REPORT OF

WILLIAM MALONEY

Territorial Mine Inspector

to the

GOVERNOR OF ALASKA

For the Year

1916

CONTENTS

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For the Year 1916.

Juneau, Alaska,
February 28, 1917.

Sir:

I have the honor of submitting herewith my annual report for the calendar year of 1916.

Very respectfully,
WILLIAM MALONEY,
Territorial Mine Inspector.

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

INTRODUCTION.

In the early part of 1916 the Inspector visited all of the lode properties in Southeastern Alaska that were accessible at that season of the year. In the early spring the Inspector attended a convention of State mine Inspectors and representatives of industrial compensation commissioners at Washington, D. C., by invitation of the Secretary of the Interior through Governor Strong. The object of the convention is hereafter stated. As soon as practicable the Inspector started on his annual inspection tour of the placer properties and visited upwards of 350 operators in the Fairbanks, Tolovana, Hot Springs, Ruby, Iditarod, Innoko, Marshall, Chisana, Tolstoi and Nome districts. In the late fall the lode properties on the western coast were inspected.

From the standpoint of production, the year 1916 is phenomenal, there having been produced by the mines in the Territory minerals valued at more than seven times the original purchase price of Alaska. This is, for the most part, due to the enormous copper output. However all operating mines have worked feverishly to expand their outputs, owing to the fabulous prices prevailing throughout the year for minerals. For the same reason prospecting was very much stimulated.

ACKNOWLEDGEMENT.

I wish to thank Mr. Sumner S. Smith, Federal Mine Inspector for Alaska, and Mr. Roy A. Dye, both connected with the Bureau

of Mines, for their assistance given me in the compiling of the data published herein.

It must be appreciated that the appropriation for the conduct of this office is very limited and that no field assistants are provided for. In an effort to comply with the statutory enactments prescribing the duties of the Territorial Mine Inspector, recourse must of necessity be had to various sources, it being manifestly impossible to give personal attention to all such matters, owing to the size of the Territory.

REPORT OF THE INSPECTOR'S ATTENDANCE AT THE CONVENTION OF STATE MINE INSPECTORS, WASHINGTON, D. C.

Pursuant to an invitation by the Secretary of the Interior to Governor Strong, I attended a convention of State mine inspectors and representatives of industrial compensation commissioners, held in Washington, D. C., February 24,-25, 1916.

The meeting was well attended by representatives from the various States. One of the principal objects of the meeting was to bring about a co-operative arrangement between the various State organizations and Federal bureaus interested in the collection of statistics relating to the mining industry.

With the view of simplifying the collection of statistics and at the same time, relieving the operator of rendering so many reports, it was the consensus of opinion that figures once collected by a state organization should be sufficient for all purposes, and that the operator should not be called upon to make another report of similar nature. It was the purpose of this meeting to so standardize and broaden the request for data as to include in one report sufficient information for the State mine inspector, the State industrial compensation commissioner, and the Federal bureaus.

The subject of the calendar year was brought up and all members agreed that the calendar year should be adopted. The representatives of the States wherein the fiscal year is now at variance with the calendar year pledged themselves to do all they could to bring about legislative enactments to have the calendar year substituted. One of the principal arguments urged in favor of the calendar year was that with the enactment of the Federal income-tax law, a report under oath was required of the financial condition of the reporting company on December 31. This law being Federal applies to all of the States, and is an important argument in favor of the calendar year.

The discussion during the first day of the convention related principally to proposed standard forms for recording and publishing data relating to mine equipment, labor and accidents. The forms relating to mine equipment provide for a directory of mines in actual operation during a calendar year and for comprehensive

data relating to power equipment, ventilation, mining methods and haulage.

With reference to accidents, a standard form was discussed that should cover fatal and non-fatal accidents that complete and comparable information would be available in the published reports of the State for any one interested in the study of accidents. The forms discussed were so grouped and general in their character as to include not only coal and metal mines, but metallurgical plants, quarries and coke ovans. The result of the meeting was the appointment of a committee to prepare standard forms along the lines proposed and discussed at the meeting.

On the second day, February 25, there was a formal discussion concerning the standardization of mining laws and regulations as relating to safety in coal mines, the point being made that miners are migratory and in going from one State to another encounter different laws, rules and regulations, with which they are necessarily not familiar. It was unanimously agreed that the Bureau of Mines draft a standard set of rules and regulations for coal mines similar to that prepared by the Bureau for metal mines and published as Bulletin No. 75.

Another point freely discussed was the adoption of certain universal danger signals, so that a miner from one State would meet the same type of signal in a mine in another State, and thus at once recognize their meaning. Mr. W. L. Chandler, of the National Safety Council, extended an invitattion to the State mine inspectors, representatives of industrial commissions, and the Bureau of Mines to assist in the establishment of universal danger signals in hazardous industries.

NEEDS OF OFFICE.

The inspector at the present time lacks funds for office rent, clerical hire, office furniture, emergency printing, stationery, stamps, telephone, etc. The appropriation should be increased to cover these items. Under the present conditions the inspector has no means of filing correspondence, bulletins, reports, maps, etc.; has no telephone number that he can give to the mining companies in case of emergency; and is obliged to do his own clerical work, which could be done much more speedily by one trained in that line and at less expense to the Territory.

MINE EXPERIMENT STATION.

The Congress of the United States, in an act approved March 3, 1915, authorized the establishment in the several mining regions of the United States and the Territory of Alaska, ten mining experiment stations and seven mine safety stations, in addition to those already established. The act, however, provides that not more than three of the experiment stations and three of the rescue cars shall be provided for or established in any one year. In other

words, three stations and three cars are to be created during each year until the ten stations and seven cars are established. The law makes it the duty of these stations "to make investigations and disseminate information with a view to improving conditions in mining, quarrying, metallurgical and other mineral industries, safe-guarding life among employees, preventing unnecessary waste of resources, and otherwise contributing to the advancement of these industries."

The establishment of these stations comes at a time when the mining industry particularly needs them, and will undoubtedly be a great benefit in the development of processes for the utilizing of low-grade ores and other deposits to the highest extent. One of these stations has been located at Fairbanks, in interior Alaska, and will be ready for service during the coming year.

Another one of these stations should be located at Juneau. In southeastern Alaska there is a number of the largest gold-lode mines in the United States besides numerous smaller gold, copper, lead, silver, zinc, antimony, molybdenum, barite mines or prospects and marble and gypsum quarries. Some of the prospects now under development contain all of those minerals and others and so far have proven too complex to be mined and separated successfully. These should prove to be interesting problems for an experimental station and would, of course, be highly beneficial to operators and prospectors. A station at Juneau would serve all the coastal region, which unquestionably comprises the greatest area of lode mines, developed and undeveloped, with promising prospects not yet mines, in the entire Territoryr.

LABOR CONDITIONS.

The demand for labor during the greater part of 1916 was in excess of the supply. This can be partly traced to the construction of the Government railroad, the large number of men employed by the Alaska Road Commission on the interior wagon roads, and also to the demand for miners in the States, especially in the copper mining industry.

There was a strike of the employees on construction work of the Government railroad, at Anchorage, during the early spring. An increase in wages was demanded. After the situation had been investigated by a board of arbitration, appointed by the President of the United States, an increase of wages was granted and the men returned to work. There was no strike involving a suspension of work in any of the mines in the Territory during the year. In some of the mining districts increase of wages was reported; also a decrease in the working hours of men employed in surface works about the mines.

The Territorial Legislature, Session of 1915, amended the law passed in the Session of 1913 making 8 hours constitute a day's work in lode mines to apply to all underground mining. This law

was generally observed, except in a few cases in the placer mining districts of interior Alaska where some of the operators disregarded it. In the Fourth Judicial Division a suit was instituted to test the legality of the act. The District Court held that the law was invalid as applied to placer mines because of its being amended without changing its title. In the title of the act the law extends to metalliferous lode mining only.

An act providing for an expression by the electors of the Territory as to whether they are in favor or not of a general eight-hour day for all wage and salary earners was passed by the Legislature at the last session and submitted to the voters at the general election held November 7, 1916. The act also provides that if the question is decided in the affirmative the Legislature shall at its next session pass such acts as may be necessary to cause such expression of the wishes of the electors to become effective. The question was decided in the affirmative by a large plurality.

MINERAL PRODUCTION

During 1916 the mining industry of Alaska again enjoyed the most prosperous year of its history by reason of the excessive demand for copper and by the continuance of the European war. The rapid increase in value during the year resulted in marked mining activity throughout the Territory. A noteworthy feature was the great number of investigations that were made on behalf of capitalists looking for properties that would warrant development on a large scale. This was true in all of the mining districts but was more pronounced in the copper-bearing regions of the Kotsina-Kuskulana districts.

Alaska has produced over $352,000,000 worth of gold, silver, copper and other minerals during 32 years of mining. The mineral production for 1916 was valued at $52,939,754; that of 1915 at $32,854,000. The increase, therefore, over that of 1915 was $20,085,754. Although this enormous increase in output was in a large measure due to the high price of copper and consequent unprecedented tonnage, yet nearly all other minerals were produced in greater quantities than in the previous year. There was a decrease in the amount and value of the output of marble and gypsum mines during 1916. The output for 1916 was distributed as follows:

Copper	$ 35,314,993
Gold and silver	17,087,214
Antimony	179,635
Tin ore	110,333
Tungsten ore	83,370
Lead ore	79,672
Gypsum	55,100
Marble	29,473
Total	$52,939,754

The Alaska mines produced gold to the value of $17,087,214 in 1916 as compared with $16,752,000 in 1915. This makes the total value of the gold mined in the Territory about $277,900,000, of which sum $196,800,000 has been won from the placers and $81,100,000 from gold-lode mines.

Gold Placer

About 640 placer mines were operated in 1916, employing some 4,925 men. The value of the placer gold output was about $10,650,000; in 1915 it was $10,480,000. All of the older districts appear to have held up or increased their output over the previous year. The increased production is, however, to be credited chiefly to the new camps of Tolovana, Marshall, and Koyuk or Dime Creek. Thirty-six gold dredges were operated in Alaska during 1916. Of these, 29 were operated in Seward Peninsula, three in the Iditarod and one in the Ruby, Fairbanks, Circle, and Yentna districts. Four of the 36 dredges were instaled during the year as follows; one in the Ruby, one in the Iditarod, one in the Yentna and one in Nome districts.

Gold Lode

About 25 gold lode mines were operated during 1916 and produced gold to the value of about $6,200,000. Southeastern Alaska, especially the Juneau district, is the only center of large quartz mining development. The next in importance is the Willow Creek district, but considerable lode mining was also done on Prince William Sound. There was a very decided falling off in the Fairbanks district. The completion of the Government railroad will stimulate an interest in the gold-lode mines of Fairbanks and interior Alaska which will be brought about by the cheapening of operating costs, especially fuel.

Copper.

There were 135,289,219 pounds of copper produced in Alaska this year, valued at $35,314,993. The production of 1915 was 86,500,000 pounds, valued at $15,000,000. The total copper production to date is 355,139,219 pounds, valued at $71,215,000. During the year 18 copper mines were operated, whereas but 13 were operated in 1915. Seven were in the Ketchikan district, eight in the Prince William Sound district and three in the Chitina district. The enormous output from the Kennecott mines in the Chitina district exceeded all other operations. They produced over two-thirds of the copper mined in the entire Territory.

Tin.

There was 232 tons of stream tin mined during 1916. Of this amount 162 tons came from the York district, where two tin dredges were operated, and a third was working placer ground

carrying both tin and gold. Development work was continued on the Lost River lode-tin mine. The rest of the concentrates were recovered incidentally to placer-gold mining in the Hot Springs district of the lower Tanana Basin. A small amount was also recovered from the gold placers on Midnight Creek in the Ruby district.

Antimony.

The mining of antimony ore began in Alaska in 1915 and continued in a small way through the first half of 1916. The fall in the price of this metal during midsummer put an end to most of these operations. During the year 1460 tons of crude ore was shipped from the Fairbanks district and 70 tons from the Nome district.

Tungsten.

Though scheelite has long been known to occur in some of the Alaska placers, up to the last two years the demand for it has not been sufficient to encourage its recovery. The recent high price of tungsten has induced miners in Alaska to turn their attention to scheelite deposits. In the fall of 1915 a scheelite-bearing vein was discovered in the Fairbanks district and its development begun. Later two other scheelite-bearing veins were found in the same district. During the winter some of the scheelite ore was treated in a local mill and six tons of the concentrates shipped out by parcel post. Scheelite mining was continued during the summer and 255 tons of the crude ore were shipped out by steamer. One scheelite-bearing vein was developed in the Nome district. Some scheelite was also recovered from the placers of this district. About 15 tons were recovered in the Nome district.

Mineral Fuels.

The production of petroleum from the only oil claims patented in Alaska, in the Katalla district, continued in 1916. The operating company was reorganized and more extensive exploitation was undertaken.

Coal.

About 8,000 tons of coal was mined in Alaska during 1916 from half a dozen small mines operating under the law of October 20, 1914, authorizing the issuance of permits by the Land Office to mine coal on specified tracts of ten acres not within the surveyed areas. The largest producer was the Bluff Point mine, on Cook Inlet, where a lignite bed was exploited for the local market. The mining of coal in the lower end of the Matanuska field for the use of the Alaska Engineering Commission was also a significant event. This part of the field is already made

accessible by the Government railroad, now under construction. The construction of a private railroad from Bering River into the Bering River coal fields was also begun and a little coal was mined at the southwest end of the Bering River field. Tenders for leases of coal lands in both the Bering River and Matanuska coal fields under the new law have been received by the Interior Department. A number of applications for ten-acre tracts have been received by the Registers of the General Land Office, Interior Department, in all parts of the Territory.

MINING INDUSTRY OF SOUTHEASTERN ALASKA.

As described by the United States Geological Survey, Southeastern Alaska, or the panhandle of the Territory, extending from Portland Canal northwestward to Mount St. Elias, separates northern British Columbia from the Pacific Ocean. To the northwest this region covers part of the great mountain mass which trends parallel with the coast and culminates in Mounts Fairweather and St. Elias, while south of Icy Straits it comprises a coastal strip about 30 miles in width, together with the many islands forming the Alexander Archipelago, which is from 80 to 100 miles in width. Both the mainland and the islands are mountainous, the general elevation back from the shore being 5,000 to 7,000 feet, with occasional summits somewhat higher, while the usual island heights are not in excess of 4,000. The islands of the Alexander Archipelago are separated from the mainland and from each other by usually narrow and often deep channels. The islands and mainland are densely wooded and covered with underbrush, making the prospecting of this part of Alaska very difficult, and have necessarily been limited to the vicinity of salt water, where the rock formation and mineral belts are clearly exposed.

About 12 gold-lode mines, 7 copper mines and 2 placer mines were operated in Southeastern Alaska during 1916. The value of the gold production in this field was about $5,960,000. Copper was produced to the value of about $1,000,000, all being from the Ketchikan district. The principal producers were the Mamie, It, Mount Andrew, Jumbo, Rush & Brown and Goodro mines. All of these properties are situated upon Prince of Wales Island.

THE TREADWELL MINES.

The four gold-lode mines of the Treadwell group, in the Juneau district, were operated on a normal basis until August 1. At that time the 200-stamp mill and half of the stamps of the 300-stamp mill were shut down to avoid the further drawing of ore from beneath settling ground in the Treadwell, Mexican and Seven Hundred Foot Mines. The other Treadwell mills were operated as in the past. The 4-compartment incline shaft at the Ready Bullion mine was completed. A new electric hoist

was installed for the man hoist, the old Ready Bullion hoist being used for hoisting ore skips. The shaft has been sunk to the depth of 2,400 feet and blocking out of the west 2,400-foot level started, several hundred feet of drifting having been done on this level. The shaft is being sunk to the 2,700-foot level. Work on the 5-compartment, vertical-combination shaft on the Mexican mine was continued throughout the year. This shaft when completed will be used for the operations of the Mexican, 700 Foot, and Treadwell mines for the hoisting of ore and men.

A new change-room with shower baths is being constructed out of the old Mexican mess house. Being near the combination shaft and being large and roomy the old mess house will make an excellent change-room.

An average of about 1,000 men were employed throughout the year at these mines.

ALASKA GASTINEAU GOLD MINING CO.

The Alaska Gastineau mine and mill was operated steadily throughout the year, an average of 6,000 tons of ore daily being maintained at the mill. Owing to the addition of waste from the hanging wall of the stopes on the higher levels, the average tenor of the ore milled fell below the original estimate. This caused misgivings on the part of some as to the ultimate success of the enterprise. However, the difficulties in selective stoping are being generally overcome, and the tenor of the ore milled shows a gradual improvement. Moreover, economies were effected so that the operating costs were reduced.

ALASKA JUNEAU.

The Alaska Juneau Gold Mining Company continued the development of its mine in a large way and much progress was made in the construction of the mill. It is expected that the mill will be completed in the spring of 1917. It is to have a daily capacity of 8,000 tons.

ALASKA EBNER.

Development work was continued throughout the year at the property of the Alaska Ebner Gold Mining Co.

ALASKA JUALIN.

The mine of the Alaska Jualin Gold Mining Company, north of Juneau, was operated throughout the year. Operations during the winter months were made possible by the installation of four 150-horsepower fuel-oil Semi-Diesel engines, hot bulb ignition. The engines are coupled to the generator during the cold, winter months when the water is too low to furnish power to drive the generator with the water wheel. When the water be-

comes plentiful the engines are discontinued and the water wheel attached.

This mine is in the Berner's Bay region. Other properties in the district north of Juneau being developed are the Kensington and Eagle River.

CHICHAGOFF MINE.

The Chichagoff mine, in the Sitka district, was operated on about the same scale as in previous years. Some work was done on a copper deposit discovered about 17 miles north of the mine, near Pinta Cove, the ore from which carries some nickel and cobalt.

KETCHIKAN DISTRICT.

The Ketchikan district was visited during April and May, 1916. Six copper mines and four gold mines were inspected. These mines employed about 260 men. Mining on Prince of Wales Island was more active during 1916 than ever before, owing to the high price of copper, the chief product.

The Mamie Mine.

The Mamie mine is situated on the east shore of Prince of Wales Island. It is operated by the Granby Consolidated Mining, Smelting & Power Co. This is the largest single operation on the Island. There are about 75 men employed. The mine is located about 5,000 feet from tide water and the ore is trammed to the bunkers on the beach where it is loaded on barges. The ore is a chalcopyrite magnetite in an altered limestone.

The Mt. Andrew Mine.

