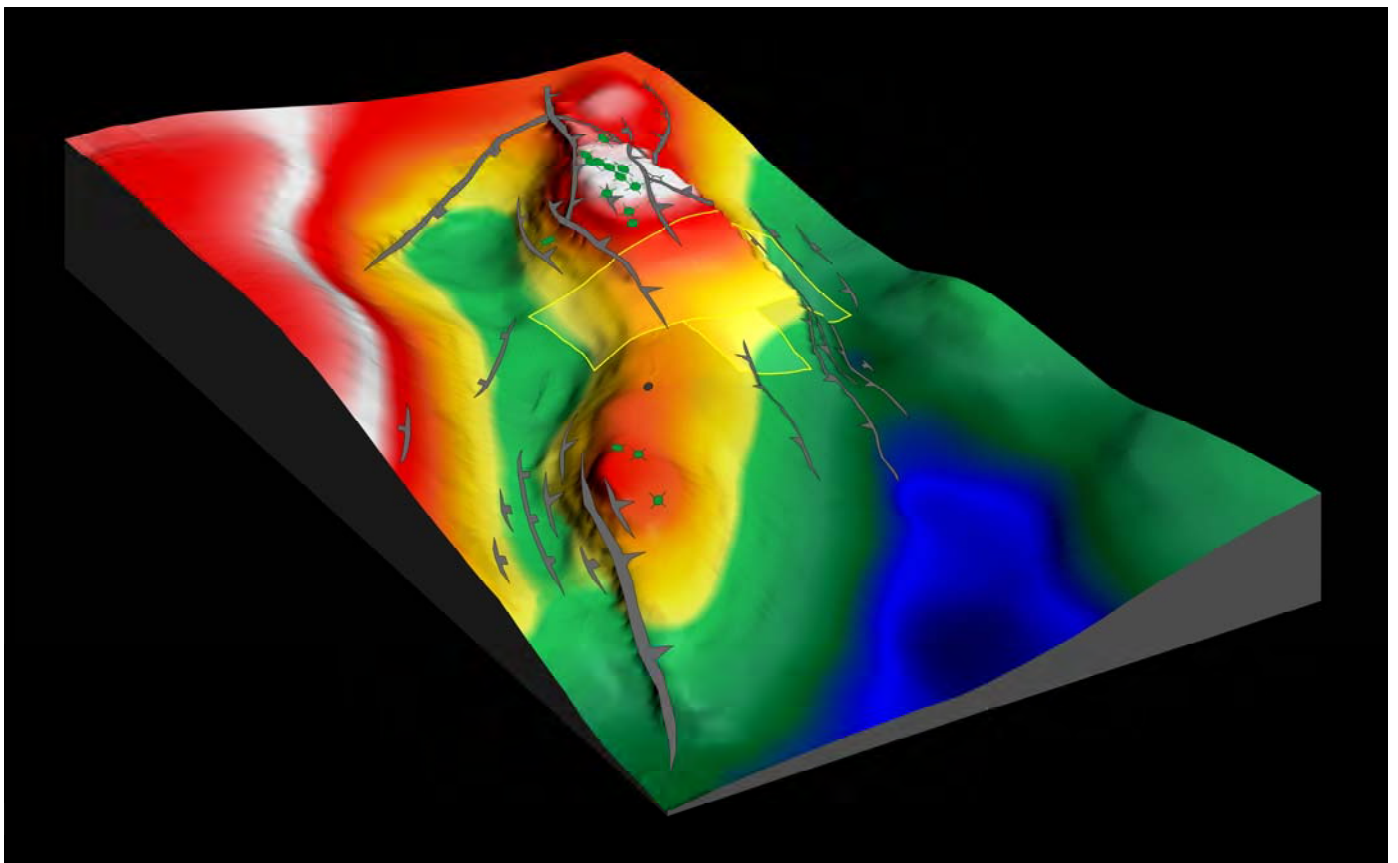


**NORTHERN LIGHTS ROYALTIES IV, LP  
LIMITED PARTNERSHIP INTERESTS**

**KITCHEN LIGHTS LEASE AREA  
COOK INLET, ALASKA**



**EXHIBIT C TO CONFIDENTIAL PRIVATE PLACEMENT MEMORANDUM  
Northern Lights Royalties IV, L.P.**

**Limited Partnership Interests**

**AN OIL AND GAS ROYALTY INTEREST INVESTMENT OPPORTUNITY**

**KITCHEN LIGHTS LEASE AREA  
NORTH COOK INLET STRUCTURE  
COOK INLET, ALASKA**

**OFFERED BY:**

**PRO AK, LLC  
660 W SOUTHLAKE BLVD. SUITE 200  
SOUTHLAKE, TEXAS 76092**

**April 1, 2019**

Each person to whom these documents are delivered agrees, by acceptance of these documents, that all information contained within is confidential in nature. By accepting delivery recipient agrees that they will not divulge, disseminate or otherwise distribute in any fashion the contents of these documents to any third-party, except any professional retained by recipient to evaluate the merits of the proposal, without written permission of the managing partner; and further, agrees to inform any such professional retained by recipient of the confidential nature of these documents. Recipient also agrees to destroy these materials in the event they elect not to participate in the partnership.

## PARTNERSHIP INTEREST FACT SHEET

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ISSUER OR THE OFFERING:	Northern Lights Royalties IV, L.P. A Texas Limited Partnership
GENERAL PARTNER:	Pro AK, LLC A Texas Limited Liability Company
PROJECT:	Kitchen Lights Lease Area Cook Inlet, Alaska
MINIMUM CAPITAL CONTRIBUTION:	\$ 25,000.00
PARTNERSHIP INTEREST PER \$25,000.00 CONTRIBUTION:	approximately 0.3602% of the outstanding partnership interests
ANTICIPATED CAPITALIZATION:	\$5,900,000 (We may increase the offering to \$8,850,000 in our discretion and purchase additional overriding royalty interests in the same leases.)

The Partnership will acquire 0.5% (0.75% if increased) of the Overriding Royalty Interest (ORI)  
in six leases in the North Block of the Kitchen Lights Lease Area.

General Partner (Pro AK, LLC)	Partnership Interests 15%
Limited Partners	<u>85%</u>
TOTAL	100%

	<u>Minimum Contribution</u>	<u>Total Cost</u>
Limited Partners Investment	\$25,000	\$5,900,000.00

## KITCHEN LIGHTS LEASE AREA INTRODUCTION

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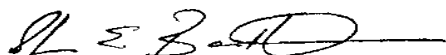
Pro AK, LLC (“Pro AK”) is pleased to announce the formation of the NORTHERN LIGHTS ROYALTIES IV, LP to acquire an overriding royalty interest in the Kitchen Lights Lease Area contained within the Kitchen Lights Unit (KLU) that pertains to the six specified leases within the January 16, 2019 William Cobb & Assoc. **Official Royalty Evaluation (ORE)** classified as contingent resources, as contained on pages 5 to 10 below. And is based on the Cobb & Associates September 22, 2004 “Reserve Evaluation of the Northern Lights Project Located in Cook Inlet of Alaska” probabilistic evaluation of the reserves and resource volumes and values for several of the Prodigy leases (the 2004 Report).

Based on the sensitivity evaluation provided by Cobb & Associates (see page 7 below), the present Contingent Resource Volume Estimates for a 4.45% ORRI are listed below. **The Partnership will acquire up to 0.5% (0.75% if increased) overriding royalty interest.**

### Contingent Resource Volume Estimates for a 4.45% ORRI

Case	Estimated Net Volumes	
	Oil, MMBO	Gas, BCF
C1	4.31	1.82
C1 + C2	7.87	3.33
C1 + C2 + C3	13.4	5.68

The Kitchen Lights Lease Area within the northern block of the Kitchen Lights Unit (KLU) is located in central part of the Upper Cook Inlet Basin, Alaska and is surrounded by giant and super-giant oil and gas fields which, to date, have produced in excess of one billion barrels of oil and several trillion cubic feet of natural gas, primarily from the Miocene Tyonek Deep Sands and the Oligocene Hemlock Sands. The Kitchen Lights Area is comprised of six leases in the Cook Inlet Basin, covering an area of 15,930 acres.



Shawn E. Bartholomae  
CEO

# WILLIAM M. COBB & ASSOCIATES, INC.

Worldwide Petroleum Consultants

January 16, 2019

Pro AK, LLC  
660 W. Southlake Boulevard, Suite 200  
Southlake, Texas 76092

## **Re: Northern Lights Project Royalty Evaluation**

As requested, William M. Cobb & Associates, Inc. (Cobb & Associates) has prepared for Prodigy Oil and Gas, LLC (Prodigy) an evaluation of Prodigy's 4.45 percent overriding royalty interest (ORRI) in several leases contained within the Kitchen Lights Unit (KLU) in the Cook Inlet of Alaska. This evaluation is based on the Cobb & Associates September 22, 2004 "Reserve Evaluation of the Northern Lights Project Located in Cook Inlet of Alaska" probabilistic evaluation of the reserves and resource volumes and values for several of the Prodigy leases (the 2004 Report).

**EVALUATION STIPULATIONS** – The volumes presented in this report result from the evaluation of the contingent resources for the interest of Prodigy in certain oil properties located the Cook Inlet, Alaska, consistent with the 2018 update to the petroleum industry's "Petroleum Resources Management System". The evaluation is based on data supplied by Prodigy and on public statements by Furie Operating Alaska, LLC (Furie). Cobb & Associates has not independently confirmed Prodigy's title to the subject interests. The results presented in this report are based on engineering and geological judgment, and as such, are estimates. There are uncertainties in the analysis of the available data. The estimated recoverable volumes may or may not, in fact, be recovered. Recoverable volumes may increase or decrease as a result of future operations, or as the result of unforeseen geological conditions. Therefore, these results are not warranted or guaranteed as to their accuracy, but represent opinions based on the interpretation of technical data.

**CHANGES FROM 2004 REPORT** – The changes from the 2004 Report include classifying all volumes as "contingent resources" because of the currently-uncertain development plans for the KLU, and the restriction of the evaluation to the "Central Area" leases from the 2004 Report, which includes the leases in the KLU in which Prodigy maintains an ORRI. Future reclassification of some of the contingent resources to the reserves category would occur once Furie provides a technical description of the exploration well results and commits to a development plan for some portion of this acreage. Such a reclassification is not certain, and depends on the results of exploration wells and the commitment of Furie to development of the subject acreage, based on the exploration wells' results.

**CONTINGENT RESOURCE BASIS** – The KLU is made up of four blocks, as shown in Exhibit 1. Furie has committed to the State of Alaska to explore and develop those blocks, consistent with a mutually-agreed Sixth Plan of Development (approved by the State of Alaska's Department of

Natural Resources on December 11, 2018). This Sixth Plan describes Furie’s commitment to ongoing exploration activities in KLU, including the subject leases which are wholly contained on the Northern block, as shown on Exhibits 2 and 3. With respect to the activities that could affect the Northern block, this Sixth Plan of Development states that Furie “intends to continue exploration drilling throughout the KLU, including outside the Corsair Block,” and that by February 2019 “it will mature two prospects for exploration wells outside the Corsair Block and present them to DNR along with evidence that commercially reasonable efforts are underway to drill these wells in either 2019 or 2020.” These statements justify classifying the estimated recoverable oil and gas volumes as “contingent resources”, which are oil and gas volumes that are estimated to be potentially recoverable from known accumulations by the application of development projects, but where there is a contingency to be resolved. In this case the contingency is the need for a defined development plan for the resources. Once Furie provides a technical description of the exploration well results and commits to a development plan including some or all of the subject acreage, the appropriate portion of the contingent resources associated with the acreage being developed could be re-categorized as reserves.

**DEVELOPMENT SCOPE AND ESTIMATED RECOVERY** – The higher-probability contingent resource case, the C1 case, represents a one-platform development. The middle- probability C2 case includes the additional production from a second platform. The lower- probability C3 case includes additional production from both platforms resulting from better-than-expected production rates. These three cases capture the key project uncertainties, assuming a development occurs: the outcome of the exploration drilling program (as reflected in the amount of oil and gas produced), and the development scope chosen by the operator (as reflected in the number of platforms).

The two most important factors that will determine whether or not a development occurs are the exploration well results and oil price. Favorable exploration results consistent with the 2004 Report expectations and reasonable oil price expectations will be required.

**EVALUATION RESULTS** – Details may not add to totals due to rounding. The various contingent resource categories have been combined in certain tables of this report for convenience and/or illustrative purposes. It should be recognized that different levels of risk and uncertainty are associated with each of these contingent resource categories; however, the recoverable volume estimates presented in this report have not been adjusted for risk.

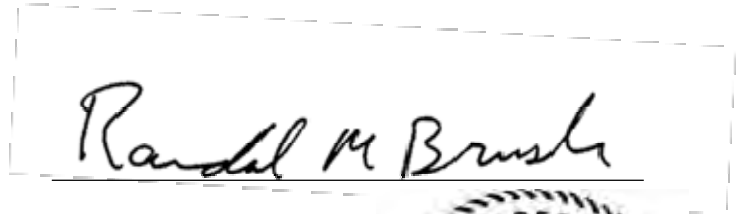
**Contingent Resource Volume Estimates for a 4.45% ORRI**

<b>Case</b>	<b>Estimated Net Volumes</b>	
	<b>Oil, MMBO</b>	<b>Gas, BCF</b>
<b>C1</b>	<b>4.31</b>	<b>1.82</b>
<b>C1 + C2</b>	<b>7.87</b>	<b>3.33</b>
<b>C1 + C2 + C3</b>	<b>13.4</b>	<b>5.68</b>

William M. Cobb & Associates, Inc. appreciates this opportunity to be of service. Please contact us with any questions or comments regarding this report.

Sincerely,

WILLIAM M. COBB & ASSOCIATES, INC.

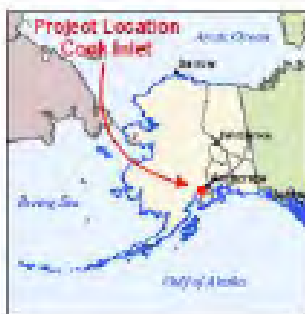
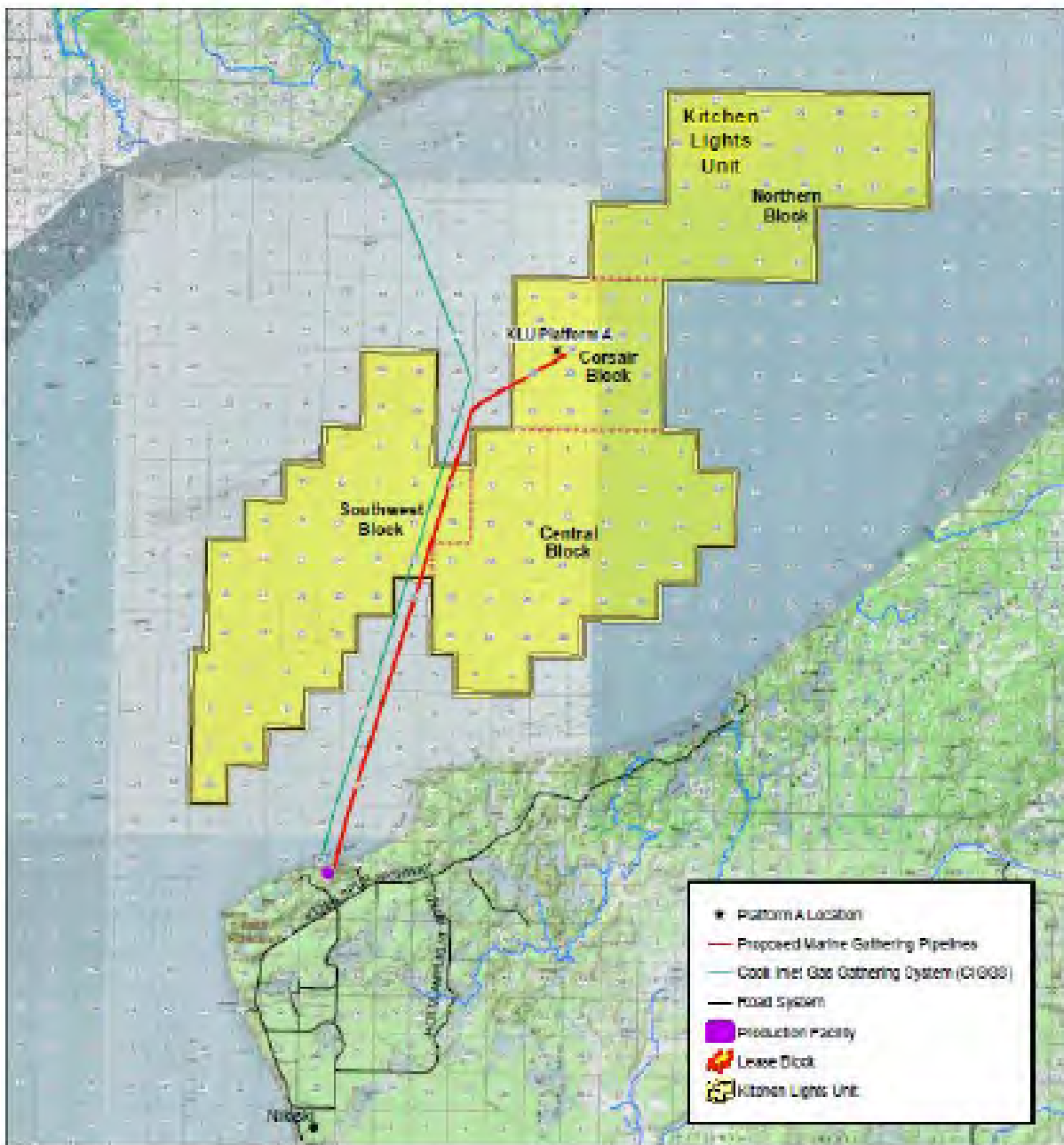
A handwritten signature in black ink that reads "Randal M. Brush". The signature is written in a cursive style and is enclosed within a dashed rectangular border.

