

A History of Bureau of Mines  
Oil & Gas Resource Investigation  
In Alaska With an Index of

Published & Unpublished  
Reports Containing Information  
on Alaskas Oil & Gas Resources  
1920 - 1974

Prepared By January 1975  
Donald P. Blasko  
Petroleum Engineer  
Anchorage Field Office

State of Alaska / DNR  
Division of Geological &  
Geophysical Surveys  
3354 College Road  
Fairbanks, AK 99709-3707  
ADGGS Library



**Title:**

A history of Bureau of Mines oil & gas resources investigations in Alaska : with an index of published and unpublished reports containing information on Alaska's oil & gas resources, 1920-1974 / prepared by Donald P. Blasko.

1975

Place Hold

**Author:**

Blasko, Donald P.

**Publisher:**

[Anchorage, Alaska?] : U.S. Bureau of Mines, 1975.

**Subjects:**

Petroleum--Alaska.

Natural gas--Alaska.

**Description:**

[17] leaves ; 28 cm.

**Notes:**

"List of pertinent reports containing oil & gas information relative to Alaska": leaves [13]-[17].

**Other Name:**

United States. Bureau of Mines.

Library	Call Number	Status
ARLIS, General Collection	TN872.A7B55 1920-1974	Book : Available
ARLIS, General Collection	TN872.A7B55 1920-1974	Book : Available

U.S. BUREAU OF MINES

A HISTORY OF BUREAU OF MINES OIL & GAS RESOURCE INVESTIGATIONS

IN ALASKA WITH AN INDEX OF PUBLISHED AND UNPUBLISHED REPORTS

---

CONTAINING INFORMATION ON ALASKA'S OIL & GAS RESOURCES

1920 - 1974

State of Alaska / DNR  
Division of Geological &  
Geophysical Surveys  
3354 College Road  
Fairbanks, AK 99709-3707  
ADCGS Library

Prepared by

Donald P. Blasko  
Petroleum Engineer  
Anchorage Field Office

January, 1975

## CONTENTS

	<u>Page</u>
Early Days	1
Naval Petroleum Reserve No. 4	2
Anchorage Field Office	4
Crude Oil Analysis	4
Natural Gas Analysis	5
Nationwide Studies	6
Alaska Minerals Yearbook Chapter	7
Land Use Planning Commission	8
Energy Programs	9
Ongoing Activity	9
List of Pertinent Reports	11

## EARLY DAYS

The U.S. Bureau of Mines has been involved in the oil and gas activity of Alaska since the early 1920's, at which time the first oil boom of the State was manifest in the form of production from the Katalla oilfield and exploration on the Alaska Peninsula. In 1922, H.C. George, an oil recovery engineer with the Bureau located in Oklahoma reported on his field investigations of the Alaska oil fields<sup>(1)</sup><sup>1</sup>. In what was probably an unpublished manuscript meant for a technical journal, George described the topography, geography, vegetation, climate and oil possibilities as well as activity in the Katalla and Yakataga areas as well as the Iniskin Peninsula area and the Puale Bay area (which was then referred to as the Cold Bay area).

Among the conclusions reached by George as a result of his investigations were that "faults or igneous intrusions, ... may have permitted the escape of most of the oil formerly held in the structures." He also observed that "the present petroleum production of Alaska is all from the District which has the least favorable surface indications." His reference here is to the Katalla area and the lush growth of timber and vegetation which surround the area which obscures the geologic conditions existing at the surface.

---

1. Underlined numbers in parentheses refer to the list, at the end of this report, of pertinent publications in which information on Alaskan oil and gas resources is found.



## NAVAL PETROLEUM RESERVE NO. 4

Oil exploration activity in Alaska practically ceased after the refinery burned down at Katalla in 1933. During <sup>1943</sup>~~that~~ year a Bureau mining engineer, (Norman Ebbley, Jr.) led a party (Dr. Henry Joesting, Territorial Department of Mines, and Capt. Henry Thomas, U.S. Army Engineers) in a three week survey of reported oil seeps and occurrences within Naval Petroleum Reserve No. 4 on the North Slope of the Brooks Range. It was on the basis of the descriptions of seeps at such places as Umiat Mountain, Fish Creek, Cape Simpson, Dease Inlet, Ungoon Point and the White Mountain area that encouraged the Navy to undertake the exploration program that began in 1944. Published <sup>(2)</sup>~~and unpublished~~ <sup>(3)</sup> accounts resulted from the Bureau-led endeavor. In what was then a logical conclusion which was to come to pass as prophesy in the current North Slope activities, Ebbley stated in one of his reports:

"Exploring and developing northern Alaska oil fields will be neither a simple nor a pleasant task. The job is big and will take careful planning and years of hard, bitter work under almost impossible conditions."

