STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF MINES AND MINERALS

REPORT
FOR THE YEAR
1963

JUNEAU, ALASKA

STATE OF ALASKA

William A. Egan - Governor

Department of Natural Resources

Phil R. Holdsworth - Commissioner

DIVISION OF MINES AND MINERALS

James A. Williams - Director

REPORT

FOR THE YEAR

1963

Juneau, Alaska

Mr. Phil R. Holdsworth, Commissioner
Department of Natural Resources
Juneau, Alaska

Dear Sir:

It is a pleasure to transmit to you this Annual Report of the Division of Mines and Minerals covering the calendar year 1963. Summaries of mineral production, exploration, and developments during the year are outlined in the report. Data in other fields over which the Division has jurisdiction are included. The activities and accomplishments of the Division are outlined, and our geological investigations are briefly described.

Progress of Alaska's oil industry has been of real significance. More than $54,000,000 was spent by the industry in exploration alone, and approximately $18,000,000 was received by the State in direct revenue from mineral production. Rising metal prices and the purchase of a remote mining property for a large sum by a major mining company are two of the signs that indicate increasing mining activities in Alaska in the near future.

This Division will continue to aid in the growth of the minerals industries.

Respectfully submitted,

James A Williams

James A. Williams, Director
Division of Mines and Minerals
Box 1391, Juneau, Alaska
December 31, 1963

DIVISION OF MINES AND MINERALS STAFF

December 31, 1963

Headquarters Office, Box 1391, Juneau

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William H. Race, Mining Engineer
Jean L. Crosby, Administrative Assistant
Dorothy C. Mihelich, Mineral Analyst
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Donald H. Richter, Mining Geologist
Wiley D. Robinson, Coal Mine Inspector
Karl L. VonderAhe, Petroleum Engineer
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Bobby Jo Brasch, Secretary
Kathryn E. Perez, Clerk-Typist

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Aldon E. Gooch, Assayer

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Preface

The mineral industry truly is a creator of wealth. It produces materials never before bought or sold that become new additions to the wealth of the nation and to the state of origin.

The United States imports more minerals than it exports, thereby reducing the nation's balance of trade and aggravating the deficit in international payments, a direct cause for the loss of gold reserves and a direct threat to national credit. Money saved by using our own minerals, and money earned by exporting minerals and mineral products, reduce that deficit.

To Alaska, a healthy mineral industry means steady employment and expansion of services of all kinds. Development of a sound economy for all of Alaska requires the energetic development of the State's mineral resources. To the encouragement of such development, the Division of Mines and Minerals is dedicated.

This annual report is intended to create interest in Alaska's minerals by providing information on the present status of the mineral industries and on possibilities for greater development. The Division can most effectively encourage new mining industry by continuing its activity of gathering and interpreting data and issuing reports which will aid in the exploration and discovery of new deposits. The Division's program of collecting oil well samples and making them available for detailed study has definite value in accelerating petroleum development.

James A. Williams

THE MINING INDUSTRY

Mineral Production

Value of 1963 mineral production was 24 per cent more than that of 1962. The increase was due primarily to expanded use of sand and gravel, but also to increased oil and gas production. Gold production decreased 2 million dollars to an estimated $3,465,000, the lowest point since 1894 except during World War II when gold mining was closed by government order. Coal production remained about equal to that of 1962 as did the value of the undistributed materials.

Table I - Mineral Production in Alaska

	1962		1963 (1)	
	Quantity	Value (Thousands)	Quantity	Value (Thousands)
Coal----------thousand short tons	871	$ 6,409	870	$ 6,400
Gold----------thousand troy ounces	165	5,784	99	3,465
Mercury----------76 pound flasks	3,719	711	400	75
Natural Gas-----million cubic feet	2,184	467	3,249 (2)	803
Petroleum, crude--thousand barrels	10,260	31,190	10,740	32,650
Sand & Gravel--thousand short tons	5,731	5,355	15,023	19,634
Silver--------thousand troy ounces	22	24	12	16
Undistributed (3)----------	---	4,256	---	4,000
Total----------		$54,196		$67,040

(1) All figures for 1963 except petroleum are preliminary and subject to revision.
(2) Includes only gas sold. An additional 7,370 million cf was used on the leases for pressure maintenance and power, or was unavoidably lost.
(3) Undistributed includes gem stones, platinum group metals, uranium ore, clay, and copper.

Note: Above statistics prepared under a cooperative agreement for the collection of mineral data between the Bureau of Mines, United States Department of the Interior, and the Division of Mines and Minerals, Department of Natural Resources, State of Alaska. Figures for coal, petroleum, natural gas, and undistributed commodities are presented on authority of the Division of Mines and Minerals only.

Figure 1 - Annual Value of All Mineral Production - Alaska 1900 - 1963

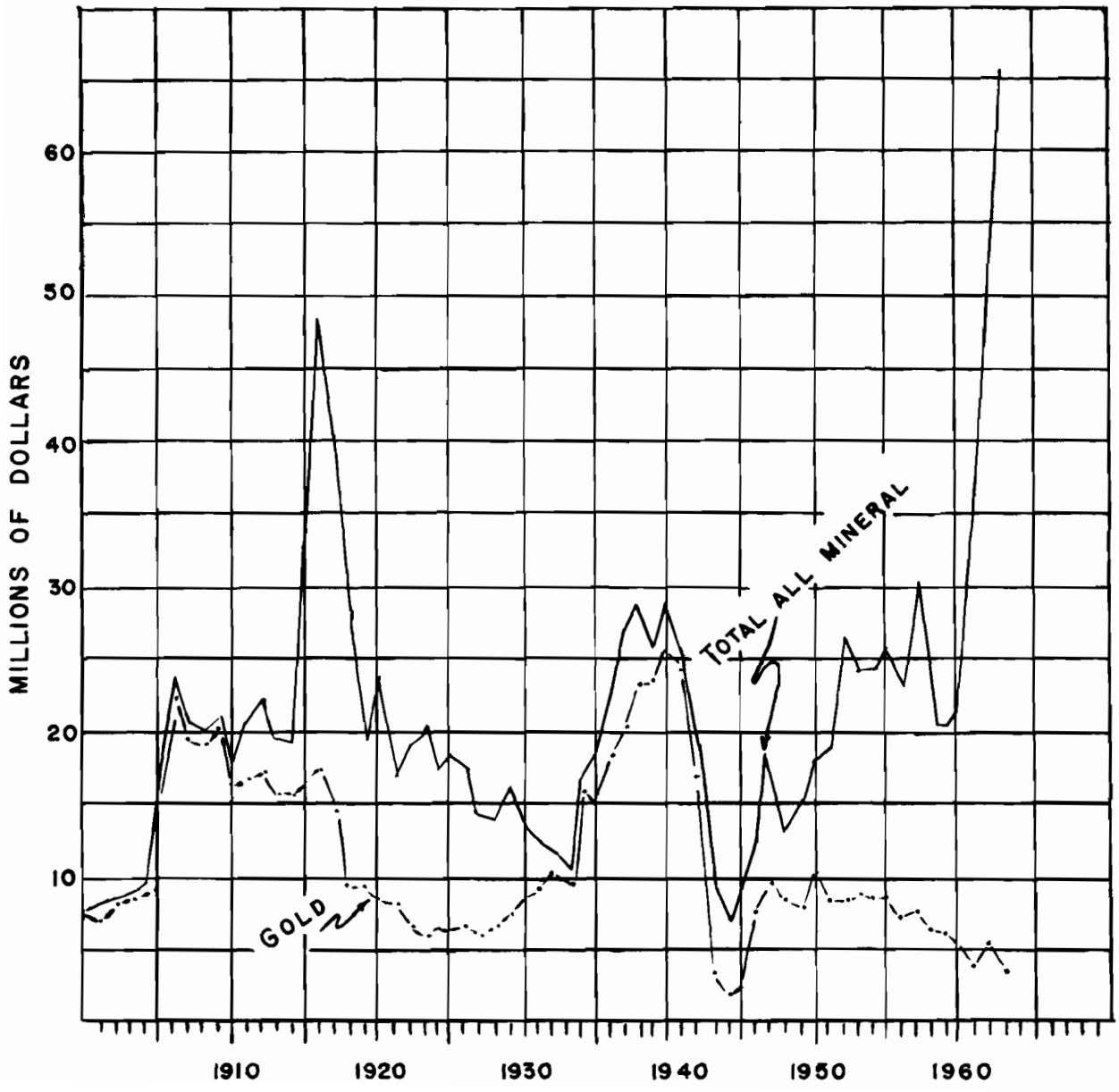


Table II - Production of Major Commodities
Dollar Value (Thousands)

Year	Gold	Mercury	Coal	Oil and Gas	Total All Production (Millions)
1950	$ 10,125	$	$ 3,033	$	$ 17.9
1951	8,387		3,767		19.5
1952	8,420	6	5,779		26.3
1953	8,882	8	8,452		24.3
1954	8,699	277	6,442		24.4
1955	8,725	12	5,759		25.4
1956	7,325	853	6,374		23.4
1957	7,541	1,349	7,296		30.2
1958	6,525	774	6,931		20.9
1959	6,262	851	6,869	311	20.5
1960	5,887	940	6,318	1,496	21.9
1961	3,998	816	5,868	17,776	34.7
1962	5,784	711	6,409	31,657	54.2
1963	3,465	75	6,400	33,453	67.0
	$100,025	$6,672	$85,697	$84,693	$410.6

Table III - Physical Volume of Alaska Mineral Production (1)

Mineral	Quantity	Years
Total gold----------troy ounces	29,764,000	
placer----------do----	20,864,000	1880-1963
lode----------do----	8,900,000	1882-1963
Total silver----------do----	20,334,000	
placer----------do----	3,834,000	1906-1963
lode----------do----	16,500,000	1906-1963
Copper----------short tons	690,000	1900-1963
Coal----------do----	15,541,000	1880-1963
Sand and gravel----------do----	95,954,000	1951-1963
Crude petroleum-----42 gal bbls	28,100,000	1958-1963 (2)
Natural gas million ft^3	6,530	1958-1963
Stone----------short tons	3,900,000	1948-1963
Mercury----------76-lb flasks	34,120	1921-1963
Tin----------short tons	2,400	1902-1963
Chromite (approx. 45% Cr_2O_3) long tons	29,000	1917-1963
Tungsten short ton units WO_3	7,000	1916-1963
Antimony (approx, 53% Sb) short tons	3,400	1928-1963
Lead----------do----	25,000	1906-1963

(1) Other than platinum, uranium, and commodity figures that are confidential. 1963 production estimated and included in total.

(2) Only other crude petroleum recorded production was from the Katalla area. From 1901 to 1932, 154,000 barrels of oil were produced.

Precious Metals

Alaskan gold production declined in 1963 after the increase in 1962. There were 302 claims staked for gold during the year compared to 366 staked during 1962. The previous year's increased gold activity is thought to have been directly related to the industry's optimism caused by legislation before Congress to relieve the depressed gold mining conditions. Approximately 370 men were employed in the gold mining industry during 1963 as compared to about 500 during 1962. Practically all production was from placer operations.

Goodnews Bay Mining Company continued dredging at Platinum, Alaska. The price of platinum increased about 6 per cent during the year.

A few of the gold operations noted during the season were as follows:

Martinson Brothers dredged on the Kougarok River above the North Fork, Seward Peninsula.

Grant Nelson dredged part of the season on the Inmachuk River, Seward Peninsula.

Keystone Mines, Inc., mined on Wolf Creek Divide in the Fairbanks District while awaiting approval of an OME participating loan for development of the property.

The U.S.S.R.& M. Company dredged in the Fairbanks area, Fortymile, and Hogatza River

New York-Alaska Gold Dredging Corporation operated two dredges at Nyac.

Fullerton Brothers operated their dragline and washing plant near Flat.

Ted Mathews dredged on Coal Creek, tributary to the upper Yukon.

Base Metals

Base metal production decreased with the closing of the Red Devil Mercury Mine. A small amount of mercury was retorted by small operations in the Sleetmute area. A few tons of lead-silver ore were shipped by Pete Smith from the Fairbanks District to the Kellogg Smelter.

Radioactives

Standard Metals Corporation, formerly Bay West, Inc., produced well over their allotment of 5,000 tons of uranium ore at the Kendrick Bay mine, in the Ketchikan District. They completed an extensive diamond drilling program that considerably increased their reserves.

Nonmetallics

The U. S. Bureau of Mines reports an increase in sand and gravel production of 2 1/2 times the 5,731,000 tons produced in 1962. The value increased to three times that of 1962. The increase was attributed to better reporting of production as well as increased road construction. Stone production was less than the preceding year and was dependent upon highway construction use. None of the limestone or marble quarries was worked.

Coal

Coal production continued at about the same rate as in 1962. Usibelli Coal Company was the largest producer in the Healy River Field, followed in rank by Evan Jones Coal Company in the Matanuska Field. Mrak Coal Company filled a smaller military contract and supplied coal to the Palmer area. Paul Omlin also supplied coal for the local market from his mine on Moose Creek in the Matanuska Field. All coal was mined by strip methods.

Prospecting and Exploration

Mining exploration expenditures for the year are estimated to total $1,500,000 or an increase of approximately $200,000 above 1962. Exploration by Kennecott Mining Company resulted in its purchasing the Ruby Creek copper deposit in the Kobuk area for a reported $3,000,000. Bear Creek Mining Company, a subsidiary of Kennecott, investigated and drilled near Orange Hill in the Nabesna area. This work will be continued. Moneta Porcupine Mines Ltd. carried on its exploration program in the Kantishna-Talkeetna region. Fremont Mining Company applied for patent on the Brady Glacier nickel deposit that is optioned to Newmont Exploration Ltd.

Offshore prospect permit holders near Nome tested their deposits by drilling through the ice during the winter or with suction dredges during the summer. Shell Oil Co. was preparing to drill through the ice this winter.

Four OME participating exploration loan contracts were active in the State during the year. Alaska Mines and Minerals, Inc., completed one exploration agreement for mercury at the Red Devil Mine with no success. Little Squaw Mining Company completed its second year in the Chandalar District under an OME agreement for lode gold exploration with encouraging results. Keystone Mines had just received approval of its gold exploration program near Fairbanks at year's end. Richard Rowe explored placer claims at Van Curlers Bar on the upper Chena River under the fourth contract.

U. S. Steel applied for patent on iron claims at Union Bay and Klukwan in Southeastern Alaska. The 1962 discovery of beryllium by the U. S. Geological Survey in the Lost River area of the Seward Peninsula led to diamond drilling by one company and detailed geological work by others. The U. S. Bureau of Mines announced discovery of beryllium near the Kendrick Bay mine in the Ketchikan District early in the year. The Division of Mines and Minerals announced discoveries of

four mineral occurrences found during the course of the 1963 field work by its mining geologists. The Division mining engineers investigated mineral prospects and did geochemical exploration work. Details on this work are included later in the report under the section on the activities of the Division.

The U. S. Geological Survey spent approximately $3,000,000 in the State during 1963. They carried on programs in geological and topographical mapping; water resources and stream flow; conservation of oil, gas, and coal. New publications of interest to Alaskan prospectors released during the year were:

Bulletin 1121-F, Geology and Petrology of Two Stocks of Layered Gabbro in the Fairweather Range, Alaska, by D. L. Rossman.

Bulletin 1121-K, Geology of the Eastern Part of the Mount Fairweather Quadrangle, Glacier Bay, Alaska, by D. L. Rossman.

Bulletin 1141-O, Reconnaissance Geology of Northern Baranof Island, Alaska, by H. C. Berg and D. W. Hinkley.

Map I-356, Preliminary Geologic Map of the Valdez-Tiekel Belt, Alaska, by H. W. Coulter and E. B. Coulter.

Map I-388, Reconnaissance Geologic Map of Chichagof Island and Northwestern Baranof Island, Alaska, by R. A. Loney, H. C. Berg, J. S. Pomeroy, and D. A. Brew.

Map I-406, Preliminary Geologic Map of the McCarthy C-5 Quadrangle, Alaska, by E. M. MacKevett, Jr.

The U. S. Bureau of Mines spent approximately $450,000 in mineral investigations, beneficiation studies, coal mine safety inspections, and mineral resource activities. It drilled or trenched a mercury deposit at White Mountain near McGrath, several deposits near Fairbanks, a gypsum deposit on Chichagof Island, and others. It investigated and sampled deposits on Baranof Island, Prince of Wales Island, and various places in Southeastern Alaska as well as in the Fortymile, Lost River, Nome, Haines, Wrangell, and Fairbanks areas.

A total of 686 claims were staked in 1963 compared to 1172 claims staked the previous year. The total included 222 gold placer, 80 gold lode, 46 copper, 20 molybdenum, 22 nickel, 184 platinum, and others in smaller numbers. Affidavits of assessment work included reports on work done for 6,785 claims.

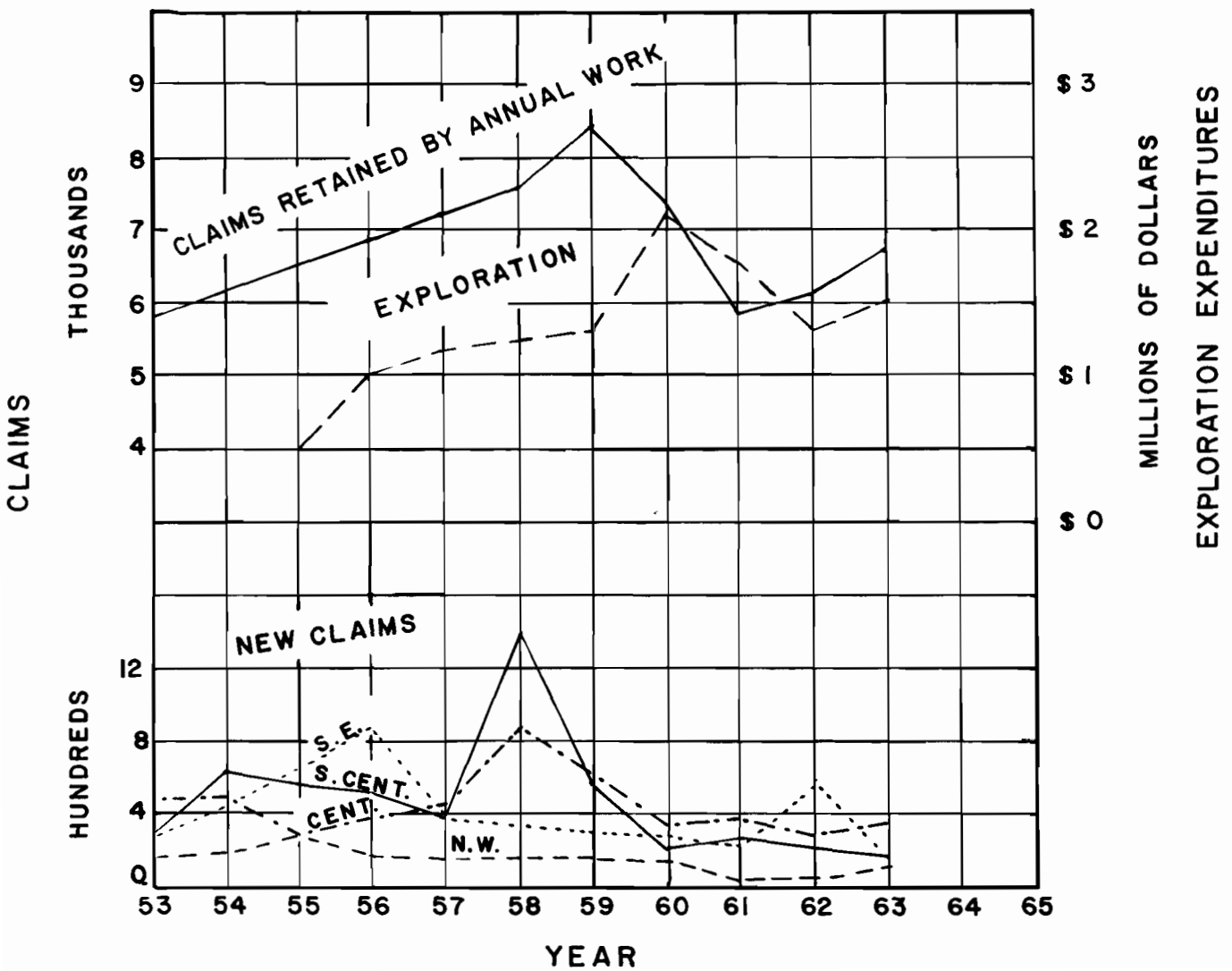
A few of the more notable exploration programs and the approximate crew numbers in the various districts are tabulated as follows:

Southeastern

Standard Metals drilling uranium ore-body extensions at Bokan Mt. - 4 men.

Newmont Exploration Ltd. - Brady Glacier nickel deposit - 4 men.

Chicago-Alaska Mining Co. - Baker Peak copper development - 2 men.


CLAIMS
THOUSANDS
HUNDREDS
MILLIONS OF DOLLARS
EXPLORATION EXPENDITURES
CLAIMS RETAINED BY ANNUAL WORK
EXPLORATION
NEW CLAIMS
S.E.
S. CENT.
CENT.
N.W.
9
8
7
6
5
4
12
8
4
0
$ 3
$ 2
$ 1
$ 0
53
54
55
56
57
58
59
60
61
62
63
64
65
YEAR

Bonanza Gold, Inc., - Magnetometer survey, Hetta Inlet, Prince of Wales Island - 3 men.

Southcentral

Fremont Mining Co. - magnetometer survey and drilling at Platinum - 9 men.

Alaska Mines and Minerals, Inc. - exploration for mercury at Red Devil - 10 men.

Utah Construction and Mining Co. - coal development Beluga Lake area - 10 men.

Northwest

Bear Creek Mining Co. - drilling Ruby Creek copper - 10 men.

Shell Oil Co. - offshore exploration - 10 men.