**Randal M. Brush, P.E.**  
**Senior Vice President**



RMB  
clients\prodigy\KLURoyaltyEvaluationJanuary2019  
Attachments

# Exhibit 1: KLU Blocks (from KLU Plan of Operations)



Service Layer Credits: Copyright © 2013 National Geographic Society. i-cubed

All Locations Are Approximate



NAD 1983 StatePlane Alaska 4, Feet



FURIE OPERATING ALASKA  
KITCHEN LIGHTS UNIT LEASE BLOCKS  
COOK INLET, ALASKA

**JACOBS**

DATE: 29 APR 2014

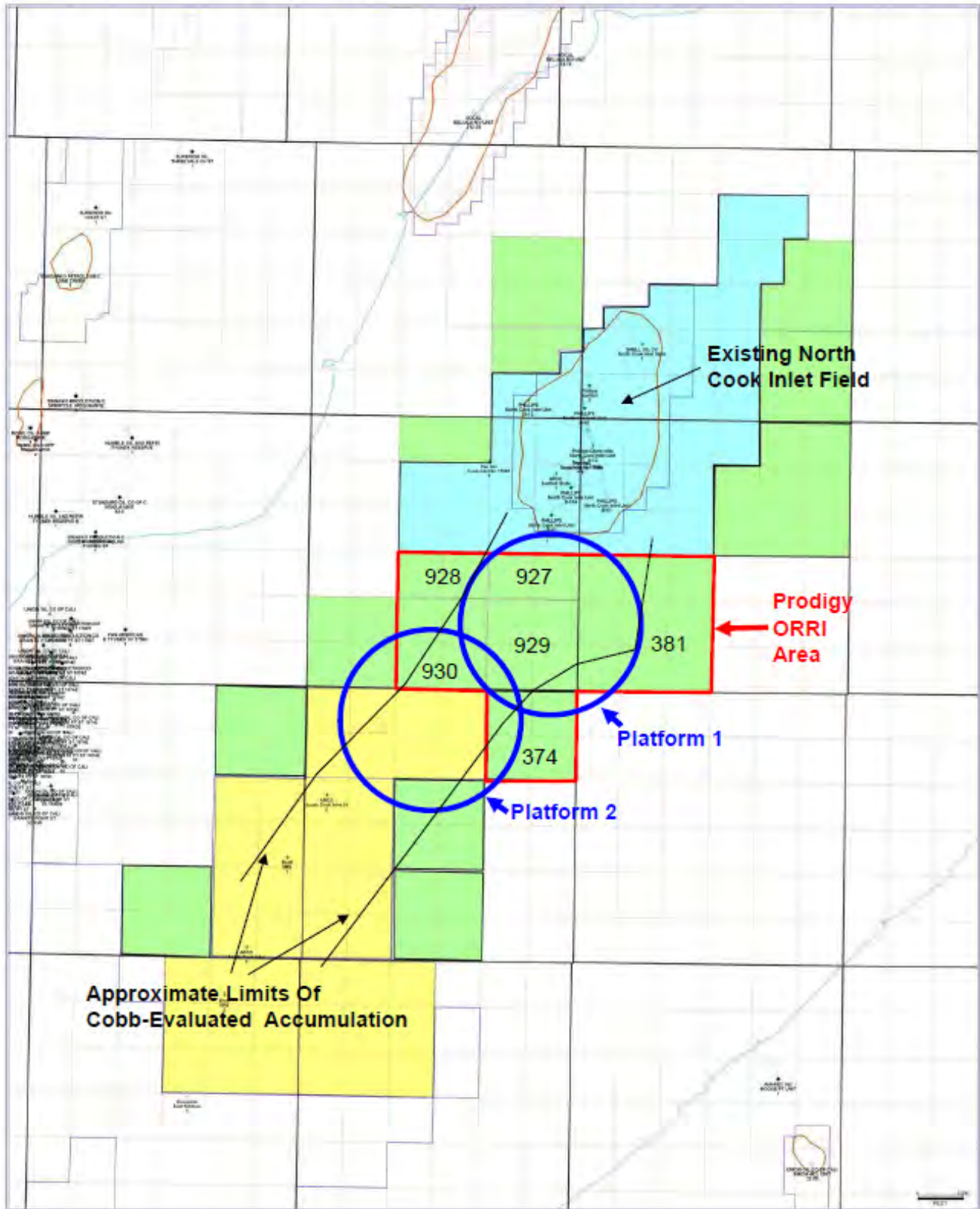
PROJECT MANAGER: T. HEIKKILA

PAGE NO.: 1

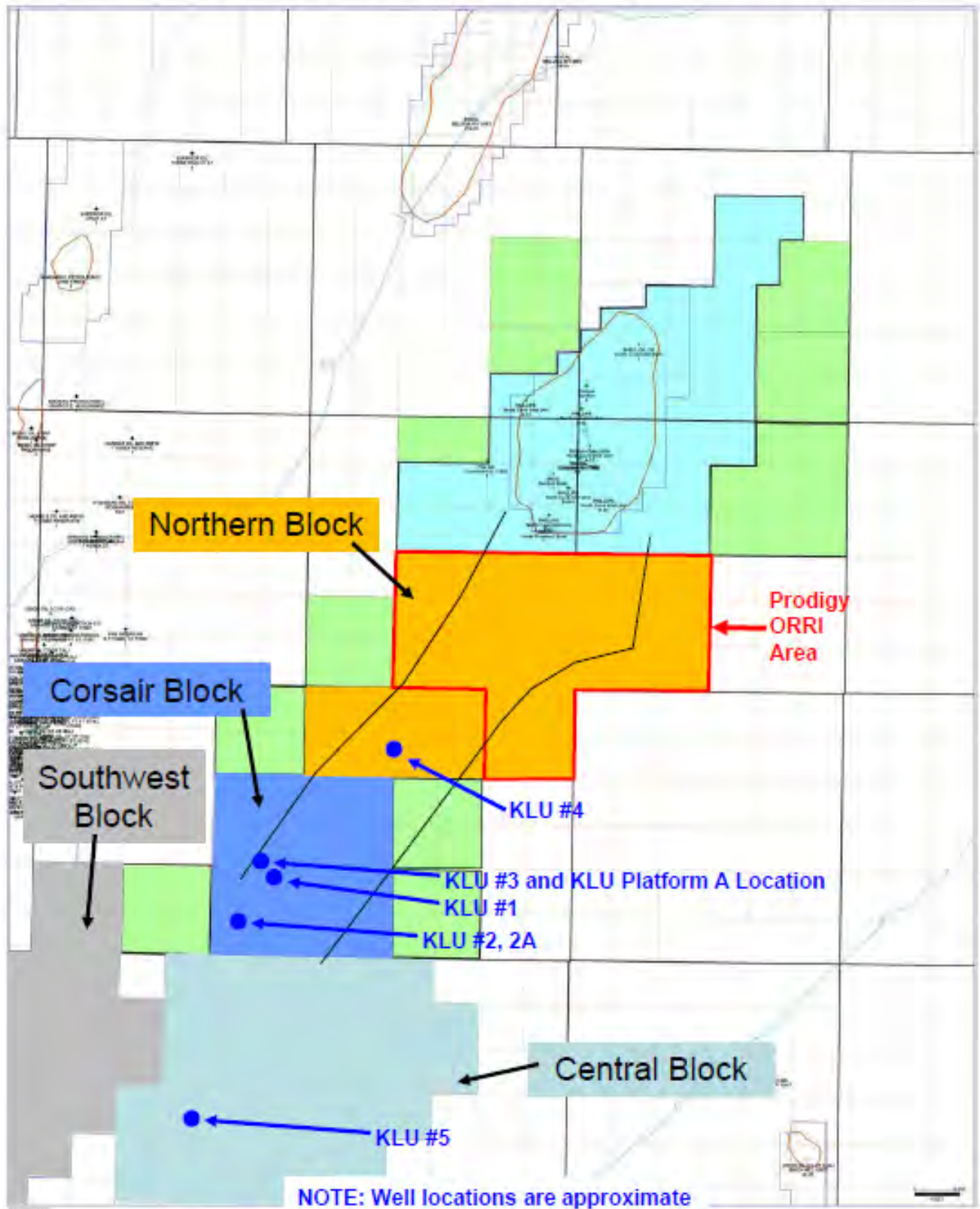
© 2013 Jacobs Engineering Group, Inc. All rights reserved.



## Exhibit 2: Tracts, Assumed Platform 1 and 2 Locations



### Exhibit 3: Prodigy ORRI Area Relative to KLU Blocks, Wells



NOTE: Well locations are approximate

# KITCHEN LIGHTS LEASE AREA GEOLOGICAL REVIEW

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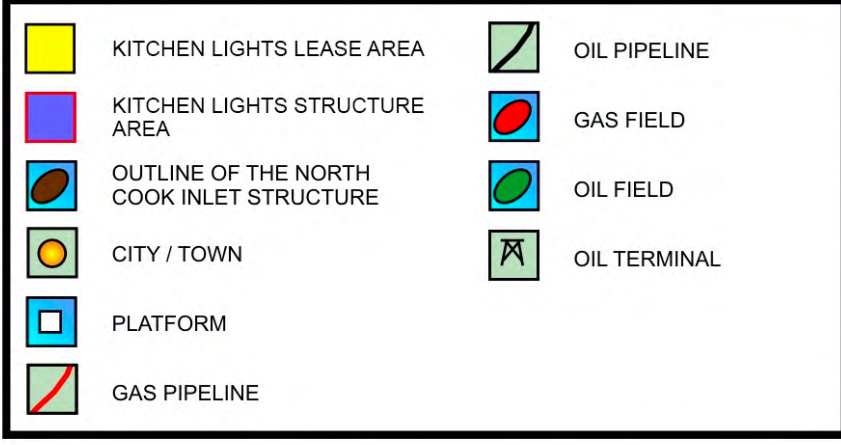
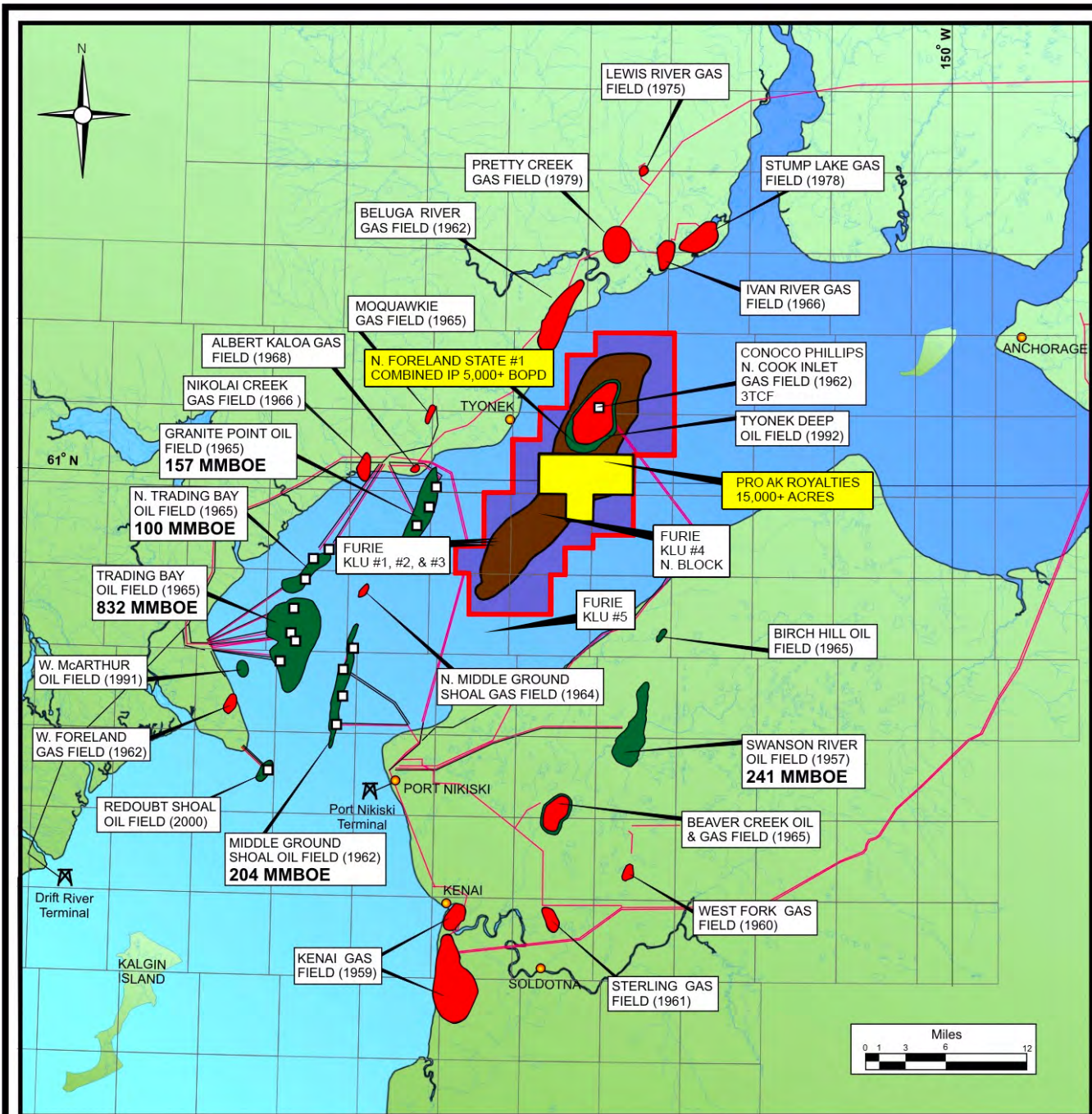
## HIGHLIGHTS

The Kitchen Lights Lease Area within the northern block of the Kitchen Lights Unit (KLU) is located in central part of the Upper Cook Inlet Basin, Alaska. The Cook Inlet Basin is oil and gas rich, having produced to-date, in excess of 1.3 BBO and 6 TCFG, primarily from sands of Miocene (Beluga and Tyonek) and Oligocene (Hemlock) age. The Kitchen Lights Area is surrounded by giant and super-giant oil and gas fields (see **Figure 1**) and is located immediately adjacent to the deep synclinal area of the Cook Inlet Basin (“source kitchen”) where significant volumes of oil and gas have been discovered and extracted.

The Kitchen Lights acreage is located on the North Block (highlighted in yellow on **Figure 1**). This area is located on the central portion of a large northeast-southwest trending faulted anticline at Tyonek Deep and Hemlock levels, known as the North Cook Inlet Structure. The anticline is approximately 23 miles in length, 3 to 6 miles in width and is characterized by very pronounced, steep-sided domes at each end. The ideal hydrocarbon trapping mechanism is both structural and stratigraphic in nature, relying on a combination of dip and fault closure and the stratigraphic thinning and pinch-out of the reservoir formations in a north-easterly direction. This combination structural-stratigraphic trap is very similar in form, and the principal reservoirs contained therein are essentially identical in character and age, to those encountered in other producing fields in this part of the basin. The northern dome of the North Cook Inlet Structure is presently being produced by ConocoPhillips and has yielded over 3 TCF of gas to date and is still producing at significant rates with no scientific end in sight. Interestingly, the deeper Tyonek Deep Formation is undeveloped in the area and there is very strong technical support for a significant extension of this prolific producing formation into the Kitchen Lights Area which is positioned directly south of the North Foreland State #1 well, which tested oil and gas at very high rates from multiple intervals in the Tyonek Deep and Hemlock Formations (see **Figure 3**).

