Cook Inlet Gas

A Vital Energy Resource for Alaskans

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Department of Natural Resources
Division of Oil and Gas
January 17, 2024




Agenda

- **Why Is Cook Inlet Gas Important?**
- **Cook Inlet Overview, Geology, & Production History**
- **DNR's 2022 Cook Inlet Gas Forecast**
- **DNR's and the Divisions Role in Cook Inlet**
- **Wrap Up**

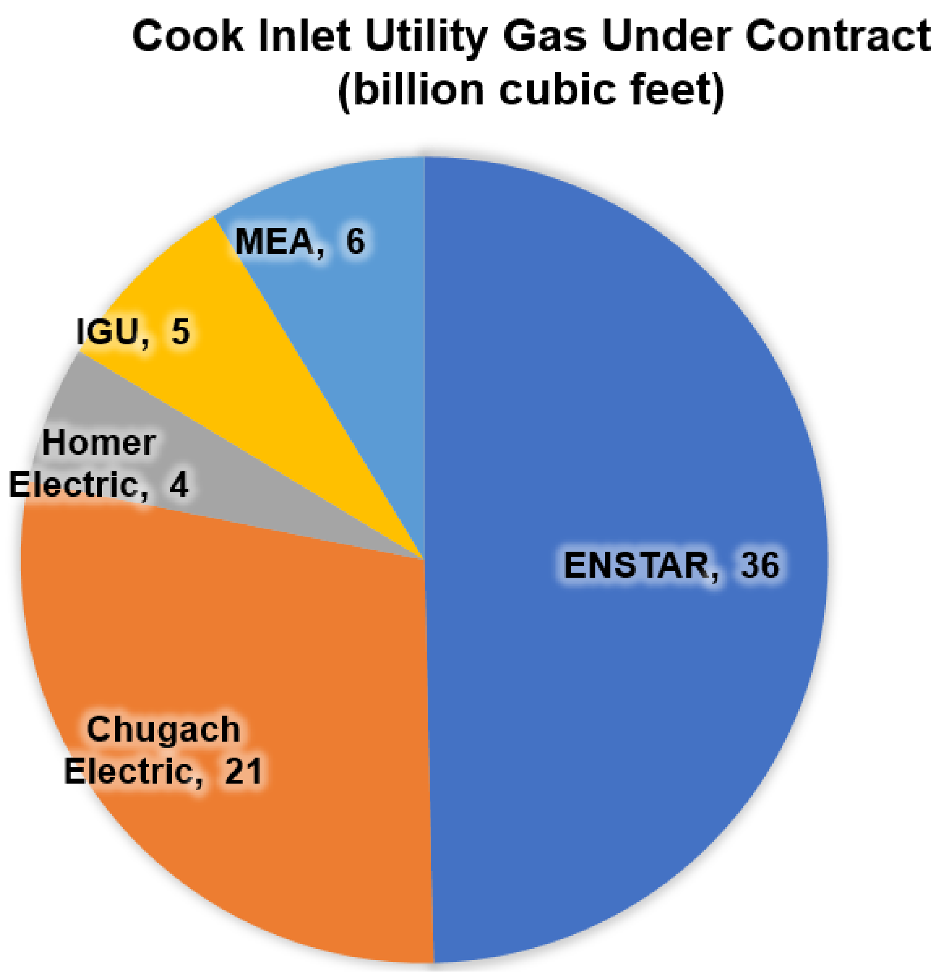
Why is Cook Inlet Gas Important?

Natural Gas

- **Enstar** serves over 440,000 people and operates in over 25 communities throughout Southcentral Alaska.
- **Interior Gas Utility (IGU)** serves over 2,400 people.

Electricity

- **Chugach Electric** serves over 302,000 people in Anchorage, Whittier, Girdwood, and Fairbanks.
- **Matanuska Electric (MEA)** serves the Mat-Su Borough and Chugach and Eagle River, over 180,000 people.
- **Homer Electric** serves nearly 36,000 people.



Cook Inlet Overview

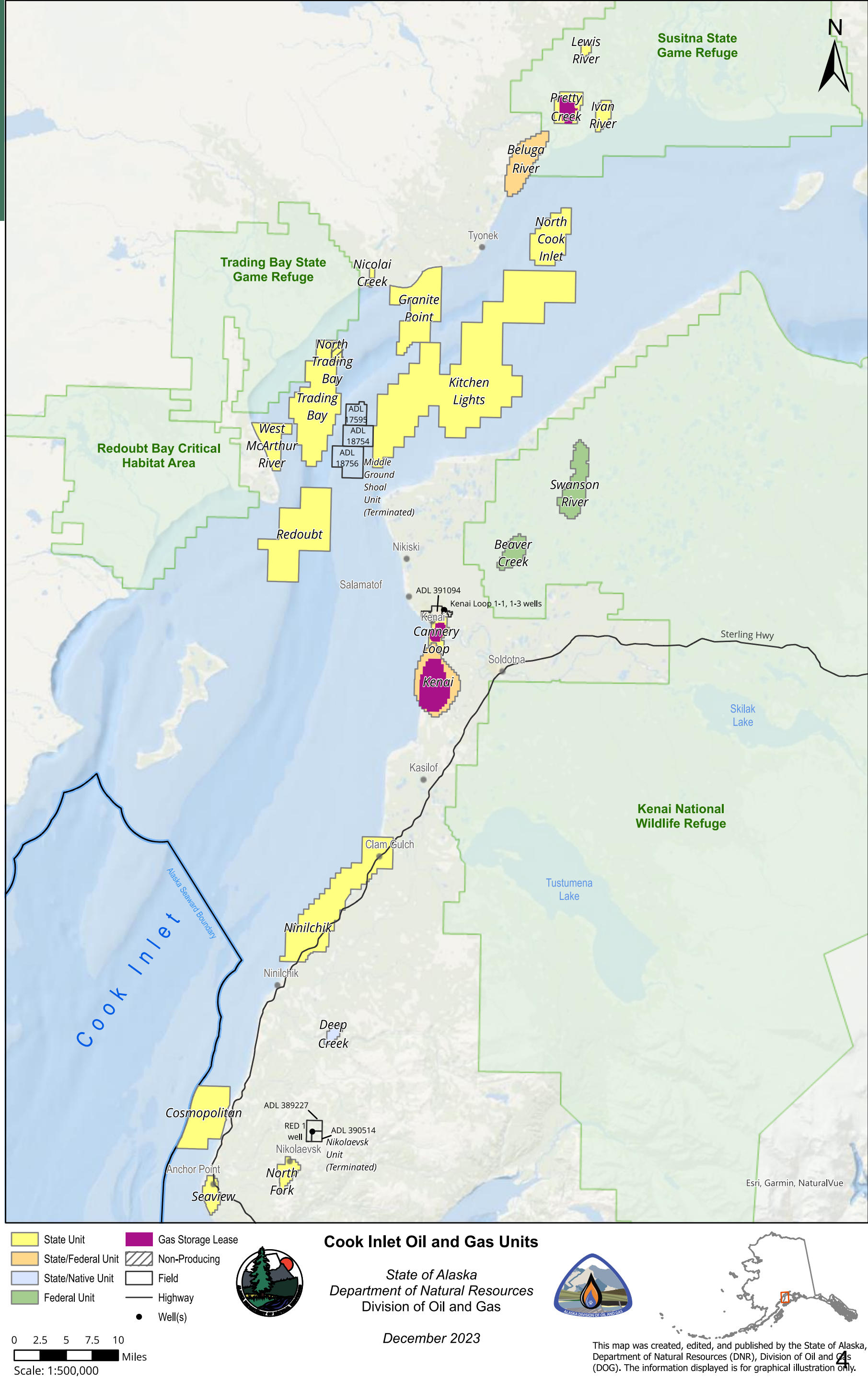
Cook Inlet is a large mature oil and gas basin

