



# NORTH SLOPE OIL & GAS ACTIVITY

Senate Resources Committee

Presented by Derek Nottingham  
Division of Oil & Gas  
Alaska Department of Natural Resources  
January 23, 2023



# AGENDA

- **Introduction**
- **North Slope Resources and Activity**
- **Project Update**
- **Methane Hydrates Test Project**
- **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 (TCF)
- **Undiscovered Conventional Gas:** ~194 TCF
- **Unconventional Gas:** ~125 TCF of methane hydrates and shale gas

*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

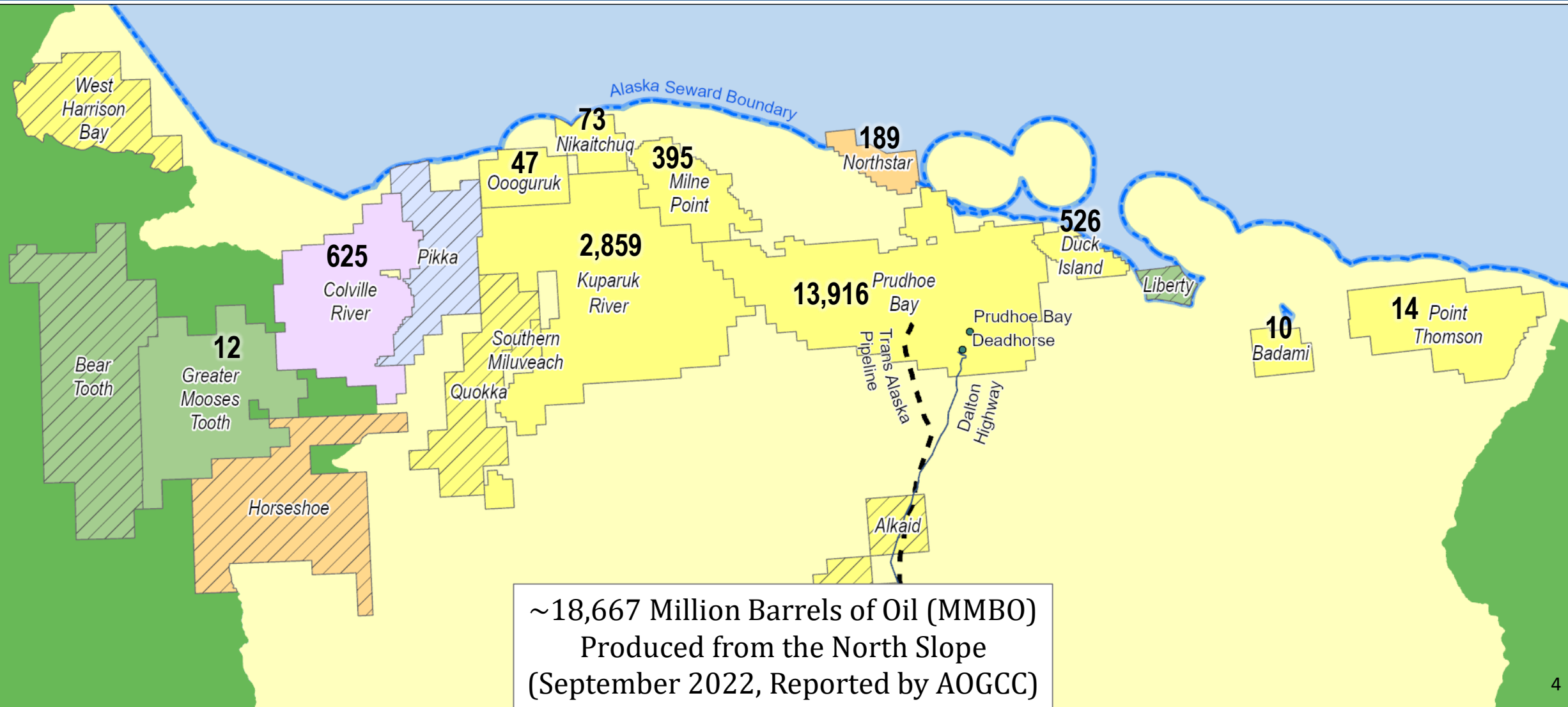
*Compared to most basins, Alaska is relatively underexplored.*