The very significant oil and gas potential of the North Cook Inlet Structure has already been confirmed by numerous wells drilled on this prominent geological feature. The principal reservoir objectives occur at depths of 11,000’ to 16,500’ and frequently contain multiple pay intervals. A total of seventeen wells have been drilled to a sufficient depth to penetrate the Tyonek Deep reservoirs on the North Cook Inlet Structure and five of these were drilled deep enough to penetrate the Hemlock reservoirs. Fifteen of the seventeen Tyonek Deep well penetrations calculated productive based on a comprehensive petrophysical analysis of the well logs carried out by William M. Cobb & Associates, Inc. and eight of these wells tested oil at initial rates of up to 3,600 BOPD per zone. Notably, the North Foreland State #1 well, which was drilled by ARCO is located a mere 2,700’ N of the Kitchen Lights lease acreage. This particular well was tested at a combined rate of over **5,000 BOPD** from both the Upper and Lower Tyonek Deep channel sands. In addition to this, the Hemlock Formation is over 250’ thick in this well and calculated productive in several different intervals, and the first sand in this sequence was tested in over **560 BOPD** (see **Figure 7**). Importantly, none of the delineation wells drilled by ARCO on this structure were ever placed on line and produced, and all of the oil and gas discovered in the Tyonek Deep and Hemlock Formations within this structure still remains undeveloped.





**Pro AK, LLC**  
**COOK INLET BASIN, ALASKA**  
**KITCHEN LIGHTS LEASE AREA**  
**COOK INLET OIL & GAS FIELDS LOCATION MAP**

**FIGURE 1**

## **BASIN EXPLORATION HISTORY**

Over the past 40 years, the Cook Inlet Basin has gone from a relatively unexplored basin, to a mature petroleum province that has produced over **1.3 BBO** and **6 TCFG**. However, almost all of the oil discovered in the basin to date has been found in only one play type. From an exploration perspective, the Cook Inlet Basin still offers tremendous potential for the discovery of significant additional oil and gas reserves particularly within prominent features like the North Cook Inlet Structure that has not yet been developed in the Tyonek Deep and Hemlock Formations. The U.S. Geological Survey carried out an assessment of the remaining hydrocarbon potential of the Cook Inlet Basin in 1996. The study concluded that only a very small percentage of the total resource potential of the basin had been discovered to date. Statistically, a further 23 oil fields remain to be discovered in the basin, with an average recoverable reserve potential of around **646 MMBO per field**. Another study published by the American Association of Petroleum Geologists indicated that another **2-3 BBO** remain to be discovered in the Cook Inlet Basin. These independent assessments of the basin's resource potential strongly support the concept that this basin is relatively under explored.

Exploration for oil in the Cook Inlet area began in the 1800's. Oil was reported seeping along the west side of Cook Inlet, in the vicinity of the Iniskin Peninsula, by the Russians as early as 1853. Drilling continued sporadically in the first half of the century with little success. The end of World War II brought increased settlement to the Kenai Peninsula and the development of a road system. This stimulated further exploration interest in this area of the basin.

In 1955, Richfield Oil Corporation ("Richfield") began exploration on the Kenai Peninsula in the Swanson River area. Oil was discovered on July 23, 1957, at a depth of around 11,000 feet in the Hemlock Formation. The initial discovery well tested oil at a rate of approximately 900 BOPD. Shortly after the Swanson River discovery, Standard Oil Company of California and Richfield formed a joint venture to explore for oil. Additional wells were drilled in the Swanson River area and more leases were taken on both sides of Cook Inlet. Several other oil companies moved in to participate in drilling activities on the Kenai Peninsula. In 1959, annual crude oil production was around 187 MBO and the state's competitive leasing process was instituted. In 1960, following further development of the Swanson River and Soldotna Creek Units, production rose to around 600 MBO per year. Production from the basin peaked at around 83 MMBO per year in 1970, and thereafter declined to around 12 MMBO per year in 2001. Most of the larger oil fields were discovered and put on production by the late 1960's and are still producing today.

In 1962, Pan American Petroleum Corporation ("Pan Am") discovered the first offshore oil in Cook Inlet. This led to an extensive phase of offshore exploration throughout the Cook Inlet Basin in the 1960's and early 1970's, resulting in the installation of 16 offshore production platforms and a big increase in development drilling. Since the 1970's no new offshore fields were developed and only one additional platform was installed, in 1986, to accelerate production of existing gas reserves in the McArthur River field. **Figure 3** is a chart showing the drilling and production history for the Cook Inlet Basin over time since the beginning of exploration in the 1950's to the present day. In the 1970's, and especially the 1980's, most of the major oil companies operating in the Cook Inlet were also exploring or developing the huge North Slope oil fields. Consequently, the Cook Inlet Basin was not given sufficient attention by the oil companies when it came to exploration budgets, which resulted in a significant decline in exploration in the Cook Inlet Basin as a whole.

## Historical Timeline

- 1958** First discovery of natural gas reserves in Cook Inlet
- 1962 – 1993** Five drillings by Shell, ConocoPhillips and ARCO with proof of several oil and gas deposits in and around the Kitchen Lights Unit (KLU), particularly in the Corsair Block
- 1964** First oil platform set up in Cook Inlet by Shell
- 1968** After discovery of Prudhoe Bay oilfield (largest US oil deposit) drilling in Cook Inlet slows considerably, leaving most of it unexplored.
- 1994** Gross natural gas production in Cook Inlet with an annual output of around 311 billion cubic feet at its peak
- 1999** Escopeta Oil Co., LLC (from 09/2011: Furie Operating Alaska, LLC = 100% subsidiary of DOGAG) acquires drilling rights for six areas in Cook Inlet in a tender process.
- 2001** Shawn Bartholomae owner of Saddleback Resources wins State of Alaska bid on leases within the Kitchen Lights lease Area. Escopeta Oil acquires more drilling rights for eight additional sections in Cook Inlet.
- 2004** Escopeta Oil acquires two exploration rights in Cook Inlet.
- 2006** Escopeta Oil acquires one additional drilling right in Cook Inlet.
- 2007** State of Alaska gives Escopeta Oil approval to form a single unit called "Kitchen"; as a result also an extension of duration of drilling rights.
- 2009** Escopeta Oil acquires more drilling rights and concessions from other oil and gas exploration companies in the upper Cook Inlet.
- 2009** Escopeta Oil receives permission to establish Kitchen Lights Unit, now comprising 337 square miles, the largest drilling unit within the Cook Inlet.
- 2010** Acquisition of Escopeta Oil Co., LLC by Cornucopia Oil & Gas Company, LLC to Furie Operating Alaska brings "Spartan 151", the first new drilling platform since 1993 to Cook Inlet.
- 2011** Escopeta's Cook Inlet Discovery (Furie Petroleum) claims “**Could Be a Historic Find**” Public announcement stating reserves as much as 3.5 Trillion Cubic Feet of Gas.

# Escopeta Oil Jack-Up Rig Makes Major Cook Inlet Gas Find

November 04, 2011 | By Chris Klint | KTUU.com

ANCHORAGE, Alaska — An Escopeta Oil jack-up drilling rig has been in Cook Inlet for only three months, but company officials announced Friday that it has discovered about 3.5 trillion cubic feet of natural gas -- an amount they say could be the inlet's largest energy discovery in 25 years.

According to a statement from the company, a single well drilled by the Spartan 151 rig reached a depth of 8,805 feet in the inlet's Kitchen Lights Unit Oct. 28, discovering 46.7 billion cubic feet of natural gas. The jack-up rig is the first to explore the inlet in at least two decades.

Officials credited the role of state tax incentives in Escopeta's decision to explore in Cook Inlet, including Senate Bill 309 sponsored by Sen. Tom Wagoner of Kenai. The bill, passed by the Legislature and signed into law by Gov. Sean Parnell this summer, offers up to \$25 million in tax credits to the first company to drill the inlet's Jurassic Formation -- an area Escopeta plans to reach next year, after suspending winter drilling due to seasonal restrictions.

"Escopeta is very excited by the results of this well, especially since we are only halfway down to the planned total depth," Bruce Webb, Escopeta's vice president of governmental and regulatory affairs, said in the statement. "We still have to drill through the Tyonek gas formations, and then into the Sunfish and Hemlock oil formations, on our way to the Jurassic."

The jack-up rig was transported from Texas and arrived at the inlet in early August. Shortly after the trip, Escopeta was assessed a \$15 million federal fine by U.S. Customs and Border Protection for violating the Jones Act by using a foreign-flagged vessel to bring the rig to Alaska.

Escopeta says the huge find from only the first of five planned wells is enough to commence planning and engineering for commercial gas production. This year's results have prompted the company to consider an accelerated natural gas development scenario, which could produce new gas deliveries from the inlet as early as 2013.

## **2012**

Furie finishes the drilling of the Cook Inlet Kitchen Lights Unit No.1 to total depth, completes the drilling of the KLU No.2 Well thereby fulfilling its 2012 obligation to the State of Alaska

### **Petroleum News**

Vol. 17, No. 14 - Week of April 01, 2012

Kitchen Lights Extended to Jan. 2016 - DOG grants unit extension  
<http://www.petroleumnews.com/pntruncate/27185921.shtml>

## **2013**

### **January**

#### **Alaska Journal of Commerce**

By BRIAN SMITH, Peninsula Clarion Published: 2012.12.17 09:30 AM

Furie seeks permit for new production platform

### **May**

Two jack-up rigs now back at work drilling in Cook Inlet

#### **Alaska Journal of Commerce**

TIM BRADNER Published: 2013.05.23 11:05 AM

The KLU #3 being drilled by Furie Operating has reached its planned depth of 10,400 feet and is making plans to do a natural gas production, a state official said.

<http://www.alaskajournal.com/Alaska-Journal-of-Commerce/May-Issue-4-2013/Companies-drill-ahead-on-Cook-Inlet-projects/>

### **Platts**

Anchorage, Alaska (Platts)--16 May 2013 417 pm EDT/2017 GMT

Independent Furie Operating completes drilling on Cook Inlet test



## MOST SUCCESSFUL WELL IN ALASKA TO DATE



Third well with potential to be the most successful well in the entire Cook Inlet – Assumptions on the natural gas deposits and daily production likely exceeded by far

In the region of the Cook Inlet, a rumour has spread like wildfire: the US subsidiary of Deutsche Oel & Gas has possibly completed the most successful natural gas well in the entire Cook Inlet, Alaska with its third well (KLU#3) in Kitchen Lights Unit.

The target depth of around 10,500 feet (corresponds to approx. 3,000 metres) was reached last week after drilling time of only 14 days, significantly fewer days than planned, during which time four exceptionally large natural gas development zones were found.

The specialists of the US subsidiary were already optimistic about the development of the third well based on the results of the first two wells in the direct vicinity. However, following initial evaluations of the reported shaft measurements and the soil and gas tests, experts now believe that both the presumed natural gas reserves and the expected daily production will by far exceed all expectations.

The prevailing pressure in each of the four development zones is so high that each zone now has to be tested separately. This extraordinarily high level of pressure and the associated high daily production levels expected in particular could make KLU#3 one of the largest, if not the largest natural gas production wells of the entire Cook Inlet.

As of mid-June, flow tests lasting several weeks will be conducted to obtain more detailed information on the expected daily production and to determine more precise information on the available natural gas reserves. After the tests have been completed the "expected reserves" will become "tested and confirmed natural gas reserves". The results of the flow tests will be available in mid-July.

## June



Preliminary decision to approve Furie Operating Alaska's application for Air Quality Control Minor Permit for the Spartan 151 Jack-up Drilling Rig, Kitchen Lights Unit Exploration Well #4 Relocation

<http://aws.state.ak.us/OnlinePublicNotices/Notices/View.aspx?id=168300>

## July

The Spartan 151 is presently being positioned over the Relocation KLU #4 and drilling will proceed any day now. The DNR has amended the required drilling commitment with Furie Operating allowing the KLU #4 to reach only 7000' at a minimum depth this year, total depth may be achieved the following year if needed. Ice moving into the inlet limits drilling with a jack up to only several months a year. Once a production platform has been set drilling may proceed throughout the year.

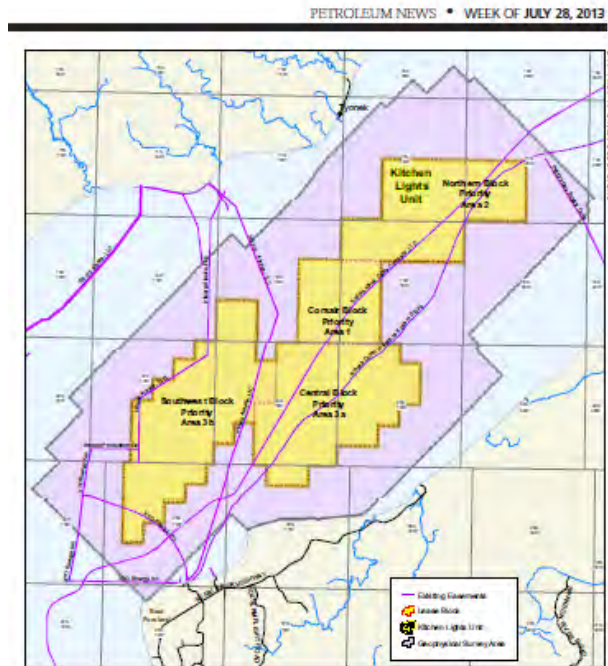


## **FOURTH DRILLING KLU#4 WILL PROBABLY BE ONE OF THE DEEPEST IN THE WHOLE COOK INLET**

In the late summer of 2011 the US subsidiary of Deutsche Oel & Gas, Furie Operating Alaska, drilled the first well in the Kitchen Lights Unit. The Spartan 151 platform was brought expressly from the Gulf of Mexico to Cook Inlet - around Cape Horn - this is an outstanding technical and logistical achievement. The first drilling (KLU#1) was completed successfully in May 2012. The second trial drilling (KLU#2) began in August 2012 and was already completed in October 2012 successfully. After only 14 days at the end of May 2013, the third drilling (KLU#3) reached its target depth of 10,500 ft (corresponds to approx. 3,000 meters). The fourth drilling (KLU#4) started in August 2013, several weeks earlier than planned. With a target depth of about 15,000 ft (corresponds to around 4,500 meters), the fourth drilling will likely be one of the deepest in the whole Cook Inlet.

## Petroleum News

Furie applies for seismic survey permit. Wants to conduct offshore 3-D survey in Kitchen Lights unit in Alaska's Cook Inlet to better characterize subsurface geology



• EXPLORATION & PRODUCTION

## Furie applies for seismic survey permit

*Wants to conduct offshore 3-D survey in Kitchen Lights unit in Alaska's Cook Inlet to better characterize subsurface geology*

**2014**

**March**

## Petroleum News

Vol. 19, No. 10 Week of March 09, 2014

Furie Operating Alaska has filed a plan of operations with the Alaska Department of Natural Resources for the company's Kitchen Lights unit, offshore in Cook Inlet. The plan envisions the installation of a gas production platform, the Kitchen Lights unit Platform A, in the waters of the inlet, about 10 miles north of Boulder Point, near Nikiski on the Kenai Peninsula, as well as the laying of twin gas pipelines from the platform to an onshore gas processing plant.

Platform installation, the laying of the pipelines and the construction of the onshore facilities will take place in parallel, between April and October 2014, Furie says. The company says that it anticipates first gas flowing from Kitchen Lights into the Kenai Peninsula gas pipeline system in the third or fourth quarter of the year.

<http://www.petroleumnews.com/pnfriends/85938699.shtml>



## **June**

### **Petroleum News**

Vol. 19, No. 24 Week of June 15, 2014

Furie's Cook Inlet development may begin to realize a long-held vision. With Furie Operating Alaska's new offshore gas production platform on its way from Texas to Cook Inlet, speculation over just how much undeveloped hydrocarbon resource may lie beneath the waters of the inlet continues unabated.

<http://www.petroleumnews.com/pnfriends/812451787.shtml>

## **July**

### **Petroleum News**

Vol. 19, No. 27 Week of July 06, 2014

Furie obtains Kitchen Lights no. 5 permit as gas field development proceeds

<http://www.petroleumnews.com/pntruncate/535552501.shtml>

## **September**

### **Peninsula Clarion**

By KAYLEE OSOWSKI September 15, 2014 - 9:56pm

Furie's monopod platform arrives in Cook Inlet

<http://peninsulaclarion.com/news/2014-09-15/furies-monopod-platform-is-in-state>

## **November**

Furie submits new plan of development with state of Alaska.  
State approves submitted plan.

## **2015**

## **March**

### **Petroleum News**

Vol. 20, No. 12, Week of March 22, 2015

Furie resumes construction on platform in Corsair blocks. Submits new plan of exploration to state of Alaska. State approves.