Newmont Exploration Ltd. - drilling and exploration of beryllium claims, Lost River area - 8 men.

U.S.S.R.& M. Co. - exploration of beryllium claims, Lost River area - 6 men.

Central

Little Squaw Mining Co. - drifting, drilling, and trenching at their Chandalar gold property - 10 men.

Moneta Porcupine Mines, Ltd. - miscellaneous mineral investigations - 5 men.

Bear Creek Mining Co. - drilling and investigating copper and molybdenum deposits near Orange Hill - 6 men.

Sinclair Oil Co. - miscellaneous mineral investigations - 5 men.

Keystone Mining Co. - shafting and exploration, gold, Wolf Creek Divide - 5 men.

Prospecting Costs

The cost of placing and supplying a prospector in the field is indicated by results of the 1963 State Prospector Assistance Program. The total cost of 631 man days in the field was $10,603.66. This cost distributed to transportation, food, and supplies (including prospecting equipment) was as follows:

Transportation	$11.25 per man day
Food	3.17 " " "
Supplies	2.38 " " "
Total	$16.80

The total includes fixed-wing aircraft charter, helicopter charter, the cost of tents, tools, food, but does not include exploratory drilling, trenching, or

wages.

Small fixed-wing aircraft are available in nearly every town in Alaska. Charter rates for a Piper Cruiser are about $20-40 an hour; a Cessna 180 is about $40-60 an hour. Helicopters are available in Ketchikan, Juneau, Anchorage, and Fairbanks. The rate is usually about $100-135 an hour with a guarantee of three hours flying a day.

Future of the Industry

Gold

With closure of the U.S.S.R.& M. Co. gold dredges in the Fairbanks area, gold production will continue to decrease unless new higher grade deposits are found or some relief from the fixed price-higher cost squeeze is obtained. The average tenor of the gravel has been decreasing gradually each year even though most producers are mining their highest grade ground. This indicates that a price increase of more than the normal cost of living increase would have to be obtained to be effective. Congressional efforts can be expected to continue to overcome Treasury Department objections to any change that might create a two-price gold system.

Coal

The coal industry is facing stiffer competition from the gas industry in the Anchorage area each year. A mine-mouth power plant has been in the planning stages for several years at Sutton but has failed to develop though numerous feasibility studies have indicated it is economical. A mine-mouth plant is currently being planned for the Healy field to furnish power to the Fairbanks area. Feasibility studies are being made for the use of the Beluga coal for export. Evan Jones Coal Company is cooperating with the University of Alaska School of Earth Science and Mineral Industries in research toward developing a coking coal by blending coals of the Chickaloon and Matanuska fields.

Base Metals

Alaskan production of ores of iron, copper, lead, zinc, and other base metals depends on the increased demand of the markets of the Pacific Ocean countries, and more particularly the demand of Japan and the western United States. New higher-grade deposits are obviously needed since the present known deposits are not being fully developed and brought into production. Political strife in foreign countries which export base metal ores increases the desirability of developing similar ore deposits in Alaska. Increased market prices during the past year have also increased interest in local ore bodies and further exploration.

THE PETROLEUM INDUSTRY

Highlights

The highlights of the industry in 1963 were:

The discovery of oil in Middle Ground Shoal, Cook Inlet, by Shell-Richfield-Standard.

The completion of the Standard refinery on the Kenai Peninsula.

The start of drilling activity north of the Brooks Range by Colorado Oil & Gas Corporation.

Further development of the Beluga and Kenai Gas Fields with completion of two wells in the former and one in the latter.

Development and Production

Swanson River Field

Development - 1963

With seven new completions and a sustained pressure maintenance program, the Swanson River Field increased its production for the year to 10,739,964 bbls. This completes the planned development of the oil zones in this field. The best production in barrels per day per well was in January with an average of 724. The daily average declined to 561 B/D/W in December but the average for the year was 610 B/D/W, an increase from the 1962 average of 588 B/D/W. In December, there were 54 producing wells, 47 of which flowed an average of 601 B/D/W, and 7 on gas lift produced 274 B/D/W. Details of oil production are shown in Tables III and IV and graphically in Figure 2. Figure 3 is a map of the field showing development to 12/31/63.

Producing Mechanism

The principal source of energy is still the expansion of reservoir fluids augmented by pressure maintenance by injection of gas into the reservoir.

Production Problems

Production problems are still minor. There is some water enroachment apparent, but the water production in 1963 was only 4.1% of the gross production. There are 25 wells cutting 1% or less; 13 cutting 2-10%; 7 cutting 10%-20%; 5 cutting 20% to 50% and 4 with greater than 50% water.

Now, since the completion of the refinery, 20,000 barrels a day of the crude is processed, removing the middle cuts (kerosene, jet fuel, diesel, etc.) for sale to the local trade. The residue is then shipped with other crude production by

tanker to California for further processing. The heavier hydrocarbons removed from the wet gas are put back into the crude oil shipped south.

Gas Injection

A third well, No. 41-8, was converted to gas injection and started operating in March. All three wells have been in almost continuous operation since with gas being injected at a rate of 9600 to 23,200 MCF (thousand cubic feet) per day at a pressure up to 6000 psi (pounds per square inch). A total of 6,316,120 MCF was injected in 1963.

All gas produced with the oil, except for small amounts sold, lost, and used for fuel, is pressurized and injected after it is depropanized. Enough dry gas is produced from wells in the shallow gas zone to fulfill requirements of the pressure maintenance program.

That oil production has remained almost constant for the past 12 months is indicative of the success of the operation.

Price of Oil

Effective December 15, 1961 for Swanson River Field
Kenai Peninsula, Alaska

Gravity	Price per barrel
25-25.9 - degree	$2.41
26-26.9	2.49
27-27.9	2.56
28-28.9	2.62
29-29.9	2.68
30-30.9	2.74
31-31.9	2.80
32-32.9	2.86
33-33.9	2.92
34-34.9	2.98
35-35.9	3.04
36-36.9	3.09
37-37.9	3.14
38-38.9	3.19
39-39.9	3.24
40-40.9	3.29

Average price for 1963 production: $3.04

Swanson River Field
Kenai Peninsula, Alaska

Standard Oil Company of California, Western Operations, Inc., Operator

Location	T7N & 8N, R9W, Seward Meridian
Discovery Well	SRU 34-10
Discovery Date	August 24, 1957
Producing Formation - Oil	Hemlock Zone - 10150'-11700'
Gas	Kenai - 3000'- 5800'
Deepest Test	SCU 22A-32 - 14,796
Wells - Oil-Flowing	47
Gas Lift	7
Gas-Producing	4
Shut-in	2
Salt Water Disposal	1
Gas Injection	3

Production Data - 1963

Oil Production	10,739,964 bbls.
Water Production	458,761 bbls.
Gas Production - with oil	2,737,921 MCF
Gas Production - gas wells	4,716,757 MCF

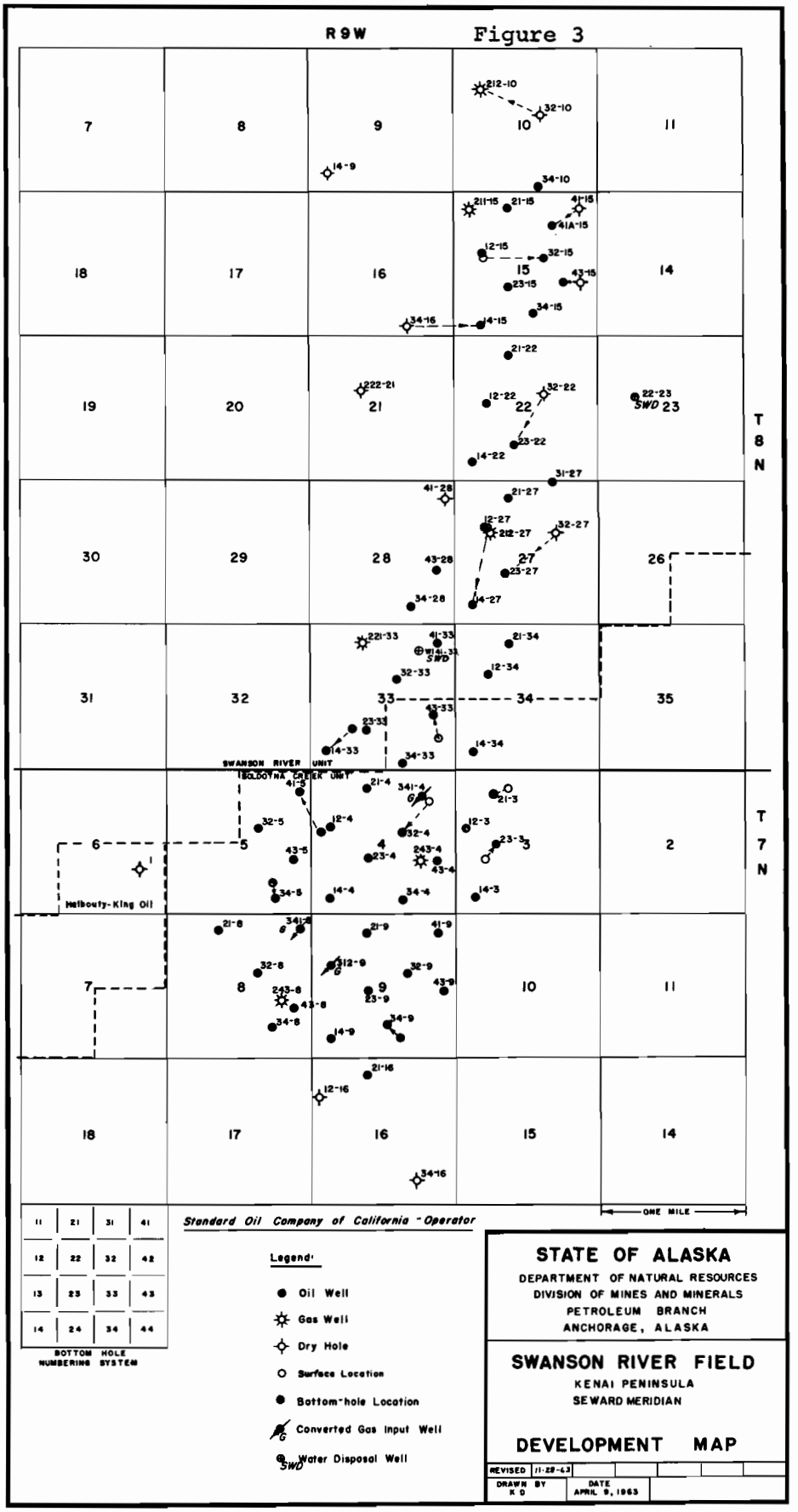
Cumulative Production 12-31-63

Oil	28,105,918 bbls.
Water	956,957 bbls.
Gas - with oil	5,993,986 MCF
Gas - gas wells	4,889,729 MCF

Reservoir Data - Hemlock Zone

Initial Reservoir Pressure	5650 psi
Reservoir Pressure 12-31-63	4600 psi
Saturation Pressure	1000-1400
Oil Gravity	30°-38° API
Temperature	180° F
Net Pay Thickness	8-300'
Porosity	18-26%
Permeability	0-3275 Mds.
Connate Water	40%
Formation Volume Factor	1.12
Gas-Oil Ratio	105-550 SCF/STB
Participating Area	6245 Acres

Figure 3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SWANSON RIVER UNIT
BELUGA RIVER UNIT
Halbouty-King Oil
ONE MILE
Standard Oil Company of California - Operator
Legend
Oil Well
Gas Well
Dry Hole
Surface Location
Bottom-hole Location
Converted Gas Input Well
Water Disposal Well
BOTTOM HOLE NUMBERING SYSTEM
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS
PETROLEUM BRANCH
ANCHORAGE, ALASKA
SWANSON RIVER FIELD
KENAI PENINSULA
SEWARD MERIDIAN
DEVELOPMENT MAP
REVISED 11-28-63
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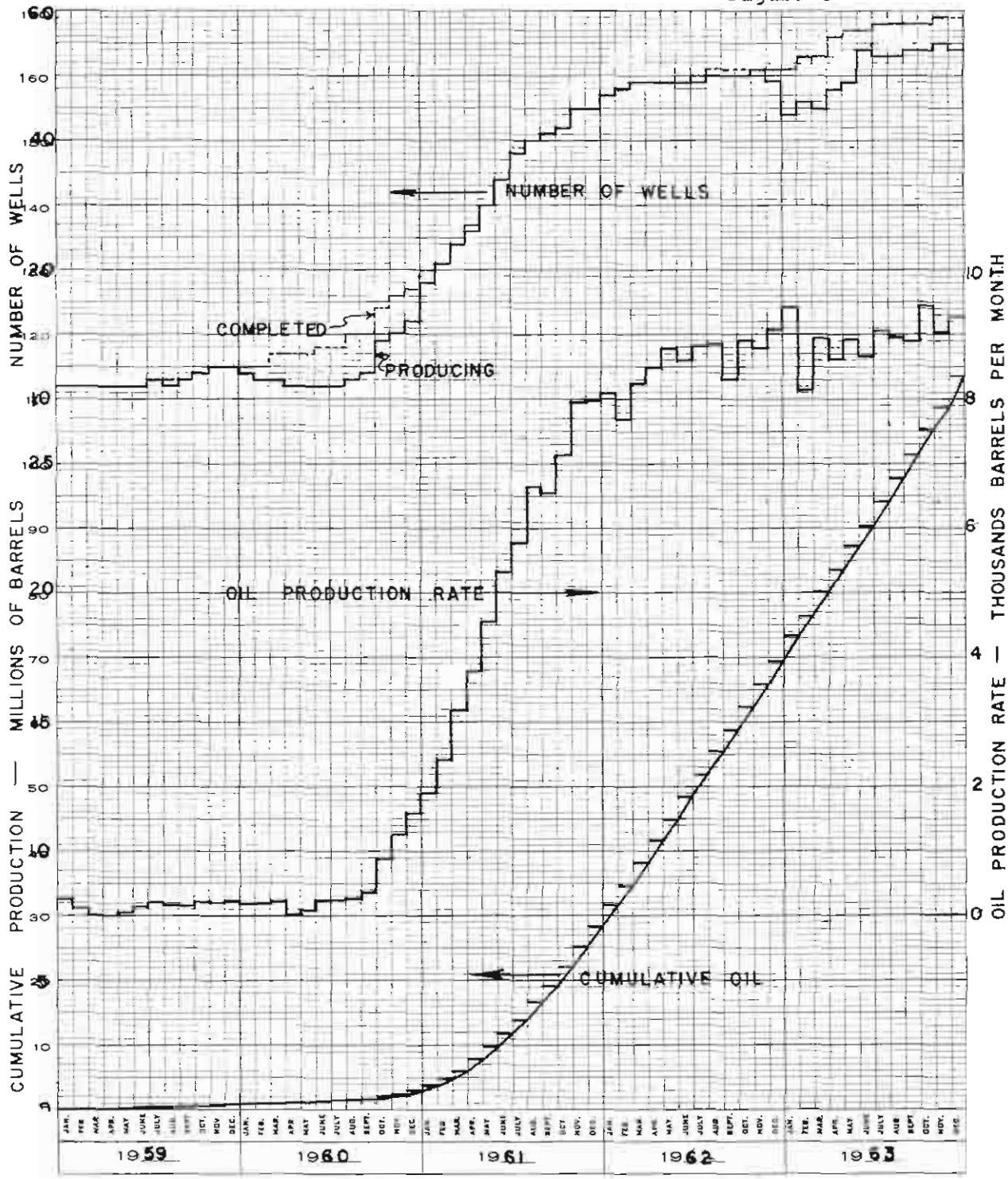
DATE APRIL 9, 1963

SWANSON RIVER FIELD

OIL PRODUCTION

Figure 4



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS

Table IV - Swanson River Field Oil Production by Months

Year	Month	Oil Prod. Month-Bbls.	Oil Prod. Year-Bbls.	Cumulative Oil Prod.-Bbls.	Number of Wells
Oil Produced Prior to 1960				222,344	
1960	Jan.	18,282			5
	Feb.	19,662			5
	Mar.	23,059			7
	Apr.	1,227			7
	May	9,790			8
	June	23,062			10
	July	23,684			9
	Aug.	27,182			12
	Sept.	36,933			12
	Oct.	88,557			14
	Nov.	127,113			16
	Dec.	159,448	557,999	780,343	18
1961	Jan.	191,601			19
	Feb.	242,799			21
	Mar.	319,593			24
	Apr.	378,605			26
	May	456,026			30
	June	531,910			34
	July	578,548			38
	Aug.	664,326			40
	Sept.	654,979			41
	Oct.	715,466			42
	Nov.	795,226			45
	Dec.	797,422	6,326,501	7,106,844	45
1962	Jan.	808,752			47
	Feb.	768,203			48
	Mar.	824,760			49
	Apr.	848,253			49
	May	877,642			49
	June	860,969			50
	July	882,674			50
	Aug.	883,754			51
	Sept.	830,246			51
	Oct.	890,016			51
	Nov.	878,220			51
	Dec.	905,621	10,259,110	17,365,954	52
1963	Jan.	943,558			44
	Feb.	812,837			46
	Mar.	894,241			46
	Apr.	862,546			48
	May	892,244			49
	June	866,712			54
	July	907,343			53
	Aug.	896,308			53
	Sept.	888,777			54
	Oct.	945,016			54
	Nov.	903,311			55
	Dec.	927,071	10,739,964	28,105,918	54

Table V A

Swanson River Field
Individual Well Oil Production Statistics

Swanson River Unit

	Well No.	Comp. Date	Oil Prod. 1961 Bbls	Cumulative Oil Prod. 12-31-61	Oil Prod. 1962 Bbls	Cumulative Oil Prod. 12-31-62	Oil Prod. 1963 Bbls	Cumulative Oil Prod. 12-31-63
SRU	34-10*	10- 1-57	59,933	184,604	29,227	213,831	1,918	215,749
	12-15*	10- 5-60	34,327	55,714	45,426	101,140	104,164	205,304
	14-15*	7-25-59	7,332	10,567	3,636	14,203	66	14,269
	21-15	6- 7-61	79,545	79,545	167,236	246,781	109,481	356,262
	23-15	4- 5-61	107,040	107,040	146,300	253,340	123,448	376,788
	32-15*	10-24-59	186,776	309,448	162,708	472,156	124,600	596,756
	34-15	8- 4-61	66,800	66,800	123,776	190,576	45,810	236,386
	41A-15	12- 9-62			6,646	6,646	136,024	142,670
	43-15	11- 1-61	2,675	2,675	19,181	21,857	29,234	51,091
	12-22	8-11-62			75,395	75,395	224,733	300,128
	14-22	2- 2-63					27,900	27,900
	21-22	1- 3-62			135,195	135,195	65,423	200,618
	23-22*	3- 9-60	120,145	152,726	86,685	239,411	52,411	291,822
	12-27*	11-30-59	183,713	253,536	164,195	417,731	110,420	528,151
	14-27*	6-14-60	238,272	244,854	312,415	557,269	270,366	827,635
	21-27	5- 5-61	119,571	119,571	232,324	351,895	195,240	547,135
	23-27	2- 5-61	98,751	98,751	66,458	165,209	88,721	253,930
	31-27*	10-26-58	40,032	143,318	16,666	159,984	12,718	172,702
	34-28	5-16-63					51,160	51,160
	43-28	7-22-61	83,914	83,914	173,245	257,159	208,821	458,980
	14-33	6-11-62			65,473	65,473	119,161	184,634
	23-33	6-10-61	37,452	37,452	44,818	82,270	50,644	132,914
	32-33*	8-25-60	195,087	231,742	294,175	525,917	227,676	753,593
	41-33	3-12-61	182,225	182,225	363,453	545,678	247,490	793,168
	12-34	10-21-60	142,787	142,787	160,764	303,551	175,760	479,311
	21-34	3-25-63					141,416	141,416
	Totals SRU		1,986,377	2,507,269	2,895,398	5,402,667	2,937,445	8,340,112

* Produced prior to 1961 - Total 520,892 bbls.

Table V B

Swanson River Field
Individual Well Oil Production Statistics

Soldotna Creek Unit

	Well No.	Comp. Date	Oil Prod. 1961 Bbls	Cumulative Oil Prod. 12-31-61	Oil Prod. 1962 Bbls	Cumulative Oil Prod. 12-31-62	Oil Prod. 1963 Bbls	Cumulative Oil Prod. 12-31-63
SCU	12-3	3-23-61	201,829	201,829	241,286	443,115	163,195	606,310
	14-3	8- 2-61	66,962	66,962	127,862	194,824	111,475	306,299
	21-3	1-10-62			253,580	253,580	199,238	452,818
	23-3	11-12-63					13,452	13,452
	12-4	4- 8-61	206,870	206,870	315,308	522,178	448,589	970,767
	14-4*	8-13-60	305,632	389,400	406,899	796,299	474,979	1,271,278
	21-4	11- 5-61	29,605	29,605	215,841	245,446	255,905	501,351
	23-4	6- 1-61	175,004	175,004	370,771	545,781	472,517	1,018,298
	32-4*	6- 5-60	317,492	391,495	398,596	790,091	425,710	1,215,801
	34-4	11-26-60	246,747	246,747	355,595	602,342	437,873	1,040,215
	41-4*	3-21-60	301,962	399,505	280,253	679,758	(1)	679,758
	43-4	5-14-61	181,890	181,890	330,931	512,821	327,105	839,926
	32-5	3-16-62			29,846	29,846	67,290	97,136
	34-5	10- 9-61	30,817	30,817	262,993	293,810	420,163	713,973
	41-5	9-20-61	41,594	41,594	116,075	157,669	102,833	260,502
	43-5	5-28-61	91,504	91,504	127,021	218,525	219,725	438,250
	21-8	2- 5-63					164,964	164,964
	41-8	5-14-61	119,506	119,506	355,493	474,999	87,270(1)	562,269
	32-8	2-22-61	130,833	130,833	194,030	324,913	204,460	529,373
	34-8	1-28-62			76,666	76,666	105,205	181,871
	43-8	7-24-61	161,965	161,965	154,901	316,866	120,657	437,523
	12-9	10- 9-60	275,247	275,247	236,586	511,833	(1)	511,833
	14-9	10-26-60	181,998	181,998	195,332	377,330	314,525	691,855
	21-9	7-19-61	137,997	137,997	353,681	491,676	390,652	882,328
	23-9	7-17-61	115,333	115,333	331,927	447,260	341,006	788,266
	32-9	1-16-61	185,766	185,766	282,033	467,799	373,733	841,532
	34-9	11- 8-61	26,014	26,014	194,171	220,185	259,224	479,409
	41-9	6-11-61	118,240	118,240	260,815	379,055	288,681	667,736
	43-9	7- 5-63					83,926	83,926
	21-16	7- 8-63					110,491	110,491
	34-33*	11-12-60	281,661	285,798	243,842	529,640	227,676	757,316
	43-33	3- 8-61	164,602	164,602	290,258	454,860	260,721	715,581
	14-34	12-23-60	243,004	243,004	361,114	604,115	329,369	933,484
	Totals SCU		4,340,124	4,599,575	7,363,712	11,963,287	7,802,519	19,765,806
	Totals SRU		1,986,377	2,507,269	2,895,398	5,402,667	2,937,445	8,340,112
	Field Total - Year		6,326,501		10,259,110		10,739,964	
	Field Total - Cumulative			7,106,844		17,365,954		28,105,918

* Oil produced prior to 1961 - 259,451 bbls.
(1) Converted to gas injection well

Gas Production - 1963

The Kenai Gas Field produced 3,105 million cubic feet of gas during 1963, as compared to 1,460 million cubic feet during 1962. Gas sales during 1963 were made to Anchorage Natural Gas Company for electric power generation and sales for heating fuel.