The Mount Andrew mine is situated 3,600 feet from tide water on the north shore of Kasaan Bay, on the east coast of Prince of Wales Island. The property is owned by the Mt. Andrew Mining Company, but is worked under a lease to W. J. Rogers. The ore consists of chalcopyrite magnetite in an altered limestone or granodiorite formation. The ore is trammed to the bunkers on the beach by aerial tram. A steam power plant is situated on the beach.

The It Mine.

The It mine is situated about one mile from tide water, on the north shore of Kasaan Bay, Prince of Wales Island. It is connected to bunkers at wharf by surface tram. The ore is chalcopyrite-magnetite in an altered limestone formation. The mine is owned and operated by the Granby Mining, Smelting & Power Co., Ltd. About 35 men are employed. The ore is trammed from mine to the wharf on surface trams in one-ton cars hauled by gasoline motor. The ore from both this and the Mamie mine is

fluxing ore. For this reason ore running as low as 1½ per cent is mined and shipped.

Rush & Brown Mine.

The Rush & Brown copper mine is connected with the wharf and bunkers on Kasaan Bay by a tram over which the cars are hauled by a small locomotive. The ore bodies are chalcopyrite and chalcopyrite-magnetite in a granodiorite-greenstone formation. The mine is opened by shaft and drift. All drilling is done with hand drills, or single jack method. Twenty men are employed. The ore is shipped to the Granby smelters, Anyox, B. C.

Goodro Mine.

The Goodro mine is situated near the Rush & Brown mine. The ore bodies are bornite and chalcopyrite in a diorite-greenstone formation. The mine is worked by the open-cut caving system. The ore is trammed to the beach by surface trams and shipped to the Granby smelter at Anyox, B. C.

Jumbo Mine.

The Jumbo, or what is commonly known as the Sulzer Copper Mine, of the Alaska Industrial Company, is situated on Hetta Inlet, on the west coast of Prince of Wales Island, at an elevation of about 1,500 feet. The ore bodies consist principally of chalcopryte and magnetite with a garnetite gangue, the wall being garnotite and granodiorite greenstone. The ore also contains considerable molybdenum. The bunkers at the mine are connected with the bunkers at the tide water by an 8,000-foot aerial tram. The property is developed by several adits driven into the mountain side connected by various cross-cuts and raises. Power is developed by a hydro-electric plant at the beach, water being taken from Jumbo Creek, under a head of 330 feet. A Sullivan air compressor driven by a 60-horsepower electric motor was installed at the mine which furnishes air for the rock drills and hoist. The ore is run over grizzlies and sorted at the mine. It is shipped by steamer to the Tacoma smelters for treatment. Twenty men are employed at the mine. The properties of the Alaska Industrial Company are under lease to Charles A. Sulzer, who is operating them. The properties embrace five claims. In addition to the copper mine, Mr. Sulzer is having a long tract of land cleared for the erection of a mill for treating a large barite deposit which has been developed by him; also for the construction of a store, living cottages and boarding house. There are 25 men employed at this work.

The bornite deposit is situated at Twin Point, 20 miles south from the mill. The ore will be mined and loaded on barges and hauled to the mill for treatment. The mill will have a capacity of about 75 tons per day. All of the copper ores on

Prince of Wales Island contain gold and silver in appreciable quantities. The Goodro contains platinum.

Ready Bullion Mine.

The Ready Bullion mine, situated near Hollis, has erected a new tram this spring preparatory to opening up the upper levels of the mine. This is a gold-lode mine in a limestone formation and is being operating by H. W. Webber

Dunton Mine.

The Dunton mine, on Harris Creek near Hollis, was ready for operation in April of this year. This is a gold-lode mine in a lime-slate formation.

KOTSINA-KUSKULANA DISTRICT.

The Kotsina-Kuskulana district, as described by the United States Geological Survey, includes part of the west end of a belt of mineralized rocks extending along the north side of Chitina Valley, from the southwest flanks of Mount Wrangle to Nizini River and possibly to the headwaters of Chitina River. This mineralized belt has already produced considerable amounts of copper and gold and gives promise, as its resources are developed, to continue producing these metals for many years to come. The extremely high market value prevailing for copper throughout the year resulted in marked mining activity throughout this district and a development activity that is likely to bring to light in the near future several additional producers of this useful metal and firmly establish the importance of this district.

Since the completion of the Copper River & Northwestern Railway in 1911, Cordova has been the distributing point for Chitina Valley, as well as for much of the Copper River Valley, and owes such measure of prosperity as it enjoys to the interior trade made possible by the railroad. The most important local distributing points along the railroad are Chitina, at the mouth of the Chitina River, which is connected by wagon road with the Valdez-Fairbanks road; Strelna, where most of the freight for the Kotsina-Kuskulana district is discharged; and McCarthy, from which supplies are carried into the upper Nizina River Valley and across Skolai Pass to White River. Kennecott, the terminus of the railroad, is the point from which the Kennecott-Bonanza ore is shipped, and has more traffic than any other point on the road. Strelna and McCarthy are more properly called distributing points for Chitina Valley, inasmuch as they serve considerable areas rather than single properties.

NIZINA DISTRICT.

Kennecott Copper Corporation.

Mining and development work were carried on at the Ken-

necott-Bonanza and Kennecott-Jumbo mines throughout the year. The production for these mines during 1916 was the greatest in their history. The value of the production more than equalled fifty per cent of the total mineral output for the entire Territory for the year. While the tonnage of ore produced is not large, being only an average of 900 tons per day, the ore is of exceedingly high metallic value, the average being about 50 per cent copper and 18 ounces of silver per ton. The new leaching plant, which was constructed during 1915, has proved a success commercially and an increase in its capacity in the near future is contemplated. A new machine shop was constructed and a large lathe, punch and shears, overhead traveling crane, and other new equipment installed during the year.

The power plant consists of two 300-horsepower Erie City vertical water-tube boilers, carrying steam at 160 pounds pressure. Power is generated by 500 k.w. generator directly connected to a Westinghouse turbine motor. A water wheel direct connected generator is used during the summer months. A building has been constructed for the installation of an additional 300-horsepower boiler; also it is contemplated to instal a 350-horsepower Diesel engine during 1917.

New mess houses and pool and reading rooms were built at the mines; a new hospital and amusement hall with moving pictures were built at Kennecott.

At the mine two new incline shafts were driven, one in each of the mines, three-compartment, two skipways and manways. The new shafts will do away with the old single-compartment incline shafts, which were always dangerous, as both men and ore used the same shaft and was the primary cause of several accidents.

Mother Lode.

Development work was continued on the Mother Lode property, situated in the same shear zone as the Kennecott-Bonanza mine, but is on the McCarthy Creek side of the ridge between Kennecott Glacier and McCarthy Creek. All of the mining is done by hand drilling. The ore is trammed to the bunkers by hand. It is sacked at the mine and from there trammed to the lower terminal on McCarthy Creek by aerial tram, where it is loaded on cars of the Copper River & Northwestern Railway and hauled to Cordova for shipment to Tacoma smelters. This company contemplates building a road from McCarthy to the mine for all-year transportation, either railway or auto-truck road; also the building of mill and power plant at mine.

Era Mine.

Development work progressed at the Era mine, owned and

operated by the Kennecott Copper Corporation and some ore was shipped from the mine this year.

Hubbard-Elliott Copper Co.

The Hubbard-Elliott Copper Co. installed a compressor driven by a gasoline engine and development work was continued during the open season.

Alaska Consolidated Copper Co.

The Alaska Consolidated Copper Company, on Nugget Creek, also installed a gasoline-driven air compressor and continued with the development of their properties during part of the year, or open season.

The Westover claims, on Dan Creek; the Tjosevig claims, at the head of Kennecott Glacier; the Berg claims, three miles south of Trail Creek; the Lakana, on the river of that name, and a number of other properties were exploited during the year.

Gold from the placers of Dan Chititu, Copper, Rex, White and Young Creeks and their tributaries produced considerable gold. About 150 men were employed on these creeks.

PRINCE WILLIAMS SOUND DISTRICT.

Granite Gold Mining Co.

The Granite mine, situated on the west side of Port Wells, was inspected December 30. The mine is operated by the owners, the Granite Gold Mining Company. Development work and actual mining were carried on continuously during the entire year. An average of about 45 men were employed. The 10-stamp and also the 7-foot Chilean mill were worked to capacity.

Cliff Mine.

The Cliff gold-lode mine is situated at sea level on the north shore of Port Valdez. It is at the base of a steep bluff at the east end of a gravel flat half a mile east of Shoup Bay. The mine is reached from Valdez by gasoline launch. The Mystic No. 1 claim, upon which the work was being done, is operated by H. E. Ellis, the owner. All of the work was above No. 1 level or the main haulage level. Three levels above this one were being mined and developed. The mill was run intermittently whenever the bunkers were full. An average of about 25 men were employed during the entire year.

Ramsay-Rutherford.

The Ramsay-Rutherford mine and mill were operated throughout the year.

Gold King.

The Gold King was operated for a short period by the owners.

Three-in-One.

The Three-in-One mine is situated near the Cliff mine, on the north shore of Port Valdez. A small mill was being erected and was to be equipped with a small Hardinge conical mill and a jaw crusher 10 by 12.

Gold Hill.

An adit was being driven on the Gold Hill claim adjoining the Three-in-One property. The tunnel was in 300 feet and a promising vein exposed. This claim is owned by George K. Love and associates.

Alaska Mines Corporation.

The Schlosser property, on Fidalgo Bay, under lease to the Alaska Mines Corporation, was operated throughout the year, and several shipments of ore were made to the Tacoma smelters. Stoping and development work were done on four levels. The ore from the lower level was hoisted from bin located at the mouth of the lower tunnel, to the ore bin of the aerial tram by a 4-horsepower gasoline hoist and overhead cable for trolley line. About 20 men were employed throughout the year.

Fidalgo Mining Co.

The property of the Fidalgo Mining Company, situated on the south side of Fidalgo Bay, was operated part of the year and a small shipment was made. The principal underground workings are on the Winchester and Elgin claims. A 385-cubic-foot water-driven air compressor was installed on the first bench, about 500 feet above sea level. The water for the power is taken from a small creek which flows from near mine workings and has a fall of about 300 feet from penstock. A small one-machine compressor, driven by gasoline engine, was installed at the mine for use during the cold weather when water is not available for water-driven plant. Eleven men were employed at this mine.

Three Man Mining Co.

Some work was done on the properties of the Three Man Mining Company, at the head of Landlock Bay. The Standard property, near the entrance to Landlock Bay was being exploited the latter part of 1916 and is expected to be shipping ore in the near future.

Beatson-Bonanza.

The Beatson-Bonanza mine, on Latouche Island, was the largest producer of copper on Prince William Sound. This mine is operated by the Kennecott Copper Corporation. The mine and mill were worked to full capacity during the year. There were

about 600 tons of milling ore and 30 tons of picked shipping ore produced per day. There were employed an average of 300 men at the mine, mill and on the surface.

New bunkers have been built and the capacity of the mill is to be increased to 1,500 tons per day by the installation of new Marcey mills, three of which were being installed at the time of visit. Additional crushers, filter press and dryers, three 500-horsepower McIntosh-Seymour Diesel engines, three 500-kilowat Westinghouse electric generators will be installed to furnish power for the new plant. A 3,000-foot Ingersoll-Rand compressor will also be installed to furnish air for mining operations. New staff house, office building, several new cottages for married men, recreation hall, with moving pictures and bowling alley, were built during the year 1916.

At present the ore is treated by the flotation process.

Miscellaneous.

Development work was done on several other properties on Knights Island. W. A. Dickey Co. was erecting a power plant for the development of their property on Knights Island. The Seattle Alaska Mining Co., on Montgomery Bay, and the Alaska Development Co., on Horse Shoe Bay, were doing some development on their properties and expect to be shippers of copper ore in the near future.

Thomas-Culross.

The Thomas-Culross Mining Co. did considerable development work on the Bugaboo and Chelan claims, on Thomas Bay, Culross Island. A new mill was erected near the mines.

Midas Mine.

The Midas mine is situated on Solomon Gulch, about six miles from the shore of Valdez Bay. It was operated throughout the year and worked three levels. A new 200-horsepower Diesel engine, built by the Akliebologet Diesel Motor Co., of Stockholm, Sweden, an Ingersoll-Rand 1,000-cubic-foot compressor and a Westinghouse 45-kilowat 125-volt electric light machine were installed at the mine during the year. Several new cottages were built near the mine for families. The mine is connected to the bunkers at the wharf by an aerial tram 5¼ miles in length. The ore is trammed in buckets from the bunkers and is loaded directly into steamships. The mine is owned and operated by the Granby Consolidated Mining, Smelting & Power Co., Ltd. The ore is shipped to the company's smelter at Anyox, B. C.

Ellamar Mine.

The Ellamar mine is situated at Ellamar, on the east shore of Virgin Bay, 20 miles southwest of Valdez. The workings are

on the Copper King and Gladhaugh claims. Mining and development work was continued throughout the season on the 100-, 200-, 300- and 400,foot levels. A gasoline motor is used underground to haul waste for filling purposes. The stopes and the old Glory hole are filled with waste, as the ore is being mined from the walls of the Glory hole. A new moving picture and amusement hall was under construction.

Mineral Production.

The value of the total mineral production of Prince William Sound was about $3,000,000 in 1916 as compared with $1,340,000 in 1915. The large increase is due to the high price of copper and its increased production. Eight copper mines and eight small gold mines were operated during 1916. The Beatson-Bonanza, Ellamar, and Midas mines were the largest copper producers and the Granite and Ramsay-Rutherford mines the largest lode-gold producers.

(a) KENAI PENINSULA.

Bluebell and Primrose Mines.

A small amount of development work was performed the past season at the Bluebell and Primrose groups which are situated about five miles southwest of Mile 18 on the Alaska Northern Railroad. Several veins on both groups have been prospected superficially by short drifts and cross-cuts and at the Primrose a small Little Giant mill has been installed. The veins are quartz in a slate-graywacke country rock and are valuable for their gold content. Most of the ore is free milling though shoots of arsenopyrite occur which contain considerable gold and silver. During the past season a test sample of ten tons of this type of ore was shipped to the Tacoma smelter. Both properties have been under the same management for the past two years.

Gilpatrick Mine.

Only the assessment work was done at the Gilpatrick mine the past season. The claims are situated about 15 miles from Mile 29 on the Alaska Northern Railroad, now taken over by the Government. There are several veins on the property ,though the greatest amount of work has been done on a mineralized dike, which is adjacent to one of these. It is well above timber line and has been opened by several hundred feet of drifts and raises. An arrastra has been installed on the creek near the bottom of the canyon to treat the soft oxidized ore from the sur-

(a) Report of Federal Mine Inspector for Alaska for the Calendar year, 1916.

face. The high-grade ore is sacked and hauled down the mountain side.

Kenai-Alaska Gold Co.

The Kenai-Alaska Gold Company owns a group of five lodes and three placer claims on the north side of Valdez Creek, about four miles from Mile 26 on the Alaska Northern Railroad. The mine, which is situated at an elevation of 4,500 feet, has been opened by two cross-cuts with connecting raises and stopes. It is connected with the mill by an 8,200-foot tram which has a fall of 2,400 feet between terminals. This property, which is equipped with a 5-stamp Hendy mill, was under lease a portion of the year to Drenan & Sweitzer.

Lucky Strike Mine.

The Lucky Strike property, owned by John Hirshey, is situated at the head of Palmer Creek, a tributary of Resurrection, about 14 miles from Hope.

There are five lode claims in the group, which is on a ridge at an elevation of 3,500 feet. The lode is a series of veinlets in a slate which appears to be crushed and broken. It has an east and west strike with a variable dip to the northwest. Two cross-cuts have been driven to intersect the ore, though, owing to the limited milling facilities, only the high-grade stringers have been worked. The ore is lowered on a 1,000-foot jig-back tram to a flat from which point it is hauled about half a mile on sleds to the mill. Here it is crushed by an 8 by 10-inch jaw crusher and drops into a 10-ton bin. From this it is fed by a Challenge feeder to a Moyle 1-stamp battery, using a 30-mesh screen. The stamp weighs 400 pounds, has a 6-inch drop and falls 110 times per minute. The pulp passes over amalagamating plates to an Ogden concentrator and is stored for future treatment. The concentrate is shipped.

Ronan & James.

The above partnership, which has a lease and bond on the Champion and Gladiator lode claims in the Moose Pass district, installed a small arrastra at the property this season.

The vein, which is about 12 inches wide, strikes N. 60 E. with a dip to the S.E. It has been opened by a 30-foot shaft on the vein and a cross-cut which taps the ore 85 feet below the collar of the shaft. Drifts have been started along the vein at the cross-cut and a stope is being driven that will tap the shaft and furnish ventilation.

Scheen-Lechner Mine.

The assessment work was the only operation carried on at the Scheen-Lechner property during the past season. The group

is situated on Valdez Creek, about 4½ miles from Mile 25, on the Alaska Northern Railroad.

Alaska Crow Creek Mining Co.

The Alaska Crow Creek Mining Company operates a hydraulic property on Crow Creek, a tributary of Glacier Creek, about five miles above its mouth. The latter flows into Turnagain Arm from the northern side, crossing the surveyed line of the Government railroad at Glacier.

There are 29 creek and bench claims in the group covering several miles of the creek bed. Much of the company's energy in the past has been expended in an effort to get the proprty in a good working condition and it was not until the fall of 1915 that the work was completed. The gravels toward the lower end of the creek, a greater portion of which were comparatively barren, were sluiced out to bedrock and a flume built to bypass the stream around this point. A bedrock flume 2,200 feet long, five feet wide and five feet deep was built in this cut on a grade of seven inches to the box length (12 feet). At the intake the floor of the first box is manganese steel plates. The next seven have railroad iron for riffles and from there 14-inch sawed, wooden blocks are used.

A ditch about a mile long conveys the water from the upper portion of Crow Creek to the penstock, which gives a fall of from 300 to 400 feet at the bottom of the pit. The main pipe line is 24 inches in diameter, several giants operated, according to the stage of the water.

The property is equipped with a complete sawmill which furnishes lumber for the flume and dwellings.

Alaska Securities Corporation.

The Alaska Securities Corporation has recently consolidated several groups of placer claims on Lynx Creek, where it is installing a plant and is drilling another group on Canyon Creek, just above the forks of the Government road.

On the Lynx Creek group a ditch nearly a mile long and a 4,000-foot pipe line is under construction which will give a 400-foot head. A tunnel has been driven through a low ridge to give room for the disposal of the tailing and a bed-rock flume laid. Hungarian riffles are used for the first two box lengths with sawed blocks the remainder of the distance.

On Canyon Creek the company has had a Keystone drill in operation the past summer testing an old channel.

Herron Dredging Co.

The dredge of the Herron Dredging Company, near Sunrise, was idle the past season.

Mathison Mining Co.