Furie plans for future in Kitchen Lights.

<http://www.petroleumnews.com/pnfriends/824123642.shtml>

# **2016**

## **May**

### **State of Alaska DNR**

LOCI 16-001, Furie Operating, KLU, Exploration Project Unit Plan of Operations  
<http://proak.net/wp-content/uploads/2016/11/Furie-KitchenLightsUnit-ExplorationDrillingDecision-002.pdf>

### **Petroleum News**

Vol. 21, No. 21, Week of May 22, 2016

<http://www.petroleumnews.com/pnfriends/227070168.shtml>

Furie planning major exploration effort  
With Kitchen Lights in production, company is covering its leasehold

## **July**

### **Platts**

Anchorage, Alaska (Platts)—11 July 2016

### **Alaska independent plans deep Cook Inlet oil test**

The company plans to reenter its KLU-4 exploration well, which has discovered gas, and drill deeper to test a potential oil prospect that has been identified

<http://www.platts.com/latest-news/oil/anchorage-alaska/alaska-independent-plans-deep-cook-inlet-oil-21944030>

### **Furie takes first steps toward adding Inlet oil platform**

The KLU-4 well was originally drilled to 10,000 feet in 2014 and will be punched down to 18,000 possibly this year but more likely next, according to Webb. “We know there’s gas there for sure; we’ve drilled through some gas and we see the gas on the seismic and on the seismic it appears to be a pretty large oil reservoir, but again, you don’t know for sure until you drill into it,” he said. “It could be really good sandstone with water.” The company once intended to drill farther, into the Jurassic formation, but expiration of the state tax credit for drilling with a jack-up rig in July caused Furie to back off on the extra drilling, Webb added. The work will be done with the Randolph Yost jack-up rig, a modified shelf-drilling rig the company moved to the Inlet early this year from the South Pacific. He said Furie hopes to get at least 2,000 barrels per day from KLU-4 starting sometime in 2019, about the time the company believes the oil production will become profitable. While Furie has identified gas in KLU-4, it hasn’t been fully delineated. “We’ll go after the oil and the gas will be there when we need it,” Webb said. It has begun the permitting process for another platform and is shooting for mid- to late 2018 to start development and eventual installation.

<http://homernews.com/homer-news/business/2016-07-06/furie-takes-first-steps-toward-adding-inlet-oil-platform>

## **September**

### **Petroleum News**

Vol. 21, No. 37, Week of September 11, 2016

During the week of Sept. 11 Furie Operating Alaska expects to start the drilling of the KLU A-1 development well in its Kitchen Lights gas field, Bruce Webb, Furie senior vice president, told Petroleum News in a Sept. 6 email. Currently the company is hooking up the wellhead of the KLU A-2 well that it drilled and completed this summer. The company must complete flow testing of the A-2 well before starting the drilling of the A-1 well, Webb explained. Furie is using the Randolph Yost jack-up rig, stationed at the Julius R gas production platform, to conduct the drilling.

<http://www.petroleumnews.com/pnads/120933695.shtml>

## **October**

### **Petroleum News**

Vol. 21, No. 40, Week of October 02, 2016

Resources Energy Inc. progresses plan to ship Cook Inlet natural gas to Japan

<http://www.petroleumnews.com/pnads/13128241.shtml>

## **2017**

### **March**

#### **Furie gears up for busy 2017**

“There are billions of barrels of oil that are unaccounted, and many of us believe it’s still down there,” said Seamount, who said he spoke from his experience as a geologist and for the commission, which is a regulatory body. “We’ve barely skimmed the surface,” of the Inlet’s potential, he said. “We’ve only tapped some of the oil that was trapped in the shallow conventional traps.”

<http://www.alaskajournal.com/2017-03-22/furie-gears-busy-2017-plans-deep-test-oil-inlet#.Wm-51q6nFhE>

#### **CEA, Furie sign supply agreement**

The 1.8 bcf per year in the new Furie gas supply would then likely account for 20 to 25 percent of the utility’s gas fuel needs during the period of the firm supply component of the contract.

<http://www.petroleumnews.com/pnads/987310338.shtml>

#### **Furie plans to drill to Jurassic**

Geologists have long speculated about the possibility of finding as-yet undiscovered oil resources in Mesozoic strata, including the Jurassic, deep under the younger and shallower Tertiary strata that host the reservoirs of the producing Cook Inlet oil and gas fields. The source of the oil in these fields lies within the Jurassic sequence, and much oil estimated to have been generated from the Jurassic source remains unaccounted for.

<http://www.petroleumnews.com/pnads/214549299.shtml>

**Furie Operating Alaska is planning to conduct a test on the Jurassic formation in the Cook Inlet this summer**

<http://www.radiokenai.us/furie-prepares-for-test-of-jurassic-formation/>

**April**

**Furie, feds ending legal battle**

The company and a group of federal agencies and officials led by the U. S. Department of Homeland Security filed a stipulation on March 24 dismissing their claims and counterclaims against the other, and each agreeing to pay their own costs.

<http://www.petroleumnews.com/pnads/109707542.shtml>

**May**

**RCA approves Furie gas supply for CEA**

“The Furie GSA has the effect of diversifying Chugach’s gas supply while retaining flexibility as to gas volumes and pricing,” the commission said.

<http://www.petroleumnews.com/pnads/135398759.shtml>

**The Explorers 2017: Furie planning Jurassic well at KLU**

In a plan of operations submitted to the state in March 2016, the local independent announced a five-year plan to drill as many as 10 exploration wells at its offshore Kitchen Lights unit.

A decision from the state Division of Oil and Gas in late May 2016 allowed the company to proceed with the KLU No. 4 project in the Corsair block and the KLU No. 9 and KLU No. 12 wells immediately.

<http://www.petroleumnews.com/pnfriends/942565013.shtml>

**United States Department of Commerce, National Oceanic and Atmospheric Administration: Exploration Drilling in the Kitchen Lights Unit of Cook Inlet, Alaska, 2017-2021**

<http://proak.net/wp-content/uploads/2017/08/2017-through-2021-Furie-Exploration-plans.pdf>

## June

### **Furie mobilizing rig early July**

“Furie also plans to drill a deep exploration well into the Jurassic in the Kitchen Light unit this year.”

<http://www.petroleumnews.com/pnads/779935720.shtml>

## July

### **State approves plans for Jurassic exploration well at Kitchen Lights**

Furie said it would drill the KLU No. 4 well to a depth capable of targeting the Sunfish Channel of the lower Tyonek formation.

<http://www.petroleumnews.com/pnads/109044506.shtml>

## October

### **Enstar files modified Furie contract**

Enstar has now agreed to extend the deadline to July 31, 2018

<http://www.petroleumnews.com/pnads/784712556.shtml>

### **Company blames tax credits for halting Kitchen Lights drilling program**

In a plan of development submitted to state officials in early October, the local independent wrote that “the lack of any meaningful appropriation to the oil and gas tax credit fund for the purchase of Alaska oil and gas production tax credit certificates” prevented the company from drilling development or exploration wells at the unit.

<http://www.petroleumnews.com/pnads/68035096.shtml>

## November

### **Furie blames state for lack of drilling. Budgetary standoff and lack of tax credit funding prompt company to postpone Kitchen Lights work**

The company said it might postpone the development well in favor of drilling a new exploration well or re-entering and deepening the existing KLU No. 4 well.

<http://www.petroleumnews.com/pnads/334342131.shtml>

## December

### **State of Alaska - Notice of Default and Cure Demand**

[http://proak.net/wp-content/uploads/2018/07/20171226\\_kt\\_notice-default-curedemand-1.pdf](http://proak.net/wp-content/uploads/2018/07/20171226_kt_notice-default-curedemand-1.pdf)

### **Kitchen Lights Unit - Revised 5th Plan of Development –Approved**

[http://proak.net/wp-content/uploads/2018/01/20171228\\_KT\\_POD\\_2018\\_Approved-1.pdf](http://proak.net/wp-content/uploads/2018/01/20171228_KT_POD_2018_Approved-1.pdf)

### **DGGS reports on oil stained Jurassic**

The producing oil fields of northern Cook Inlet all have reservoirs in younger rocks that are Tertiary in age, although the oil is understood to have originated in a Jurassic source rock in the Mesozoic.

<http://www.petroleumnews.com/pnads/90605495.shtml>



# **2018**

## **January**

### **State says company failed to meet drilling commitment for 2017 but can cure default through new development plan for 2018**

The division has also approved Furie's Kitchen Lights plan of development for the coming year and has said that the company can cure the default by meeting all of the drilling commitments in the new plan.

<http://www.petroleumnews.com/pnads/660121661.shtml>

### **ML&P signs agreement for Furie gas**

Municipal Light & Power has asked the Regulatory Commission of Alaska to add Furie Operating Alaska LLC to the list of gas suppliers in the ML&P tariff, following the signing of a gas supply agreement between ML&P and Furie.

<http://www.petroleumnews.com/pnads/526456226.shtml>

### **Furie asks DOG for corrections to Kitchen Lights plan approval**

Furie Operating Alaska has written to Chantal Walsh, director of Alaska's Division of Oil and Gas, requesting corrections to what the company characterizes as factual errors in an approval notice the division issued for the new plan of development for Furie's Kitchen Lights unit.

<http://www.petroleumnews.com/pnads/11236000.shtml>

## **July**

### **Furie planning completion of two more Kitchen Lights gas production wells**

Furie Operating Alaska is planning to complete one well and drill another, to achieve a target of having a total of four production wells on line in its Kitchen Lights gas field in Cook Inlet by the end of this year's drilling season, Scott Pinsonnault, the company's chief operating officer, told Petroleum News July 9.

The Spartan 151 jack-up rig is on site at the Julius R. production platform, being cantilevered over the platform. "They've been rigging up ... for the last five or six days," Pinsonnault said.

<http://www.petroleumnews.com/pnads/846963353.shtml>

## **September**

### **Furie is testing one Kitchen Lights development well, drilling another**

Furie Operating Alaska has completed the KLU A-1 well and is currently using the Spartan 151 jack-up rig to drill the KLU A-4 well at the Julius R. platform in the Kitchen Lights unit

<http://www.petroleumnews.com/pnads/753661044.shtml>

## **October**

### **Furie plans development well in 2019; exploration depends on tax credit payments**

Furie Operating Alaska's latest plan of development for its Cook Inlet Kitchen Lights gas field indicates that the company hopes to drill and evaluate an additional development well into the Sterling formation from the Julius R. production platform in 2019.

<http://www.petroleumnews.com/pnads/315810297.shtml>

## December

### **Kitchen Lights Unit Sixth Plan of Development – Approval**

[http://dog.dnr.alaska.gov/Documents/Units/2018/20181211\\_KitchenLights\\_POD\\_2019\\_Approved.pdf](http://dog.dnr.alaska.gov/Documents/Units/2018/20181211_KitchenLights_POD_2019_Approved.pdf)

### **Kitchen Lights POD approval indicates Furie carried out its 2018 program**

Furie Operating Alaska completed its planned 2018 drilling program in the Kitchen Lights unit, offshore in Cook Inlet, according to a state notice approving the company's latest plan of development.

<http://www.petroleumnews.com/pnads/30024445.shtml>

## 2019

### January

#### **Judge rules on constitutionality of tax credit bonds**

The small oil companies and banks holding more than \$800 million in refundable tax credits scored a victory Wednesday when an Alaska Superior Court judge threw out a lawsuit challenging the state's plan to sell bonds to pay off those credits.

<http://www.alaskajournal.com/2019-01-03/judge-rules-constitutionality-tax-credit-bonds#.XEjQnVVKhhF>

#### **1JU-18-00699CI Forrer, Eric vs. State of Alaska et al MJP**

On 1-2-19 Judge Pate dismissed the case. The State of Alaska requested a motion for entry of final judgement. Forrer's attorney filed a motion for reconsideration and opposed the defendant's motion for entry of final judgement. On 1-22-19 Judge Pate issued an order denying the motion for reconsideration and issued an order granting entry of final judgement.

<https://records.courts.alaska.gov>



Published videos Alaska's Cook Inlet Kitchen Lights

**Sept. 10<sup>th</sup> 2015**

[Deutsche Oel & Gas Onshore Gas Processing Facility](#)

**Sept. 3<sup>rd</sup> 2015**

[Deutsche Oel & Gas Pipeline Hydro Test](#)

**Aug 6<sup>th</sup> 2015**

[Deutsche Oel & Gas Production Platform Installation](#)

**July 7<sup>th</sup> 2015**

[Deutsche Oel & Gas Monopod Installation](#)

**May 27<sup>th</sup> 2015**

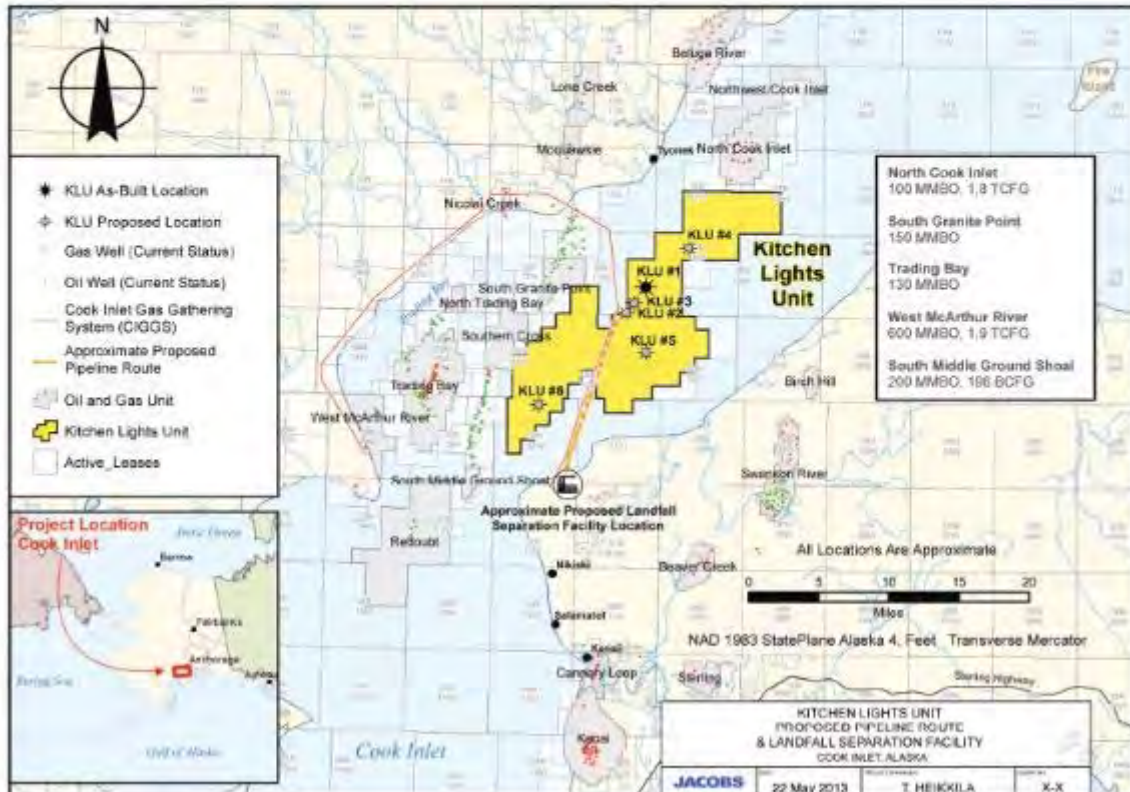
[Deutsche Oel & Gas Pipeline Kitchen Lights Unit](#)

**April 11<sup>th</sup> 2015**

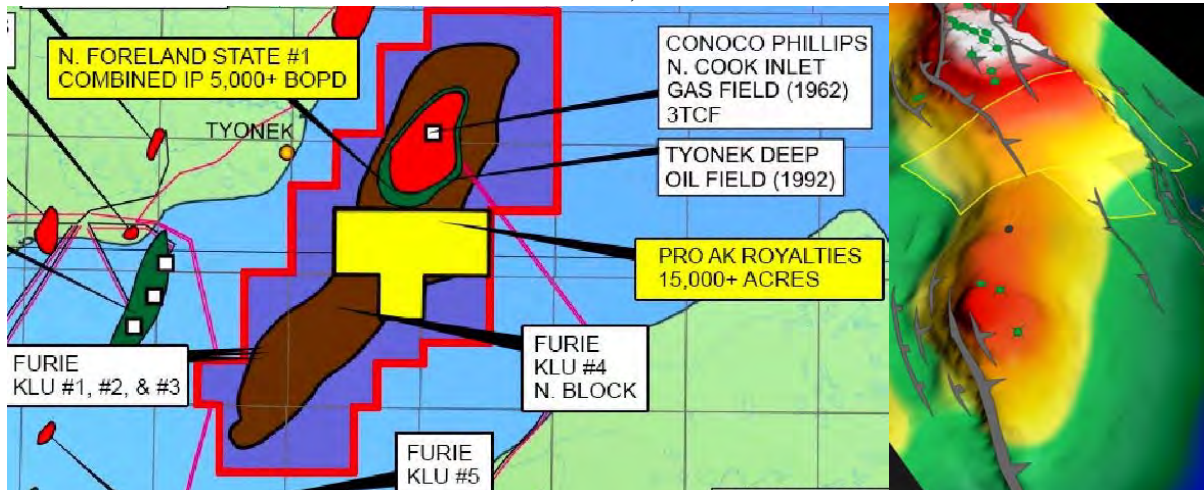
[Deutsche Oel & Gas KLU3 Success](#)