The Sterling Gas Field produced 45 million cubic feet during the year, as compared to 25 million cubic feet during 1962. Gas sales are made to Consolidated Utilities, Ltd., which generated electric power for the city of Kenai and community.

The Swanson River Gas Field produced 4,716 million cubic feet during 1963. All of this gas was used in the gas injection project for the oil zone of the field. Casing head gas from the Hemlock Zone totalled 2,738 million cubic feet for the year, 108 million of which was sold and the remainder used in the injection project.

Table VI A

Kenai Gas Field
Kenai Peninsula, Alaska

Union Oil Company of California, Operator

Location	T4 & 5N, R11W & 12W, Seward Meridian
Discovery Well	Kenai Unit 14-6
Discovery Date	October 11, 1959
Producing Formation	Kenai 4240'-5728'
Deepest Test	14-6 - 15,047'
Wells	
Producing	3
Shut-in	2

Production Data	1960	1961	1962	1963
Gas Production	17,474 MCF	214,718 MCF	1,460,171 MCF	3,105,539 MCF
Water Production	0	0	0	0

Reservoir Data	
Initial Reservoir Pressure	1900 - 2400
Average Reservoir Pressure	
Gas Gravity	.556
Temperature	
Net Pay Thickness	9' - 135'
Porosity	15 - 35%
Permeability	350 - 3000 Mds.
Connate Water	18 - 35%
Developed Area	11,000 Acres

Production Statistics
Cumulative Production

	Wells		Oil	Water	Gas
	Producing	Shut In	(Bbls)	(Bbls)	MCF
1- 1-61	2	0	0	0	17,474
12-31-61	3	2	0	0	232,192
12-31-62	3	2	0	0	1,692,367
12-31-63	3	2	0	0	4,797,906

Table VI B

Sterling Gas Field
Kenai Peninsula, Alaska

Union Oil Company of California, Operator

Location	Section 15, T5N, R10W, Seward Meridian
Discovery Well	23-15
Discovery Date	August 4, 1961
Producing Formation	Kenai 5250-54 (Perforations)
Deepest Test	23-15 - 14832'
Wells	
Currently being produced	
Flowing	1
Production Data - 1963	
Gas Production	70,910 MCF
Water Production	0
Reservoir Data	
Initial Reservoir Pressure	
Average Reservoir Pressure	
Gas Gravity	.569
Temperature	
Net Pay Thickness	
Porosity	
Permeability	
Connate Water	
Developed Area	

Production Statistics
Cumulative Production
First Production May 1962

Date	Wells	Oil (Bbls)	Water (Bbls)	Gas MCF
12-31-62	1	0	0	25,186
12-31-63	1	0	0	96,096

Table VII

Swanson River Field Injection Project

Injection Statistics
Cumulative Injection

Gas Injection started November, 1962

Date	Number Injection Wells	MCF Injected In Month	MCF Injected Cumulative
1962, Nov.	1	32,710	32,710
Dec.	2	219,450	252,160
Total 1962		252,160	
1963, Jan.	2	298,399	550,559
Feb.	2	315,833	902,392
Mar.	3	524,071	1,426,463
Apr.	3	462,465	1,888,928
May	3	535,667	2,424,595
June	3	605,941	3,030,536
July	3	721,397	3,751,933
Aug.	3	647,810	4,399,743
Sept.	3	572,192	4,971,935
Oct.	3	624,597	5,596,532
Nov.	3	495,749	6,092,281
Dec.	3	475,999	6,568,280
Total 1963		6,316,120	

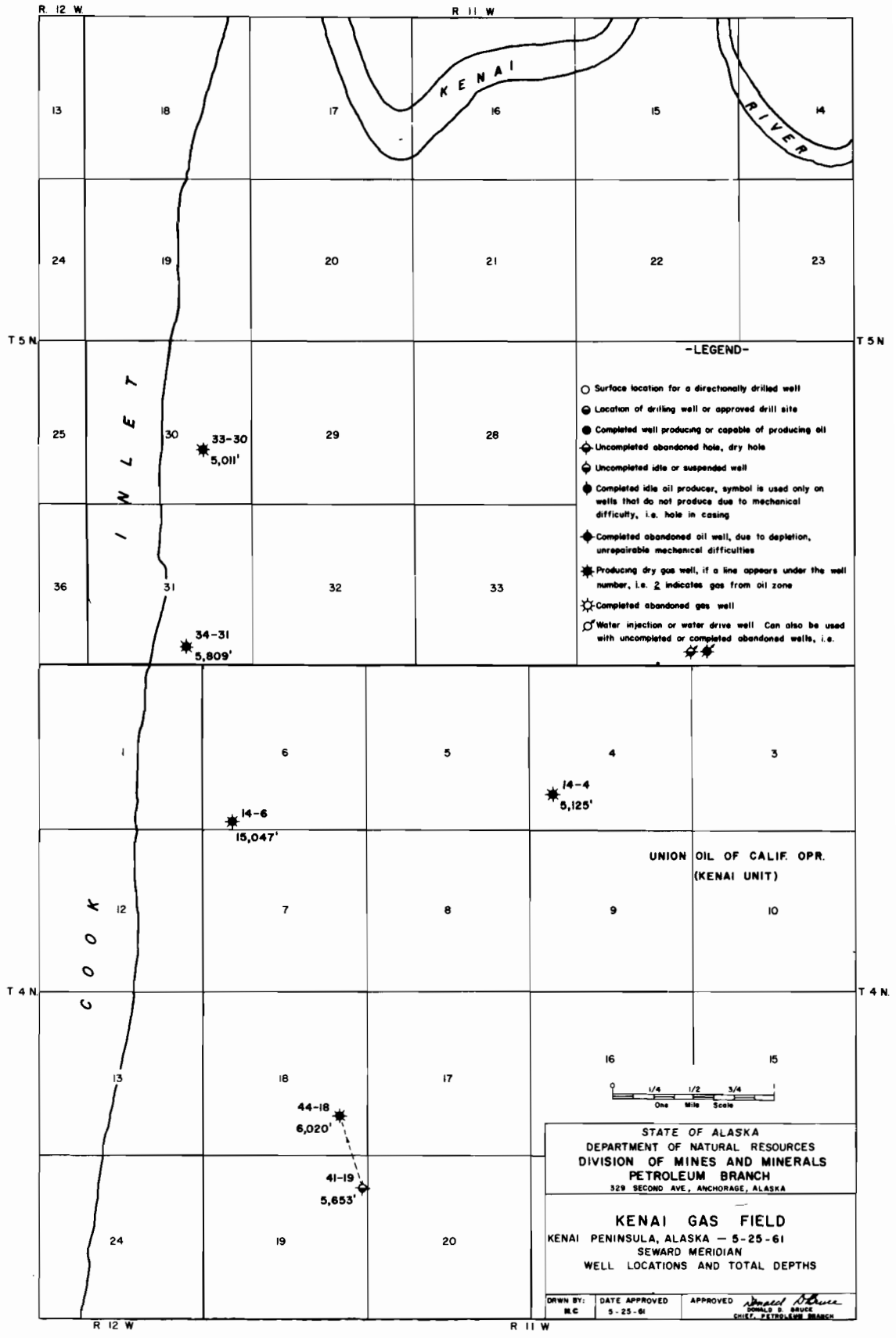
Table VIII

Swanson River, Beluga River and Kenai Unit Development Wells
Spudded and/or Completed - 1963

Well Number	¼ Sec.	Twp.	Rge.	M.	Spud Date	Completion Date	TD	Feet Drilled 1963	Status* 12-31-63
SCU- 21- 8	NW 8	7N	9W	S	12-16-62	2- 5-63	11,000	4,710	POW
SCU- 43- 9	SE 9	7N	9W	S	2-10-63	4- 4-63	11,101	11,101	POW
SCU- 21-16	NW16	7N	9W	S	5-20-63	7- 8-63	11,055	11,055	POW
SCU- 23- 3	SW 3	7N	9W	S	7-12-63	11-12-63	10,948	10,948	POW
SRU- 14-22	SW22	8N	9W	S	12-14-62	2- 2-63	11,000	3,358	POW
SRU- 21-34	NW34	8N	9W	S	2- 7-63	3-25-63	11,065	11,065	POW
SRU- 34-28	SE28	8N	9W	S	3-30-63	5-16-63	10,880	10,880	POW
BRU-232- 4	NE 4	12N	10W	S	1- 4-63	2- 2-63	5,300	5,300	GSI
BRU-233-27	SE27	13N	10W	S	2-23-63	3-25-63	5,680	5,680	GSI
KU - 43- 9	SE 9	5N	10W	S	6-19-63	7- 5-63	6,202	6,202	GSI
Total Development Footage Drilled 1963								80,337	

*"POW" means producing oil well. "GSI" means shut-in gas well.

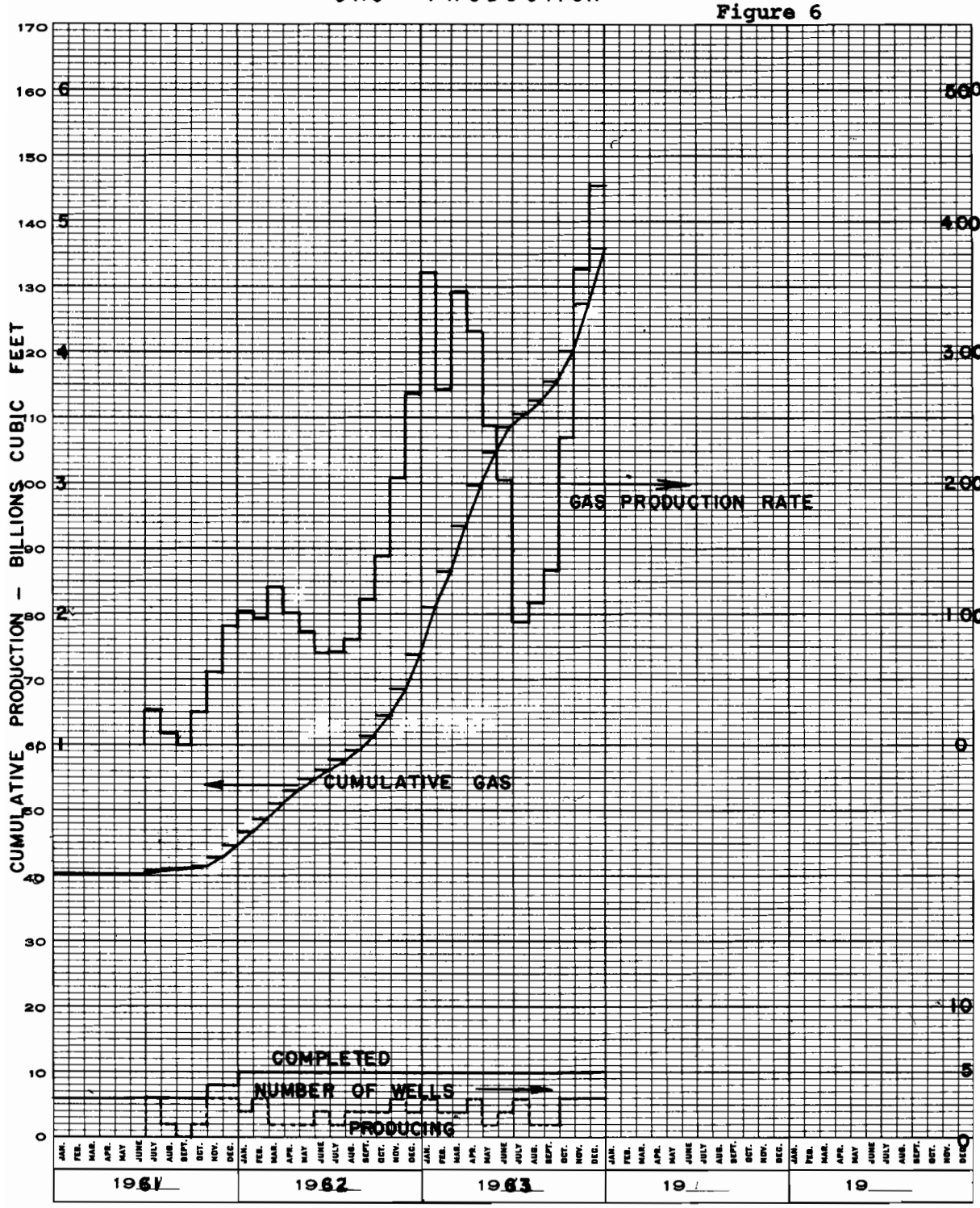
Figure 5


R. 12 W.
R 11 W
KENAI
RIVER
T 5 N.
T 4 N.
INLET
COOK
33-30
5,011'
34-31
5,809'
14-6
15,047'
14-4
5,125'
44-18
6,020'
41-19
5,653'
UNION OIL OF CALIF. OPR.
(KENAI UNIT)
-LEGEND-
Surface location for a directionally drilled well
Location of drilling well or approved drill site
Completed well producing or capable of producing oil
Uncompleted abandoned hole, dry hole
Uncompleted idle or suspended well
Completed idle oil producer, symbol is used only on wells that do not produce due to mechanical difficulty, i.e. hole in casing
Completed abandoned oil well, due to depletion, unrepairable mechanical difficulties
Producing dry gas well, if a line appears under the well number, i.e. 2 indicates gas from oil zone
Completed abandoned gas well
Water injection or water drive well Can also be used with uncompleted or completed abandoned wells, i.e.
0 1/4 1/2 3/4 1
One Mile Scale
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS
PETROLEUM BRANCH
329 SECOND AVE., ANCHORAGE, ALASKA
KENAI GAS FIELD
KENAI PENINSULA, ALASKA — 5-25-61
SEWARD MERIDIAN
WELL LOCATIONS AND TOTAL DEPTHS
DRWN BY: M.C
DATE APPROVED 5-25-61
APPROVED Donald B. Bruce
DONALD B. BRUCE
CHIEF, PETROLEUM BRANCH

KENAI GAS FIELD

GAS PRODUCTION

Figure 6



STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS
PETROLEM BRANCH

SWANSON RIVER FIELD

GAS PRODUCTION AND INJECTION

Figure 7

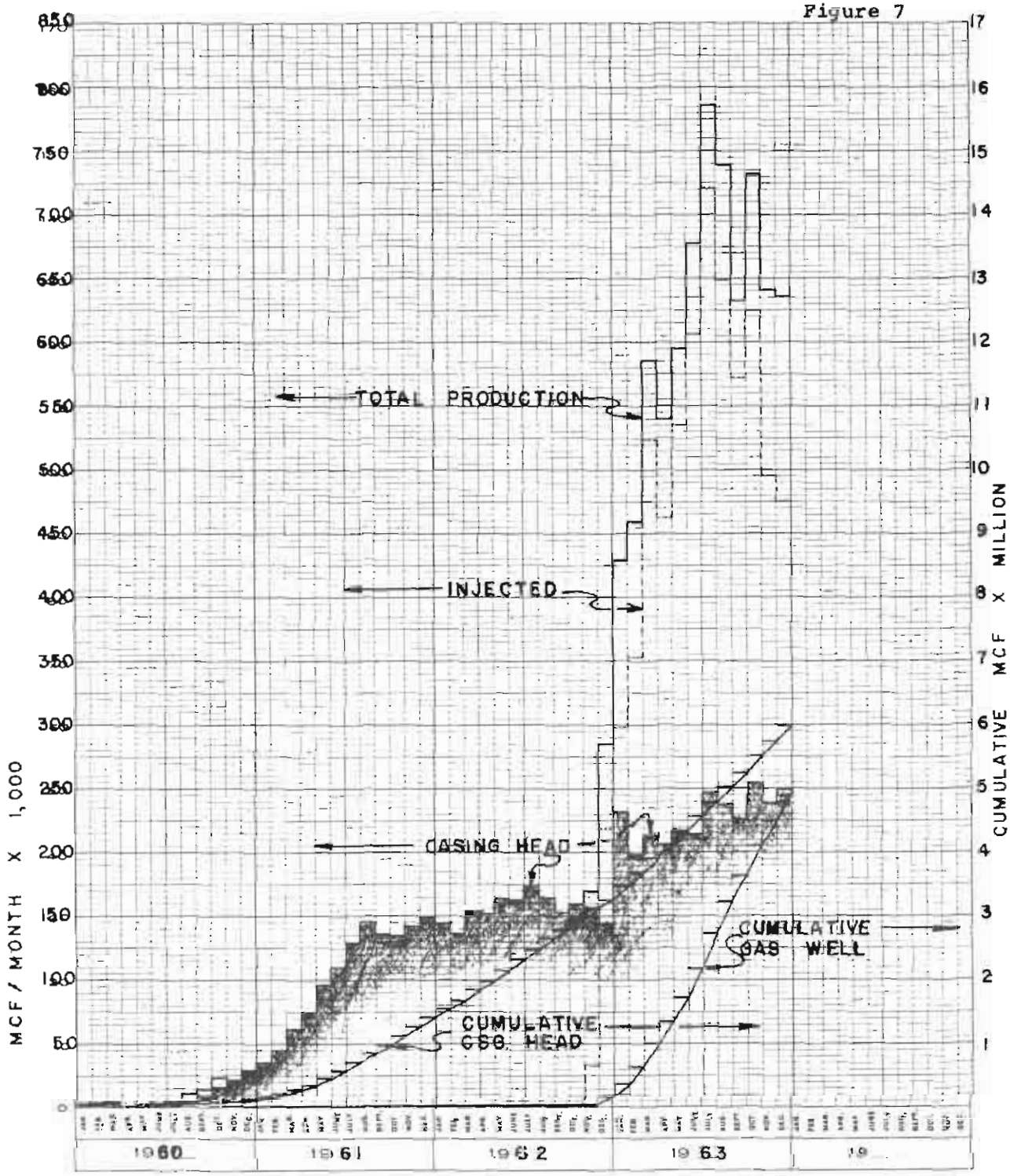
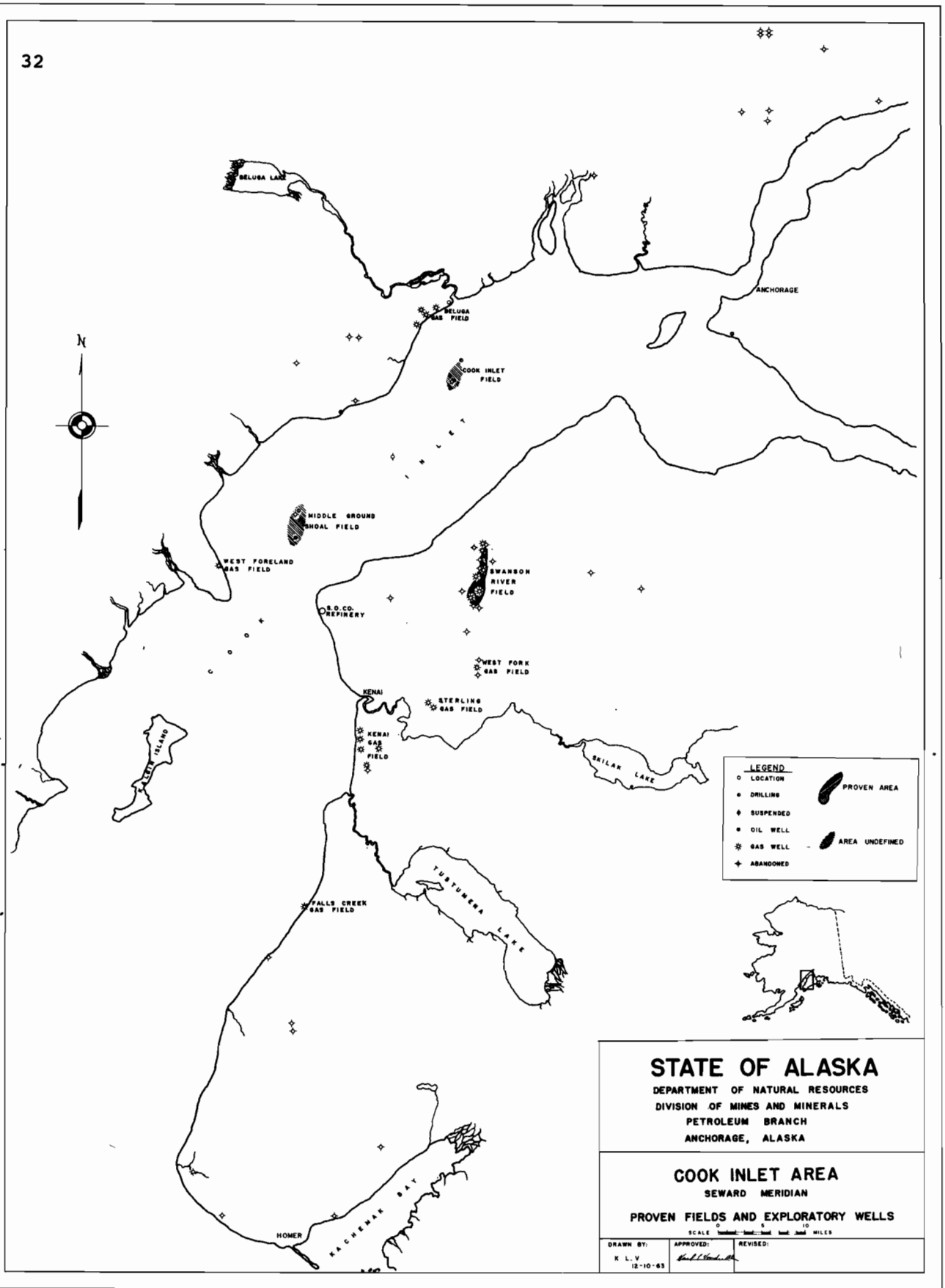


Table IX

Swanson River Gas Production Statistics

Year	Csg.Head	Gas Zone	Total	Blown or Lost	Used	Sold	Injected
Prior to 1959	5,502	0	5,502	5,502	-	-	-
1959	26,611	0	26,611	25,832	779	-	-
1960	96,700	19,760	116,460	58,342	56,593	1,525	-
1961	1,260,977	0	1,260,977	1,009,234	208,303	43,440	-
1962	1,866,275	153,212	2,019,487	1,439,366	233,107	94,854	252,160
1963	2,737,921	4,716,757	7,454,678	315,275	714,870	108,413	6,316,120
Total	5,993,986	4,889,729	10,883,715	2,853,551	1,213,652	248,232	6,568,280



STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINES AND MINERALS
PETROLEUM BRANCH
ANCHORAGE, ALASKA

COOK INLET AREA

SEWARD MERIDIAN

PROVEN FIELDS AND EXPLORATORY WELLS

SCALE 0 5 10 MILES

DRAWN BY:	APPROVED:	REVISED:
K L.V 12-10-63		

Exploration Activity

The year 1963 was very significant for Alaska oil exploration. The Shell Oil Company, with Standard Oil Company of California and Richfield Oil Company as partners, made an oil discovery of commercial importance in Cook Inlet waters under difficult operating conditions. This marked the arrival of Alaska's long awaited second oil field.

