AR-1918

REPORT

OF THE

Territorial Mine Inspector

TO THE

Governor of Alaska

FOR THE

YEAR 1917

CONTENTS.

REPORT OF

WILLIAM MALONEY, TERRITORIAL MINE INSPECTOR

to the

GOVERNOR OF ALASKA,

For the Year 1917.

Juneau, Alaska, April 4, 1918.

Sir:

I have the honor of submitting herewith my annual report for the calendar year of 1917.

Very Respectfully,
WILLIAM MALONEY,
Territorial Mining Inspector.

Honorable J. F. A. Strong,
Governor of Alaska.

MINERAL PRODUCTION.

From the standpoint of mineral production, the Territory of Alaska has again enjoyed a most profitable year. While the value of the mineral production for the year 1917 will not equal that of 1916, it was greater than that of any other year since mining operations began in the Territory. The constant demand for copper, and the high prices prevailing throughout the year have stimulated the depelopment of numerous copper properties all over the Territory.

The value of gold decreased considerably during 1917, due to the increased cost of production brought about by the war, and the increased cost of mining supplies, such supplies having in many instances increased in cost by 200 per cent within the last three years. Gold, being maintained as the base or standard of value, does not increase with the rise and fall of the market—consequently its value has suffered severely by reason of the high prices demanded for other commodities. The caving of the Treadwell mine and the depletion of some of the richer placers have in part been responsible for the decrease in the gold production.

By reason of the failure of a number of the mine operators to make returns as required by section 10 of the mine inspection act, it is impossible for this office to give very accurate figures on the mineral production of the different districts. In the absence of complete information, the statistics published in the advance sheet, from the United States Geological Survey, which it is believed do not vary over 5 per cent from the actual figures, will be published.

The United States Geological Survey has a number of men in the field every year and, through personal contact and after years of patient urging, it has been able to get fairly accurate responses from the mine operators throughout the Territory in regard to the annual mineral production.

The annual report on the mineral resources and mineral production of Alaska in 1917 is now in preparation under the direction of G. C. Martin, of the Geological Survey, Department of the Interior. Some of the important features of this report relating to mining development during the year are abstracted in the following statement. Complete statistics of

the mineral production of Alaska can not be collected within less than three or four months after the close of the year, but meanwhile it is desirable to publish the preliminary estimates here given, which are believed to vary not over 5 per cent from the actual figures.

The value of the mineral production of Alaska in 1917 is estimated at $41,760,000, exceeding that of any previous year except 1916, which was $48,632,000. The decrease in 1917 was, therefore, about $6,870,000. During 33 years of mining Alaska has produced over $391,000,000 worth of gold, silver, copper and other minerals.

Alaska mines are believed to have produced gold to the value of about $15,450,000 in 1917, compared with $17,240,000 in 1916. The total value of the gold mined in the Territory is now about $293,500,000, of which $207,000,000 has been won from placers. In 1917 about 88,200,000 pounds of copper were produced in Alaska, valued at about $24,000,000. The production in 1916 was 119,600,000 pounds, valued at $29,480,000. The total copper produced to date is 427,700,000 pounds, valued at $88,400,000.

The value of Alaska's lesser mineral products in 1917 was about as follows: Silver, $1,050,000; coal, $300,000; tin, $160,000; lead $160,000; antimony, $40,000; tungsten, chromium, petroleum, marble, gypsum, graphite, platinum, etc., $600,000. The year 1917 marks the first production of chromium in Alaska and about 81 ounces of platinum was saved in placer gold mining at several widely separated localities.

GOLD PLACER MINING.

The data in hand indicates that the value of the placer gold output in 1917 was $9,850,000; in 1916 it was $11,140,000. The decrease was due chiefly to restriction of operations because of the high cost of supplies and the scarcity of labor. The placer output was increased only in the Tolovana, Marshall, and Ruby districts and at the new Tolstoi camp.

GOLD LODE MINING.

About 33 gold lode mines were operated in 1917, compared with 29 in 1916. The value of this lode gold mined decreased from $5,912,000 in 1916 to about $5,250,000 in 1917. The decrease was due chiefly to the disaster at the Treadwell mine. Southeastern Alaska, especially the Juneau district, is still the only center of large quartz mining development in the Territory. Next in importance is the Willow Creek lode district. Gold-lode mining on Prince William Sound, Kenai Peninsula and in the Fairbanks district is at a standstill.

COPPER MINING.

The copper production of Alaska in 1917 was about 88,200,000 pounds, valued at about $24,000,000. This is less than the production in 1916, which was 119,600,000 pounds, valued at $29,484,000, but is greater than the production of any other year. The reduction in output was due largely to labor troubles at the Kennecott-Bonanza mine. During the year 17 copper mines were operated, compared with 18 in 1916—8 in the Ketchikan district, 6 in the Prince William Sound district, and 3 in the Chitina district. The enormous output of the Kennecott-Bonanza mine, in the Chitina district in 1917, as in previous years, overshadowed that from all others.

TIN MINING.

About 232 tons of stream tin was produced in Alaska in 1917. Most of this came from the York district, where two tin dredges were operated. Developments were also continued on the Lost River lode-tin mine. The rest of the concentrates were recovered incidentally to placer-gold mining, chiefly in the Hot Springs district.

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ANTIMONY MINING.

The mining of antimony ore (stibnite) began in Alaska in 1915, and continued on about the same scale throughout the first half of 1916, when a fall in the price of antimony put an end to most of these operations. Mining continued at two localities in the Fairbanks district in 1917.

TUNGSTEN MINING.

The Fairbanks district and Seward Peninsula were the principal producers of tungsten in Alaska in 1917. In the Fairbanks district two tungsten mines are in course of development. At one of these mines one unit of a 75-ton mill is in operation and late in the summer was turning out several hundred pounds of scheelite concentrates daily. At the other mine a similar mill was in course of construction. Underground work was in progress at both mines. The present indications give promise of a large increase in the production of tungsten in the Fairbanks district. In Seward Peninsula tungsten was produced principally by sluicing the residual scheelite-bearing lode material in Sophie Gulch. Smaller quantities were recovered as the result of placer mining at other localities.

MINERAL FUELS.

The production of petroleum from the only oil claim patented in Alaska in the Katalla District, was increased somewhat in 1917. Drilling continued on a small scale, but no new productive wells were obtained.

About 61,000 tons of coal, valued at $300,000, were mined in Alaska during 1917. The largest production was derived from the Eska Creek mines in the Matanuska field, which were taken over by the Alaskan Engineering Commission. Coal was mined also at the Doherty mine in the Matanuska field, at the Bluff Point mine on Cook Inlet, on Cache Creek, and near Candle. The most important event of the year in connection with coal mining was the completion of the Matanuska branch of the government railroad. The high-grade coal on Chicaloon River is now being opened by the Alaskan Engineering Commission, and small shipments to Anchorage have been reported. Work preparatory to mining is being undertaken by private lessees on Moose Creek.

The coal lands in the Nenana coal field have been subdivided and will be offered for leasing at an early date. The Government railroad is now being built southward to this field from Nenana, on the Tanana River, and will probably reach the field and make the coal available for shipment in the summer of 1918. A private railroad from Controller Bay to a patented coal claim in the eastern end of the Bering River field is now under construction and is reported to be nearing completion.

DREDGING.

Thirty-nine dredges were operated in Alaska during the mining season of 1917, of which 32 were situated on the Seward Peninsula, three in the Iditarod District, and one each in the Ruby, Circle, Fairbanks and Cache Creek districts. Two of the large dredges near Nome, which had been under construction for several years, were completed and one of them was operated during a part of the season. One of the dredges of the American Gold Dredging Co., formerly operated on the Amcovik River, was moved to Swanson Creek in the American River district, near Teller.

The Alaska Mines Corporation (successors to the Nome Consolidated Dredging & Power Co.) optioned considerably more ground and completed, in the Nome district, a dredge that has been under construction by the Nome Consolidated Dredging Co., since 1912 on Flat Creek. Last season

this company dismantled the dredge that was operated on Wonder Creek by the Nome Consolidated Co.

SOUTHEASTERN ALASKA.

About 9 lode-gold mines, 8 copper mines and 2 placer mines were operated in Southeastern Alaska during 1917. Preliminary estimates indicate that the value of the gold produced in this field was about $4,900,000. The estimated copper production from this region (all of it from the Ketchikan district) was 3,650,000 pounds, valued at about $1,000,000.

In the Ketchikan district no gold mines were operated. The principal copper producers were the Rush and Brown, It, Jumbo, and Mount Andrew mines. The Mamie mine was closed down in the spring, and an increased output was made at the It. The Rich Hill Copper property on Kasaan Peninsula, is being developed by the Granby Company. A 60-ton flotation mill was constructed on the Salt Chuck mine (formerly the Goodro mine) where milling was begun late in the summer. A molybdenite-bearing lode in the vicinity of Shakan on the west coast of Prince of Wales Island, is being developed. Marble quarrying at Tokeen was continued about as usual.

Development of the copper lodes of the Ketchikan district, particularly on the Kasaan Peninsula, has led to the uncovering of large bodies of magnetic iron ore at a number of places. This magnetite, which contains usually about 0.5 per cent of copper has hitherto been regarded only as a low-grade copper ore. Attention has recently been redirected to these ores as a source of iron. Magnetic separation should yield a high-grade iron ore and a valuable by-product of chalcopyrite to pay for the cost of separation. Plans for utilizing these iron ores are now being considered.

MINING AND METALLURGICAL EXPERIMENT STATIONS UNITED STATES BUREAU OF MINES.

A mine experiment station was established at Fairbanks during the present year, one of the eight authorized by an act of Congress in 1915, under the supervision of the United States Bureau of Mines.

This station will make qualitative analyses for the prospector as well as conduct tests on ores for the purpose of determining the character of the ore and the milling process best adapted for the most economical treatment of it. The station is equipped with small testing or sample mills of different types, stamps, ball-mills, roll-mill, flotation process, cyanide process and the tables, amalgamation, Pachuca and settling tanks necessary for the operation of the same. The station will be of great benefit and assistance to the mining industry of the interior of Alaska.

Another of the United States experiment stations was established on the grounds of the University of Washington at Seattle, Washington, for the benefit of the Pacific Northwest States and Southeastern Alaska. This station, in addition to having the metallurgists and chemists of the United States Bureau of Mines, will have the cooperation of the Faculty of the College of Mines and the assistance of the students in conducting investigations. At present the principal investigations being conducted by the station are in electric metallurgy and in the mining, treatment and use of coal. The Fairbanks station was visited during July and August and was under construction at that time. The Seattle station was visited in October, when investigations were being made into the treatment and separation of copper and nickel ore of southeastern Alaska, as well as preparations to test and determine the character of washing plant required for the washing and cleaning of the Matanuska coal.

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SCHOOL OF MINES

The Territorial Legislature, third session, passed an act providing for the establishment of the Alaska Agricultural College and School of Mines, in accordance with the provisions of the Act of Congress approved March 4, 1915, and for the granting of a charter to the above institution. Owing to the vastness of the Territory, its sparsely populated condition and the small number of students that would congregate at any one place, it would be very hard to enroll enough students to insure the maintenance of this college in the manner desired. A better plan for the present needs of the Territory would be to establish classes, in the several principal centers of mining or agriculture, in those industries. For instance, a class in mining could be established in the school of Juneau, where excellent opportunities for the study of mining and metallurgical operations are offered to the students, as some of the largest mines in the United States are situated almost within the city. These mines are equipped with the most modern mills known to the mining industry and mining and milling costs have been reduced to the lowest known to the mining world. I am sure that the managements of those properties would be pleased to cooperate with a class of that kind to the extent of letting the students have free access to the mines and mills for the purpose of studying mining and milling methods. An abundance of minerals and ores for laboratory and experimental work could be procured nearby.

The large school house recently built in Juneau could easily furnish the class room or rooms necessary for such a course. The necessary laboratory for the conduct of assays, analysis and general metallurgical studies, could be erected near the school building at a nominal cost. Class rooms for the study of the different branches of agriculture could be added to the high schools of Fairbanks, Anchorage and other centers where agriculture is engaged in extensively enough to warrant the establishment of such a school, and where studies of the soil could be conducted by the students. Fairbanks also could establish a class in mining, having the use of the United States Bureau of Mines mining and metallurgical experiment station.

The establishment by the United States Bureau of Mines of a mining and metallurgical experiment station at Juneau is a possibility, and the United States Bureau of Mines might be induced to contribute that much toward the establishment of a school of mines at Juneau. This is not a new method of conducting schools of this kind. Australia and New Zealand have used this method for years and have even conducted them as night schools. Some of the most efficient mining engineers of those countries gained their knowledge in that way while working in the mines, thereby acquiring a practical and technical education at the same time.

LABOR CONDITIONS.

During the year there was a shortage of labor in some districts or localities, but, taken as a whole, there was an ample supply of labor within the Territory and wherever there was a shortage it was due to its distribution, some localities having an excess while others suffered from a shortage. The large, low-grade mines of the Juneau district were severely handicapped in the operation of their mines and mills by reason of the lack of sufficient labor. The shortage of labor in this district could be traced to the small wage paid by those mines as compared with the mines in other sections, and the copper mines of the States.

A shortage of labor was noted in the Fairbanks district, although the placer operations had decreased fully fifty per cent below that of 1916, in the number of men employed, and $5 a day and board, for eight hours'

work, was the going wage. This can be partly traced to the large number of men employed by the Alaska Road Commission on the interior wagon roads and the construction of the Government railroad, where the pay was more certain, although lower, large numbers of laboring men being attracted to the railroad construction towns of Nenana and Anchorage, where the number of idle men was noticeable.

There were three strikes by those employed in the mining industry during the year. Early in June the miners in the Willow Creek District demanded an increase in wages from $3.50 per day and board to $4 per day and board. The Willow Creek Mines Company, operating the Gold Bullion Mine, was the only company in the district to grant the request of the miners; the other mines continued operations without experiencing any difficulty in getting all the labor needed.

On June 16 the miners working at the mines of the Kennecott Coper Corporation at Kennecott, demanded that they be paid a flat rate of $4.50 a day and board, instead of the sliding scale then in force at that mine, the miners agreeing to accept the old scale of $3.75 and $4.25 per day and pay $1.25 per day for board upon the price of copper dropping below 18 cents per pound; upon the company refusing this offer the men quit in a body and established a camp near McCarthy, which contained about 220 men. Better living conditions were also demanded by the men.

The schedule of wages used as a base rate by the Kennecott Copper Corporation, which became effective January 1, 1917, in the mining department was as follows:

Shift Bosses	$5.25
Compressormen	4.75
Hoistmen	4.50
Miners	4.25
Trammers (main level)	4.25
Powdermen	4.25
Skip Tenders	4.25
Timber Boss	4.75
Timbermen	4.25
Timbermen Helpers	3.75
Pipe and Trackmen	4.50
Pipe, Track and General Repairmen	4.25
Pipe and Track Helpers	3.75
Tramway Operator Shift Boss	4.25
Tramway Men	3.75

Shaft miners and muckers and miners working in a raise at a distance of over 25 feet, measured vertically from its starting point on the level below, will receive 50 cents per shift above base rates here given during the period of such employment only.

All men to work 8-hour shifts, except those working on a monthly basis.

Board $1.25 a day; hospital, 10 days or under, 10 cents per day hospital fee; over ten days $2 per month for single men, calendar month; men with families $3 per menth.

The system of payment before the strike was a base rate as above stated, with an added bonus. The bonus rate adopted January 1, 1917, was as follows:

The standard rate of wages as a base rate will prevail when the average price of copper during the previous month was under 18 cents per pound.

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The raise in the bonus continuing on this rate for every 5 cents per pound raise in copper, the employee receiving a bonus of 25 cents a day additional.

All employees employed by the month shall receive a bonus of not to exceed $15 per month.

After the men had struck, the company offered a new schedule of rates for bonus, which was as follows:

Effective June 16, 1917, the standard wage scale will continue as the base rate and will prevail when the average price of copper for the previous month is under 15 cents per pound.

When the average price of copper is 15 cents and under 18 cents per pound, each employee engaged upon a daily wage basis will receive a bonus of 25 cents per day.