# THE KITCHEN LIGHTS UNIT – THE DEVELOPMENT REGION OF DEUTSCHE OEL & GAS AG

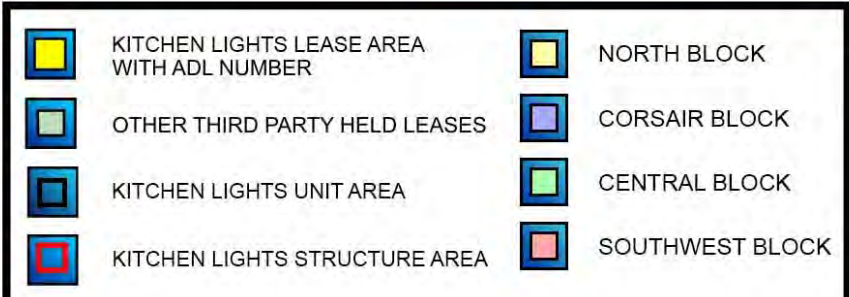
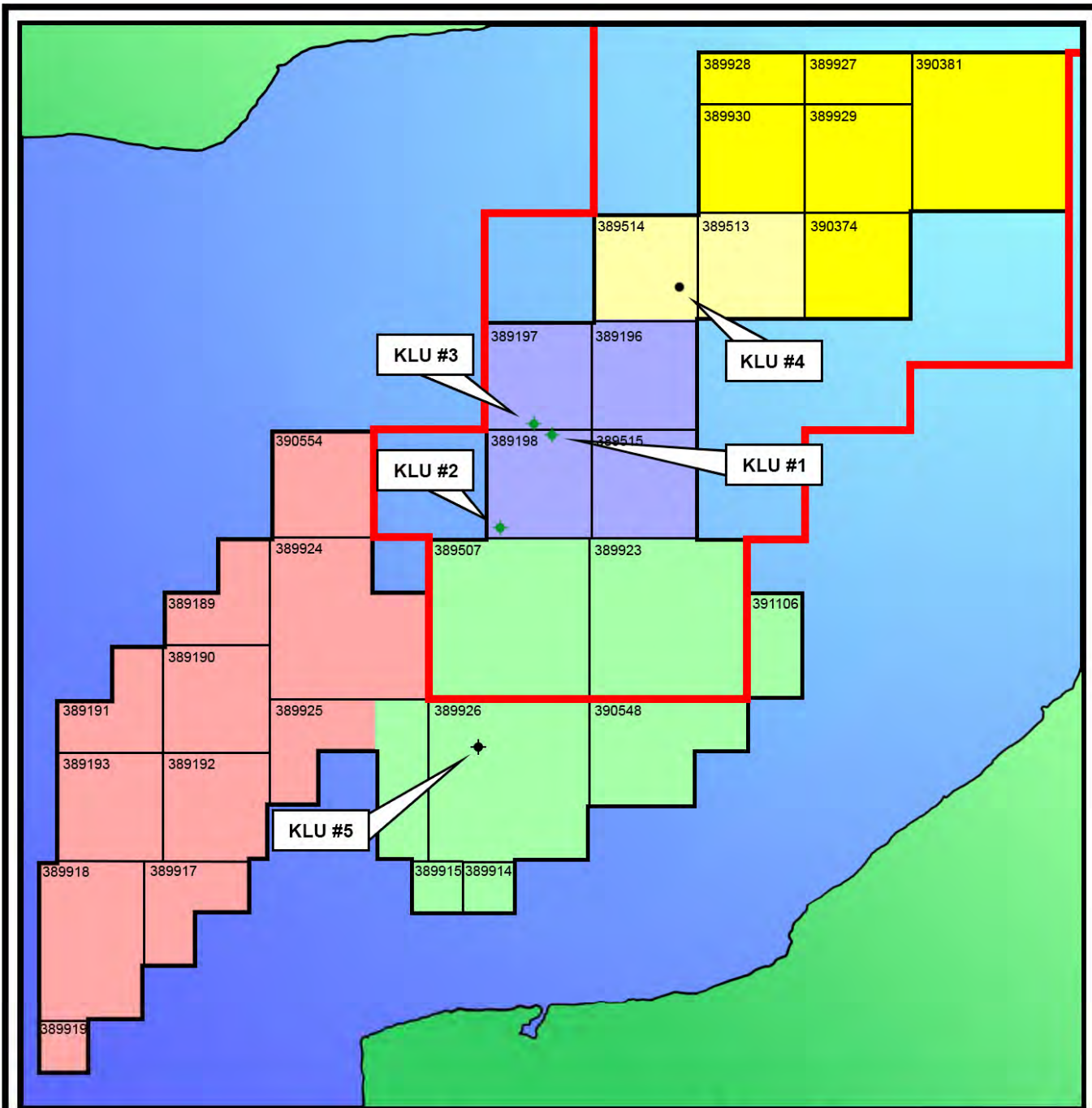
The Kitchen Lights Unit development region of Deutsche Oel & Gas AG, covering 83,300 acres (approx. 337 square kilometers), is the largest development region in Cook Inlet.



## PRO AK, LLC







**Pro AK, LLC**  
**COOK INLET BASIN, ALASKA**  
**KITCHEN LIGHTS LEASE AREA**  
**LEASE LOCATION MAP**

**FIGURE 2**

## **NORTH COOK INLET STRUCTURE EXPLORATION HISTORY**

Exploration activity on the North Cook Inlet Structure was curtailed significantly in the 1970's and 1980's, post discovery of the oil fields on the North Slope of Alaska, and was only rekindled in the 1990's. In 1992, ARCO drilled a significant discovery on the southern flank of North Cook Inlet Structure northern dome. The **ARCO North Foreland State #1** well was tested at a combined initial rate of **5,560 BOPD** from three separate intervals in the Tyonek Deep and Hemlock Formations. In 1995, Phillips Petroleum Corporation ("Phillips") and ARCO reached an agreement allowing Phillips to conduct delineation drilling on the northern dome of North Cook Inlet Structure. Several successful Tyonek Deep delineation wells were drilled on this part of the structure in the late 1990's and the discovered oil pool was named the Tyonek Deep oil field. Unofficial reserve estimates reported to the State of Alaska indicate that approximately **700 MMBO** can be developed in the Tyonek Deep interval from wells drilled from and tied back to the ConocoPhillips operated Tyonek gas platform. At the present time it is anticipated that this part of the Tyonek Deep oil field will only be developed upon cessation of commercial gas production from the currently installed platform. However, there is strong technical support for a significant extension of this undeveloped oil field into the Kitchen Lights Lease Area and the successful completion of the delineation drilling program that is presently underway by Furie Operating on the Northern Block, thereby accelerating plans for the installation of a production platform to capture the oil and gas reserves in the Kitchen Lights Lease Area.

### **Leases**

Kitchen Lights Area, which comprises six undeveloped leases covering an area of 15,930 acres in the Upper Cook Inlet Basin. (see **Figure 2**)

**Table 1 below summarizes Kitchen Lights gross and net acreage position in the Cook Inlet.**

<b>TABLE 1. ACREAGE SUMMARY KITCHEN LIGHTS AREA</b>			
<b>Lease ADL Number</b>	<b>Block Number</b>	<b>Gross Acres</b>	<b>Net Acres</b>
ADL-389927	<b>425</b>	<b>1,280.0</b>	<b>1,280.0</b>
ADL-389928	<b>426</b>	<b>1,280.0</b>	<b>1,280.0</b>
ADL-389929	<b>428</b>	<b>2,560.0</b>	<b>2,560.0</b>
ADL-389930	<b>429</b>	<b>2,560.0</b>	<b>2,560.0</b>
ADL-390374	<b>345</b>	<b>2,560.0</b>	<b>2,560.0</b>
ADL-390381	<b>420</b>	<b>5,690.0</b>	<b>5,690.0</b>
<b>Total Acres</b>		<b>15,930.0</b>	<b>15,930.0</b>

## SUPPORTING GEOLOGICAL DATA

The present day structural configuration of the North Cook Inlet Structure has been defined using a combination of 2-D seismic data and sub-surface well control. Formation tops for the key prospective horizons were identified from well logs in 17 deep wells drilled on the North Cook Inlet Structure and synthetic seismograms were generated in eight wells to assist in identification of the reflectors on the seismic data.

A total of 17 wells have been drilled to a sufficient depth to penetrate the potential reservoirs of Tyonek Deep interval. **Figure 3** is a depth structure map at near top Tyonek Deep Sunfish Sands level. This map was used to define the extent of the potentially productive areas associated with the Tyonek Deep Sunfish Sands and Channel Sands which were both ascribed the area that lies within the -15,200' depth contour at near top Sunfish Sands. The potentially productive area associated with these sands is affected by intense faulting and thinning and pinch-out of the sands under the northern dome of the North Cook Inlet Structure which has experienced a much more complex geological history in comparison to the central saddle area and southern dome. The northern dome of the structure represents a paleo-high that formed a prominent topographic high throughout late Mesozoic and Tertiary times and non-deposition of some sand units in the Tyonek Deep interval occurred in places. In addition, the presence of some structurally high and apparently wet Tyonek Deep sand intervals under the northern dome of the structure implied that some of the traps were breached by late re-activation of the fault systems in this area. This is supported by the presence of relatively high residual oil saturations measured in cores and observed in mud log samples, suggesting that oil was once present in these sands. The leases are located south of the area that experienced the complex geological history under the northern dome of the North Cook Inlet Structure and the breaching of fault seals is not anticipated in any of the Kitchen Lights leases. This concept is supported by the fact that the ARCO North Foreland St. #1 which was successfully tested in the Tyonek Deep Sunfish Sands and Channel Sands is located just 2,700' N of the Kitchen Lights leases.

**Figure 4** is a formation evaluation log illustrating the log characteristics of the main potentially productive intervals in the Tyonek Deep Sunfish Sands in the ARCO North Foreland St. #1 well. The gross Tyonek Deep Sunfish interval is around 554' thick in this well and the calculated net pay is approximately 100' thick. The reservoir interval has a calculated average porosity of around 14% and an average water saturation of around 37%. The first sand in this sequence at a depth of around 12,652' was tested at an initial rate of **1,400 BOPD** (44.2° API gravity) and **1,088 MCFGPD** naturally without stimulation.

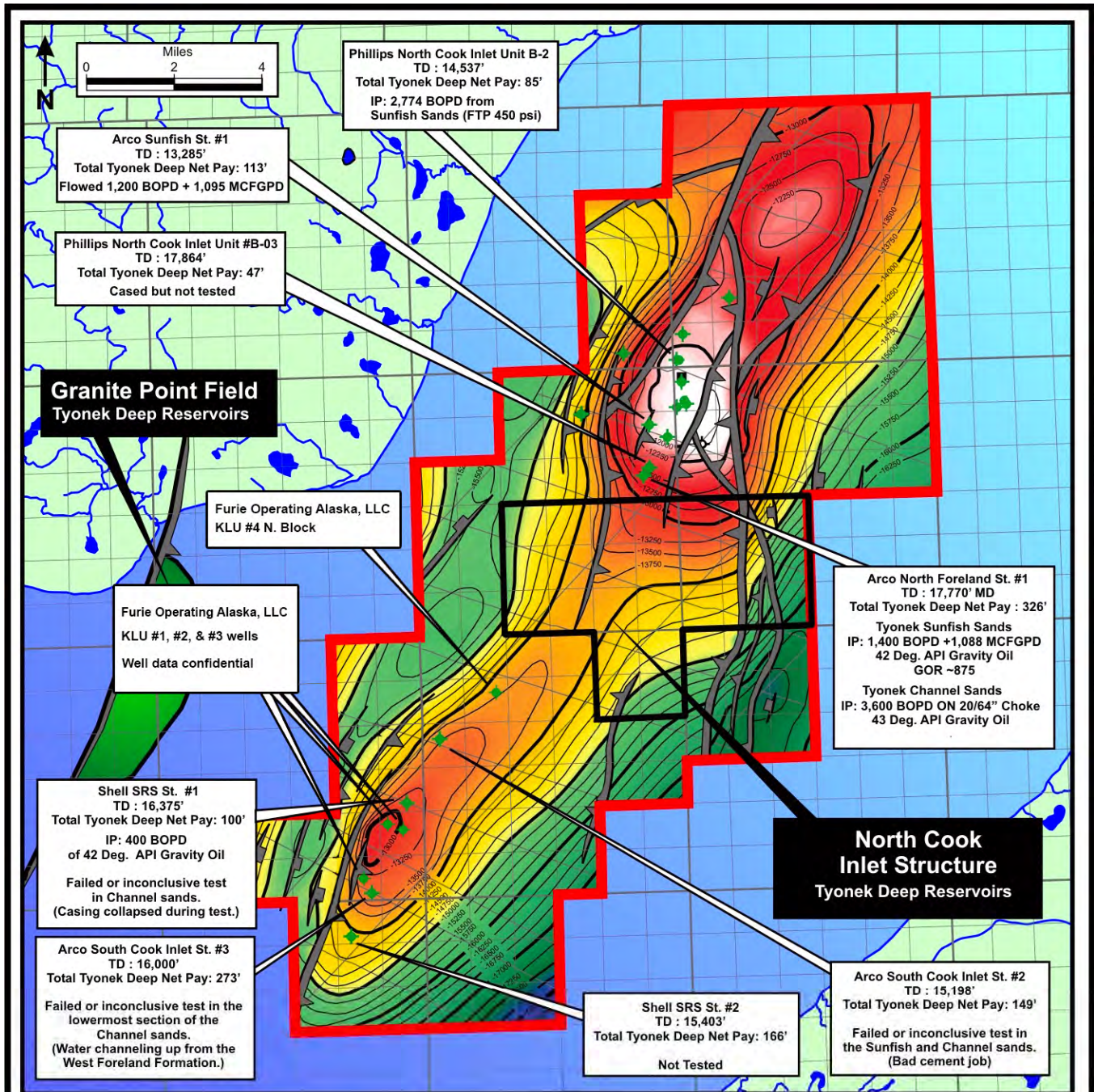
The Tyonek Deep Channel Sands show over 200' of net pay over much of the central core leases in the Kitchen Lights Area, situated on the southern flank of the northern dome of the North Cook Inlet Structure. **Figure 5** is a formation evaluation log illustrating the log characteristics of the main potentially productive intervals in the Tyonek Deep Channel Sands in the ARCO North Foreland St. #1 well. The gross Tyonek Deep Channel Sands interval is around 1,684' thick in this well and the calculated net pay is approximately 226' thick. The reservoir interval has a calculated average porosity of around 15% and an average water saturation of around 43%. The first sand in this sequence at a depth of around 13,200' was tested at an initial rate of **3,600 BOPD** (43° API gravity oil) with 9% base sediment and water. The very low true resistivity readings observed in the interval that was drill stem tested in this well (3 to 10 ohm's) are typical of the productive Tyonek Deep Channel Sands elsewhere on the North Cook Inlet Structure.

**Figure 6** is a depth structure map at near top Hemlock Sands level. This map was prepared by subtracting the combined isopach of the Hemlock and West Foreland intervals, derived from well data, from the calculated depth structure at near top Mesozoic level. This map was used to define the extent of the potentially productive area associated with the Hemlock Sands which was ascribed the area that lies within the -16,500' depth contour at near top Hemlock Sands. The potentially productive area associated with these sands is, like the Tyonek Deep Formation, affected by intense faulting and thinning and pinch-out of the sands under the northern dome of the North Cook Inlet Structure. The potentially productive area is less extensive than the potentially productive areas associated with the Tyonek Deep reservoirs and faulting at this level is more intense. Whilst it was not possible to map the reservoir sequences within the Hemlock interval from the seismic data, it was possible to clearly observe thickening of the combined Hemlock-North Foreland interval in a southerly direction away from the northern dome of the North Cook Inlet Structure.