- Has produced over 1.4 billion barrels of oil and 12 trillion cubic feet of gas.
- 26 producing fields operated by 8 different companies.
- Over 200 oil and gas leases in Cook inlet

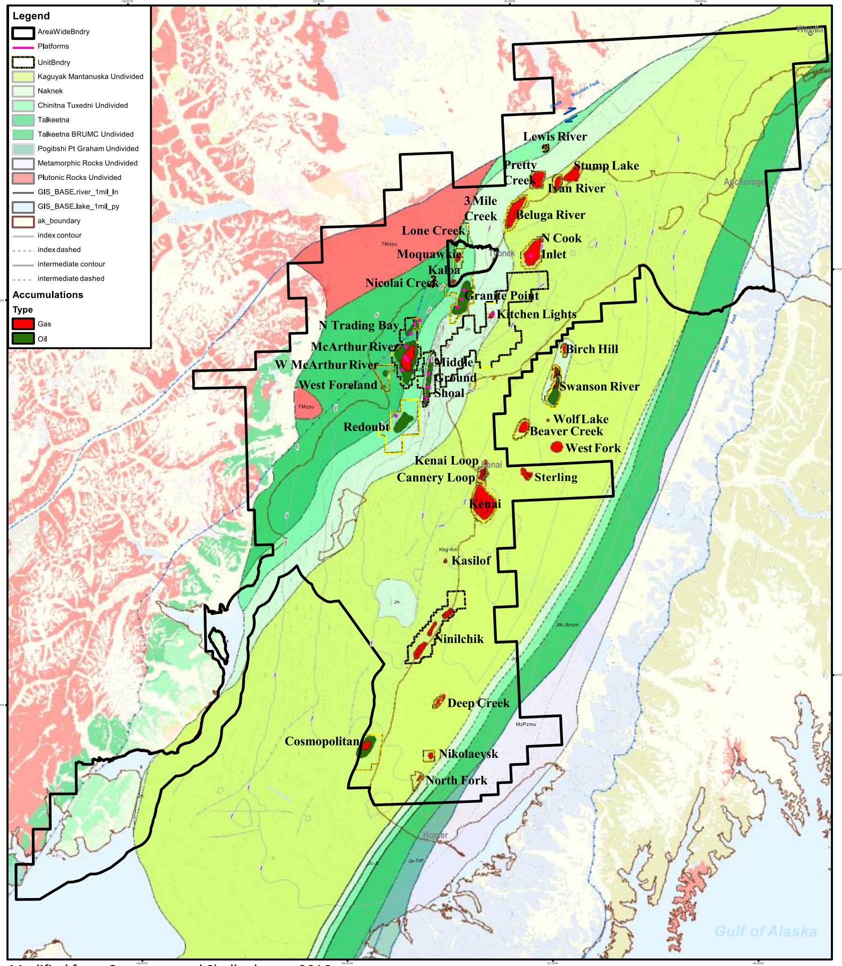
Gas production has been declining since 1990

- Peak gas production in 1990 was over 850,000 thousand cubic feet per day.
- Current production is just over 200,000 thousand cubic feet per day.

Cook Inlet gas provides heat and electricity to 70% of Alaskans



Cook Inlet Geology



Modified from Gregersen and Shellenbaum, 2016

Top Mesozoic Subcrop Map with Oil and Gas Accumulations, Cook Inlet Basin, Alaska