The raise in the bonus continuing on this rate for every 3 cents per pound raise in the price of copper, the employee receiving 25 cents a day added bonus.

Mess employees on a monthly basis will receive a bonus of $4 per month for each 25 cent change in the bonus for employees on a daily basis.

Bonuses to all other employees on a monthly basis will be fixed by special agreement.

In each and every case the bonus for the current month will be determined by the average selling price of electrolytic copper as given in the Engineering & Mining Journal quotations for the preceding month.

After almost a month of bickering and trying to agree upon a basis of settlement, without coming to any agreement, the company sent men to Cordova and Anchorage, who secured enough men to take the places of those that went out on the strike, thus proving that labor could be procured in the Territory, even under those conditions, which is usually difficult of accomplishment.

At the Ellamor mine the men did not demand any advance in wages, but demanded of the management that they discharge the foreman within twenty-four hours or they would all walk out. The demand was signed by 28 of the hundred men employed at the mine. The manager that evening (June 25), before the 24 hours had elapsed, posted a notice to the effect that the mine would be closed until July 7 for repairs to the machinery. The 28 men that signed the agreement drew the money coming to them and left the camp the evening of the 25th. The mine resumed work as soon as the repairs were completed, the foreman having left in the meantime.

The eight-hour law, as amended, covering all underground mining, was generally observed throughout the Territory. The ten-hour scale of wages. ($5 per day and board for eight hours' work) was maintained in the underground placer mines.

A general eight-hour law, applicable to all wage and salary earners in the Territory, was passed by the Alaska Legislature, session of 1917, in response to a referendum submitted to the people at the general election of 1916, the referendum having been adopted by an overwhelming majority. The law became effective January 1, 1918. This law will not effect the mining industry to any great extent, as the quartz mines and underground placer mines are already operated under an eight-hour law. It will, however,

affect the surface placer and dredges to a certain extent, but the number of men employed in those is small as compared with the other mining industries.

USE OF EXPLOSIVES.

Under the new explosive act, in force since November 15, 1917, all users of explosives must first procure licenses and

> Any person in the United States, its Territories, Alaska, the District of Columbia and other dependencies of the United States, found with explosives in his possession and who does not have a license issued by the Federal Government, showing the purpose for what the explosives are to be used, will be at once arrested and fined up to $5,000 or sent to prison for one year. If the circumstances warrant, the person may be fined $5,000 and in addition given the one year in prison."

This is the principal clause in a war measure passed by the last Congress, and it is now being put into effect by the Bureau of Mines, which has been charged with its enforcement. Mr. Francis S. Peabody, of Chicago, a well known coal operator, familiar with the use of explosives, has been appointed by Secretary of the Interior Lane to act as assistant to the Director of the Bureau of Mines, Van H. Manning, in the enforcement of the law. D. C. Sargent, with headquarters at Cordova, has been appointed Inspector of Explosives for Alaska, and will represent the Bureau of Mines in the administration of the law within this Territory. Under the law, the Director of the Bureau is empowered to utilize the services of all United States officers and all police officers of states, including city police forces, county sheriffs, deputies, constables and all officers in any way charged with police duty. The police are not only to look after enforcement of the law, but are also to make thorough investigations of all dynamite outrages and fires in factories and warehouses and to make their reports to the Director of the Bureau of Mines. Persons apprehended in plots to blow up factories or bridges will be turned over to the authorities for prosecution under Federal laws.

The law provides that everyone who handles explosives must have a license. The manufacturer, the importer and the exporter must have licenses issued by the Bureau of Mines in Washington, as well as the purchaser and seller of explosives. In Alaska these licenses will be issued by the United States commissioners. Only citizens of the United States or of the countries friendly to the United States and the Allies, may obtain licenses. Contractors, mining companies, quarrymen and others using large quantities of explosives which are handled by employees, may issue explosives to their employees only through those employees holding a license called a "foreman's license."

The purchaser of dynamite, in obtaining a license, must state definitely what the explosive is to be used for, and will be held accountable for its use as stated and the return of any explosive that may be left.

With the strict enforcement of this law, the Federal authorities hope to prevent explosives from falling into the hands of disloyal persons and to withhold explosives from persons who will not guard them carefully enough to prevent their being stolen.

Every applicant for a license must appear in person before the licensor, who is directed to refuse to issue a license to any person not known to him to be responsible and loyal, or, if not known to him, unless he is recommended by reputable citizens of the community.

A corporation official applying for a license for a corporation and a foreman applying for a foreman's license should present proper credentials

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to show their official capacities. The word "foreman" as used in the regulations, designates the person actually issuing explosives from the explosives magazines and any other person who may be designated by his company to see that explosives are taken by workmen only to points necessary to the carrying on of his duties and that unused explosives are returned to a safe place, whether or not this man is known at the mine or plant or carried on the pay roll under the title of foreman.

Under an interpretation of section 9 of the law, every person authorized to sell or issue or otherwise dispose of explosives, shall keep a complete, itemized and accurate record, showing each person to whom explosives are sold, given, bartered or to whom or how otherwise disposed of; the quantity and kind of explosives; the purpose for which they are to be used; and the date of each sale, gift, barter or other disposition; and this shall be sworn to and furnished to the director of the Bureau of Mines, or his authorized representatives, whenever requested.

JUNEAU DISTRICT.

Alaska Treadwell Gold Mining Co.—Mine Accident.

The most serious disaster that has ever happened to the mining industry in Alaska, so far as the effect on the mineral output is concerned, is the caving of the Alaska Treadwell, 700 and the Alaska-Mexican mines, all properties owned by the Alaska-Treadwell Gold Mining Company and subsidary companies.

The cave-in occurred on April 22, at 1:30 a. m., letting in the waters of Gastineau Channel, which filled the underground workings of the Treadwell, the 700 and the Mexican mines. The subsidence followed a well-defined fault line crossing the ore body north and south and following closely the east end line of the 700-ft. claim. The hanging wall had been settling for over two years, but with increasing speed since July, 1916, when the work of drawing ore from the upper stopes was discontinued on account of the settling of the hanging wall.

One of the principal contributing causes of the cave-in was the drawing of broken and caved pillar ore from the upper levels, thereby removing the support from the hanging wall. This was done in an effort to make the mine pay for the development of the lower levels. The ore from the 1750-ft. level to the 2300-ft. level was of too low a grade to pay the cost of operation. Consequently the stopes below the 1750-ft. level to the 2300-ft. level were abandoned, leaving a solid block of approximately 500 feet of rock between. Practically a new mine was developed below the 2300-ft. level and on that level and the 2500-ft. level development work was well advanced—stopes had been cut and ore was being hoisted in continually increasing tonnage. The central shaft had been sunk below the 2800-ft. level and a cross-cut was being driven on the 2700-ft. level, to the ore body. Diamond drill holes had been driven on those levels and ore yielding an average of over $2 a ton was found. New equipment consisting of storage electric motors, Granby self-dumping cars, electric hoists, pumps, etc., had just been lowered into the mine a short time before the accident and all of it was lost.

For several days prior to the cave-in, surface subsidence was noticed and special watchmen were detailed to watch for any indication of a cave-in. At 11:30 p. m., April 21, a further subsidence was noted and the management was notified that water was running into the mine. When warning was given of the danger, 130 men were underground and all reached the surface and have been accounted for except one. Several men have stated

that he came up on the cage, but this statement is doubted, as he had a family and his family have not seen him since.

There were 773 men employed in the flooded mines at the time of the disaster, distributed as follows: Alaska Treadwell mine, 462; 700 mine, 250 and the Mexican mine, 61. Because of the shortage of labor at the time all of the men who wanted work were employed in the Alaska-Juneau, Perseverance, and the other mines on the mainland.

The power plants, warehouses, cyanide plant, foundry and the machine shops were used and operated with about 50 per cent of the force previously employed. This was possible because these foundry and machine shops do most of the foundry and machine repair work for the Alaska Juneau Gold Mining Co.

The annual output of the mines flooded was approximately three million dollars. Therefore, the annual gold output of the Territory will be reduced by that amount.

The Ready Bullion mine, which is situated about 2000 feet to the eastward of the flooded mines and which was connected with them by one tunnel only, driven on the 1350-ft level, was saved. A concrete bulkhead, 36 feet thick, imbedded into the sides, floor and roof of the tunnel prevented the flooding of this mine. An additional concrete bulkhead, 50 feet thick, was put in after the flood to reinforce the first bulkhead. Mining operations are carried on continuously in this mine and though a small amount of water seeps through the crevices in the rock and around the bulkhead, it is not enough to cause any great inconvenience and it can be handled by a small pump.

History of the Alaska Treadwell Mines.

The Treadwell group of mines is situated on the northeast side of Douglas Island, about two and one-half miles southeast of the city of Juneau, which is located on the mainland across Gastineau Channel. The group consists of four mines, beginning with the Treadwell mine at the northwest end and embracing the following in the order named: The 700-ft. mine, the Mexican mine, and with a 2,000-ft. space intervening, the Ready Bullion Mine. These four mines are operated by three separate mining companies, as follows: The Alaska-Treadwell Gold Mining Co., which operates the Treadwell mine; the Alaska-Mexican Gold Mining Co., which operates the Mexican Mine; the Alaska-United Gold Mining Company, which operates the 700-ft. mine and the Ready Bullion mine. From an operating standpoint, these mines have always been referred to as the Treadwell mines, all of them being under the same management.

The Treadwell mines were first discovered in the fall of 1880 by Pierre Erussard (French Pete), who located the Paris and Bear's Nest claims. Two years later the interests of Erussard were transferred to John Treadwell, who, with associates, formed the Alaska Mill & Mining Co. A controlling interest was purchased in 1890 by English capital and the Alaska-Treadwell Gold Mining Co. succeeded in the management of the properties.

These mines, through the magnitude of their operations and low mining and milling costs, attracted the attention of the mining world. At the time of the cave-in there were five stamp mills operating a total of 960 stamps and treating approximately 5,000 tons of ore a day.

At the time of the disaster to the properties, they were in process of consolidation, involving the Alaska-Treadwell, the Alaska-United and the Alaska-Mexican companies. These were to be merged into one operating company and a mill similar to the one built for and now operated by the Alaska-Juneau Gold Mining Company on the mainland, was to be

constructed to take the place of the stamp mills, in order to lower the milling costs. New underground and electric haulage equipment was being installed and Granby self-dumping cars and many other labor-saving devices were added to further decrease the cost of production.

The total output of the three mines that were flooded, as given by the report of the committee on consolidation, up to June 1, 1916, was valued at $54,886,968 and the dividends declared were $21,337,651.

The grand total summary of accomplishments of all the mines for the period of their whole history, up to June, 1916, was given as follows:

Tons crushed	$26,464,047
Yield	$62,797,459.91
Yield per ton	2.37
Operating profit	25,938,579.07
Operating cost per ton	1.42
Operating profit per ton	0.95
Dividends	21,337,651.00
Dividends per ton	0.805

To facilitate the handling of the increased tonnage anticipated under the consolidation, the Mexican mine shaft was being widened from a two-compartment shaft to a five-compartment shaft (two skip-ways, two manways and pipe compartment), the dimensions of the shaft being 8x32 feet in the clear. This shaft was nearing completion down to the 2100-ft. level and was used in hoisting men and material at the time of the accident.

The mines flooded were situated mostly below and extending under the Gastineau Channel to a depth of approximately 2200 feet below water level. The ore body being worked had a length of about 2500 feet and a width varying from 100 to 300 feet and between 45 and 50 miles of tunnels had been driven. The cave-in took place to the 1200-ft. level, caving to the surface on the western side of the fault line for a distance of about 250 feet, the eastern side standing almost vertically, very little subsidence being noted.

It is very doubtful if the mines will ever be unwatered and operated again.

Alaska-Gastineau Mining Company.

The Alaska-Gastineau Mining Company which operates the Perseverance mine in Silver Bow Basin, about four miles from Juneau, is the operating company for the Alaska Gold Mines Co.

This mine, considered from the standpoint of tonnage, is one of the largest mines on the American continent, and its output was 2,240,346 gross tons, or an average of 186,696 a month. The mine is in a large fissured zone of slate and metagabbro, cemented together by a network of quartz lenses and veinlets.

Development work for 1917 consisted of 4,731 feet of drifts or levels; 1,702 feet of cross-cuts; 1,678 ft. of raises—a total of 7,244 feet of development, in addition to which 12,754 feet of diamond drill holes were driven. An average of 687.25 men were employed during the year, 525.23 in the mine and 162.02 in the mill.

The stopes are worked on a caving system, overhead stoping just enough ore being drawn to give headroom for the machines. The ore is blasted out along the foot wall and the ore drops from the hanging wall with a little additional blasting. From the stopes the ore passes over grizzlies into chutes, the over size being bulldozed in dulldozing chambers. From the chutes it is drawn into 4-ton cars of the Granby self-dumping type and hauled by storage battery motor to the main ore-

ways. The ore is drawn through the ore-way into 12-ton cars and hauled a distance of about three miles by electric trolley motors to the mill, situated a short distance from the beach, near the mouth of Sheep Creek.

The mill, originally designed to treat 6,000 tons per day, has handled as much as 10,000 tons per day and maintained an average of over 6,000 tons per day for the entire year. The cars are dumped four at a time by a revolving tipple, and the over-size from the grizzlies pass through gyratory and jaw crushers and unite with the under-size in a 10,000-ton storage bin, cut in solid rock. From this bin it is conveyed by a belt conveyor to the mill and distributed by a second conveyor to the ore bins. From these it passes to large rolls and impact screens, the oversize being returned by automatic self-dumping skips to the first set of mill bins, and the under size passing to a second set of bins, to be drawn into smaller rolls and impact screens, also set in a closed circuit. From the last-mentioned bins the dry pulp is drawn to double-decked Garfield tables, where it is concentrated, reground in tube mills and passed to Wilfley tubes, the concentrates going to the retreating plant.

Power for the mine and mill is suplied from several sources. At the mine a small hydroelectric plant furnished power from the waters of Gold and Survey creeks. A large reservoir and hydro-electric plant, constructed at Salmon Creek, about four miles from Juneau, furnishes 6,000 horsepower the year round. Another plant has been constructed at Annex creek, a tributary of Taku Inlet, and furnishes at present 4,000 horse power, and has an ultimate capacity of 12,000 horse power.

The Alaska-Juneau Gold Mining Company.

The Alaska-Juneau Gold Mining Company, which has the Alaska-Juneau mine in Silver Bow Basin, about two miles from Juneau, operated their property throughout the year. This property adjoins the property of the Alaska-Gastineau Mining Co., and is of practically the same character, but the ore body is wider.

The mine is opened by a 6,538-ft. tunnel driven through the ore body, and two incline raises driven through to the surface. Some ore was mined from the "Old Glory Hole," near the old Alaska-Juneau mill on Gold Creek, during the summer, but most of the ore milled was drawn from one large stope (250x800 ft.) The caving system is used, the ore being undercut from both sides, meeting in the center, in the shape of an inverted V. Raises were driven through the ore body and powder drifts put in at intervals, but since starting to cave, only two of the powder drifts have been blasted, the ore caving freely.

The ore passes over grizzlies into chutes, the oversize being bulldozed in bulldozing chambers, connected by drifts paralleling the bulldozing chambers. From the chutes, the ore is drawn into 12-ton cars and hauled by electric motor, using an overhead trolley, to the mill which is situated on Gastineau Channel and within the corporate limits of Juneau. The cars are dumped four at a time, by a revolving tipple, two tipples of this design being in place over the ore bin. From the bin the ore passes through jaw and gyratory crushers direct to ball mills, from which the pulp passes to roughing tables. It then passes through tube mills, from which it flows over Wilfley tables.

This mill, designed to treat 8,000 tons of ore daily, was started April 1, 1917, but up to the present time has not exceeded 4,000 tons per day. This mill, as it now stands, is acknowledged to be a failure. Not only has it failed in crushing capacity, but the operating cost is higher and recovery of gold lower than was estimated. Experiments are in progress, however, with a

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The Jualin-Alaska Mine.

