

# Alaska Department of Natural Resources Update

*The Alaska Support Industry Alliance*

Presented by Corri Feige  
Commissioner, Department of Natural Resources

January 10, 2019



# STATE OF ALASKA

## - LAND BASE & OWNERSHIP -

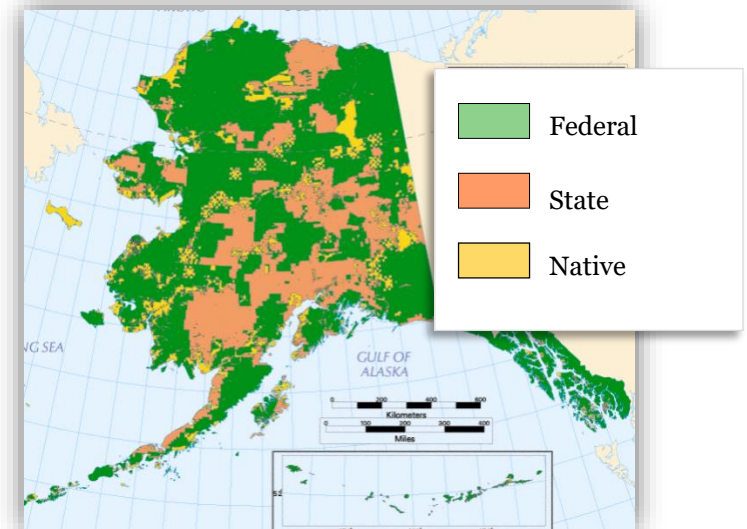


### Land Base

- 586,412 sq. miles—more than twice the size of Texas
- Larger than all but 18 sovereign nations
- More coastline than all other 49 states combined
- More than 3 million lakes; half of world's glaciers

### Land Ownership

- *Federal Land: (~60.3%)* more than 200 million acres
- *State Land: (~27.4%)* Approx. 100 million acres of uplands
- *Native Corporation Land: (~12%)* 44 million acres
- *Private: (<1%)* Approx. 1 million acres



# STATE OF ALASKA

## - OIL & GAS RESOURCE POTENTIAL-

### North Slope

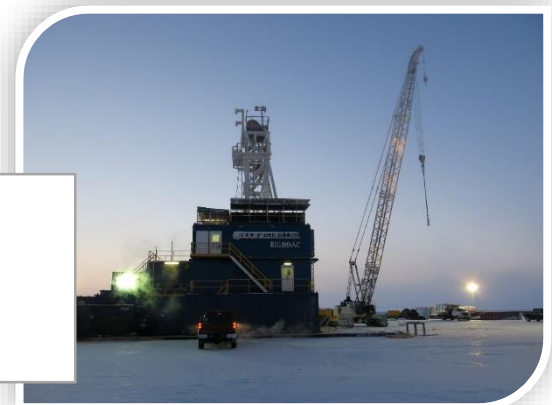
- More undiscovered, potentially recoverable oil than any other Arctic nation
  - **OIL:** Est. 40 billion barrels of conventional oil
  - **GAS:** Est. over 200 trillion cubic feet of conventional natural gas
- Untapped unconventional resource potential, including tens of billions of barrels of heavy oil, shale oil, and viscous oil, and hundreds of trillions of cubic feet of shale gas, tight gas, and gas hydrates

*Compared to most basins, Alaska is relatively underexplored, with 500 exploration wells on the North Slope, compared to Wyoming's 19,000.*

### Cook Inlet

- Significant undiscovered resources remain
  - 19 trillion cubic feet of natural gas
  - 600 million barrels of oil
  - 46 million barrels of natural gas liquids

