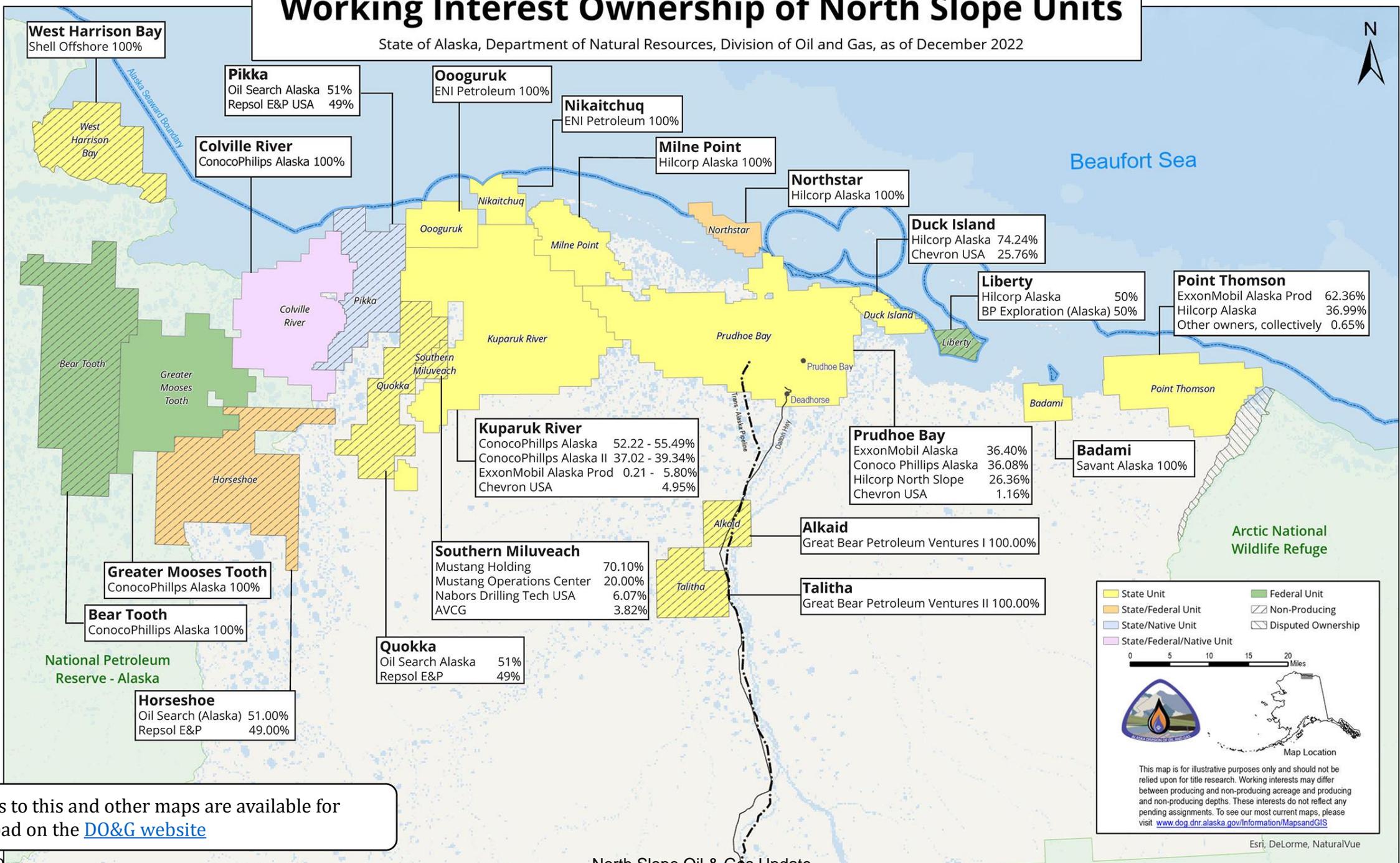
MILLIONS OF BARRELS, CUMULATIVE



~18,667 Million Barrels of Oil (MMBO)
Produced from the North Slope
(September 2022, Reported by AOGCC)

Working Interest Ownership of North Slope Units

State of Alaska, Department of Natural Resources, Division of Oil and Gas, as of December 2022



West Harrison Bay
Shell Offshore 100%

Pikka
Oil Search Alaska 51%
Repsol E&P USA 49%

Oooguruk
ENI Petroleum 100%

Nikaitchuq
ENI Petroleum 100%

Milne Point
Hilcorp Alaska 100%

Northstar
Hilcorp Alaska 100%

Duck Island
Hilcorp Alaska 74.24%
Chevron USA 25.76%

Liberty
Hilcorp Alaska 50%
BP Exploration (Alaska) 50%

Point Thomson
ExxonMobil Alaska Prod 62.36%
Hilcorp Alaska 36.99%
Other owners, collectively 0.65%

Colville River
ConocoPhillips Alaska 100%

Kuparuk River
ConocoPhillips Alaska 52.22 - 55.49%
ConocoPhillips Alaska II 37.02 - 39.34%
ExxonMobil Alaska Prod 0.21 - 5.80%
Chevron USA 4.95%

Prudhoe Bay
ExxonMobil Alaska 36.40%
Conoco Phillips Alaska 36.08%
Hilcorp North Slope 26.36%
Chevron USA 1.16%

Badami
Savant Alaska 100%

Southern Miluveach
Mustang Holding 70.10%
Mustang Operations Center 20.00%
Nabors Drilling Tech USA 6.07%
AVCG 3.82%