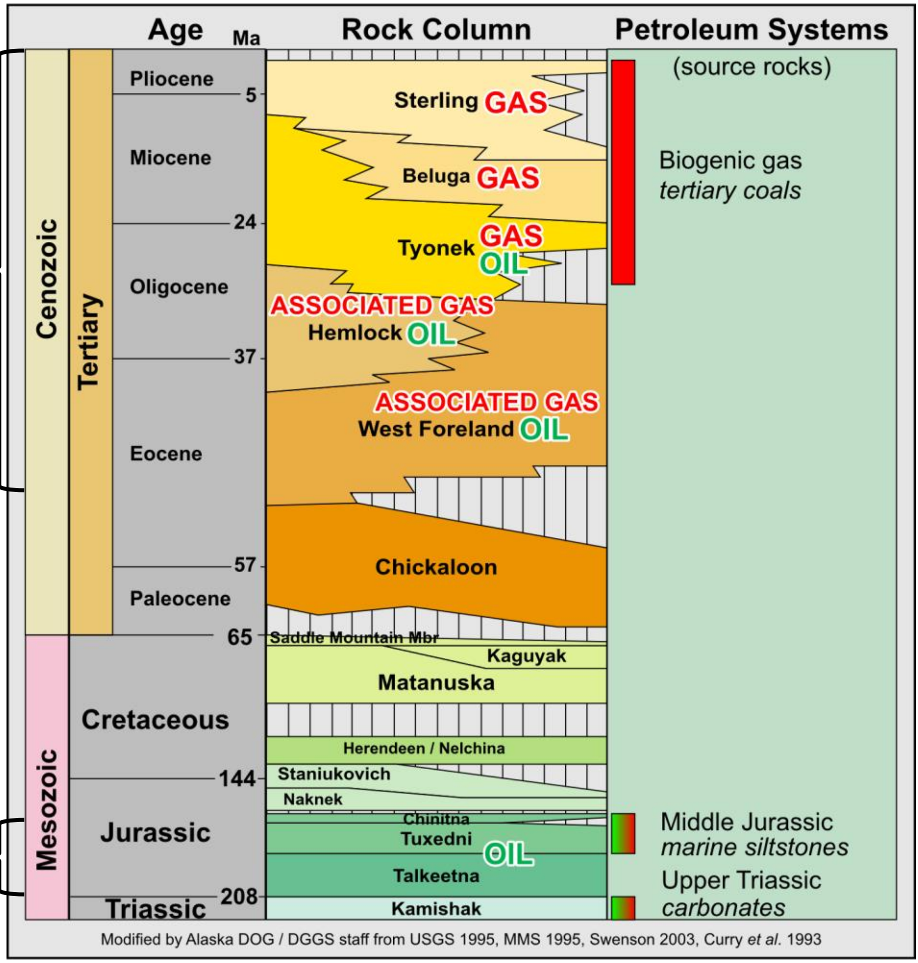
Two Sources of Gas In Cook Inlet Basin

1. Biogenic gas from coals.
2. Oil migrated from source rocks, creating associated gas.

Majority of oil and gas production is from Tertiary reservoirs

Oil seeps; TBU M-28 produced oil

Cook Inlet Stratigraphic Column



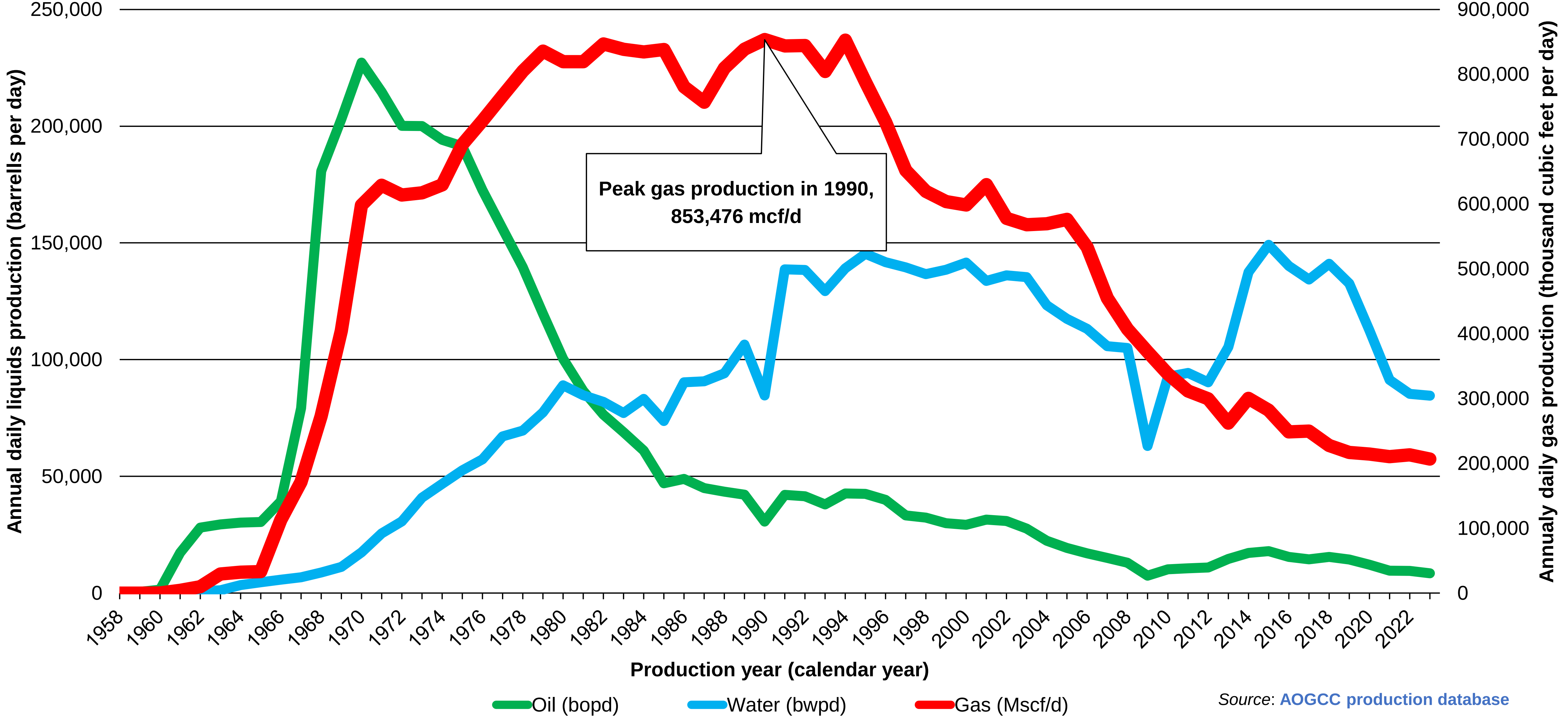
Modified by Alaska DOG / DGGS staff from USGS 1995, MMS 1995, Swenson 2003, Curry *et al.* 1993

More resources from the Department of Geological & Geophysical Surveys (DGGS)

- **Cook Inlet geology and hydrocarbon potential (project link)**
- **Seismic and well data (catalog link)**

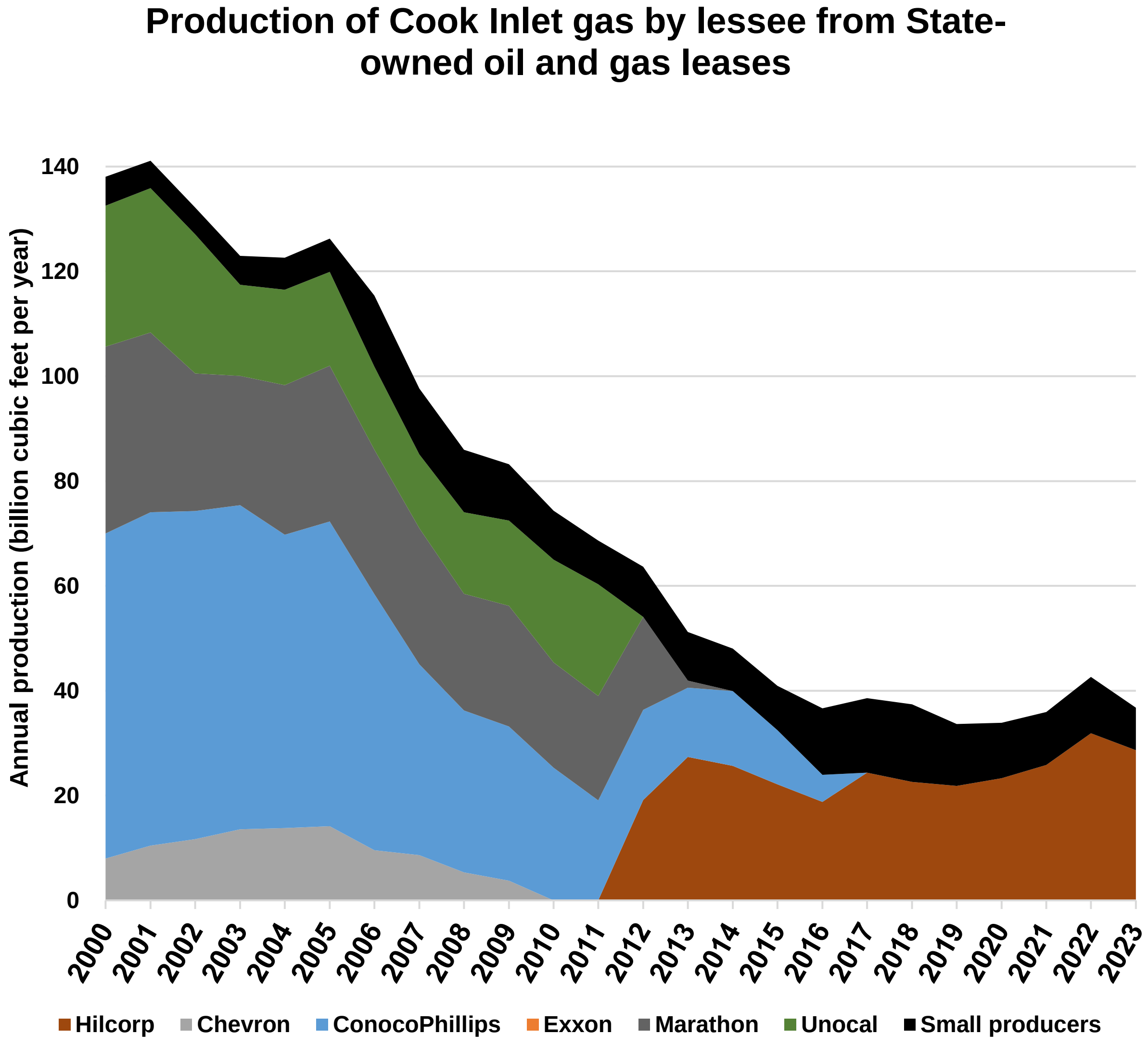
Quick Look Guide to Cook Inlet Oil and Gas
LS Gregersen, 3-13-2020