*Sources: USGS & BOEM*





# STATE OF ALASKA

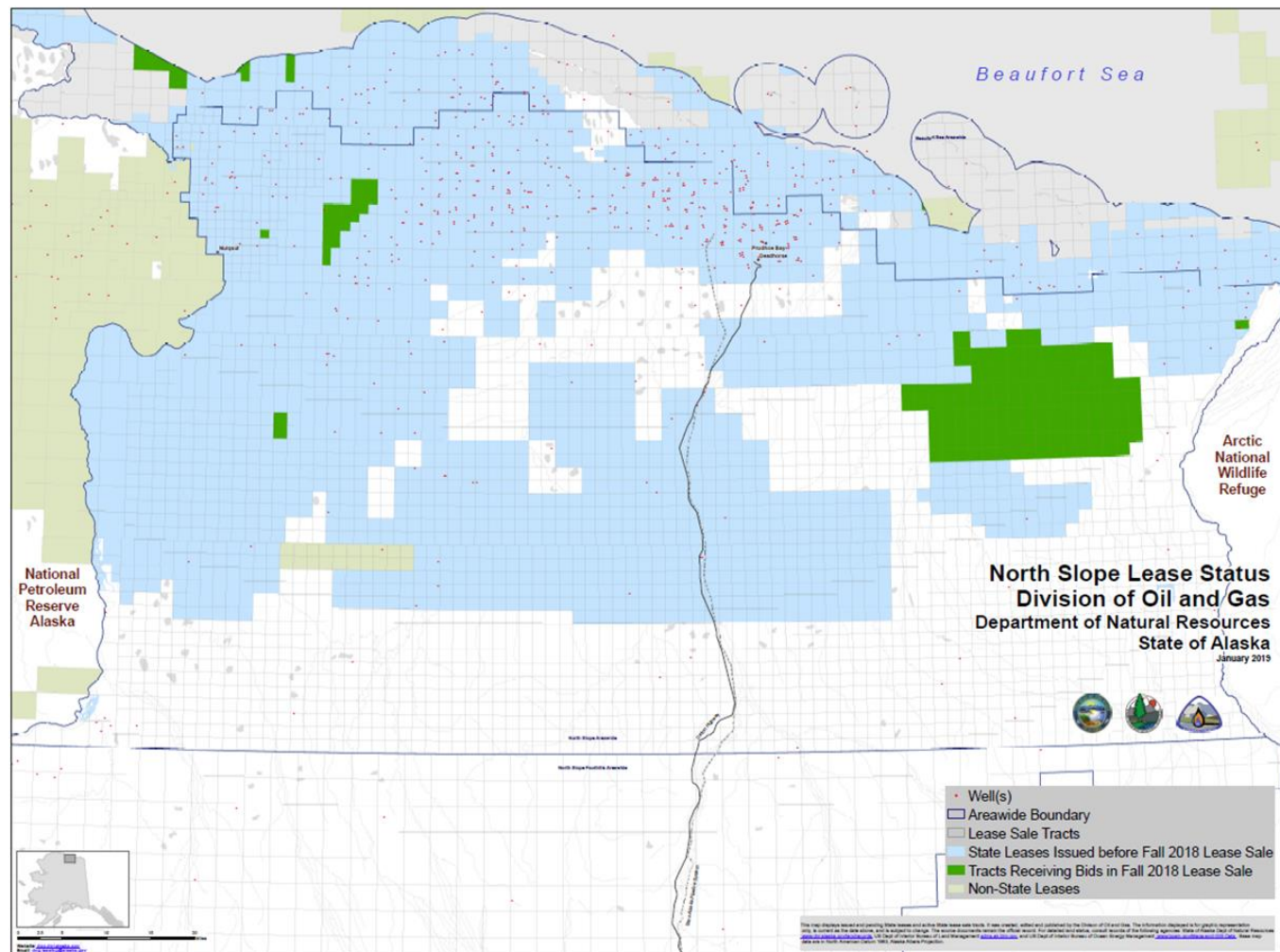
## - OIL & GAS OUTLOOK -

2018 Fall Lease Sale brought the 3<sup>rd</sup> highest amount of winning bids since 1998

Total Bonus Bid:  
**\$29,234,028.10**

Highest Bid Per  
Acre: **\$586.00**

Total Leased Acres:  
**243,950**



# STATE OF ALASKA

## - OIL & GAS OUTLOOK -

### North Slope Oil and Gas Activity

State of Alaska, Department of Natural Resources, Division of Oil and Gas, as of October 2018

Beaufort Sea



**Caelus**  
Deferring work at Smith Bay this winter.

**Smith Bay**  
CT-1 & CT-2

**Division of Oil and Gas**  
Additional tax credit datasets have recently been publicly released to Alaska Geologic Materials Center (Umiat 2D/3D, Puviat South 3D, Ikkipuk River 2D, and North Shore 3D). Datasets from two more surveys and 32 wells to be released in November.

**Oil Search**  
Planning to drill Pikka B and C appraisal wells at Pikka Unit this Winter from ice roads and ice pads. Pikka Nanushuk development is currently in pre-Front-End Engineering Design stage. Final Investment Decision expected in mid-2020. Targeting first oil in 2023.

**Caelus**  
Received approval to expand Nuiqsut, Kuparuk, and Torok PAs at Ooguruk Unit.

**Eni**  
May resume development drilling at Nikaichuq Unit this fall. Planning to drill up to three new wells and add laterals to as many as 8 existing single lateral wells at Spy Island.

**Hilcorp**  
Plan to drill 50-70 wells from Moose pad at Milne Point field. Drilling to start late 2018 and first production expected in November. Peak production anticipated to be 16,000 BOPD in 2020 with 30-50 million barrels ultimately recovered.

**BOEM**  
Issued final EIS for Hilcorp's Liberty project to develop field from gravel island five miles offshore and utilize buried subsea pipe-in-pipe pipeline.

**Glacier Oil and Gas**  
Starfish exploration well B1-07 on production since May; September flow rate averaged 1,148 BOPD.

**ConocoPhillips**  
Planning pad expansions at CRU in 2019 to add 10 more well slots at CD5 and more slots at CD2 to accommodate 32 wells at Fiord West. May drill late 2018 CD4-95 exploratory well into Narwhal Nanushuk trend just west of Putu 2 from existing CD4 pad in southern CRU.

**ConocoPhillips**  
Achieved first oil from GMT1 in October; expect peak production of 25,000-30,000 BOPD from Jurassic Alpine C Lookout reservoir.

Planning to drill 4-6 exploration wells in Bear Tooth Unit Willow trend during early 2019.

**BLM**  
Published final Supplemental EIS for GMT2 Rendezvous field development. Preferred alternative is ConocoPhillips' plan to build 14-acre drill pad capable of up to 48 wells as a satellite of CRU Alpine Processing Facility.

**National Petroleum Reserve - Alaska**

#### Exploratory Wells Spud

- 2018
- 2017
- 2016
- Oil & Gas Unit Boundary

0 5 10 15 20 Miles



The accuracy of this map is subject to pending decisions currently on appeal and other administrative actions. Please visit [www.dnr.alaska.gov/information/MapsandGIS](http://www.dnr.alaska.gov/information/MapsandGIS) to see our most current maps.

**Elixir Petroleum**  
Announced purchase of 35,423 acres in NPRA north of Umiat from Paul Craig.

**Great Bear Petroleum**  
Filed lease plan of operations for Winx 1 exploration well to be drilled east of Horseshoe wells by 88 Energy affiliate Captivate Energy. Partners also include Otto Energy and Red Emperor Ltd.

**Brooks Range**  
Proposing to produce Mustang field using early production facility.

**ConocoPhillips**  
Planning expansion of Eastern NEWS with second phase of development. Expected to come online in 2023.

Planning to drill three new wells at KRU Drill Site 2M.

Planning to drill Cairn prospect (Seabee Fm) east of Tarn field from DS 2S in late 2018.

**88 Energy**  
Ended production testing of HRZ shale at Icewine 2 and suspended well with plans to farm out interest.

**BP Exploration**  
2018 POD called for 7 wells in Prudhoe's Flow Station 2 region. Planning to conduct field-wide 3D seismic survey. Three additional wells possible at Lisburne PA. Planning for major gas sale in accordance with AGDC progress on AKLNG project.

**Eni**  
Acquired Caelus' 350,000 acre onshore exploration fairway between Prudhoe Bay and Point Thomson.

**BLM**  
Received application from SAEExploration, ASRC, and Kaktovik Inupiat Corp to conduct 3D seismic survey in 1002 area of Arctic National Wildlife Refuge. Proposed Marsh Creek 3D survey would take two winter seasons to complete.

**Division of Oil and Gas**  
Bid opening for fall lease sales for Beaufort Sea, North Slope, and North Slope Foothills Area-wide sales and three sales of blocks of leases: Gwydyr Bay, Harrison Bay, and Storms scheduled for November 15 at 9 AM. Combining unleased acreage backed by publicly available information to offer three blocks of leases in fall oil and gas lease sales.

**Alaska LNG**  
Project at de-risk regulatory stage. FERC expects EIS to be finalized in late 2019, allowing for Final Investment Decision in 2020 with project execution completion and first gas in 2024-2025.

# STATE OF ALASKA

## - OIL & GAS OUTLOOK -

### Cook Inlet Oil and Gas Activity

State of Alaska, Department of Natural Resources, Division of Oil and Gas, as of October 2018

#### Division of Oil and Gas

Issued call for substantial new information for Spring 2019 Alaska Peninsula Area-wide oil and gas lease sale. Deadline for receiving information is October 26, 2018. Issued preliminary best interest finding for proposed Cook Inlet Area-wide oil and gas lease sales, 2019-2028.