Alkaid
Great Bear Petroleum Ventures I 100.00%

Talitha
Great Bear Petroleum Ventures II 100.00%

Quokka
Oil Search Alaska 51%
Repsol E&P 49%

Greater Mooses Tooth
ConocoPhillips Alaska 100%

Bear Tooth
ConocoPhillips Alaska 100%

Horseshoe
Oil Search (Alaska) 51.00%
Repsol E&P 49.00%

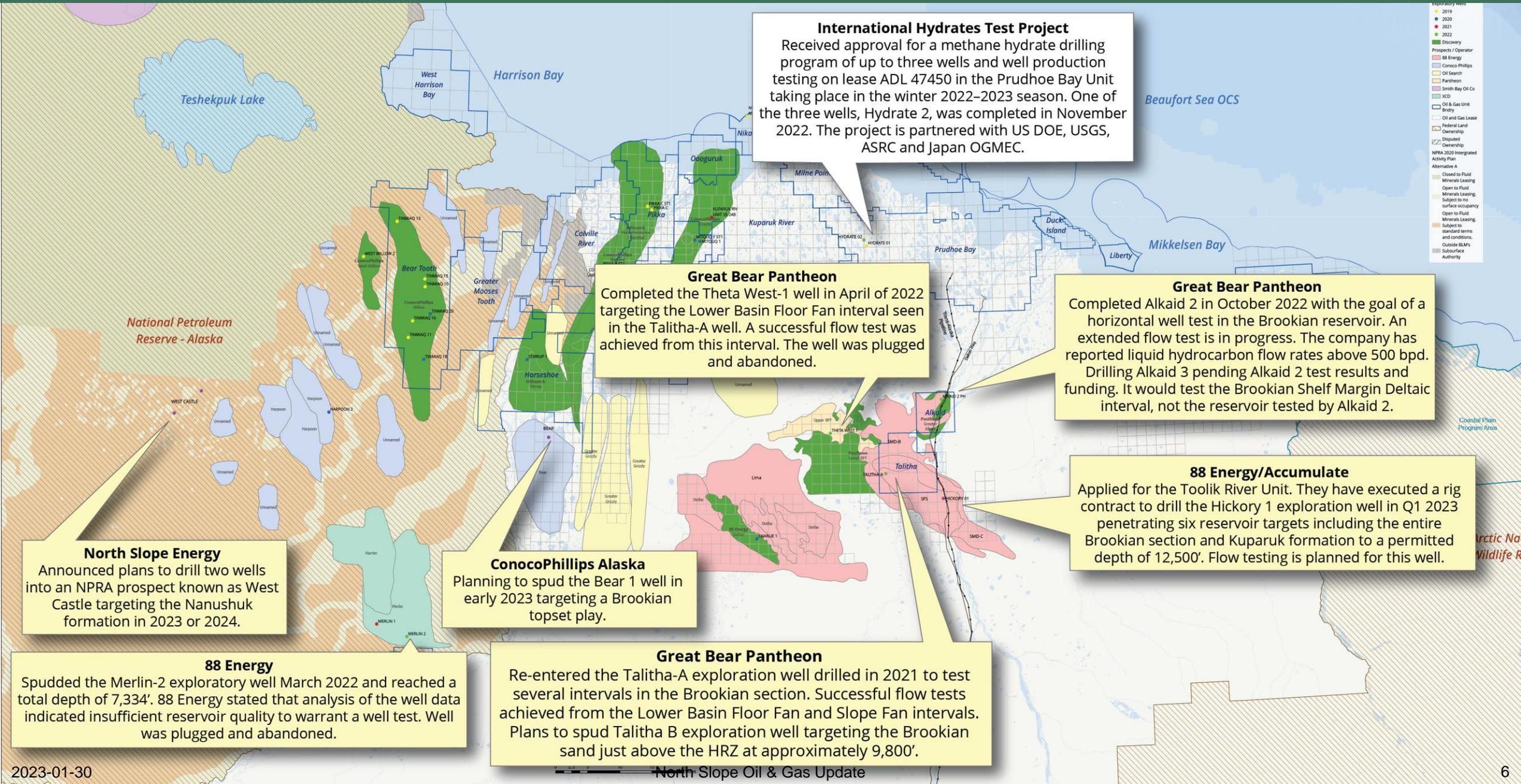
■ State Unit
■ State/Federal Unit
■ State/Native Unit
■ State/Federal/Native Unit
■ Federal Unit
 Non-Producing
 Disputed Ownership



This map is for illustrative purposes only and should not be relied upon for title research. Working interests may differ between producing and non-producing acreage and producing and non-producing depths. These interests do not reflect any pending assignments. To see our most current maps, please visit www.dog.dnr.alaska.gov/Information/MapsandGIS

Updates to this and other maps are available for download on the [DO&G website](http://www.dog.dnr.alaska.gov)

NORTH SLOPE EXPLORATION DRILLING 2022-2023



International Hydrates Test Project
 Received approval for a methane hydrate drilling program of up to three wells and well production testing on lease ADL 47450 in the Prudhoe Bay Unit taking place in the winter 2022-2023 season. One of the three wells, Hydrate 2, was completed in November 2022. The project is partnered with US DOE, USGS, ASRC and Japan OGMEC.

Great Bear Pantheon
 Completed the Theta West-1 well in April of 2022 targeting the Lower Basin Floor Fan interval seen in the Talitha-A well. A successful flow test was achieved from this interval. The well was plugged and abandoned.

Great Bear Pantheon
 Completed Alkaid 2 in October 2022 with the goal of a horizontal well test in the Brookian reservoir. An extended flow test is in progress. The company has reported liquid hydrocarbon flow rates above 500 bpd. Drilling Alkaid 3 pending Alkaid 2 test results and funding. It would test the Brookian Shelf Margin Deltaic interval, not the reservoir tested by Alkaid 2.

North Slope Energy
 Announced plans to drill two wells into an NPRA prospect known as West Castle targeting the Nanushuk formation in 2023 or 2024.

ConocoPhillips Alaska
 Planning to spud the Bear 1 well in early 2023 targeting a Brookian topset play.

88 Energy/Accumulate
 Applied for the Toolik River Unit. They have executed a rig contract to drill the Hickory 1 exploration well in Q1 2023 penetrating six reservoir targets including the entire Brookian section and Kuparuk formation to a permitted depth of 12,500'. Flow testing is planned for this well.

88 Energy
 Spudded the Merlin-2 exploratory well March 2022 and reached a total depth of 7,334'. 88 Energy stated that analysis of the well data indicated insufficient reservoir quality to warrant a well test. Well was plugged and abandoned.

Great Bear Pantheon
 Re-entered the Talitha-A exploration well drilled in 2021 to test several intervals in the Brookian section. Successful flow tests achieved from the Lower Basin Floor Fan and Slope Fan intervals. Plans to spud Talitha B exploration well targeting the Brookian sand just above the HRZ at approximately 9,800'.