Sustaining interest in the Cook Inlet Area, Copper River Basin, and Alaska Peninsula, plus a momentous upsurge of exploratory activity on the Arctic Slope, carried the Statewide exploratory field party statistics well over comparable figures for last year.

Summing up the various phases of exploration activity, it can be concluded the discovery of substantial oil and gas reserves, the development of refinery capacity, and a continuing vigorous exploration program guarantee a permanent and expanding stature for the oil industry in the Alaska economy.

Oil exploration activity in 1963 was divided among the following areas:

Cook Inlet Area

Once again Cook Inlet Area was the leading area within the State for exploratory drilling, with 15 out of 22 exploratory wells drilled or commenced. A significant new oil field was discovered at Middle Ground Shoal #1 operated by Shell Oil Company with Standard Oil Company of California and Richfield Oil Company as partners. A 48-hour potential test flowed oil at the rate of at least 700 barrels per day through a 5/8" top hole choke from the interval 7480' to 8177'. Among the difficult operating conditions are 30-foot tides, 8-knot currents which change directions four times a day, silty water, floating debris, and high winds. It lies in 125 feet of water three miles south of Pan American's Middle Ground Shoal #1 which discovered gas at shallow depths in 1962 but was plugged and abandoned when deteriorating well conditions made it impossible to continue. Shell was permitted to set drillable plugs in the casing and suspend rather than complete the well and risk mechanical damage to submerged well head equipment and possible escape of crude oil into Cook Inlet. The well will be left suspended until productive capacity from additional wells will warrant large scale production and storage facilities. Shell also commenced another offshore drilling operation at their North Cook Inlet #1 and succeeded in setting surface casing before the drilling season closed. The company plans to erect a permanent drilling-production platform in the Middle Ground Shoal area this coming summer.

The Pan American group, consisting of Sinclair, Skelly, and Phillips, in addition to Pan American, drilled their Middle Ground Shoal #2 this summer with a tender barge and platform arrangement but were unable to complete testing before weather terminated the drilling season.

Pan American Petroleum Corporation was successful in its efforts to "kill" its Cook Inlet #1 well which blew out of control in 1962 after a mechanical failure in the connections below the blowout preventers. Every effort to bring

the well under control from the drilling ship on the location was unsuccessful and the blowout was ignited to prevent pollution of Cook Inlet waters.

A relief well commenced about 1500 feet northeast of the blowout was directionally drilled towards the bottom-hole location of the burning well. The relief well was suspended in 1962 when ice flows snapped two anchor lines and threatened the safety of the entire operation.

This same relief hole (Cook Inlet #1-A) was re-entered in 1963 and drilled to approximately the same depth as the burning well. Salt water and drilling mud were pumped into the relief well to penetrate the intervening reservoir sands and kill the wild well. On October 23, 1963, the wild well suddenly ceased to blow. Presumably the injected fluids caused caving in the well bore which plugged the hole. The WODECO II drilling ship was moved over the #1 hole but attempts to re-enter and properly plug it off were unsuccessful. Both wells were suspended for the winter of 1963-64. The #1-A relief well will be re-entered in the spring of 1964 for a completion attempt and tests will be made to determine whether the #1 well is effectively plugged from bottom to top.

The Pan American group is expected to have three offshore drilling rigs in Cook Inlet waters this summer.

In upland portions of the Cook Inlet area, three producing development wells were completed in 1963 in the giant Swanson River Field, but exploratory efforts in 1963 to extend the productive limits laterally and to deepen horizons were unsuccessful. Present oil production from the field is all produced from the Hemlock sands near the base of the Tertiary Kenai formation. On the west side of Cook Inlet, Standard Oil Company of California is attempting to extend the producing limits of the Beluga River field northward and to greater depths. Elsewhere in the Cook Inlet uplands, the Matanuska Valley-Susitna Valley area saw increased exploratory activity whereas in the Kenai Peninsula area activity was slowed partly because of lease title uncertainties evolving from the "Tallman Decision." This decision of the U. S. Court of Appeals declared certain oil and gas leases in the Kenai National Moose Range to be a "nullity" and cast a cloud on many other leases within the Moose Range. At year's end it was not yet known whether the decision would be brought before the Supreme Court for appeal.

Gulf of Alaska

Exploration Activity diminished markedly in this area. Only one well, British Petroleum's White River Unit #3, was drilled in this province and was plugged and abandoned without encountering commercial shows. Active exploratory interest continues in the central and western Gulf of Alaska land areas and offshore possibilities are being considered.

Copper River Basin

An increase in exploratory activity was noted in this basin with the drilling of the Eureka #2 by Aledo Oil Company and Moose Creek #1 by Pan American Petroleum Corporation. Another drilling operation, the Salmon Berry Lake #1 of Mobil Oil Company, had just commenced at year's end. Seismic exploration

doubled in 1963 as compared to 1962.

Alaska Peninsula and Bristol Bay

The Richfield Oil Company as operator plugged and abandoned its Wide Bay #1 near Kanatak on the southeast side of the Alaska Peninsula. This operation was unique in that the hole was drilled from a platform placed on wooden piles and connected to the mainland by a one-half mile-long wooden pile causeway.

Gulf Oil Corporation plugged and abandoned its Sandy River #1 north of Port Moller on the west side of the Alaska Peninsula. More exploratory drilling is expected in this general area in 1964 and 1965 following the active seismic and surface exploration of 1963.

Arctic Slope

A shallow field extension completion was made by Colorado Oil & Gas Corporation on the Gubik structure lying about 17 miles northeast of Umiat at a location less than one mile from where the U.S. Navy had discovered gas but was unable to effect a completion. The well was completed for an initial flow gauge of 890 mcf/d through a two-inch choke. This well was drilled on competitive leases obtained from the Federal Government within the known geologic structure of the Gubik field.

At year's end British Petroleum Exploration Co. (Alaska) Inc. was preparing to drill its Shale Wall Unit about 40 miles southeast of Umiat and also the East Umiat Unit across the Colville River from the Umiat field.

Rapidly increasing exploratory interest in the Arctic Slope is evidenced by a five-fold increase in seismic exploration and a ten-fold increase in geologic surface work over the 1962 levels. Relatively abundant surface outcrops and lack of major unconformities make surface work feasible and meaningful. This area led all other areas with 116 surface party crew months, which is four times as many as the next most active area. Eleven companies were active in actual exploration work.

Atlantic Refining Company's South Ocean Point development contract was approved during 1963. It covers more than one-half million acres east of the Naval Petroleum Reserve #4 boundary and north of the Gubik Gas field.

The Echooka River development contract proposal of Shell Oil Company and Standard Oil Company of California was approved. It lies west of the Canning River and contains over 600,000 acres.

The Federal Government is expected to open several million more acres to oil and gas leasing in 1964.

Table X

DEVELOPMENT WELLS - SWANSON RIVER, BELUGA RIVER and KENAI
Active in 1963

State Permit	Company	Well Name	Well No.	Location ¼	Sec	T	R	B&M	Date Spud	Date Comp.	Footage T.D.	Footage Drilled 1963	Status* 12-31-63	Initial Prod. Bbls or MCF	Remarks
54-61	SOCAL	SRU	21-34	NW	34	8N	9W	S	2- 7-63	3-25-63	11,065	11,065	POW	625	35.1° API
37-62	SOCAL	Beluga R.U.	232- 4	NE	4	12N	10W	S	1- 4-63	2- 2-63	5,300	5,300	GSI	74,000	Open flow potential
63- 2	SOCAL	Beluga R.U.	233-27	SE	27	13N	10W	S	2-23-63	3-25-63	5,680	5,680	GSI	16,300	Open flow pot.1960 psi
63-11	Union	Kenai U.	43- 9	SE	9	5N	10W	S	6-19-63	7- 5-63	6,202	6,202	GSI	No flow tst s.i.pressure 1960 "	
19-62	SOCAL	SCU	21- 8	NW	8	7N	9W	S	12-16-62	2- 5-63	11,000	4,710	POW	580	38.0° API
31-62	SOCAL	SCU	43- 9	SE	9	7N	9W	S	2-10-63	4- 4-63	11,101	11,101	POW	570	35.2° API
63-10	SOCAL	SCU	21-16	NW	16	7N	9W	S	5-20-63	7- 8-63	11,055	11,055	POW	291 B/D	36.2° API
63-12	SOCAL	SCU	23- 3	SW	3	7N	9W	S	7-12-63	11-12-63	10,948	10,986	POW	441 B/D	36.0° API
34-62	SOCAL	SRU	14-22	SW	22	8N	9W	S	12-14-62	2- 2-63	11,000	3,358	POW	320 B/D	31.6° API
63- 7	SOCAL	SRU	34-28	SE	28	8N	9W	S	3-30-63	5-16-63	10,880	10,880	POW	350 B/D	34.1° API
										Total Development		80,337			

EXPLORATORY WELLS ACTIVE IN 1963
Includes Stepout Wells one mile or more from Production

28-62	Pan Am	Cook Inlet State	1A	SW	6	11N	9W	S	8-27-62		12,477	7,296	Suspended until spring	
29-62	SOCAL	SRU	14- 9	SW	9	8N	9W	S	9-29-62	4-22-63	14,360	2,387	P&A	1 mi.WNW of production
32-62	Aledo	Eureka	2	SW	18	2N	10W	CR	10-28-62	5- 6-63	8,546	2,189	P&A	
35-62	Richfield	Wide Bay	1	NW	5	33S	44W	S	12-13-62	10-17-63	12,566	11,402	P&A	
36-62	Sinclair	Swan Lake U.	2	NE	3	7N	6W	S	1-10-63	2-22-63	6,932	6,932	P&A	
38-62	SOCAL	SCU	22A-32	NW	32	7N	9W	S	12-22-62	4-22-63	14,796	2,806	P&A	Dates are for redrill
63- 1	B.P.	Wasilla State	1	SW	33	17N	1W	S	1-21-63	2-25-63	4,849	4,849	P&A	
63- 3	Pan Am	Moose Creek	1	NE	29	4N	3W	CR	3-15-63	7-18-63	7,869	8,419	P&A	
63- 4	B.P.	White River U.	3	SE	29	21S	19E	CR	3-30-63	7-10-63	6,984	6,984	P&A	
63- 5	Halbouty	Fritz Creek	1	NE	4	6S	12W	S	2-17-63	3- 3-63	3,794	3,794	P&A	
63- 6	Pan Am	Tyonek State	2	NW	25	11N	12W	S	8-19-63		8,427	8,929		
63- 8	Pan Am	MGS State	2	NE	19	9N	12W	S	5-19-63		10,899	11,077	Suspended until spring	
63- 9	Shell	MGS State	1	NE	1	8N	13W	S	6-14-63	9-18-63	9,655	9,655	OWSI pending constr.platform & pipeline	
63-13	Colorado	Gubik Unit	1	NW	21	1N	3E	U	7-16-63	11-12-63	4,406	4,406	Susp. Small gas well.	
63-14	Gulf Oil	Sandy R. Fed.	1	NE	10	46S	70W	S	9- 4-63	12- 2-63	13,068	13,068	P&A	
63-15	Union	Knik Arm State	1	NE	1	14N	4W	S	7-26-63	8-31-63	6,106	6,106	P&A	
63-16	Superior	Happy Valley U.	31-22	NW	22	2S	13W	S	9- 9-63	12- 9-63	13,528	13,528	P&A	
63-17	Standard	Naptowne U.	24- 8	SW	8	6N	8W	S					Location susp. indefinitely	
63-18	Shell	N.Cook Inlet	1	SW	29	12N	9W	S	10-12-63		1,504	1,504	Suspended until spring	
63-19	Pan Am	Romig Park,Inc.	1	SE	9	12N	4W	S	10-25-63		9,010	9,010	Drilling	
63-20	SOCAL	Beluga R.U.	14-19	SW	19	13N	9W	S	12-28-63		352	352	Drilling	
63-21	Socony	Salmon Berry L.U.	1	NW	24	6N	6W	CR	12-23-63		135	135	Drilling	
63-22	Humble	Susitna St.U.	1	SE	18	15N	4W	S	12-28-63		418	418	Drilling	

*POW - Producing oil well, GSI - Gas shut in,
P&A - Plugged and abandoned, OWSI - Oil well shut in

Total Exploratory 135,248
Grand Total 215,585

General

Conservation Hearings

Order #12: On May 7, 1963, the Pan American Petroleum Corporation submitted a request for an exception to Section 2061.1 of the Oil and Gas Conservation Regulations. This Section requires the bottom hole location, or the surface location in the case of a straight hole, to be at least 500' from the boundaries of a quarter section or corresponding lot. To facilitate the proper depth of water under the offshore drilling barge tender and to avoid expensive repositioning, the exception was granted by Order #12 dated May 23, 1963. No protests were received during the protest period or at the hearing.

State of Alaska Lease Sales

Competitive Sale #10: On May 8, 1963, a total of 141,549 acres were leased for total bonus bids of $4,137,027.12. This is an average price of $29.23 per acre. These lands were in the Cook Inlet Basin area.

Competitive Sale #12: On December 11, 1963, a total of 256,026.08 acres were leased for $3,053,371.60, an average price per acre of $11.90. All of the leased lands were in the Cook Inlet area.

Noncompetitive Sale #4: Held on April 17, 1963, this sale offered 171 tracts of which a total of 161,400.21 acres were leased. Applicants filing on these tracts totaled 5143.

Pursuant to Section 2008.1 of the Alaska Oil and Gas Conservation Regulations, well records for the following wells drilled in Alaska were released to the public during 1963 through local scouting services and reproduction firms in Anchorage:

Well Name and Number	Operator
Soldotna Creek Unit 14-34	Standard Oil Co. of California
Soldotna Creek Unit 14-9	Standard Oil Co. of California
Kenai Unit 41-19	Union Oil Co. of California
Kaliakh River 2RD	Richfield Oil Corporation
Kenai Unit 44-18	Union Oil Co. of California
Soldotna Creek Unit 32-9	Standard Oil Co. of California
Swanson River Unit 23-27	Standard Oil Co. of California
Soldotna Creek Unit 32-8	Standard Oil Co. of California
Soldotna Creek Unit 43-33	Standard Oil Co. of California
Swanson River Unit 41-33	Standard Oil Co. of California
Soldotna Creek Unit 12-3	Standard Oil Co. of California
Swanson River Unit 23-15	Standard Oil Co. of California
Soldotna Creek Unit 12-4	Standard Oil Co. of California
Falls Creek Unit No. 1	Standard Oil Co. of California
Soldotna Creek Unit 43-8	Standard Oil Co. of California
Soldotna Creek Unit 12-16	Standard Oil Co. of California
Swanson River Unit 21-27	Standard Oil Co. of California
Soldotna Creek Unit 43-4	Standard Oil Co. of California

Well records to be released during 1964 and their release dates:

Well Name and Number	Operator	Release Date
Swanson River Unit 41-28	Standard Oil Co. of Cal.	1- 4-64
Anchor River No. 1	Standard Oil Co. of Cal.	1-24-64
Swanson River Unit 21-22	Standard Oil Co. of Cal.	2- 3-64
Soldotna Creek Unit 21-3	Standard Oil Co. of Cal.	2- 4-64
Bering River Unit No. 2	Richfield Oil Corp.	2-20-64
Soldotna Creek Unit 34-8	Standard Oil Co. of Cal.	2-28-64
Stedatna Creek-State No. 1	Pan American Pet. Corp.	3- 8-64
Soldotna Creek Unit 243-8	Standard Oil Co. of Cal.	3-24-64
Chaix Hills Unit No. 1-A	Standard Oil Co. of Cal.	4- 3-64
Nenana No. 1	Union Oil Co. of Cal.	4- 6-64
Soldotna Creek Unit 32-5	Standard Oil Co. of Cal.	4-11-64
Swanson River Unit 21-34	Standard Oil Co. of Cal.	4-25-64
West Foreland No. 1	Pan American Pet. Corp.	4-29-64
Swanson River Unit 211-15	Standard Oil Co. of Cal.	5-12-64
Swanson River Unit 222-21	Standard Oil Co. of Cal.	5-19-64
West Fork 233-16	Standard Oil Co. of Cal.	5-26-64
Swanson River Unit 221-33	Standard Oil Co. of Cal.	6- 6-64
Chuit-State No. 1	Superior Oil Co.	6-10-64
Pittman No. 1	Union Oil Co. of Cal.	6-27-64
Malaspina Unit No. 1	Colorado Oil & Gas Corp.	6-28-64
Bell Island Unit No. 1	British American Oil Prod. Co.	7- 1-64
Swanson River Unit 14-33	Standard Oil Co. of Cal.	7-11-64
Sterling Unit 43-28	Union Oil Co. of Cal.	8- 7-64
Middle Ground Shoal State No. 1	Pan American Pet. Corp.	8-30-64
Swanson River Unit 12-22	Standard Oil Co. of Cal.	9-11-64
Riou Bay No. 1	Standard Oil Co. of Cal.	10- 2-64
Chuit-State No. 2	Superior Oil Co.	10- 4-64
SRS - State No. 1	Shell Oil Co.	10-14-64
Soldotna Creek Unit 22-32	Standard Oil Co. of Cal.	10-21-64
Malaspina Unit No. 1-A	Colorado Oil & Gas Corp.	11-21-64
South Diamond Gulch Unit No. 1	Occidental Pet. Corp.	11-24-64
White River Unit No. 2	Richfield Oil Corp.	11-25-64
Tazlina Unit No. 1	Union Oil Co. of Cal.	11-29-64

Table XI

Summary of Statistics

Years 1959 - 1963

	1959	1960	1961	1962	1963
Drilling Permits Approved	16	30	55	38	25
Exploratory Wells Spudded	8	10	25	31	16
Development Wells Spudded	8	16	29	10	9
Wells Completed (Oil)	3	13	27	7	8
Wells Completed (Gas)	3	3	5	5	4
Wells Abandoned	4	9	19	21	15
Footage Drilled, Exploratory	75,705	93,749	197,499	290,976	135,248
Footage Drilled, Development	62,197	166,592	302,989	78,619	80,337
Total Footage Drilled	137,902	260,341	500,488	369,595	215,585
Average No. Active Rotary Rigs/Wk	5	7	9	10	7
Average Daily Oil Production	510	1,529	17,333	28,107	29,424
Geologic Field Party Months	129	57.5	57.6	43	47
Seismic Crew Months	92.0	40.0	73.4	86.23	113
Gravity Crew Months	7.5	4.9	14.5	9.5	10
Magnetometer Crew Months					0

Estimated Industry Expenditures

Exploration (includes geological and geophysical work, exploration drilling and administrative expense. Does not include money spent for oil & gas leases acquired by individuals and out of State companies)					$54,030,000
Development drilling costs					4,635,000
Production costs (including secondary recovery)					1,594,000
Refinery construction and maintenance					5,600,000
Total industry expenditures exclusive of marketing and sales activity	$30,654,000	$37,805,000	$42,405,000	$65,500,000	$65,859,000

Table XI Continued

Summary of Statistics

Years 1959 - 1963

	1959	1960	1961	1962	1963
State Oil & Gas lease acreage in effect at year's end		117,203	501,065	1,370,652	1,590,392
Federal Oil & Gas lease acreage in effect at year's end		33,287,120	26,807,695	19,550,312	14,035,381*
State O&G lease acreage issued (does not include transferred Federal leases)				622,852	378,550
				Competitive ---	235,197
				Noncompetitive ---	143,353
Federal Oil & Gas leases transferred to State					86,127
Federal O&G lease acreage issued				683,246	996,616
Full time year around employees of oil industry, excluding marketing				613	655
Cumulative mileage low grade roads and seismic trails built by oil industry				885	1,185
Cumulative mileage heavy duty roads built by oil industry				331	370
Total crude throughput-Alaskan Refinery, barrels					2,600,000

*Includes a correction in Federal Land Office figures of 248,245 less than carried up to August 1963.