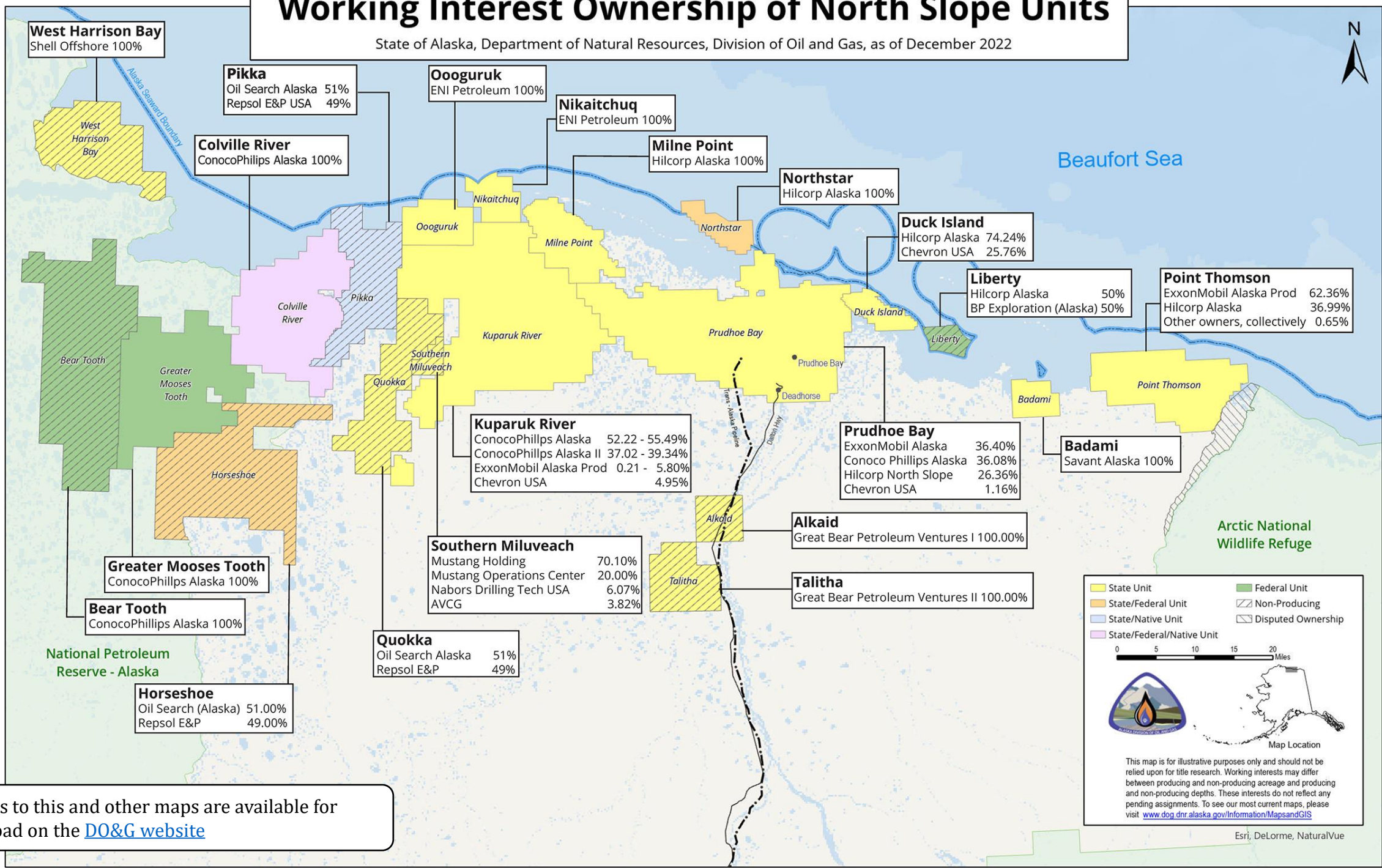
# NORTH SLOPE OIL PRODUCTION

*MILLIONS OF BARRELS, CUMULATIVE*



# Working Interest Ownership of North Slope Units

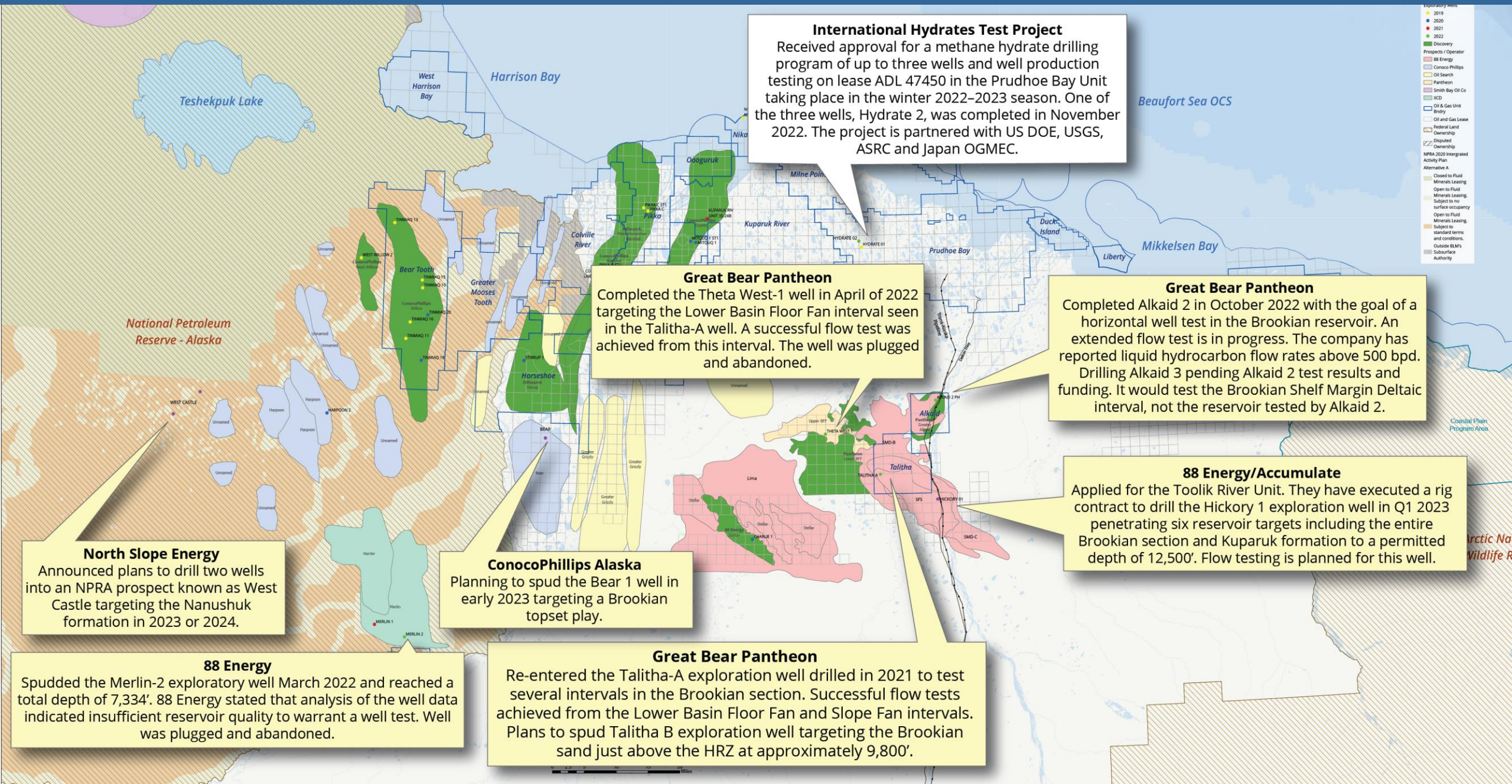
State of Alaska, Department of Natural Resources, Division of Oil and Gas, as of December 2022



Updates to this and other maps are available for download on the [DO&G website](http://DO&G website)



# 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 NPR 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

	Status: January 2022	Status: January 2023	Production Rate Estimates
<b>Pikka</b>	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 BOPD.
<b>Willow</b>	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.
<b>CRU Narwhal CD8</b>	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 to 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.
<b>MPU Raven Pad</b>	Long-Range Activities of Milne Point Unit (MPU) 40 <sup>th</sup> 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 the 2018 M Pad development at MPU.
<b>KRU Nuna-Torok</b>	2021 Kuparuk River Unit (KRU) Plan of Development (POD) appraisal activity for two existing wells and seismic data processing.	2022 KRU POD states rotary drilling is planned in Q3 2022 with an additional injector/producer pair for additional Torok reservoir appraisal to inform future developments.	Peak rate up to 25,000 BOPD.