The Jualin Mine, situated on Berners Bay, was operated throughout the year, an average of 36 men being employed in the mine and mill. The ore consists of gold-bearing quartz in a diorite formation. The approximate strike of the vein is N. 40 degrees west; the dip, 60 to 90 degrees northeast, with an average width of about four feet.

The method of ore extraction is back-stoping, using stulls for support. Water, Leyner & Waugh machine drills are used. The ore is trammed to the shaft and hoisted in mine cage in cars. From the collar of the shaft the cars are pushed to the mill, hand power being used. At the mill the ore is treated by 10 stamps and run over amalgam plates.

Considerable water is encountered in the lower workings, a centrifugal turbine, direct-connected, electric pump, situated on the lower level, is used to handle the water, which has an average flow of 700 gallons per minute. Power is furnished by a water wheel in the open season and semi-Diesel fuel oil engines hot bulb ignition, during the cold weather. The power plant is situated one and one-half miles below the mine.

An average ore extraction of 33 tons a day was made, 830 feet of development work done and 1227 feet of diamond drill holes bored during 1917. This property is operated by the Jualin-Alaska Mines Company.

The Admiralty-Alaska Mine.

This property, operated by the Admiralty-Alaska Gold Mining Company, is situated at Funter Bay. Development work was started July 1 and continued to December 1. This work embraced the construction of 3700 feet of surface tram, 36-inch gauge, for the haulage of ore from the mine to the mill, the laying of 307 feet of 22-inch steel pipe to furnish power for the compressor; the construction of a compressor building 20x80 feet, and the installation of a Chicago Pneumatic 24x18x14 compressor, rated at 1400 cubic feet. Three hundred and seven feet of 22-inch, 185 feet of 10-inch, 300 feet of 8-inch and 300 feet of 6-inch steel pipe, connecting a reservoir with a 5-inch Pelton water wheel, furnishes the power. A mess house, 20x40 and store, 12x14, were also constructed; 126 feet of tunnel driven, and an average of 10 men employed during these five months.

SITKA DISTRICT.

Chichagoff Mining Co.

The Chichagoff mine, situated on Klag Bay on the west coast of Chichagoff Island, was inspected in May, 1917. The claims of this company embrace the original Chichagoff mine and the adjoining Golden Gate properties, consisting in all of seven claims. The ore consists of high-grade gold quartz, which occurs in chutes along a vein cutting a gray-wacke formation.

The main haulage tunnel or adit is over 4,500 feet in length. There are five ore chutes cut by this adit, of which the Golden Gate is the largest. Two shafts have been sunk—one 840 feet from the mouth of the tunnel, having a depth of 1000 feet below the floor of the tunnel and the other is 2500 feet from the mouth of the tunnel and has a depth of 600 feet. The

greatest depth attained below the apex was 2400 feet. Work was being done on five levels, overhand method of stoping, using timber, square setting, 5x5xwidth of vein, averaging 3 feet. A block of ore is mined to the apex of the chute, only enough being drawn to give good working room between broken ore and the back, after which all of the ore is drawn from the stope and the walls and timbers swept clean. This block is then filled with waste and the adjoining block is worked in the same manner. The broken ore is trammed to the mills situated near the entrance of the main haulage way. Two mills are used to treat the ore, the Chichagoff and the Golden Gate. In the former, which contains 20 stamps, the crushed ore from the batteries passes over plates to a tube mill, from which it goes to a second set of plates, thence to Deister tables and finally is treated by flotation. In the Golden Gate mill there are ten stamps and the battery pulp, after flowing over amalgam plates, is treated on Wilfley tables. An average of about 130 tons of ore every 24 hours is treated. 140 men were employed by the company underground and on the surface at the time of the visit.

Power for the operation of the mills and mine is derived from Sister Lake, situated five miles from the mine, and is generated by two water-driven electric generators, one 300 k.w. and the other of 125 k.w. Two compressors are in use at the mine plant, one of 900 cubic feet capacity and the other of 600 cubic feet capacity, both electric-driven.

The company provides bunk and mess-houses, cottages and change room, with bathing facilities for the men. A store is also conducted by the company, at which the employees can purchase supplies.

Miscellaneous:

Development work was continued on the group of copper claims near the head of Pinta Bay, about 15 miles northwest of Chichagoff. A little prospecting, but no under-ground development work, was done on the Copper-Nickel deposit at Nickel, about 22 miles northwest of Chichagoff.

The Gypsum Mine.

The Gypsum mine of the Pacific Coast Gypsum Company, which is situated at Gypsum, on Chichagoff Island, is connected with the bunkers at tidewater by a railroad one mile long. The gypsum here occurs in a large deposit, 400x800 ft., lying between gravel. The shrinkage system of mining is used and consists of back-stoping in ore-filled stopes, only enough of the broken ore being drawn through the chutes to give working room between ore and roof. After the stopes are finished, the broken ore is drawn.

Mining operations are carried on three levels, and the greatest depth attained is 225 feet. Cars having a capacity of 1000 pounds are used underground and are trammed by hand. The cars are hoisted to the surface in mine cage and then dumped into bunkers at the mine, from which bunkers it is drawn and hauled to the beach bunkers in ten-ton cars by steam engine.

An average of 18 men were employed throughout the year.

The output of gypsum was curtailed considerably due to the great amount of water encountered on the lower levels and not having adequate pumping facilities to handle the water, an average of 1000 tons per month having been maintained during the year.

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COPPER RIVER BASIN.

The largest mineral producers of the Copper River region, in 1917, as in the preceding years, were the Jumbo and Bonanza copper mines. Considerable copper was also shipped from the Mother Lode Mine, and small shipments were made from several other properties.

The important local development in copper mining during the year included the successful operation of an ammonia leaching plant installed at Kennecott in 1915 and the construction of automobile roads for hauling ore from the Mother Lode mine and from Nugget Creek. Much development work was done at these and other mines, some of which will soon be shipping ore.

Labor troubles reduced the output of the Jumbo and Bonanza mines at Kennecott during the summer.

Hydraulic mining continued on a large scale in the Nizina and Chistochina districts.

The Kennecott Copper Corporation:

The Kennecott Copper Corporation, operating the Jumbo and Bonanza mines and developing a number of other claims in the Copper River district, is the largest shipper of copper ore in Alaska. Both the Bonanza and Jumbo mines are connected with the concentrating plant, at the terminal of the Copper River and Northwestern Railroad, by Bleichert aerial tramways, 16,600 feet in length.

At the time of my visit, July 2-7, the properties were closed on account of labor troubles, which lasted about one month, beginning June 16. This strike considerably curtailed the output for 1917.

The new incline shaft in the Bonanza mine, which was started in 1916, is down to the 900-ft. level. This was sunk on an incline of about 33 degrees. A new electric hoist has been installed, operating skips. The Jumbo new incline shaft, sunk on an incline of 33 degrees is down to the 800-ft. level. Both of these are 3-compartment shafts—two skip-ways and a man-way. An independent manway, extending from the 180-ft. level to the 700-ft. level, was put in during the year.

The leaching plant, constructed in 1915, proved a success commercially, and grading was under way, at the time of visit, for the foundation of an addition to the present plant, which will double the capacity.

The present power plant, consisting of two 300-h. p. Erie City boilers and a 500 k.w. generator, was being increased by the installation of two 250-h.p. Erie City boilers, burning crude oil, and a 500-h.p. steam turbine, direct connected, to a 500-k. w. generator.

The bunk-house at the mill has been enlarged to accommodate from 150 to 200 men. Ground was being graded for the erection of a new bunk-house at the Bonanza Mine.

The Mother Lode Copper Mines Company:

This company during the summer, built 15 miles of wagon road from McCarthy, on the Copper River & Northwestern Railroad, to the mill on McCarthy Creek. This 15 miles of automobile road has 16 bridges and two tunnels; it was constructed without Federal or Territorial aid of any kind, without even the cooperation of any other mine owners. Motor trucks were used for hauling during the summer months.

At the McCarthy station a 300-h. p., oil-burning boiler and an Allis-Chalmers turbine generator was installed. From McCarthy to the lower camp, which is one and a half miles below the mine, a 15-mile transmission line was erected of No. 4, hard-drawn copper wire, carrying current at

1600 volts. At the lower camp, this current is transformed to 440 volts and is then delivered to the mine. A 2-story building for the use of officials, containing offices for the general manager, dining and living quarters, has been erected at the lower camp. The company expects to make a bull-jig product of 50 per cent copper. They expect also to ship a screened product composed of pulverized glance and copper carbonates, which will assay 20 per cent copper. The mine will send down 200 tons of ore per day over the 6000-ft. Leschen aerial tram. The concentrates will be shipped to the smelters and the tailings stacked to run through a leaching plant at a later period. The Pringle vertical shaft is to be sunk 600 feet below the Pittsburg tunnel. For this purpose an electric hoist has been placed underground. This is a second-motion, herringbone gear hoist, having a capacity of 100 to 300 ft. per minute. At the same time the Rhodes tunnel is being driven 215 feet below the Pittsburg tunnel, to tap the Pringle shaft. This shaft will have two hoists and one pump compartments, and will be sunk in the ore body. The mine has been equipped with 25 piston and Jack hammer drills, and three electric-driven air compressors of from 33 to 10-drill capacity. This company plans to build next year a 500-ton mill, installing a set of rolls, three Hancock jigs and Wilfley tables, together with a copper leaching plant. A hydro-electric plant to be installed on McCarthy Creek is contemplated in the near future. In all, 1352 feet of development work was done and 1900 tons of ore shipped, employing an average of 74 men in the mine, mill and plant during 1917.

NIZINA DISTRICT.

This district was visited in July. Gold mining in the Nizina district is restricted to the gold placers of Dan, Chititu creeks and certain of their tributaries, as well as on Rex and White creeks.

The principal mining operations were on lower Dan Creek, below the canyon, conducted by the Dan Creek Mining Co. Water is conveyed to the workings by a flume 650 feet long and a steel pipe line from 15 to 30 inches in diameter and 10,200 feet long. All boulders over 15 inches in diameter are broken with powder, but small ones are carried through the sluice boxes.

A complete sawmill is owned and operated when necessary by the company.

A small amount of placer gold is obtained by drifting in the bench gravels on the south side of Dan Creek. The gold-bearing gravels occupy in part the former channel of Dan Creek but were left as bench gravels when the creek cut its present channel below them. Mining in these gravels is handicapped by the difficulty of obtaining water for sluicing.

Two hydraulic plants were in operation on Chititu. One plant was at the mouth of White and Rex Creeks and the other one a half mile below on Chititu. Two hydraulic plants were being operated on the benches of Rex Creek—one on No. 3 bench, left limit, and the other No. 13 bench, left limit. Several smaller operations were being carried on by drifting into the benches both on Rex and Chititu creeks. About 100 men were employed in the placer mines in this district.

The operations on No. 3 bench, conducted by L. H. Carvey and H. F. Andrus, are situated on the east side of Rex Creek. The bedrock rim is 55 feet higher than the stream. From 100 to 150 feet of gravel, forming the bench, rests on a shale bedrock. The gold is coarse and is said to be rather evenly distributed throughout the gravel, although the gold contents at bedrock is slightly greater. The water for these operations is taken from Rex Creek, two miles above its mouth.

ORIAL MINE INSPECTOR

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Alaska-Chitina Copper Co.

This company has purchased or leased the Westover property, situated on the north side of Dan Creek. The Alaska-Chitina Copper Co. began operations on the Westover property October 15, 1917, so that their operations cover only two and a half months during 1917. An average of 12 men were employed during this period. Five hundred tons of ore were mined, using single jack; the ore will be freighted to McCarthy during the winter, where it will be loaded on cars of the C. R. &. N. W. R. R., and shipped to Cordova for transshipment by steamer to Ladysmith Smelter. These deposits occur in the limestone and contain boronite and glance.

Slate Creek District:

About 10 claims were operated in the Slate Creek region on Falls, Willow, Nugget, Slate and Spruce creeks, during the year.

Chisana District.

The operations of gold placers in the Chisana district, in the upper Tanana region, were continued during the year. Seventeen claims were operated, employing about fifty men. The principal creek was Little Eldorado, with Bonanza next in importance, approximately $30,000 being produced in this district during 1917.

The North Midas Copper Co.

The mine of this company, situated on the Kuskulana River, about 17 miles from the station of Strelna, on the C. R. &. N. R. R., has developed a promising ledge of gold and copper ore. The company has installed a Chicago Pneumatic Tool Co. compressor and expect to make regular shipments of gold ore.

The Chitina-Kuskulana Copper Co.

The property of this company is situated about 12 miles from Strelna. A power plant has been installed, burning wood, to drive its air compressor. This company has a very good copper prospect, but was disappointed during the past year by delayed shipments of machinery. However, it expects to do considerable work during 1918.

Alaska Copper Corporation:

This property is situated on Nugget Creek, about 17 miles from Strelna, and is the oldest property out of Strelna. During 1917 a wagon road was constructed to this property or the old road improved. This mine has been making periodic shipments for ten years. It has recently been taken over by the Ladysmith Smelting Co., or Alaska Corporation. This property is equipped with two Chicago Pneumatic Tool Co. air compressors. The property has been opened by a 300-ft. shaft and tunnel.

PRINCE WILLIAM SOUND.

The estimated value of the total mineral production of Prince William Sound in 1917 is about $4,200,000, compared with about $3,000,000 in 1916. This represents the value of the production of six copper mines and seven small gold mines.

The larger part of the production came from one mine—the Beatson-Bonanza, operated by the Kennecott Copper Corporation. The other producing copper mines were the Ellamar, Midas, Schlosser, Mackintosh,

and Blackbird. The Blackbird group on Latouche Island began shipping ore after having lain idle for several years. The capacity of the milling plant at the Beatson-Bonanza was increased to 1600 tons a day. Six hundred feet of tunnels and cross cuts were driven on the Rua property. A large, low-grade copper property was discovered on Long Bay. Some diamond drilling on a nickeliferous deposit on Knight Island is reported.

There was a decline in gold mining and milling throughout the district, and the total production of gold mines was small.

The Beatson-Bonanza:

The Beatson-Bonanza mine on Latouche Island, owned and operated by the Kennecott Copper Corporation, was the largest producer of copper on Prince William Sound The mine and mill were operated to full capacity throughout the year and 274,877 tons of ore was mined and milled during 1917.

The ore body, which consists of a large lenticular deposit of chalcopyrite, in a slate and graywacke gange, is opened by a main tunnel, with cross cuts on the bunker level. Approximately 140 feet above this is a bench or "Glory Hole," about 150x600 ft., above which a bluff extends to a height of about 150 feet. The ore is mined in benches and is blasted into chutes, bulldozed and drawn out on the bunker level. Part of the ore is mined by stopes from the main level. In fact, most of the mining during the winter months is done underground, to avoid the snow and ice. Square sets are used in some of the stopes where the ground is loose and heavy. The ore is trammed to the mill in 7-ton cars by an electric storage battery locomotive. Below this level a shaft has been sunk 230 feet and new drifts started. An electric hoist is used to hoist ore and material through the shaft. Two 125-gallon triplex pumps at the shaft station and two 100 gallon sinker pumps in the shaft handle the water, an average of approximately 90 gallons per minute being encountered in this work.

The power plant, which consisted of three 305-h.p. boilers, two 500-k.w. turbine generators, and a seven-drill, two-stage compressor, has been added to by the installation of three 500-h.p. McIntosh-Seymour Diesel engines, three 500-k.w. Westinghouse electric generators and a 3,000-cu. ft. Ingersoll-Rand compressor.

The completion of additional bunkers, new Marcey mills, crushers, filter press and driers increased the daily output of the mine and mill from 650 to 1600 tons. An average of 325 men were employed throughout the year, distributed as follows: Mine, 140; mill, 48; surface construction, 137. The mine and mill were inspected June 23.

Alaska Mines Corporation:

The Schlosser property on Fidalgo Bay, under lease to the Alaska Mines Corporation, was operated throughout the year, and several shipments or ore were made to the Tacoma Smelter. Seven hundred and fifty feet of development work was done on the property during 1917, on which an average of 23 men was employed. Overhand, single jack stoping is the method employed in mining the ore. The ore is trammed to the upper bunkers from the mine in 13-cu. ft. cars by hand, where the ore is hand-sorted. The ore is then conveyed to the bunkers at the wharf over an aerial tram 2800 feet long.