Federal development contracts for which the Petroleum Branch approved technical data during 1963 and general location of areas:

Eureka 72,651 acres. Aledo Oil Co. Inc., operator. Copper River Basin approximately 130 miles northeast of Anchorage.

Gubik 34,025 acres. Colorado Oil & Gas Company, operator. Arctic Slope 17 miles ENE of Umiat.

Happy Valley 39,538 acres. Standard Oil Company of California, farm out to Superior Oil Company, operator. On Kenai Peninsula near Ninilchik.

Moose Creek 17,623 acres. Pan American Petroleum Corporation, operator. Copper River Basin.

Shale Wall Unit 93,755 acres. British Petroleum Exploration Company (Alaska), Inc., operator. Arctic Slope 40 miles southeast of Umiat.

Wide Bay Unit 173,860 acres. Richfield Oil Corporation, operator. Alaska Peninsula south of Kanatak.

Federal unit agreements for which the Petroleum Branch approved technical data during 1963 and general location of areas:

South Ocean Point 597,120 acres. Atlantic Refining Company, operator. North coast of Arctic Slope, east of Colville River.

Echooka River 659,975 acres. Shell Oil Company and Standard Oil Company of California, operator. Northeast Arctic Slope.

State unit agreements for which the Petroleum Branch approved technical data during 1963:

Susitna State Unit 12,664 acres. Humble Oil and Refining Company, operator. Six miles west of Goose Bay in lower Susitna Valley. This unit agreement will be the first to be made solely between a unit operator and the State of Alaska. All leases within the unit area were obtained from the State in the 10th Competitive Oil and Gas lease sale held May 8, 1963.

EMPLOYMENT AND ACCIDENTS

	No. of Mines (1)		No. of men Employed (1)		No. of Accidents			
	1962	1963	1962	1963	1962		1963	
					Fatal	Nonfatal	Fatal	Nonfatal
Placer Mines								
Dredges	21	14	296	199		16		14
Nonfloat	72	48	188	146		1		2
Hydraulic	18	10	13	19		0		0
Coal Mines								
Underground	1	0	18	0		1		0
Strip	3	3	233	190		22		24
Lode Mines								
Metal (2)	4	4	56	43		11		4
Nonmetal (3)	3	6	25	12		1		2
Petroleum Production & Exploration			658	737	4	109	1	101
Exploration Metals	78	75	279	227		6		0
Totals	200	160	1766	1573	4	167	1	127

(1) Estimated
(2) Lode mines include lode, prospector and intermittent underground operation and exploration projects, excluding sand, gravel and stone operations
(3) Includes jade, limestone and peat

NOTE: The above data is compiled from information collected by the Division of Mines and Minerals, the U. S. Bureau of Mines, and the Employment Security Division and Safety Division of the Alaska Department of Labor. Many of the small mining operations are part time, and others accomplish little more than assessment work. This Division reports most of these small operators, whereas some of the other agencies do not because these individuals and partnerships do not employ help. Estimated average monthly insured employment in the Alaska Mining Industry for 1963 is 1204 compared to 1239 in 1962 according to data compiled by the R&A Section, Employment Security Division, Alaska Department of Labor.

REPORTS

Geologic Field Work

The results of the 1963 field work undertaken by the Division's mining geologists are summarized in the following brief reports. The purpose of these summaries is to indicate the type of investigations that are being made and to acquaint those who are interested in these areas with the general results of the work. Complete detailed reports and maps on these projects will be issued and placed on sale by the Division of Mines & Minerals before the 1964 field season begins. Notice will be given in the Division's monthly Mines and Petroleum Bulletin as the reports become available. The accompanying map shows the general locations of the numbered projects.

(1) PAINT RIVER AREA, Kamishak Bay, Alaska Peninsula

G. Herreid & D. Richter, Mining Geologists
25 square miles mapped
July 24-August 7, 1963

Copper, Iron

In the Paint River area a series of steeply dipping cherts, limestones and black slates of Upper Triassic age (?) are overlain with marked angular unconformity by a thick assemblage of greenstone volcanics. Igneous rocks ranging in composition from diorite to quartz monzonite intrude both the sediments and volcanics.

Contact metamorphic deposits consisting of massive garnet-amphibole-calcite rock with local concentrations of magnetite, chalcopyrite and pyrite appear to be genetically related to the more acidic intrusives. Localization of the deposits also appears to have been influenced to some extent by the volcanic rock-sediment contact.

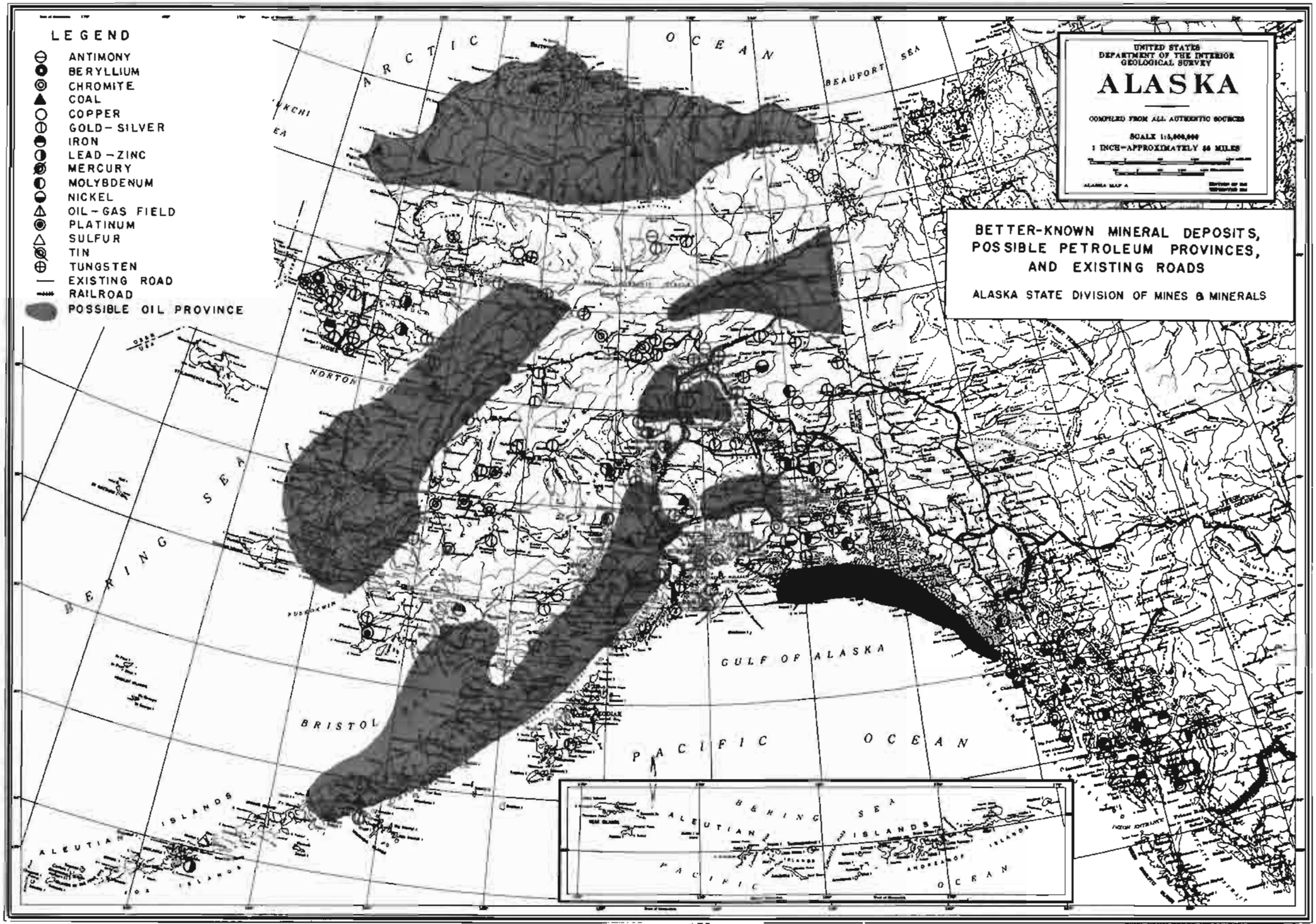
Geologic mapping, geochemical sampling of stream sediments, and reconnaissance and detail magnetometer surveys indicate that the known copper and iron deposits are small and widely scattered. However, the volcanic rock-sediment contact in the vicinity of granitic intrusives, appears to be a favorable guide to ore. Further prospecting and geologic mapping in these favorable areas is justified. A number of small geochemical anomalies and one weak, but rather broad, magnetic anomaly may also warrant further investigation.

(2) HAYES GLACIER MOLYBDENUM AREA

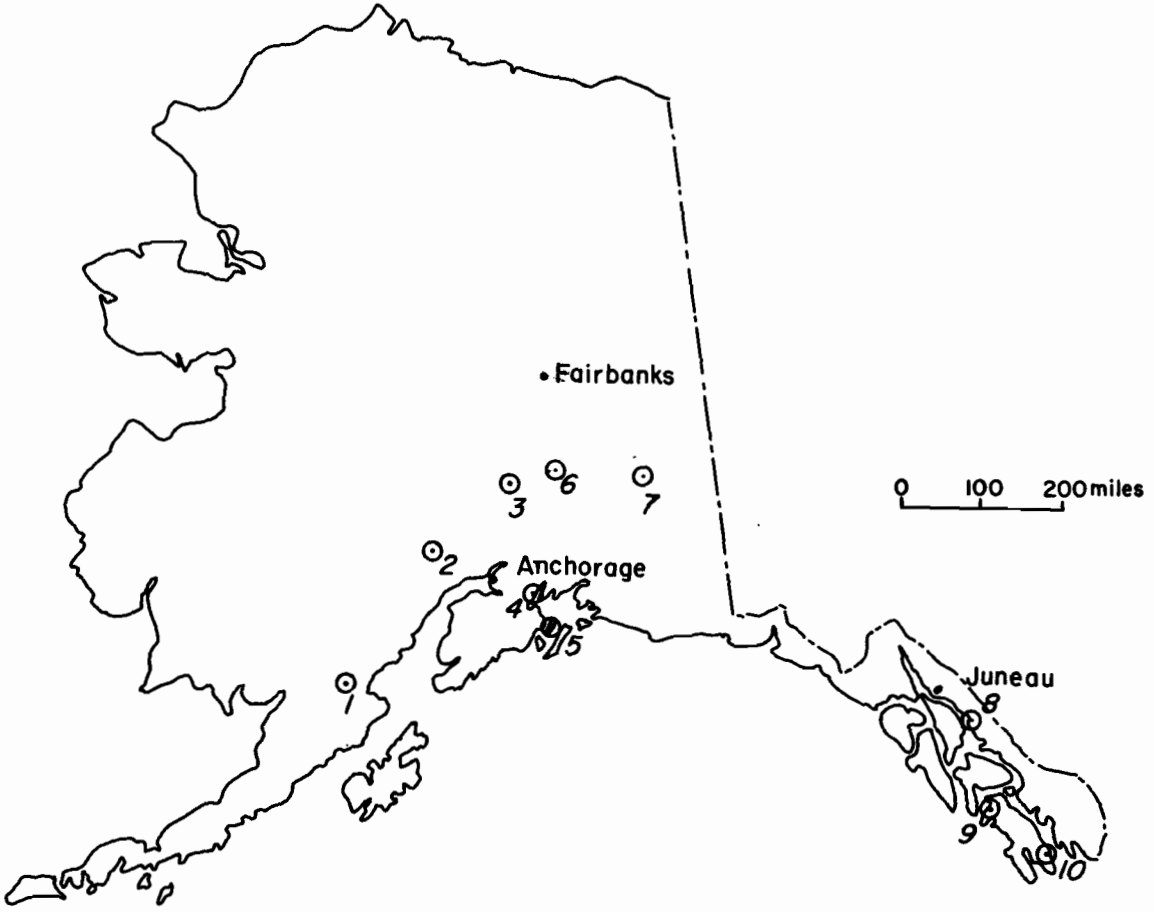
G. Herreid, Mining Geologist & R. Saunders, Mining Engineer
10 square miles mapped
August 15-25, 1963

Molybdenum

The Hayes Glacier molybdenum prospect was examined briefly and the remainder


LEGEND
ANTIMONY
BERYLLIUM
CHROMITE
COAL
COPPER
GOLD – SILVER
IRON
LEAD – ZINC
MERCURY
MOLYBDENUM
NICKEL
OIL – GAS FIELD
PLATINUM
SULFUR
TIN
TUNGSTEN
EXISTING ROAD
RAILROAD
POSSIBLE OIL PROVINCE
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
ALASKA
COMPILED FROM ALL AUTHENTIC SOURCES
SCALE 1:4,000,000
1 INCH – APPROXIMATELY 64 MILES
BETTER-KNOWN MINERAL DEPOSITS,
POSSIBLE PETROLEUM PROVINCES,
AND EXISTING ROADS
ALASKA STATE DIVISION OF MINES & MINERALS
ARCTIC OCEAN
BEAUFORT SEA
BERING SEA
BRISTOL
GULF OF ALASKA
PACIFIC OCEAN
ALEUTIAN ISLANDS
NORTON SOUND

ALASKA
MAP A



Map showing location of geology branch field areas in 1963. Numbers refer to reports in text.

of the time was spent in areal mapping an area of granitic intrusives and greenstone flows four miles southeast of the foot of Trimble Glacier. Rhyolite dikes and several different granite facies are present in the area. No significant mineralization was seen and geochemical stream sediment samples taken by Mr. Saunders did not show any anomalous metal values.

(3) PORTAGE CREEK-SUSITNA RIVER AREA

D. Richter, Mining Geologist
12 square miles mapped
July 3-12, 1963

Molybdenum

The Portage Creek area has been prospected for many years for molybdenum. However, prior to the present investigation there was no published information on the geology and mineral deposits of the area.

The rocks in the area consist of a series of low grade regionally metamorphosed graywacke and slate of Mesozoic age that have been intruded by a quartz monzonite stock. Near the stock the sedimentary rocks have been warped and folded by the forceful nature of the intrusion. The folds trend N 60° E to E and plunge at low angles to the southwest.

Molybdenum deposits in the area appear to be genetically related to the quartz monzonite stock. Molybdenite, with minor sphalerite, arsenopyrite and chalcopyrite occurs locally in silicified zones around the margin of the stock and disseminated molybdenite and chalcopyrite are present in some of the fractured hornfelsic graywacke country rock surrounding the stock. Although no deposits of economic importance were observed, overburden is thick and bedrock exposures poor. Additional exploration work along the stock-country rock contact appears warranted.

(4) GRANITE MINE, Port Wells, Prince William Sound

G. Herreid, Mining Geologist
July 17-18, 1963

Gold

The Granite Mine was visited in conjunction with a private project to recover the mill tailings. Because little detailed information is available concerning the mines in the Prince William Sound gold district, one level of the mine was mapped and sampled. The gold is in fissure quartz veins which crosscut a granite-graywacke contact. It had been reported that one end of the vein is cut off by a fault, but no evidence of this was seen. The Granite Mine operated up until World War II and briefly afterward. Under present conditions the mine is too low grade to operate.

(5) DRIER BAY AREA, Knight Island, Prince William Sound

D. Richter, Mining Geologist
25 square miles mapped
May 20-June 28, 1963

Copper

Knight Island is underlain by a thick assemblage of greenstone volcanic flows and related basic dikes and sills, with minor interbedded sediments. The rocks were probably deposited during early Cretaceous time in an elongate submarine trough. In late Cretaceous-early Tertiary time they were folded, uplifted and subject to low grade regional metamorphism. Bedding, schistosity and principal fold axes in the area trent N to N 20° E.

A number of small copper sulfide deposits have been vigorously prospected but none has yeilded commercial quantities of ore. The deposits consist of massive pyrrhotite, chalcopyrite and cubanite in small lenses, pods and discontinuous irregular veins which are apparently restricted to certain major shear zones or zones of strong schistosity. These zones, which trend parallel to the structural grain of the country rock, are as much as 1,000 feet wide and may extend the length of the island (15-20 miles). In the Drier Bay area six of these schistose zones have been recognized; four contain all the known mineral deposits in the area and two are apparently barren.

A trace element-mineralogical study of the Knight Island rocks has been undertaken in cooperation with the U. S. Geological Survey. Preliminary results indicate that trace element concentrations in the barren and mineralized schistose zones differ significantly.

Further work is planned on Knight Island during 1964.

(6) DENALI-MACLAREN RIVER AREA

M. Kaufman, Mining Geologist
275 square miles mapped
June 12-August 31, 1963

Copper

The map area is underlain by two major northeast trending belts which extend along the south flank of the Alaska Range. The belt in the southeast portion of the map area is composed of basic volcanic rocks with minor interbedded argillite and limestone. Northwest of the volcanics lies a belt of argillite with minor andesitic volcanics. Limestone up to 1,000 feet thick extends along the contact between the sedimentary and volcanic belts. This limestone is interbedded with argillite in some places and volcanics in others. A number of granitic stocks are present in the sedimentary and volcanic rocks. Local schistose zones occur adjacent to the igneous rocks in places. Areas of amphibolitized greenstone may indicate other intrusive bodies at depth.

A drainage heavy metal geochemical survey was conducted throughout the area and a number of anomalies were found. Twenty-one mineral localities were described.

At least two of these warrant further work and were reported on in a special release issued January 30, 1964. The contact area between the volcanics and limestone, particularly in the vicinity of granitic intrusives, appears to offer the best possibility for large copper deposits.

(7) AHTELL CREEK AREA, Slana District

D. Richter, Mining Geologist
30 square miles mapped
August 13-September 1, 1963

Copper, Lead, Zinc, Silver

In the Ahtell Creek area an igneous complex consisting of small stocks of diorite, quartz monzonite and quartz monzonite porphyry intrudes a thick sequence of interbedded sediments and basic volcanics. The bedded rocks, which are considered Permian in age, dip at moderate angles to the east and southeast away from the central intrusive core. Carbonatization has affected most of the bedded rocks in the area and locally, along the intrusive contacts, silicification has been intense.

Quartz and quartz-carbonate veins containing minor base metal sulfides and silver and a number of pyritized zones have been prospected in the area. The genesis of the veins is obscure. However, the pyrite-rich zones generally occur within silicified rocks near an intrusive contact. During the course of the geological-geochemical investigation a quartz vein carrying 20 ounces of silver across a width of three feet was discovered and a large geochemical anomaly located.

Further work in the Slana district is planned for 1964.

(8) WINDHAM BAY

G. Herreid, Mining Geologist & W. Race, Mining Engineer
15 square miles mapped
June 3-27, 1963

Gold, Zinc, Copper

The map area extends along the coast line from the head of Windham Bay north to Pt. Astley and west to Wood Spit. This is an area of low grade metamorphic rocks--phyllite, greenstone, and black slate which have been intruded by several granitic bodies. Gold properties have been sporadically explored at the head of Windham Bay for over 80 years and zinc and copper have been reported in the area. The mines at the head of Windham Bay were examined and the Marty tunnel was mapped on a scale of 1 inch = 50 feet and sampled. The coastline was mapped on a scale of 1 inch = ½ mile. Stream sediment geochemical samples were taken at the creek mouths by Mr. Race. Hornblende metasomatism is common along granite contacts and iron sulfides were found at one such contact. These contacts are possible locations for base metal deposits, but no significant quantities of base metals were found. The gold properties at the head of the Bay appear to be too low grade to mine at present.

(9) DRY PASS

G. Herreid & M. Kaufman, Mining Geologists
7 square miles mapped
May 4-13, 1963

Molybdenum, Copper, Magnetite, Scheelite

The Dry Pass map area lies along the contact of a 5 x 15 mile diorite batholith which has intruded limestone and graywacke. Contact metamorphism along the contacts of this intrusive has transformed the limestone to marble, which was quarried at one time. In many areas, contact metamorphic silicates are present (tactite rock) and in some of these, ore minerals have been introduced. Deposits of molybdenum, magnetite, copper and scheelite are present in the contact aureole. The largest deposit known in the district is a molybdenite-chalcopyrite-magnetite vein in the diorite.

Field work consisted of mapping and sampling a new discovery by Angus Lillie of disseminated molybdenite in tactite and mapping the surrounding district on a 1 inch = ½ mile scale. Many small mineral showings were examined. The area along the contact of the diorite is of greater than average potential for ore deposits and should receive further prospecting and geologic investigation.

(10) NIBLACK ANCHORAGE

G. Herreid & M. Kaufman, Mining Geologists
8 square miles mapped
May 17-26, 1963

Copper

The map area is underlain mainly by isoclinally folded greenstone extrusive rocks which have been intruded by a quartz diorite body on the north side of Niblack Anchorage. Beds strike northwest and folds plunge moderately toward the southeast and have been overturned toward the northeast. Layers of quartz-sericite rock are interbedded with the greenstone. Locally these are mineralized with pyrite and rarely, with pyrite-chalcopyrite. The Niblack Mine produced copper for several years from one of these zones. In other areas of the world pyrite-chalcopyrite lenses of economic size and grade occur along similar quartz-sericite bands in greenstone. These bands are an important guide to ore mineralization in the Niblack Anchorage area and probably also in the region lying northwest of Niblack Anchorage.