# METHANE HYDRATES TEST PROJECT



Nordic Calista 3 on the Kuparuk State 7-11-12 Pad Photo: Division of Oil and Gas Permitting Section

- Japanese Organization for Metals and Energy Security (JOGMEC) and U.S. Department of Energy (DOE) funded program
- Program seeks to determine long-term production potential of methane hydrate reservoirs
- ASRC Energy Services (AES) is performing operations which are occurring on the 07-11-12 pad on the west side of Prudhoe Bay
- Objectives are to drill a monitoring well and two production test wells, production testing from April through December 2024
- The Geologic Data Well and Production Test Well 1 are complete. AES is currently drilling Test Well 2
- Production Test scheduled to start in April 2023 and will run through December 2024.

Total petroleum system and assessment units (AUs)	AU probability	Accumulation type	Total undiscovered resources							
			Gas (BCFG)				NGL (MMBNGL)			
			F95	F50	F5	Mean	F95	F50	F5	Mean
Northern Alaska Gas Hydrate Total Petroleum System										
Nanushuk Formation Gas Hydrate AU	0.9	Gas	0	19,978	46,706	21,511	0	0	0	0
Tuluvak-Schrader Bluff-Prince Creek Formations Gas Hydrate AU	0.9	Gas	0	16,231	38,449	17,608	0	0	0	0
Sagavanirktok Formation Gas Hydrate AU	0.9	Gas	0	13,840	30,475	14,677	0	0	0	0
Total undiscovered conventional resources			0	50,049	115,630	53,796	0	0	0	0

[BCFG, billion cubic feet of gas; NGL, natural gas liquids; MMBGL, million barrels of natural gas liquids. Results shown are fully risked estimates. For gas accumulations, all liquids are included in the NGL category. F95 represents a 95-percent chance of at least the amount tabulated; other fractiles are defined similarly. Fractiles are additive under the assumption of perfect positive correlation. Shading indicates not applicable]

**Of the estimated 53.8 TCF of gas within hydrates on the North Slope, 48 percent occurs on federally managed lands, 45 percent on lands and offshore waters managed by the State of Alaska, and 7 percent on Native lands.**

Source: 2019 USGS Assessment of Undiscovered Gas Hydrate Resources in the North Slope of Alaska 2019