Cook Inlet Production History

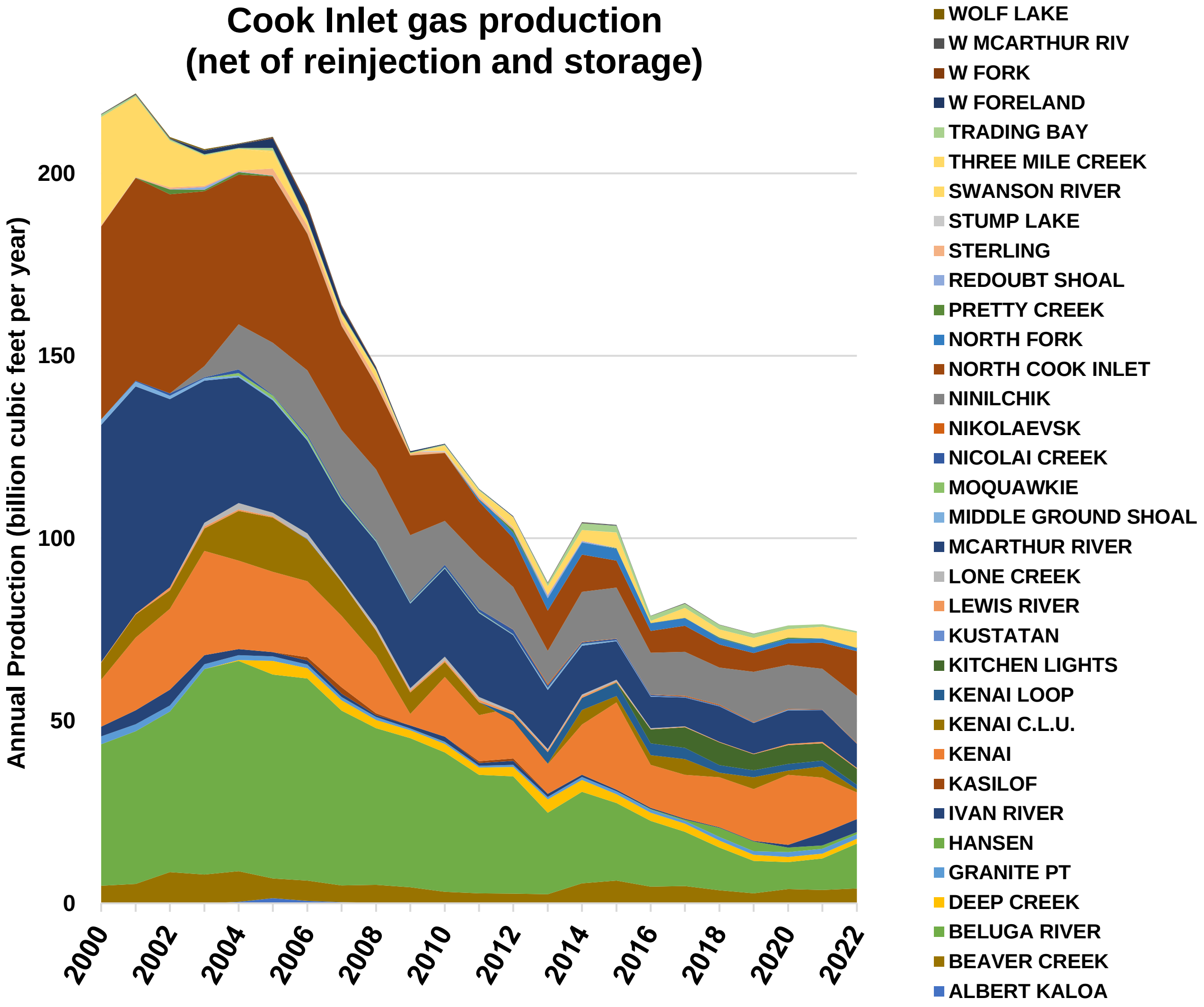


Source: **AOGCC production database**

Cook Inlet Fields Overview: Gas Production History



Note: State Lands Only



Note: State + Federal + Private Lands

Cook Inlet Production by Field:

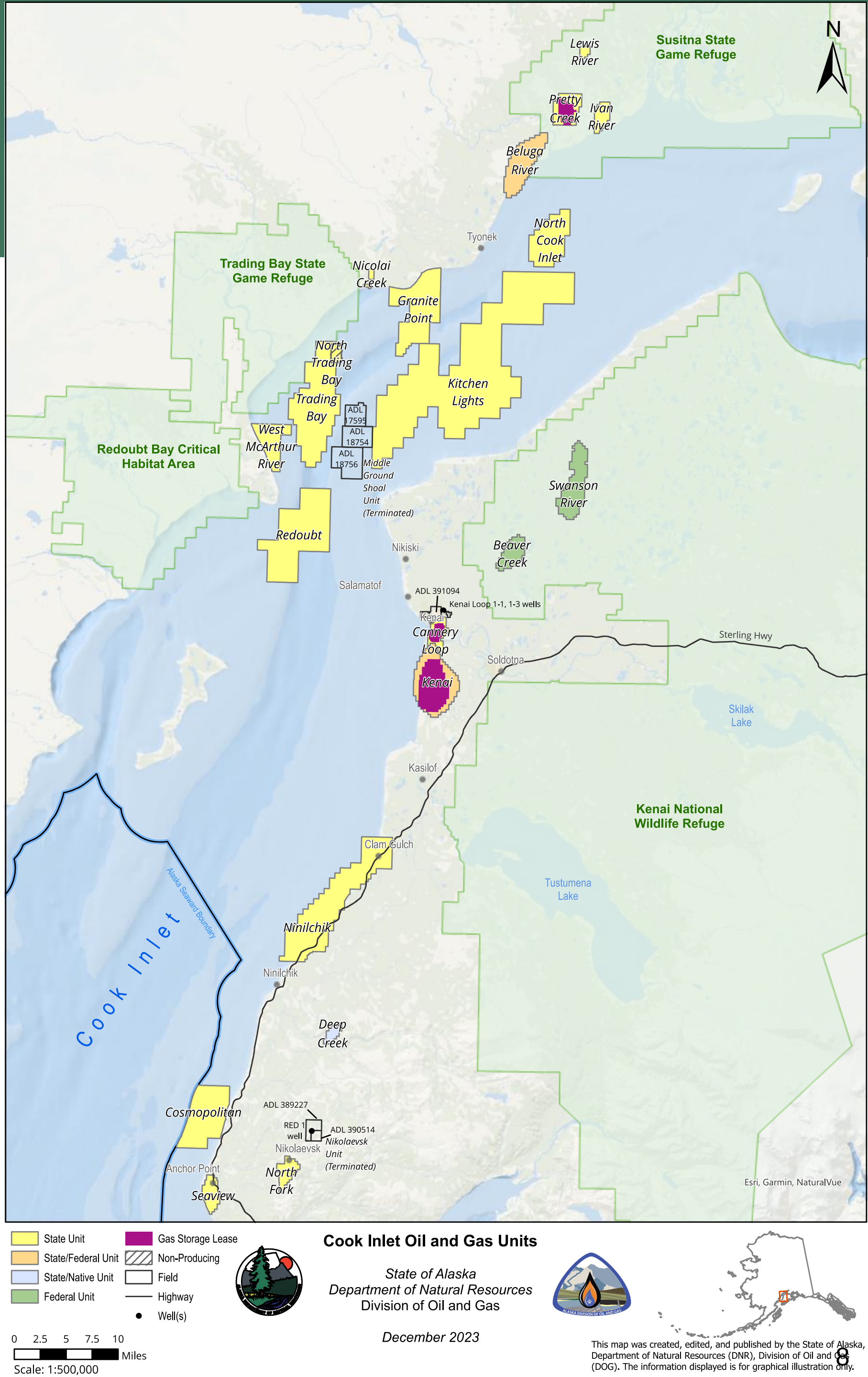
Field	Operator and lessees	2023 Gas Production	2023 Oil Production
Kenai Loop	AIX Energy LLC	0.66.bcf	
Nicolai Creek	Amaroq Resources, LLC	0.1 bcf	
Hansen	Bluecrest Alaska Operating LLC	0.43 bcf	713 bopd
Redoubt Shoal	Cook Inlet Energy, LLC.	0.04 bcf	443 bopd
West McArthur River	Cook Inlet Energy, LLC.	0.05 bcf	586 bopd
Kitchen Lights	Furie Operating Alaska, LLC; Cornucopia Oil & Gas Company; A. L. Berry; Danny Davis; Taylor Minerals, LLC; Corsair Oil & Gas	3.58 bcf	
Beaver Creek	Hilcorp Alaska, LLC	2.73 bcf	382 bopd
Beluga River	Hilcorp Alaska, LLC; Chugach Electric Association	**12.13 bcf**	
Deep Creek	Hilcorp Alaska, LLC	1.27 bcf	
Granite Pt	Hilcorp Alaska, LLC	1.09 bcf	2,232 bopd
Ivan River	Hilcorp Alaska, LLC	2.14 bcf	
Kenai	Hilcorp Alaska, LLC	6.78 bcf	
Kenai C.L.U.	Hilcorp Alaska, LLC	1.97 bcf	
Lewis River	Hilcorp Alaska, LLC	0.22 bcf	
McArthur River	Hilcorp Alaska, LLC	4.85 bcf	2,589 bopd
Middle Ground Shoal	Hilcorp Alaska, LLC	0.00 bcf	0 bopd
Red 1 Well	Hilcorp Alaska, LLC	0.07 bcf	
Ninilchik	Hilcorp Alaska, LLC	**14.31 bcf**	
North Cook Inlet	Hilcorp Alaska, LLC	**12.34 bcf**	
Seaview	Hilcorp Alaska, LLC	0.00 bcf	
Swanson River	Hilcorp Alaska, LLC	2.59 bcf	732 bopd
Trading Bay	Hilcorp Alaska, LLC	0.4 bcf	890 bopd
North Fork	Vision Operating, LLC	0.79 bcf	

bcf = billion cubic feet

bopd = barrels of oil per day

Source: AOGCC through November 2023

https://dog.dnr.alaska.gov/Information/MapsAndGis



Gas Storage

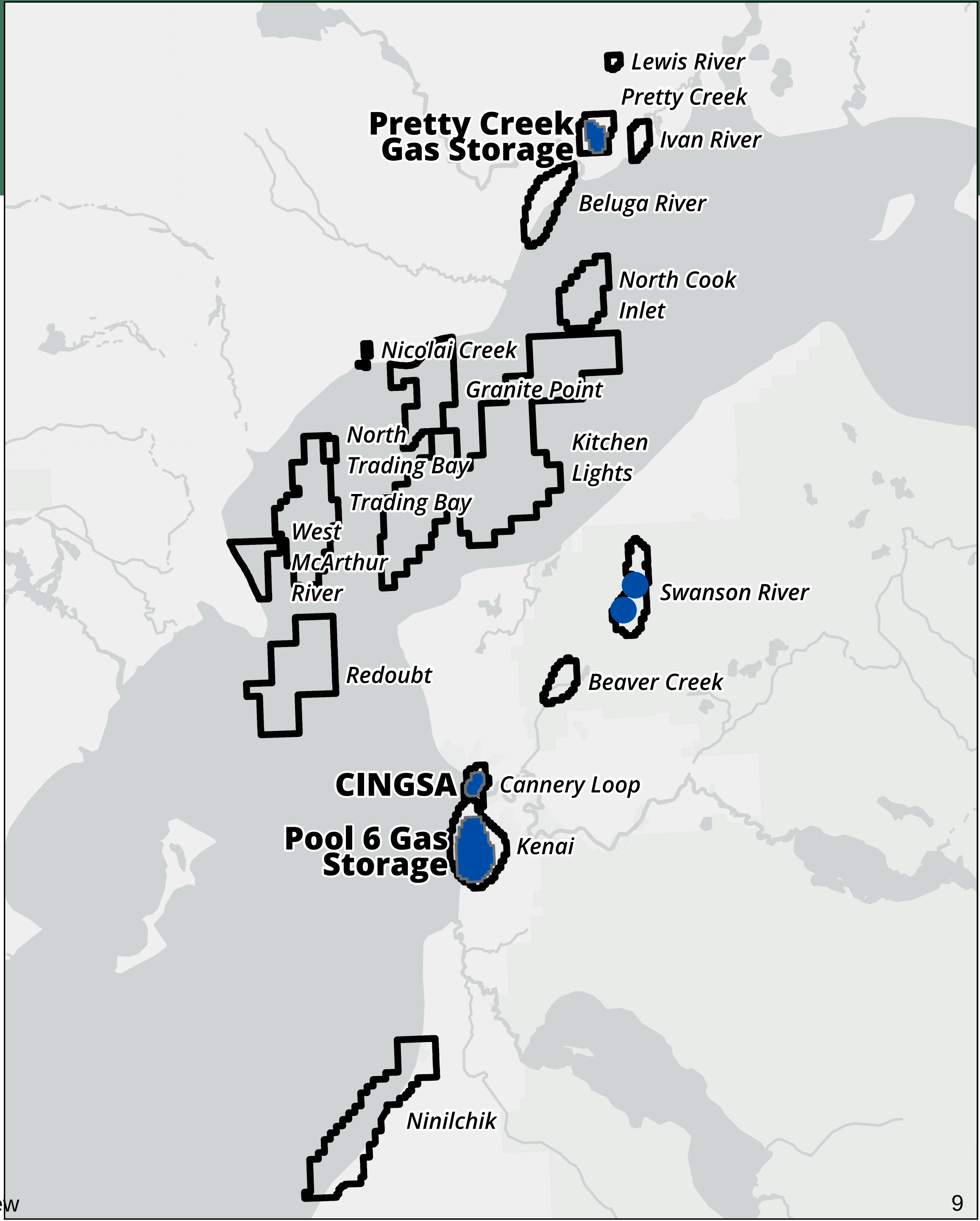
What is gas storage?