#### Visit

<http://list.state.ak.us/mailman/listinfo/DOG.Licensing> to subscribe to leasing announcements.

#### Division of Oil and Gas

Soliciting Statewide Nominations of Lands with geothermal resources for potential future disposal.

#### Amaroq Resources

(Previously Aurora Exploration)  
Nicolai Creek Unit 2018 plan included three well cleanouts and drilling NCU 12 well targeting Beluga and Upper Tyonek gas sands. Anticipated negotiating purchase of Apache's 3D seismic shot in 2012 to evaluate future exploration targets.

#### Doyon-CIRI

Totahaket 1 drilled this summer; encountered several gas shows but did not find commercial quantities of oil or gas.

#### Division of Oil and Gas

Approved exploration license application in Houston-Willow area to Samuel Cade and Daniel Donkel.

#### Furie

Completed KLU A-1 development well in Corsair block, with initial gas production from lower and middle Sterling zones. Drilled the KLU A-4 development well into Tyonek to evaluate identified 3D amplitude targets. Added perforations to KLU 3 at the Beluga interval. Contracted new technical team to evaluate previously acquired 3D seismic data and propose exploratory drilling targets over next several years. May drill one new development well in 2019 to stratigraphic equivalent of Sterling flow tested zones and add perforations to KLU A-2A and 3.

#### Hilcorp

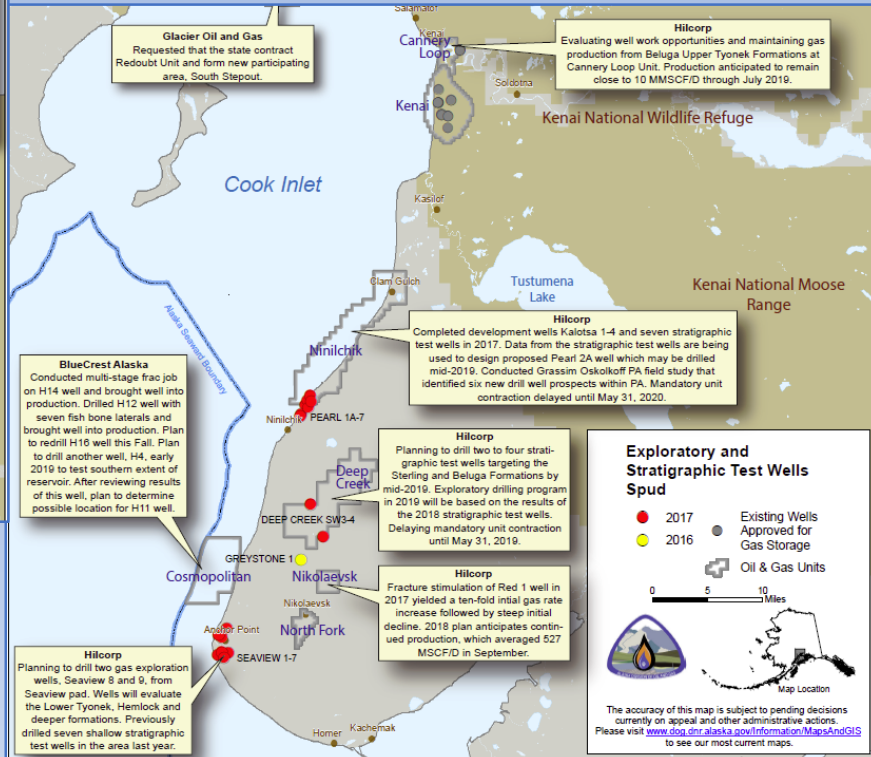
Planning to sidetrack a well from the Monopod platform in the Trading Bay Unit into the North Trading Bay field in an attempt to restore unit production. Sidetrack will target Tyonek G and Hemlock reservoirs.

#### Glacier Oil and Gas

Requested that the state contract Redoubt Unit and form new participating area, South Stepout.

#### Hilcorp

Evaluating well work opportunities and maintaining gas production from Beluga Upper Tyonek Formations at Cannery Loop Unit. Production anticipated to remain close to 10 MMSCF/D through July 2019.





# STATE OF ALASKA

## - OIL & GAS OUTLOOK -

- 2019 is expected to be the busiest year in the last 10 years for exploration and production rig activity.
- Pikka, Mustang, and Placer finds demonstrate great potential.
- New data suggests enormous potential in Nanushuk and Torok formations.
- Legacy fields including Prudhoe and Kuparuk have exceeded internal expectations through infield work.
- Smaller companies, like Caelus, Great Bear & Armstrong, are engaging in exploration plans that will help maximize TAPS throughput into the future.
- New players, like Oil Search, indicate industry acknowledgment of large, viable fields that were unknown.
- Continuous work with North Slope communities, presidential administration, and Congressional delegation on Arctic energy policy and decision making that support responsible development (ANWR Coastal Plain, OCS, NPR-A)

# STATE OF ALASKA

## - ROYALTY RATE -

### Offshore

Royalty Rate: 16.67%  
SOA Royalty: 0 - 3 Miles 100%,  
3 - 6 Miles 27%,  
Greater than 6 Miles 0%

### NPR-A

Royalty Rate: 12.5% or 16.67%  
SOA Royalty: 0% (Mitigation Fund)