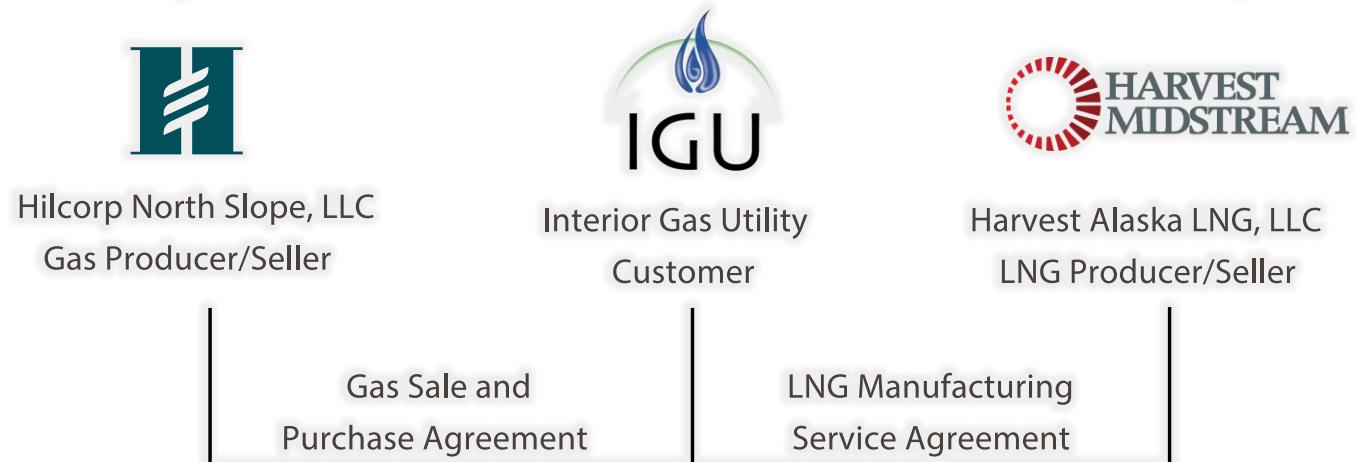


# TRUCKING NATURAL GAS TO MARKET

## 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

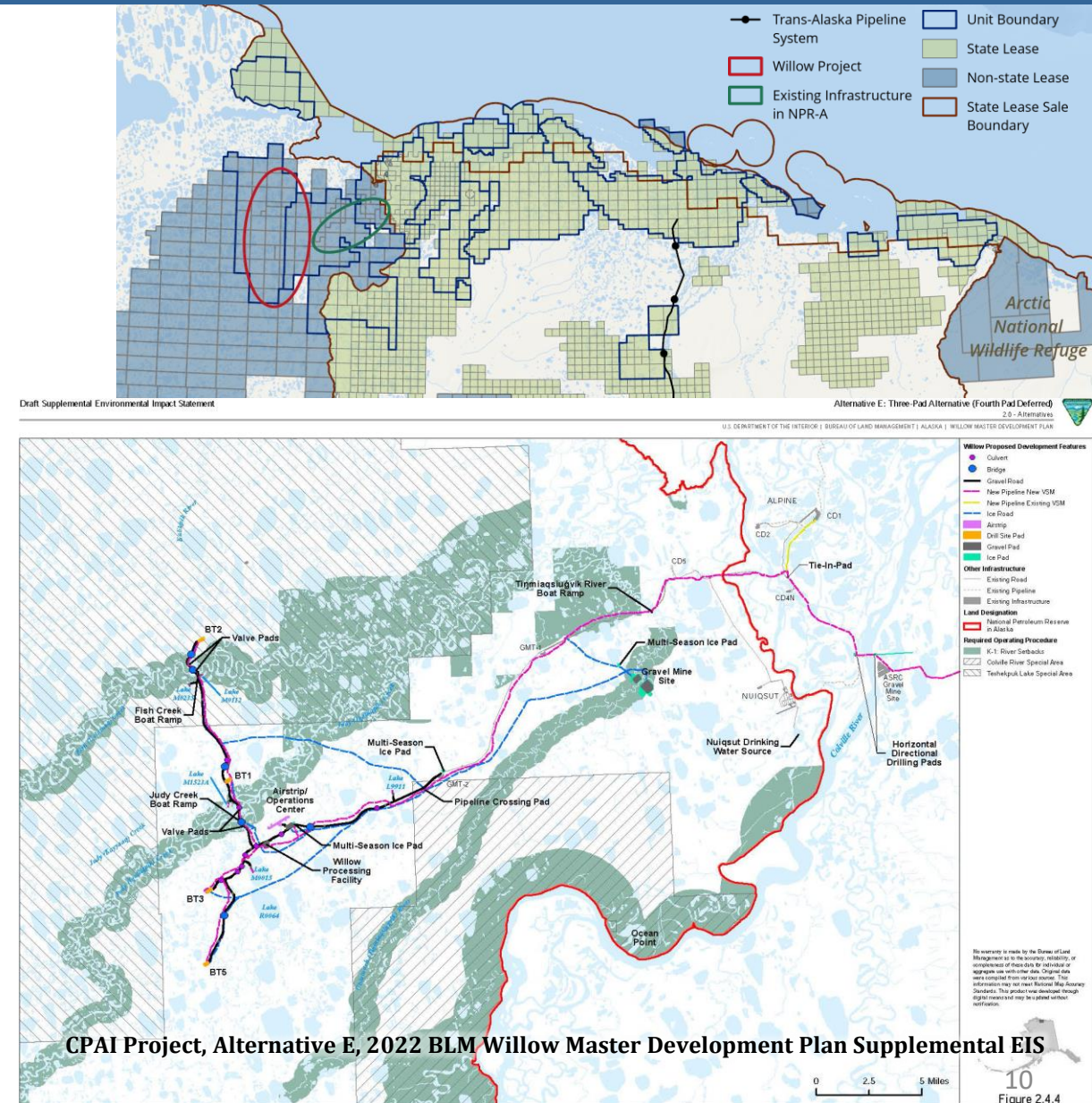
- Comment period for Draft Final Supplemental Environmental Impact Statement (SEIS) closed August 29, 2022
- Final SEIS review completed by Cooperating Agencies in January 2023
- Publication of Final SEIS is expected imminently
- A Record of Decision (ROD) should follow as soon as 30 days after the publication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