STATUS UPDATE OF KEY FUTURE PROJECTS: NORTH SLOPE

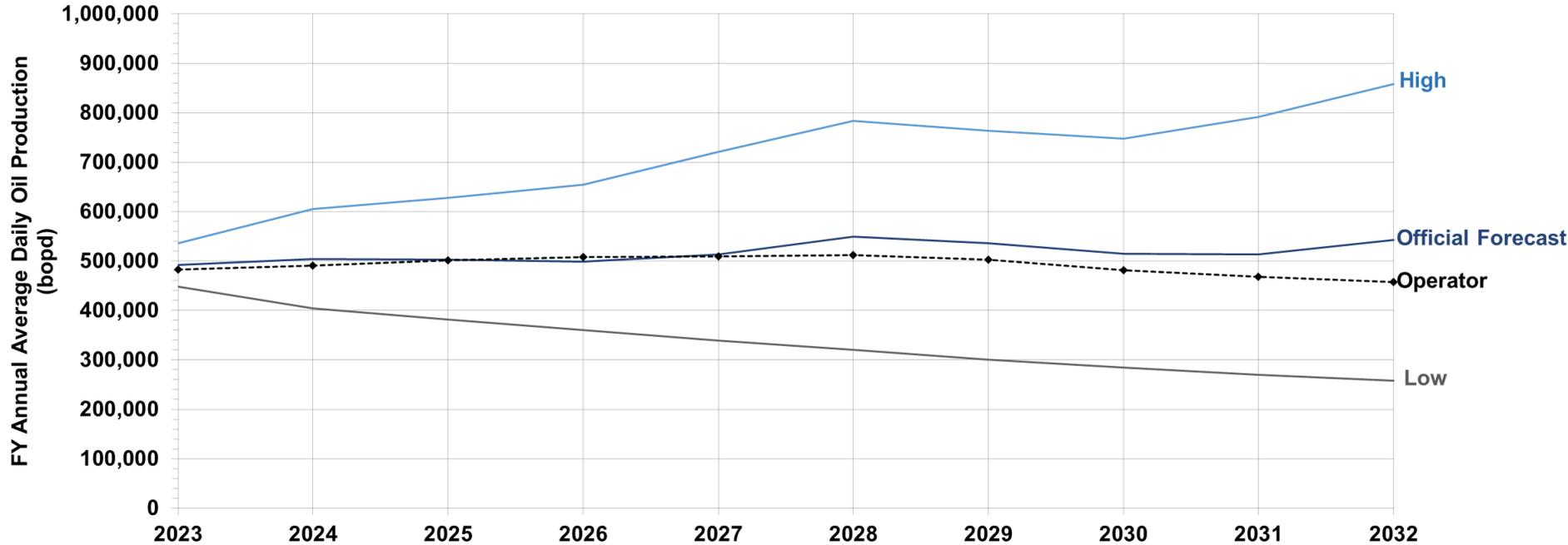


Unit (operator)	Status: January 2022	Status: January 2023	Production Rate Estimates
Pikka (Santos/Oil Search)	Ongoing front-end engineering and design (FEED); start of production (Phase 1: 2025; Phase 2 final investment decision (FID) expected ~2024/2025).	Project FID approved in August 2022 for Pikka Phase 1. Project first oil anticipated in 2026.	Peak design capacity rate, Phase 1: 80,000 barrels of oil per day (bopd)
Willow (ConocoPhillips)	Addressing AK District Court remand; likely to target a new BLM Record of Decision anticipated by YE 2022. Construction expected to start Q1 2023. First oil post 2025/2026.	Awaiting BLM Record of Decision (ROD) on Supplemental Environmental Impact Statement (SEIS). FID cannot be made before the ROD. First oil expected 6 years after FID, if approved.	Peak rate: ~180,000 bopd
CRU Narwhal CD8 (ConocoPhillips)	Narwhal reservoir first oil December 2021. Produced ~1600 BOPD. Drilling expected from CD4 to total ~12 wells. Full development requires a new pad (CD8) and drilling an additional 20–40 wells starting in ~2028 from CD8.	Sustained Unit Production from CD8 could commence as early as 2028, pending stakeholder alignment, permitting, internal studies and alignment. This conceptual first oil date remains consistent with the 23rd POD submitted in 2021.	Peak DNR estimates >32,000 bopd
MPU Raven Pad (Hilcorp)	Long-Range Activities of Milne Point Unit (MPU) 40 th plan of development (POD) discuss future drilling opportunities in undeveloped acreage in the northwest of the unit.	November 2022 Hilcorp formally applied for approval to construct a new drilling and production pad (R Pad) on ADL 25509 within MPU.	Peak DNR estimates ~10,000 bopd. Analogous to 2018 M Pad development at MPU
KRU Nuna-Torok (ConocoPhillips)	2021 Kuparuk River Unit (KRU) POD appraisal activity for two existing wells and seismic data processing.	2022 KRU POD states rotary drilling is planned in 2022 Q3 with another injector/producer pair for Torok reservoir appraisal to inform future developments.	Peak rate up to 25,000 bopd

FALL 2022: NORTH SLOPE ANNUALIZED FORECAST



Fall 2022 Forecast: North Slope



- Comparison of DNR vs Operator Forecasts across the same group of fields.
- Operator's numbers in charts exclude not-yet producing fields, while Official Forecast includes production from future projects.

Short Term:

- DNR forecasts FY 2023 annualized average daily statewide production at 501 thousand barrels of oil per day (mbopd), and North Slope production at 492 mbopd, with a range of 448 mbopd and 535 mbopd.