**Figure 7** is a formation evaluation log illustrating the log characteristics of the main potentially productive intervals in the Hemlock Sands in the ARCO North Foreland St. #1 well. The gross Hemlock Sands interval is approximately 250' thick in this well and the calculated net pay is approximately 40' thick. The reservoir interval has a calculated average porosity of approximately 11% and an average water saturation of around 40%. The first sand in this sequence at a depth of around 14,870' was tested at an initial rate of **560 BOPD** (39° API gravity) with trace water.

In summary, the very significant oil and gas potential of the North Cook Inlet Structure has already been confirmed by numerous wells drilled on this prominent geological feature. The principal reservoir objectives occur at depths of 11,000' to 16,500' and frequently contain multiple pay intervals. A total of 17 wells have been drilled to depths sufficient to penetrate the Tyonek Deep reservoirs on the North Cook Inlet Structure and five of these were drilled deep enough to penetrate the Hemlock reservoirs. Fifteen of the 17 Tyonek Deep well penetrations calculated productive based on a comprehensive petrophysical analysis of the well logs and eight of these wells tested oil at initial rates of up to 3,600 BOPD per zone. All five of the Hemlock well penetrations calculated productive based on the comprehensive petrophysical analysis of the well logs and one of these wells tested oil at initial rates of up to 560 BOPD.





**North Cook Inlet Structure**  
Tyonek Deep Reservoirs

- Structure Size: 3 to 6 Miles wide X 23 Miles Long (100 Sq. Mile Area)
- Combination Structural-Stratigraphic Trap With up to 3,500' of Vertical Relief

**Granite Point Field**  
Tyonek Deep Reservoirs

- Structure Size: 1.5 miles Wide X 6 Miles long (9 Sq. Mile Area)
- 1,500' Hydrocarbon Column
- 3 Platform Development with 37 Active Producers & 23 Active Injectors
- Peak Production: 48,000 BOPD & 33 MMCFGPD in 1968
- Cum Production to Date: 137 MMBO 122 BCFG 157 MMBOE

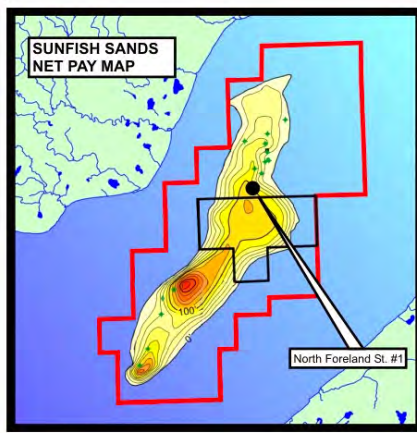
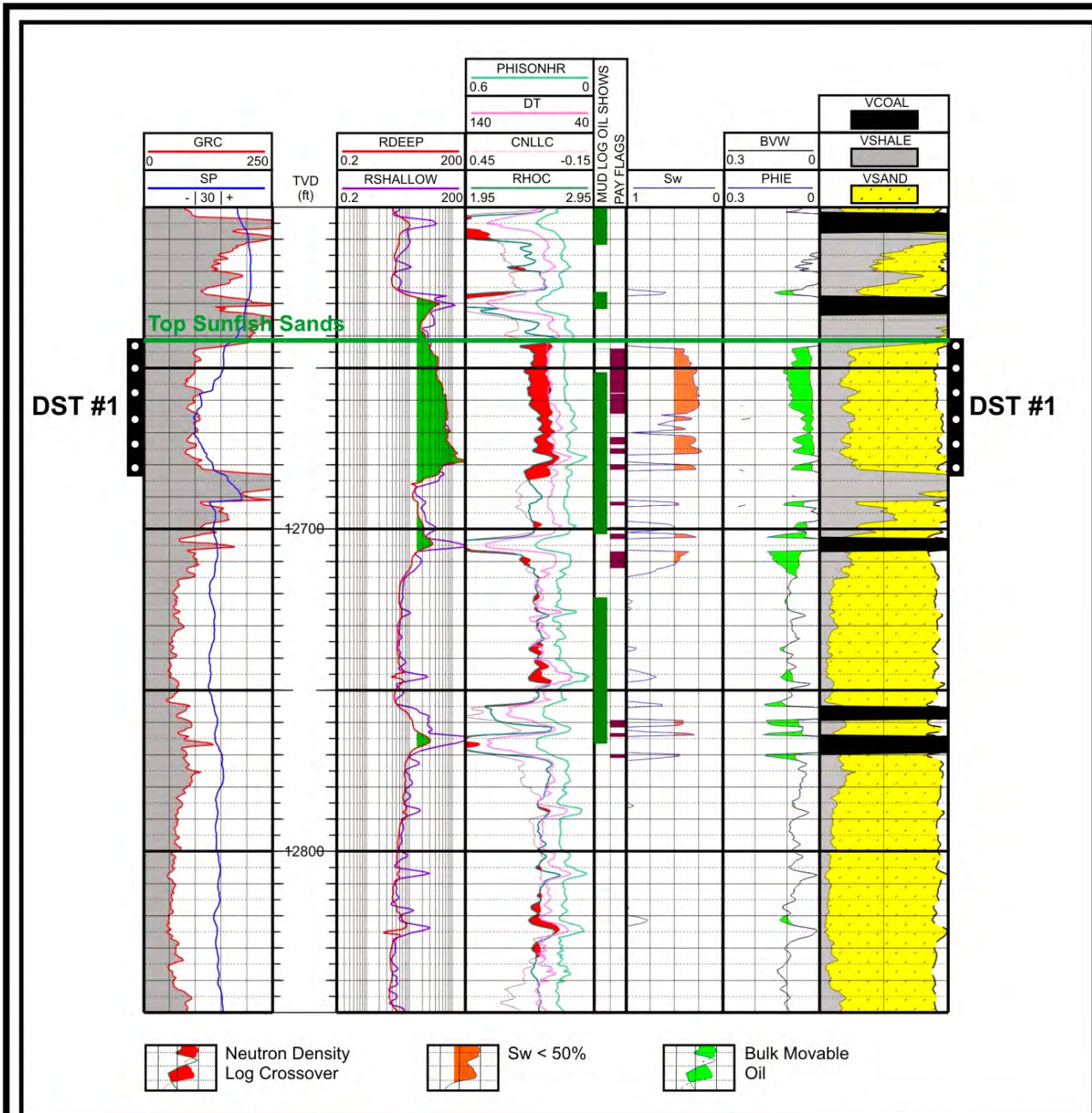
**Pro AK, LLC**

**COOK INLET BASIN, ALASKA**  
**KITCHEN LIGHTS**  
**LEASE AREA**

**TOP TYONEK DEEP**  
**SUNFISH SAND**  
**DEPTH MAP**

**FIGURE 3**



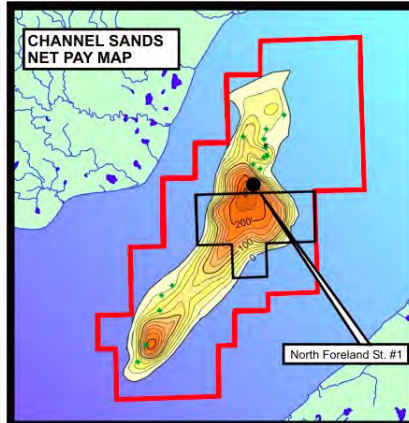
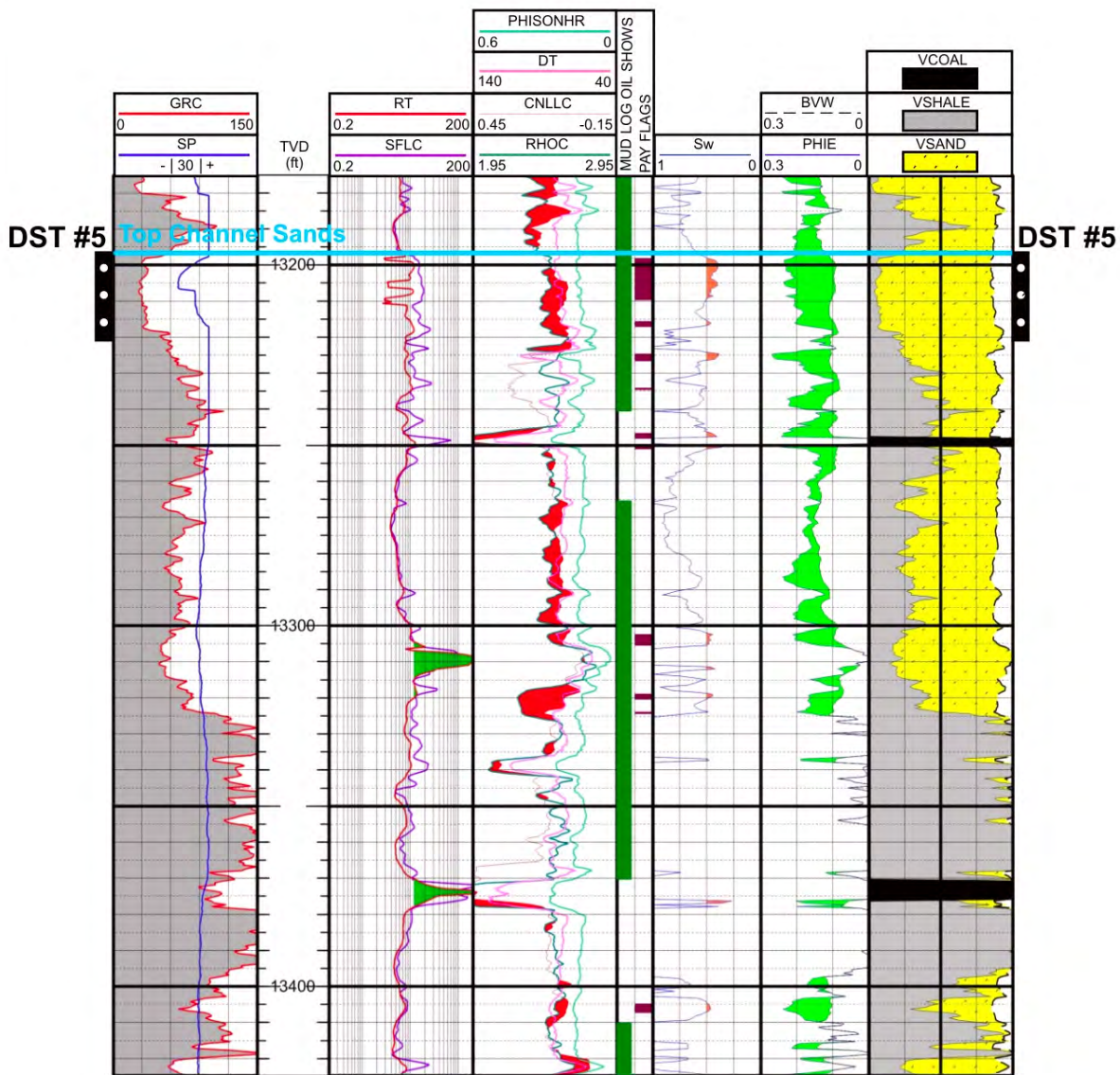


**DST #1:** 12,652-12,692' MD  
 IP: 1,400 BOPD & 1,088 MCFGPD  
 44.2 deg. API gravity oil

The Sunfish gross interval in the North Foreland St. #1 well is 554' thick, with approximately 100' of net pay. The reservoir interval has an average Ø of around 14% and an average Sw of around 37%.

**Pro AK, LLC**  
 COOK INLET BASIN, ALASKA  
**KITCHEN LIGHTS LEASE AREA**  
 NORTH FORELAND ST. #1  
 FORMATION EVALUATION LOG  
 TYONEK DEEP  
 SUNFISH INTERVAL

**FIGURE 4**



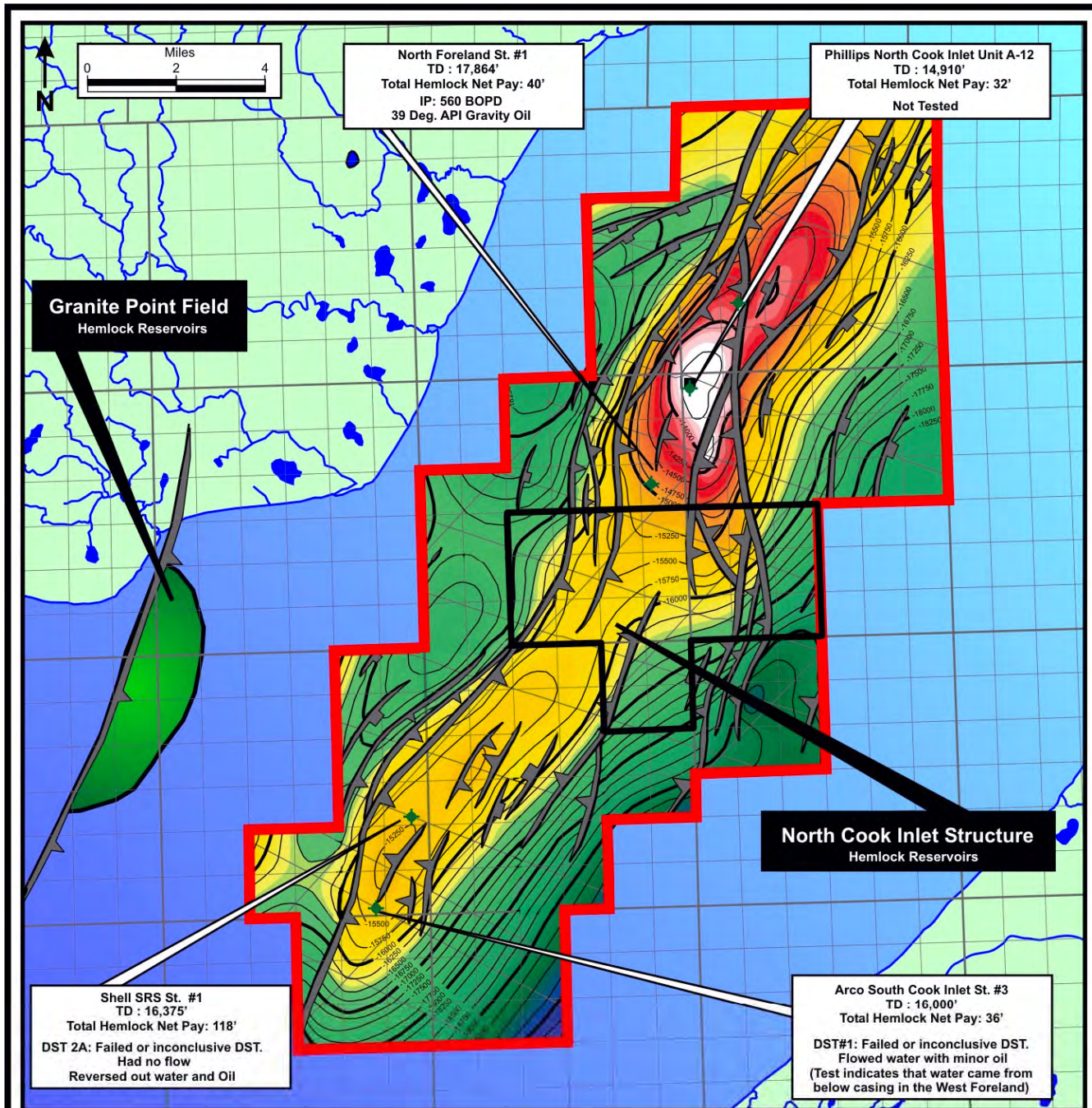
**DST #5:** 13,206-13,230' MD  
 IP: 3,600 BOPD on 20/64" Choke  
 43 deg. API gravity oil

The Channel gross interval in the North Foreland St. #1 well is 1,684' thick with approximately 226' of net pay. The reservoir interval has an average Ø of around 15%, and an average Sw of around 43%. The zone tested in DST #5 is the first sand encountered in the top of the Channel interval.