### State Lands

Royalty Rate: 12.5% or 16.67%  
SOA Royalty: 83% - 100%

### ANWR Coastal Plain

Royalty Rate: 16.67%  
SOA Royalty: 50%

Umiat

Nikaitchuk North

Nikaitchuk

Pikea Ooguruk

Milne Point

Northstar

Beechey Point

Prudhoe Bay

Deadhorse

Liberty

Badami

Point Thomson

Kaktovik

Bear Tooth

Greater Mooses Tooth

Nuiqsut

Placer

Kuparuk River

Southern Milne

Gulbar

Prudhoe Bay

Deadhorse

Liberty

Badami

Point Thomson

Kaktovik



# STATE OF ALASKA

## - STATUS OF MINERAL INDUSTRY -

**12%**

**Value of Alaska's  
Mineral Industry  
(\$3.15 Billion)**

**105%**

**Exploration  
Expenditures  
(\$120.8 million)**

**38%**

**Development  
Expenditures  
(\$299.5 Million)**

**7%**

**Estimated  
Revenue to Industry**

**16%**

**State Mining Claims**

**230%**

**New  
Claims**

**5%**

**Full-Time  
Employment**



# STATE OF ALASKA

## - 2017 MINERAL PRODUCTION -

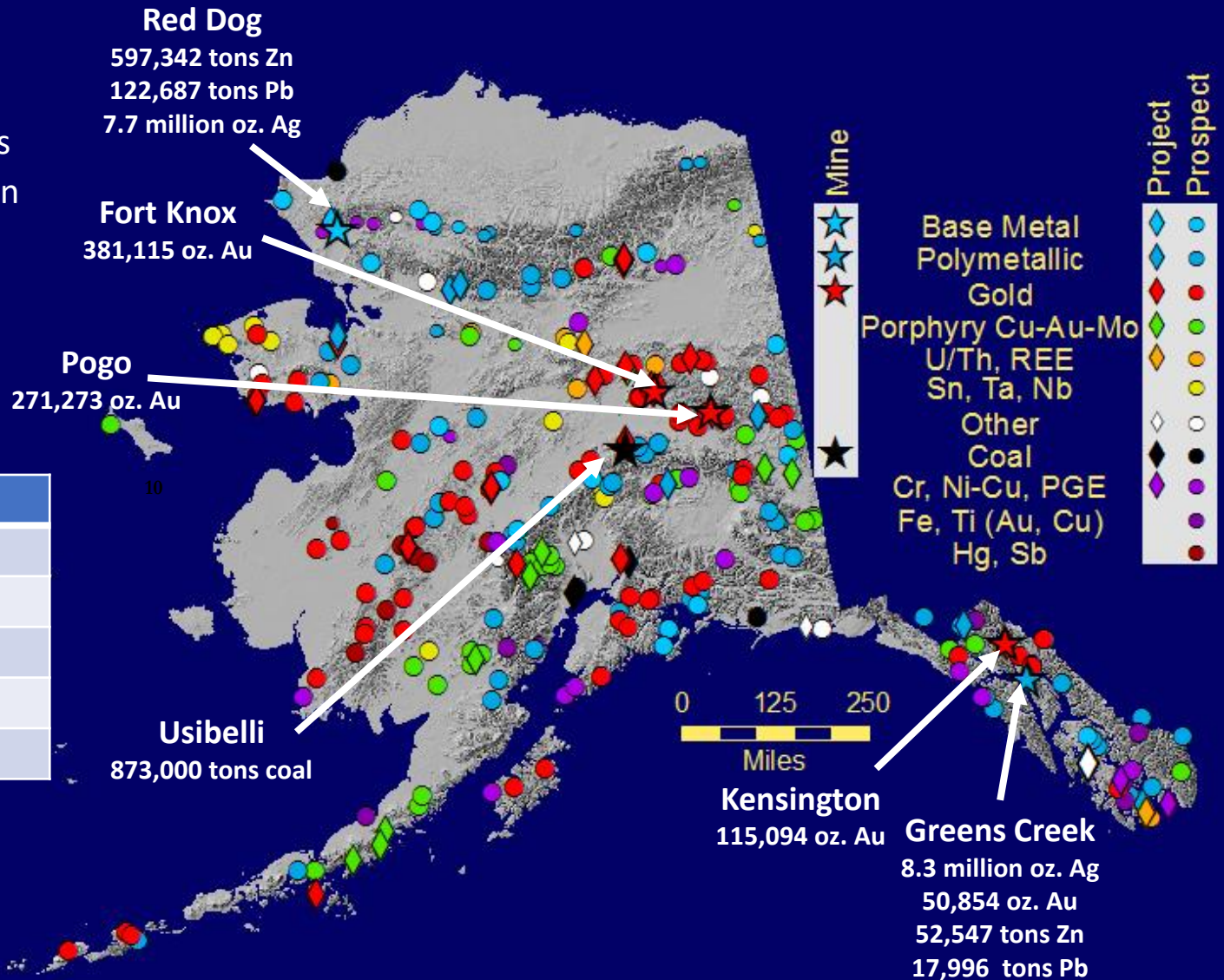
**5 major lode mines**

**1 coal mine**

~ 230 placer Au mines

~ 52 active exploration projects

	2017 Production
<b>Zinc</b>	649,889 tons
<b>Lead</b>	140,683 tons
<b>Gold</b>	>818,336 ounces
<b>Silver</b>	16 million ounces
<b>Coal</b>	873,000 tons



# STATE OF ALASKA

## - AKTIGIRUQ ZN-PB-AG [TECK]-

Sediment-hosted massive sulfide deposit

Anarraaq resource:

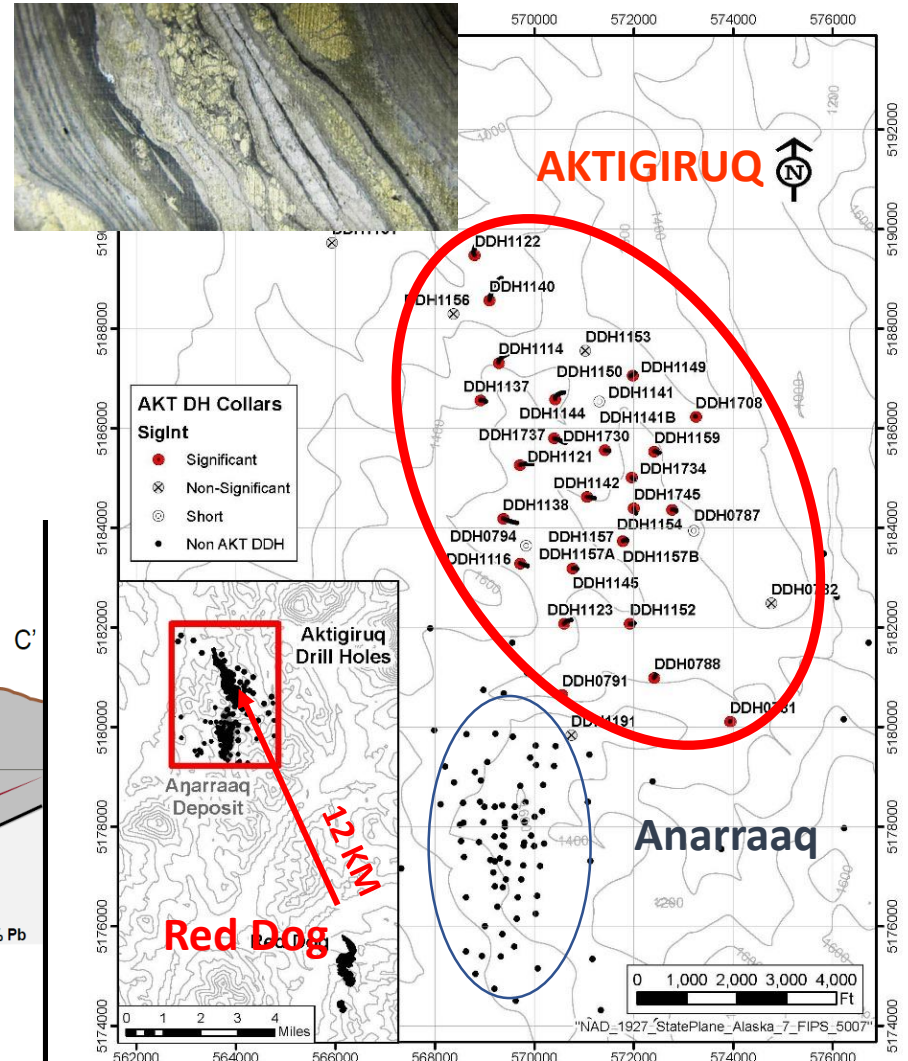
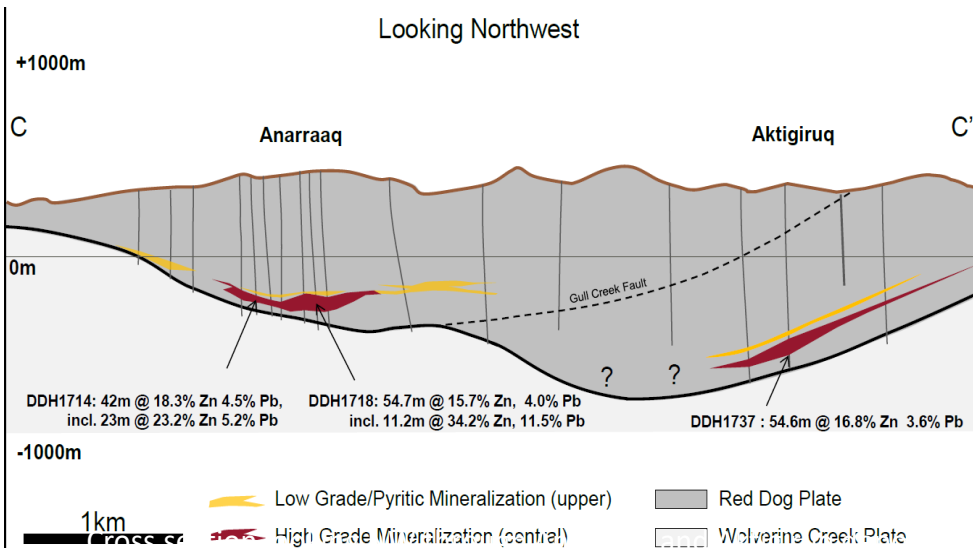
-Inferred: 26 M tonnes @ 13.8% Zn, 4.3% Pb, 84.3 g/T Ag

2018 Aktigiruaq program:

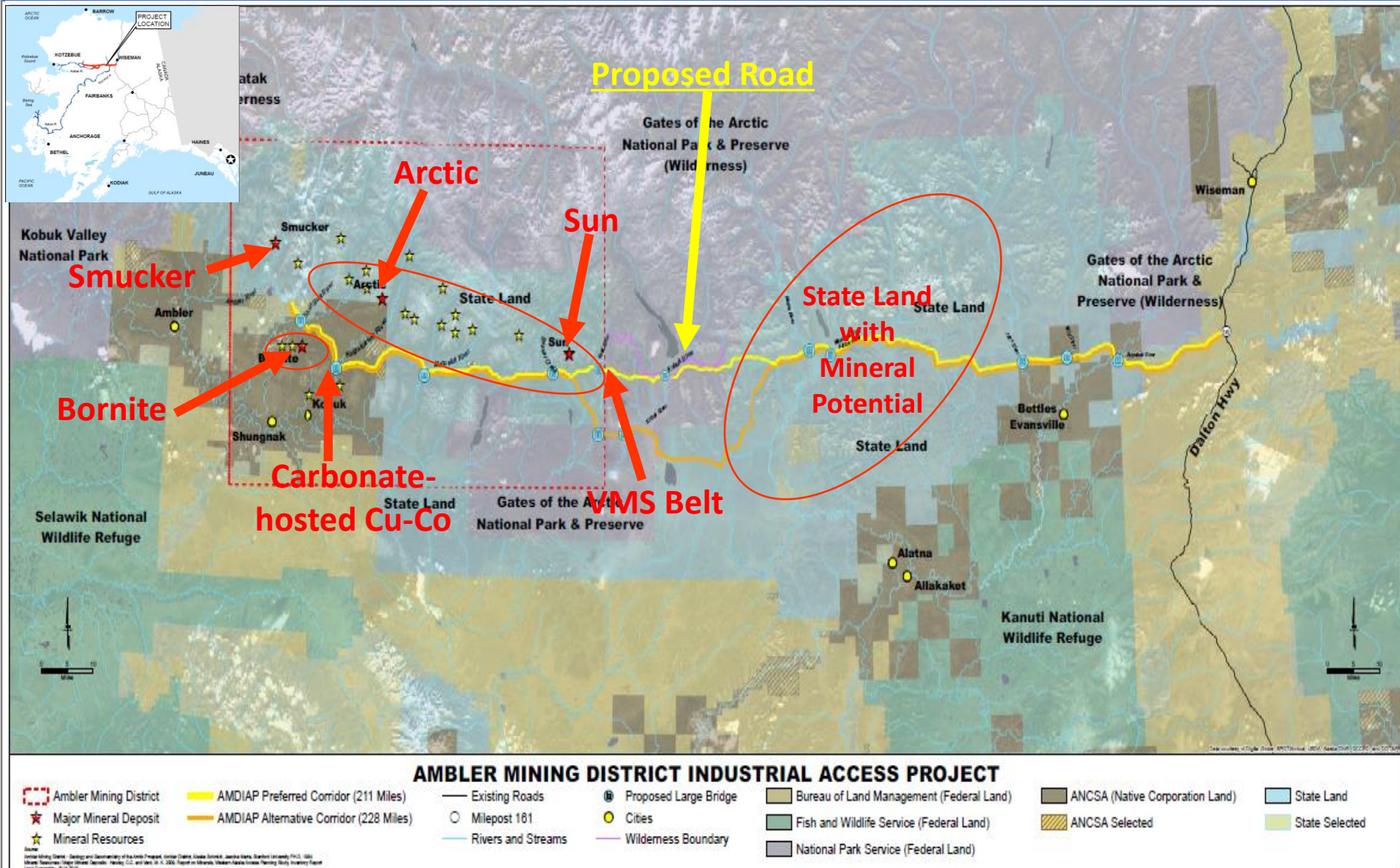
-Drilling program

-Ore body is 400 to 1,000 m below surface

-2016 drilling encountered 54.6 m @ 16.8% Zn, 3.63% Pb (DDH1737)