The Mathison Mining Company is operating a group of 18

claims and a fraction on Resurrection Creek, about 3½ miles from Hope.

The main portion of the creek is carried along one bank while the opposite side is worked out in a series of pits, as the creek is wire and there is buttle fall. A 48-foot sluice, four feet wide, with a grade of seven inches to the box length, is used with small railroad iron for riffles. Three or four No. 2 giants are kept in operation. According to the stage of the water, which is brought in under a 350-foot head. The tailing being washed clear from the sliuces by a tailing giant. A steam shovel has been in operation the past few seasons digging a 7-mile ditch to obtain more water.

Pearson Brothers.

The Pearson Brothers operated a group of 8 claims on Resurrection Creek, about six miles from Hope. The Creek is comparatively wide and flat, so the water is carried in a ditch along one bank, while the creek bed is worked off in a series of pits. The gravel has a depth of five or six feet and is comparatively free from large boulders. The water is brought to a penstock which gives a fall of 310 feet. At the intake the hydraulic pipe has a diameter of 24 inches which is reduced to 11 inches by the time the water is distributed to the giants.

St. Louis Mining & Trading Co.

The St. Louis Mining & Trading Company is operating a group of placer claims on Resurrection Creek, about four miles from Hope. Owing to the width of the channel and the slight grade of the creek, the water from the creek is carried along one side of the channel while a series of pits on the other side are worked out. The giants wash the gravel into a 36-foot flume, 4½ feet wide, in which 60-pound railroad iron is used for riffles. The discharge is kept from clogging by a giant which stacks the tailings. A 30-inch pipe line brings the water 1½ miles, giving a fall of 137 feet. The line is reduced gradually to 11 and 9 inches at the giant's

*MATANUSKA-SUSITNA DISTRICT

"Alaska Free Gold Mining Co.

The property of the Alaska Free Gold Mining Company, under lease to William Martin, of Seattle, is situated on Fishhook Creek, just to the westward of the Independence.

There are several orebodies on the property which, owing to their rather irregular nature, have been opened at a number of different points without following any special line of development, though connections have been made on the ore from the easterly to the westerly side of the mountain. They are in a blocky diorite, the approximate strike being N. 20° W. with a dip of 38° to 40° SW.

"The mine workings are about 1,000 feet above the mill and connect-

aReport of Federal Mine Inspector for the Calendar Year, 1916.

ed to the mill bins by three sets of aerial tramways. On the easterly side of the mountain a 750-foot tram connects the mine bins with an intermediate bin from which the ore is trammed over a track about 500 feet to a second mine bin. From here it is lowered to the mill over a single-span, 2,100-foot tram. To the west of this a single-span, 2,400-foot tram connects another set of mine bins to the mill and, further to the west of this, a third tram, 4,500 feet long with two towers, connects another set of workings to the mill. All track cables have a diameter of ⅝-inch and the haulage and tailropes ¼-inch. The buckets have a capacity of approximately 450 pounds."

"At the mill bins, which have a capcity of 80 tons, the ore is crushed by a jaw crusher to 1½ inches and fed automatically to two 10-foot, slow-speed Lane mills, running from 6 to 8 R. P. M. The size of the product is governed by the height of discharge and the amount of feed water. Quicksilver is fed to the mills and the pulp is split into four parts going over 5 by 10-foot plates set on a grade 1½ inches to the foot. From these it passes over two Barnes concentrators to classifiers and on to the cyanide plant, the slime being impounded for possible future treatment. The concentrate is shipped to the smelter."

"The cyanide plant consists of four 30-ton leaching tanks, two sump and two solution tanks, the pulp being given a four-day treatment. The gold is precipitated on zinc shaving, the precipitate dried, roasted and shipped to the smelter."

"The power for the plant is furnished by a 10-inch turbine under a 54-foot head, one 25- and one 16-horsepower gasoline engine all belted to the same shafting."

"Independence Gold Mines Co.

The Independence Gold Mines Company is operating the Independence mine, a lode-gold property, near the head of Fishhook Creek, a tributary of the Little Susitna River.

"There are two veins: the Granite Mountain and the Independence, in a blocky diorite. The workings on the Independence are at an elevation of 4,650 feet; those on the Granite Mountain 4,100, while the mill has an elevation of 3,650 feet. The strike of both veins is approximately N. 10° W. The dip of the Independence is about 40° and the Granite Mountain is from 0° to 26° SW. On the Granite Mountain where the bulk of the work has been done, a drift has been run 259 feet on the vein. From the end of the drift an incline, which flattens about one-third of the way down, has been sunk 480 feet on the vein and from these two both overhand and underhand stopes have been driven wherever the value of the ore warranted it. Stulls are used to support the roof and the waste used for pack walls.

"The bins on the Independence are connected with the mill by a single-span, 2-800-foot aerial tramway with ⅝-inch track and ¼-inch haulage and tailrope cables. The Granite Mountain bins are connected to the mill by a 1,730-foot tram with similar cables. Both tramways carry 400-pound buckets.

"At the mill the ore passes over a 1-inch grizzly to the bins, the

oversize going to a 7- by 9-inch Dodge crusher. From the bins it is fed automatically to a 3-stamp battery of 500-pound stamps and one 1,300-pound Nissen stamp. The practice is to crush to 40 mesh, using both inside and outside amalgamation, the pulp from the batteries flowing over plates set on a grade of 1¾ inches to the foot. From the plates the pulp passes over an Ogden concentrator to tailing ponds. The mill capacity will be increased this year by the addition of a 5-foot,, 6-inch Denver mill, which has a rated capacity of 30 to 40 tons per 24 hours when run at a speed of 30 R. P. M. The pulp from this mill will pass over amalgamating plates to a Wilfley table and be stored for future treatment."

"Mable Milling, Mining & Power Co.

"The Mable Milling, Mining & Power Company is opening a property on Archangel Creek, a tributary of the Little Susitna, just above Fishhook.

"Some open cuts have been made and drift run on the ore which is in a blocky diorite.

"A 15-ton Denver mill is being installed about 1,200 feet below the mine and a 3,500-foot tramway, with one tower being erected to convey the ore from the mine to the crushing plant.

"Willow Creek Mines.

The Willow Creek Mines Company is operating the Gold Bullion mine, on the divide between Willow and Craigie Creeks, under lease and bond. The company is also operating the Nugget property which joins the Gold Bullion on the Willow Creek side and the Brooklyn Development Company's ground on the western side of Willow Creek.

"The mine is situated at an elevation of 4,500 feet and, as the vein is comparatively flat, has been opened by a number of drifts. These have been started where the value of the ore on the surface warranted and an irregular system of overhand stoping followed, according to the size and value of the orebodies. The roof is supported by stulls and pack walls built with the waste. The vein, which fills a fissure in a grano-diorite, varies from eight inches to seven feet in thickness, has an average strike of S. 10° E. and dips approximately 14° NW. Through the diorite, which is quite blocky, are numerous quartz stringers, some of which are large enough and contain enough gold to be profitable mining.

Owing to the nature of the orebodies, the mine bins are connected with intermediate bins with a light aerial tramway which can be easily moved and the intermediate bins connected to the mill by an aerial tramway of more substantial construction. The mine bins are 700 feet above the intermediate bins and the latter 800 feet above the mill. One 2,500-foot span connects the mine and intermediate bins with ¾-inch track and ¼-inch haulage and tailrope cables which carry two 5-cubic-foot buckets. This tram runs entirely by gravinty. The line from the intermediate bins to the mill is 3,800 feet in length with seven towers. The track cables are ⅞ of an inch in diameter, the haulage

and tailrope ¼ inch, and the buckets contain 7 cubic feet. For a short distance of the buckets travel it is necessary to use a small amount of power. As the mine is far above timber line, it is necessary to send up all mine timbers as well as supplies for the mine camp over these tramways."

"At the mill the ore goes over a 7- by 9-inch Blake crusher to bins having a working capacity of 160 tons from which it is fed to the stamps by Challenge feeders. There are three batteries, two 5-stamp and one 2-stamp, which crush the ore to ½mm., using a diagonal slot screen. Seven of the stamps weigh 1,050 pounds each, the others 850 pounds, but these will probably be increased in weight at a later date. They fall 6 inches and drop 105 times per minute. The practice is to use both inside and outside amalgamation. From the batteries the pulp flows over plates set on a grade of 1¼ inches to the foot, the standard 5- by 10-foot plate being used for each battery. The pulp is carried by launders to a hydraulic classifier, the oversize going to a second classifier, the spigot product to Wilfley tables. The overflow on the second classifier is sent to the slime pond for storage and the spigot discharge to a second Wilfley. The Wilfley concentrate is treated on the ground or shipped to the Selby smelter, according to its value The sand is pumped to the cyanide plant. The latter consists of five 30-ton leaching tanks, two sump tanks, one make-up and one storage tank. The pulp is given a 4-day treatment and the gold precipitated on zinc shavings. The precipitate is dried, roasted and shipped to the Selby smelter.

"The power for the mill is furnished by a 12-inch reaction turbine under a 25-foot head with a 12-foot draft in tube. A 2,000-foot pipe line, consisting of four sections 500 feet each of 8-, 7-, 6-, and 5-inch pipe, is being laid to furnish additional power for the plant.

"This spring the mine, intermediate, and mill bins have been enlarged and the five 850-pound stamps added to the equipment, giving the plant a capacity of approximately 40 tons per 24 hours."

"Cache Creek Dredging Co.

During the past spring the Cache Creek Dredging Company installed a dredge on Cache Creek, which is the first serious attempt at this type of mining in this portion of the Territory.

"The bedrock is made up of slates, graywackes, sandstones and shales with occasional beds of lignite.

"The creek is comparatively shallow, the average depth being approximately six feet, so the dredge was built with a large hull to secure shallow draft. It is 87 feet long, 54-foot beam and 7 feet deep. The boards of the bottom planking are 4 by 12's, the sides 6 by 12's and the deck 3 by 12's. The winch deck is 30 feet above the main deck and the pilot deck 12 feet above this. The spuds are made of wood reinforced with steel, are 44 feet long and weight 11 tons each.

"There are 65 seven-cubic-foot, close- connected buckets with manganese steel lips; and, while the dredge has a capacity of 3,000 cubic yard per 24 hours, the management has based its plan on a 2,000-cubic-yard

output, on account of the shallowness of the ground and the number they have not proved a serious hindrance, as they are not large enough of boulders. Though the latter have retarded the speed of the dredge, to require special appartus for handling them. With the present number of buckets, the dredge will dig 30 feet below the water line, though it is improbable that it will be called upon to work at anywhere near this distance on this portion of the creek.

"The gravel from the buckets falls over an 11-inch grizzly into a 48-inch flume, 108 feet long. The grade of the flume is adjustable, though the best results are obtained by keeping it at a fall of approximately 1⅛ inches to the foot. The riffles are 2 by 4-s capped with ⅝-inch manganese steel plates and are set 1¾ inches apart. A 6-inch centrifugal pump supplies wash water at the grizzly and an 18-inch centrifugal pumps directly to the flume. The buckets are washed clean by water from two nozzles, the product falling to a save-all sluice equipped with Hungarian riffles. This flume is 18 inches wide and set on a grade of one inch to the foot.

"A feature never previously used on an Alaskan dredge is the construction of rock shutes from the grizzly. The oversize from the bars pass to a "Y", the branches of which pass on each side of the save-all sluice and empty in the pond aft of the dredge, where the rock forms a dam and prevents the fine from filling the pond under the boat. These chutes are 42 inches wide and lined with manganese steel plates at the points of greatest wear.

"Power is furnished by a 250-horsepower Yarrow tubular boiler, using coal for fuel which is mined locally. A 150-horsepower Reaves engine drives the pumps and dynamo; a 125-horsepower Lidgerwood, the digging ladder; and a 20-horsepower, the winches. The steam from the engines passes to a condenser and returns to the boiler.

"There are a number of beds of lignite outcropping on Cache Creek and its tributaries from which an ample supply of fuel may be secured at a low cost. The company has secured a free-use 10-acre permit to mine coal and this summer obtained its supply from an open-cut about two miles from the dredge. This haul will be obviated the coming season as a contract has been let to drive entries and open rooms on a 5-foot bed on Cache Creek proper during the winter, so a supply will be easily available at a convenient point in the spring. The coal burns almost like wood. It has a long flame and makes a good steaming coal, though the percentage of ash is high. If the company had not owned the steam equipment before the installation of the boat was planned, the situation would have been ideal for an electrically operated dredge, the power being generated at the point where the coal was mined.

"After a short, though successful season, the only change planned on the dredge is to add a second bull wheel so the drive will be on both sides of the bucket line."

"Doherty Coal Mine.

This spring a contract was let by the Alaskan Engineering Com-

mission to R. G. Doherty to furnish 2,000 tons of coal for the use of the railroad. Mr. Doherty opened a small mine on the west bank of Moose Creek about a mile above the railroad right-of-way to supply this amount of fuel.

"A drift was driven on a bed which strikes S. 55°W. to S. 70° W. and dips 40° to 53° SE. for approximately 800 feet. Fifteen feet above this the airway was driven and rooms turned off from the latter. The first rooms were 20 feet wide and separated by 10-foot pillars but later they were driven as double rooms with a width of 50 feet and 30-foot pillars left between. They were driven up approximately 100 feet along the bed to the conglomerate overburden which covers the outcrop except in the creek valley. The coal is lignitic and contains a small amount of gas although ventilation is entirely natural except for the dead ends where a small home-made fan has been used. The width of the bed varies from point to point, the average being over three and a half feet and the following a typical cross-section:

	Feet.	Inches.
Hard sandstone hanging wall		
Scaly sandstone with stringers of coal		4 to 6
Hard black coal with many niggerheads	1	6
Shale parting		
Fairly hard black coal with irregular fracture and no well developed cleat	1	
Lignitic coal with woody structure	1	6
Soft dark brown shale		6
Hard sandstone footwall		

"There are several other partings in the bed but they lack regularity. At other points the sandstone footwall gives way to a fire clay.

"The coal is hauled in 4-cubic-yard cars from the mine to the railroad bunkers by a 35-horsepower locomotive."

FAIRBANKS DISTRICT

The Fairbanks district was visited during June and July and 81 placer mines and 10 quartz mines were inspected. There were 650 men employed. In addition to the mines visited there were several other smaller operations on creeks in the district which would possibly bring the number of men employed in the mines up to 800. The value of the gold output was $1,775,000 of which $1,725,000 was recovered from the placer mines and about $50,000 from the quartz lodes. The distribution of the output was about as follows:

Chatanika, Cleary Creek and Tributaries	$325,000.00
Fairbanks Creek	200,000.00
Little Eldorado	120,000.00
Dome Creek	175,000.00
Pedro and Twin Creeks	225,000.00
Goldstream and Engineer Creeks	300,000.00
Ester, Gold Hill, Happy & St. Patrick Creeks	250,000.00
Vault Creek	40,000.00
Gilmore Creek	40,000.00

Smallwood, Fish, Big Eldorado and other local creeks	50,000.00	
Gold from quartz lodes, Fairbanks region	50,000.00	
		$1,775,000
The other districts whose trade and gold are handled through the Fairbanks banks are:		
Hot Springs	$750,000.00	
Tolovana	700,000.00	
Tenderfoot, Kantishna and outlying districts	75,000.00	
		1,525,000
Antimony, Tungsten and other metals, about	$200,000.00	200,000
Total mineral output		$3,500,000

During fourteen years the Fairbanks district has produced gold to the value of about $60,800,000, of which the placer mines have produced $68,740,000. Lode mining was begun in 1910 and since that time has produced gold to the value of $1,118,000. Other minerals produced in the district are antimony, tin, scheelite or tungsten, silver and lead, having a total value of about $312,340. Antimony was first produced commercially during 1915 and scheelite during 1916. The first shipment of lead ore was made during 1916. Tin has been recovered from the gold placers in the Hot Springs district since 1913.

During the mining season of 1916, 1460 tons of antimony ore were shipped. The larger part of this was recovered from three mines, namely, the Eagle mine, at the head of Treasure Creek: The Chatam mine, near the head of Chatam Creek; and A. Friedrich's mine, on Vault Creek. Several other properties were operated in a small way during the first half of 1916. The fall in the price of antimony during the mid-summer put an end to most of the antimony operations.

During the year 1916, 255 tons of scheelite ore, containing over 5 per cent tungsten oxide, were shipped by freight and six tons of scheelite concentrate, containing about 65 per cent tungsten oxide, were shipped by parcels post. The scheelite came from three properties.

Two small shipments of lead ore were made, totalling 24 tons, containing 3. 67 tons metallic lead and 1,083 ounces of silver. These shipments were made from a property situated near the head of Cleary Creek.

Gold Lode Mining.

Several small auriferous lode mines were operated in the Fairbanks district during 1916, and gold to the value of about $50,000 recovered. Development work was continued on a number of properties. The completion of the Government railroad and the establishing of an experiment station by the Bureau of Mines to assist in the development of the mineral industry will stimulate an interest in lode mining that is likely to develop several good producing lode mines.

TOLOVANA DISTRICTS

The Tolovana district was visited during July. Seventeen properties were being operated at the time of visit. The gold-bearing gravels are largely slate, chert, and quartz. All of the 17 properties visited were on the benches of Livengood Creek, which extended from opposite No 1 below discovery to No. 17 above discovery, a distance of about three miles. There were several smaller operations on Iillian, Ruby, Amy and Olive Creeks and prospecting on Mike Hess Creek. All of the smaller operations were closed at time of visit on acount of need of water for sluicing caused by lack of rain. The gold from the deep channels is dark colored and has an assay value of $18.75 to $18.90 per ounce. The total value of the gold production for this district during the year was about $700,000. Gas is encountered in the deep placer mines of this district. One man lost his life on Mike Hess Creek and three were burned by the ignition of gas on Livengood Creek.

The town of Brooks, situated on bench opposite discovery Livengood Creek, is the commercial center of the district. Transportation of supplies is one of the most serious difficulties of this camp. Supplies are shipped during the summer season by way of the Tolovana River which, during the dry season, is very difficult to navigate, even with small flat-bottom river boats, partly on account of shallow bars, but principally on account of log jams. The whole bottom of the river appears to be one tangled mass of logs and in places they are piled so that it is difficult to get over them during low water. This condition prevails for 30 miles below the large log jam which is about 120 miles from the mouth of the river, where two trams have been built for the purpose of transferring the freight across from below the large log jam to above it.