- Gas storage is a production and injection operation used to mitigate fluctuating demand for natural gas that is driven by swings in ambient temperature.
- During times of peak demand, more gas is called for (by consumers) than is deliverable from producing reservoirs.
- By placing gas in storage during times of low demand, a greater volume of gas is available for withdrawal during times of peak demand.

There are four gas storage pools

- CINGSA – Established in 2011, gas storage capacity 18 bcf, operated by CINGSA (an RCA regulated utility).
- Kenai Gas Pool 6 – Established in 2006, gas storage capacity 50 bcf, operated by Hilcorp.
- Pretty Creek – Established in 2005, gas storage capacity 3 bcf, operated by Hilcorp.
- Swanson River (Federal) – Established in 2001, gas storage capacity 3.4 bcf, operated by Hilcorp.

bcf = billion cubic feet of natural gas
CINGSA = Cook Inlet Natural Gas Storage Alaska



SOUTHCENTRAL GAS DEMAND: DEMAND BY USER TYPE

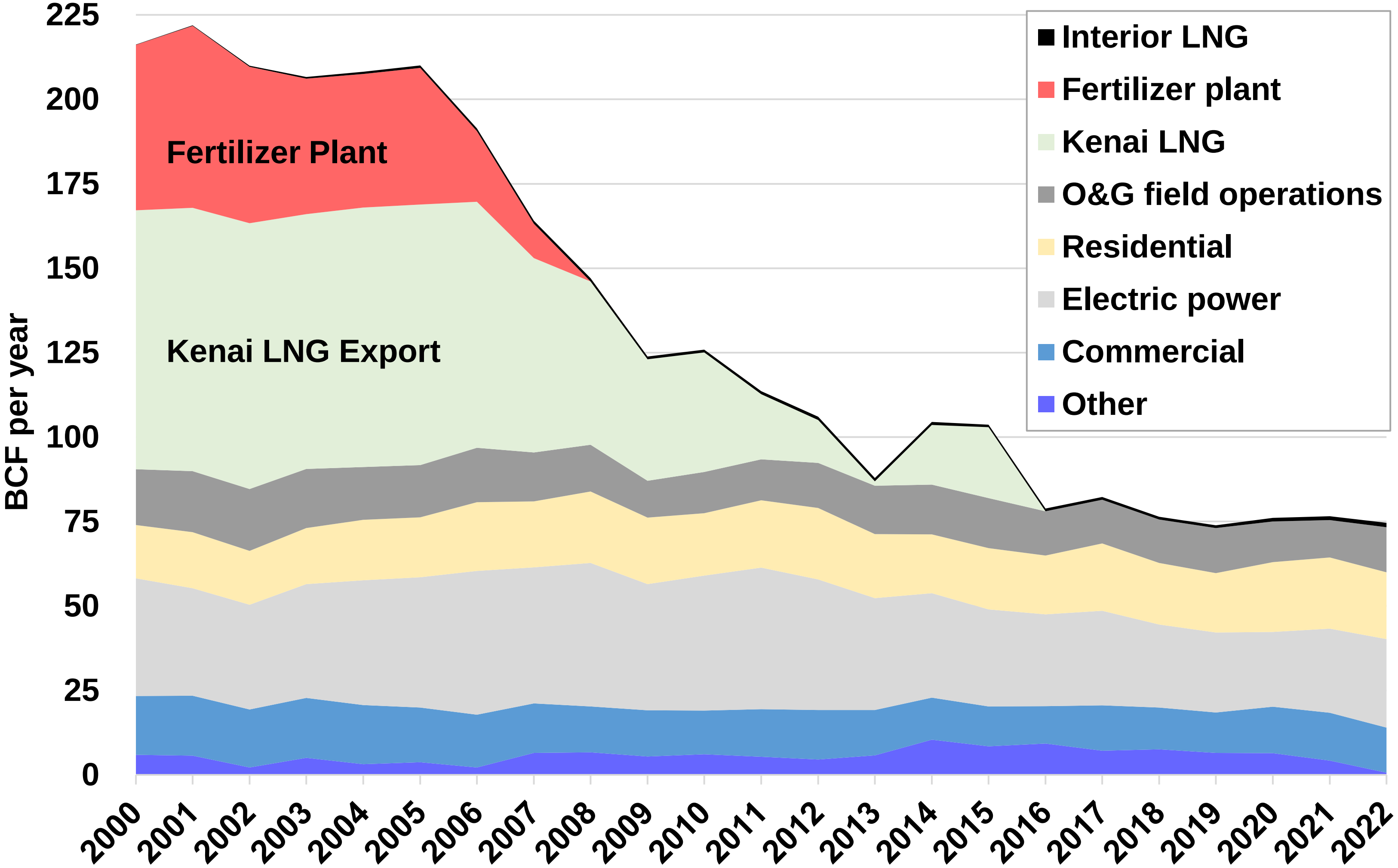
Kenai LNG Plant

- Nikiski liquified natural gas (LNG) facility is operated by Trans-Foreland Pipeline Co. LLC – which is a sub of Marathon Petroleum.
- Last exported LNG was 2015.
- Department of Energy (DOE) authorization for exporting LNG expired in 2018.
- Dec. 2020 Federal Energy Regulatory Commission (FERC) approved LNG imports to this facility an annual capacity up to 1.8 billion cubic feet (bcf) per year.

Nutrien Fertilizer Plant

- Second largest ammonia/urea plant in U.S.
- Shut down and mothballed in 2007, however Nutrien maintains permits and remains interested in reopening the plant.
- Gas prices relative to Lower 48 makes economics difficult.
- Potential source for blue hydrogen/blue ammonia.