# STATE OF ALASKA

## - ARCTIC VMS (TRILOGY METALS / SOUTH32 LIMITED)-

### New PFS:

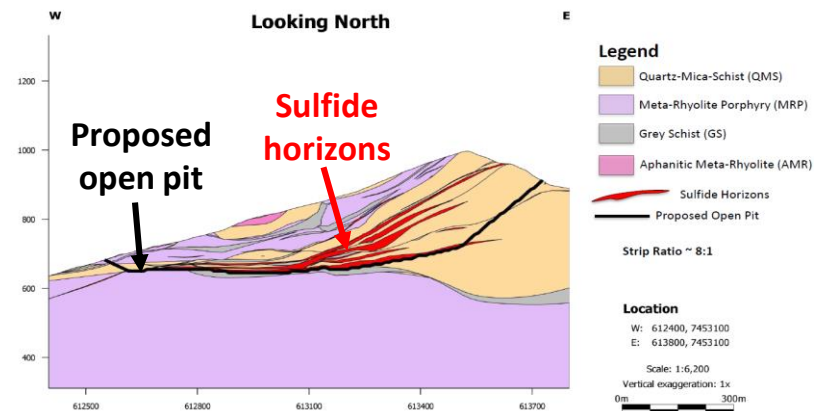
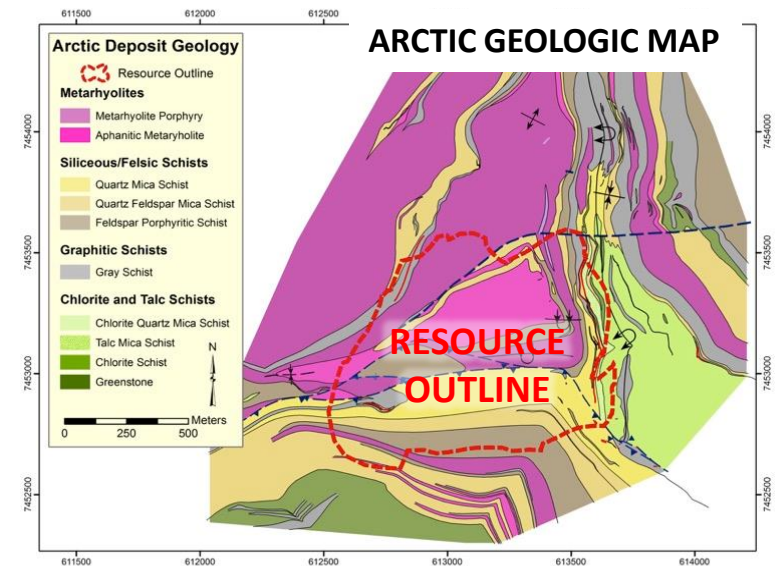
- Ave. annual payable production: >159 M lbs. Cu, 199 M lbs. Zn, 33 M lbs. Pb, 30,600 oz. Au, & 3.3 M oz. Ag
- 12-year mine life
- Estimated pre-tax & after-tax payback of 2 years
- Converted indicated mineral resources to probable reserves
- Pre-tax 38.0% IRR; \$1,935 million NPV at 8%

### Resource: (based on 152 DDH)

Oct 2017	Million Tonnes	Cu %	Zn %	Pb %	Au g/T	Ag g/T
Indicated	36	3.07	4.23	0.73	0.63	47.6
Inferred	3.5	1.71	2.72	0.6	0.36	28.7
<b>Total</b>	<b>39.5</b>	<b>2.95</b>	<b>4.09</b>	<b>0.73</b>	<b>0.61</b>	<b>45.9</b>

### 2018 program (US\$6.7 million):

- Completed ore-sorting program
- Geotechnical & hydrological studies
- Preparing for feasibility study & starting permitting in 2019
- Working with AIEDA to advance the Ambler Mining District Industrial Access Road Project; BLM working on EIS.





# STATE OF ALASKA

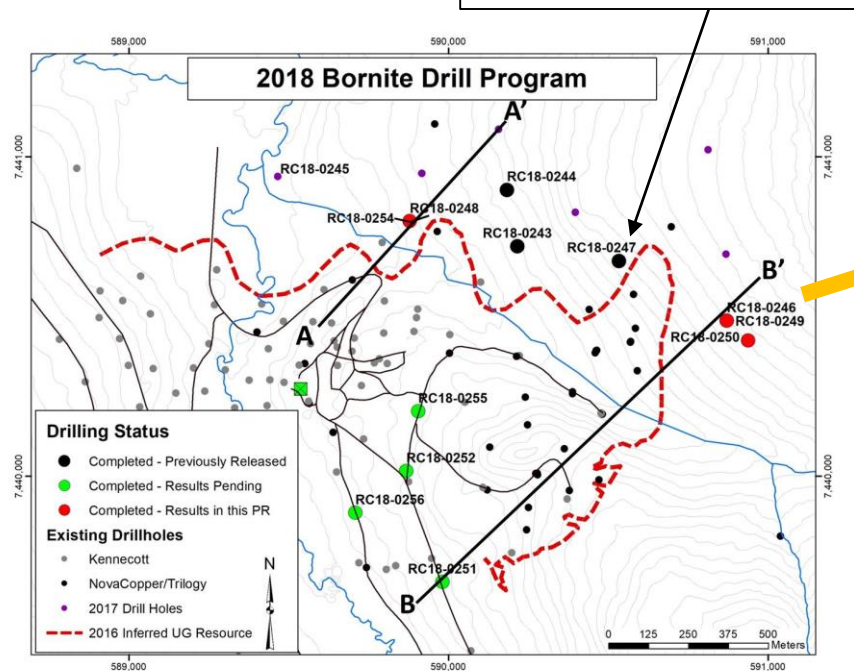
## - BORNITE CARBONATE-HOSTED CU-CO (TRILOGY METALS / SOUTH32 LIMITED)-

### 2018 program (US\$10.8 M):

- 12 holes; total 10,123 m of infill & off-set drilling
- Seismic survey
- Metallurgical testing: produce Cu concentrates of 24% - 33% Cu; & no deleterious metals