## Construction

- Begin staging and early construction works for winter of 2023–2024

## Anticipated performance

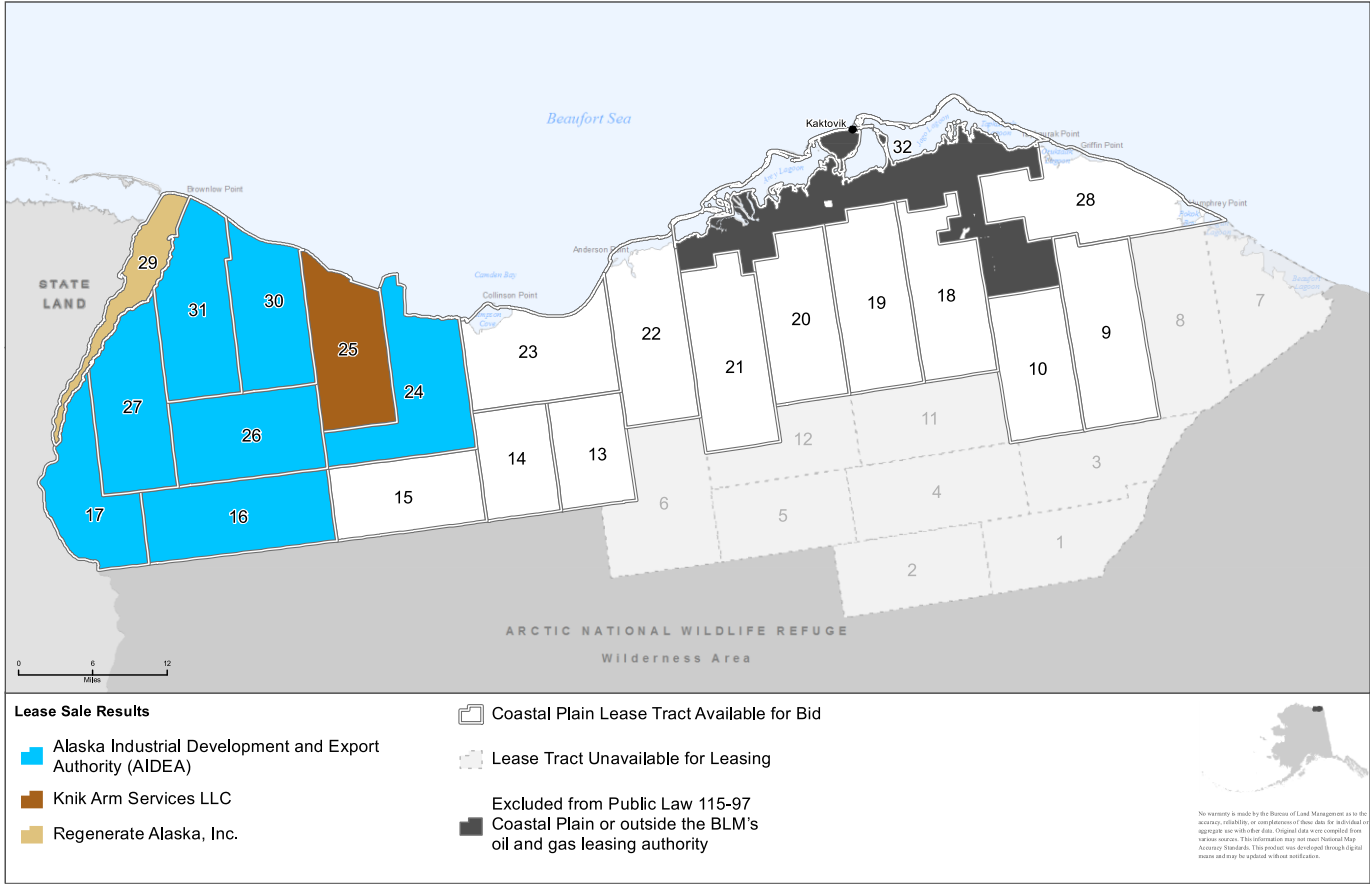
- Expected peak production of 180,000 barrels of oil per day (bopd)
- 600 million barrels of oil estimated (mmboe) total production over project life
- \$8–17 billion in royalty and property tax payment to State of Alaska, US, and municipal governments