The log jam covers a horseshoe bend in the river about two miles long and is impassable with any kind of boat. One of the trams is 700 feet long and the other 1,300 feet. This jam dams the river. The very low grade of the river causes the water to backup for a distance of about 10 miles. From 10 miles above the jam to West Fork, a distance of about 30 miles, it is almost impossible to get through, even with a small poling boat at low water ,such as it was at the time of visit—middle of July. From West Fork to Brooks a tram was under construction, wooden rails being used. A steam locomotive of crude construction is used to haul the cars which are also of local manufacture. The locomotive was constructed by putting a 20-horsepower boiler and a 5 x 8 double-cylinder hoist on a flat car, the gear of the hoist being connected to the axle by sprocket and chain. The cars were constructed from native lumber, the wheels being of wood with an iron rim and flange made from sheet iron.

A winter trail was cut from what is called the trapper's cabin to Brooks via West Fork but was impassable for teams during the summer season. The trail from Brooks to Olnes, where it connects with the Tanan Valley Railroad, is impassable for freight teams during the summer season, but is used during the winter season for the hauling of supplies. The freight rate by river route during the open season

from Fairbanks to Brooks is $65 per ton, or $60 from the mouth of the Tolovana River. A much higher rate was paid to polling boats during the low water for transportation of provisions and supplies absolutely necessary for the maintenance of the camp.

Timber is plentiful along the Tolovana River. Two saw mills situated at West Fork furnish all of the lumber needed in this district. The timber on Livengood Creek is small and scrubby. About 250 men were employed in this district.

HOT SPRINGS DISTRICT

The Hot Springs district was visited during July. About 16 placer mines, employing some 300 men, were operated in this district during the year. These yielded gold to the value of about $750,000. Of this Eureka Creek produced about $60,000, Woodchopper, Sullivan and American Creeks, and their tributaries, produced $690,000. In addition to gold 70 tons of tin or cassiterite ore were recovered and 58 tons shipped as a by-product from the placer mines operating for gold. The value of the tin ore was approximately $35,000, making the total mineral production of the district $785,000. The gold production for 1915 was $610,000.

CIRCLE DISTRICT.

The Circle district includes the Birch Creek district and the placers of Woodchopper and Beaver Creek. It is estimated that gold to the value of $250,000 was produced from about 50 mines, employing some 200 men. The largest output came from Mammoth Creek, where a dredge was operated during the entire mining season. Hydraulic mining operations were continued on a number of creeks.

RAMPART DISTRICT.

Mining continued i nthe Rampart district on about the same scale as in recent years on Hunter, Little Minook, Hoosier, Slate, Big Minook, and Ruby Creeks. The district produced approximately $30,000.

EAGLE DISTRICT.

Mining operations were continued in the Eagle and Seventy-mile districts on about the same scale as in the previous years,. About $20,000 was produced during the season 1916.

RUBY DISTRICT.

The Ruby district was visited in August and 16 properties inspected. The principal creeks are Poorman, Flat and Spruce, in the Poorman district; and Long Creek, in the Long Creek district. Early in the season a large increase in the gold output was anticipated in this district, but the pinching, or decrease of the gold values in the pay-gravel, in some of the most promising claims on Long Creek, below the margin of profitable mining, together with the extended drought during the first part of the season, curtailed the output considerably. The output for 1915 was $800,000. The estimated output for 1916 was $840,000, an

increase of $40,000 over the production for 1915. The completion of the new dredge on Greenstone Creek early in the season helped matrially to maintain the output. New deep-underground placer mining operations on Birch and Straight Creeks (one plant on each creek) showed considerable cassiterite or tin ore to be associated with the placer gold but no effort was made to save it. It is not known, therefore, if there is enough to be mined commercially. The bedrock formation is granite; the overburden is 80 feet in depth, frozen. Some cassiterite ore was recovered from the placer gold operations on Midnight Creek and shipped to Seattle. On Trail, Tamarack, Bear Pup, Tenderfoot and Duncan Creeks mining operations were continued during the open season as in former seasons. About 300 men were employed.

The Alaska Road Commission expended during the open season about $70,000 on the Ruby-Long wagon road which will be of inestimable value to the operators and to the development of this district. The closest mines are about 30 miles from Ruby, the nearest landing point on the Yukon River where supplies are landed. The roads in the summer time have been almost impassable, resulting in freight charges being as high as eight and ten cents per pound from Ruby to Long City.

MARSHALL DISTRICT

The Marshall district is on the Yukon near its delta and about 50 miles below Russian Mission. Gold was found in this district in 1913 but until 1916 the production was very small. In 1916 some rich placer were developed on Willow Creek, on which seven plants employing about 200 men were operated and produced gold to the value of $250,000. There was a great influx of prospectors to this district before the close of the summer season. The district should get a thorough prospecting during the winter of 1916-1917 and some very good discoveries of placer gold may be expected. A hydraulic plant was being installed on Elephant Creek and some work was done on Disappointment Creek and a small amount of gold recovered. Freight and supplies for the mines are shipped via the Yukon River to Marshall. Marshall is the principal distributing point and is situated about 12 miles from Willow Creek. From Marshall supplies are trans-shipped by small boat or launch through the sloughs of the river delta to within 3 miles of the Willow Creek camps where they are loaded on wagons and hauled along one of the poorest wagon roads in the Territory to the mines on Willow Creek. Some development work was done on the quartz claims near the head of Willow Creek.

KOYUKUK DISTRICT.

The Koyukuk district was not visited during 1916 by the inspector. The estimated production of gold for this district this season is $300,000. Of this amount about $200,000 was taken from the deep placers of Hammond and Nolan Creeks. Linda, Gold, Myrtle and other smaller operations contributed their quota to the output. Two drills were shipped to the district during the open season. The estimated production in-

cludes the Indian River and the Chandelar districts. About 200 men were employed in the district.

IDITAROD DISTRICT.

The Iditarod district was visited during the month of August. The gold production of the Iditarod district for 1916 was about $2,200,000, an increase of $150,000 over the production in 1915.

Eleven placer mines, four steam-scraper plants and three dredges were operated. One dredge was on Flat Creek and one was on Otter Creek. The other dredge was installed on Black Creek by the Otter Creek Dredging Company, but operated only a part of the season. It is a 2½ cubic-foot revolving-screen Flume dredge built by the Union Construction Co. Power is furnished by two 50-horsepower semi-Diesel fuel-oil internal-combustion engines built by the Scandia Engineering Co., of Stockholm, Sweden. The two horsepower Union Distillate Engines on the Otter Creek dredge were taken off and replaced with two 50-horsepower hot-bulb fuel-oil Atlas engines, built in Stockholm, Sweden. A saving is claimed for this type of engine over the distillate or gasoline internal-combustion engine both in the quantity of fuel used and cost price of fuel. The quantity of fuel used a large factor in the operation of dredges in this district, the freight alone being approximately 45 cents per gallon from Seattle to San Francisco to Otter Creek.

Some of the richest placer mines in the district are situated near the top of the divide and at the extreme head of Flat, Happy and Chicken Creeks and can only be operated during the spring thaw or very wet weather, they being so high the drainage area is very limited. During the winter of 1915-1916 snow fences were constructed on top of the divide between those creeks, causing the snow to pile up in large drifts to a depth of over 80 feet, which furnished water for sluicing on those claims until the first of August, thereby adding materially to the gold output. The largest operations were those of the two dredges on Flat and Otter Creeks. There were approximately 400 men employed in the district.

INNOKO DISTRICT.

It is estimated that 30 mines were operated in the Innoko district in 1916, that about 150 men were employed and that gold was produced to the value of approximately $160,000. The principal producing creeks were Ophir, Gaines, Spruce and Yankee. New pay was discovered on the benches, left limit of Gaines Creek just above the mouth of Little Creek which may prove to be of considerable importance. There was also some prospecting with drills on Moore and Yankee Creeks for the purpose of installing dredges. A discovery of some importance was made on Boob Creek, a tributary of Madison Creek which is a tributary of Tolstoi Creek, a tributary of the Dishna River which flows into the Innko River a short distance above Dishakaket. Only a few thousand dollars were produced during 1916, but indications are that a very good output can be expected during 1917. A town named Cooper was located at the confluence of Madison and Tolstoi Creeks, which is

reached in the summer time by boat up the Innoko River to the Dishna River and thence up the Dishna River to opposite the town of Cooper where a landing is made and goods hauled five miles across country to the town on Tolstoi Creek. Tolstoi Creek is too shallow most of the open season for navigation even by a small gas boat. There should be some provision made for the construction of wagon roads into new camps. Take for example the camp of Cooper, the nearest point it can be reached by water is five miles and that five miles is most swamp road. The road is needed the worst at this time to get machinery and supplies into the camp for its development and not after the mines have been exhausted and all of the gold extracted and paid out for the transportation of supplies and machinery.

KUSKOKWIM BASIN

A dredge was shipped for installation on Candle Creek, in the Takotna district, or upper Kuskokwim. It was to be shipped to McGraths during the summer season and hauled from there over to Candle Creek during winter by horse teams and sleds and assembled during the spring of 1917, but owing to the breaking of the propeller shaft of the boat that was bringing the dredge machinery from Seattle to the Kuskokwim and the boat putting back to Seattle the machinery did not arrive before the close of navigation, thus delaying the installation of the dredge for one year. Good returns are said to have been obtained from Canyon and Windy Creeks; also the Aniak district, in the lower Kuskokwim Basin; and from Candle Creek, on the upper Kuskokwim basin. The exact amount of the gold output for 1916 has not been learned but it is estimated to be about the same as last year, of $2,900,000 in 1916, which is the same as that of 1915. In addition the Kuskokwim Basin

SEWARD PENINSULA

The Seward Peninsula mines produced gold to the estimated value of $2,900,000 in 1916, which is the same as that of 1915. In addition to the gold production there were 162 tons of tin ore valued at $81,000, 15 tons of scheelite or tungsten ore valued at $22,000 and 70 tons of antimony ore valued at $6,000, making a total mineral production for the Peninsula of $3,009,000. About 70 tons of graphite were mined but on account of lack of transportation facilities to Nome no shipments were made.

Since 1897 the Seward Peninsula mines have produced gold in the value of $74,351,000. Most of this gold was taken from the placer mines, although from 1903 to 1907 the Big Hurrah Quartz mine produced some gold and small amounts have been recovered from several lodes at different times.

The other mineral resources of the Peninsula that have been developed are the York tin deposits, first developed in 1900; the antimony deposits, first mined on a commercial scale in 1915; scheelite or tugnsten ore, mined near Nome during 1916 for the first time commercially; and a small amount of copper has been shipped from Kougarok district

and Pilgrim River. Some graphite has been mined in the Port Clarence and Fairhaven districts. Coal has been mined in the Fairhaven district in a small way since 1902 for local consumption. There was considerable prospecting for copper, tungsten and gold lodes during the past year.

A corps of engineers and geologists investigated the practicability of putting in a hydroelectric power plant in the Saw Tooth Range in the Kougarok district. The purpose being to furnish power to the dredges and lode mines of the Peninsula. Investigations of the lode and gravel deposits were also made by the engineers and geologists to determine if they could dispose of sufficient power to warrant the installation of the power plant. The investigations had a tendency to stimulate interest in the prospecting and development of lode mines.

There were 31 dredges operated on Seward Peninsula during the year 1916. There were dredging for gold 29 dredges and for tin two. The two tin dredges were in the York district. The gold dredges were situated as follows: seven in the Nome district, 4 in the Solomon River, 10 in the Council district, 3 in Port Clarence district, 3 in Fairhaven and 2 in the Kougarock district. One new dredge was installed on Glacier Creek. One of the Flodin dredges moved from Solomon River to Canyon Creek in the Casadepaga River section. Another one of the Flodin dredges was purchased by O. W. Flowers and operated for a part of the season on upper Solomon River and later in the season was dismantled preparatory to moving during the winter four miles lower down Solomon River. The Mystery Creek dredge was purchased by the Northern Light Mining Co. and moved from Mystery Creek to Ophir Creek in the Council district. The Warm Creek dredge which was idle during 1915 was changed from a revolving screen dredge to a flume dredge and operated a part of the season an Warm Creek. The dredges of the Nome Consolidated Mining & Development Co. were idle during 1916. This company has three dredges in the Nome district. The one on the third beach, or No 8 Cooper, was dismantled during the summer and fall. Extensive alterations are planned in the reconstruction of the dredge; also the completion of the Flat Creek dredge which has been partially built ever since 1911. There were 16 idle dredges in Seward Peninsula during 1916. Some are idle for the reason that the productive placer ground has been worked out and the cost of moving a machine as large as a dredge any distance without dismantling it is prohibitive. The work of dismantling, rebuilding and hauling over almost impassable roads is more expensive than purchasing a new dredge that is fitted to the ground, as nearly every creek or piece of dredgeable ground has different characteristics either as to depth or formation. A dredge that is suited to one piece of ground would be practically worthless on another of different formation and character. One of the most important things in building a dredge is to know the depth and character of the ground desired to be dredged. It may mean the difference between success and failure of a gold- dredging enterprise.

About 65 placer mines and 30 open-cut plants were operated on

the Peninsula during 1916. The placers developed on Dime Creek, a tributary of the Koyuk River in the Council District, which was discovered during 1915, have yielded gold to the value of $150,000 this year. Most of this was extracted during the winter. Reported rich strikes on the benches of this creek during the summer have caused added activity to this camp and a material increase in the gold output may be expected for 1917. Sweepstake Creek, another tributary of the Koyuk River, has been a steady producer for several years and still adds its quota to the gold output of the Council district. The ten dredges in the Council district have produced about $600,000. Placer mining in the Kobuck region during 1916 continued. The output was about $15,000.

The mines of Seward Peninsula employ about 1,100 men. It is very hard to get the exact number for the reason that there are so many engaged on small opencut or hydraulic operations in remote parts of the Peninsula, where it is impracticable for the inspector to visit. In view of the vast territory to be covered in a limited season, he is obliged to confine his inspection to the principal mining centers. These small operations are, however, conducted on such a scale as to involve little risk of serious accidents.

There was an abundance of rain during the mining season which was favorable to hydraulic mining and helped to increase the output of the larger hydraulic operations as well as to stimulate operations on a number of smaller creeks which are neglected during dry seasons.

The inaccessibility of a large part of the Peninsula through lack of transportation facilities is very discouraging to prospectors. While the Alaska Road Commission has done good work with the small amount of funds allotted to it, yet there should be more and better wagon roads. This is of the greatest importance to the development of the mineral resources of the Peninsula. A wagon road from Nome to Candle through the center of the Peninsula would be of inestimable value. The cabins erected along the trail between Dahl Creek, in the Kougarok, and Candle with the moneys received from the Territorial fund was a great benefit to the traveling miners coming to Nome to take the last boats to the States.

On acount of the extremely stormy weather during the latter part of 1916 no boats were able to sail to the Kotzebu Sound, as only small gasoline launches make the trip with the exception of one or two freight steamers which take in supplies during the summer and they are not allowed to take passengers, although some of them have accomodations for fifty or more. The customs officers, however, will not allow steamships to take passengers when they have gasoline aboard and that was a part of the steamers' cargo. This was being supplied to the dredges in that locality. Peculiarly, though, a small gasoline launch, loaded with gasoline from stem to sterm and hardly seaworthy, can take all the passengers that can climb aboard,. As many as fifty-two have been on launches that had not accomodations for ten. But such launches are welcome conveyances to walking across the country, it taking three days to walk from one road house to another. One man

who had walked across the country a couple of years ago realized that to get to Nome this fall he would have to walk across the country again and rather than attempt it committed suicide. He expressed to his friend a short time before he killed himself his horrible dread of the trip. Some provision should be made allowing large steamships on that northern run to take passengers between Nome and those extreme northern towns.

A road from Davidsons' landing, on Mary's River, to Taylor Creek would be of great value to the upper Kougarok. The road is already there but is impassable during the summer season. A very good road has been constructed by the Alaska Road Commission along the right limit of Solomon River from the ocean beach to East Fork, on Solomon River, a distance of about 12 miles. With very little added expense and work a good wagon road could be built from East Fork to Council and along the beach from Bonanza River to Nome, which would serve as an auto truck road and greatly benefit the mining industry of that section. The road around Cape Nome was built during the summer of 1915 from the money received from the Territorial Forest fund and has been of great assitance to the operators of the Solomon River and Council districts during the summer, as the extremely stormy weather made travel by boat from Nome to Solomon impossible most of the season. Owing to dredges being made up of very heavy machinery, the moving of them from one locality to another is quite impossible without roads. The construction of a wagon road, therefore, from Candle to the Kugruk River is very much needed, as the coal fields located there are of importance to the operators.

ACCIDENTS.

There were 29 fatalities chargeable to the mining industry during the year 1916. According to the returns on the forms to the companies at the end of each year, there were 194 serious and 568 slight accidents. Of the serious accidents 167 were reported at or about the time the accident occurred. Twenty-two fatal, 174 serious and 562 slight accidents were chargeable to the lode mining industry, and 7 fatal, 21 serious and 6 slight accidents to placer mining and dredges. For a detailed report of the fatal and serious accidents in both lode and placer mines throughout the Territory, see Tables Nos. I to V, inclusive, in the appendix.

There were approximately 9,125 men employed in mining in Alaska the past year. About 4,925 were engaged in placer mining and dredging and 4,200 in lode mining. Of the fatalities in lode mines, 19 were chargeable to underground mining, 2 to construction work on mills or power plants on surface, and one to snowslide. One man killed underground was not on duty at the time of the accident but was showing a friend through the mine. His death, however, was chargeable to the condition of that part of the mine where the fall of rock from the roof took place. The accident occured in a drift through which rock or ore was being hauled by horse cars and happened just after a train had passed that part of the drift. The man lost in the snowslide was a

lineman, going over the power line when he was caught in the slide and buried. His body has not yet been recovered.

Of the men killed in the placer mines there were only two that were working for wages, one on a dredge and one in an underground placer. The one on the dredge was drowned by falling off a barge, while crossing a river. All of the other fatalities were either prospectors or operators of the claims who were doing development work preparatory to hiring additional help. Two of the men were prospecting at the time they lost their lives.

Figuring on the basis of 4,200 men in the lode mining industry, 22 deaths, the ratio of fatalities is 5.23 per 1,000 men employed. Taking the number of men engaged in placer mining, 7 deaths, the ratio of fatalities in 1.624 per 1,000 men employed.

The placer mines are only operated part of the year, therefore the comparison between them and the lode mines are not equal. The lode mines are operated on an overage about 360 days in the year, while the placer mines are operated but 180 days or one-half that time, on an average. Therefore the men employed in the lode mines are necessarily exposed to the dangers incident to the industry double the time of those employed in the placer mines.

*CAUSES OF MINE ACCIDENTS.

"The causes of mine accidents are many and varied. Any extended study of such accidents, however, leads to the conclusion that they naturally fall into two groups or classes. The first group includes those that might be termed preventable. That is to say, the accidents coming under this head might have been prevented by the exercise of ordinary care, prudence, or foresight. The accidents in the second group, which for want of a better name may be designated as nonpreventable 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 can not be materially reduced." * * *

CONTRIBUTING CAUSES.