Long term:

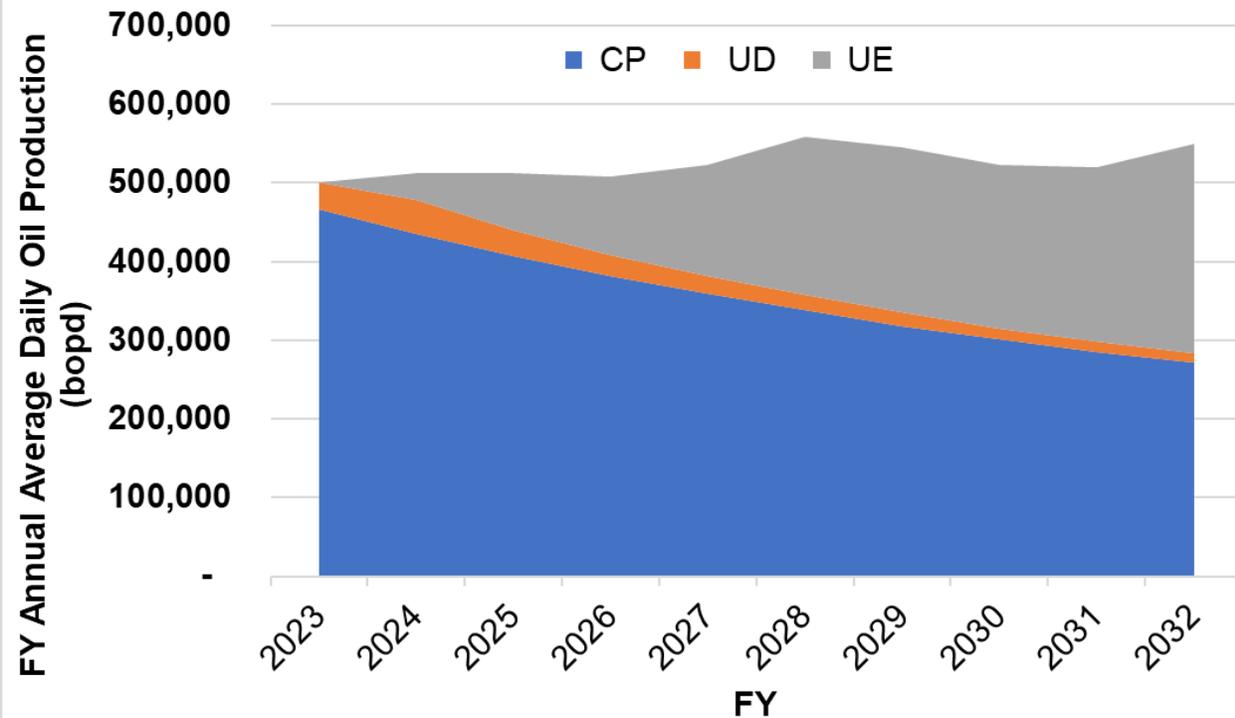
- Long term forecast reliability is gauged by general ballpark comparison between DNR and operators' aggregate forecasts. Operators' long-term outlook falls within DNR's long term forecast range.
- Specific differences are expected and do highlight DNR's ground-up uncertainty analysis on all included projects.

Outlook on production assumes that operators' plans and other project drivers stay unchanged.

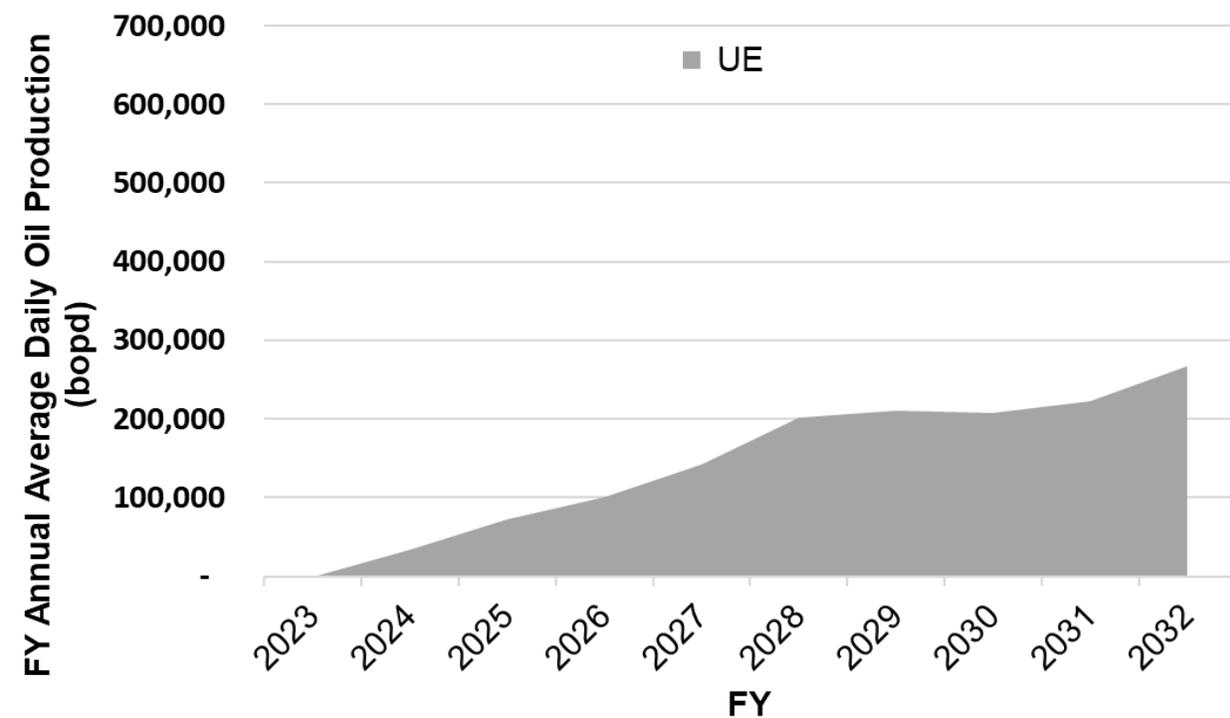
ALASKA STATEWIDE OIL PRODUCTION FORECAST – FALL 2022 EXPECTED CASE AND CATEGORIES OF PRODUCTION



AK Fall 2022 Production Forecast (Expected Case):
Production Categories



AK Fall 2022 Production Forecast (Expected Case):
UE Only



- *Current Production (CP) remains backbone of state production in near and medium term*
- *Under Development (UD) segment represents production expected from wells drilled in FY 2023*
- *Under Evaluation (UE) begins to play a more significant role in production in the next 5–10 years*
- *Production outlook depends on several factors including operators' plans, oil price, fiscal system*