Geochemical stream sediment sampling for heavy minerals was used successfully to locate an area containing concentrations of pyrite without visible copper minerals in quartz-sericite rock. Pyrite-chalcopyrite zones should be easily detectable.

Recognition of the importance of quartz-sericite bands, used in conjunction with geochemical drainage sampling, should be effective in prospecting for copper in this region.

Harvison Mercury Prospect

by Martin W. Jasper, Mining Engineer

The recent discovery by John Harvison, Red Devil, Alaska, is situated at approximate Longitude 157° 37' West and Latitude 61° 52' North at about 1,000 foot elevation on a ridge crest on the east side of the George River. It is about 5.5 miles N35E from this stream's confluence with the Kuskokwim River, 3 miles south of the East Fork's junction with George River, and about 32 miles N32W of the Red Devil Airstrip. Small plane landings have been made on an unimproved strip on the rounded ridge crest within a few hundred yards of the principal showing.

After "good indications" were found in panned soil samples, considerable shallow stripping and trenching was done with a small tractor, which exposed a number of scattered small lenses or pods. An open cut 35 feet in length cross-cutting the most encouraging showing was excavated by hand drilling on an approximate due north bearing. During the course of this work a possible ore shoot 3.5 feet in width was intersected at about 20 feet from the south end of the cut. From this point to the face of the cut, minor amounts of cinnabar were reported. Because the 12 to 14 foot open cut face and side walls sloughed off as ice "veinlets" melted, the last 15 feet were timbered and lagged.

A winze was started on the ore shoot and was down 3.5 feet at the time of the visit to the property on September 15, 1963. After bailing water out of the winze, it was noted that the walls and floor were coated with a half inch of ice, showing ground temperatures at the depth to be below freezing.

The formation exposed in the winze and open cut was mostly a dark brown argillaceous sandstone, with slight silicification giving it a quartzite appearance. The footwall of the mineralized winze section is slickensided with striations indicating a general horizontal displacement along bedding of the sandstone (?) of undetermined amount. The fault movement, however, was sufficient to develop a breccia zone, as shown in the winze, two to three feet in width. Mr. Harvison reported having found several short and small segments of highly oxidized dike material in the breccia zone.

The footwall strike in the winze is east-west, and its dip appears to be 45° to 50° north. About 50 feet north of the winze a weathered and oxidized dike (or sill?) was partially exposed but not sufficiently to obtain its strike and dip or full width. It resembles the wide sill exposed in the stripped area of the Parks property as well as dike exposures on other properties in the district which are locally referred to as andesite. The dike segments reported in the winze may be fragments of the above-mentioned oxidized dike.

Mineralization in the winze is limited to cinnabar filling of the scattered breccia voids, resulting in solid cinnabar fillings from 2 to 4 inches in size, with a few fine veinlets noted along fractures between them. No stibnite was noted in this area. During the course of excavating the open cut and winze, the high grade encountered was sorted and stockpiled. The owner reported that some

small pods or lenses were also found in shallow digging between the face of the open cut and the partially-exposed dike to the north.

It was estimated that the 5 to 6 tons of high grade would run 10 to 15% mercury.

Mr. Harvison plans to obtain drilling equipment to deepen the winze following the oreshoot, and "long-hole" the walls to determine extent of the mineralization in this area before further attention is given to other showings on the property.

Magnetic Anomalies in Alaska

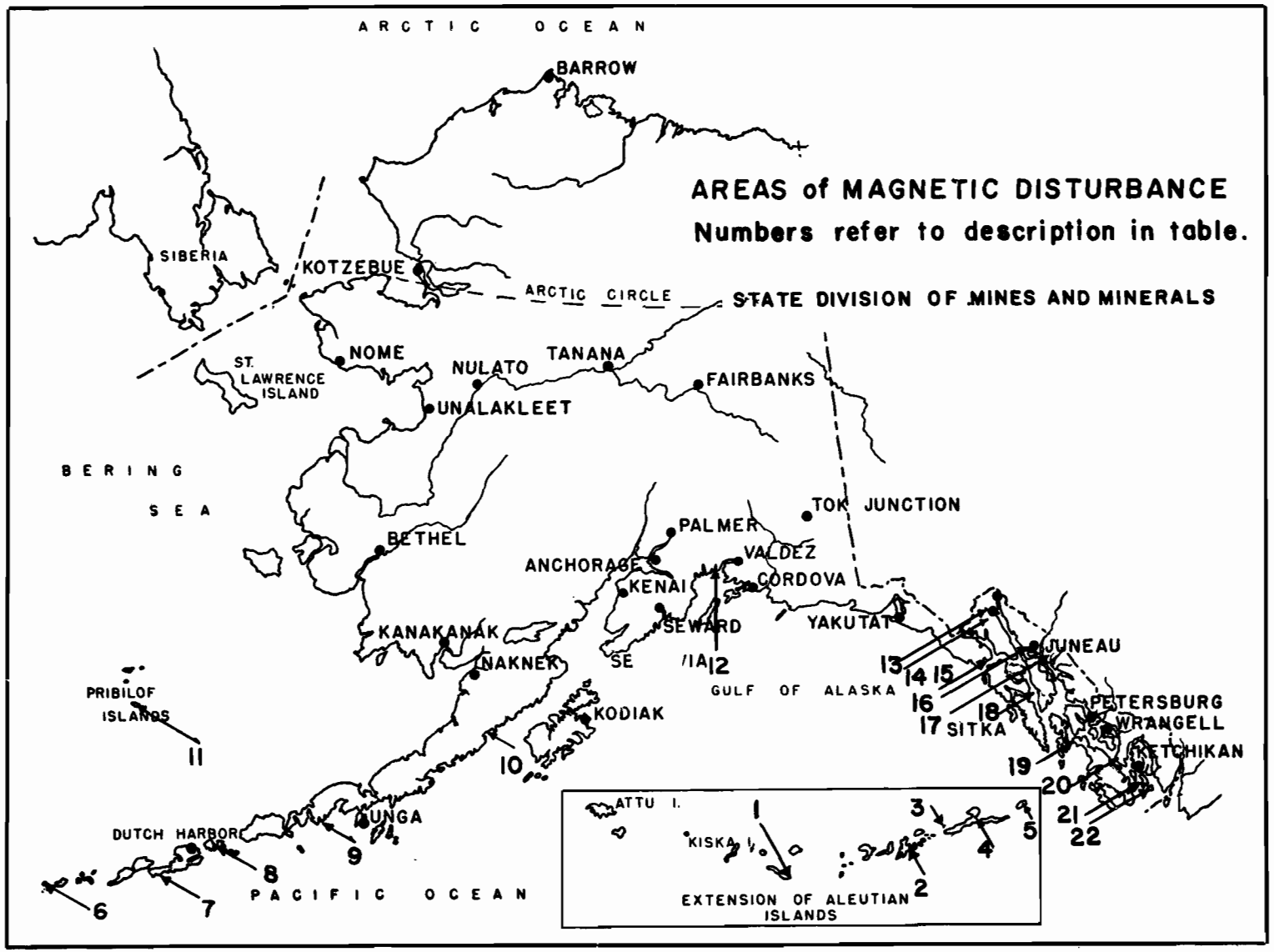
by Donald Richter & Gordon Herreid, Mining Geologists

The World Aeronautical Charts compiled by the U. S. Coast and Geodetic Survey show 22 areas of local magnetic disturbance in Alaska. Approximately half of the anomalies occur in relatively recent volcanic areas and presumably reflect local changes in the magnetic intensity or orientation in the flows and intrusives. Others are associated with known magnetite deposits and some, because of water or overburden cover, have no ready explanation. The purpose of this brief note is to direct attention to these anomalous areas, especially those not explained by surface features and which occur in regions deemed geologically favorable for the occurrence of mineral deposits.

All of the magnetic anomalies reported for Alaska on the Charts are shown on the accompanying State map. Although these anomalies are restricted to the coastal regions from the Aleutian Islands to Southeast Alaska, the confined distribution is apparent rather than real, as the source data used to compile the Charts undoubtedly came in large part from the U. S. Coast and Geodetic Survey's hydrographic and coastal water investigations. That agency would not necessarily be aware of magnetic anomalies away from the coastal areas. The absence of anomalies along the entire Alaskan coast north of the Alaska Peninsula, on the other hand, may be real, reflecting changes in the nature of the geologic environment.

The accompanying table shows the location, maximum observed compass deviation, geologic environment and probable cause, where known, at each of the anomalies. Some of the anomalous areas in Southeast Alaska have been described by Buddington and Chapin in U. S. Geological Survey Bulletin 800 (pp352-353).

Acknowledgment is due Karl VonderAhe, Petroleum Engineer for the State of Alaska, who originally pointed out the presence of the magnetic data on the World Aeronautical Charts.


ARCTIC OCEAN
BARROW
AREAS of MAGNETIC DISTURBANCE
Numbers refer to description in table.
SIBERIA
KOTZEBUE
ARCTIC CIRCLE
STATE DIVISION OF MINES AND MINERALS
NOME
NULATO
TANANA
ST. LAWRENCE ISLAND
FAIRBANKS
UNALAKLEET
BERING SEA
TOK JUNCTION
PALMER
BETHEL
VALDEZ
ANCHORAGE
CORDOVA
KENAI
SEWARD
YAKUTAT
KANAKANAK
JUNEAU
NAKNEK
SE AK
GULF OF ALASKA
PETERSBURG
PRIBILOF ISLANDS
KODIAK
WRANGELL
SITKA
KETCHIKAN
DUTCH HARBOR
UNGA
PACIFIC OCEAN
ATTU I.
KISKA I.
EXTENSION OF ALEUTIAN ISLANDS
1
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12
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19
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21
22

Table XII

AREAS OF MAGNETIC DISTURBANCE IN ALASKA

No.	Location	Maximum observed Compass deviation at ground level	Note*	Geologic environment	Cause
	Aleutian Islands-Alaska Peninsula				
1	Constantine Harbor, Amchitka Island	5°	192	Relatively recent volcanic flows, intrusives and related sediments.	Unknown, but probably due to local variations in intensity and direction of magnetization in the volcanic rocks.
2	Northwest end, Kagalaska Is.	11°	191		
3	Koniuji Island	10°	191		
4	South Shore, Nazan Bay, Atka Island	5°	191		
5	Finch Point, Seguam Island	7°	191		
6	South Shore, Amukta Island	6°	191		
7	Cape Aiak, Unalaska Island	6°	190		
8	Akun Bay, Akun Island to Tigalda Island	8°	190		
9	Arch Point to Cold Bay	14°	190		
10	Cape Igvak to Wide Bay	14°	136		
	Pribilof Islands				
11	St. George Island	10°	135	Ultramafic rocks	Unknown
	South Central Alaska			Intersection of major faults in greenstone-graywacke assemblage.	Unknown
12	Port Valdez	20°	137		
	Southeast Alaska			Ultramafic (hornblendite) rocks.	
13	Klukwan	8°	138		Magnetite deposit
14	Haines	20°	138	Ultramafic (hornblendite) rocks.	Magnetite?
15	Lemesurier Island north to mainland	7°	138	Water covered.	Unknown
16	East of Douglas, Douglas Is.	170°	138	Ultramafic (hornblendite) rocks.	Magnetite deposit
17	Snettisham	78° (10° at 3000 feet)	138	Ultramafic rocks.	Magnetite deposit
18	East of Catherine Island, Chatham St.	6°	138	Water covered.	Unknown
19	Shakan, Kosciusko Island	5°	138	Contact Metamorphic aureole	Unknown
20	North of Myers Chuck	38°	186	Ultramafic rocks.	Magnetite deposit
21	7 Miles south of Annette Is.	18°	186	Water covered.	Unknown
22	Southeast point, Duke Island	47°	186	Ultramafic rocks.	Magnetite deposit

*Numbers refer to U.S. Coast and Geodetic Survey, World Aeronautical Charts.

Keystone Mines Exploration

by Robert H. Saunders, Mining Engineer

In the spring of 1963, Keystone Mines, Inc., was formed by Eugene Schreiber, owner of the McCarty claims; Nordale Corporation, owners of the Nordale group of claims; and Algo Company of Minneapolis, owners of the Hi-Yu claims. The Nordale and McCarty claims roughly cover a strip of land about one mile wide from upper Wolf Creek across the divide to upper Fairbanks Creek in the Fairbanks District. The Hi-Yu claims adjoin the Nordale and McCarty claims on the northeast and extend northeasterly about two miles to Moose Creek. The Keystone Mines, Inc., own or control 62 contiguous mining claims.

Immediately after Keystone Mines, Inc., was formed, the corporation applied for an OME assistance for exploration on the Nordale group. The proposed exploration program consisted of sinking a 200-foot shaft on a vein exposed on the Kawalita claims and drifting at the 200-foot level. It was planned that if the exploration work indicated sufficient reserves of ore, the old Nordale adit could be extended to provide easy access to the ore from a suitable millsite on upper Wolf Creek. Ed Ebbert has been in direct charge of all of the work that has been done on the property during 1963.

The vein on the Kawalita claim is exposed the full length of the claim in an open cut that was made by Arctic Alaska Fisheries and Enterprises, Inc., a corporation that leased the Nordale group during 1959 through 1962. The Kawalita open cut slopes uphill from the east end of the claim to the west. Mining was begun in the open cut in June 1963, pending approval of the OME application. The ore was hauled by truck to the Hi-Yu mill, which was operated one shift per day almost every day from early June until late October. The mill contains two 5-stamp batteries, but part of the time only one battery was used.

Toward the end of June, a movement of overburden and rock on the Kawalita claim squeezed shut the drift through which ore was being trammed. After that, mining by hand in the bottom of the existing open cut was continued westward.

In late July, mining in the open cut had reached the west boundary of the Kawalita claim, which is also the boundary between the Nordale group and a group of claims owned by John Sheldon and Roudolph and Adolph Vetter. Although approval of the application to OME had not yet been obtained, preparations were made for shaft sinking.

The shaft was started down on the vein at about 45 degrees. Twenty-five feet from the collar, the vein was cut off by a fault. The shaft was continued in country rock to a depth of 56 feet. A cross cut into the hanging wall side of the shaft at the 50-foot level intersected the vein 15 feet from the shaft. It was thought the vein might steepen in depth so the shaft, if continued downward at 45 degrees, would intersect the vein.

From the cross cut at the 50-foot level, a drift was turned to follow the vein westward. Timbering was necessary throughout the entire drift. In places,

some of the ore above the drift level was stoped. Approval of the application for OME contract was delayed, partly because of the income being derived from the mining and milling and partly because of the desire to continue exploration laterally. Stoping and drifting on the 50-foot level were continued throughout October. Seventy-five feet from the shaft the vein makes a bend to the north, but in a short distance it bends to the south and continues on the same strike that exists east of the two bends. The drift was driven a total distance of 125 feet. Near the west end of the drift the vein is steeper below the drift than above it.

In late October when the ore began to freeze in the open bin, the mill was shut down.

Shaft sinking under the OME contract started on November 1, 53 feet from the collar. E. H. Beistline was retained by Keystone to do the necessary engineering work on the project.

Water was encountered below the 50-foot level, and pumping was started. On November 29 the shaft was down 80 feet. The vein had not been intersected, and another cross cut probably will be driven into the south in the near future to check the position of the vein.

DIVISION OF MINES & MINERALS

General

The over-all mission of the Division of Mines and Minerals is to aid and promote new and increased mineral production in the State of Alaska. The Division administers the laws with respect to mining and petroleum exploration, mining, mine safety, and conservation of oil and gas. It operates four public assay laboratories for the purpose of aiding bonafide prospectors and miners with free assays, mineral identifications, and consultations. It provides technical advice in the field and office on prospecting and mining problems. It does the geological mapping and other functions of a State Geological Survey. It conducts a continuing survey of the mineral resources and operations in the State and disseminates this information for the assistance of prospectors, miners, and petroleum operators. By law, the Division is required to foster and promote the best interests of the mining, mineral, and related industries of the State, and is also charged with the protection of investors in these industries. It provides the Division of Lands with necessary technical help and advice in mineral leasing and other related matters administered by that Division.

The Division of Mines and Minerals' authority and functions as delegated by the Commissioner of Natural Resources are found in Alaska Statutes, Title 27.

Charts on the following two pages give a brief over-all view of the Division organization, personnel, functions, and a summary of work accomplished in 1963. A map following the charts shows the areas in which Division personnel did field work in 1963 and are planning it for 1964.

ORGANIZATION, FUNCTIONS, AND COSTS

DIRECTOR

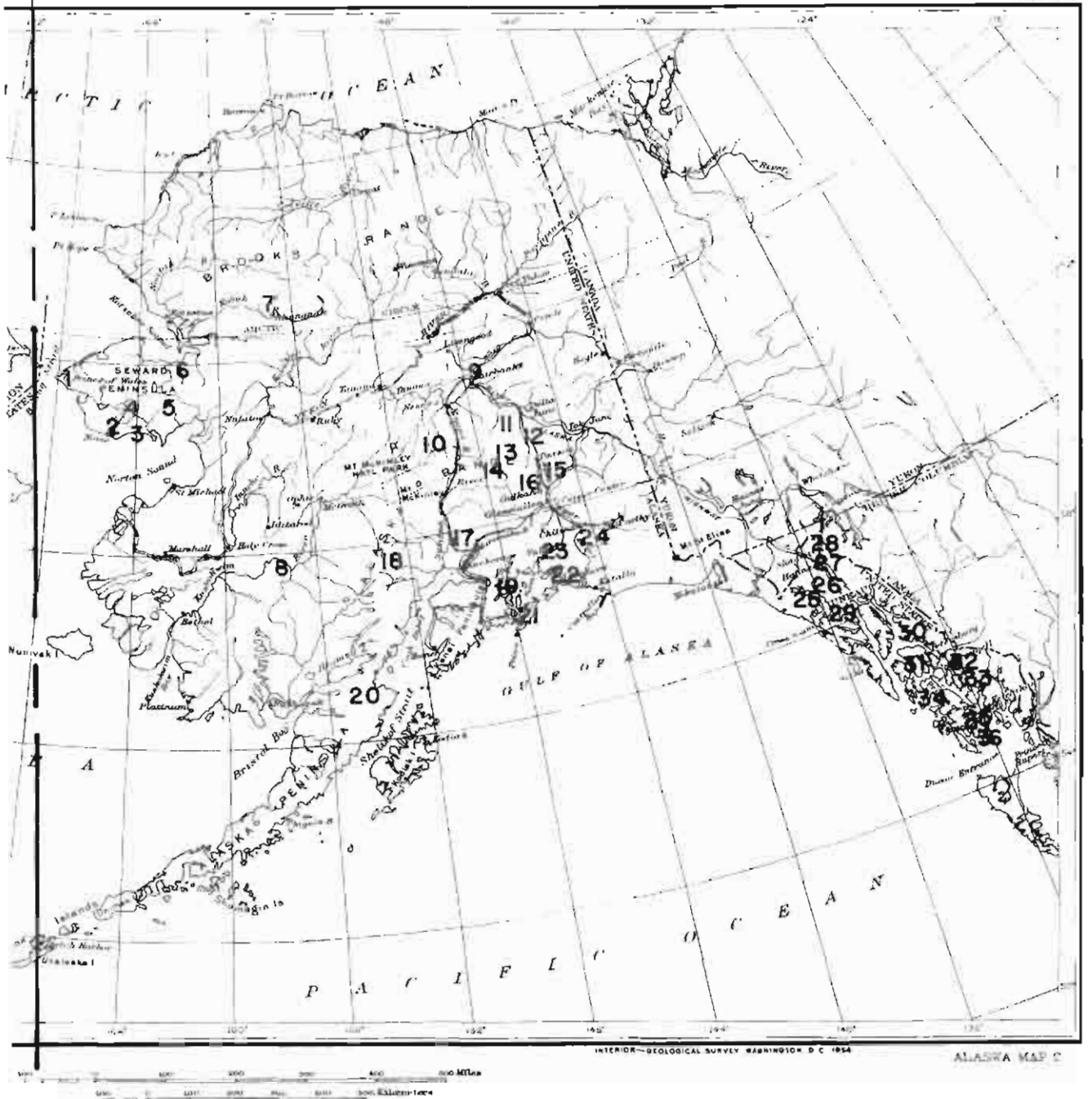
ADMINISTRATION BRANCH	MINING BRANCH	METALLURGY BRANCH	PETROLEUM BRANCH	GEOLOGY BRANCH
Personnel				
Admin. Assistant Minerals Analyst Stenographer	3 Mining Engineers Coal Mine Inspector	3 Assayers Assayer-Engineer	Petroleum Geologist Petroleum Engineer Clerk Steno Clerk Typist	3 Mining Geologists
Functions				
Mineral Records and Information	Prospect Examinations and Reports	Ore Assaying and Analyses	Conservation Regulation	Ore Province Evaluation
Publishing	Safety Inspections Public Inquiries	Mineral Identification	Safety Inspections	Ore Deposit Investigations
Budget, Finance Property, & Personnel	Technical Advice and Help to Prospectors and Miners	Ore Testing Research	Technical Advice to Dep't. of Nat. Resources	Economic Geology Reports and Maps
Locations				
Juneau	Juneau Anchorage Fairbanks Nome	Anchorage Fairbanks Ketchikan Nome	Anchorage	Anchorage
Costs (FY 63-64 App'n.)				
$57,250	$63,350	$77,000	$44,500	$56,650

Division Total: $298,750

Areas of Investigations

The numbers listed below refer to those on the map on the opposite page. Locations of areas as indicated by the numbers are approximate.