**Pro AK, LLC**  
 COOK INLET BASIN, ALASKA  
**KITCHEN LIGHTS LEASE AREA**  
**NORTH FORELAND ST. #1 FORMATION EVALUATION LOG**  
**TYONEK DEEP CHANNEL INTERVAL**

**FIGURE 5**





**North Cook Inlet Structure**  
 Hemlock Reservoirs

- Structure Size: 3 - 6 Miles wide X 23 Miles Long (100 Sq. Mile Area)
- Combination Structural-Stratigraphic Trap with up to 3,000' of Vertical Relief

**Granite Point Field**  
 Hemlock Reservoirs

- Structure Size: 1.5 miles Wide X 6 Miles long (9 Sq. Mile Area)
- Tyonek Deep Developed First
- Cum Production: 2 MMBO
- 2 Active Producers
- Peak Production: 1,789 BOPD in 1992

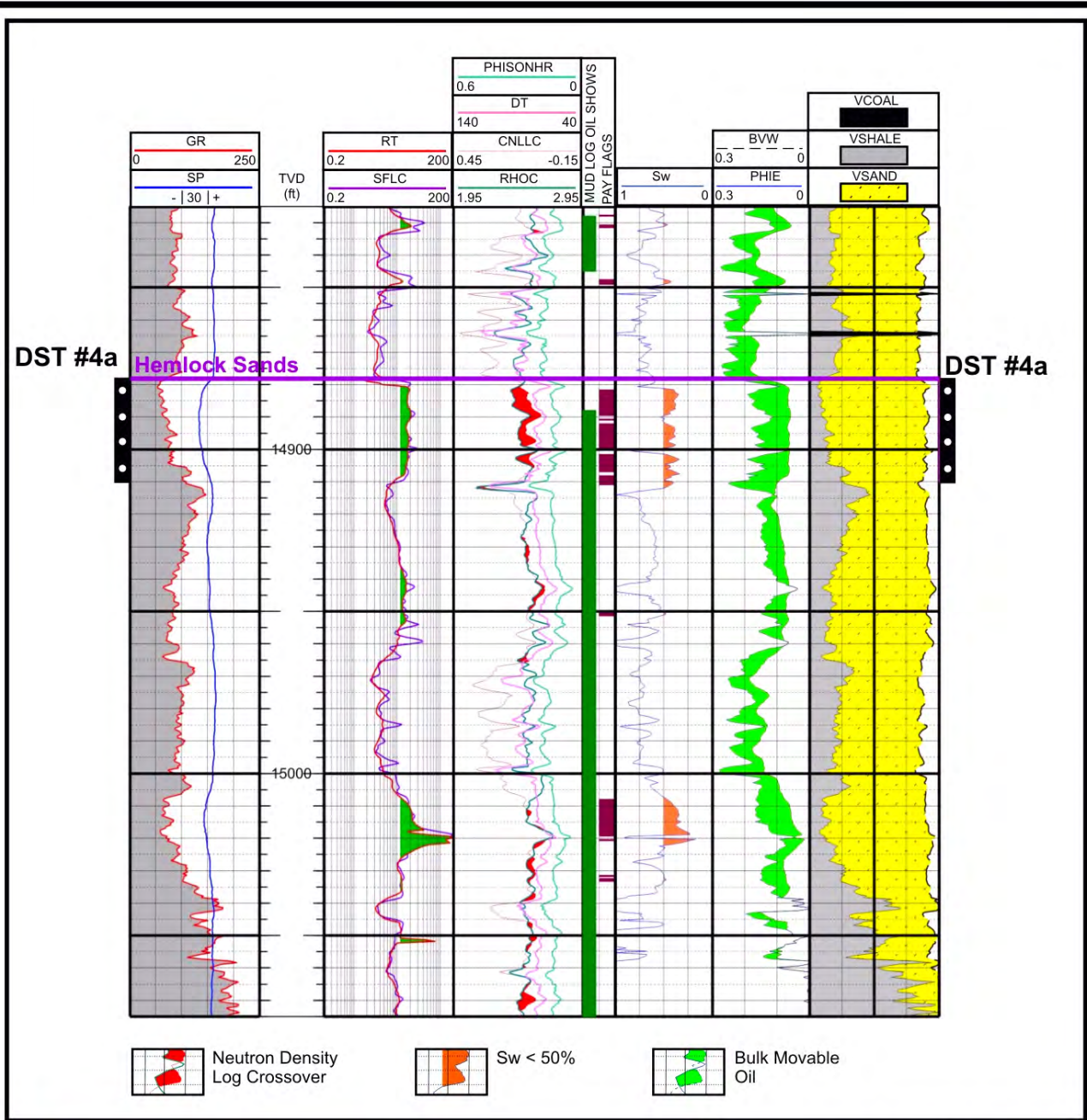
**Pro AK, LLC**

**COOK INLET BASIN, ALASKA**  
**KITCHEN LIGHTS**  
**LEASE AREA**

**TOP HEMLOCK SANDS**  
**DEPTH STRUCTURE MAP**

**FIGURE 6**





DST #4a

Hemlock Sands

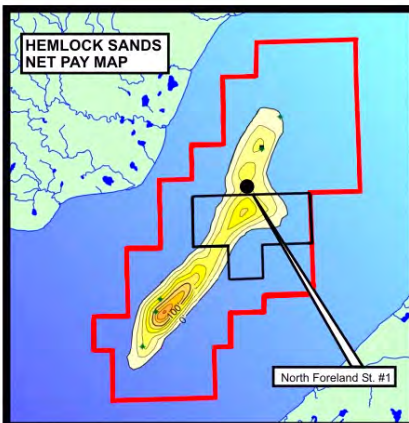
DST #4a

TVD (ft)

14900

15000

- Neutron Density Log Crossover
- Sw < 50%
- Bulk Movable Oil



**DST #4a:** 14,890-15,100' MD  
 IP: 560 BOPD + Trace water  
 39 deg. API gravity oil

The Hemlock gross interval in the North Foreland St. #1 well is 250' thick with approximately 40' of net pay. The reservoir interval has an average  $\phi$  of around 11% and an average Sw of around 40%.

**Pro AK, LLC**  
 COOK INLET BASIN, ALASKA  
**KITCHEN LIGHTS LEASE AREA**  
 NORTH FORELAND ST. #1  
 FORMATION EVALUATION LOG  
 HEMLOCK INTERVAL

FIGURE 7

## Resource Volumes Methodology

The Cobb & Associates 2019 Royalty Evaluation is based on the 2004 probabilistic evaluation of the reserves and resource volumes attributable to the net overriding royalty interest in the Kitchen Lights Area. The resource volumes were estimated using a Monte Carlo-based probabilistic model. Gross reservoir volume, net pay thickness, porosity, oil saturation, recovery factor and oil formation volume factor were input values used to generate distributions of both OOIP and recoverable oil. The governing equation used to calculate the recoverable oil volumes is as follows:

$$\text{Recoverable Oil Volume} = \frac{\text{Area} * \text{Net Pay} * [\text{Porosity} * \text{Oil Saturation}] * \text{Recovery Factor}}{\text{Oil Formation Volume Factor}}$$

Each variable is defined as follows:

- Area – This is the hydrocarbon-bearing area for each zone and each lease. The Tyonek Deep Sunfish and Channel Sands were assigned potentially productive areas of equivalent extent based on structural and stratigraphic spill levels estimated from the near top Tyonek Deep Sunfish Sands depth map and those for the Hemlock Sands were estimated using similar criteria from the near top Hemlock Sands depth map. Minimum, most likely, and maximum values were estimated for each zone and lease and used as inputs to triangular distributions in the Monte Carlo evaluation.
- Net Pay – Net pay values were mapped for each zone based on a detailed petrophysical evaluation of all available logs. Again, minimum, most likely, and maximum values were estimated for each zone and lease and used as inputs to triangular distributions in the Monte Carlo evaluation.
- Porosity \* Oil Saturation – Porosity and oil saturation were combined in this variable because of the close relationship between the two. When porosity is low, oil saturation is also expected to be low, resulting from high water saturation. Conversely, high values of porosity will be expected to be accompanied by high oil saturations. Therefore, the minimum, most likely, and maximum porosity values were multiplied by the minimum, most likely, and maximum oil saturation estimates from the log analysis, with the resulting values used as input to the triangular distribution for the Monte Carlo analysis.
- Recovery Factor – Finally, the fraction of recoverable hydrocarbon was estimated. The recovery factor variable captures both the uncertainty in recovery from rocks connected to the wellbores and the uncertainty in the continuity of the reservoir. The oil-bearing sands are vertically distributed over a large interval, suggesting that some sands may be laterally discontinuous. For this reason, a triangular distribution with wide range of recovery factors was used. The minimum value (10%) corresponds to the case of low continuity, with most recovery coming from primary depletion. The most likely value (25%) corresponds to the case of moderate continuity, with both waterflood and primary depletion contributing to recovery, while the maximum value (40%) corresponds to the case of high continuity, with waterflood displacement occurring in a majority of the reservoir.

Oil Formation Volume Factor – The reservoir volume of oil was then converted to a surface (stock tank barrel) volume of oil using an average value from tests of 1.5 reservoir barrels of oil per stock tank barrel of oil. The input values for each zone and each lease are summarized in Table 2, 3 and 4.

Using the input values for the variables in the governing equation, the Monte Carlo simulations generated distributions of both OOIP and recoverable oil by zone and by lease. Recoverable oil was only counted if the estimated recovery per well exceeded 500 MBO, a reasonable estimate of the minimum drilling target required in the Cook Inlet. The individual distributions for each zone and lease were then arithmetically summed to create an OOIP distribution and a recoverable oil distribution for the area of overriding royalty interest.

**TABLE 2. PROBABILISTIC ANALYSIS INPUTS  
TYONEK DEEP SUNFISH SANDS**

Parameters		Area (Acres)			Phi * So (%)			Net Pay (ft)	
Lease	Max.	Likely	Min.	Max.	Likely	Min.	Max.	Likely	Min.
ADL-389927	1,280	1,280	1,280	11.7%	8.2%	3.4%	100	90	80
ADL-389928	1,048	758	318	11.7%	8.2%	3.4%	90	50	10
ADL-389929	2,560	2,560	2,245	11.7%	8.2%	3.4%	100	80	60
ADL-389930	2,414	2,103	1,436	11.7%	8.2%	3.4%	90	50	10
ADL-390374	1,759	1,254	340	11.7%	8.2%	3.4%	70	45	10
ADL-390381	2,613	2,600	2,069	11.7%	8.2%	3.4%	90	50	20

**TABLE 3. PROBABILISTIC ANALYSIS INPUTS  
TYONEK DEEP CHANNEL SANDS**

Parameters		Area (Acres)			Phi * So (%)			Net Pay (ft)	
Lease	Max.	Likely	Min.	Max.	Likely	Min.	Max.	Likely	Min.
ADL-389927	1,280	1,280	1,280	9.8%	8.3%	4.9%	220	200	180
ADL-389928	1,048	758	318	9.8%	8.3%	4.9%	180	100	20
ADL-389929	2,560	2,560	2,245	9.8%	8.3%	4.9%	200	160	100
ADL-389930	2,414	2,103	1,436	9.8%	8.3%	4.9%	180	100	20
ADL-390374	1,759	1,254	340	9.8%	8.3%	4.9%	140	80	20
ADL-390381	2,613	2,600	2,069	9.8%	8.3%	4.9%	180	100	40

**TABLE 4. PROBABILISTIC ANALYSIS INPUTS  
HEMLOCK SANDS**

Parameters		Area (Acres)			Phi * So (%)			Net Pay (ft)	
Lease	Max.	Likely	Min.	Max.	Likely	Min.	Max.	Likely	Min.
ADL-389927	1,280	1,280	0	8.3%	6.5%	6.0%	35	25	15
ADL-389928	525	296	0	8.3%	6.5%	6.0%	25	15	5
ADL-389929	2,495	1,151	0	8.3%	6.5%	6.0%	35	25	15
ADL-389930	2,050	1,449	0	8.3%	6.5%	6.0%	35	20	5
ADL-390374	506	0	0	8.3%	6.5%	6.0%	15	10	5
ADL-390381	1,859	1,161	257	8.3%	6.5%	6.0%	35	20	5

## Classification

The 2019 Report include classifying all volumes as “**contingent resources**” because of the currently-uncertain development plans for the KLU, and the restriction of the evaluation to the “Central Area” leases from the 2004 Report, which includes the leases in the KLU in which Prodigy maintains an ORRI. Future reclassification of some of the contingent resources to the reserves category would occur once Furie provides a technical description of the exploration well results and commits to a development plan for some portion of this acreage. The volumes presented in this report result from the evaluation of the contingent resources for the interest of Prodigy in certain oil properties located the Cook Inlet, Alaska, consistent with the 2018 update to the petroleum industry’s “Petroleum Resources Management System”.

Even though the current classification has changed, the estimated recoverable volumes have not. In 2004 the recoverable volumes were categorized as to their reserves status, based on the 2004 Society of Petroleum Engineers/World Petroleum Council (SPE/WPC) “Petroleum Reserves Definitions”. The recoverable volumes having a greater than 90 percent chance of occurring (the P<sub>90</sub> volume) were classified as **Probable Reserves**, in accordance with the SPE/WPC criteria that “Probable Reserves” may include (1) reserves anticipated to be proved by normal step-out drilling”. In the 2019 report this is considered to be higher-probability contingent resource case (**the C1 case**). And represents a one-platform development.

The 2004 P<sub>50</sub> volumes were classified as “**Probable plus Possible Reserves**”, because the additional volumes will depend on confirmation that economically recoverable oil exists throughout the Kitchen Lights Lease acreage. In the 2019 report this is the middle-probability (**C1+C2 case**). And includes the additional production from a second platform.

The 2004 P<sub>10</sub> recoverable volumes were classified as “**Probable plus Possible plus Resource**”, because the additional volumes will depend on a number of the uncertainties (such as area, oil saturation, and porosity) turning out to be favorable. In the 2019 report, this is the lower-probability (**C1+C2+C3 case**). And includes additional production from both platforms resulting from better-than-expected production rates.

Delineation of the Kitchen Lights Area acreage will greatly reduce the uncertainty in recoverable volumes, and, if successful, will likely move significant volumes of oil currently classified as **Contingent Resources** to the **Proved Undeveloped Reserves** category in the Kitchen Lights Area. ” Once a commitment to development is made, the corresponding reserves (as calculated with the consideration of the well test results, logs, and all other data, such as 3D seismic data, available at that time) associated with the scope of that planned development would be reclassified as **Proved Undeveloped**”.



## Acreage Volumes

In 2004 Cobb & Associates has prepared a reserve evaluation of the Kitchen Lights Area for the Tyonek Deep and Hemlock Sands. Based on this evaluation, there are approximately **301.6 MMBO** and **127.46 BCFG** of resource potential attributable to the overriding royalty interest within the Kitchen Lights Area. The potentially recoverable oil and gas volumes attributable to Kitchen Lights interests have been re-stated but reclassified to contingent resources by Cobb & Associates in July 2019.

The Kitchen Lights Area of development is shown in **Figure 8**. The development area comprises 6 leases of overriding royalty interest (ADL-389927, ADL-389928, ADL-389929, ADL-389930, ADL-390381 and ADL-390374).

Recoverable oil per producer was estimated for the Kitchen Lights Area based on the 230 acres per producer well density observed at Granite Point (a producing field from the same zones located 6 to 10 miles west of Kitchen Lights Area, although only a fraction of the size of the North Cook Inlet Structure it has produced over **156 MMBO** to-date. The estimated OOIP and potentially recoverable oil volumes associated with each development area are summarized in Tables 5, 6, 7 and 8.

**TABLE 5. OOIP AND RECOVERABLE OIL VOLUMES  
TYONEK DEEP SANDS AND HEMLOCK SANDS (ALL CONTINGENT RESOURCES)**

Development Area	Gross OOIP (MBO)			Gross Recoverable Oil (MBO)		
Lease Area	P <sub>90</sub> Case or C1	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case or C1+C2+C3	P <sub>90</sub> Case	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case or C1+C2+C3
ADL-389927	115,962	156,077	190,654	22,899	36,054	55,575
ADL-389928	20,450	41,268	71,299	2,965	9,722	18,202
ADL-389929	171,430	238,567	310,697	34,331	56,288	87,631
ADL-389930	65,688	123,629	194,174	13,402	28,138	52,042
ADL-390374	24,459	50,814	89,012	3,652	12,072	22,935
ADL-390381	96,069	156,179	239,205	19,655	35,165	65,117
<b>All Areas</b>	P <sub>90</sub> Case or C1	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case or C1+C2+C3	P <sub>90</sub> Case	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case or C1+C2+C3
Total	494,058	766,534	1,095,041	96,904	177,439	301,509

Note: Totals may not exactly match due to rounding.

**TABLE 6. OOIP AND RECOVERABLE OIL VOLUMES  
TYONEK DEEP SUNFISH SANDS**

Development Area	Gross OOIP (MBO)			Gross Recoverable Oil (MBO)		
Lease Area	P <sub>90</sub> Case or C1	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case	P <sub>90</sub> Case or C1	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case or C1+C2+C3
ADL-389927	32,092	46,660	59,797	6,969	11,366	16,827
ADL-389928	6,233	12,874	23,200	0	3,160	6,116
ADL-389929	52,989	77,898	104,182	11,688	18,723	28,583
ADL-389930	19,870	38,496	61,813	4,375	9,410	16,363
ADL-390374	8,133	17,214	30,788	0	4,112	7,982
ADL-390381	29,173	49,172	77,749	6,320	11,603	21,310
<b>All Areas</b>	<b>P<sub>90</sub> Case or C1</b>	<b>P<sub>50</sub> Case or C1+C2</b>	<b>P<sub>10</sub> Case</b>	<b>P<sub>90</sub> Case or C1</b>	<b>P<sub>50</sub> Case or C1+C2</b>	<b>P<sub>10</sub> Case or C1+C2+C3</b>
Total	148,490	242,314	357,529	29,352	58,374	97,181

Note: Totals may not exactly match due to rounding.