The Ellamar Mine:

The Ellamar Mine, situated on Virgin Bay, 20 miles southwest of Valdez, was operated throughout the year, employing an average of 99 men.

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The mine is opened on seven levels from a 3-compartment vertical shaft, 600 ft. deep, crosscuts being driven from the shaft to the ore. A cofferdam has been constructed about the outcrop to prevent the mine from being flooded at high tide. The ore body, which is on the 200-ft. level is about 250 feet long and over 50 feet wide, fills a fractured zone in sedimentary rocks, chiefly slate. The principal levels have been worked as open cuts and the lower levels by the shrinkage system. As all of these stopes have been emptied and as considerable ore remained on the walls and in the pillars, a system of filling has been introduced by which the old openings are cribbed and filled and the adjoining ore bodies mined. Crosscuts have been run in the hanging wall and raises driven to obtain waste rock with which the levels are filled as the cribs are built up. The ore is then mined and dropped through cribbed chutes to the level below. After being hand-sorted, the ore is stored in bins, from which it is loaded, by means of an aerial tram, into ships.

Eight hundred and fifty-two feet of development work was done during the year 1917. The ore is trammed by hand underground, and the waste for filling is hauled by gasoline motor. Very little water is encountered, most of it being seepage from the surface, which is especially noticeable after high tides, the quantity of water averaging about 60 gallons a minute.

The Fidalgo Mining Co.:

The property of the Fidalgo Mining Co., situated on the south side of Fidalgo Bay, was operated throughout the year, and some ore was shipped. At the time the mine was visited on June 27, eleven men were employed.

The Cliff Mine:

The Mystic No. 1 claim was operated during the year by the owner, H. E. Ellis, employing an average of eleven men. Five hundred and ten feet of development work was done during 1917, and the mill was run intermittently, whenever the bunkers were full.

The Granite Gold Mine:

The Granite Gold Mine, situated on the west side of Port Wells was operated for a short period only during 1917, closing down about June 1. The reason given was the high cost of fuel oil and other supplies, due to the war.

Ramsay-Rutherford:

The Ramsay-Rutherford mine and mill, which employed an average of 121 men, were operated until June 9, 1917, when they were closed down. Up to the above date, 350 feet of development work had been done.

The Midas Mine:

The Midas mine is situated on Solomon Gulch, about six miles from the shore of Valdez Bay, and is owned and operated by the Granby Consolidated Mining, Smelting & Power Co. The mine was operated throughout the year and three levels were worked. There were 2148 feet of development work done during 1917, consisting of 294 feet of shaft, 524 feet of tunnel, 357 feet of levels and 975 feet of winze and raises. An average of over 2000 tons of ore per month was maintained and an average of 48 men for the year was employed.

The ore is chalcopyrite, in a quartz and pyritic gangue. The ore body

strikes nearly east and west and dips 45 degrees north. The ore is mined by the room and pillar and overhead stoping methods. Power is furnished by a 200-h.p. Diesel engine, using fuel oil, and consuming on an average about 200 gallons per day of 24 hours. A 1000-cu.ft. Ingersoll-Rand compressor furnishes air and a 45-k.w., 125 volt Westinghouse electric generator furnishes the lighting system for the mines and buildings.

Homestake Mining Co.:

The Homestake Mining Co. installed a new 2-stamp mill on their property, Harriman, fiord, in the Port Wells district, but no active mining was done during the year.

Eads-Meekan:

Development work on this property, which is located on Peters Bay in the Port Wells district, was stopped during the latter part of June. Work was also suspended on a five-stamp mill which was in course of erection.

Thomas Cullross Mining Co.

The property of this company is situated on Thomas Bay, Cullross Island. All of the work done was on Bugboo No. 1 and No. 2 claims, and all the operations were in the lower tunnel, which was 140 feet in length and which follows a fissure vein. A car tram connecting the mine with the mill, 1250 feet long, was constructed. The ore was treated by a 10-ft. Lane mill, driven by a 5-ft. Pelton wheel, the slimes passing over amalgam plates to two Diester tables, driven by a 26-inch Risdon water wheel, the concentrates being shipped to the smelter. Eleven men were employed at the time of the visit, June 27.

KENAI PENINSULA.

The lode and placer mines of the Kenai Peninsula yielded a smaller output than in the previous year. There was very little activity in the lode mines. The larger placer operations were on Resurrection and Crow Creeks. Preliminary steps were taken toward commencing placer mining on a large scale on Canyon Creek. Large shipments of chromic iron ore were made from Port Chatham.

SUSITNA DISTRICT.

In the Willow Creek district four lode mines were operated in 1917, and a small mill was being erected on a fifth. A promising new quartz vein was opened at the head of Fishook Creek and the vein has already been traced for several claim lengths.

The Alaska Free Gold Mining Co.:

The property of the Alaska Free Gold Co., under lease to William Martin of Seattle, situated on Fishook Creek, suspended operations for a short period during the summer on account of labor troubles, but resumer operations for a short period in the fall, closing down for the winter about the first of October.

The Willow Creek Mines:

The Willow Creek Mines company operated the Gold Bullion mine, situated on the divide between Willow and Cragie creeks, during the summer season, closing down October 25. Winter work, usually consisting of development work (the mill being idle during the winter months), was resumed December 1. This mine was inspected June 17.

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The Mable Mining, Milling & Power Co.

The Mable Mining, Milling, & Power Company's property, situated on Archangel Creek, a tributary of the Little Susitna River, was operated throughout the mining season. The ore is treated in a 15-ton Denver mill, which was erected during 1916, about 1200 feet below the mine. The ore is conveyed from the mine to the mill over 3500-ft. tramway. This mine was inspected June 17 also.

The Talkeetna Mining Company:

This company is developing a property on Archangel Creek above the Mable Mining Company's property. A 15-ton Denver mill was installed below the mine and operated a short period during the mining season of 1917.

The Cache Creek District:

The Cache Creek District was not visited, but the Geological Survey report for 1917 is as follows:

The Cache Creek district continued the principal source of placer gold in the Yentna Basin. The inaccessibility of placers on Cache Creek has made mining there very expensive, but a new wagon road from Talkeetna, on the Government railroad, to Cache creek, which is now under construction, will soon afford a quick and easy approach to the district. A dredge burning local coal was operated on Cache creek and 15 hydraulic plants are working on Cache and Peters creeks during the summer. Over 100 men were employed, producing placer gold valued at between $125,000 and $150,000. Operations at the end of the season were hampered by protracted rains and serious floods, which caused considerable damage to several mining plants. Late in the fall a Hudson dry dredge was installed on the ground along the north side of Kichâtna River, at the mouth of Nakochna River, to begin mining in the spring of 1918. Some prospecting and mining were done in the camp and Lake Creek basin. Along the lower Kahiltna River, prospecting for platinum was carried on by one company in two localities, one about three miles below the mouth of Peters Creek and the other a short distance upstream from the mouth of the river. A hand drill and two power drills were used in prospecting the river bars, about 12 men having been employed in this work. The prospecting is to be continued next season.

Platinum occurs at many other places in the Susitna basin, including Cache, Peters Camp, and Lake Creek, as well as on the Kichna and Chulitna rivers, and commercial platinum placers may ultimately be found.

COAL OUTPUT IN THE TERRITORY DURING 1917.

The following report on coal operations in the Territory of Alaska was furnished by Sumner S. Smith, Federal Mine Inspector and Residental Engineer in charge of the coal mining operations for the Alaska Engineering Commission and the development of the properties reserved by the Government for naval purposes.

The Eska and Doherty mines were inspected by the Territorial Mine Inspector in June.

> The past year has witnessed a growing activity in the Alaskan coal fields and an increased production of approximately five hundred per cent over last year's output. A number of new operators produced small amounts of coal from ten-acre free use permits and several of the former operators greatly increased

their outputs. Several leasing units in the Matanuska fields have been leased and are now under exploration. In the Bering River field private interests have continued construction of a standard gauge road to their holdings on Canyon Creek and are reported to have the mine opened in such a manner that shipments can be started at an early date. The Matanuska branch of the Government railroad has been completed to unit 12 on the Chickaloon River, with a spur 2.7 miles up Eska Creek and a preliminary survey on Moose Creek, some five mile to Units 2 and 3. Unit No. 12, in the Matanuska field, was withdrawn last year for the use of the Alaskan Engineering Commission, although work was not commenced at that point till this summer, owing to the difficulties of getting in supplies before the completion of that portion of the railroad. Unit 7 was leased early this spring to the Eska Creek Coal Company, which shipped 7783 tons, one-sixth of which went to the local market and the balance to the Alaskan Engineering Commission. As this corporation was not financially strong, it transferred its holdings to the Commission, which took over the property to insure a regular supply of fuel.

The largest producers from the ten-acre permits were the Doherty Coal Company, the Cache Creek Dredging Company and John A. Herbert. The first produced about 19,500 tons, of which 500 tons were sold to the local trade in Anchorage and the balance to the Commission. The second mined about 5000 tons, which was used during the active season on the company's dredge on Cache Creek. The last-named produced 4300 tons at Bluff Point, on Cook Inlet, which was sold to the canneries and towns along the Inlet. Those figures are all in long tons. George Wallin, of Candle, mined about 500 tons on his ten-acre lease near that point. The Commission produced approximately 18,500 short tons from the Eska Creek Mine and 300 short tons from the Chickaloon property, which has been taken out in development work.

The total output from the entire Territory probably approximates 60,000 tons, as there were some two dozen operators on the free use ten-acre areas who mined small amounts for their own use.

In the Matanuska field a group of men headed by Henry Baxter, of Anchorage, have commenced development on Units 2 and 3, while another group have started work on Units 10 and 11, under the management of Lars Netland of San Francisco.

MEMORANDDM OF OPERATIONS IN THE MATANUSKA COAL FIELD.

Doherty Mine:

This property is situated about three-quarters of a mile from the railroad right of way at Moose Creek. The bed strikes in a general easterly and westerly direction and has a dip varying from 42 to 46 degrees toward the south. The upper level was driven 1200 feet on the bed and the coal worked out between this and the surface. A slope was then sunk 140 feet and a level driven 1600 feet from this point. The coal was worked out by the room and pillar method and work was suspended on the property in the fall of 1917, when the company failed to receive a new contract from the Engineering Commission.

Alaskan Engineering Commission:

During the previous winter the officials of the Alaskan Engineering Commission realized that considerable time might elapse before the private interests, who had applied for leases in the Matanuska field, would be able to produce coal for the

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Commission's needs. Therefore, they requested that Leasing Unit Twelve be set aside for their use and Executive Order was issued on June 18, 1917, reserving this unit. During the month of April, 1917, the Engineering Commission had engineers investigate the amount of available fuel from the mines in operation and found that there was liable to be a shortage for construction purposes unless these properties were opened on a larger scale. As the lessees on the only property which was situated on an operating branch of the road did not have sufficient capital to finance for increased operation, it was decided that the Commission should purchase this property and supply its own fuel. Leasing Unit Seven was, therefore, taken over and control assumed on June 18, 1917. This lease lies 2.7 miles from the railroad right of way on the Matanuska Branch. The general structure is synclinal. There are several faults parallel to the main axis of the syncline and numerous smaller faults at almost right angles to it. There are, however, a series of coal beds from which a considerable amount of coal may be taken above the water level, and the ground explored until development warrants diamond drilling the property.

The Commission is at present mining on three beds, the Maitland, Eska and Shaw. The latter two have been opened on the east and west side of the creek. The entries on both sides of the creek have been driven approximately 800 feet. The beds vary from two and a half to three and a half feet in thickness, have a general east and westerly dip to the south at angles from eight to forty-five degrees and are worked by the room and pillar method. Some eighteen-thousand short tons were produced from this mine during 1917.

The development of Unit Twelve has not been extensive as on Unit Seven as the railroad was not completed to that point until late in the fall. However, substantial office building, warehouse and bunk houses have been erected and hoist installed. A slope has also been started on a bed of coal which cross section shows to be twelve feet in thickness, with one-foot of rock, four feet from the foot wall. A cross-cut has been started at the westerly end of the lease to intersect this bed and drifts have been started near the slope both in an easterly and westerly direction. The work at the present time is insufficient to show the exact strike or dip of the bed or how many other beds in the series are of commercial value, although there are several varying from three to five feet in thickness.

Chickaloon Coal Company;

Mr. Lars Netland is manager of this company and it has commenced the development of Leasing Units Ten and Eleven. Several small prospect shafts have been sunk through the gravel to bed rock and outcrops of several coal seams have been found. Cross-cuts to intersect the coal-bearing series are now being driven at several points.

Matanuska Coal Company:

This company has been working on Leasing Units Two and Three and are now shipping to Anchorage from thirty to fifty tons per day. The coal is hauled about four and one-half miles from the mine to the railroad right of way. At this point, it is transferred to railroad cars and shipped to Anchorage. The work done at present is insufficient to make a definite statement as to the extent of the coal bed. The outcrop at one point measured eleven feet in thickness.

THE FAIRBANKS DISTRICT.

The Fairbanks District was visited during July and August. Fifty-one placer mines, employing 460 men, and 16 lode mines and prospects, employing 75 men, were inspected. In addition to the mines, several small operations were visited, which employed approximately 150 men, making an average of about 700 men employed in the mines of the district.

The high cost of mining supplies curtailed the output of this district considerably. Many of the large steam scraper, open-cut operations closed down early on account of the excessive cost of mining supplies, many necessary commodities costing as much as 200 per cent more than before the beginning of the European war. It is very doubtful if any of those that suspended operations will resume work until market conditions are normal and the high prices now asked for mining supplies drop to their former levels.

The total gold recovered from the placer mines of the Fairbanks region was 67,566.54 ounces, valued at $1,217,097.16; and from the gold lode mines, 2,605.66 ounces, valued at $43,773.23; making the total value of the gold output of the Fairbanks district $1,260,870.39. In addition to gold, antimony, scheelite and galena to the value of approximately $50,000 were mined and shipped during 1917.

There was a decrease in the output of placer gold of over $500,000, below that of 1916, in this district, the distribution of the placer output being as follows:

Name	Ounces	Value
Cleary, Chatham and Wolfe Creeks	12,691.80	$222,080.26
Goldstream, Gilmore, Engineer and Pedro	16,100.25	300,259.71
Dome Creek	7,624.88	139,104.02
Little Eldorado Creek	7,499.07	133,999.00
Fairbanks Creek	8,173.48	146,606.04
Vault and Treasure Creeks	3,401.45	63,403.12
Big Eldorado, Smallwood and Sargent	1,849.03	35,240.02
Ester, Gold Hill, Happy and St. Patrick	10,226.72	176,404.19

During fifteen years the Fairbanks district has produced gold to the value of about $69,000.000, of which the placer mines have produced approximately $68,400,000. Lode mining was begun in 1910 and since that time has produced gold to the value of about $1,200,000.

During the mining season of 1917, 161 tons of antimony ore was shipped, the larger part of which was recovered from the old dumps of the Eagle, Chatham and Friedrich mines, by hand sorting. Some antimony was mined on the Cotton Blossom mine at the head of Ready Bullion Creek and at the McCarthy mine, at the head of Fairbanks Creek.

Dredging:

One dredge, operated on Fairbanks Creek, continued work during the mining season. It is reported that a large dredge will be installed on upper Fairbanks Creek during 1918.

Tungsten Concentrates:

In the Fairbanks district two tungsten mines are in course of development. At one of these mines one unit of a 75-ton mill of the Faust type, is in operation and at the time of visit was recovering several hundred pounds of scheelite concentrates daily. At the other mine a similar mill was erected, but no ore was treated during 1917. Ten tons of scheelite concentrates were shipped during the open season, containing 65 per cent tungsten oxide.

TORIAL MINE INSPECTOR

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Lead Ore:

A small shipment of lead-silver ore was shipped to the Selby smelter, totaling about 28 tons. This was shipped from a property situated near the head of Cleary Creek.

LODE MINING.