1.	Lost River	Prospects examined in 1963.
2.	Snake River, Nome	Prospects examined in 1963.
3.	Solomon, Daniels Creek, Bluff, Topkok Head, Fish River	Prospects examined in 1963, proposed geologic mapping in 1964.
4.	Kougarok District	Prospects examined in 1963.
5.	Death Valley, Omilak	Prospects examined in 1963, proposed geologic mapping in 1964
6.	Candle, Kugruk River	Prospects examined in 1963, proposed reconnaissance in 1964.
7.	Ruby Creek	Prospect visited in 1963.
8.	Sleetmute, Red Devil Mine, George River	Prospects and mining operation examined in 1963.
9.	Fairbanks District	Prospects and mining operations examined in 1963.
10.	Kantishna District	Prospects examined in 1963.
11.	Ptarmigan Creek	Proposed geologic mapping in 1964.
12.	Rainbow Mountain	Prospects examined in 1963.
13.	Denali-Maclaren River	Geologic mapping done in 1963.
14.	Rusty Creek, Clearwater	Prospects examined in 1963.
15.	Ahtell Creek, Slana District	Geologic mapping done in 1963, proposed geologic mapping in 1964.
16.	Rainy Creek	Proposed geologic mapping in 1964.
17.	Portage Creek-Susitna River, Willow Creek District	Geologic mapping done in 1963. Prospects examined in 1963.
18.	Hayes Glacier	Geologic mapping done in 1963.
19.	Port Wells	Prospect examined and mapped in 1963.
20.	Paint River	Geologic mapping done in 1963.
21.	Knight Island	Geologic mapping done in 1963, proposed geologic mapping in 1964.
22.	Ellamar-Landlocked Bay	Proposed geologic mapping in 1964.
23.	Valdez	Prospects examined in 1963.
24.	Chitina	Prospects examined in 1963.
25.	Nunatak-Adams Inlet	Proposed reconnaissance in 1964.
26.	Haines	Prospects examined in 1963.
27.	Skagway-Clifton	Proposed geologic mapping in 1964.
28.	Lemesurier Island	Proposed geologic mapping in 1964.
29.	Windham Bay	Geologic mapping done in 1963
30.	Kosciusko Island Dry Pass	Geologic mapping done in 1963, proposed geologic mapping in 1964.
31.	Groundhog Basin	Prospects examined in 1963.
32.	Bradfield Canal	Prospects examined in 1963.
33.	Shakan	Prospects examined in 1963.
34.	Niblack Anchorage, Baker Island	Geologic mapping done in 1963, proposed geologic mapping in 1964.
35:	Bokan Mountain	Mining operation examined in 1963.



INTERIOR—GEOLOGICAL SURVEY WASHINGTON D C 1954

ALASKA MAP C

BY U S GEOLOGICAL SURVEY FEDERAL CENTER, DENVER COLORADO OR WASHINGTON 25, D C

SUMMARY OF WORK ACCOMPLISHED IN 1963

DIRECTOR

Supervision and administration of Division, field and branch supervisory trips, hearings and new regulations for both mining and petroleum safety, edits all Division reports, Chairman of Alaska Oil and Gas Conservation Committee, active member of American Mining Congress Public Lands Committee.

ADMINISTRATION BRANCH

Accounting, budgeting, personnel, property, public information, publishing all reports and monthly bulletin (circulation 1750), 686 claim location notices and uncounted assessment work affidavits processed, 7471 unpatented claims now on file, mineral inventory and bibliography compilation continued, 285 visitors assisted.

MINING BRANCH

34 property examinations, 5 mineral investigations, reports of investigations submitted, 52 coal mine safety inspections, underground and placer safety inspections, Mine Safety Regulations, annual, economic, and monthly publications, numerous prospectors and miners assisted with technical advice and various kinds of help, advice and help to Division of Lands on mineral and coal permits and lease problems.

METALLURGY BRANCH

Received 3,060 samples, completed 3,602 assays and 224 identifications, assisted 2,800 visitors, rendered some field assistance.

PETROLEUM BRANCH

Approved 34 new wells, administered petroleum conservation regulations, made numerous well safety examinations, witnessed oil discovery for royalty purposes, stored and inventoried 50 sets of well samples, inspected abandoned wells, compiled reports on production and other related statistics, gave technical advise to the Division of Lands in leasing matters.

GEOLOGY BRANCH

Mapped geology of 412 square miles of area judged to be favorable for mineralization and prepared reports with recommendations for exploration. Found four mineral occurrences of possible commercial value.

Future Work

The Division will continue to assist and promote the mineral industries, and provide information to stimulate exploration. The mining engineers will spend more time in the field, making geochemical surveys in connection with geologic mapping in addition to their regular work of mineral and prospect investigations.

Legislation has been proposed to allow the Division to charge fees for assaying. This should reduce the nonessential work now being done and allow the assayers to do better and more effective work on the more important samples that come in and on other prospecting and metallurgical problems that are brought to them.

As related elsewhere in this report, oil and gas exploration is increasing steadily. Particular interest is being shown in the Arctic Slope. The Petroleum Branch work load will increase with the growing industry as it expands in various parts of Alaska in addition to the Arctic Slope such as the Copper River Basin, the Susitna Valley, and of course the Cook Inlet Region.

The Geology Branch will continue its geologic and geochemical investigations into the mineral possibilities of selected promising areas and preparation of detailed reports for use by prospectors and exploration companies. Some of these areas will be extensions of those investigated in 1963 where further work was found to be advisable. These are the Drier Bay Area, Knight Island, Prince William Sound; Portage Creek, Susitna River Area; Slana District; and the Hayes Glacier Area.

Additional areas in which economic geologic investigations are tentatively planned are as follows:

Seward Peninsula: Daniels Creek(3)* - an area of about 25 square miles around the placer deposits; Fish River(3) - an area of about 40 square miles in the vicinity of reported mercury and other metals; Omilak(5) - about 10 square miles around the lead-silver deposit; Kugruk River(6) - brief reconnaissance work along a granite-limestone contact to determine if further work is advisable.

South Central Alaska: Ptarmigan Creek area(11) - several square miles around an area of molybdenite mineralization associated with quartz stockworks in granodiorite; Rainy Creek area(16) - copper mineralization.

Prince William Sound: Ellamar to Landlocked Bay(22) - an area of a former major copper producer and many prospects. This study may reveal new exploration techniques to use in the area.

SE Alaska: Lemesurier Island(29) - around the known molybdenum mineralization; Nunatak to Adams Inlet(26) - zone of hydrothermal alteration with disseminated molybdenite and copper sulfide mineralization; Skagway to Clifton(28) - area of molybdenum mineralization; Kosciusko Island(31) - areas of molybdenum and copper deposits; Baker Island(35) - areas of molybdenum and copper mineralization.

*Map location on page 61

Prospector Assistance Program

The Prospector Assistance Program enacted by the 1963 Legislature went into effect promptly following public hearings and adoption of regulations. While too early to fully evaluate results, some reports turned in on completed projects are excellent and made valuable additions to geologic knowledge of Alaska and its mineral possibilities.

Of 25 applications received, two were subsequently withdrawn by the applicant and four were denied. Nine applicants fully complied with the provisions of their approved projects and, upon receipt of their final reports, were reimbursed in accordance with provisions of Chapter 51 SLA 1963. Twenty-one claims were staked under the program.

Members of the screening boards appointed by the Department of Natural Resources were:

Richard Denny	- State Assayer, Ketchikan
Robert Saunders	- " Mining Engineer, Fairbanks
Willow Burand	- " " " , Nome
Martin Jasper	- " " " , Anchorage
William Race	- " " " , Juneau
Dr. Donald Cook	- College of Earth Science & Mineral Industries, University of Alaska
Dr. Robert Forbes	- CESMI, University of Alaska
Leo Mark Anthony	- " " " "
Roger Markl	- " " " "

1963 Prospector Assistance Program

Name	Locality Prospected	Claims Staked	Samples Assayed	Cost of Travel	Cost of Food	Equipment & Misc.	Total Cost	Total Cost/man Day	Cost to State
Ora P. Schoonover	Chulitna Riv. Talkeetna D-1	0	4	$1250.00	$295.04	$272.85	$1817.89	$58.64	$ 725.92
Champe C. Ransome & 3 partners	Lost River Seward Penin.	4	4	1429.32	640.16	802.35	2971.83	15.81	2228.87
Mark B. Ringstad	East Fork Chandalar Riv.	0	0	1938.03	181.05	23.80	2142.88	57.91	1607.16
Wendell Dawson & K. G. Adams	Leduc River SE Alaska	0	1	639.83	113.26	0	758.09	12.23	481.78
Jim Fuksa & 1 partner	Glacier Cr. Kantishna	6	12	51.83	85.35	107.71	252.45	3.67	189.34
Julius G. Sirilo & 1 partner	Kasigaluk & George River	0	31	253.05	368.74	27.71	649.50	6.01	487.13
John W. Huff	Glacier & Groundhog Basins	11	28	853.50	0	20.23	873.73	19.86	655.30
John J. Smith	Hooper Bay Romanzof	0	11	215.30	114.34	75.59	405.23	12.28	303.92
Vern M. Morey	Kelsall River	0	2	463.50	202.36	66.20	732.06	11.80	549.05
Totals	9	21	93	$7099.36	$2000.30	$1504.00	$10,603.66	$16.80(1)	$7228.47

(1) Average

LIST OF ALASKA MINING OPERATIONS ACTIVE DURING 1963

Name and address of Operator	Location of Mine & Recording District	Approx. Crew	Type of Operation*
Admiralty Alaska Gold Mining Co., Box 2642, Juneau	Funter Bay Juneau	3	Nickel-copper lode development
Aho, John 725 2nd Ave., Fairbanks	Fortymile River Fairbanks	2	Placer preparation
Ahwinona, Jacob & Sam Nome	E. Seward Peninsula Cape Nome	2	Prospecting
Alaska Exploration & Mining Co., Talkeetna	Bird Creek Talkeetna	1	Hydraulic
Alaska Horizons Co. Vic Fondy & Ray Jones Box 4931, Spenard	Treasure Creek Talkeetna	2	Testing ground with caisson
Alaska Mines & Minerals, Inc. Box 422, Anchorage	Red Devil Mine Kuskokwim	16	Mercury production
Alaska Nickel Co. Fred Jenkins Box 2, Eagle	Flume Creek Fairbanks	2	Gold lode development
Alaska Portland Cement Co. Ltd. 136 Kentucky Street Petaluma, California	Foggy Pass Nenana	3	Limestone exploration
Alexander, Betty Nome	Quartz Creek Cape Nome	1	Nonfloat, development work
Amero, A. W. Chandalar	E. Fork Chandalar Riv. Fairbanks	1	Prospecting
Anderson, Ellis Chandalar	Tobin Creek Fairbanks	1	Small scale hand
Anderson, Tury & Associates Fairbanks	Fairbanks Fairbanks	1	Lode prospecting
Atlas Mines George J. Waldhelm Box 755, Nome	Dahl Creek Cape Nome	1	Nonfloat

*Types of operations are explained at end of list.

Baker, V. G. Fairbanks	Jade Mountain Noatak-Kobuk	2	Jade lode and placer
Basin Creek Mining Co. Herbert Engstrom Box 554, Nome	Basin Creek Cape Nome	2	Dredge
Bear Creek Mining Co. W. 917 Mallon Spokane, Washington	Ruby Creek Noatak-Kobuk	22	Copper lode development
Bear Creek Mining Co. W. 917 Mallon Spokane, Washington	Orange Hill Chitina	12	Exploration
Beckwith, Rea Box 119, Anchorage	Alaska general Several	3	Mineral investigations
Berg, L. C. Box 58, Sitka	Chichagof District Sitka	1	Prospecting
Beshores, Paul & Associates Box 1161, Mollala, Oregon	Kugruk River Fairhaven	1	Nonfloat
Bierman, William Yakima, Washington	Slate Creek Chitina	2	Nonfloat
Bittner, Paul Central	Deadwood Creek Fairbanks	1	Hydraulic
Blackman, George & Dyer, A. H. Box 526, Anchorage	Friday Creek Fairbanks	2	Nonfloat
Bliss, Patrick & Son 129 East 11th, Anchorage	Ungalik Creek Cape Nome	3	Nonfloat
Boedecker, Bill & Joines, Evert Hollis	Hollis Ketchikan	2	Prospecting
Bonnell, Frank 1057 W. 80th Street Los Angeles, California	Kantishna District Fairbanks	1	Lode prospecting
Botts, Earl & Lyle Box 1465, Fairbanks	Timberline Creek Palmer	1	Stripping & trenching
Brandl, P. & R. Box 4042 Star Route, Spenard	Nugget Creek Talkeetna	2	Nonfloat
Breseman, John W. Box 796, Pelican	Chichagof District Sitka	1	Prospecting

Brockway, John T. 1737 Glacier Avenue, Juneau	Baker Peak Sitka	2	Copper development
Bronson, Robert; France, Jack & Wilbur, Palmer	Old Brassel Property Palmer	2	Gold lode mining
Brown, Erwin General Delivery, Petersburg	Southeastern Alaska Several	1	Prospecting
Brumfield, James & Robertson, Stanley, Box 1566, Fairbanks	Nugget Creek Fairbanks	2	Nonfloat
Burnette, Dewey & Hunter, Martha, Box 1995, Fairbanks	Crooked Creek Fairbanks	2	Nonfloat
Canyon Creek Mining Co. Jens Kvamme & Sons Akiak	Canyon Creek Kuskokwim	4	Nonfloat
Carr, G. W. Miller House	Miller Creek Fairbanks	2	Nonfloat
Casanoff, Jack Kiana	Klery Creek Noatak-Kobuk	1	Small scale hand
Casto, Steve 33 Mile, Haines	Porcupine Creek Haines	1	Small scale hand
Chambers, Van California	Bluff Cape Nome	2	Nonfloat
Cline, Harvey Cordova	Yakataga Beach Cordova	1	Small scale hand
Coffield, Lawrence Usibelli	Black Creek Talkeetna	1	Gold lode prospecting
Coffield, Lawrence Usibelli	Black Creek Talkeetna	1	Nonfloat
Coleman, George Palmer	Independence Mine Talkeetna	1	Caretaking & Maintenance
College Road Peat Kushman Brothers 12 Timberland Dr., Fairbanks	College Road Fairbanks	2	Peat
Colp Mining Co. Doublas Colp	Klery Creek Noatak-Kobuk	10	Dredge
Columbia Iron Mining Co. 525 William Penn Place Pittsburgh, Pennsylvania	Southeastern Alaska Several	8	Iron development

Cordero Mining Co. 131 University Avenue Palo Alto, California	White Mountain Kuskokwim	1	Mercury lode exploration
Crane, Fred & Associates Kotzebue	Northwest & Northern Alaska Regions Several	2	Prospecting
Davis, Bon Box 45, Nome	Gold Run Cape Nome	1	Nonfloat
Davis, Dr. & Associates Utah	Bluff Cape Nome		Prospecting
Davis Mines, Inc., Talbert E. Davis, 1511 Mary Ann, Fairbanks	Shovel Creek Noatak-Kobuk	2	Nonfloat
Dawson, Wendell 2455 - 140th Avenue, N.E. Kirkland, Washington	Unuk River Ketchikan	1	Prospecting
Degnan, Joseph A. Ophir	Mastodon Creek Mt. McKinley	2	Nonfloat
Delong, Ralph Nome	Coffee & Rock Creeks Cape Nome	1	Hydraulic
Dickman, O. J. Teller	Kigluaik Mountains Cape Nome	4	Nonfloat
Duncan, Jason H. 944 Yellowstone Road Xenia, Ohio	Beauty Bay Seward	2	Gold lode
Eckers, Theron Kasaan	Kasaan Peninsula Ketchikan	2	Prospecting
Edgecumbe Exploration Co. C. T. & G. H. Morgan Box 758, Sitka	Silver Bay Sitka	2	Gold lode maintenance
Edwards, Herk & Miller, Vern Nome	Nome area Cape Nome	2	Prospecting
Emerick, Rollie; Brakefield, Erwin; Monroe, C; Greathouse, C. R. Delta Junction	Alaska general Several	2	Prospecting
Empire Jade Co., Gene Joiner Kotzebue	Jade Creek Noatak-Kobuk	1	Jade recovery & cutting

Falls, Bentley Box 33, Livengood	Wilbur Creek Fairbanks	1	Nonfloat
Farland, Gene Nome	Koyana Creek Cape Nome	1	Offshore prospecting
Farrell, Ed & Higgens, Bert	Steamboat Creek Fairbanks	2	Nonfloat
Fennimore, George & Associates Talkeetna	Yakataga Beach Cordova	4	Placer development
Ferguson, Archie & Belobraidich, John, Kotzebue	Candle Creek Fairhaven	6	Nonfloat
Fern Gold Mining Co. 502 Columbia Building Spokane, Washington	Willow Creek Palmer	2	Gold lode development
Flat Creek Placers Fullerton Brothers Flat	Flat & Willow Creeks Mt. McKinley	3	Nonfloat
Foreman, Kenneth C.	Hollis Ketchikan	1	Development & drilling
Foster, Neal W. Box 279, Nome	Seward Peninsula Several	1	Lode prospecting
Foster, Neal Box 279, Nome	Hannum Creek Fairhaven	2	Nonfloat
Fremont Mining Co. Box 125, Forest Grove, Oregon	Alaska general Several	10	Mineral explorations & drilling
Ghezzi, Alfred R. Box 1857, Fairbanks	Third & Fourth Districts Several	1	Prospecting
Gilbertson, George 314 Charles Street Fairbanks	Canyon Creek Fairbanks	2	Nonfloat
Gold Cord Mining Co. 2309 Lord Baranof Blvd., Anchorage	Fishhook Creek Palmer	1	Gold lode development
Goodnews Bay Mining Co. 422 White Building, Seattle Platinum	Salmon Riv. & tribs. Bethel	40	Platinum dredge & nonfloat
Grant Mining Co. Frank C. Edgington Box 53, Tanana	Grant Creek Ft. Gibbon	2	Nonfloat

Hancock, K. S. Haines	Porcupine Creek Haines	1	Small scale hand
Hansen, Burnett F. Eagle	Ben Creek Fairbanks	2	Nonfloat
Hanson, Aage 1108 10th Avenue N., Seattle, Washington	Craigie Creek Talkeetna	1	Gold lode development
Harvison, John Red Devil	George River Kuskokwim	2	Mercury prospecting & development
Hassel Mining Co. Harold Hassel Box 1071, Fairbanks	Ready Bullion Creek Fairbanks	2	Nonfloat
Havrilack, Harry Rampart	Ruby Creek Rampart	1	Nonfloat
Hawkins, W. A.; Eichner, Ken; Lillie, Angus Ketchikan	Southeastern Alaska Several	1	Prospecting
Heiner, Larry Petersburg	Southeastern Alaska Several	1	Prospecting
Henton, Fred Mile 42, Seward Highway	Slate Creek Seward	1	Gold lode development
Hersch & Herning, Harold Candle	Mud Creek Fairhaven	2	Nonfloat
Hickok, Clara Talkeetna	Thunder Creek Talkeetna	2	Hydraulic
Hill, Lloyd Star Route, Palmer	Grubstake Gulch Palmer	1	Soapstone mining
Hofstad, Richard Petersburg	Petersburg District Several	1	Prospecting
Hogendorn, Jack Deering	Inmachuck River Fairhaven	1	Hydraulic
Holloway, Dorr; Juancorena, Mariano; Neubauer, Jack	Red Devil Property Kuskokwim	4	Mercury lode stripping
Huff, J. W. Box 837, Ward Cove	Gravina Island Ketchikan	1	Prospecting
Humble Oil & Refining Co. 1829 E. 5th Avenue Anchorage	Bristol Bay District Bristol Bay	10	Iron lode development

Idaho Bar Mining Co. Rampart	Idaho Bar Rampart	2	Nonfloat
Inmachuck Mining Co. Grant H. Nelson Nome	Inmachuck River Fairhaven	6	Gold dredge
Johansen, Engbret Chicken	Ingle Creek Fairbanks	2	Small scale hand
Johnson, Iver M. Fairbanks	Chisana District Fairbanks	2	Nonfloat
Kawolsky, Ignacey Nome	Charley Creek Cape Nome	1	Prospecting
Keystone Mines, Inc. Box 630, Fairbanks	Wolf Creek Fairbanks	5	Lode gold
Kloss, Herman; Davis, Jack (K & D Lode) Sunset Cove	Sunset Cove Juneau	2	Gold-antimony lode development and prospecting
Kodiak Exploration Co. Box 448, Kodiak	Kodiak Island Kodiak	3	Tungsten & copper prospecting
Kopanski, Max Skagway	Juneau District Skagway	1	Prospecting
Ladybird Mining Co. 1305 Airport Heights Road Anchorage	Valdez Creek Talkeetna	2	Placer preparations
Langlow, Jens Central	Switch Creek Fairbanks	1	Hydraulic
Lanning, Tony Manley Hot Springs	Eureka Creek Manley Hot Springs	1	Nonfloat
Lee Brothers Dredging Co. Box 208, Nome	Solomon River Cape Nome	10	Gold dredging
Leonard, Harry B. Wiseman	Smith Creek Fairbanks	1	Small scale hand
Leslie, Robert Box 1838, Fairbanks	Granite Creek Fairbanks	1	Placer development
Lie, Harold Kotzebue	Bear Creek Cape Nome	2	Nonfloat