He also noted:

"It will mean certain failure to plow blindly into this work with scores of men and tons of equipment. It will take careful supervising and managing by men familiar with the climate and topography of northern Alaska."

During the time of the exploration of Naval Petroleum Reserve No. 4, Bureau of Mines engineers became involved from time to time doing research work for the Navy. Because of unusual reservoir condi-

tions and difficulties encountered in drilling and completing the wells at Umiat, the Department of Navy asked the Bureau of Mines to make laboratory studies of the reservoir sand to determine the cause of well plugging and to provide laboratory information to be used as an aid in estimating oil recovery from frozen reservoir rocks under solution-gas expansion from low-saturation pressure conditions. Work on this project was done at the Bureau's petroleum research station in Laramie, Wyoming and the results published in various publications<sup>(4)</sup>.

Also, an evaluation was made by the Bureau of Mines of the effect of clay-water, brine and oil-base drilling fluids on the productivity capabilities of test wells drilled on the Umiat anticline.

---

This work was done by the Bureau's laboratory and petroleum engineers in San Francisco<sup>(5)</sup>.

An engineering evaluation was made of the recoverable petroleum reserves in the Umiat structure by engineers at the Bureau's Laramie, Wyoming facility. These results were transmitted to the Navy and later released to the public<sup>(6)</sup>.

In 1953, then Territorial Governor of Alaska F.B. Heintzleman requested the U.S. Bureau of Mines to study the feasibility of transporting natural gas from the Gubik field, discovered by the Navy, to Fairbanks, Anchorage, and the railbelt area. Once again engineers at the San Francisco facility performed the work. The

results were submitted to the Territorial Government, but probably were never released in a public publication<sup>(8)</sup>.

#### ANCHORAGE FIELD OFFICE

From the time of completion of the Navy's work in NPR No. 4 in 1952 to 1957 the Bureau's involvement in petroleum activity in Alaska was minimal, as was industry's activity itself. The Bureau again "awakened" to the petroleum activity in Alaska in 1958 following the discovery of oil at Swanson River. The resource evaluation projects concerning oil and natural gas at that time were handled by petroleum engineers in the Laramie station until 1964. At that time, the decision was made to station a Bureau petroleum engineer full-time in Alaska. In order to establish communication with industry, the office was established in Anchorage where industry is stationed instead of Juneau, where the Bureau has its headquarters office.

#### CRUDE OIL ANALYSIS

The Bureau of Mines attempts to obtain samples of crude oils from all producing areas in the world. These oils are analyzed and the analyses are used in studies of the relationships of crude oil composition and stratigraphy as well as in determining the refining characteristics of oil. To this extent, the Bureau's program in Alaska has included this sample collection and analy-



zation activity. To date, excluding work already done in NPR No. 4, the Bureau has analyzed all oils from all producing formations in the Cook Inlet Basin. In most cases, at least one sample was obtained from each field in the Inlet and on the Kenai Peninsula, including the non-productive Redoubt Shoal field. Analyzations have also been performed on the condensate produced from the Kenai Deep gas unit and the North Cook Inlet gas field as well as from two wildcat wells having oil shows but which were eventually plugged and abandoned in the Inlet. Information obtained from a study of the fields and the crude oil produced on the Kenai Peninsula and offshore Cook Inlet was published in 1972<sup>(9)</sup>.

---

Several analyses of crudes from the North Slope have been completed, but to date have not been published formally. This data is available to anyone interested and can be obtained by visiting the Anchorage Field Office or contacting the petroleum engineer.