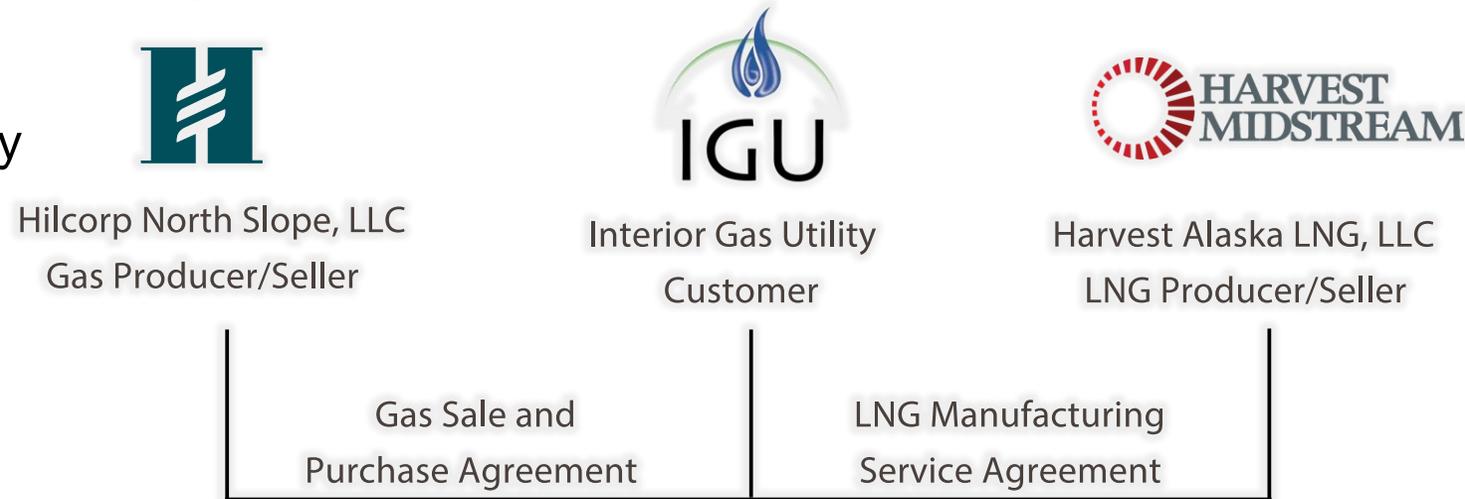
TRUCKING NATURAL GAS TO MARKET



Agreement between Hilcorp North Slope LLC and the Interior Gas Utility

- Hilcorp subsidiary Harvest Midstream to produce LNG from Prudhoe Bay gas
- Facilities to produce 150,000 gallons/day to be built and online in October 2024
- 20-year contract with opportunity to increase term and capacity
- Plans to truck LNG from Deadhorse to Fairbanks

Hilcorp provides Harvest with gas supply on IGU's behalf. The two are not contractually-bound for the purpose of this agreement



Compressed natural gas (CNG) service coming to the North Slope

- SES Midstream LLC acquired a lease to site a compression facility for taking Prudhoe Bay gas and distributing CNG by truck to oilfield customers across the North Slope.

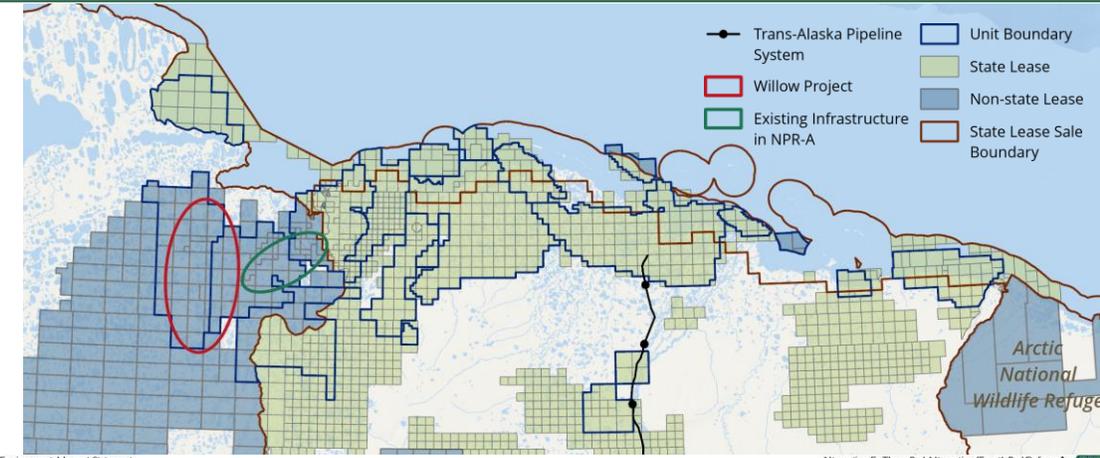
WILLOW UPDATE

Permitting

- Comment period for Draft Final Supplemental Environmental Impact Statement (EIS) closed August 29, 2022
- Final SEIS review completed by cooperating agencies in January 2023
- Publication of Final SEIS is expected imminently
- A Record of Decision (ROD) should follow as soon as 30 days after Final SEIS publication
- The State Pipeline Coordinator's Section (SPCS) will begin reviewing permits based on the SEIS shortly after the ROD