"In the examination of the various reports and in the perusal of the detailed accounts of the accidents included in these tables, several facts stand out prominently. The first is that the experienced miner is not at all exempt from underground accident. In many cases constant exposure to risk makes the miner forgetful or heedless of the dangers confronting him. The old hand is furthermore likely to evince considerable unwillingness to employ the safety devices furnished by the operator. The second fact is that the relatively safe parts of the mine

aBureau of Mines' Bulletin 75, "Rules and Regulation for Metal Mines. pp. 208-210, 212-215.

are responsible for an unduly high proportion of accidents. This, of course, is to be accounted for by the fact that when the men are in dangerous places they exercise a higher degree of care to avoid danger, and when they are in less dangerous places they become heedless and forgetful. The third is that in time of scarcity of labor when the operator is compelled to employ anyone willing to engage in this line of work, the lack of a common language between the supervisor and the workman in which instructions can be given and warnings issued is a constant menace and source of injury."

"The fourth is that the spirit of restlessness and desire for change, characateristic of the metal miner in the United States, is responsible for many injuries. The shifting character of the working force in the mine and the necessity of keeping the men as long as possible has brought about a state of lax discipline. When the men are constantly changing from one mine to another it requires some little time before they can learn the dangerous places, and doubtless many accidents can be attributed to the lack of unfamiliarity with conditions in the particular mine. Youth is also a factor in mine accidents, generally in the form of inexeprience and willingness to take unnecessary risks."

"It is hoped that it may be possible at some time in the future for a qualified inquiry to be undertaken which will show the relative frequency of accidents with respect to the experienced and inexperienced miner, and which will show the number of years experience in the mines of each miner killed or seriously injured. It is also to be hoped that it may be possible to show at the same time the comparative death and injury rates among the English and non-English speaking miners and mine laborers." * * *

"RESPONSIBILITY FOR MINE ACCIDENTS.

Responsibility of Operator and Superintendent

The first responsibility must rest with the operator. It is his duty to provide adequate safety devices for the protection of the miners. It is his duty to select a careful and experienced superintendent who can enforce discipline and compel compliance with safety rules and regulations. If the superintendent can not enforce wholesome and desirable rules, it is the duty of the operator to replace him with one who will and can."

"The responsibility rests next with the mine superintendent. He is responisble for the management of the mine, for the enforcement of discipline, and the selection of his subordinates. It frequently appears in the annual reports of the various State mine inspectors, that the inquest held over the body of a deceased miner develops the fact that such miner had violated some rule of the mine. This indicates a lamentable lack of discipline. Many injuries can thus be traced to the failure to enforce important rules. It is futile, for example, to warn a miner that failure to bar down all loose rock from the back of his working place is dangerous, to call his attention to a rule of the mine forbidding such a practice, and then permit him to go ahead and do the very act forbidden. The frequent repetition of such instances creates

the impression that rules of this character are not intended to be enforced and are designed only for the protection of the company in case a suit for damages is brought for injuries resulting from doing this particular act, when the defence would be made that the miner knowingly violated a rule of the mine."

* * * * *

"The duty of the operator or superintendent does not cease when he has furnished means of safety and issued general instructions. He should see to it that the one is properly used and the other implicitly obeyed. Under no circumstances should the miner be permitted to jeopardize the lives of his fellow workmen, nor should a foreman or other subordinate official of the mine be permitted to jeopardize the lives of those in his charge. The miner who persists in violating a rule intended for his own protection and that of his fellow workmen should be immediately discharged, and a subordinate who is unwilling or unable to see that wholesome rules are complied with should be forthwith removed. It is possible that if the superintendent or foreman will not discharge men who decline to obey rules promulgated for their safety laws may be passed making such action compulsory."

"The superintendent and mine foreman must be actuated with a feeling of respect toward the provisions of the law, as well as toward the rules of their own company, before they can hope to inculcate a like feeling in their men. A careless foreman means careless workmen. A laxity in complying with the provisions of the law or the terms of company rules is responsible for loose practices and carelessness on the part of the men. If the men in charge of particular parts of work in the mine are made to feel that they are personally responsible whenever an accident happens to the men immediately under their charge, this will necessarily induce a more painstaking attention to details on their part, and a far higher degree of caution and prudence."

"Effect of Labor Conditions.

Some reasons for the failure to maintain a higher degree of discipline in the mine and for the failure of the operator or superintendent to discharge the responsibility resting upon him in this respect are to be found in labor conditions. It is a common saying in times of scarcity of mine help that every man is a miner. This may be attributed, perhaps, to two causes: First, the rapid development of the industry, and, second, the constant and increasing competition with other industries. The combination of these causes has undobtedly compelled operators to take unskilled and inexperienced men. Again, the necessity for keeping the men has brought about a laxity of mine discipline and, in consequence, loss of life. It is unquestionably true that in mining districts where a considerable number of foreign laborers are employed much of the alleged lack of intelligence on the part of the workmen is due to a lack of comprehension which the possession of a common language would remove."

"It seems to be a frequent practice for men who have been employed

underground as trammers or laborers to go to another district or mine and apply for a job as miner. If labor is scarce the examination as to the qualifications of the applicant for the position sought is apt to be a superficial one, and while doubt might exist as to the knowledge and experience of the applicant, yet he will be assigned to work of which he is almost entirely ignorant, without further questioning. A slight increase in wages is thus sufficient to induce men to assume the increased dangers incident to the use of explosives and the mining of the ore."

* * * * *

If experienced men can not be employed, then it devolves upon the operator to use not ordinary precaution, but extraordinary precaution. Only experienced men with a reputation for prudence and carefulness should be assigned to the more dangerous places, and every effort should be made to instruct the workers in their duties, and in the means of avoiding the dangers to which they are of necessity exposed."

"Responsibility of Miner.

Finally the responsibility rests upon the miner to exercise care in the face of danger, and ont to neglect simple precautions merely because injury has not happened through their neglect in the past. If miners were held to a high standard of care, if they were given to understand that a failure to comply with the rules of the mine would result in dismissal, and if this step were taken in a few instances, the the miner would soon recognize the necessity of compliance."

"The prevention of accidents from fall of rock and from explosives largely depends upon the caution of the individual miner. The vast majority of accidents under the head of explosives could be prevented by reasonable care. Such things as returning to a shot within a few minutes after the fuse has been lighted, and when all the charges are known not to have exploded, tamping explosives with an iron bar, crowding explosives into a tight hole, drilling into an old hole after a misfire, and bending over a powder box with a lighted lamp or candle in the cap are wholly inexcusable. Ten to 30 per cent of the accidents in mines are due to such causes. Accidents from failure to replace timbers broken by a shot, or to sound the roof after blasting or after taking down the drilling machine are due to carelessness. Likewise with accidents resulting from failure to use the ladder compartment instead of the skip road, from crawling up a mill hole from below to dislodge rocks that have become stuck and being smothered in the dirt and ore released by the dislodging of the rock, and from jumping on the cage while in motion. Numerous other instances of this sort might be mentioned, but the point is that these causes of injury are entirely within the control of the individual miner; they are some of the things that must be left to his prudence and judgment."

"Cooperation Necessary.

"There can be no such thing as placing the responsibility for mining accidents entirely upon the shoulders of the mine operator, the mine superintendent, or the individual miner. The responsibility rests upon them all, each must assume his share and each must discharge it to the best of his ability. It is the duty, as it is probably the desire, of the operators to furnish every known safeguard to life and limb and to provide every safety device that promises to decrease the dangers of mining. It is the duty of the miner to use them whenever possible and it is the duty of the superintendent and foreman to see that they are used.

In order to bring about a reduction in the number of fatal and non-fatal accidents in metal mines, there must be helpful spirit of cooperation between the mine superintendent and the mine foreman, between the mine forman and the miners, and lastly among the mine superintendent, foreman and miners, and the mine inspector. Some operators in the past have been inclined to look upon the inspector in somewhat the same manner that a criminal would look upon a police officer. They felt it necessary to conceal everything possible from him and to give absolutely no assistance toward showing the true conditions existing in the mine, with the result that oftentimes important violations or evasions of the law were overlooked. The mining laws are enacted for the mutual benefit of operators and miners, and if properly and rigidly enforced the result would do much to lessen the constant danger attending the miners in their hazardous work, and in the betterment of the physical conditions of the miner. The miner himself is in the best position to determine the relative safety of his working place, and he is naturally held responsible therefor, but he is likewise in the best position to point out the dangerous places to the inspector. He is constantly subjected to a risk of injury at the hand of others, and should not hesitate to call the attention either of the mine foreman or of the mine inspector to violations of the law or of the mine rules."

"Whatever may have been the tendency in the past, there can be no doubt that the average operator and superintendent is to-dav keenly interested in the prevention of accidents, and is both willing and anxious to use every available means that will assist in accomplishing that end. Fatal accidents are regarded with horror, and the loss of life is taken to heart. Too frequently, however, the lesson is soon forgotten before steps have been taken to remedy the cause and prevent another loss of life therefrom."

"The average operator furnishes ample supplies of timber, sees that the powder is thawed and distributed by a man employed for that purpose, has the shafts, cages, guides, and brakes, regularly examined and tested, employs cagers who are the only ones allowed to give signals to the engineer, and employs a competent hoisting engineer; winzes and raises are protected; yet in spite of all this acci-

dents continue to happen. Lax discipline, failure to provide adequate safety devices, inexperienced workmen, scarcity of help, non-English speaking laborers, heedlessness or forgetfulness on the part of the miners, all contribute to swell the number of accidents."

"The remedy for these conditions must be sought along the line of the general education of the miner as to the requirements of his work and an intelligent supervision of such work on the part of the operator and superintendent, as well as a rigid enforcement of safety rules and regulations."

"Perhaps the placing of a suggestion box at the shaft house, such as is now generally employed in mercantile establishments, in which miners might drop either signed or unsigned communications and suggestions regarding the possible improvement of conditions in the mine might be helpful if these suggestions were examined by the superintendent, and the payment of a slight cash reward for suggestions adopted might contribute to the betterment of conditions."

"Most mine foremen are probably doing all that they can in the way of instructing those under them, but the constant pressure from above to get increasing quantities of ore at decreasing costs, renders them unable to meet the demand for instruction which inexperienced help requires. This pressure is felt by the men also, so that in their desire to make a showing they are led to neglect simple precautions. This pressure should not be exerted to the extent of inducing careless or dangerous practices if the number of mining accidents is to be lowered.

RECOMMENDATIONS.

The following amendments to the Mine Inspestion Act are recommended:

Section 5 (Ch. 72, Session Laws of Alaska, 1913, pp. 276, 277) provides for the reporting of fatal and serious accidents and contemplates that such reports shall so describe the accident as to enable the inspector to determine the cause. By a careful study of causes measures may be taken looking to the prevention or recurrence of similar accidents.

There has not been much difficulty in obtaining reports on fatal accidents, but the inspector and operators have differed as to what constitutes a serious accident. For example, a company had been bothered with gas and men on several occasions had been burned by the ignition of this gas. The superintendent was notified by the Territorial and Federal mine inspectors to use safety lamps when in gaseous part of the mine and to make a report of all serious accidents, especially when burned by the ignition of gas. Subsequently two men went up a raise about 30 feet with open lights, neglecting to test the raise with safety lamps. A gas pocket was ignited and the men were blown down the raise. One man had his ankle dislocated and had not fully recovered 16 months after the accident; the other man had the skin burned off his face and hands. Both inspectors considered it a very serious acci-

dent but it was not reported. The inspectors instituted a suit in the Commissioner's court against the superintendent for failing to report serious accidents in compliance with Sec. 5. One of the men injured and another one, who had been burned a short time previous to the above accident, testified that they did not consider the accident a serious one. The Commissioner held that a serious accident was one in which a person was permanently disabled.

The law does not define what shall be considered a serious accident, so there might be an honest difference of opinion as to what constitutes such an accident. For the purpose of classification the inspectors have regarded accidents as serious when the injured is entitled to compensation or when the hazard has been great even though the injury was slight. This, however, is not satisfactory, because length of time a man is disabled is not sufficient information for the inspector to determine the cause of accidents; and it is the "cause" that concerns the inspector, in order that he may make recommendations looking to the avoidance of a like accident in the future. Again, an extremely serious accident may result in but slight injury or in no injury at all to persons. So may a comparatively trivial accident result in serious injury or death. For instance, a couple of years ago, in the Fairbanks district, a shaft caved in imprisoning 30 men for several days. Before they could be rescued it was necessary to sink another shaft 180 feet. This was done and all of the men were saved. Not a man, so far as is known, received even a scratch, but can it be said that this was not a serious accident?

In view of the fact that the reports do not give the length of time from which the injured employee is detained from his work, and that there may be an honest difference of opinion as to what constitutes a serious accident, Section 5 should be amended requiring the reporting of minor and serious accident alike, as well as to require a second report on serious accidents designed to show how long the injured man was detained from his work. Section 5 should read as follows:

Sec. 5. Whenever a serious or fatal accident occurs in any mine it is the duty of the person in charge thereof to immediately notify the inspector of the mining inspection district wherein such mine is located, in the quickest manner possible, and upon receiving such notice the inspector of mines must, if possible, at once repair to the place of accident, and investigate fully the cause of such accident, and whenever possible to do so, the inspector shall be present at the coroner's inquest held over the remains of the person or persons killed by such accident and testify as to the cause thereof, and state whether in his opinion, the accident was due to the negligence or mismanagement of the owner or person in charge. **All minor accidents shall be reported by mail and these reports shall show the number of days the employee was detained from his regular employment because of the accident.** If the inspector can not be immediately present in case of a fatal or serious accident occurring, it is the duty of the owner or person in charge of the mine to have written statements made by those witnessing the same and

sworn to. In case no person was present at the time of the accident, then the verified statement of those first present after the accident must betaken and such statement must be forwarded to the inspector. **A scond report shall be made to the mine inspector on all serious accidents showing when the injured returned to his regular employment.** If, after making such investigation the inspector deems the facts to warrant it, he may prosecute criminally the owner, lessee, lessor, agent, operator, manager or superintendent of the mine in which such accident occurred.
(Amendments are underscored.)

To avoid any misunderstanding or dispute as to what is a serious accident, definitions of serious and minor accidents should be inserted under Section 8 (Session Laws, 1915, Ch. 69, p. 131), as follows:

A SERIOUS ACCIDENT, for the purpose of this Act, shall mean one which, in the opinion of a reputable physician, will incapacitate the employee for a period of two weeks or longer; or where the hazard has been great though there may have been no injury.

A MINOR ACCIDENT, for the purpose of this Act, shall mean the on account of which the employee is incapacitated for performing his regular duties at least one complete shift.

Such an accident as the breaking of a cable on a man-hoist, even though there was no one on the cage, a fire underground, a magazine explosion, an explosion of gas or dust, the burning of a shaft-house,, or the hoisting of men in to the sheave would certainly be serious on account of the hazard though any of these might happen without injury to any one.

The question has arisen on several occasions whether or not a company should report accidents in which contractors were injured. There are certainly two types of contractors. First, the contractor who is merely a high-paid employee on account of his greater skill or endurance; and second, the independent contractor who maintains separate organization and equipment. The former is represented by the contractor who drives raises, drifts, crosscuts, and the like, and who is furnished machines, tools, power, and powder by the employer, even though he may be charged a fee for the use of these. The latter is represented by the contractor who undertakes to construct a mill, erect a metallurgical plant, or build a headframe and who furnishes his own equipment and organization. Section 8 (Session Laws, 1915, p. 131) should be amended to read:

AN EMPLOYEE, for the purpose of this Act, shall mean every person employed in the mining industry, including contractors or subcontractors and their employees, except an independent contratcor.

AN INDEPENDENT CONTRACTOR is one who renders service in the course of an occupation or profession representing the will of his

employer only as to the result of his work and not as to the means by which it is accomplished.

While the law provides that the inspector may send out blanks for the collection of certain data it offers no means of determining the names or the number of operators in the various mining districts except by visiting them each season. With the limited facilities now at the disposal of the inspectors, it is impossible to cover the entire Territory in a season and, with the constant changing of the operators in the placer fields, it is impossible to keep accurate account of the number of men employed, the claims worked and the accidents that happen when the inspector is not in the same district. An amendatory section to correct this should be inserted after Section 1 of Chapter 72, Session Laws, 1913, as follows:

Sec. 1½ Each operator at the beginning of the year, or as soon thereafter as practical, shall register with the mine inspector, giving the name of the operator, the name of the property and its location, and the probable number of men to be employed during the coming season.

At the present time the law only applies to mines where six or more men are employed, which is manifestly nujust, as the employees working on a small property are as fully entitled to the protection of the law as those working where hundreds are employed. Section 7 (Session Laws, 1913) should be amended to read:

Sec. 7 The provisions of this Act **shall apply to all mines employing labor.**

At many of the mines throughout the Territory the men are compelled to change, eat, and sleep in the same room, creating conditions most unhealthy and unsanitary. To correct this Section 11 (Session Laws, 1915, p. 152), which is the section on sanitation in the amendments to the original mine inspection act of 1913, should be further amended by adding the following paragraph:

At any mine where ten or more men are employed separate change, living and dining rooms shall be provided by the operator, such change room to be fitted with tub or shower baths and facilities for drying clothes.

Under Section 16 of the amendments "Hoisting of Men or Materials" (p. 134) the following subsections should be added:

(j-1) Where one compartment in a shaft or incline is used as a manway the same shall be closely lagged from any hoisting compartment.

(j-2) In any lode mine where a single-compartment shaft or incline is used as a manway, the same shall not be used as a manway when the cage or skip is in motion. Provided, That this shall not be constructed to prevent men from riding on the skip or cage in a regular hoisting compartment.

In Section 23 "Ventilations" (p. 139), the word "light" in the fifth line of the paragraph should be amended to read **"candle"** as it is obvious that the test of burning an electric light in a mine atmosphere offers but little evidence as to the chemical composition of the same.

In the case of accident the first person called is the foreman or

shiftboss. It then becomes the duty of this oficial to see that the wounds of the injured man are properly dressed and that he is removed from the mine without further injury. To Section 26 "First Aid to the Injured" (p. 141) should be added the following subsection:

(c) No one shall hold a position as stopeboss, shiftboss or foreman in any mine who has not studied first aid to the injured and who is not competent to dress wounds, stop bleeding, set bones temporarily, perform artificial respiration ,and properly transport an injured person.

One of the most objectionable pieces of machinery used underground, both on account of the danger from fire and the contamination of the atmosphere from the exhaust, is a gas engine. The following subsection should be added to Section 28, "Machinery" (p. 142):

(m) No internal combustion engine shall be used underground without the written permission of the mine inspector.