# 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 al 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

## Alaska's storage resources

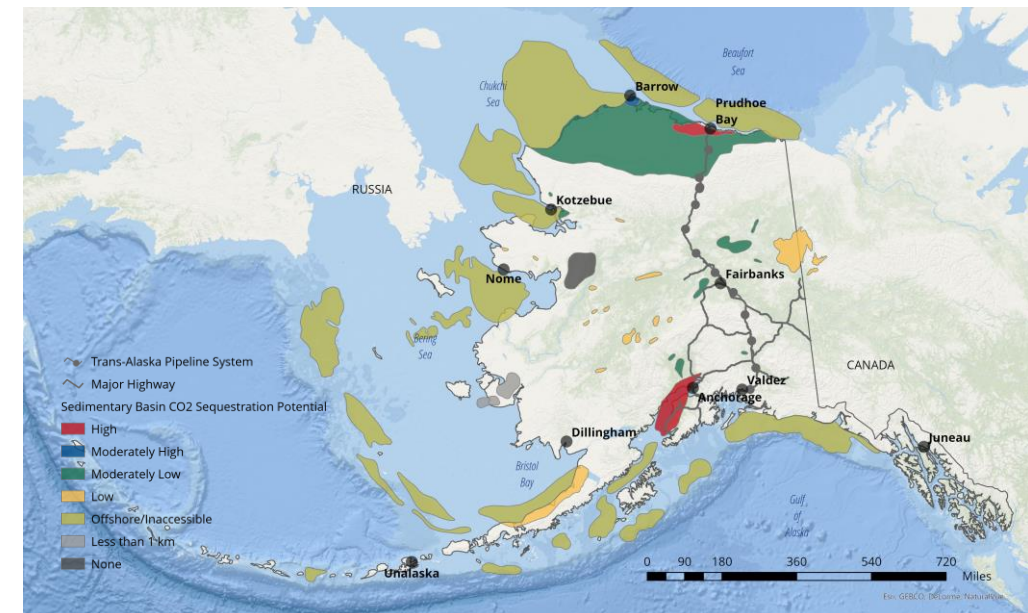
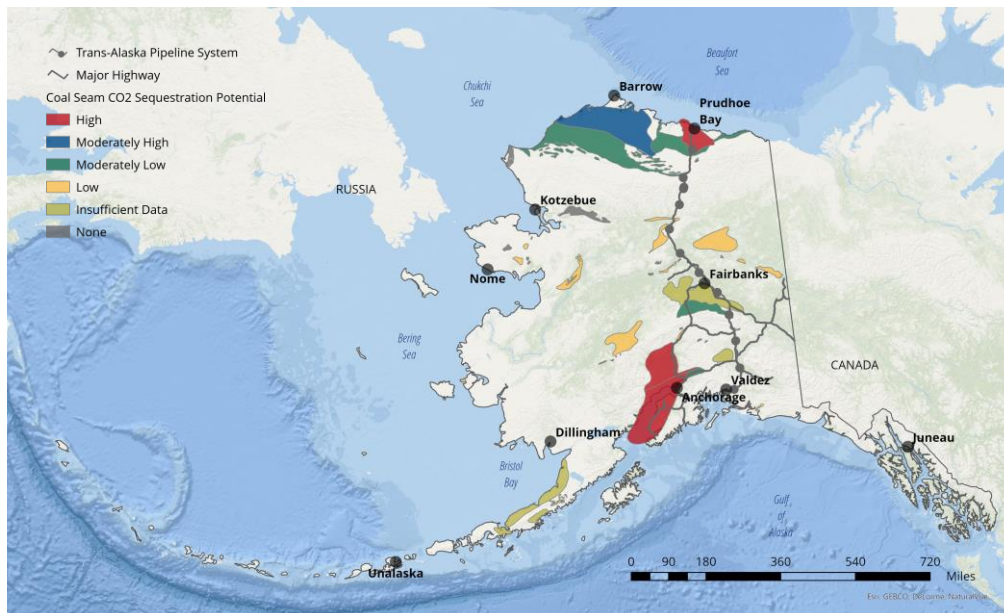
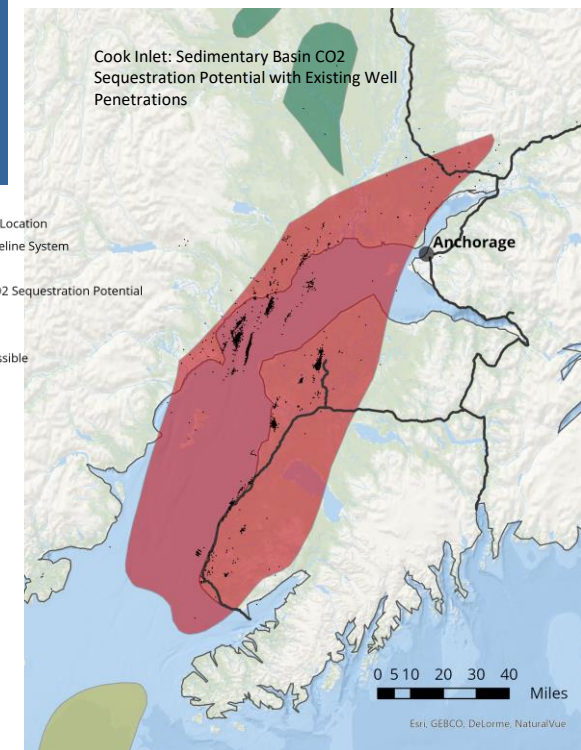
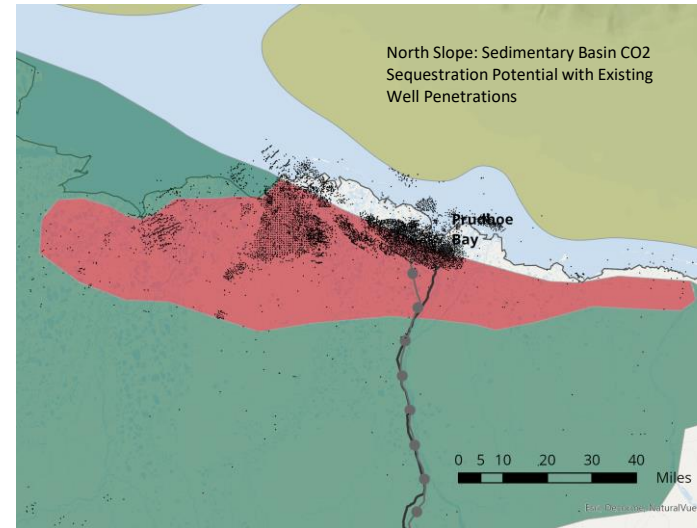
- Approximately 50 gigatons (GT) of storage potential in unmineable coals of Cook Inlet region
- Additional storage capacity in depleted fields and saline aquifers
- Significant tertiary recovery opportunities through CO<sub>2</sub> flood

## Subsurface data available to the public for project planning

- Search inventory map at [dgs.alaska.gov](https://dgs.alaska.gov) hosted by the Division of Geological and Geophysical Surveys
- Request well data at [commerce.alaska.gov](https://commerce.alaska.gov) from the Alaska Oil and Gas Conservation Commission (AOGCC)

## 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, Underground Injection Control (UIC) Class VI primacy, pore space access, and long-term liability



# THANK YOU