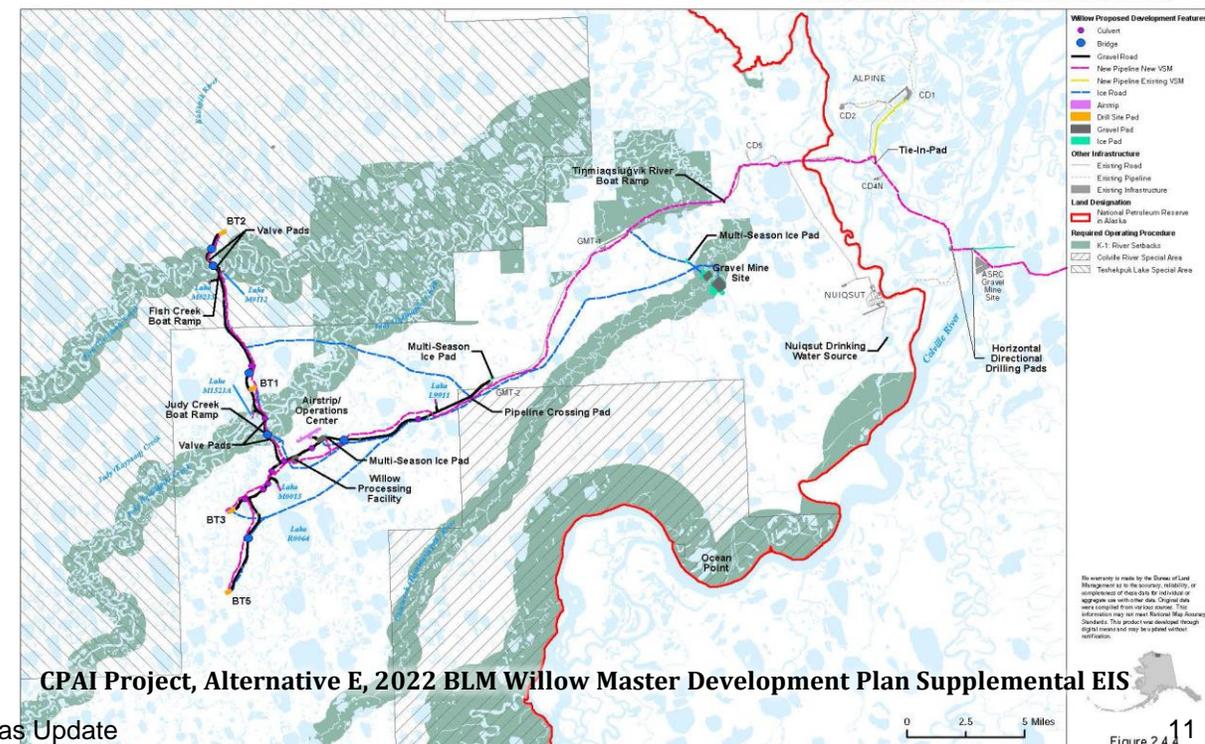
Anticipated performance

- Expected peak production of 180,000 barrels of oil per day (bopd)
- 600 million barrels of oil estimated (mmboe) total production over project life
- \$8–17 billion in royalty and property tax payment to State of Alaska, US, and municipal governments



Draft Supplemental Environmental Impact Statement

Alternative E: Three-Pad Alternative (Fourth-Pad Deferred)
2.0 - Alternative

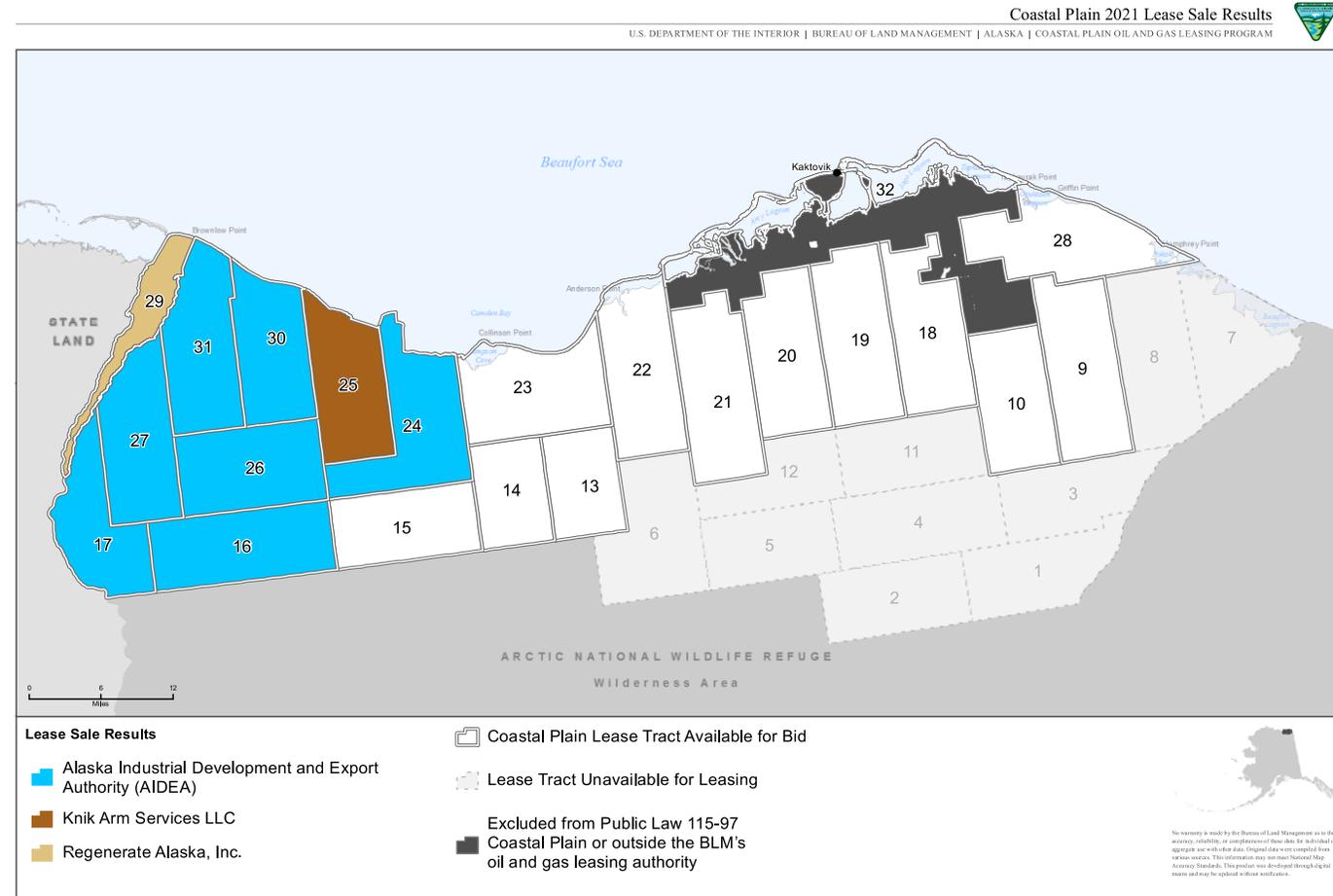


CPAI Project, Alternative E, 2022 BLM Willow Master Development Plan Supplemental EIS