#### NATURAL GAS ANALYSIS

The Bureau also began a natural gas analyzation program a number of years ago which continues to the present time and which the Alaskan Bureau activity participates in. Initially, collection of samples and publication of analysis results were written to present the results of gas analysis made by the Bureau of Mines

program of continuous survey for the occurrence of helium in natural gas. In 1961, the Bureau started publishing data on all gas samples collected and analyzed during the calendar year and has continued to do so. This has been a function of the Bureau of Mines Helium function located at Amarillo, Texas. To date (circa 12-74), twelve of the publications dealing with natural gas analyses contain information on Alaska gases<sup>(10)</sup>.

In addition, as part of the Bureau's concern with the overall energy resources of Alaska, an open-file report dealing with natural gas fields and natural gas analyses exclusively in the Cook Inlet area was released in 1974<sup>(11)</sup>.

---

#### NATIONWIDE STUDIES

Although the petroleum program of the Bureau's Alaskan office deals mainly with Alaskan activities, from time to time information is provided for Bureau projects which are nationwide in scope. Several reports have been issued in which data from Alaska can be compared to similar type information relative to producing areas of the Lower 49<sup>(12)</sup>. In particular, Alaskan data has been obtained on natural gas liquids in order to define the importance to the resource base and the economy of the individual areas of the nation; heavy oil deposits in Alaska were identified to determine reserves according to feasibility of recovery and their rela-

tionship to the energy base of the nation; classification of oil producing reservoirs as to producing, stripper or marginal in order to develop a better knowledge of known petroleum resources; and developing and analyzing costs of oil field operations to determine representative costs of developing and recovering crude oil in each principal producing area of the Nation.

During the late 60's, the Alaska petroleum office of the Bureau provided information on the effects of oil industry operations in the Kenai National Moose Range as a part of a nationwide project on national mineral resource extraction and land use conflicts. Years later, the information was expanded and updated, and a technical presentation was prepared for the Environmental Quality Conference for the Extractive Industries of the American Institute of Mining, Metallurgical and Petroleum Engineers which was held in Washington, D.C. (13).

#### ALASKA MINERALS YEARBOOK CHAPTER

Way back at the inception of a full time petroleum based position in Alaska in the early 60's, a basic responsibility of the position was to develop data on oil and gas activities to be included in the Alaska Chapter of the Bureau of Mines Minerals Yearbook. From 1965 until 1970, when the statistical function of minerals activity in the State was transferred from the field to the



Washington headquarters office, the petroleum engineer's contribution relative to the petroleum activities in the State merited a co-authorship for the minerals Chapter<sup>(14)</sup>. Although the Yearbook function is no longer a field responsibility, the Chapter author continues to rely heavily on the Alaska petroleum office for significant activity, and for completeness and correctness of information contained in the Chapter.

#### LAND USE PLANNING COMMISSION

In 1971, the President of the United States signed into law Public Law 92-203, the Alaska Native Claims Settlement Act (ANCSA). ~~As a result of the creation of the Joint State-Federal~~ Land Use Planning Commission authorized by ANCSA, the Bureau of Mines came to play an important part on the Resource Planning Team of the Land Use Planning Commission by compiling information for a statewide resources inventory. Vast quantities of petroleum and natural gas information were submitted to the Resource Planning Team for its preparation of a formal report encompassing all resources. Reports on all of the possible petroleum provinces of Alaska were prepared describing the geology of the petroleum province, the occurrence of surface indications of any exploration that may have taken place, production history, land status, leasing activities and any other pertinent information along with a list of references of information contained in the

literature. As a result of this activity much information now exists in file form which will be useful in future petroleum project work. Some oil and gas related information that resulted from this cooperative venture has already been published by the Bureau<sup>(15)</sup>. All of the information thus gathered was later extremely useful when reviewing Interior and Agriculture agency environmental statements for plans for the 80-million acres of land withdrawn for parks, forests, and wildlife refuges under section 17 D.2 of ANCSA. Continuing appraisal of all facets of the energy potential of the State is helpful when considering inter-resource potential of the State<sup>(16)</sup>.

---

#### ENERGY PROGRAMS

The petroleum program of the Bureau of Mines in Alaska has become so far reaching as to be presently encompassed by an energy program. Cost data for equipment and operations for drilling and producing geothermal wells in Alaska were derived and utilized for the preparation of a manuscript which will soon be released by the Bureau as an Information Circular<sup>(17)</sup>.