Several small auriferous lode mines were operated during 1917, in the Fairbanks district. Development work was continued on a number of properties. Very little more than the actual assessment work necessary to hold the properties can be expected until the completion of the Government railroad and the termination of the European war, as the present high cost of supplies and fuel is almost prohibitive, and operators will wait more favorable conditions. Before resuming any extensive development work or operations. Eight gold lode mines were worked in a small way and five of these operated their own mills. One silver-lead deposit is being worked and made a shipment. Two antimony mines were in operation and some ore was hand-picked from old tailings and shipped. Two tungsten mines were in process of development.

The driving of the tunnel on the Bondholder Lode mines, situated on St. Patrick's Creek, was continued during the open season, by the owners, 231 feet of tunnel and 25 feet of cross-cuts having been driven. No additional help was employed.

On the Mohawk extension, exploration work was done during 1917. A prospect shaft was sunk and some very good gold-bearing ore was exposed.

The St. Paul mine, operated by Daniel Thomas and partners, is situated at the head of Eva Creek. A small mill which was erected in 1916 was run intermittently when ore bins were filled. This is a gold lode mine.

The Kennecott Copper Corporation optioned the Rhine lode on Ester Dome and prospected the property during the spring, but forfeited their option in August, 1917. The extent or value of the ore was not learned. The only statement made by this company was that the property was not extensive enough for them to take hold of and operate.

Tolovana District:

The Tolovana District was visited during August and 23 properties were inspected. New pay was located on the right limit of Amy Creek, on the benches during the early spring. The value of the gold produced during 1917 was about $1,100,000, which was an increase of about $400,000 over 1916. A new tram was constructed from the Trapper's cabin on Tolovana River to the town of Brooks, a distance of about 12 miles, which greatly facilitated the handling of freight. The cars were drawn by gasoline motor or auto truck, using 4x4 wooden rails. About 350 men were employed in the mines of this district.

Circle District:

This district produced gold to the value of about $200,000. One dredge is operated in this district on Mammoth Creek. About 100 men were employed.

Hot Springs District:

There was a considerable decrease in the production of gold in the Hot Springs District during 1917. The value of the gold production was about $425,000, compared with $750,000 in 1916. The larger portion of the

1917 production came from Eureka Creek region. About 200 men were employed in this district.

About 25 tons of tin ore were produced in this district during 1917.

Ruby District:

The Ruby district was visited the latter part of August, and twenty-two placer mines inspected, employing about two hundred and fifty men. This district showed an increase in the production of gold over any other year, the value of the gold produced in 1917 being $925,000. The Yukon Gold dredge, on Greenstone creek, was the largest producer. This dredge, however, has completed the dredging of all the ground held by the company and the dredge has been dismantled. This company was drilling on some of the adjacent creeks, with a view to finding paying ground, on which to place the dredge. The Alaska Road Commission completed the Ruby-Long road to Long City during 1917. This connects Ruby, on the Yukon River, with Long City, in the interior mining center. It is an excellent wagon road and should reduce the cost of supplies to the miners, through a considerable reduction in the freight rate between those points.

In the Poorman region, the center of the greatest mining activity during 1917, twenty plants were operated, but work was suspended, on account of the shortage of water, at most of the plants at the time of my visit.

Tolstoi:

The value of the gold production of Tolstoi was about $60,000 during 1917, most of which was produced by five plants, employing about 25 men. The greater part of the production was by one plant on Boob Creek which is the only creek from which there was any production of platinum. It was not separated from the gold, but was sold with it to a bank in Iditarod. The platinum in the gold was said to amount to about one per cent, which would make approximately 30 ounces of platinum produced.

Iditarod:

Three dredges were operated in the Iditarod district in 1917, one on Flat, one on Ophir and one on Black creek. Open-cut mining was continued on the claims at the head of Flat, Happy and Chicken. About 300 men were employed in the mining industry during 1917, and the output was valued at over $1,800,000.

Marshall District:

The gold production of the Marshall district was about $425,000, as compared with $270,000 in 1916, mostly from five plants on Willow Creek, employing about 200 men, but some smaller plants were at work on Willow, Disappointment and Elephant creeks. Drilling was done on Lower Willow Creek and some very excellent results reported.

Ophir District:

About 22 plants, employing 130 men were operated in the Ophir district, and the value of the output is placed at $55,000.

Kuskokwim Basin:

The dredge for Candle Creek was landed at McGrath during the summer and will be hauled by sled teams during the winter and assembled and made ready for operation by the opening of the mining season of 1918.

A strike was reported in the Amak district, lower Kuskokwim, near

ka Creek region. About 200 men were

produced in this district during 1917.

the latter part of August, and twenty-
loying about two hundred and fifty
crease in the production of gold over
gold produced in 1917 being $925,000.
stone creek, was the largest producer.
d the dredging of all the ground held
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e. The Alaska Road Commission com-
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Good News Bay, late in the season, and Wattemus Creek produced gold to the value of $12,000 between the date of discovery in September and the freeze-up

SEWARD PENINSULA.

The Seward Peninsula mines produced gold to the estimated value of $2,700,000 in 1917, which is about $200,000 less than in 1916. This was due to the early closing of the mining season. In 1917, up to the first of October, the gold output had exceeded that of 1916, but owing to the cold weather early in September mining had to be practically suspended, whereas usually the season for hydraulic mining extends to the middle of October. In addition to the gold production, stream tin, graphite, scheelite, galena, and copper ore were produced to the value of over 100,000.

Since 1897 the Seward Peninsula mines have produced gold to the value of $77,051,000, most of which came from the placer mines.

Twenty-nine gold dredges and two tin dredges were operated on Seward Peninsula during the mining season; seven in the Nome District; six in the Solomon district, ten in the Council district, two in the Port Clarence district, two in the Fairhaven district and two in the Kougarok district and two tin dredges in the York district.

There were about 170 placer mines in addition to the dredges operated during the mining season, employing approximately 750 men. The dredges employ an average of about ten men to the dredge, or about 310, making a total of 1060 men employed in the placer mines of the Peninsula.

Lode mining development for the year consisted, for the most part, of the necessary assessment work. Some development work was done on tin and silver-lead properties in the vicinity of Lost River and a small shipment of ore made.

Lode Mining:

Considerable work was done on a silver-lead prospect in the Kugruk River section and samples shipped to Seattle for analysis. A small Hardinge mill was set up on a gold lode property near Bluff.

NOME DISTRICT.

There were seven dredges operated in the Nome district—one on each of the following creeks: Bourbon, Bangor, Center, Flat, Glacier, Hastings, and Osborne. The Pioneer Mining Companies, conducting hydraulic operations on Little and Anvil Creeks, are the largest producers and employers of labor in this district, employing an average of about 200 men during the mining season.

The Alaska Mine Corporation (successors to the Nome Consolidated Mining, Power & Dredging Company) had one dredge in operation during the entire mining season, the Bourbon creek dredge. This company finished and put into operation during the season the Flat creek dredge, which started digging about September 1. This dredge is the largest on Seward Peninsula at the present time, having a hull, which was constructed in 1911, 112 feet in length, 55 feet in width and 8 feet in depth. The digging ladder is 108 feet in length, carrying ninety 8-cubic-ft. buckets, close connected, and has a digging depth of 57 feet below water level. The gravel is dumped into a revolving screen 37 feet long by 7 feet in diameter. The sands flow over sluice tables having a combined area of 3500 feet of sluicing surface. The coarse gravel and rock pass onto a belt conveyor and are conveyed to the tailing pile on a stacker ladder 132 feet in length. The machinery is electrically driven and is equipped with 300

horsepower, distributed as follows: digging motor, 150 h. p.; swinging motor, 35 h. p.; screen motor, 35 h. p., screen pump, 50 h. p.; table pump, 60 h. p.; primer pump, 40 h. p.; and stacker, 20 h. p.

The company also purchased the dredge on Holyoke Creek, belonging to the Bessie Dredging Co., the hull of which was built in 1911. This dredge will be completed and ready for operation by the opening of the mining season of 1918. This hull is a little larger than the Flat Creek dredge, but will be equipped with buckets of the same capacity.

The power for the operation of these dredges is furnished by a central plant situated on Bourbon creek, about one mile from Nome City. A battery of three Sterling boilers, burning crude oil, furnish steam for a turbine, direct connected to a 650-k. w., generator. The current is sent over the transmission wire at 2,300 volts and stepped down to 440 volts on the boats.

Most of the ground owned by this company is frozen, and the depth is from 20 to 120 feet to bedrock. Experiments were carried on during the summer, or open season for the purpose of determining a method of thawing the gravel and muck. Superheated steam, hot water and water of the normal heat of ponds and ditches was experimented with. The process consisted of drilling a hole to bedrock with a keystone drill, inserting a 2-inch pipe, and, where water was used to force the water down the pipe, allowing it to rise from the bottom and flow over the surface, the circulation of the water drawing the frost out of the gravel and muck. Very little difference was noticeable in the thawing capacity of hot water and the pond water, which during the summer season is about 42 degrees Fahrenheit, and from indications it looked like the cold water system would solve the thawing difficulty, but no thorough test had been made up to the time I left Nome. The holes thawed were to be dug out during the winter and the exent of the thawed area at bedrock was to be demonstrated.

If the cold water method proves successful, it will be the means of opening a large area of dredgeable ground, for the coastal plain from the present beach to the foothills cover an area of approximately 3 miles in width and 30 miles in length, all of which contain gold. Some of it probably does not contain enough gold to pay for its recovery even under these conditions, but most of it does. The depth of the gravel and glacial muck overlying the solid formation varies from 10 to 150 feet, but when thawed it would shrink at least one-third, that being about the proportion of ice and glacial silt overlying the gravel.

A number of underground placer mines were operated along the submarine beach, Center Creek and the third beach line.

Hydraulic operations were continued near Jess Creek by Ravenkilda and Jensen, under lease from the Penny River Ditch Co.

Tungsten ore (scheelite) was produced principally by sluicing the scheelite-bearing lode material in Sophia Gulch. Small quantities were recovered from the placer mines at other localities and about ten tons of scheelite ore was shipped during 1917.

SOLOMON DISTRICT.

Six dredges were operated in the Solomon district, during the mining season, five on Solomon River and one on Shovel Creek.

Myland, Hultberg, Fisher and Madsen purchased the Shovel Creek Mining Company's dredge on Shovel Creek and moved it to the adjoining property up the creek.

Scott & Newberg, purchased the Risdon dredge of the Nome-Montana-

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. p., screen pump, 50 h. p.; table pump,
stacker, 20 h. p.

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New Mexico Mining Co., of Solomon River, and operated it a short period on Solomon River near the mouth of Shovel Creek.

The Esquimo Mining Company (successors to the Seward Dredging Company), operated their dredge throughout the mining season.

O. W. Flowers installed new Scandia Fuel Oil Engines on his dredge, on Solomon River, below Ori Fino, replacing the steam engines. This dredge was formerly one of the Flodine Dredges and is of the Risdon type.

C. E. Kimball operated his two-flume dredge throughout the mining season on Solomon River.

COUNCIL DISTRICT.

Ten dredges were operated in the Council District during 1917; three on Ophir, two on Melsing, one on Warm, one each on Camp, Elkhorn, Canyon and Goose Creeks. All of these dredges use gasoline or fuel engines to furnish power for operating.

KOYUK RIVER DISTRICT:

The gold production of the Koyuk River district increased considerably over the preceding year. Dime Creek produced 175,000, the larger part of which was recovered from the underground placers during the winter months, six mines producing the major portion. During the summer months, opencut mining operations on some of the benches were conducted. Some platinum is recovered in this district by crude methods of separation, usually by panning and using quicksilver, about one ounce of platinum to $5,000 in gold being recovered. The platinum production amounted to about 35 ounces. Most of the production came from four claims. At the time of visit, Sept. 19-22, there were several men engaged in prospecting and setting up plants for winter work. Several small ditches had been constructed during the summer, and in all about 250 men were employed.

Four plants, employing eleven men were operated on Sweepstake Creek, producing about $10,000. This gold also contained a small amount of platinum and about an ounce was separated from the gold.

Bear Creek produced about $20,000 from four plants, employing 14 men during the mining season, and using the hydraulic and open-cut mining methods. Some prospecting was also done on this creek. A few pennyweights of platinum was produced.

The Keewalik Mining Co., near Candle, continued operations on Johnny Bull Hill, using bedrock flume and Ruble elevator, water being secured from the company's ditch. The over-burden, consisting of muck and ice, to a depth of about 20 feet, is removed by stripping. All of the ground is frozen. After this the gravel, having an average depth of about 7 feet, is piped over the Ruble elevator, which removes the large rock, the finer material and gold passing into and through the flume underneath.

An average of 22 men was employed.

The Candle Creek dredge was operated throughout the season. No. 19 bench, Candle Creek, was operated during the mining season by Halloran and Lee, with a steam scraper, besides which there were several other smaller operations.

The Fairhaven Mining Company operated their property, situated on the Imnachuck River, near the mouth of Pennell Creek, working three hydraulic elevators, water for which is furnished by a ditch 40 miles long from Imaruk Lake. This company furnished employment to about 45 men.

The Deering dredge on the Inmachuck River caught fire early in the season and was burned. The building of a new dredge is contemplated by the company.

Kougarok District:

Two dredges and a number of open-cut mines were operated during the mining season. Most of this work is done above Dewey Creek, on the Kougarok River and on Macklin Creek.

Port Clarence District:

During the mining season two tin dredges were operated in the York region, one on Buck Creek and the other on Grouse Creek, below the mouth of Buck Creek. These produced 155 tons of tin ore. In addition to this, about 6 tons of placer tin was sluiced by two men working on Iron Creek, which flows into Sutter Creek, a tributary of Buck Creek. A small amount of tin ore was shipped from the Lost River Mines. Some development work was done on tin lode claims at the head of Buck Creek, Tin City, Lost River, and Ear Mountain. Work was done on two graphite properties during the summer of 1917. On one of these it consisted of assessment work only. On the other property about four miles of road was constructed from the property to Graphite Bay, an arm of Imaruk Basin. In addition to this about 100 tons of graphite was mined and hauled to Graphite Bay by gasoline tractor. Fifty tons of graphite was shipped during the open season.

One of the two gold dredges on the Anikovic was moved to Swanson Creek, a tributary to American River and operated for a part of the season. The gold dredge on Bud Creek was operated during the mining season.

Kobuk Region:

Placer mining in a small way was continued in the Kobuk region during 1917. The production of the district was about $25,000 in value. A strike was reported on Walker Lake during the summer, but no authentic information has been received. About 25 men were employed in this district.

SAFETY FIRST.

The Alaska Legislature, session of 1917, added to Chapter 51, "Mine Inspection Regulations," section 26, First Aid to the Injured, paragraph (c) of which is as follows:

> "No one shall hold a position as a stope boss, shift boss, or foreman in any mine, mill, metallurgical plant or machine plant connected with such mine, who has not studied first aid to the injured and who is not competent to dress wounds, adjust injured limbs, temporarily, perform artificial respiration and properly transport an injured person."

Committee organization has not made great progress in the mining industry of Alaska. One of the principal reasons for this is the spirit of restlessness and desire for change, characteristic of the metal miner in this country, making it difficult to retain any one set of men long enough to properly organize safety first or first aid teams.

ACCIDENTS AND ACCIDENT PREVENTION.

The causes of mine accidents are many and varied. Any extended study of such accidents, however, leads to the conclusion that they natu-

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rally fall into two groups or classes. The first group includes those that may be termed preventable; that is to say, the accidents coming under this head might have been prevented by exercise or ordinary care, prudence, or foresight. For example, take the case of a train hand in the Ready Bullion mine who was killed by a fall of rock. He was employed as brakeman on a train; a chute was hung up, and the chute puncher put a shot in and blasted it, after which the train pulled to the chute to load. While the chute puncher was getting his bars to open the chute, the brakeman climbed upon the apron of the chute, evidently to look up the chute to see why the ore did not run, and in doing so, must have loosened some ore. At any rate the ore rushed down, caught him and crushed his head, killing him instantly. If he had attended to his own duties and waited until the chute puncher returned with the bars with which to loosen the ore, he may have been alive today, or at the most he would not have been killed at that time.