### 2019 program: Anticipated ~US\$9.2 million budget

20.1m @ 4.55 % Cu, 0.17% Co

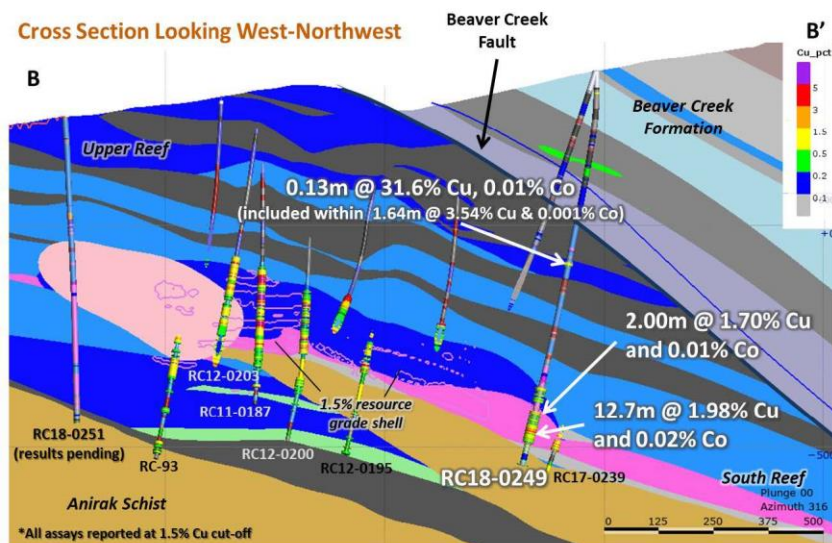


\*RC18-0248 and RC18-0254 drilled from the same drill collar; RC18-0246 and RC18-0249 drilled from the same drill collar

	Million Tonnes	Cu %	Co %
Indicated	40.5	1.02	0.017
Inferred	141.9	1.74	0.025
<b>Total</b>	<b>182.4</b>	<b>1.24</b>	<b>0.019</b>

Contained metal: 77 M lbs. Co & 5.45 B lbs. Cu

### Cross Section Looking West-Northwest





# STATE OF ALASKA

## - DGGs MAPPING TANACROSS QUADRANGLE PORPHYRY DISTRICT-

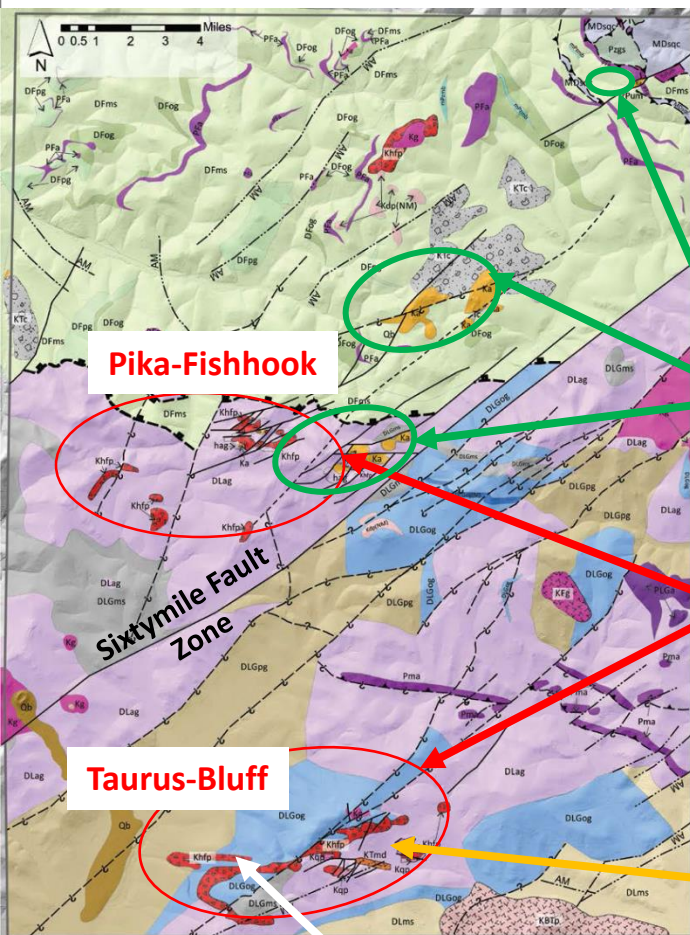
### Taurus Porphyry Cu-Mo-Au Deposit

Unofficial resource: 75.2 M tons @ 0.275% Cu, 0.032 Mo, 0.166 g/T Au

#### Notable intercepts (2008) East Taurus:

-772 feet of 0.309% Cu, 0.036% Mo, 0.245 g/T Au

-179 feet of 0.258% Cu, 0.026% Mo, 0.149 g/T Au



**Andesite  
(66 Ma?)**

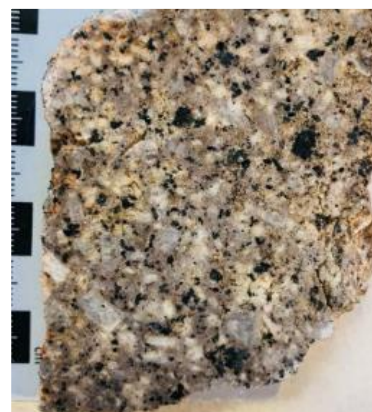


Potassic Alteration  
with Cu-Mo-Au



Quartz-sericite-pyrite

**Hbl porphyry  
(66.3 Ma)**



**Taurus  
Qtz-Feldspar  
Porphyry  
(70-72 Ma)**



**Qtz Monzonite  
Hbl-Feldspar Porphyry  
(68-70 Ma)**

# STATE OF ALASKA

## - GRAPHITE CREEK (GRAPHITE ONE RESOURCES) -

USA's largest, large-flake graphite deposit

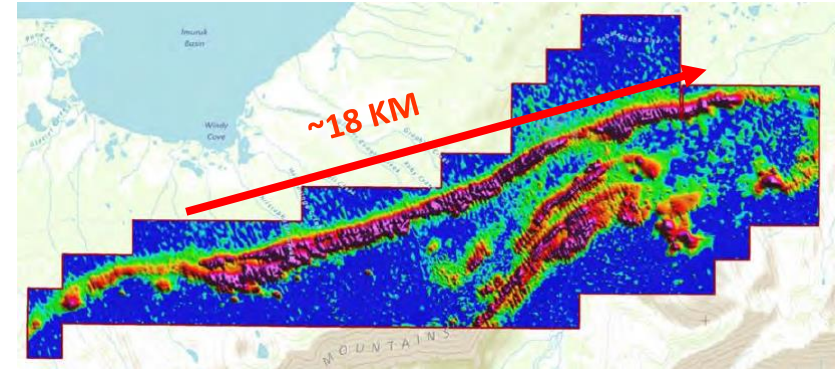
### 2018 Program:

- 6 holes, 800 m of in-fill drilling
- Additional metallurgical testing
- Alternative access routes
- Initiate environmental surveys
- Collect data for future PFS



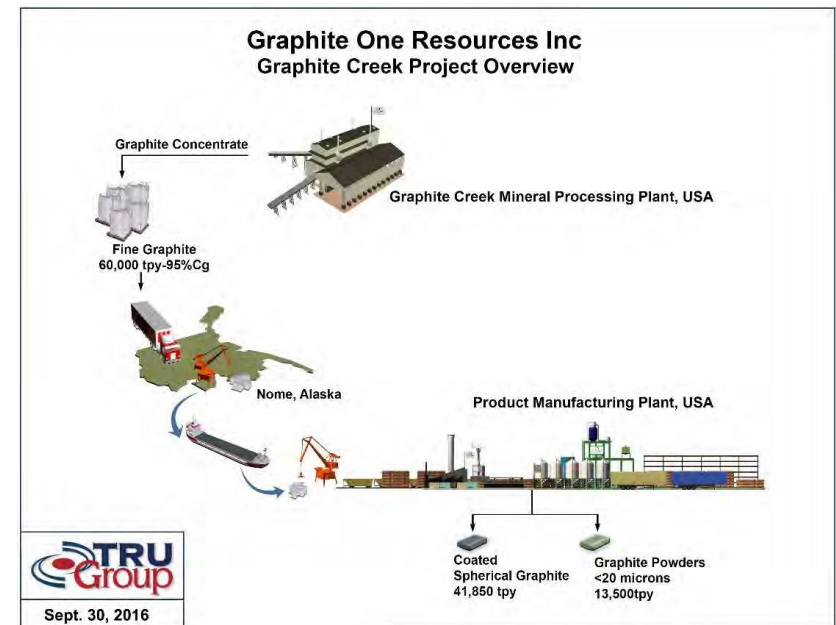
### 2017 PEA:

- Open-pit: 1.11 M tonnes graphite-bearing material/year
- 40-year mine life
- 41,850 tonnes of high-grade coated spherical graphite/year for lithium-ion battery applications
- 13,500 tonnes of refined, sub-20-micron graphite powder/year for various end-uses.



Time-Domain Electromagnetic Survey  
(red=conductive graphitic units)

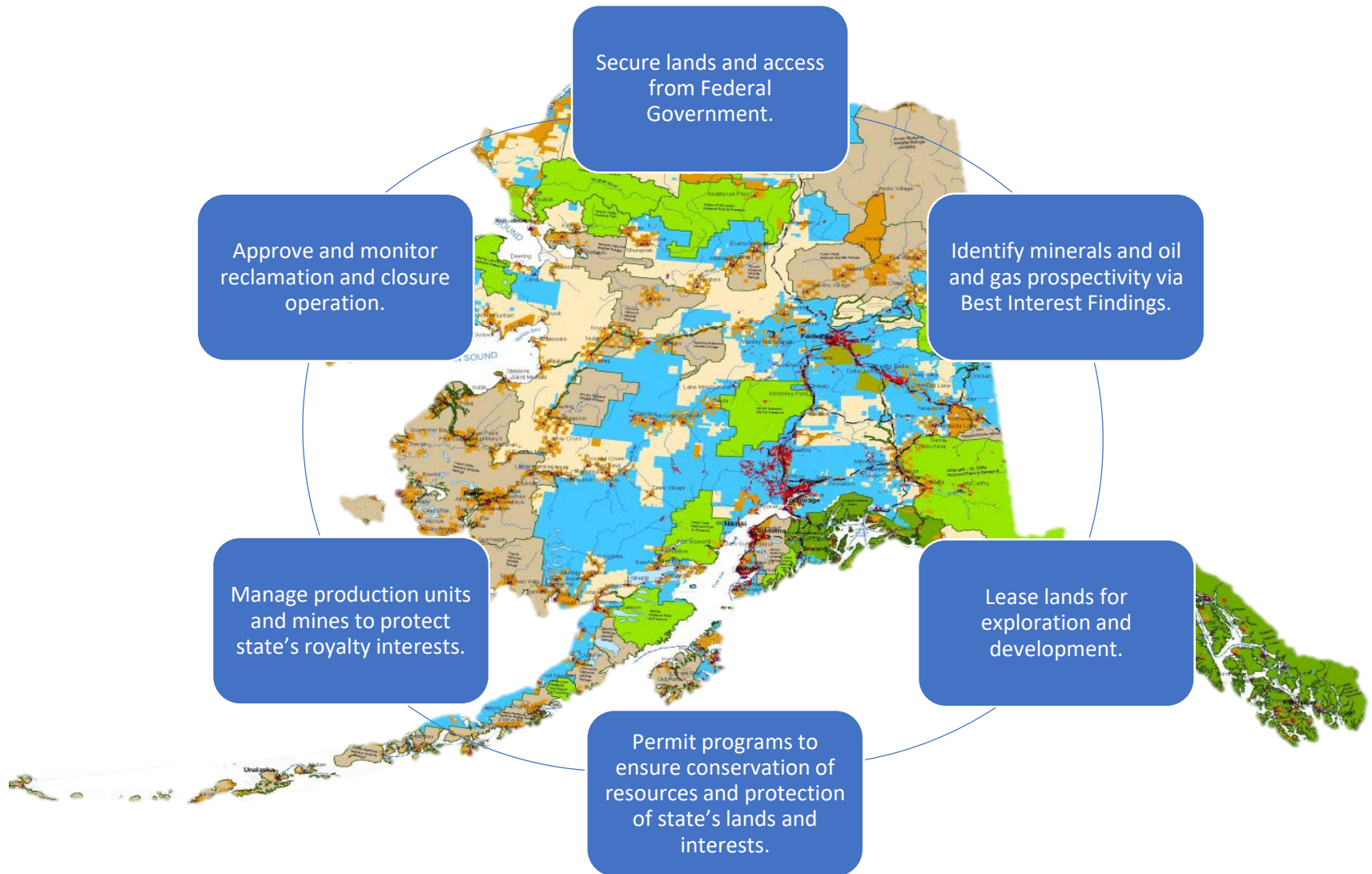
6% cutoff	Million Tonnes	Cg %
Indicated	10.3	7.2
Inferred	71.2	7.0
<b>Total</b>	<b>81.5</b>	<b>7.0</b>





# STATE OF ALASKA

## - DEPARTMENT OF NATURAL RESOURCES LAND LIFE CYCLE -





# THANK YOU!