#### ONGOING ACTIVITY

At the present time, it would appear that the petroleum program has come full-cycle in Alaska; i.e. oil seep investigations.

Emphasis has been placed for the past field seasons in locating, observing and sampling oil, gas, and water from naturally occurring seeps on the Alaska Peninsula and the north-central Gulf of Alaska area. Results of these investigations, which will help establish base line data on natural pollution as well as potential hydrocarbon resource areas, will be published<sup>(18)</sup> by the Bureau of Mines as soon as possible so that factual data will be available to the industry and the general public prior to any offshore lease sales or transmission of North Slope crude oil by tanker from Valdez to northwest United States ports.

---



LIST OF PERTINENT REPORTS

containing

---

Oil & Gas Information Relative to Alaska

1. United States Bureau of Mines "A Preliminary Investigation of the Alaska Oil Fields." 1922. H.C. George, Oil Recovery Engineer
2. United States Department of the Interior, Bureau of Mines War Minerals Report 258 "Oil Seepages of the Alaska Arctic Slope" 1944.
3. The Oil Weekly, February 4, 1946. "Oil in Alaska - A Report on an Expedition to the Far North to Locate Rumored Seeps and Secure Samples" Capt. Henry Thomas, Corps of Engineers, U.S. Army, Inactive.

Mining and Metallurgy, September 1944. "Oil Seepages on the Alaskan Arctic Slope" Norman Ebbley Jr., Mining Engineer, U.S. Bureau of Mines.

U.S. Department of the Interior, Bureau of Mines (in cooperation with the Interstate Oil Compact Commission) Monograph 12 "Surface and Shallow Oil-Impregnated Rocks and Shallow Oil Fields in the United States" Compiled by Ball Associates, Ltd. 1965.

- 
3. United States Department of Interior, Bureau of Mines "Report of Investigation of Petroleum Seepages - Arctic Slope Area, Alaska" Norman Ebbley, Jr., Mining Engineer U.S. Bureau of Mines and Henry R. Joesting, Assoc. Mining Engineer, Territorial Department of Mines. October, 1943.

Territorial Department of Mines "Notes on Northern Alaska Supplementing Report of Investigation of Petroleum Seepages, Arctic Slope, Alaska, 1943." Henry R. Joesting, Assoc. Mining Engineer. November, 1943.

U.S. Bureau of Mines. "Alaska's Arctic Oil Reserve - Melodrama or Farce?" Norman Ebbley, Jr. Mining Engineer. January, 1944.

4. U.S. Bureau of Mines Report of Investigations 5642, "Oil Recovery and Formation Damage in Permafrost, Umiat Field, Alaska". Oren C. Baptist. 1960.

Society of Petroleum Engineers of AIME. Technical Note 2045. "Oil Production from Frozen Reservoir Rocks, Umiat, Alaska." Oren C. Baptist, 1959.

5. U.S. Bureau of Mines Report of Investigations 5706. "Well Productivity Related to Drilling Muds: Umiat Field, Naval Petroleum Reserve No. 4, Alaska" George L. Gates and W. Hodge Caraway, 1960.

Society of Petroleum Engineers of AIME Field Case History  
"Effect of Completion Fluids on Well Productivity in Permafrost, Umiat Field, Alaska." George L. Gates and W. Hodge Caraway, 1960.