Estimated consumption of Cook Inlet gas by end use (Source: EIA, AOGCC)



DNR 2022 Cook Inlet Forecast

Purpose of the 2022 Cook Inlet Gas Forecast:

- Independent analysis to provide information on gas supply issues in the Cook Inlet
- Also provides production information for DOR’s revenue forecast

Methodology:

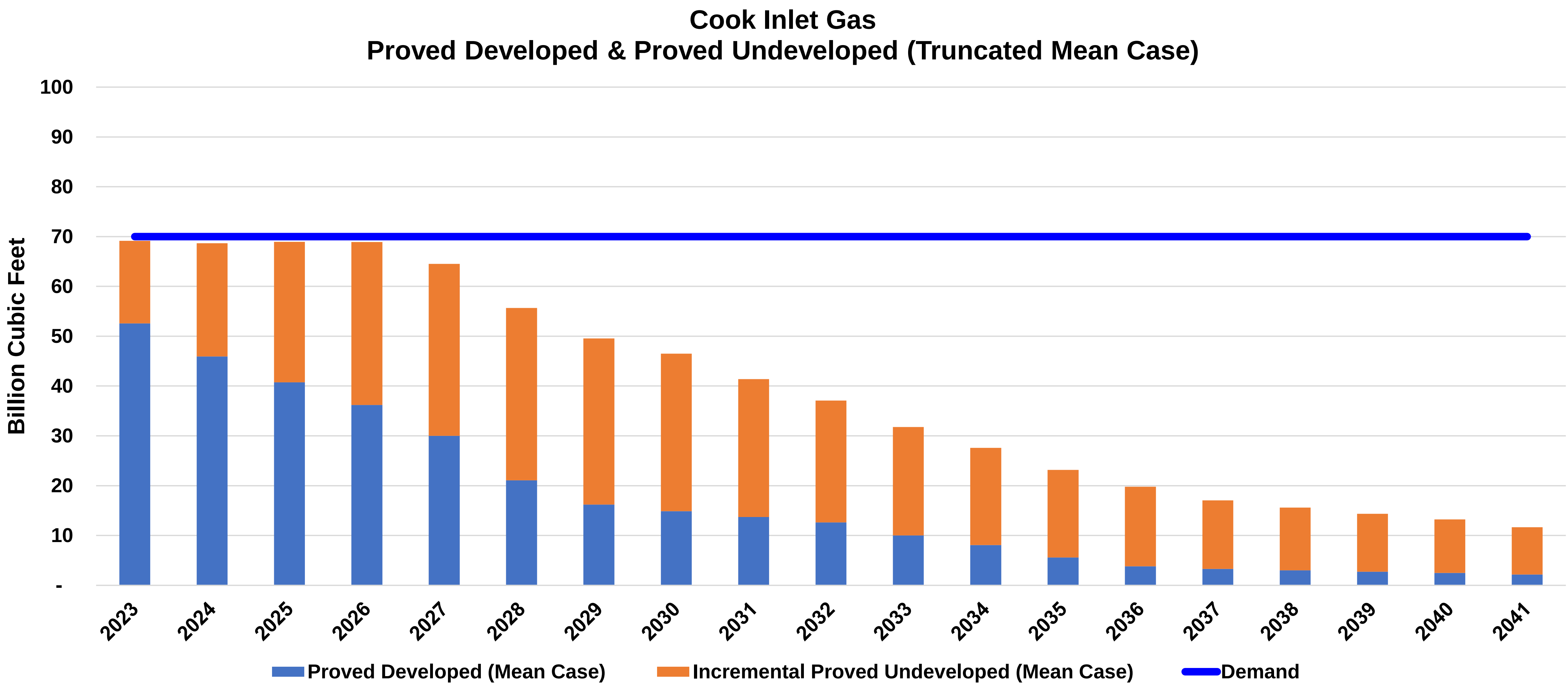
- Utilized public production data to assess Units producing gas in the Cook Inlet
- Generally accepted petroleum engineering practices used to develop projections
- Standardized set of economic limits were used for each Unit

Key Assumptions:

- Assumes 15 development wells per year until 2030, and no new wells beyond that
- Assumes gas price is flat at 70 BCF, with escalation for inflation. Does not forecast market changes responding to supply/demand
- Does not include contribution from non-producing known prospects and does not forecast likelihood of their development
- Forecasted volumes do not account for gas produced from gas storage

Download of Cook Inlet gas studies from the Division of Oil & Gas website.

Forecast Proved Developed & Proved Undeveloped



Role of DNR

- The Department of Natural Resources (DNR) manages the State's land and mineral resources and facilitates responsible development of Alaska’s resources
- Division of Oil and Gas (DOG) oversees the development of the State's oil and gas leases from the exploration phase to abandonment and lease relinquishment
- DOG has several mechanisms to facilitate the relationship between the State and oil and gas explorers and producers:
  - Lease agreements
  - Unit agreements
  - Plans of operation
  - Plans of exploration and development (POE or POD)