ANWR UPDATE



- **AIDEA's leases remain suspended pending completion of the SEIS. The other two lessees relinquished their leases, so AIDEA's are the only remaining (blue in lease map).**
- **Lease suspension litigation is in briefing cross-motions for summary judgment.**
 - Plaintiffs' and State's opening briefs were filed December 5, 2022.
 - BLM's response is due February 3, 2023.
 - Briefing should conclude in mid- to late-March.
- **The leasing program litigation remains stayed pending completion of the SEIS. Next status report is due April 28, 2023.**



NET ZERO GREENHOUSE GAS (GHG) INITIATIVES OF NORTH SLOPE COMPANIES



ConocoPhillips Emissions Reductions Targets and Performance

- Reduce methane intensity by 10% and routine flaring to zero by 2025.
- Reduce Scope 1 and Scope 2 Greenhouse Gas (GHG) intensity by 40–50% (gross operated and net equity) by 2030
- Net zero Scope 1 and Scope 2 emissions by 2050

[Emissions Reduction Targets | ConocoPhillips](#)

ENI's Strategy Against Climate Change

- 35% reduction in net Scope 1, 2, and 3 emissions by 2030
- 55% reduction in net Scope 1, 2, and 3 emissions by 2035
- 80% reduction in net Scope 1, 2, and 3 emissions by 2040
- Net zero Scope 1, 2, and 3 emissions by 2050

[Net Zero at 2050 | Eni](#)

Exxon 2030 Greenhouse Gas (GHG) Emission Reduction Plans:

(Relative to 2016 level and apply to Scope 1 and Scope 2 GHG emissions from operated assets)

- 20–30% reduction in corporate-wide GHG intensity
- 40–50% reduction in upstream GHG intensity
- 70–80% reduction in corporate-wide methane intensity
- 60–70% reduction in corporate-wide flaring intensity

[Advancing climate solutions | ExxonMobil](#)

Hilcorp

"We have to operate to the same high standards as everyone else. We may be private, but we have capital providers, we have partners, we have lots of other people involved in business with us. They're feeling those pressures (i.e. ESG, emissions reductions), and we have to be responsive to those as well." — Greg Lalicker, Hilcorp CEO.

[How America's Biggest Privately Owned Oil Company Takes A Divergent Approach To The Energy Transition \(forbes.com\)](#)

Repsol Path Towards Decarbonization

- 55% reduction in scope 1 and scope 2 emissions in operated assets by 2025
- 30% reduction in scope 1, 2, and 3 net emissions by 2030
- Net zero by 2050

[Net zero emissions by 2050 commitment | Repsol](#)

Santos Path to Net Zero

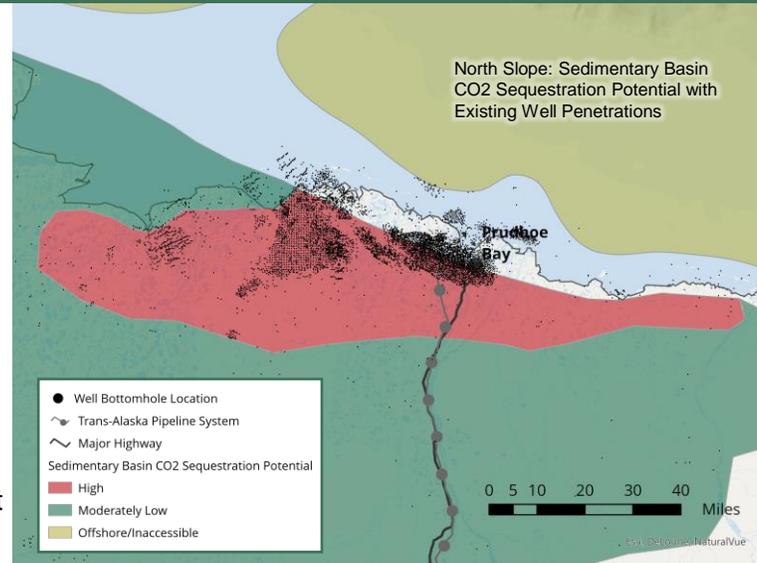
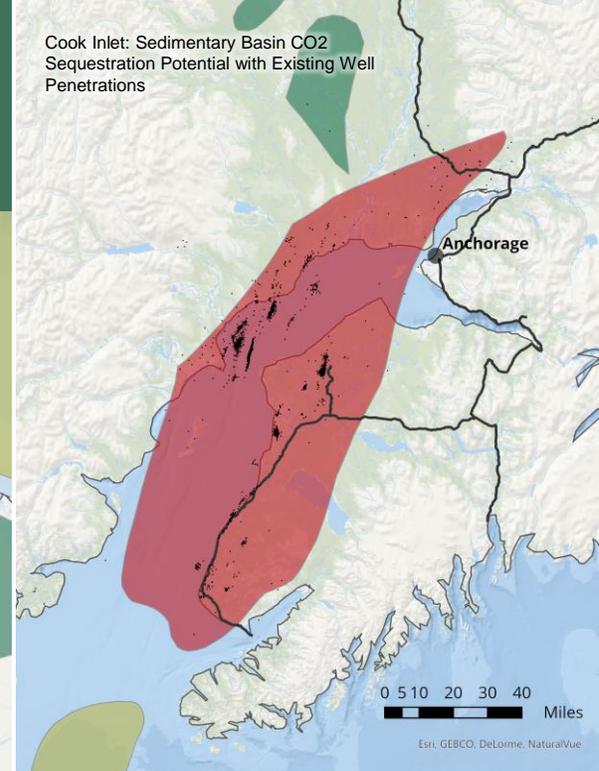
- 26–30% reduction in scope 1 and scope 2 absolute emissions (from 2020 baseline) by 2030
- Actively work with customers to reduce scope 1 and scope 2 emissions by > 1 million tons of carbon dioxide per year by 2030
- Scope 1 and scope 2 absolute emissions at net zero by 2040.
- **Santos has committed to net-zero emissions (scope 1 and scope 2) for the Pikka Project**