**TABLE 7. OOIP AND RECOVERABLE OIL VOLUMES  
TYONEK DEEP CHANNEL SANDS**

Development Area	Gross OOIP (MBO)			Gross Recoverable Oil (MBO)		
Lease Area	P <sub>90</sub> Case or C1	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case or C1+C2+C3	P <sub>90</sub> Case or C1	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case or C1+C2+C3
ADL-389927	80,361	101,640	118,980	15,930	24,688	35,495
ADL-389928	13,561	26,952	45,640	2,965	6,561	12,086
ADL-389929	113,948	150,485	188,934	22,643	36,848	54,437
ADL-389930	42,698	77,405	118,238	9,026	18,728	32,039
ADL-390374	16,237	33,090	56,959	3,652	7,960	14,953
ADL-390381	63,255	99,508	148,487	13,335	23,562	40,399
<b>All Areas</b>	<b>P<sub>90</sub> Case or C1</b>	<b>P<sub>50</sub> Case or C1+C2</b>	<b>P<sub>10</sub> Case or C1+C2+C3</b>	<b>P<sub>90</sub> Case or C1</b>	<b>P<sub>50</sub> Case or C1+C2</b>	<b>P<sub>10</sub> Case or C1+C2+C3</b>
Total	330,060	489,080	677,238	67,551	118,347	189,409

Note: Totals may not exactly match due to rounding.

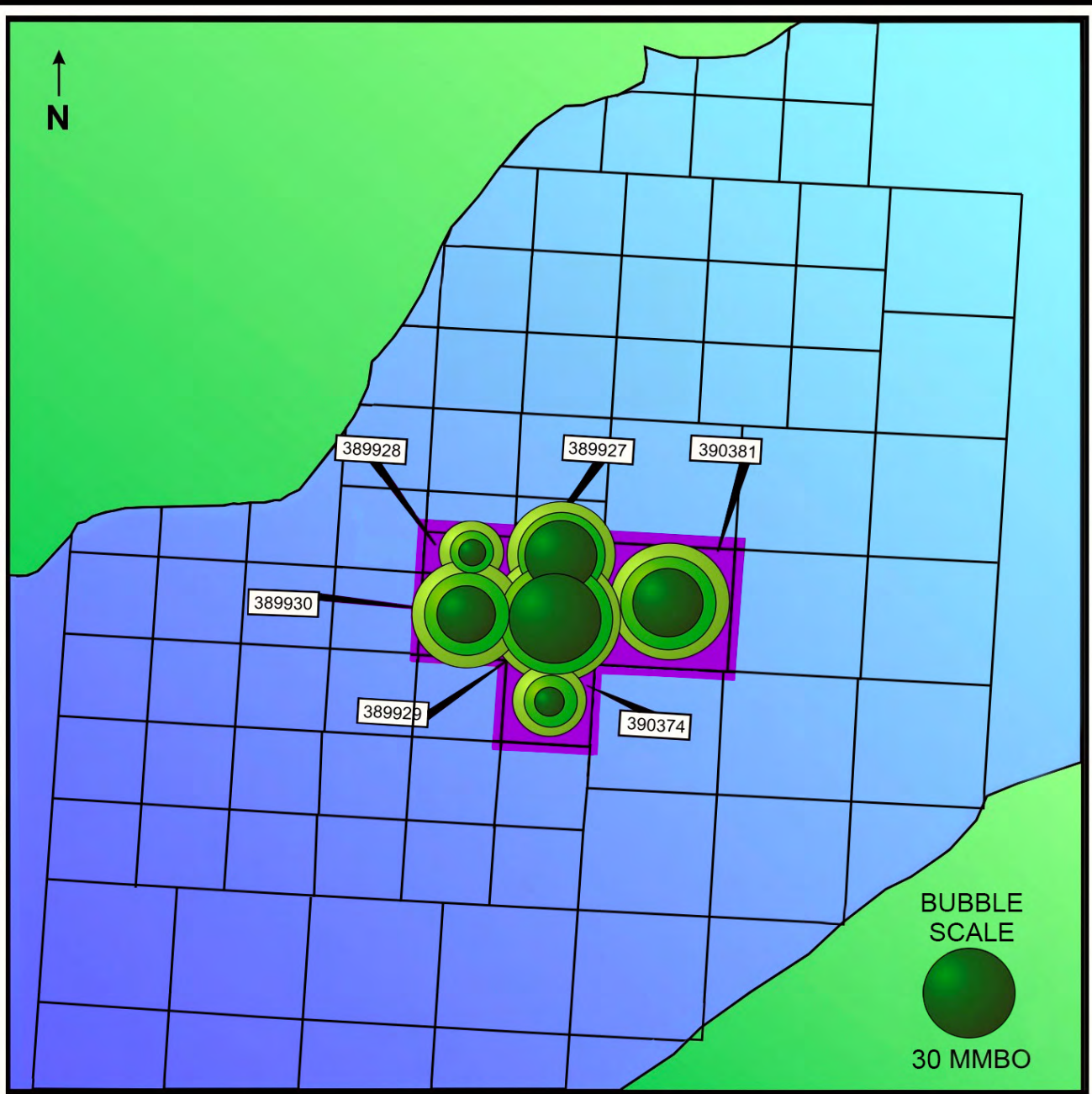
**TABLE 8. OOIP AND RECOVERABLE OIL VOLUMES  
HEMLOCK SANDS**





Development Area	Gross OOIP (MBO)			Gross Recoverable Oil (MBO)		
	P <sub>90</sub> Case or C1	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case or C1+C2+C3	P <sub>90</sub> Case or C1	P <sub>50</sub> Case or C1+C2	P <sub>10</sub> Case or C1+C2+C3
<b>Northern Area</b>						
ADL-389927	3,509	7,777	11,877	0	0	3,253
ADL-389928	657	1,443	2,458	0	0	0
ADL-389929	4,493	10,184	17,582	0	718	4,611
ADL-389930	3,121	7,729	14,122	0	0	3,641
ADL-390374	89	510	1,265	0	0	0
ADL-390381	3,641	7,499	12,969	0	0	3,409
<b>All Areas</b>						
Total	15,510	35,142	60,273	0	718	14,914

Note: Totals may not exactly match due to rounding.

A minimum recoverable oil volume threshold per well was applied to the calculated OOIP figures. Only those potentially recoverable oil volumes in excess of 500 MBO per well were included in the gross recoverable oil volumes. **Figure 8** is a bubble map showing the distribution of recoverable oil volumes by category and lease for the acreage within the Kitchen Lights Area. Figures 10 and 11 are pie charts showing a more detailed distribution of recoverable oil volumes by category and lease. These figure illustrate that in all cases the overwhelming majority (>90%) of the potentially recoverable oil volumes attributable to the acreage within the Kitchen Lights Area are located on the North Block within the Central Development Area.

It is estimated that the leases and overriding royalty interest contain approximately 30% of the oil volumes that may be potentially recovered from the Tyonek Deep and Hemlock Sands in the North Cook Inlet Structure as a whole. Significant oil volumes are also expected to be recovered from ConocoPhillips' and Furie Alaska, LLC acreage, located at the northern and southern ends of this structure. The range in oil volumes that may be recovered from the Tyonek Deep and Hemlock for the entire North Cook Inlet Structure are estimated to be in the region of 250 MMBO to 900 MMBO.



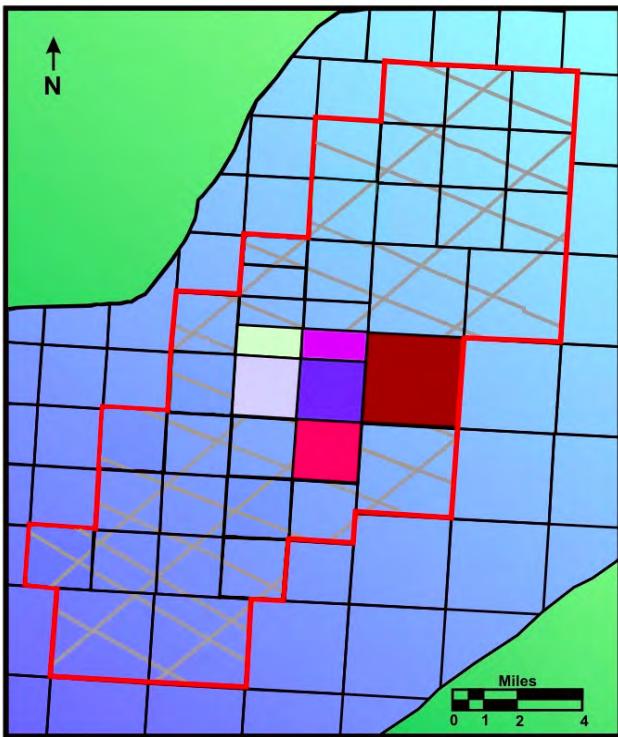
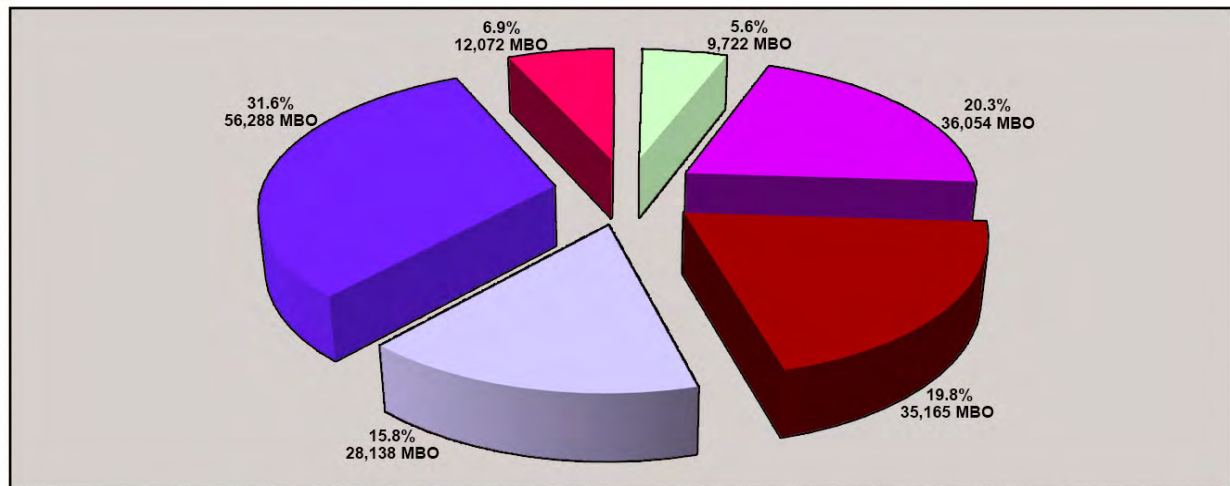
	PRO AK LEASE AREA
	P <sub>90</sub> CASE BUBBLES
	P <sub>50</sub> CASE BUBBLES
	P <sub>10</sub> CASE BUBBLES







**Pro AK, LLC**  
 COOK INLET BASIN, ALASKA  
**KITCHEN LIGHTS**  
**LEASE AREA**




DISTRIBUTION OF  
 RECOVERABLE OIL VOLUMES  
 BUBBLE MAP

FIGURE 8

$P_{90}=C_1, P_{50}=C_1+C_2, P_{10}=C_1+C_2+C_3$



	ADL-389928	9,722 MBO	5.6%
	ADL-389927	36,054 MBO	20.3%
	ADL-390381	35,165 MBO	19.8%
	ADL-389930	28,138 MBO	15.8%
	ADL-389929	56,288 MBO	31.6%
	ADL-390374	12,072 MBO	6.9%

-  COLOR CODED NORTHERN LIGHTS LEASES
-  NORTHERN LIGHTS PROJECT GEOGRAPHIC AREA
-  SEISMIC

**Pro AK, LLC**  
**COOK INLET BASIN, ALASKA**  
**KITCHEN LIGHTS**  
**LEASE AREA**

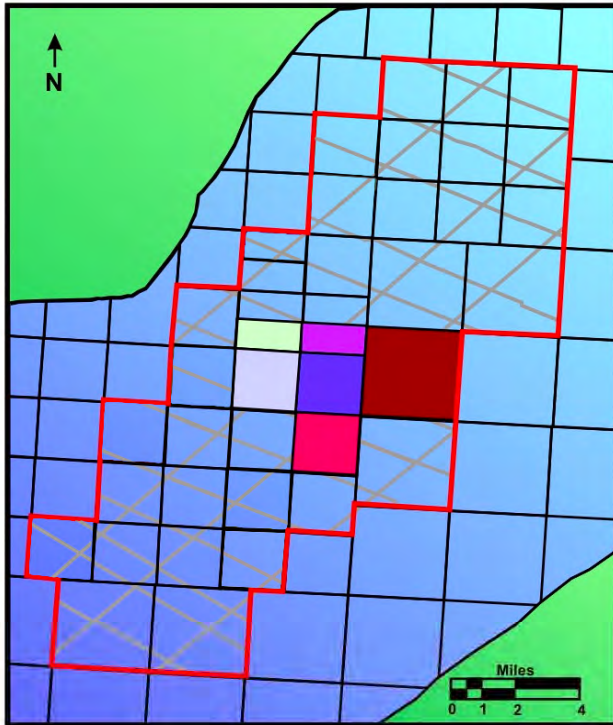
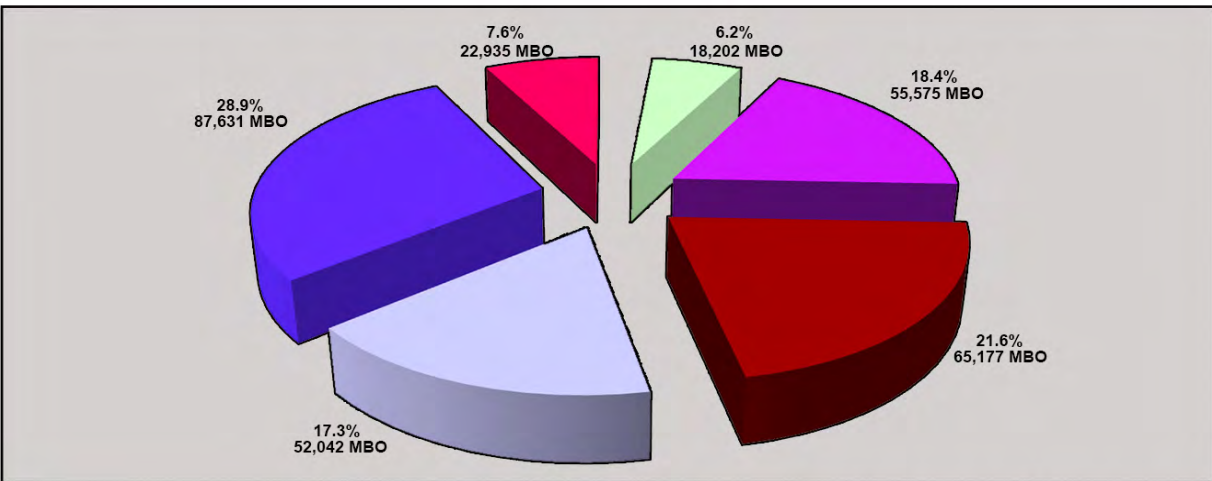
**DISTRIBUTION OF**  
**RECOVERABLE OIL VOLUMES**  
**BY LEASE PIE CHART**

**P<sub>50</sub> CASE**




**FIGURE 10**

**C1+C2**





ADL-389928	18,202 MBO	6.2%
ADL-389927	55,575 MBO	18.4%
ADL-390381	65,177 MBO	21.6%
ADL-389930	52,042 MBO	17.3%
ADL-389929	87,631 MBO	28.9%
ADL-390374	22,935 MBO	7.6%

-  COLOR CODED NORTHERN LIGHTS LEASES
-  NORTHERN LIGHTS PROJECT GEOGRAPHIC AREA
-  SEISMIC

**Pro AK, LLC**  
**COOK INLET BASIN, ALASKA**  
**KITCHEN LIGHTS**  
**LEASE AREA**

DISTRIBUTION OF  
 RECOVERABLE OIL VOLUMES  
 BY LEASE PIE CHART

**P<sub>10</sub> CASE**

FIGURE 11

**C1+C2+C3**