The above suggestions cover the most important changes necessary in the present law and represent the best practice of the States where mine inspection has been in operation any length of time.

EMPLOYERS' LIABILITY ACT.

At the last session of the Legislature an Employers' Liability Act was passed, which has been severely criticized by both miners and operators. The principal objectionable features are the manner of collection and the difference between the compensation paid for a death when the man is single and when married. When a man who is killed is single and without dependents the employer is bound to pay the funeral expenses, provided they do not exceed $150; also any expenses incurred after the injury and before death, not to exceed $150. But, if a man killed is married and has a family, the employer may be compelled to pay from $3,000 to $6,000, according to the number of children under the age of 16 years. This situation, therefore, naturally has a tendency to work a hardship on the married man, since an employer will not assume a $6,000 risk when he may asume but a $300 risk at the outside, and may be less than $100. This would appear to be along business lines.

Of all the compensation laws passed by the different States and Territories (31 States have adopted compensation laws), Alaska has the most liberal and pays the highest benefits. Nevada is the only other State or Territory that pays a maximum of $6,000 to beneficiaries. All of the States pay only a nominal sum for single persons without dependents, most of them less than in Alaska.

Compensation laws are based on the principal of relieving society of the burden of caring for the widows, orphans and cripples and to make each industry pay for the support of those injured or dependent upon those killed, who otherwise would become a burden to the community. Therefore, if a person has no dependents there is no burden left on the community.

The greatest evil of the Alaska Compensation Act is the manner of collecting the benefits due to the beneficiareis and to those injured. In most of the States the benefits are paid by an industrial board, or

commission, but it is an open question whether Alaska can afford the expense of maintaining an accident insurance commission or any other board of that character on account of the size of the Territory and the inaccessibility of many parts of it. Under the present system the benefits are collected through the courts, which naturally leads to litigation and the paying of large sums to attorneys, who take from the injured or beneficiary a large percentage of the sums due, thereby frustrating the intention of the law—to avoid public charges. Some way should be devised whereby money could be paid into the clerks of the courts, as at present, and by them paid to the injured person or beneficiary upon proof of their rights to the same. The amount collectible as attorney fees should be limited. Under present conditions unscrupulous attorneys get hold of ignorant injured employees or beneficiaries and charge them exorbitant fees to collect the compensation due when often only proof that they are the injured parties or beneficiaries is required.

A provision should be made to provide medical attention for the injured for a certain period. Under the present law no provision is made for this service and if a person were employed for a firm who did not employ a physician and were injured, he would be obliged to pay, in most cases doubtless, for medical attention all that would be due him under the compensation law.

The present compensation act does not provide for any definite time for the payment of compensation due to persons injured. Section 5 (Session Laws, 1915, p. 153) should have an amendment prescribing a definite time for the payment of compensation after two weeks disability, say, weekly or monthly.

Some person or board independent o femployer or employee should be designated to receive reports when a man is injured and how long he is detained from his work, and to see that he is paid his compensation for the full time.

INCREASED APPROPRIATION FOR OFFICE RENT, CLERICAL ASSISTANCE, ETC.

At the present time the inspector has no funds available for office rent, clerical hire, office furniture, emergency printing, stationery, stamps, telephone, etc. An appropriation to cover these items is urgently needed. Under present conditions the inspector has no means of filing correspondence, bulletins, reports, maps, etc.; has no telephone number that he can give to the mining companies in case of emergency; and is obliged to do his own clerical work. By authorizing the employment of funds for clerical asistance the inspector would be able to handle the routine office work and reports more speedily and would have more time to devote to mine inspection.

APPENDIX

TOTAL FATALITIES IN LODE MINES IN THE TERRITORY OF ALASKA DURING THE YEAR ENDED DECEMBER 31, 1916

Date of Accident	Name of Person	Nationality	Occupation	Age	Married or Single	Dependents: Widow	Dependents: Children under 16 Years	Name of Company and Mine	Nature and Cause of Accident in Brief
Jan. 3	Eugene M. Kelly	American	Mach. Man	40	Married	Yes	3	Alaska-Juneau Gold Mining Company	Back broken by a dirt slide which struck injured as he was setting a false set while timbering the portal of a tunnel.
Jan. 4	Domenico Ciotta	Italian	Miner	41	Married		4	Alaska-Treadwell G. M. Co. Tread.	Injured, who had been bulldozing in a stope, started to return to the gangway with powder. It had been their custom to leave bunches of powder tied up with primes at the head of the manway raise and in passing this powder it became ignited and exploded, throwing both men into the raise and killing them.
Jan. 4	Guio Guizzo	Italian	Miner	29	Single				
Jan. 16	Ernest Gost	Greek	Miner	26	Single			Kennecott Copper Corp., Bonanza Mine	Injured walked over a chute while the same was being drawn and was carried down with the ore which smothered him.
Mar. 17	James Gunn	English	Driver	33	Single			Alaska-Treadwell G. M. Co.—700 Mine	Killed by a fall of loose rock in a drift showing a friend through the mine.
Mar. 21	Emil Oswald Heinze	German	Mucker	50	———			Kennecott Copper Corp. Bonanza Mine	Crushed by descending timber skip while walking up the incline at his noon hour.
Mar. 22	Joe Vizzetti, Sr.	Italian	Mach. Man	51	Married	Yes	5	Alaska-Gastineau Mining Co.—Perseverance	Crushed by slab falling from roof while operating machine drill.
Mar. 31	Gus P. Clarey	American	Mach. Man	26	———			Alaska-Treadwell G. M. Co.—700 Mine	Killed by fall of rock from pillar and roof while barring down.

aReport of Federal Mine Inspector for the Calendar Year, 1916.

aTOTAL FATALITIES IN LODE MINES IN THE TERRITORY OF ALASKA

DURING THE YEAR ENDED DECEMBER 31, 1916.

Date of Accident	Name of Person	Nationality	Occupation	Age	Married or Single	Dependents Widow	Dependents Children under 16 Years		Nature and Cause of Accident in Brief
April 19	Arnold C. Bonsdorff	Dane	Laborer	34	Single			Alaska-Juneau Gold Mining Company	While ascending the stairway next to the tramway used for hauling construction material the injured placed his hand on a passing car and caught either his hand or sleeve which threw him under the car and crushed him.
April 27	Joe Kosich	Austrian	Mach. Man	26	Single			Alaska-Juneau Gold Mining Company	Standing above chute when the same was drawn and was pulled down with and buried in the ore.
July 1	Oscar Johnson	Swede	Shift Boss	33	Single			Ellamar Mining Co. Ellamar	The injured was repairing a pipe line in the manway and allowed the end of the timber which he was using for a lever to project into hoisting compartment. The descending cage truck this and crushed his head against the shaft timbers.
July 13	Nik Krinis	Greek	Bulldozer	47	Married	Yes	5	Alaska-United G. M. Co.—Ready Bullion	Injured had blased a hole in a stope to break down a slab. On returning to the stope a second slab fell and crushed him.
July 15	Rune Carlson	American	Motorman	22	Single			Alaska-Gastineau Mining Co.—Perseverance	Fell into an oreway. Probably was attempting to bar large rock out of car.
Aug. 4	Nick Olson	Russian	Skiptender	—	———			Chichagoff Mining Co. Chichagoff	Thrown out of skip which was off the track and fell down shaft.
Aug. 7	Christofferson	Norwegian	Miner	28	Single			Alaska-Industrial Co. Jumbo	Fell into oreway.

Aug.	13	Fred Mattson	Finlander	Trammer & Cager	23	Single			Ellamar Mining Co. Ellamar	Fell into shaft
Aug.	15	Joe Gretland	Norwegian	Miner	28	———			Mount Andrew M. Co. Mt. Andrew	Deceased went into another man's place after the man working there had gone to notify the foreman it was unsafe. A rock fell while deceased was trying to place a timber and killed him.
Sept.	6	Ole Roen	Norwegian	Mach. Man	22	Single			Alaska-Juneau Gold Mining Company	Asphyxiated by powder gas in a raise.
Oct.	25	Gus Vos	Hollander	Steel w'kr	30	Single			Alaska-Juneau Gold Mining Company	Crushed by steel plates sliding from car which was unloading on inclined trawmay.
Oct.	26	A. Sheboff	Russian	Mucker	23	Single			Alaska-Gastineau Mining Co.—Perseverance	Crushed by a slab of rock from the side of a drift which fell while injured was cleaning up around a chute.
Nov.	30	Louis Tremantine	Italian	Miner	49	Married	Yes	5	Kennecot Copper Corp.—Beatson	Crushed by a slab from the roof of a stope which fell while the injured man was running the machine drill.
Dec.	14	H. D. McClellan	American	Lineman	37	Married	Yes	2	Alaska-Gastineau Mining Company	Was struck by and buried beneath a slide of snow covering 10 or 15 acres of ground.

aBureau of Mines' Bulletin 75, "Rules and Regulations for Metal Mines,"

TOTAL FATALITIES IN PLACER MINES IN THE TERRITORY OF ALASKA DURING THE YEAR ENDED DECEMBER 31, 1916

Date of Accident	Name of Person	Nationality	Occupation	Age	Dependents	Name of Operator and Mine	Nature and Cause of Accident in Brief
	Alex Woodside	Scotchman	Operator	—	None	Watson & Woodside	Crushed in the bottom of a shaft by a bucket which was being hoisted. The cable broke when bucket caught on side of shaft.
May 10	Michael Pasich	Hungarian	Mucker	24	None	Gold Hill Mining Co.	While driving drift in frozen gravel the deceased unexpectedly drove into thawed ground which ran and buried him. He was suffocated before assistance could be rendered.
July 2	Chris Heeney	Irish	Operator	42	None	Heeney, Pike & Miller	Crushed by fall of gravel from roof of drift.
July 11	Albert Bjorklund	Scandinavian	Operator	30	None	Bjorklund & Bachner	Deceased, while adjusting steam points in the bottom of shaft was weakened from gas from decayed vegetation. While being hoisted from the shaft he slipped out of the chair, falling 50 feet to the bottom of the shaft.
Aug. —	Jack Seaburg	Scandinavian	Operator	40	None	Seaberg & Isler	Killed by falling boom.
Aug. —	Oscar Erickson	Swede	Prospector	....	None	Oscar Ericson	Overcome in the bottom of a shaft by fumes from a fire set to thaw the face of a drift.
Oct. 11	Andros Peter Theodore Anderson	Norwegian	Engineer	—	None	C. E. Kimball Co.	Fell off of scow while crossing from river bank to dredge and was drowned.

SERIOUS ACCIDENTS UNDERGROUND IN LODE MINES IN THE TERRITORY OF ALASKA DURING THE YEAR ENDED DECEMBER 31, 1916

Date of Accident	Name of Person	Nationality	Occupation	Age	Name of Company and Mine	Nature and Cause of Accident in Brief
Jan. 4	Joe Succa	Italian	Mach. Man	29	Alaska-Gastineau Mining Co.—Perseverance	The waste on which the machine was set moved and allowed the machine to fall across the operator, breaking both his legs.
Jan. 5	Joe Sandona	Italian	Mach. H'pr	28	Alaska-Gastineau Mining Co.—Perseverance	Injured was standing with his hand resting on the machine when a rock fell from the roof bruising and lacerating the hand between the rock and machine
Jan. 9	Ed Moro	Belgian	Mach. Hl'pr	26	Alaska-Gastineau Mining Co.—Perseverance	First joint, index finger, right hand badly crushed by machine which rolled over while injured attempted to lift it off the ground.
Jan. 9	E. Johnson	American	Mucker	21	Jualin Alaska Mines Company	Crushed the ends of the fourth and fifth fingers between a piece of ore and car. The ore protruded over top of car and caught on timber.
Jan. 9	R. A. Barnes	American	Mach. Hl'pr	50	Alaska-Gastineau Mining Co.—Perseverance	Right foot bruised by fall of rock while injured was carrying a load of drill steel through a stope.
Jan. 11	Ray Gossett	American	Mach. Hl'pr	32	Alaska Gold-Belt Company	Collar bone broken. Clothing caught in gear of diamond drill and injured was thrown against chuck nut.
Jan. 11	John Varlmos	Greek	Bulldozer	35	Alaska-Gastineau Mining Co.—Perseverance	Injured was barring down rock in a chute which had hung up when the ore gave way and came down on him, resulting in a fratcured skull and badly cut and bruised shoulder.
Jan. 31	John Bogandovich	Austrian	Mucker	42	Alaska-Juneau Gold Mining Company	Two ribs broken on left side by rock falling from a chute while injured was barring down.
Feb. 2	Mike Cook	Russian	Mucker	40	Alaska-Gastineau Mining Co.—Perseverance	One bone of right hand broken by fall of rock in a drift.
Feb. 4	Louis Welvert	Belgian	Steel P'kr	23	Alaska-Mexican G. M. Co.—Mexican Mine	Injured was carrying drill steel across a stope when he fell and the steel bruised the third finger on his right hand.
Feb. 8	M. H. Gerney	American	Foreman	60	Ellamar Mining Co. Ellamar	Leg broken by fall of rock in a waste raise.
Feb. 13	Jim Zezoff	Russian	Mucker	30	Alaska-Gastineau Mining Co.—Perseverance	Thumb of right hand crushed and whole hand lacerated. Injured attempted to hold coupling link between two cars with his candlestick when the motor bumped against them and caught his hand between the bumpers.
Feb. 16	Mike Zugic	Montenegrin	Mach. Man	24	Alaska-Gastineau Mining Co.—Perseverance	Small piece of steel from drill cut the tissue of left eye.
Feb. 18	Emelio Petrasso	Italian	Mach. Hl'pr	26	Alaska-Treadwell G. M. Co. Tread. Mine	The injured was climbing a ladder when his pardner dropped a monkey whench which fell on the middle finger of his right hand.
Feb. 26	Pietro Bonna	Italian	Laborer	40	Alaska-United G. M. Company	Tim of thumb on right hand crushed by a rock which slipped while injured was unloading car.

aReport of Federal Mine Inspector for Alaska for the Calendar Year, 1916.

SERIOUS ACCIDENTS UNDERGROUND IN LO DE MINES IN THE TERRITORY OF ALASKA DURING THE YEAR ENDED DECEMBER 31, 1916.

No. of Accidents	Name of Person	Nationality	Occupation	Age	Name of Company and Mine	Nature and Cause of Accident in Brief
Feb. 29	Mike Chalovich	Montenegrin	Mach. Hl'pr	35	Alaska-Gastineau Mining Co.—Perseverance	Eyes filled with dirt from a small explosion caused by drilling into a cut-off hole.
Mar. 3	L. P. Hamilton	American	Mach. Hl'pr	35	Alaska-Gastineau Mining Co.—Perseverance	While watching the car being loaded at a chute the injured was struck by a rock which bounced off the car and bruised his left foot.
Mar. 6	Math Jakominich	.....	Mach. Hl'pr	25	Alaska-Gastineau Mining Co.—Perseverance	The jack bar slipped from the column which the injured was tightening and threw him down He sustained a compound fracture of first phalanx of index finger.
Mar. 13	Mike Knaz	Montenegrin	Mach. Hl'pr	38	Alaska-Gastineau Mining Co.—Perseverance	The injured was carrying a machine over a waste pile when he fell with the machine on top of him causing a right inguinal hernia. (Old case.)
Mar. 14	Steve Rolando	Italian	Mucker	36	Alaska-Juneau Gold Mining Company	Ruptured by strain while rolling a heavy rock.
Mar. 16	Gus Erickson	Swede	Contractor	28	Alaska-Gastineau Mining Co.—Perseverance	Contused and pnctured wounds on right arm, chest, both hands and upper left leg, due to flying particles from an explosion caused by drilling into a missed hole.
Mar. 16	Andrew Erickson	Swede	Contractor	22	Alaska-Gastineau Mining Co.—Perseverance	Contused wound of left wrist due to flying particles from an explosion caused by drilling into a missed hole.
Mar. 19	John Jarico	Italian	Mach. Hl'pr	40	Alaska-Gastineau Mining Co.—Perseverance	Injured was helping lower machine when it fell off the arm dropping on his right foot and bruising it severely.
Mar. 19	Kosta Guizino	Montenegrin	Chute Puncher	37	Alaska-Gastineau Mining Co.—Perseverance	Injured had been barring down in a chute. He laid his bar on a plank and a rock fell and struck one end of the bar throwing the other end against his face, lacerating the lip and eye.
Mar. 25	Dan Sakatos	Greek	Mach. Man	30	Alaska-Gastineau Mining Co.—Perseverance	Injured was standing with his hand on crossbar when a rock fell from roof and crushed fourth finger of left hand between rock and bar.
April 6	Louis Odolovich	Austrian	Mucker	45	Alaska-Juneau Gold Mining Company	End of left index finger broken by fall of rock.
April 10	J. M. Steele	American	Miner	45	Kennecott Copper Corp. Bonanza Mine	Injured fell through a raise from one stope to another while trying to start ore which was blocked. He sustained general contusions, especially about the right arm and shoulder.
April 18	Costa Caramarizie	Greek	Mucker	45	Alaska-Gastineau Mining Co.—Perseverance	Clearing tracks at chute while train was loading. Did not hear the "go ahead" signal and was struck by car when train started, sustaining a lacerated wound of left eye, fracture of left radius, and fracture of second rib, both sides.
April 18	James Bowie	Scotch	Mach. Man	43	Alaska-United G. M. Co.—Ready Bullian	The injured was climbing up a raise on a rope when he slipped and fell 30 feet, sustaining a cut on the head and sprained ankle.

aReport of Federal Mine Inspector for Alaska for the Calendar Year, 1916.