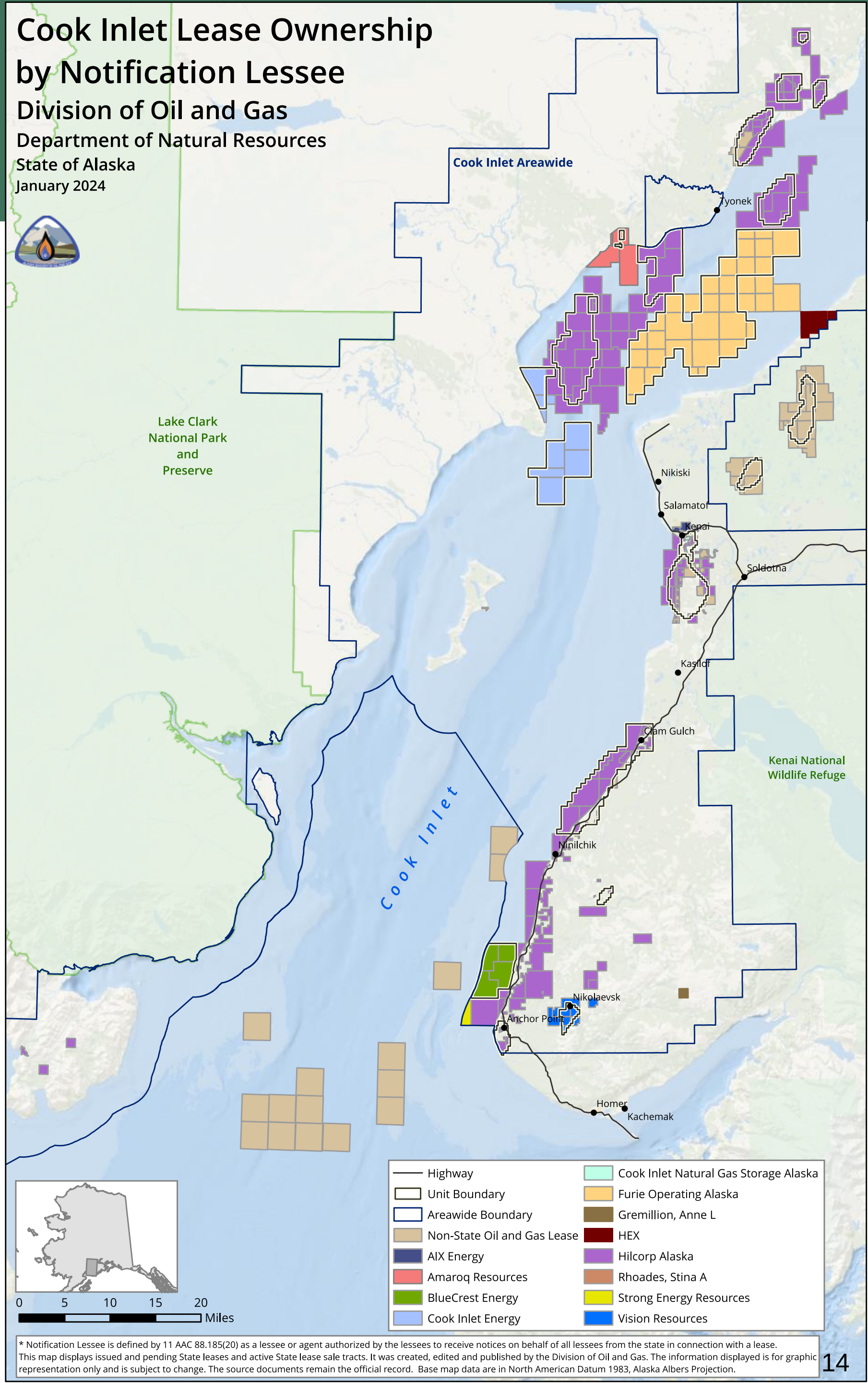
Cook Inlet Leases

What is a State of Alaska Oil and Gas Lease?

- A lease is a tract of land designated for oil and gas exploration
- Leases are offered at lease sales or through exploration licenses
- Primary lease terms are between five and ten years
- Commercial production "holds" the lease

What is an Oil and Gas Unit?

- Leases are combined to form a ***unit*** for the protection of all parties
- Facilitates joint development, conserve natural resources, and avoid waste
- Unit agreement is developed between the lessees and the State
    - Requires the development of a plan of development/exploration (POD/POE) along with other reporting requirements
    - Requires the operator to act as a prudent operator while developing the unit.



Cook Inlet Recent Lease Sale Results

New, competitive lease terms offered:

- Net profit share as the bid variable
- Fixed per-acre cash bonus
- No royalty—percentage of net profits owed to the State after recovering capital investments and operating costs to bring production online

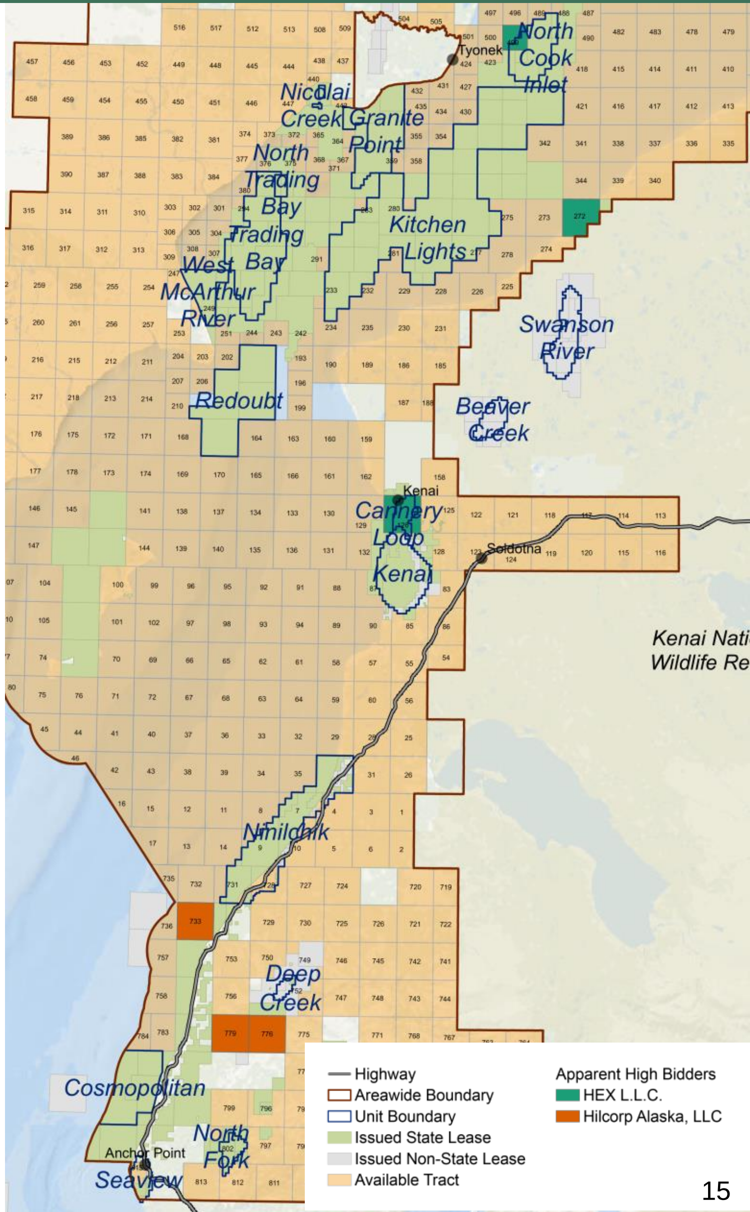
Six tracts received bids

- Three from Hilcorp Alaska LLC
- Three from Hex LLC

Net profit share rate bids: 5.7% – 11%

Cash bonus revenue: About $600,000

Acres receiving bids: About 15,000 acres



Oil & Gas Royalty Statutes

New leases	Existing leases		
No production		Mature production	
AS 38.05.180(f)(3) *Prescriptions on commercial terms for DNR's oil and gas leases*	AS 38.05.180(f)(4)–(5) *Five percent royalty rate on initial production under limited circumstances*	AS 38.05.180(f)(6) *Reduced royalty rates on oil for some offshore fields under limited conditions*	AS 38.05.180(j) *Royalty modification by DNR Commissioner*

• Minimum royalty rate at 12.5%
• Options for sliding-scale royalty rates or net profit sharing
	• 180(f)(4) Cook Inlet Discovery Royalty
	  ◦ 1996 SB 112
	  ◦ Only used once
	• 180(f)(5) New production granted 5% royalty for 10 years
	  ◦ 1998 HB 380
	  ◦ Applied to only six known fields at the time of legislation
	  ◦ Four fields qualified
		• 2003 SB 185
		• Effective, more successful at prolonging production than predicted
		• Only applies to offshore oil fields
		• Doesn't apply to all offshore oil fields
			• Expanded in 1995 by HB 207
			• May modify royalty for unproduced pools (5%), mature pools (3%), or shut-in pools that are uneconomic (3%)
			• High bar and lengthy process

Conclusions and Wrap up

- Cook Inlet gas provides heat and electricity to 70% of Alaskans
- Cook Inlet oil and gas production from its existing leases has been on decline for several decades
- Cook Inlet still has significant resources yet to be developed
- Future gas supplies from the basin are expected to fall short of demand within five years
- Existing gas contracts are not expecting to meet demand in the near future

QUESTIONS?

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