Lindquist, Hjalmer 133 N. Marion, Bremerton, Washington, or Ophir	Bedrock & Ester Creeks Mt. McKinley	1	Nonfloat
Little Creek Mine Ivor C. Carlson Ophir	Little Creek Mt. McKinley	2	Nonfloat
Little Squaw Mining Co. 309 Radio Central Building Spokane, Washington	Chandalar District Fairbanks	5	Gold lode development
Long Creek Mining Co. Ash Richardson, Ruby	Long Creek Fairbanks	4	Nonfloat
Lucky Seven Mining Co. Walter E. Roman Miller House	Portage Creek Fairbanks	3	Nonfloat
McClure, Francis Schaefer; Schaefer, Norman 62 Copeland Avenue La Crosse, Wisconsin	Cinnabar Creek Kuskokwim	2	Mercury lode exploration
McReynolds, Warren; Williams, E. C., Box 292, Ketchikan	Kasaan Peninsula Ketchikan	2	Prospecting
Manske, Dan Box 797, Fairbanks	Ingle Creek Fairbanks	1	Nonfloat
Martinson Brothers Nome	Kougarok River Cape Nome	5	Gold dredge
Marvel Creek Mining Co. Awe, Charles Aniak	Marvel Creek Bethel	3	Nonfloat
Mathews Mining Co. Box 2061, Fairbanks	Woodchopper Creek Fairbanks	5	Dredge
Meldrum, William Chicken	Stonehouse & Chicken Creeks Fairbanks	2	Stripping
Mendenhal, Roy Deering	Milroy Creek Fairhaven	2	Nonfloat
Miller, James; Lindgrin, Earl; Atwood, M. J.	Sheep Creek Fairbanks	3	Nonfloat
Minalaska, Inc. Magnuson Brothers, Ophir	Gaines Creek Mt. McKinley	1	Nonfloat

Mineral Basin Mining Corp. Arthur Moa, Box 126, Hyder	Mt. View Property Ketchikan	4	Exploration (lode)
Minerals, Inc. W. W. Gilkey, Box 1211, Juneau	Yakutat District Juneau	2	Beach placer investigations
Miscovich Brothers Flat	Otter Creek Mt. McKinley	6	Dredge
Monte Cristo Mining Co. R. W. Beck, Gakona	Slate Creek Chitina	5	Nonfloat
Morgan, Milton F. & Novak, M.J. 5115 El Cajon Blvd., San Diego, California	Nome-Bluff Cape Nome	4	Prospecting offshore
Mrak, William Sutton	Grubstake Gulch Palmer	1	Nonfloat
Mt. Andrew Mining Co. Box 358, Ketchikan or 1011-1030 W. Georgia St., Vancouver 5, B. C.	Kasaan Peninsula Ketchikan	8	Iron & copper exploration, drilling, and geophysical
Mt. Parker Mining Co. A. F. Parker Box 2127, Juneau	Mt. Parker Mine Juneau	1	Gold lode maintenance
Munz, Bill Nome	Bluff Cape Nome	1	Dredge
Nesland, Erling & Associates 2027 Airport Road, Fairbanks	Tramway Bar Fairbanks	2	Nonfloat
Newlun, O. H. Box 623, Ketchikan	Prince of Wales Island Ketchikan	1	Prospecting
Newmont Mining Corp. of Canada Ltd., Room 604- 749 W. Hastings Vancouver, B. C.	Rapid River Cape Nome	12	Diamond drilling
Newmont Mining Corp. of Canada, Ltd., Room 604- 749 W. Hastings Vancouver, B. C.	Alaska general Several	5	Nickel lode exploration
New York-Alaska Gold Dredging Corp., 2503 Smith Tower, Seattle or Nyac	Tuluksak R., Calif. Cr., Rock Cr. Bethel	14	Gold dredge

Novak, John 1780 Ocean Blvd. Coos Bay, Oregon	Bering Sea & others Cape Nome	2	Offshore prospecting
Nugget Mining Co. Steven Petersen, Nome	Niukluk River Cape Nome	2	Gold dredge
O'Carroll, Michael Fairbanks	Spruce Creek Mt. McKinley	3	Nonfloat
Ogden Brothers Fairbanks	Candle Fairhaven	5	Nonfloat
Olive Creek Mines Carl Parker, Box 552 Fairbanks	Amy Creek Fairbanks	3	Nonfloat
Olson, Henry T. "Tiger" Taku Harbor	Juneau & Admiralty Districts	1	Prospecting
O'Neill Ventures William O'Neill 505 8th Ave., Anchorage	Dan Creek McCarthy	2	Development work
Pade, Otto Skagway	Skagway Skagway	1	Prospecting
Palmer, R. B. Box 1617, Fairbanks	Sourdough Creek Fairbanks	1	Prospecting
Pankratz, Fred; Doyle, Al Nome	Bering Sea & Beaches Cape Nome	4	Beach & offshore prospecting
Pannick, Harry General Delivery, Fairbanks	Flume Creek Fairbanks	1	Nonfloat
Pearson, Clayton T. & Bothe, Lenhard Red Devil Mine	Lost River Cape Nome	3	Prospecting
Pekovich, W. S. Box 2642, Juneau	Port Snettisham Juneau	1	Iron lode development
Permanente Cement Co. Oakland, California	Kings River Palmer	2	Limestone exploration
Pieper, Paul Ketchikan	Kasaan Ketchikan	1	Prospecting
Pilgrim, E. R. Box 1896, Fairbanks	Stampede Creek Fairbanks	2	Antimony lode development

Pratt, Jack; Dube, Tony Suntrana	No Grub Creek Fairbanks	2	Nonfloat
Price, Stanton c/o Dean Goodwin Box 1262, Juneau	Windfall Harbor Juneau	1	Prospecting
Prince Creek Mining Co. Agoff, S. E. Flat	Prince Creek Mt. McKinley	4	Nonfloat
Purdy Brothers Chicken	Myers Fork Fairbanks	2	Nonfloat
Purkeypile, I.W. & Associates 320 - 3rd St. Hamilton Acres Fairbanks	Tonzona District Mt. McKinley	3	Lode prospecting
Quail Creek Mining Co.	Quail Creek Rampart	2	Nonfloat
Quitsch, William Valdez	Mineral Creek Valdez	1	Gold lode prospecting
Radovan, Martin McCarthy	Glacier Creek McCarthy	1	Copper lode prospecting
Redstone Mining Co. Carl Heflinger 409 Clara Street, Fairbanks	Livengood Creek Fairbanks	2	Nonfloat
Reed, Curtiss & Rybachek, Stanley, Livengood	Wilbur Creek Fairbanks	2	Placer prospecting
Renshaw, A. L. & Associates 2309 Lord Baranof Blvd. Anchorage	Willow Creek Palmer	2	Gold lode development
Rhode Island Creek Mines A. W. Pringle Manley Hot Springs	Rhode Island Creek Manley Hot Springs	3	Nonfloat
R. S. Richards & Associates Box 1817, Anchorage	N. Fork Kashwitna R. & Alaska Peninsula area	5	Copper, iron, gold lode
Ricks, Dean Fairbanks	Fairbanks District Fairbanks	1	Prospecting
Robinson, George F. Chicken	Wade Creek Fairbanks	1	Nonfloat
Ron-Lee Mines	Faith Creek Fairbanks	2	Nonfloat

Rosander & Gates Ophir	Bear Creek Mt. McKinley	3	Nonfloat
Rosander & Reed Ophir	Yankee Creek Mt. McKinley	4	Nonfloat
Ross, Donald Box 917, Ketchikan	Southeastern Alaska	1	Prospecting
Rowe, Richard W. 707 East 9th, Anchorage	Van Curlers Bar Fairbanks	3	Placer exploration
Shapley, George Craig	Tuxekan Island Ketchikan	1	Prospecting
Sheldon, Charlie Shungnak	Shungnak River Noatak-Kobuk	1	Jade placer
Shell Oil Co. Shell Bldg., 100 Bush St., San Francisco, California	Bering Sea Cape Nome	14	Offshore prospecting
Sherman, Mike Candle	Patterson Creek Fairhaven	1	Nonfloat
Sinclair Oil Co. Box 584, Anchorage	Alaska general Several	6	Prospecting
Sirilo, Julius Box 625, Bethel	Aniak District Kuskokwim	1	Prospecting
Smith, Pete & Associates Box 1660, Fairbanks	Steamboat Creek Fairbanks	2	Nonfloat
Squaw Creek Mining Co. Jack Wilke, Boundary	Canyon Creek Fairbanks	1	Nonfloat
Standard Metals Corp. Box 1081, Ketchikan	Kendrick Bay Ketchikan	10	Uranium mine
Steears, Al Box 826, Ketchikan	Southeastern Alaska Several	2	Prospecting
Stelting, H. W. Box 19, Haines	Haines Haines	1	Prospecting
Stensland, A. H. Box 1985, Ketchikan	Helm Bay Ketchikan	1	Prospecting
Strandberg Mines, Inc. Box 2099, Anchorage	Eureka Creek Manley Hot Springs	3	Nonfloat

Stuver, Jules Flat	Moore Creek Mt. McKinley	2	Hydraulic
Sweepstakes Mine Charles Moon & Baldwin Box 371, Nome	Sweepstakes Creek Cape Nome	1	Nonfloat
T and T Mining Co. William Thomas 503 7th Ave., Fairbanks or Rampart	Hunter Creek Rampart	1	Nonfloat, stripping
Taylor, Arley & Associates c/o Snitely Bros. Wenatchee, Washington	Eureka Creek Fairbanks	4	Nonfloat
Tetinek, Eugene Fortuna Ledge	Willow Creek Wade Hampton	1	Nonfloat
Titus, Jack; Cook, Fred Solomon	Shovel Creek Cape Nome	2	Small scale hand
Totem Exploration Co. Joe Blazek 317 Dock St., Ketchikan	Southeastern Alaska Several	2	Prospecting, exploration & diamond drilling
Tozer, James; Kuzminski, Robert; Kellog, Joseph; Ransom, Champe Box 34, Adak, Alaska	Lost River area Cape Nome	4	Prospecting
Tweet, N. B. & Sons Teller	Kougarok River Cape Nome	6	Nonfloat, hydraulic
Ulrich, Henry Nome	Rock Creek Cape Nome	1	Small scale hand
Uotila, Gus Ophir	Birch Creek Nulato	1	Stripping
Uranium & Strategic Ore Development Co., Mr. Hammond Anchorage	Craigie Creek Talkeetna	2	Gold lode prospecting
U.S.S.R.& M. Co. Box 438, Nome	Nome District Cape Nome	4	Prospecting
U.S.S.R.& M. Co. Box 1170, Fairbanks	Fairbanks District Fairbanks	60	2 gold dredges
U.S.S.R.& M. Co. Box 1170, Fairbanks	Hogatza River Ft. Gibbon	34	Gold dredge

U.S.S.R.& M. Co. Box 1170, Fairbanks	Mosquito Fork Fairbanks	15	Dredge
Valdez Mines Ltd. W. Fillipek, President 10032 105th St., Edmonton, Alberta	Canyon Creek Chitina	8	Nickel-copper prospecting
Wackwitz, Charles & Fred Box 1595, Fairbanks	Bedrock Creek Fairbanks	2	Nonfloat
Wall, Melvin Box 3256, Spenard	Valdez Creek Palmer	2	Placer development
Watson, Mrs. Ben Cape Yakataga	Yakataga Beach Cordova	2	Small scale hand
Weinard, Fred Candle	Mud Creek Fairhaven	2	Nonfloat
Weisner Trading Co. Ira Weisner, Rampart	Little Minook & Hoosier Creeks Rampart	4	Nonfloat
Wheeler, Vernon & Associates Box 14A, Wasilla	Grubstake Gulch Palmer	4	Gold lode development
Williams, Burton A. May Creek via Cordova	Rex Gulch McCarthy	1	Small scale hand
Willis, George Red Devil	Parks Property Kuskokwim	1	Small mercury operation
Withrow, Alfred W. Bettles Field	Koyukuk River Fairbanks	1	Small scale hand
Wiurm, Andrew Box 491, Nome	Dome Creek Cape Nome	1	Hydraulic
Woodman, I. N. Box 573, Valdez	Tonsina Lake area Valdez	1	Prospecting
Worthington, John	Prince of Wales Island Ketchikan	2	Prospecting
Yelinore, Inc. Paul Fretz, 947 Orcas St., Anchorage	Yellow Band Property McCarthy	2	Development work
Young, Frank R. Haines	Haines District Haines	1	Prospecting

Zaiser, Clarence Ruby	Greenstone Creek Nulato	2	Nonfloat
Zimin, Nick South Naknek	Alaska Peninsula & Bristol Bay District	1	Prospecting
Zukoev, James	Bonnifield District Nenana	1	Nonfloat

"Nonfloat" indicates mechanical placer gold operation using draglines and/or bulldozers to transport gravel to nonfloating washing plant, bedrock sluiceboxes, or elevated sluices.

"Hydraulic" indicates placer gold operation in which gravel is excavated and transported to sluiceboxes solely by water jets from hydraulic nozzles.

"Small scale hand" indicates placer gold operation in which gravel excavation and transportation is accomplished by hand or ground sluicing.

OIL AND GAS COMPANIES ACTIVE DURING 1963

Name and Alaskan Address of Company	Home or Regional Office	Type of Activity
Atlantic Refining Company P.O. Box 59, Anchorage	P.O. Box 2819 Dallas 2	Geophysical field party
British American Oil Producing Co., 426 Eagle St., Anchorage	Mercantile-Dallas Bldg. Box 749, Dallas 21	Geophysical
British Petroleum Exploration Co. (Alaska), Inc. 308 B Street, Anchorage	620 5th Avenue New York City 20	Geologic field party, geophysical, drilling
Cities Service Oil Company	Bartlesville, Okla.	Geologic field party
Colorado Oil and Gas Corp.	Box 749, Denver	Drilling, geophysical
Honolulu Oil Corporation	215 Market Street San Francisco 5	Geophysical
Marathon Oil Company 520 K Street, Anchorage	550 S. Flower Street Los Angeles 17	Geophysical, drilling
Mobil Oil Company Box 1734, Anchorage	612 S. Flower Street Los Angeles 54	Geophysical, drilling
Pan American Petroleum Corp. 333 B Street, Anchorage	Box 591, Tulsa 2	Geophysical, geologic field party, drilling
Phillips Petroleum Corp. Box 419, Anchorage	Bartlesville, Okla.	Geologic field party, geophysical, drilling
Pure Oil Company Box 1651, Anchorage	35 East Wacker Drive Chicago	Geologic field party, geophysical, drilling
Richfield Oil Corp. Box 2241, Anchorage	555 S. Flower Street Los Angeles 17	Drilling, geophysical, geologic field party
Shell Oil Company 430 C Street, Anchorage	Suite 1055 Dexter Horton Bldg. Seattle 4	Geologic field party, geophysical, drilling

Sinclair Oil and Gas Company Box 584, Anchorage	Box 521 Tulsa, Okla.	Geologic field party, geophysical, drilling
Skelly Oil Company Box 1314, Anchorage	Box 1650 Tulsa 2, Okla.	Geophysical, drilling
James H. Snowden	750 W. 5th Street Fort Worth, Texas	Drilling
Standard Oil Co. of California Box 7-839, Anchorage	225 Bush Street Standard Oil Bldg. San Francisco 20	Production, drilling, geologic field party, geophysical, refining
Superior Oil Company Box 1167, Anchorage	550 S. Flower Street or Box 3015 Terminal Annex, Los Angeles	Geologic field party, geophysical, drilling
Texaco, Inc. Box 664, Anchorage	3350 Wilshire Blvd. Los Angeles 5	Geophysical, geologic field party
Union Oil Co. of California 2803 Denali, Anchorage	Union Oil Center Los Angeles	Drilling, geophysical, production

ACTIVE COAL MINES, 1963

Name and Address of Operator	Location of Mines & Coal Field	Type of Operation	Approx. Crew
Arctic Coal Co., Inc. Lignite	Lignite Nenana Field	Strip	4
Evan Jones Coal Co. Box 619, Anchorage, or Jonesville	Jonesville Matanuska Field	Strip	50
Mrak Coal Co. Box 16, Sutton	Near Eska Matanuska Field	Strip	35
Paul Omlin	Premier Mine Matanuska Field	Strip	2
Usibelli Coal Mines, Inc. Usibelli	Healy Creek Nenana Field	Strip	95

Note: Above data from DM&M records.

LIST OF REPORTS ISSUED BY THE DIVISION OF MINES AND MINERALS AND CORRESPONDING PRECEDING AGENCIES

*Report of the Mine Inspector for the Territory of Alaska to the Secretary of the Interior, fiscal year ended June 30, 1912.

*Report of the Mine Inspector for the Territory of Alaska to the Secretary of the Interior, fiscal year ended June 30, 1913.

*Report of the Mine Inspector for the Territory of Alaska to the Secretary of the Interior, fiscal year ended June 30, 1914.

*Report of the Territorial Mine Inspector to the Governor of Alaska for the year 1915.

*Report of William Maloney, Territorial Mine Inspector, to the Governor of Alaska for the year 1916.

*Report of the Territorial Mine Inspector to the Governor of Alaska for the year 1917.

*Annual Report of the Territorial Mine Inspector to the Governor of Alaska, 1920.

*Annual Report of the Territorial Mine Inspector to the Governor of Alaska, 1921.

*Annual Report of the Mine Inspector to the Governor of Alaska, 1922.

*Annual Report of the Mine Inspector to the Governor of Alaska, 1923.

*Report upon industrial accidents, compensation and insurance in Alaska for the biennium ending December 31, 1924.

*Report of the Territorial Mine Inspector, calendar years 1925-26.

*Report of cooperation between the Territory of Alaska and the United States in making mining investigations and in the inspection of mines for the biennium ending March 31, 1929.

*Report of cooperation between the Territory of Alaska and the United States in making mining investigations and in the inspection of mines for the biennium ending March 13, 1931.

*Mining investigations and mine inspection in Alaska, biennium ending March 31, 1933.

*Report of the Commissioner of Mines to the Governor, biennium ending December 31, 1936.

*Report of the Commissioner of Mines to the Governor, biennium ending December 31, 1938.

*Report of the Commissioner of Mines to the Governor, biennium ending December 31, 1940.

*Report of the Commissioner of Mines to the Governor, two biennia ended December 31, 1944.

*Report of the Commissioner of Mines, biennium ended December 31, 1946.

*Report of the Commissioner of Mines, biennium ended December 31, 1948.

*Report of the Commissioner of Mines, biennium ended December 31, 1950.

*Report of the Commissioner of Mines, biennium ended December 31, 1952.

*Report of the Commissioner of Mines, biennium ended December 31, 1954.

*Report of the Commissioner of Mines, biennium ended December 31, 1956.

*Report of the Commissioner of Mines, biennium ended December 31, 1958.

*Report of the Division of Mines and Minerals, for the year 1959.

Report of the Division of Mines and Minerals, for the year 1960.

Report of the Division of Mines and Minerals, for the year 1961.

Report of the Division of Mines and Minerals, for the year 1962.

*Joesting, Henry R., Strategic mineral occurrences in interior Alaska, Pamphlet No. 1, May 1942.

*Joesting, Henry R., Supplemental to Pamphlet No. 1 - Strategic mineral occurrences in interior Alaska: Pamphlet No. 2, March 1943.

*Anderson, Eskil, Mineral occurrences other than gold deposits in Northwestern Alaska: Pamphlet No. 5-R, May 1944.

*Steward, R.L., Prospecting in Alaska (26-page pamphlet), December 1944. (Revised to November 1949).

*Glover, A.E., Industrial minerals as a field for prospecting in Alaska, including a glossary of elements and minerals (82-page booklet) March 1945. (Revised to May 1946).

*Anderson, Eskil, Asbestos and jade occurrences in the Kobuk River region, Alaska: Pamphlet No. 3-R, May 1945.

*Roehm, J.C., Some high calcium limestone deposits in Southeastern Alaska: Pamphlet No. 6, March 1946. Mimeographed copies are available.

Proper Claim Staking in Alaska; Information Circular No. 1, May 7, 1963.

Rights of Canadians in Alaska under the Mining Laws; Information Circular No. 2, September 15, 1953.

Hand Placer Mining Methods; Information Circular No. 3, April 16, 1962.

*Alaska Uranium Information; Information Circular No. 4, March 15, 1955.

General Alaskan Mineral Information; Information Circular No. 5, February 10, 1964.

Alaskan Prospecting Information; Information Circular No. 6, July 5, 1963.

*Compulsory Assessment Work Affidavits; Information Circular No. 7, July 15, 1957.

Mineral Industry Consultants Available for Work in Alaska; Information Circular No. 8, March 29, 1962.

Dealers in Alaskan Rocks and Minerals; Information Circular No. 9, March 12, 1963.

Skin Diving for Gold in Alaska; Information Circular No. 10, April 12, 1962.

List of DM&M Publications; Information Circular No. 11, March 29, 1962.

Services of the Division of Mines and Minerals; Information Circular No. 12, August 7, 1962.

Dangers in Old Mine Openings; Information Circular No. 13, November 6, 1962.

Race, William H., The Mineral Industry of the Kenai-Cook Inlet-Susitna Regions, 1962.

Report No. PE 85-22; Report on Preliminary Investigation of the Kings River Area Limestone Deposits, Anchorage Quadrangle, by Martin W. Jasper and Miro Mihelich, State Mining Engineers, January 1961.

Report No. PE 65-1; Report on the Mespelt Mine of Strandberg Mines, Inc., Nixon Fork District, Medfra Quadrangle, Alaska, by Martin W. Jasper, State Mining Engineer, February 1961.

Alaska's New Mining Law for State Lands, by James A. Williams, Director, State Division of Mines and Minerals, December 1961 (Reprinted from Mining Engineering Magazine).

Geology and Ore Deposits of Alaska, by Gordon Herreid, Geologist, State Division of Mines and Minerals, December 1961 (Reprinted from Mining Engineering Magazine).

Map: Better-Known Mineral Deposits, Possible Petroleum Provinces, and Existing and Proposed Roads.

Map: M.I. Report No. 194-1; A Preliminary Map of the Bedrock Geology of the Fairbanks Mining District, Alaska, by Robert B. Forbes and Jim M. Brown, Department of Geology, College of Earth Science and Mineral Industries, University of Alaska for the Division of Mines and Minerals, December 1961. Price: $1.00

Geologic Report 3: Geology of the Portage Creek-Susitna River Area, by Donald H. Richter, Mining Geologist, 1963. (2 sheets) Price: $0.75.

*Out of print. On file in certain public and university libraries.