An accident at the Alaska-Juneau mine, where two men contracted to put in powder drifts, furnishes another example. They would drive two or more of these drifts at the same time—blast one and, while it was clearing, would drill and blast in the other. In this case, after blasting one of the drifts and while working in another, the sampler came along to take samples. One of the contractors asked the sampler to help him measure the amount of rock broken in the face of the drift just blasted. The sampler protested, saying one could not go in there on account of the amount of gas. The contractor, however, insisted, took one end of the tape, went in and was overcome by powder gas. Two of his rescuers were also overcome. He never regained consciousness, although artificial respiration was applied for over three hours. The other two were resuscitated, one of them (the deceased's partner), spending some time in the hospital. This curiosity to know how much rock was broken resulted in his death when it could easily have been measured with safety later.

Many such cases could be cited which are classed as preventable accidents.

The accidents in the second group, which, for want of a better term may be designated unpreventable accidents, include those resulting from the inherent dangers and hazards of the work itself and against which human foresight, skill and care seem powerless to guard. Such accidents probably amount to less than half of the total number.

It has been stated that accidents are the inevitable accompaniment of mining, but granting that this is true to the extent indicated by the above classification, no valid reason exists why the number of preventable accidents cannot be materially reduced by the exercise of care, prudence and foresight.

ACCIDENTS IN ALL METAL MINES DURING THE YEAR ENDING DECEMBER 31, 1917.

	Killed	Seriously injured. (Time lost more than 14 days.) Permanent total disability.*	Permanent partial disability.†	Others.	Slightly injured. Time lost 1 to 14 days.
Underground					
Number killed or injured by—					
Fall of rock or ore from roof or wall	5		4	6	39
Rock or ore while loading at working face or chute	1		1	8	36
Timber or hand tools				2	10
Explosives	1		3		5
Haulage system (mine cars, mine locomotives, breakage of rope, etc.)	1		2	5	15
Falling down chute, winze, raise or stope	1		2	2	9
Run of ore from chute or pocket	2		1	3	11
Drilling accidents (by machine or hand drills)			2	2	24
Machinery (other than locomotives or drills)			3	2	2
Nails, splinters, etc.			2	2	18
Other causes			2	2	48
Total number killed or injured underground	11	—	23	32	217
Shaft Accidents					
Number killed or injured by—					
Objects falling down shafts	1		2		
Skip, cage, or bucket	1		4	1	2
Other causes					1
Total number killed or injured by shaft accidents	2	—	6	1	3
Surface Accidents					6
(At surface yards and shops.)					
Number killed or injured by—					
Mine cars or mine locomotives, gravity or aerial trams			1	3	4
Run or fall of ore in or from ore bins				1	7
Falls of Persons					11
Nails, splinters, etc.				1	31
Hand tools, axes, bars, etc.					30
Electricity			1		2
Machinery					5
Other causes	1			3	82
Total number killed or injured by surface accidents	6	—	2	8	172
	7				
Open-Pit Accidents					
Number killed or injured in pit by—					
Falls or slides of rock or ore				1	10
Falls of persons				3	
Hand tools					2
Other causes				2	47
Total number killed or injured by open-pit accidents	—	—	6		
				6	59
Grand total	20	31	47		454

*—Permanent Total Disability.—Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis, or other condition permanently incapacitating workman from doing any work of a gainful occupation.

‡—Permanent Partial Disability.—Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

†—Ore-Dressing Plants to include stamp mills, sampling works, slime plants, lixiviation, leaching, cyanide, and flotation mills.

Average number of persons employed, 4,320.

ACCIDENTS IN ALL METAL MINES DURING THE YEAR ENDING DECEMBER 31, 1917.—(Continued.)

	Killed	Seriously injured. (Time lost more than days.) Permanent total disability.*	Permanent partial disability.‡	Others.	Slightly injured. Time lost 1 to 14 days.
Ore-Dressing and Milling Accidents.†					
Number killed or injured by—					
Haulage system (cars, motors, etc.)	1				1
Railway cars or locomotives					2
Crushers, rolls or stamps	1		3	3	6
Tables, jigs, etc.			1		1
Other Machinery				3	1
Falls of persons	1			3	12
Suffocation in ore bins					2
Falling objects (rocks, timbers, etc.)					13
Cyanide or other poisoning				1	3
Scalding (steam or water)					1
Electricity				1	2
Hand tools, axes, bars, etc.					13
Nails, splinters, etc.					22
Flying pieces of rock from sledging or crushing			1		7
Other causes				2	37
Total number killed or injured at mills	3	....	5	13	123
Auxiliary Works' Accidents.					
(Yards, shops, construction, etc.)					
Number killed or injured by—					
Railway cars and locomotives					1
Falls of persons	1		1		6
Nails, splinters, etc.			1		6
Hand tools, axes, bars, etc.			1		4
Electricity			1		1
Machinery			3		1
Other causes			1		5
Total number killed or injured by shop and yard accidents	1	....	8	....	24
Grand total	4	....	13	13	147

*—Permanent Total Disability.—Loss of both legs or arms, one leg and one arm, total loss of eyesight, paralysis, or other condition permanently incapacitating workman from doing any work of a gainful occupation.

‡—Permanent Partial Disability.—Loss of one foot, leg, hand, eye, one or more fingers, one or more toes, any dislocation where ligaments are severed, or any other injury known in surgery to be permanent partial disability.

†—Ore-Dressing Plants to include stamp mills, sampling works, slime plants, lixiviation, leaching, cyanide, and flotation mills.

Average number of persons employed, 4,320.

ACCIDENTS IN PLACER MINES DURING THE YEAR ENDING DECEMBER 31, 1917

	Killed	Seriously injured. Time lost more than 14 days.			Slightly injured. Time lost 1 to 14 days.
		Permanent Total Disability.	Permanent Partial Disability.	Others	
Dredging					
Number killed or injured by—					
By machinery					
By other causes	1				1
Total number killed or injured	1	—	—	1	1
		....	....	1	
Hydraulicking.					
Number killed or injured by—					
By rock while handling					
By tools					
By other causes					
Total number killed or injured	—	—	—	1	3
	....	....	....	1	1
Underground					4
By fall of roof or gravel					
By timber or hand tools	2				
By explosives					
By falls of persons	2		2		2
By hoisting	2				
Total number killed or injured	2				
Grand total	8	—	—	—	—
	9	....	2	....	2
Average number of persons employed, 4,000		....	2	2	7

DREDGES

Name	Alaska Address	Creek or River	Type	Size of Bucket Cu. Ft	Bucket Line	Maximum Digging Depth Feet	Rated H.P.	Source of Power	Actual capacity in yds. per 24 Hours	Dimensions of Hull, ft.	Manager
Seward Peninsula											
American Gold Dredging Co.	York	Anicovik	Flume	2	Open	12	80	Distillate	1,200	30 x 60	B. Bernard
American Gold Dredging Co.	York	Anicovik	Flume	1¾	Close	15	50	Distillate	1,200	23 x 54	B. Bernard
American Tin Dredging Co.	York	Buck	2 Flumes	2	Open	15	50	Distillate	1,200	24 x 58	Nels Nelson
Arctic Dredging Co.	Nome	Hobson	Belt Stk'r	2½	Open	14	92	Distillate	1,240	30 x 60	F. Middaugh
Arctic Creek Dredge	Nome	Arctic	Flume	2½	Open	12	60	Distillate	1,000	28 x 60	C. Servatius
Bangor Creek Dredging Co.	Nome	Bangor	Flume	3½	Open	35	140	Crude Oil	2,300	36 x 92	C. Mitchell
Bering Dredging Co.	Taylor	Kougarok	Flume	2½	Close	15	100	Distillate	1,200	30 x 60	John Mathews
Blue Goose Mining Co.	Council	Ophir	Flume	2½	Close	17	90	Steam	1,600	32 x 96	A. N. Kittilsen
Candle Creek Dredging Co.	Candle	Candle	Flume	1¾	Open	14	50	Distillate	1,000	24 x 90	Frank Sundquist
Center Creek Dredging Co.	Nome	Center	Flume	3½	Open	40	123	Fuel Oil	2,000	35 x 74	Andy Anderson
Ernst-Alaska Dredging Co.	Nome	Nome	Flume	1¾	Open	12	40	Fuel Oil	700	24 x 46	Philip Ernst
Flowers' Dredge	Solomon	Solomon	Bucket Stacker	2¾	Open	12	80	Steam	1,000	34 x 68	O. W. Flowers
Flume Dredging Company	Council	Melsing	Flume	2½	Open	18	50	Distillate	1,000	26 x 50	C. E. Kimball
Flume Dredging Company	Council	Melsing	Flume	2½	Open	12	60	Distillate	1,000	28 x 60	C. E. Kimball
Fries Dredging Co.	Deering	Inmachuk	Flume	2¾	Open	12	60	Distillate	700	24 x 56	H. Fries
Glacier Creek Dredge	Nome	Glacier	Flume	2	Open	17	60	Crude Oil	1,000	24 x 56	Ames & A. Guinan
Goose Creek Dredge	Dickson	Goose	Flume	2	Open	12	50	Distillate	1,200	24 x 56	George A. Adams
Hastings Creek Dredge	Nome	Hastings	Flume	2½	Open	18	85	Distillate	1,200	30 x 66	Joseph Belleview
Inmachuck Dredging Co.	Candle	Inmachuk	Flume	3	Open	18	107	Distillate	1,400	30 x 62	
Johnson Dredge	Candle	Kugruk	Flume	3	Close	16	107	Distillate	2,000	30 x 62	Iver Johnson
Julian Mining Co.	Nome	Osborne	Belt Stk'r	2¾	Open	15	87	Distillate	1,000	30 x 60	V. Julian
Keliher Dredge	Taylor	Kougarok	Stacker	2½	Open	15	90	Distillate	1,000	30 x 60	James Kelliher
Kimball Co., C. E.	Nome	Solomon	Flume	2½	Open	13	90	Distillate	1,000	30 x 60	C. E. Kimball
Kimball Co., C. E.	Nome	Solomon	Flume	2½	Open	13	60	Distillate	1,000	28 x 60	C. E. Kimball
Moody Mining Co.	Nome	Canyon	Flume	2½	Open	12	60	Distillate	1,000	28 x 60	C. L. Peck
Northern Light Mining Co.	Council	Ophir	Flume	2½	Open	12	50	Distillate	1,000	28 x 60	Gilbert A. Russell
Alaska Mines Corporation	Nome	Burbon	Belt Stk'r	7	Close	35	310	Electricity	7,000	48 x 114	John Miles
Alaska Mines Corporation	Nome	Flat	Belt Stk'r	8	Close	57	390	Electricity	6,000	55 x 112	John Miles
Alaska Mines Corporation	Nome	Holyoke	Belt Stk'r	8	Close	57	390	Electricity	6,000	55 x 112	John Miles
Nome-Montana-New Mexico Mng. & Dredging Consolidated	Solomon	Solomon	Bucket Stacker	5	Open	16	120	Steam	1,600	38 x 87	G. F. Ramsay
Oro Dredging Company	Council	Elkhorn	Flume Bucket	1¼	Open	8	18	Distillate	600	16 x 24	Charles Spencer

DREDGES—Continued

Name	Alaska Address	Creek or River	Type	Size of Bucket Cu. Ft	Bucket Line	Maximum Digging Depth Feet	Rated H.P.	Source of Power	Actual capacity in yds. per 24 Hours	Dimensions of Hull, ft.	Manager
Plein Mining & Dredging Co.	Nome	Nome	Stacker	2¾	Open	12	60	Steam	1,000	34 x 68	J. F. Plein
Ruby Dredging Company	Nome	Casadepaga	Flume	2¾	Open	9	60	Distillate	1,200	30 x 60	W. W. Johnson
Seiverson & Johnson	Dickson	Solomon	Bucket								
Seward Dredging Co.	Dickson	Solomon	Stacker	2¾	Open	12	80	Steam	1,000	34 x 60	C. O. Seiverson
Shovel Creek Gold Dredging Co.	Dickson	Shovel	Belt Stk'r	5	Close	12	25	Electricity	4,000	40 x 86	R. C. Oglisby
Solomon Dredging Co.	Dickson	Solomon	Belt Stk'r	2¾	Close	15	120	Distillate	1,200		Correy C. Brayton
Sunset Mining Co.	Teller	Sunset	Belt Stk'r	3½	Close	25	130	Steam	2,000	45 x 85	J. A. Malloch
Uplift Mining Co.	Council	Camp	Flume	1¾	Open	12	40	Distillate	700	24 x 46	Max Hirsberg
Warm Creek Dredging Co.	Council	Warm	Flume	2 1-3	Open	10	60	Distillate	1,200	24 x 46	A. N. Kittilson
Wild Goose Mining & T. Co.	Nome	Ophir	Flume	2½	Open	12	75	Distillate	1,000	15¼ x 50	Charles Milacek
Willow Creek Dredging Co.	Dickson	Willow	Belt Stk'r	3½	Close	25	160	Distillate	2,200	30 x 75	Fred M. Ayer
Windy Creek Dredge	Teller	Windy	Belt Stk'r	3	Open	12	90	Distillate	1,000	40 x 60	Jerry L. Wilson
York Tin Dredging Co.	York	Grouse	Flume	2¾	Open	18	97	Distillate	1,200	45 x 65	H. Dobson
			Flume	2½	Open	14	87	Distillate	1,000	28 x 60	W. W. Johnson
Cache Creek											
Cache Creek Dredging Co.	Cache via Susitna	Cache	Flume	7	Close	30	295	Steam	2,000	54 x 87	Ed. L. Smith
Circle											
Berry Dredging Co., C. J.	Circle	Mastadon	Flume	3½	Open	18	160	Steam	1,000	24 x 04	C. J. Berry
Fairbanks											
Fairbanks Gold Mining Co.	Fairbanks	Fairbanks	Bucket		Open	16	85	Steam	1,000	45 x 90	G. Aarons
Iditarod											
Otter Creek Dredging Co.	Iditarod	Otter	Flume	3½	Close	18	120	Fuel Oil	2,000	30 x 62½	J. E. Riley
Otter Creek Dredging Co.	Iditarod	Black	Flume	2½	Close	15	120	Fuel Oil	1,000	30 x 60	J. E. Riley
Yukon Gold Co.	Iditarod	Flat	Belt Stk'r	7½	Close	26	300	Electricity	5,000	16½ x 95	E. A. Austin
Kenai Peninsula											
Herron Dredging Co.	Hope	6-Mile									Charles Herron
Ruby											
Yukon Gold Co.	Ruby	Greenstone	2 Flume	3½	Open	18	160	Steam	2,000	30 x 60	

TABLE NO. XI.