April	21	Peter E. Genatos	Greek	Mucker	28	Alaska-Gastineau Mining Co.—Perseverance	Third rib fractured while attempting to couple two cars.
April	24	Antonio Dalla	Italian	Bulldozer	31	Alaska-Treadwell G. M. Co. Tread. Mine	While preparing to bulldoze a rock in a stope a piece of ore rolled down the pile above breaking the left leg and one rib.
April	29	Ralph Marcine	Italian	Timberman Helper	25	Alaska-Gastineau Mining Co.—Perseverance	Contusion of right foot, fracture fourth phylange. Injured was hoisting some planks in a chute when one fell and struck him on the foot.
May	2	Nick Demer	Greek	Bulldozer	25	Alaska-Gastineau Mining Co.—Perseverance	Compound fracture of inferior maxillary and lacerated wound of neck. Injured was barring down at a chute when a rock fell on one end of the bar which flew up and struck him in the jaw.
May	4	George T. Quinge	Norwegian	Carpenter	45	Alaska-Juneau Gold Mining Company	Right hip and groin bruised. Injured was working on construction of tramway when a rock rolled down the hill and struck him.
May	5	Mike Moras	Montenegrin	Bulldozer	36	Alaska-Gastineau Mining Co.—Perseverance	Fracture of inferior mixillary, lacerated wound of right cheek and scalp. Injured was barring down at a chute and had his bar over the check board when the ore fell on the bar, throwing it up so it struck him in the jaw and knocked him off the platform.
May	8	Otto Hocking	Swede	Chute Puncher	35	Alaska-Gastineau Mining Co.—Perseverance	Lacerated wound of left hand, compound fracture of third and fourth fingers. Injured was standing with one hand on the check board when fell on it.
May	8	Thomas Griffen	Irish	Mucker	26	Alaska-Juneau Gold Mining Company	Index finger on right hand cut and bruised. Barring down in a tunnel when a rock fell from the roof and struck him on the hand. instep bruised by machine which fell on in jured's foot.
May	9	Rista W. Lucich	Cervian	Mach. Hl'pr	26	Alaska-Juneau Gold Mining Company	Instep bruised by piece of drill steel falling down manway.
May	13	Joe Rodich	Austrian	Mach. Man	26	Alaska-Gastineau Mining Co.—Perseverance	Ulcer on eye ball due to cut from piece of steel which broke off the drill when starting a hole.
May	22	Tom Basoff	Russian	Chute Puncher	32	Alaska-Gastineau Mining Co.—Perseverance	Contusion of first toe, left foot. Injured was standing before a chute when a piece of ore fell over the chute door and struck him on the toe.
May	22	Emil Kilmutsky	Russian	Mach. Man	35	Alaska-Juneau Gold Mining Company	Instep bruised by machine which fell on injured's foot.
May	25	Jacob Nordahl	Norwegian	Pipe Man	43	Alaska-Juneau Gold Mining Company	Right thigh cut by rock blown out of air pipe while injured was cleaning the line.
May	25	Albert Henden	Norwegian	Mach. Man	30	Alaska-Juneau Gold Mining Company	Face and nose cut and bruised. Henden was assisting Nordahl in removing rock and dirt from the air pipe.
May	25	Mike Ogden	Austrian	Chute Puncher	—	Goodrow Mining Co. May Group	Rupture due to lifting excessive weight.

aReport of Federal Mine Inspector for Alaska for the Calendar Year, 1916.

SERIOUS ACCIDENTS UNDERGROUND IN LODE MINES IN THE TERRITORY OF ALASKA DURING THE YEAR ENDED DECEMBER 31, 1916.

Date of Accident	Name of Person	Nationality	Occupation	Age	Name of Company and Mine	Nature and Cause of Accident in Brief
May 30	Algot Johnson	Swede	Mucker	21	Kennecott Copper Corp. Bonanza Mine	End of second toe, left foot, crushed by a rock falling from a chute.
June 8	John Wilson	Finlander	Mach. Man	27	Jualin Alaska Mines Co., Jualin Mines	First finger of right hand mashed. A piece of rock projected from the car which the injured was pushing and struck on the timbers forcing it back so it caught his finger between the rock and the car.
June 10	Antonio Bertolini	Tyrolian	Laborer	40	Alaska-Treadwell G. M. Co. Tread. Mine	Cuts on head and face and right hip injured by falling rock in a stope.
June 13	Pete Perovich	Montenegrin	Machineman Helper	39	Alaska-Gastineau Mining Co.—Perseverance	Lacerated wound of left eye and a contusion of left ankle. Injured was walking across a stope when the broken ore moved throwing him down and bruising him.
June 15	C. Garavatti	Italian	Steel Nipper	26	Alaska-United G. M. Company—700 Mine	Left leg fractured by fall of rock from roof in a stope.
June 16	Gust. E. Johnson	Swede	Rock Breaker & Driver	18	Alaska-United G. M. Co.—Ready Bullion	Collar bone broken. Injured was caught between car and chute.
June 17	C. W. Carlsen	American	Miner	34	Alaska Free Gold Company	Slipped on ice in raise and fell, dislocating shoulder.
June 27	Pete Diebrich	Montenegrin	Chute Puncher	34	Alaska-Gastineau Mining Co.—Perseverance	Compound fracture of fourth finger on right hand. A rock fell on the bar and caught the injured's finger between the bar and the chute board.
June 29	J. Flenor	American	Motorman	45	Alaska-Gastineau Mining Co.—Perseverance	Contused wounds of left ankle. While injured was walking along a drift he turned to look at a chute and ran into a truck.
July 3	Sam Aboff	Russian	Machineman Helper	22	Alaska-Gastineau Mining Co.—Perseverance	Back, legs and shoulder injured by fall of rock in a stope.
July 7	Bob Rosandich	Austrian	Laborer	25	Alaska-Juneau Gold Mining Company	Back, shoulder and left side bruised. Injured and two others were pushing loaded dump car out of tunnel when motor train came around curve and struck dump car, throwing it off track and catching the injured between the dump car and side of the tunnel.
July 10	Nick Popa	Austrian	Machineman Helper	40	Alaska-Gastineau Mining Co.—Perseverance	Face and hands burned by flame from acetylene gas which was generated when injured pourned carbide in an old can containing water.
July 20	Gus James	Greek	Mucker	27	Ellamar Mining Co. Ellamar Mine	Right leg bruised and thigh fractured from falling in a chute.
July 22	Vuko Tomasovich	Montenegrin	Mucker	23	Alaska-Gastineau Mining Co.—Perseverance	Fractured left tibia when hit by a car-dump which injured had just unhooked.
July 23	Peter M. Nikaloff	Belgian	Chute Puncher Hl'pr	39	Alaska-Gastineau Mining Co.—Perseverance	Contusion of hipe. Injured stepped between car and chute just as motorman started train.

July	25	Obren Odalovich	Austrian	Chue Puncher	24	Alaska-Gastineau Mining Co.—Perseverance	Compound fracture of the nose and contused wound of scalp. Injured had the bar over chute board when a rock fell on the inside end of the bar, throwing the bar against his face and knocking him off the platform into the car.
July	25	Henry Jackson	Finlander	Mach. Man	38	Alaska-Juneau Gold Mining Company	Right eye bruised—vision impaired—by small falling rock while injured was ascending ladder in raise.
July	27	Christ Nick	Turk	Laborer	39	Alaska-Juneau Gold Mining Company	Right foot crushed. Injured was removing rocks from side of drift when the ore train came up behind him and jammed his foot between a car and a piece of rock.
July	29	James Jarden	Austrian	Cageman	29	Alaska-Gastineau Mining Co.—Perseverance	Compound fracture of fifth metacarpal bone, right hand. Injured was raising oil tank with winch when handle broke and flew back striking him on the hand.
Aug.	4	L. Watt	Scotchman	Mach. Man	38	Alaska-Gastineau Mining Co.—Perseverance	Index finger crushed; amputation necessary. Injured was walking with a bar on his shoulder when he fell, catching his hand between the bar and a rock.
Aug.	8	George Sabolek	Austrian	Hand Miner	37	Alaska-Mexican G. M. Mining Co.—Mexican	Right arm crushed; amputated below elbow. Injured went up chute to determine position to place powder to start chute when rock fell on him and knocked him down chute about 25 feet.
Aug.	12	Nick Kupoff	Russian	Chute Puncher	25	Alaska-Gastineau Mining Co.—Perseverance	Fracture of first toe, left foot. Rock rolled over chute board and fell on injured's toe.
Aug.	12	Mike Voinovich	Montenegrin	Laborer	29	Alaska-Juneau Gold Mining Company	Face and eyes cut by flying rocks from an explosion of a cap or piece of powder in the waste injured was shoveling.
Aug.	15	Frank Powers	American	Laborer	20	Alaska-Juneau Gold Mining Company	Third finger, left hand, badly bruised while loading steel beams on a truck.
Aug.	20	Mike Odal	Austrian	Mach. Man	22	Alaska-Gastineau Mining Co.—Perseverance	Fracture of twelfth dorsal vertebra and contused wounds of scalp and face. Fall of rock in a stope.
Aug.	25	Alex Sagoff	Russian	Carman	22	Kennecott Copper Corp. Bonanza Mine	End of third finger, left hand, lacerated by falling rock which caught injured's hand between car and bar.
Aug.	28	Sam Karadich	Montenegrin	Mach. Man	25	Alaska-Gastineau Mining Co.—Perseverance	Contused wounds of third and fourth fingers, left hand. Injured was pulling up some steel and caught his hand under the cable.
Sept.	9	Oscar Bondeson	Swede	Mucker	28	Chichagoff Mining Co. Chichagoff	Leg broken by fall of rock in a drift.
Sept.	9	Nunzio Greko	Italian	Laborer	30	Alaska-Juneau Gold Mining Company	Head, face and hip bruised. Overcome by powder gas and fell down chute.

aReport of Federal Mine Inspector for Alaska for the Calendar Year, 1916.

aTOTAL FATALITIES IN LODE MIN ES IN THE TERRITORY OF ALASKA
DURING THE YEAR ENDED DECEMBER 31, 1916.

Date of Accident	Name of Person	Nationality	Occupation	Age	Name of Company and Mine	Nature and Cause of Accident in Brief
Sept. 9	Alex Govzdenovich	Montenegrin	Laborer	28	Alaska-Juneau Gold Mining Company	Top of head cut, shoulders, back, and upper portion of legs bruised. While the injured was helping put the skip on the track the steel bar that he was using lost its hold and he became overbalanced and fell down an incline raise about 125 feet.
Sept. 16	Attilio Costa	Italian	Mach. Man	32	Alaska-Gastineau Mining Co.—Perseverance	Lacerated wounds of second and third fingers, right hand. Column bar slipped while injured was adjusting head block and caught his fingers between bar and wall.
Sept. 16	John Yakich	Montenegrin	Mucker	33	Alaska-Gastineau Mining Co.—Perseverance	Contused wound of left foot caused by injured's dropping rock on foot.
Sept. 22	John B. Larson	Finlander	Timberman & Hoistman	34	Alaska-Juneau Gold Mining Company	Two or three ribs broken on left side. Injured was standing on carpenter's horse setting hangers for the trolley wire when the horse turned over and threw him to the ground.
Sept. 23	Lawrence Linden	American	Miner	40	Kennecott Copper Corp. Bonanza Mine	Two cuts in head. Rock rolled down from a pile of ore which was thought to be frozen.
Sept. 29	Battista Allio	Italian	Mach. Man	26	Alaska-Treadwell G. M. Co. Tread. Mine	Left arm fractured by a piece of steel which fell down a raise while the injured was setting timbers.
Oct. 2	George Besoloff	Russian	Mucker	40	Chichagoff Mining Co. Chichagoff	Lower leg broken. Injured was riding timber truck and attempted to stop same with foot.
Oct. 2	Charles Penn	Austrian	Mach. Man	29	Alaska-Gastineau Mining Co.—Perseverance	Fracture of fourth metacarpal bone, right hand. Injured was pulling on jack bar when it slipped and caused him to fall on his hand.
Oct. 3	E. Patzold	German	Miner	50	Jualin Alaska Mines Company	Leg bruised by fall of rock in a stope.
Oct. 3	G. Tomme	Belgian	Miner	34	Jualin Alaska Mines Company	Flesh torn from leg by hook on car. Injured was walking along drift and did not see car in time to get out of way.
Oct. 5	Tom Tsciokas	Greek	Bulldozer	31	Alaska-Gastineau Mining Co.—Perseverance	Contused wounds, right forearm, due to fall of rock in a chute.
Oct. 15	Eli Lalich	Austrian	Machineman Helper	26	Alaska-Gastineau Mining Co.—Perseverance	Contused wounds of first, second and third fingers, left hand. A small skip had stuck in a raise and when the injured tried to start same it gave way suddenly and caught his hand between the skip and timbers.
Oct. 15	Mike Jelich	Austrian	Bulldozer	45	Alaska-Gastineau Mining Co.—Perseverance	Back hurt and internal injuries from falling off a ladder.
Oct. 15	George Gogoff	Russian	Chute Puncher	21	Alaska-Gastineau Mining Co.—Perseverance	Lacerated wound of index finger, right hand. Finger caught between bar and rock.
Oct. 19	Oscar Ness	Finlander	Mach. Man	29	Alaska-Juneau Gold Mining Company	Left eye injured by piece of steel flying from the bit of a nearby machine.

Oct.	22	Red Alechsich	Montenegrin	Mach. Man	34	Alaska-Juneau Gold Mining Company	Left foot bruised by falling jack bar, which injured was using in setting some drift timbers.
Nov.	3	Charles Penn	Austrian	Mach. Man	29	Alaska-Gastineau Mining Co.—Perseverance	Face and head cut, muscles of neck and back sprained. Injured was thrown down by an air blast.
Nov.	11	Earl Rhodes	American	Machineman Helper	23	Alaska-Gastineau Mining Co.—Perseverance	Felon on right index finger due to infection in a wound from a sliver on a drill rod.
Nov.	13	W. W. Eggen	American	Motorman	22	Alaska-Gastineau Mining Co.—Perseverance	Left leg bruised and cut below knee. Injured ran motor into standing trip and caught leg between cars and motor.
Nov.	27	Knut Danielson	Swede	Mach. Man	37	Alaska-United G. M. Co.—700 Mine	Left leg broken below knee. Had helper loosen clamp on tripod and machine fell off, striking injured on leg.
Nov.	27	Pete Miller	Austrian	Mach. Man	40	Jualin Alaska Mines Company	Bruised leg. Fall of ground in a raise.
Dec.	1	Pete Batello	Italian	Mach. Man	42	Jualin Alaska Mines Company	Bruised finger. Steel in machine broke, throwing it against wall.
Dec.	2	Frank Peters	Indian	Mucker	26	Alaska-Juneau Gold Mining Company	One or two small bones broken in foot. Injured was lifting rock in the car when it broke and fell on foot.
Dec.	7	Lazo Kovacik	Austrian	Chute Puncher	52	Alaska-Gastineau Mining Co.—Perseverance	Right side and both arms injured. Injured stepped off the motor in motion and grabbed the ladder and the moving car crushed him between car and ladder.
Dec.	8	Ely Radovich	Montenegrin	Contractor	30	Ellamar Mining Co. Ellamar Mine	Burned on face, and hands, bruises on arms, legs, and body. Blown down a raise by an explosion of methane.
Dec.	9	Ike Hall	Finlander	Mucker	27	Alaska-Juneau Gold Mining Company	Ulcer on cornea, right eye, due to bruise from flying rock.
Dec.	31	Herman Lurda	Finlander	Mach. Man	40	Alaska-Gastineau Mining Co.—Perseverance	Back and right leg bruised by motor which ran into injured while he was standing on a drift which was so smoky that he did not see the motor approaching.

aReport of Federal Mine Inspector for Alaska for the Calendar Year, 1916.

SERIOUS ACCIDENTS ON SURFACE ABOUT LODE MINES IN THE TERRITORY OF ALASKA DURING THE YEAR ENDED DECEMBER 31, 1916

Date of Accident	Name of Person	Nationality	Occupation	Age	Name of Company and Mine	Nature and Cause of Accident in Brief
Jan. 5	Earl Denham	American	Drill Sharpener	30	Alaska-Mexican G. M. Co.—Mexican Mine	Third and fourth fingers of left hand crushed. Injured rested hand underneath hammer of drill sharpener and accidentally turned on the air.
Jan. 20	Chris Johnson	Norwegian	Laborer	24	Alaska-Juneau Gold Mining Company	Fell from the dock while unloading lumber and sustained bruises and cuts about the head.
Feb. 7	Ben Datel	Norwegian	Feeder	25	Alaska-Treadwell G. M. Co. Tread. Mine	While changing a cam shaft the same fell off the horses and a cam slipped off, crushing the big toe on the right foot.
Feb. 10	Joseph F. Zace	American	Laborer	43	Alaska-Treadwell G. M. Co. Tread. Mine	Abscess on right hand due to infected cut.
Feb. 12	Mike Moor	Belgian	Laborer	42	Alaska-Juneau Gold Mining Company	Fell while carrying steel on mill grade and broke small bone in ankle.
Feb. 15	George Petersen	Swede	Laborer	32	Alaska-Gastîneau Mining Co.—Perseverance	End of index finger on the left hand crushed while moving a drill sharpener off a track. Accidentally placed finger under the hammer as the machine was turned over and it fell with the above result.
Mch. 4	John Mackenen	Finlander	Mill Man	46	Alaska-United G. M. Co.—700 Mine	Left ankle bruised by falling stamp while making repairs in mill.
Mch. 15	George Martin	Hungarian	Chuteman	30	Alaska-Gastineau Mining Co.—Perseverance	Injured was on running board of locomotive which backed up against the train, catching his left foot between the drawheads and bruising it badly.
Mch. 18	Geo. Atkinson	English	Laborer	32	Alaska-Juneau Gold Mining Company	Resting hand on boulder when one rolled down from above and broke two bones in right hand.
Mch. 20	Chester Leonhardt	American	Mill Man	19	Alaska-Gastineau Mining Co.—Perseverance	Injured attempted to stop a belt while in motion and his left arm was jerked between the pulley and the belt and broken.
Mch. 20	Fred Christensen	Norwegian	Laborer	25	Alaska-Juneau Gold Mining Company	The injured was struck by a broken cable on a donkey engine and sustained a broken collar bone and two scalp wounds.
Mch. 28	J. E. Steers	American	Fireman	46	Alaska-Juneau Gold Mining Company	Burned on right eye by hot scale while cleaning boiler.
April 2	Thos. Murphy	American	Laborer	30	Alaska-Treadwell G. M. Co. Tread. Mine	Injured was riding on a load of baled hay when one of the bales struck a platform and threw him eight feet on to the rocks below. Right arm fractured, right hip sprained and head cut.
April 2	Pete Viano	Italian	Laborer	26	Alaska-United G. M. Co.—Ready Bullion	Fell about 30 feet from a platform from which he was throwing down old timbers and fractured skull.
April 20	F. J. Samson	German	Mucker	51	Alaska-Juneau Gold Mining Company	Bruises on back, internal injuries. Preparing a blast on mill grade when a rock rolled down from above and struck injured on back.

aReport of Federal Mine Inspector for Alaska for the Calendar Year, 1916.

aSERIOUS ACCIDENTS ON SURFACE ABOUT LODE MINES IN THE TERRITORY OF ALASKA DURING THE YEAR ENDED DECEMBER 31, 1916.