[Santos to be net-zero emissions by 2040 | Santos](#)

[Santos Announces Pikka FID | Santos](#)

GEOLOGIC CARBON STORAGE

Cook Inlet: Sedimentary Basin CO2 Sequestration Potential with Existing Well Penetrations



Alaska's storage resources

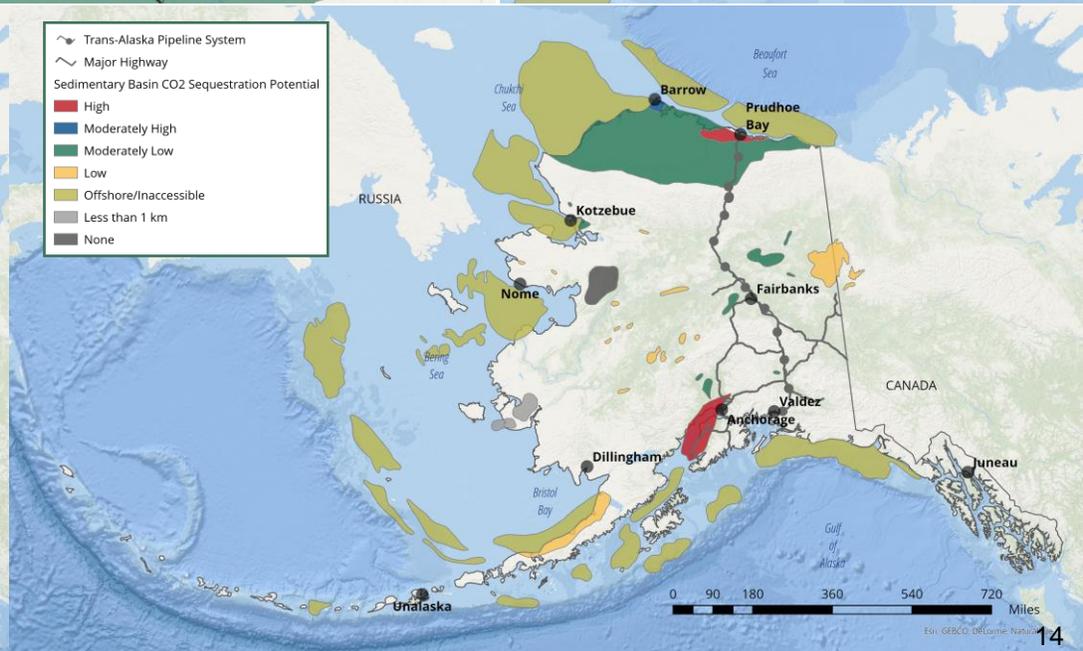
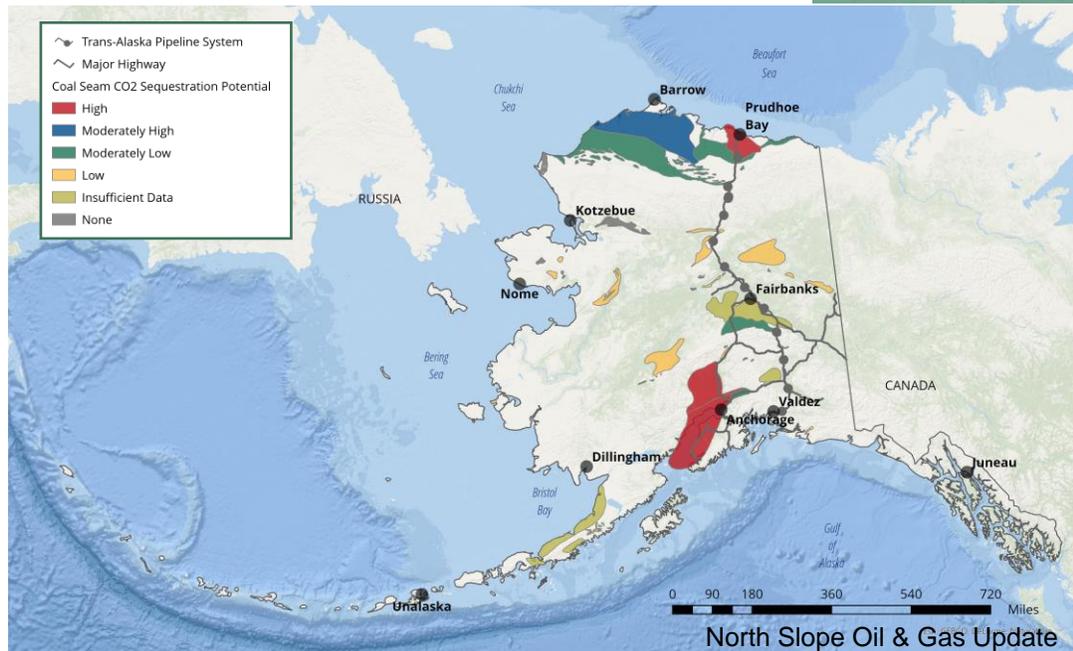
- Approximately 50 GT of storage potential in unmineable coals of Cook Inlet region
- Additional storage capacity in depleted fields and saline aquifers
- Significant tertiary recovery opportunities through CO₂ flood

Subsurface data available to the public for project planning

- Search inventory map at dgs.alaska.gov hosted by the Division of Geological and Geophysical Surveys
- Request well data at commerce.alaska.gov from the Alaska Oil and Gas Conservation Commission

Exploration opportunities on state land

- Large, contiguous blocks of state land ownership at tidewater in key storage basins
- 2023 Carbon Storage bill will address state leasing regime, Safe Drinking Water Act Underground Injection Control (UIC) Class VI primacy, pore space access, and long-term liability



North Slope Oil & Gas Update

Esri, GEBCO, DeLorme, NaturalVue 14

QUESTIONS?