LODE MINES

OPERATOR	MINE	Local Address	MANAGER
Southeastern Alaska			
Admiralty-Alaska Gold Mng. Co.		Juneau	W. S. Peckovch
Alaska Gold Belt Mining Co.	Perseverance	Juneau	A. B. Dodd
Alaska Gold Mines Co.	Perseverance	Juneau	B. L. Thane
Alaska Industrial So. (See Chas A. Sulzer)			
Alaska-Juneau Gold Mining Co.	Alaska-Juneau		P. R. Bradley
Alaska-Mexican Gold Mining Co.	Mexican	Treadwell	P. R. Bradley
Alaska-Treadwell Gold Mng. Co.	Treadwell	Treadwell	P. R. Bradley
Alaska-United Gold Bining Co.	700-Foot	Treadwell	P. R. Bradley
	Ready Bullion		
Chichagof Mining Co.	Chichagof	Chichagof	J. R. Freeburn
Crystal Gold Mining Co.		Snettisham	Bernard Hene
Dunton Gold Mining Co.	Dunton	Hollis	C. H. Dunon
	Eagle		
Eagle River Mining Co.	River	Amalga	B. L. hane
Ebner Gold Mining Co.	Ebner	Juneau	
Goldstream Mining Co.	Goldstream	Ketchikan	
Goodro Mining Co.	Goodro	Ketchikan	S. J. Goodro
Granby Con. M., S. & P. Co.	It-Mamie	Hadley	M. W. Sweetser
Jualin-Alaska Mines Co.	Jualin	Juneau	H. G. Young
Juneau Sea-Level Copper Mines		Chichagof	E. E. Fleming
Kensington Mining Co.	Kensington	Kensington	B. L. Thane
	Cymru-		
Lakina & Tagish Mines Co.	Moira	Ketchikan	J. L. Harper
	Mount	Hadley	W. J. Rogers
Mount Andrew Mining Co.	Andrew	Craig	
Nester Mining Co.	Neston		John Wick
Northland Development Co.		Ketchikan	P. A. Tucker
Pacific Coast Gypsum Co.	Gypsum	Gypsum	D. C. Stapleton
Princeton Mining & Milling Co.		Dolomi	B. A. Eardley
	Ready		
Ready Bullion Mining Co.	Bullion	Hollis	H. W. Webber
Rush & Brown		Kasaan	U. S. Rush
Sea Level Mine	Sea Level	Ketchikan	
Sulzer. Chas. A. lessee, Alaska Industrial Co. property)	Jumbo	Sulzer	Chas. A. Sulzer
Thane Exploration Co., B. L.		Juneau	B. L. Thane
Copper River			
Alaska Consolidated Copper Co.	Nugget Creek	Strelna	H. W. DuBois
	Gray's Copper		
Great Northern Development Co.	Mountain	Philips	E. F. Gray
	Hubbard-	Elliott Cr.	
Hubbard-Elliott Copper Co.	Elliott	Via Strelna	A. J. Elliott
Kennecott Copper Corporation	Bonanza-Jumb	Kennecott	E. T. Stannard
Lakina & Tagish Mines Co.			J. L. Harper
Mother Lode Copper Mines Co.	Mother Lode	McCarthy	W. B. Handcock
North Midas Copper Co.		Strelna	O. J. Berg
Prince William Sound			
Alaska Gold Mining Co. (formerly Black Diamond)		Valdez	Geo. F. White
Alaska Mines Corporation	Schlosser	Valdez	Byron Wilson
Alice Mines, Ltd.	Alice	Valdez	M. J. Callaghan
	Bennett-		
Bennett-Daley Mine	Daley	Valdez	Samuel Pepper
Big Four Mine	Big Four	Valdez	A. Wilcox
Black Diamond (See Alaska Gold Mining Co.)			
Cameron-Johnson Gold Mining Co. (See Valdez Gold Co.)			
Cliff Mine	Cliff	Valdez	H. E. Ellis
Cube Mines Company, The		Valdez	
Ellamar Mining Co.	Ellamar	Ellamar	L. L. Middelcamp
Ellis Imperial Mining Co.		Valdez	H. E. Ellis
Fidalgo Mining Co.	Fidalgo	Ellamar	Mm. Mackintosh
	Galena		

TABLE NO. XI. (Continued)

OPERATOR	MINE	Local Address	MANAGER
Galena Bay Mining Co.	Bay	Valdez	Chas. Simonstead
Gold King Mine	Gold King	Valdez	Owners: Frank Gustavson, Angus Chishom, Gus Nelson, Palmer
Granby Con. M., S. & P. Co.	Midas		J. Cook
Granite Gold Mining Co.	Granite	Valdez	W. R. Millard
Irish Cove Copper Co.	Barrack Mine	Valdez	W. A. Dickey
Kennecott Copper Corporation	Beatson-Bonanza	Latouche	E. T. Stannard
Landlock Bay Copper Co.	Landlock Bay	Latouche	W. A. Rystrom
Mineral King Mining Co.	Mineral King	Ellamar	Russel Herman-Glen Eaton
Mountain King Mine	Mountain King	Valdez	W. L. Smith
Ramsey-Rutherford Mining Co.	Ramsey-Rutherford	Valdez	Henry Deyo
Renolds-Alaska Development Co.		Valdez	Archie Hancock
Sea Coast Mining Co.	Sea Coast	Latouche	
Sealey-Davis Mining Co.	Sealey-Davis	Valdez	E. C. Seeley-J. M. Davis
Sweepstake Mining Co.	Sweepstake	Valdez	A. L. Singletary
Thomas Culross Mining Co.	Bugaboo	Valdez	Don M. Thomas
Three Man Mining Co.	Three man	Ellamar	W. A. Dickie
Valdez Gold Co. (formerly Cameron-Johnson Mining Co.)		Valdez	
Valdez Mining Co.		Valdez	
Kenai Peninsula			
Bluebell Mine	Bluebell	Seward	Chas. Hubbard
John Gilpatrick	Gilpatrick	Seward	John Gilpatrick
Hickey Mining Co.		Seward	
Kenai-Alaska Gold Mining Co.		Seward	
Lucky Strike Mine	Lucky Strike	Seward	J. R. Hayden
Moose Pass Mining Co.	Moose Pass	Seward	John Hirshey
Primrose Mine	Primrose	Seward	Henry Salisbury
Ronan & James		Seward	Chas. Hubbard
Slater, John B.		Seward	John Ronan
Scheen-Lechner Mine	Scheen-Lechner	Seward	John B. Slater
Stetson Creek Mining Co.		Seward	H. Hoben
Willow Creek			
Alaska Free Gold Mining Co. (See Martin, Wm.)		Wasilla	
Brooklyn Development Co.			
Gold Bullion Mine (See Willow Creek Mines)			
Independence Gold Mines Co.	Independence	Wasilla	
Mable Milling, Mining & P. Co.			
Martin, William(lessee Alaska Free Gold property)		Wasilla	L. S. Robe W. E. Bartholf
Willow Creek Mines (lessee Gold Bullion property)	Gold Bullion	Wasilla	Wm. Martin
Talkeetna Mining Co .		Wasilla	J. H. Collier
Fairbanks			
American Eagle Mine	American Eagle	Fairbanks	K. I. Fulton
Bondholder Mine, The	Bondholder	Fairbanks	E. Tyndall
Chatam Mining Co.		Fairbanks	Si Scrafford
Crites & Feldham	Crites & Feldman	Fairbanks	C. Crites
Friedrich, Alois		Fairbanks	Alois Friedrich
Goyot, L. G.		Fairbanks	L. G. Goyot
Homestake Mining Co.	Homestake	Fairbanks	Joe Henderson, Lessee; G. St. George, owner
Mayflower Mine	Mayflower	Fairbanks	Thos. Gilmore & ———Stevens

Local Address	MANAGER
Valdez	Chas. Simonstead
Valdez	Owners: Frank Gustavson, Angus Chishom, Gus Nelson, Palmer
Valdez	J. Cook
Valdez	W. R. Millard
Latouche	W. A. Dickey
Latouche	E. T. Stannard
Ellamar	W. A. Rystrom
Valdez	Russel Herman-Glen Eaton
Valdez	W. L. Smith
Valdez	Henry Deyo
Latouche	Archie Hancock
Valdez	
Valdez	E. C. Seeley-
Valdez	J. M. Davis
Valdez	A. L. Singletary
Ellamar	Don M. Thomas
Valdez	W. A. Dickie
Valdez	
Valdez	
Valdez	Chas. Hubbard
Valdez	John Gilpatrick
Valdez	
Valdez	J. R. Hayden
Valdez	John Hirshey
Valdez	Henry Salisbury
Valdez	Chas. Hubbard
Valdez	John Ronan
Valdez	John B. Slater
Valdez	H. Hoben
Valdez	
Valdez	
Valdez	
Valdez	L. S. Robe
Valdez	W. E. Bartholf
Valdez	
Valdez	Wm. Martin
Valdez	J. H. Collier
Valdez	
Valdez	K. I. Fulton
Valdez	E. Tyndall
Valdez	Si Scrafford
Valdez	C. Crites
Valdez	Alois Friedrich
Valdez	L. G. Goyot
Valdez	Joe Henderson, Lessee; G. St. George, owner
Valdez	Thos. Gilmore & ——— Stevens

TABLE NO. XI. (Continued)

OPERATOR	MINE	Local Address	MANAGER
Mizpah Mine	Mizpah	Fairbanks	A. Hess
McArthur, W. T.		Berry	W. T. McArthur
McCarthy Mine	McCarthy		J. J. McCarty
	McNeill-	Fairbanks	Mike McNeil
McNeil-Huddleson Mine	Huddleson	Fairbanks	Louis Golden
Newsboy Mining Co.	Newsboy	Fairbanks	John Contadi
Poz & Contadi		Olnes	Joe Poz——
Reliance Mining Co.	Reliance	Fairbanks	W. Spalding
	Rhoads-		
Rhoads-Hall Mining Co.	Hall	Fairbanks	L. B. Rhoads
Tanana Hydraulic & Quartz M. Co.		Fairbanks	G. St. George
Columbia Mining Co.		Fairbanks	J. Meier
Fairbanks Tungsten Mines Co.		Fairbanks	H. Munroe
Rainbow Mine		Fairbanks	Roy Maddison
Thomas, Hagen, McCann & Micheally		Berry	David Thomas Frank Hagel, Jas. McCann & John Micheally
Wyoming & Colorado Mine	Wyoming & Colorado Eagle	Cleary	Tony Goeseman
Wood, Richard	Antimony	Fairbanks	Richard Wood

TABLE NO. XII.

PLACER MINES

OPERATOR	CLAIM	CREEK	Local Address
	Chisana		
W. E. James, W. A. Johnson, N. P. Nelson, Matilda Wales	Nos. 4, 5,6, 9	Bonanza	Chisana
W. E. James, W. A. Johnson, N. P. Nelson, Matilda Wales	No. 1	Little Eldorado	Chisana
A. T. Wright	Nos. 11 & 11 Fraction	Bonanza	Chisana
F. W. Best, Don L. Greene	No. 7	Bonanza	Chisana
F. W. Best, Don L. Greene	No. 3	Bonanza	Chisana
Anthony McGettigan, R. K. Hover	No. 2 bench	Bonanza	Chisana
A. M. Taylor and J. P. Mclellan	No. 2	Bonanza	Chisana
Edward Briggen	No. 2 below Disc.	Big Eldorado	Chisana
J. E. McCabe, E. R. Behling, Joe Davis	No. 3 below upper Disc.	Big Eldorado	Chisana
Virgil Lee Catching & Lee Catching	No. 2 Disc.	Gold Run	Chisana
F. Whitham	No. 2	Little Eldorado	Chisana
D. C. Sargent, D. P. Thornton	No. 1	Skookum Gulch	Chisana
Wm. Johnston	No. 1	Johnson Creek	Chisana
W. E. McKinney	No. 8	Bonanza	
	Circle		
Adamik, Martin			Woodchopper
Anderson, J. P.			Miller House
Armstrong, Charles			Woodchopper
Bayles, Otto G.			Deadwood
Beatson & Nelson			Woodchopper
Berry, C. J.			Miller House
Bloom, Pete			Deadwood
Boyle, Charles			Woodchopper
Boyle, John			Woodchopper
Clark, A. P.			
Cochran, John Doe			
De Michael, Michael			Circle
Erickson, Riley			Deadwood
Fenlanson, Chris			Woodchopper

TABLE NO. XII. (Continued)

OPERATOR	CLAIM	CREEK	Local Address
Fisher, August			Woodchopper
Garner & Berry			Miller House
Gibbon, Billy			Woodchopper
Greep, Harry			Deadwood
Holstrum, John			Woodchopper
Ingalsbe, Al			Deadwood
J. F. Kelly			Miller House
Kronjaeger, Alfred			Deadwood
Larson, Chris			Woodchopper
Lee, O. B.			Woodchopper
Marigold Mining Co.			Miller House
Matthews, Dave			Woodchopper
Morel & Johnson			Deadwood
Philips, Thos.			Deadwood
Pompal, Jos.			Deadwood
Powers, Geo.			Woodchopper
Sather, Antone A.			Deadwood
Scesniak, Frank			Woodchopper
Slaven, Frank			Woodchopper
Van Bibber, Pat			Deadwood
Copper River			
Brooks, E. W.		Jolly Gulch	Nizina
Carvey, Bert		Rex	Nizina
Dan Creek Mining Co.		Dan	McCarthy
Elmer, J. M.		Slate	Dempsey
Esterly & Andrus		Chititu-Rex	Nizina
Gresh, John		Miller Gulch	Dempsey
Holmes & Brail		Upper Chesna	Dempsey
Kraemer, Hemple & Leavell		Slate-Miller Gulch	Dempsey
Schroeder, William		Miller Gulch	Dempsey
Crow Creek			
Alaska Crow Creek Mining Co.		Drow	Girdwood, via Anchorage
Fairbanks			
James McPike	No. 1	Goldstream	Gilmore
Wagner, Henry	No. 7	Goldstream	Fox
Fred Blecker & E. B. Collins	No. 10	Goldstream	Fox
Harry Attwood	No. 11	Goldstream	Fox
M. G. Casalegno	No. 15 below	Goldstream	Fox
Andrew Johnson, et al	No. 16	Goldstream	Fox
Val Debelt, et al	No. 22	Goldstream	Fox
C. P. Gius	Nos. 5 & 7		Gilmore
Fred Bond		Gilmore Pup	Gilmore
Harry Chiasano		Steamboat Gulch	Gilmore
J. M. Woodin	No. 1 below	Pedro Creek	Gilmore
J. Guise			
J. E. Toldo	No. w below	Pedro	Gilmore
A. Hanot	Discovery	Pedro	Gilmore
Chas. Norlein	No. 6	Gilmore	
Leo Roggie	No. 12	Goldstream	Fox
A. Troseth and partner	No. 1	Chatham	Cleary
Pearsen & Johnson	No. 4	Chatham	Cleary
Al Hilty	No. 6	Cleary	Cleary
	Discovery	Cleary	Cleary
	No. 11 below	Cleary	Chatanika
Foster & Hungerford	No. 12	Cleary	Chatanika
Fred Zeimer & Weiss	No. 17 bench	Cleary	Chatanika
Otto Smith, Chas. Nargord, August Strom, Peter Soroghan	22 below Gold Hill Pioneer Association	Goldstream	Fairbanks
George Sandstrom, Herman Johnson, Geo. Johnson, Mrs. Geo. Johnson	Nos. 11 and 2, Pioneer Association		Berry
			Berry

TABLE NO. XII. (Continued)

OPERATOR	CLAIM	CREEK	Local Address
A. Sjolseth	Bon Ton		
Jack Eagen & Bros.	Association Komoko Creek	Gold Hill Kokomo Creek	Berry Meehan
Chas. McCrary	Fish Creek	Fish Creek	Meehan
Quartz Prospectors and Miners			
C. Crites & Feldman	Helen Mine	MooseCreek	Meehan
A. Hess	Mizpah Mine	Fairbanks	Meehan
Tom Gilmore & Stevens	Mayflower Mine		Meehan
L. J. McCarty and M. McNeil	Mayflower Mine		Meehan
Jack Pomeroy	Eagle Mine		Fairbanks
Martin Harris	Frederick Mine Nicholas II.		
J. Meiers	First Chance	Steel Creek	Fairbanks
Fairbanks Tungsten & Mines Co.	Gilmore	Head of Gold	Fairbanks
Steve Lady		Gilmore Creek	Gilmore
Ben Thompson	Ryan Lode	St. Patrick	Fairbanks
Tyndall & Finn	Bondholder	St. Patrick	Berry
R. Smith & W. McGlone	Mohawk Extension	St. Patrick	Berry
Roy McQueen	Ready Bullion	Dome	Berry
L. Creighton	Little Eldorado	Little Eldorado	Fairbanks
Nels Giske, Lars Westenvik	Chimera Nos. 3, 4	Cleary	Cleary
David Thomas		Ester	Berry
H. F. Webber	Discovery	Ester	Berry
Brawick Sether & Thompson	Idaho	Little Eldorado	Little Eldorado
Alf. M. Anderson	No. 3 below	Little Eldorado	Little Eldorado
Frank Nelson	No. 1 above	Little Eldorado	Little Eldorado
Chas. McDonald & Husdal	No. 3	Little Eldorado	Little Eldorado
Sam Samsen & Pete Pearson	No. 6	Little Eldorado	Little Eldorado
Fraker & Nelson	No. 7	Little Eldorado	Little Eldorado
George Ewer	No. 6 above	Dome Creek	Olnes
Jack Letender	No. 3	Dome Creek	Olnes
James Canning and partner	No. 2	Mary's Gulch	Olnes
Chris Nerland	Discovery	Dome	Olnes
Isaac Takkle	No. 4 below	Dome	Olnes
Tom Quirk & G. W. Robbins	No. 11 below	Dome	Olnes
Victor Kleinsmith	Niggerhead Association	Fairbanks	Olnes
Fairbanks Dredge	No. 6 above		Meehan
Fred Parker	No. 3	Fairbanks	Meehan
Charles Grill	No. 6 below	Fairbanks	Meehan
Martin Sather	No. 12 below	Fairbanks	Meehan
Chris Anderson & H. Honsdall	No. 15 below	Fairbanks	Meehan
A. McDaniels, H. McCorrie, Sam Russell, Wm. McCarty and Herman Fawcett		St. Patrick	Fairbanks
John Steel, John Burman, Albert Burman, Dick Thorson, and Chas. Hendricksen		St. Patrick	Berry
Sam Christiansen & Mike Hohenadel	Gold Hill Midway Claim		Berry
Fred Rehie and O. Landstrom	Gold	Slate	Little Eldorado
Pete Oklevik, P. O. Oklevik		Little Eldorado	Little Eldorado