6. U.S. Bureau of Mines Open File Report (unnumbered) "Recoverable Petroleum Reserves in the Umiat Structure, Naval Petroleum Reserve No. 4, Alaska". Staff, Petroleum and Natural Gas Branch, (Laramie, Wyo.), 1952
  7. U.S. Bureau of Mines Report of Investigations 5447. "Analyses of Some Crude Oils from Alaska." C.M. McKinney, E.L. Garton and F.G. Schwartz, 1959.
  8. U.S. Bureau of Mines Report to the Territory of Alaska. "A Study of the Economic Practicability of a Natural Gas Pipeline from the Gubik Field to Fairbanks and Anchorage, Alaska." R.V. Higgins and G.B. Shea. 1953.
- 
9. U.S. Bureau of Mines Report of Investigations 7688. "Oil Fields and Crude Oil Characteristics of the Cook Inlet Basin." Donald P. Blasko, Welton J. Wenger, and J.C. Morris. 1972.
  10. U.S. Bureau of Mines Bulletin 576 "Helium - Bearing Natural Gases of the United States" W.J. Boone, Jr. 1957.
- U.S. Bureau of Mines Bulletin 617 "Helium - Bearing Natural Gases of the United States". R.D. Munnerlyn and R.D. Miller. 1963.
- U.S. Bureau of Mines Information Circular 8221. "Analysis of Natural Gases of the United States, 1961" Richard D. Miller and Geraldine P. Norrell.
- U.S. Bureau of Mines Information Circular 8302. "Analyses of Natural Gases of the United States, 1964." B.J. Moore, R.D. Shrewsbury.
- U.S. Bureau of Mines Information Circular 8316 "Analysis of Natural Gases of the United States, 1965." B.J. Moore and R.D. Shrewsbury.



U.S. Bureau of Mines Information Circular 8356. "Analyses of Natural Gases, 1966." B.J. Moore and R.D. Shrewsbury.

U.S. Bureau of Mines Information Circular 8395. "Analyses of Natural Gases, 1967." B.J. Moore and R.D. Shrewsbury.

U.S. Bureau of Mines Information Circular 8443. "Analyses of Natural Gases, 1968." L.E. Cardwell and L.F. Benton.

U.S. Bureau of Mines Information Circular 8518. "Analyses of Natural Gases, 1970." L.E. Cardwell and L.F. Benton.

U.S. Bureau of Mines Information Circular 8554. "Analyses of Natural Gases, 1971." L.E. Cardwell and L.F. Benton.

U.S. Bureau of Mines Information Circular 8607. "Analyses of Natural Gases, 1972." L.E. Cardwell and L.F. Benton.

U.S. Bureau of Mines Information Circular 8658. "Analyses of Natural Gases, 1973." B.J. Moore.

11. U.S. Bureau of Mines Open File Report 35-74. "Natural Gas Fields--Cook Inlet Basin, Alaska". Donald P. Blasko. 1974.
12. U.S. Bureau of Mines Information Circular 8263. "Heavy Crude Oil Reservoirs in the United States: A Survey". W.D. Dietzman, M. Carrales and C.J. Jirik. 1965.

U.S. Bureau of Mines Information Circular 8352 "Heavy Crude Oil - Resource, Reserve and Potential Production in the United States." Staff, 1967.

U.S. Bureau of Mines Information Circular 8408 "Impact of Petroleum Development in the Gulf of Mexico". L.K. Weaver, C.J. Jirik and H.F. Pierce, 1969.

U.S. Bureau of Mines Information Circular 8455 "Potential Oil Recovery by Waterflooding Reservoirs Being Produced by Primary Methods" Staff, 1970.
13. AIME. Environmental Quality Conference for the Extractive Industries. EQC Paper No. 44. "Effect of Petroleum and Natural Gas Industry Activities on Public Land Use in a Selected Area of Alaska." Donald P. Blasko, 1971.
14. U.S. Bureau of Mines Minerals Yearbook. "The Mineral Industry of Alaska" 1965-1970 and continuing.

15. U.S. Bureau of Mines Open File Report 69-73. "Oil and Gas Exploratory Well Locations in Alaska (Revised 1-75)" Donald P. Blasko.
  16. U.S. Bureau of Mines Information Circular 8626. "Mineral Resources of the Trans-Alaska Pipeline Corridor. John J. Mulligan, 1974.
  17. U.S. Bureau of Mines Information Circular (TO BE RELEASED 1975) "Geothermal Energy: Economic Potential of Selected Geothermal Sites in Alaska" J.C. Rosenbruch and R.G. Bottge.
  18. U.S. Bureau of Mines Information Circular (Proposed) "Occurrences of Oil and Gas Seeps, Alaska Peninsula, Alaska; Western Gulf of Alaska." Donald P. Blasko.
- U.S. Bureau of Mines Information Circular (Proposed)  
"Occurrences of Oil and Gas Seeps, Northcentral Gulf of Alaska." Donald P. Blasko.
-