TABLE NO. XII. (Continued)

OPERATOR	CLAIM	CREEK	Local Address
Hot Springs			
Bock, A.		Deep	Tofty
Brandstrom & Anderson		Eureka	Eureka
Frank & Graham		Pioneer	Eureka
Glenn Mining Co.			Eureka
Howell & Cleveland		Woodchopper	Tofty
Hosler, D. J.		American	Hot Springs
Johnson, Ed.		Eureka	Eureka
Jones & Stewart		Cash	Tofty
Kanally & Hasting		American	Hot Springs
Lane, A. H.		Eureka	Eureka
Murray, Michael		American	Hot Springs
McKinzie, J.	Gold Age	Miller	Tofty
Ness, Edward		American	Hot Springs
Olsen & Everson		Eureka	Eureka
Peterson & Davidson		Boulder	Tofty
Stevens, Frank		Eureka	Eureka
Iditarod			
Beatson, Bates, Longtin and Dawson	No. 1 below	Otter	Flat City
Brevis, J. L.		Willow	Flat City
McKenzie & Mathewson		Chicken	Flat City
McMillan, R.	Discovery	Otter	Flat City
	Bench		
Manley, Frank		Willow	Flat City
Rilley & Marston		Otter & Black	Flat City
Strandberg, Dave	Link, Madden Bench and Upper Placer		Flat City
Welch, Al		Happy	Flat City
Innoko			
Greer & McNulty		Boob	Copper
Harling, Tom		Yankee	Ophir
Pitcher & Van Orsdale		Tolstoi	Copper
Reich, John	No. 5 below	Gaines	Ophir
Schwasball, Andy		Tolstoi	Copper
Snalley Bros.		Ophir	Ophir
Spencer, Fred		Gaines	Ophir
Thorn & Higgins	Hippard Fraction	Gaines	Ophir
Vibh, Nels	No. 2 above	Gaines	Ophir
Warren & Coutts	No. 11 above	Gaines	Ophir
Kenai Peninsula			
Alaska Securities Corporation			Seward
Mathison Mining Co.			Hope
Pearson, A. & H.			Hope
Renner, John			Sunrise
St. Louis Mng. & Trading Co.			Hope
Koyukuk River			
Collins, Ernest M.			Wiseman
Holzer & Wilson Mng. Co.			Wiseman
Pingel, H.			Wiseman
Smith, Ellingson & Nelson			Wiseman
Watts, Vernon			Wiseman
Webster & Co., Daniel			Wiseman
Williams, Mrs. Mary			Wiseman
Wooll, John E.			Wiseman
Marshall (Wade Hampton)			
Betsch, Jean, McGrath and McDonald	No. 1 above	Willow	Fortuna Ledge
Mack & McKinzie	Upper	Willow	Fortuna Ledge
Nelson, Nels	Discovery	Willow	Fortuna Ledge
Pilcher, Geo. M.	No. 4 above	Elephant	Fortuna Ledge
Smith & Giacherio	No. 2 above	Willow	Fortuna Ledge
Waskey, Frank	Bumblebee	Willow	Fortuna Ledge

TABLE NO. XII. (Continued)

OPERATOR	CLAIM	CREEK	Local Address
	Ruby		
Anderson & Johnson	No. 3 above	Long	Long City
Black & Leveredge	No. 4	Flat	Poorman
Buckley Bros.	Novikaket Association	Long	Long City
Cook, Charles		Poorman	Poorman
Coyle Bros. & O'Donnell		Poorman	Poorman
Coyle, Denis		Spruce	Poorman
Felton, Alex	No. 3	Tenderfoot	Poorman
Gidling & Anderson	No. 2	Bear Pup	Long City
Graham & Walker	Novikaket Association	Long	Long City
Hegstrom & Nelson	No. 1	Straight	Long City
Herman & McKinnon	No. 2	Duncan	Poorman
Jones & Lundin	Alabama Association	Birch	Long City
Kells, A.	Windy Bench	Long	Poorman
LaBelle, Joseph		Tamarack	Poorman
Larson, Alex	No. 1 above	Long	Long City
Matheson, Girlund & Wiel		Spruce	Poorman
Miller & Pike	Wedge Frac. bet. 2 & 3	Bear Pup	Long City
Monahan, John		Spruce	Poorman
McCloud, D.	Windy Claim	Flat	Poorman
Nixon and Maurial		Poorman	Poorman
Neihoof and Lindgarde		Spruce	Spruce
Shorpshear, J. F.	No. 2 Bench	Poorman	Poorman
Strite, Chas.	No. 3	Bear Pup	Long City
Swanson & Cale		Fourth of July	Long City
Thompson, Morton, Johnson & McLaughlin	Banner	Flat	Poorman
Van Winkle & Wallace	Buckeye Bench	Long	
Ward & Bishop		Tamarack	Poorman
Willeke, Herman	Surprise Fraction	Poorman	
Wyman & Balanger	O. K.	Head of Flat	
Yukon Gold Co.		Greenstone	Long
	Seward Peninsula		
Arctic Mining Co.		Bangor	Nome
A. I. Brown	X. Y. Z.		Nome
Candle Ditch Co.	Bully Mill	Center	Candle
Clark, Harry		Dexter	Nome
Coggins, Bernard		Dexter	Nome
Connely & Jensen		Gold Bottom	Nome
Connelly & Bros.		Dexter	Nome
Cordovado, A. V.	Bessie Bench	Holyoke	Nome
Dakota-Alaska		Boulder	Nome
Fairhaven Mining Co.		Immachuck R.	Deering
French, A. E.		Jump	Candle
Gewiler & Gloor		Dime	Haycock
Gilette & McMillan		Center	Nome
Gum, Henry		Center	Nome
Gunderson, Lars		Dime	Haycock
Hanson, Olson & Evans		Candle	Candle
Jepson, Carl		Sweepstake	Haycock
Kronquist, F. S.		Candle	Candle
Landstorm, A. J.		Little	Nome
Lee Bros. & Halloran		Candle	Candle
Lundberg, O. A.		Candle	Candle
McCoy, F. J.		Sweepstake	Haycock
McGann, Thomas		Jess	Nome
Madsen, Jens		Dime	Haycock
Mebes, Fred		Submarine Beach	Nome
Nelson, Nels	Diamond L		Nome
Nohrdlung Bros.		Candle	Candle
Olson Bros.		Dime	Haycock
Olson, Otto W.	Tundra Association	Little	Nome
Orhem & Brown		Dexter	Nome
Peterson, Peter X.		Buster	Nome
Pioneer Mining Co.		Little	Nome

TABLE NO. GII. (Continued)

OPERATOR	CLAIM	CREEK	Local Address
Porter Wallace		Dime	Haycock
Ravenkilda & Jenson		Jess	Nome
Reed, C. T.		Mountain	Nome
Regling & Oson		Dime	Haycock
Roberts, E. A.		Crooked	Council
Rouse, Thomas		Immachuck R	Deering
Ryden, R. E.		Bear	Candle
Smith, Sam		Dime	Haycock
Stewart, A. C.		Sledge	Nome
Stonehouse, John		Buster	Nome
Sunset Mining Co.		Sunset	Teller
Sutton, W. L.		Dime	Nome
Swanberg & Lee		Osborne	Haycock
Valentine & Anderson		Dime	Haycock
Vogel, Charles	Diamond L		Nome
Frawley & Roberts	Rockaway	Submarine	Nome
		Beach	
Norbert Pearson & Rice	No. 6 bench	Dime	Haycock
McNulty & Rylander	No. 4 above	Dime	Haycock
Jean Dougherty	No. 2 above	Dime	Haycock
Warsing, Frank	Diamond L		Nome
Wilson, Al		Sweepstake	Haycock
	Susitna River		
Adams, A. A.		Falls	Cache Creek via Susitna
Bubb & Bahern		Dollar	Cache Creek via Susitna
Carlson, C. J.		Lucky Gulch	Valdez Creek via Gulkana
Duff, Clark,		Valdez	
Eberhart & Anderson		Falls	Valdez Creek via Susitna
Francis & Foster		Long	Valdez Creek via Susitna
Gage & Mack		Thunder	Cache Creek via Susitna
Giedaken, Wm.		Bird	Cache Creek via Susitna
Gray, John		Treasure	Cache Creek via Susitna
Hammersmith, Charles		Bird	Cache Creek via Susitna
Hansen, Chris		Willow	Cache Creek via Susitna
Harper Bros.		Nugget	Cache Creek via Susitna
Jenkins, Frank		Willow	Cache Creek via Susitna
Kast, Nelson & Larsen		Peorman	Cache Creek via Susitna
McElroy & Remmer		Falls	Cache Creek via Susitna
Peterson, William		Cache	Cache Creek via Susitna
Price, Hugh		Nugget	Cache Creek via Susitna
Raymond, Carl			Cache Creek via Susitna
Rice, John		Willow	Cache Creek via Susitna
Richardson, R.		Ramsdyke	Cache Creek via Susitna
Smith & Hogan		Nugget	Cache Creek via Susitna
Tesmer & Biedermann		Cache	Cache Creek via Susitna
Thunder Cr. Mining Co. (M. A. Ellis, Manager)		Thunder-Windy	Cache Creek via Susitna
Valdez Placer Mines Co.		Valdez	Valdez Creek via Gulkana
Van Eiderstein & Zindel		Peters	Cache Creek via Susitna
Weatherell & Andersen		Gold	Cache Creek via Susitna
Wolf & Maloche		Spruce	Cache Creek via Susitna

TABLE NO. GII. (Continued)

OPERATOR	CLAIM	CREEK	Local Address
	Tolovana.		
Tony Zuber & M. Altman	Sunnyside Bench	Livengood	Brooks
N. J. Brown		Lucky Creek	Brooks
P. Lynch & T. Verdier	Discovery	Olive Creek	Brooks
J. M. Hudson	No. 2 below Discovery	Olive Creek	Brooks
H. R. Miller		Ruth	Brooks
H. Crook	Deep Ass'n.	Livengood	Brooks
D. Dooling & R. Paterson	No. 4	Myrtle Creek	Brooks
H. Hanson & M. J. Brown	Discovery Bench	Livengood	Brooks
R. C. Barthel & Sam Lowry	Nelson Bench	Livengood	Brooks
Colbert & Samson	Ready Bullion	Livengood	Brooks
Ernest Peterson, Tom McKinnon & Sam Godfrey	Lovely Bench	Livengood	Brooks
O. Miller, C. Clausen, Jack Allman	Fish Ass'n.	Livengood	Brooks
O. Iverson & O. Tolson	Fish Ass'n.	Livengood	Brooks
B. Camos, Olson & Erickson	Eagle Bench		Brooks
B. Peterson & Nelson	Virginia Bench	Livengood	Brooks
Craig & McKinon	Leitrim Association	Livengood	Brooks
Funter & McKinon	Leitrim Association	Livengood	Brooks
A. Peterson & Anderson	Marriette Bench	Livengood	Brooks
E. Nelson, C. A. Johansen, & A. Clive	Tolovana Bench	Livengood	Brooks
Enstrom Bros.	No. 20 above Discovery	Livengood	Brooks
A. Bostrom & E. Johnson	Gold Dollar Bench	Livengood	Brooks
John Back	B.X. Fraction	Amy	Brooks
H. Paterson & H. J. Atwell	No. 3 below Discovery	Amy	Brooks
F. Soini, J. Krananen and Mike Niknony	Lucky Bench	Amy	Brooks
R. C. Koebsch, E. N. Welter, F. F. Pauli, and C. A. Smith	Mutual Bench	Amy	Brooks
Carl Nelson		Head of Amy	Brooks
W. Kelly, F. E. Pauli, and C. A. Smith	Union Bench	Amy	Brooks
C. Lind , Pierce & Cramer	Gan Association	Livengood	Brooks

LAWS PASSED AT THE THIRD REGULAR SESSION
of the
TERRITORIAL LEGISLATURE
re
MINING

Ch.	No.	TITLE
4	H. B. 3	An Act to declare employment in underground coal mines, underground lode mines; underground placer mines; in underground coal, lode or placer workings; and in all other underground mines, or workings of any kind or nature whatsoever, to be injurious to health and dangerous to life and limb. To regulate and limit the hours of employment in said occupations; to declare the violation thereof a misdemeanor, and to provide penalties for the violation thereof, and repealing all acts and parts of acts in conflict herewith to the extent of such conflict.
17	H. B. 31	An Act to provide for the erection of cabins and shelter along traveled roads and trails and the equipment of such cabins, making it a crime to remove such cabin or any portion thereof, or any articles contained therein, prescribing the penalty for such offense and declaring an emergency.
31	S. B. 24	An Act providing a relief fund for the rescuing and relief of persons lost while prospecting, boating, hunting or otherwise, in the Territory of Alaska, and declaring an emergency therefor.
36	S. B. 2	An Act to provide for the construction, maintenance and protection of public roads, bridges, trails and ferries and property pertaining to public roads in the Territory of Alaska, to provide funds, regulations and penalties; to carry the provisions and purposes of this act into effect; to provide for the appointment of a Territorial Board of Road Commissioners and defining their duties; to provide for a Board of Divisional Road Commissioners for the First, Second, Third and Fourth judicial divisions in the Territory of Alaska and for other purposes; and declare an emergency.
44	S. B. 36	An Act to amend chapter 71 of the 1915 Session Laws of Alaska, entitled, "An Act relating to the measure and recovery of compensation of injured employees in the mining industry of this Territory, and compensation to designated beneficiaries where such injuries result in death, defining and regulating the liability of employers to their employees in connection with such industry, and repealing all Acts and parts of Acts in conflict with this Act."
51	H. B. 26	An Act to establish the office of mine inspector; to prescribe the duties, powers, qualifications and compensation thereof; to regulate the operation of mines in the Territory of Alaska; to provide for the health and safety of mine workers in the Territory; to declare the violation of any of the provisions hereof a misdemeanor and prescribing punishment therefor; repealing chapter 72 of the 1913 Session Laws of Alaska, and Chapter 69 of the 1915 Session Laws of Alaska.
55	S. B. 13	An Act to Regulate and limit the hours of employment for all wage and salary earners in the Territory of Alaska, to declare the violation thereof a misdemeanor and to prescribe punishment therefor.
57	H. B. 59	An Act defining the rights of locators of mining claims over the waters of any rivers or creeks on which such claims may be staked and the rights of locators of water rights on creeks and rivers in the Territory of Alaska.
62	S. B. 15	An Act for the establishment of the Alaska Agricultural College and School of Mines, in accordance with the provisions of the Act of Congress, approved March 4, 1915, and to grant a charter to the Alaska Agricultural College and School of Mines.
74	S. B. 29	An Act to amend sections 1 and 2 of chapter 76, Laws of Alaska, 1915, entitled "An Act to establish a system of taxation create revenue and provide for collection thereof for the Territory of Alaska, and for other purposes," and to amend an act entitled "An Act to establish a system of taxation, create revenue and provide for collection thereof for the Territory of Alaska, and for other purposes," approved May 1, 1913, and declaring an emergency, approved April 29, 1915.