Date of Accident	Name of Person	Nationality	Occupation	Age	Name of Operator and Mine	Nature and Cause of Accident in Brief
May 3	Ed. R. Evans	American	Crusherman	27	Alaska-Juneau Gold Mining Company	Middle finger of left hand cut and bruised at end. Injured was prying a piece of steel from the grizzly plate when the bar slipped, causing him to fall and catch his finger between the bar and a bolthead.
May 6	B. M. Rice	American	Laborer	21	Alaska-Gastineau Mining Company	Left leg broken at ankle. Injured attempted to shift a belt from a high-speed to an intermediate pulley with his foot and was caught between the belt and pulley.
May 7	Charles Slaymaker	American	Laborer	40	Alaska-Treadwell G. M. Co. Tread. Mine	One bone in left leg broken. Caught between draw bar of locomotive and car while attempting to couple them.
May 10	G. J. Cassidy	American	Donkey Engineer	46	Alaska-Juneau Gold Mining Company	Left ankle caught between planks and bruised while injured was moving a donkey engine from the wharf on to a barge.
May 17	John McCarthy	American	Mucker	52	Alaska-Juneau Gold Mining Company	Right ankle bruised. When pushing car from face of mill grade to end of dump the car bumped at the end of the track and backed a foot or two so the injured fell on the track and the car-bumper passed over his ankle.
May 24	E. J. Sliter	American	Laborer	46	Alaska-Juneau Gold Mining Company	Ankle and foot bruised by falling plank while working a pile driver.
May 29	Bob Rosandich	Austrian	Laborer	25	Alaska-Juneau Gold Mining Company	Right leg bruised. Injured was trying to put a dump car on the track when the car slipped and fell on him.
May 31	Einas Sgvland	Finlander	Mucker	21	Alaska-Juneau Gold Mining Company	Both ankles bruised. Injured was thrown over dump by car turning over as he attempted to dump it.
June 5	David A. Wheeler	American	Laborer	29	Alaska-Juneau Gold Mining Company	Left arm crushed, amputation necessary. While helping change cable from bottom to top of drum on a small hoist at an incline tramway injured's arm was caught in loop of cable.
June 12	Lou McDonald	American	Laborer	31	Alaska-Juneau Gold Mining Company	Thumb on right hand bruised while loading steel on a truck.
July 15	Herman Hugh	Swiss	Laborer	22	Alaska Free Gold Mining Co.	Mitten caught in saw. Palm of hand cut.
Aug. 3	Otto Stewart	Swiss	Steel Sharpener	38	Alaska-Gastineau Mining Co.—Perseverance	Injured struck left hand with hammer, causing slight abrasion which became infected.
Aug. 18	A. A. Squires	Swiss	Flume Tender	65	Alaska-Gastineau Mining Co.—Perseverance	Cut over left eye and body bruised. Injured man thrown from car when horse shied, throwing car off track.
Sept. 4	Tury Saks	Russian	Laborer	36	Alaska- United Gold Mining Company	Two bones broken in left leg and chest bruised. Was shifting belt from belt line shaft pulley and was caught in the belt which threw him to the floor.

Sept.	7	Jess Coddington	American	Gripman	23	Kennecott Copper Corp.—Jumbo Mine	Calles fracture, left arm. Injured stopped tramway to tighten bucket grip. He fastened bucket with rope which failed to hold when grip was loosened and he was knocked to the ground.
Sept.	20	George N. Peterson	Dane	Mill Oiler	24	Kennecott Copper Corporation	Lost third, fourth and fifth fingers and portion of left hand. Fingers drawn into bevel gear when injured attempted to put grease on gear with his hand.
Oct.	2	E. I. Whitmore	American	Skip Operator	40	Alaska-Gastineau Mining Company	Right elbow dislocated, right hand bruised and left hand so badly crushed that amputation was necessary. Injured was moving conveyor-dumper when his hands were caught between rope and niggerhead on gypsy.
Oct.	23	Olaf Jamne	Norwegian	Painter	40	Alaska-Juneau Gold Mining Company	Left arm broken at shoulder and wrist by fall from roof of mill.
Oct.	30	Battista Bobadadelli	Italian	Concentrator	30	Alaska-Juneau Gold Mining Company	Head, jaw and wrist bruised while attempting to move a belt from the pulley.
Nov.	19	Frank Ross	American	Electrician	25	Alaska-Gastineau Mining Company	Sprained right ankle. Slipped on mat at foot of stairs in mill.
Dec.	19	Steve Vukovich	Montenegrin	Mucker	27	Alaska-Juneau Gold Mining Company	End of thumb on right hand crushed. Injured attempted to remove rock from wheel which he used to block the car and the wheel pinched his thumb.

aReport of Federal Mine Inspector for Alaska for the Calendar Year, 1916.

SERIOUS ACCIDENTS IN PLACER MINES IN THE TERRITORY OF ALASKA

DURING THE YEAR ENDED DECEMBER 31, 1916

Date of Accident	Name of Person	Nationality	Occupation	Age	Name of Operator and Mine	Nature and Cause of Accident in Brief
April 1	Axel Sandberg		Operator	—	Kleinschmidt & Sandberg, Niggerhead Association	The injured lost the sight of one eye and injured the other, lost four fingers on right hand, had his right leg broken in two places and hearing affected by an explosion of dynamite and caps. He was alone at the time and does not know the cause of the explosion.
April 5	Paul Schultz		Operator	—	Paul Schultz	Injured was burned and bruised by an explosion which was caused by drilling into a missed hole.
April 18	James O'Dea		Machinist	—	Yukon Gold Company	Accidentally struck on the head by a hammer which caused a slight wound. This later became infected.
April 19	James Mulvehill		Laborer	45	Yukon Gold Company	The injured was engaged in thawing frozen ground ahead of a dredge. He stepped near a live steam point and crust gave way, plunging his foot into the hot muck and scalding his leg above the shoe top.
April 25	Wm. Kelly		Operator	—	Kelly, Sampson & Colbert, Gold Dollar As'n	Injured raised a lighted candle to examine roof and ignited a gas pocket which burned his face and ha nds.
April 25	Sam Lowery		Laborer	—	Kelly, Sampson & Colbert, Gold Dollar As'n	Injured was with Wm. Kelley when examining roof and was burned when gas pocket became ignited by a lighted candle. Face and hands burned.
April —	Wm. Flater				Cleveland & Howell Mohawk Claim	Injured was timbering a drift when the gravel caved from the side and broke his leg below the knee.
May 11	Adolph Holtman		Mucker	—	Finley & Peterson Deep Channel Ass'n.	Caught between two large pieces of frozen gravel and leg crushed so badly that amputation at thight was necessary.
May 19	Tom Isaacson	Finlander	Miner	46	Mohawk & Lorraine claim, Howell & Cleveland, operators	Leg broken by slab of bedrock which slid out of the side of the drift.
June 1	George Getton	Russian	Miner	—	Howell & Cleveland Hohawk & Lorraine Claims	Eye injured by piece of flying gravel.
June —	E. Richards	English	Carpenter	42	Flume Dredge Co. No. 1 above, Melsing Cr.	While the injured was assisting in unloading a line shaft from a wagon it fell and broke his leg.
July 10	George McFeely	Scotch	Timberman	—	August Peterson	Injured was timbering shaft when he lost his balance and fell 25 feet, straining his back.
July 14	Harvey G. Dorr	German	Mucker	—	Frank Waskey, No. 1 below, Willow Creek	Leg broken by a boulder which fell off a conveyor in a hydraulic pipe.
July 29	John Neilson		Laborer	33	Yukon Gold Co.	Injured was engaged in thawing frozen ground ahead of a dredge. He Attempted to remove a plank from a steampoint hole and slipped, plunging his legs into the hole and scalding them.

SERIOUS ACCIDENTS IN PLACER MINES IN THE TERRITORY OF ALASKA

DURING THE YEAR ENDED DECEMBER 31, 1916.

Date of Accident	Name of Person	Nationality	Occupation	Age	Name of Operator and Mine	Nature and Cause of Accident in Brief
Aug. 4	Dan Dooling	American	Operator	44	Dooling, McIntosh & Patterson, No. 1 below Myrtle Creek	Boulder fell from face of drift and struck injured on foot, breaking several small bones.
Aug. 9	Carl Karleen		Engineer	—	Julian Dredge Co.	Injured stood on winch drum on dredge without notifying winchman who started winch and threw injured against the clutch. This lacerated the thigh and calf of right leg.
Aug. 10	Alex Kannoff	Russian	Miner	—	Howell & Cleveland Mohawk & Lorraine	Injured entered old workings of the mine and ignited a pocket of gas which burned his face and hands.
Aug. 18	Abraham Jukko	Finlander	Miner	—	Howell & Cleveland Mohawk & Lorraine	Injured entered old workings and lighted a pocket of gas which burned his face and hands.
Aug. —	O. W. Flowers		Operator	—	Flowers Drege, O. W.	The injured thrust his hand through the spokes of a gear wheel to screw down a grease cup, when the winchman, who had not been notifield that anyone was working on the engine, started the winch, crushing the injured's arm so badly that amputation was necessary.
Sept. 13	Louis Peterson		Pipe Man	—	Pioneer Mining Co. Ault Claim	Injured lost control of a nozzle which swung around and broke two of his ribs.
Oct. 5	Dommick Brondino	Italian	Miner	34	Howell & Cleveland Mohawk & Lorraine	The eye of the injured was struck by a chip of rock from a boulder which he struck with his pick.

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 Hour	Dimensions of Hull, ft.	Manager
Seward Peninsula											
Americaon Gold Dredging Co.	York	Anicovik	Flume	2	Open	12	80	Distillate	1,200	30 by 60	B. Bernard
Americaon Gold Dredging Co.	York	Anicovik	Flume	1¾	Close	15	50	Distillate	1,200	23 by 54	B. Bernard
American Tin Dredging Co.	York	Buck	2 Flumes	2	Open	15	50	Distillate	1,200	24 by 58	Nels Nelson
Arctic Dredging Co.	Nome	Hobson	Belt Stk'r	2½	Open	14	92	Distillate	1,240	30 by 60	F. Middaugh
Arctic Creek Dredge	Nome	Arctic	Flume	2½	Open	12	60	Distillate	1,000	28 by 60	C. Servatius
Bangor Creek Dredging Co.	Nome	Bangor	Flume	3½	Open	35	140	Crude Oil	2,000	36 by 92	C. Mitchell
Bering Dredging Co.	Taylor	Kougarok	Flume	2½	Close	15	100	Distillate	1,200	30 by 60	John Mathews
Blue Goose Mining Co.	Council	Ophir	Flume	2½	Close	17	90	Steam	1,600	32 by 96	A. N. Kittilsen
Candle Creek Dredging Co.	Candle	Candle	Flume	1¾	Open	14	50	Distillate	1,000	24 by 90	Frank Sundquist
Center Creek Dredging Co.	Nome	Center	Flume	3½	Open	40	123	Fuel Oil	2,000	35 by 74	Andy Anderson
Ernst-Alaska Dredging Co.	Nome	Nome	Flume	1¾	Open	12	40	Fuel Oil	700	24 by 46	Phillip Ernst
Flowers' Dredge	Solomon	Beach Solomon	Bucket Stacker	2¾	Open	12	80	Steam	1,000	34 by 68	O. W. Flowers
Flume Dredg Co.	Council	Melsing	Flume	2½	Open	18	50	Distillate	1,000	26 by 50	C. E. Kimball
Flume Dredg Co.	Council	Melsing	Flume	2½	Open	12	60	Distillate	1,000	28 by 60	C. E. Kimball
Fries Dredging Co.	Deering	Inmachuck	Flume	2¾	Open	12	60	Distillate	700	24 by 56	H. Fries
Glacier Creek Dredge	Nome	Glacier	Flume	2	Open	17	60	Crude Oil	1,000	24 by 56	Ames & A. Guinan
Goose Creek Dredge	Dickson	Goose	Flume	2	Open	12	50	Distillate	1,200	24 by 56	George A. Adams
Hastings Creek Dredge	Nome	Hastings	Flume	2½	Open	18	85	Distillate	1,200	30 by 66	Joseph Belleview
Inmachuk Dredging Co.	Candle	Inmachuk	Flume	3	Open	18	107	Distillate	1,400	30 by 62	
Johnson Dredge	Candle	Kugruk	Flume	3	Close	16	107	Distillate	2,000	30 by 62	Iver Johnson
Julian Mining Co.	Nome	Osborne	Belt Stk'r	2¾	Open	15	87	Distillate	1,000	30 by 60	V. Julian
			Bucket		Open	15	90				
Kelliher Dredge	Taylor	Kougarok	Stacker	2½	Open	15	90	Distillate	1,000	30 by 60	James Kelliher
Kimball Co., C. E.	Nome	Solomon	Flume	2½	Open	13	60	Distillate	1,000	30 by 60	C. E. Kimball
Kimball Co., C. E.	Nome	Solomon	Flume	2½	Open	13	60	Distillate	1,000	28 by 60	C. E. Kimball
Moody Mining Co.	Nome	Canyon	Flume	2½	Open	12	60	Distillate	1,000	28 by 60	C. L. Peck
Northern Light Mining Co.	Council	Ophir	Flume	2½	Open	12	50	Distillate	1,000	28 by 60	Gilbert A. Russell
Nome Consolidated Dredg. Co.	Nome	Burbon	Belt Stk'r	7	Close	35	310	Electricity	7,000	48 by 114	John Miles

aNot Operating in 1916.

DREDGES

NAME	Alaska Address	Creek or River	Type	Size of Bucket Cu. ft.	Line Bucket	Maximun Digging Depth Feet	Rated H.P.	Source of	Actual Capacity in yds. per 24 Hour	Dimensions of Hull, ft.	Manager
Nome Consolidated Dredg. Co.	Nome	Wonder	Belt Stk'r	7	Open	70	330	Electricity	6,000	48 by 114	John Miles
Nome Consolidated Dredg. Co.	Nome	Wonder	Belt Stk'r	7	Open	70	330	Electricity	6,000	48 by 114	John Miles
Nome-Montana-New Mexico Mng. & Dredg. Consolidated	Solomon	Solomon	Bucket Stacker	5	Open	16	120	Steam	1,600	38 by 87	G. F. Ramsay
Oro Dredging Co.	Council	Elkhorn	Flume	1¼	Open	8	18	Distillate	600	16 by 24	Charles Spencer
Plein Mining & Dreging Co.	Nome	Nome	Bucket Stacker	2¾	Open	12	60	Steam	1,000	34 by 68	J. F. Plein
Ruby Dredging Co.	Nome	Casadepaga	Flume	2¾	Open	9	90	Distillate	1,200	30 by 60	W. W. Johnson
aSeiverson & Johnson	Dickson	Solomon	Bucket Stacker	2¾	Open	12	80	Steam	1,000	34 by 60	C. O. Seiverson
Seward Dredging Co.	Dickson	Solomon	Belt Stk'r	5	Close	12	25	Electricity	4,000	40 by 86	R. S. Oglisby
aShovel Creek Gold Dredg. Co.	Dickson	Shovel	Belt Stk'r	2¾	Close	15	120	Distillate	1,200		Corey C. Brayton
aSolomon Dredging Co.	Dickson	Solomon	Belt Stk'r	3½	Close	25	130	Steam	2,000	45 by 85	J. A. Malloch
Sunset Mining Co.	Teller	Sunset	Flume	1¾	Open	12	40	Distillate	700	24 by 46	Max Hirshberg
Uplift Mining Co.	Council	Camp	Flume	2½	Open	10	60	Distillate	1,200	24 by 46	A. N. Kittilson
Warm Creek Dredging Co.	Council	Warm	Flume	2½	Open	12	75	Distillate	1,000	25½ by 50	Charles Milacek
Wild Goose Mining & T. Co.	Nome	Ophir	Belt Stk'r	3½	Close	25	160	Distillate	2,200	30 by 75	Fred M. Ayer
aWillow Creek Dredging Co.	Dickson	Willow	Belt Stk'r	3	Open	12	90	Distillate	1,000	40 by 60	Jerry L. Wilson
Windy Creek Dredge	Teller	Windy	Flume	2¾	Open	18	97	Distillate	1,200	45 by 65	J. A. Welch
York Tin Dredging Co.	York	Grouse	Flume	2½	Open	14	87	Distillate	1,000	28 by 60	W. W. Johnson
Cache Creek											
Cache Creek Dredging Co.	Cache via Susitna	Cache	Flume	7	Close	30	295	Steam	2,000	54 by 87	Ed. L. Smith
Circle											
Berry Dredging Co., C. J.	Circle	Mastadon	Flume	3½	Open	18	160	Steam	1,000	24 by 04	C. J. Berry
Fairbanks											
Fairbanks Gold Mining Co.	Fairbanks	Fairbanks	Bucket Stacker	3½	Open	16	85	Steam	1,000	45 by 90	G, Aarons
Iditarod											
Otter Creek Dredging Co.	Iditarod	Otter	Flume	3½	Close	18	120	Fuel Oil	2,000	30 by 62½	J. E. Riley
Otter Creek Dredging Co.	Iditarod	Black	Flume	2½	Close	15	120	Fuel Oil	1,000	30 by 60	J. E. Riley
Yukon Gold Co.	Iditarod	Flat	Belt Stk'r	7½	Close	26	300	Electricity	5,000	46½ by 95	E. A. Austin
Kenai Peninsula											
aHerron Dredging Co.	Hope	6-Mile									Charles Herron
Ruby											
Yukon Gold Co.	Ruby	Greenstone	2 Flume	3½	Open	18	160	Steam	2,000	30 by 60	

TABLE NO. VII. **LODE MINES**

OPERATOR	MINE	Local Address	MANAGER
	Southeastern Alaska		
Admiralty Alaska Gold Mining Co.		Juneau	W. S. Peckovich
Alaska Gold Belt Mining Co.		Juneau	A. B. Dodd
Alaska Gold Mines Co.	Perseverance	Juneau	B. L. Thane
Alaska Industrial Co. (See Sulzer, Chas. A.)			
Alaska Juneau Gold Mining Co.	Alaska Juneau	Juneau	P. R. Bradley
Alaska Mexican Gold Mining Co.	Mexican	Treadwell	P. R. Bradley
Alaska Treadwell Gold Mining Co.	Treadwell	Treadwell	P. R. Bradley
Alaska United Gold Mining Co.	700 Foot		
	Ready Bullion	Treadwell	P. R. Bradley
Chichagoff Mining Co.	Chicagoff	Chichagoff	J R. Freeburn
Crystal Gold Mining Co.		Snettisham	Bernard Heine
Dunton Gold Mining Co.	Dunton	Hollis	C. H. Dunton
Eagle River Mining Co.	Eagle River	Amalga	B. L. Thane
Ebner Gold Mining Co.	Ebner	Juneau	Geo. Osborne
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		Chichagoff	E.: E. Fleming
Kensington Mining Co.	Kensington	Chichagoff	B. L. Thane
Lakina & Tagish Mines Co.	Cymru-Moira	Ketchikan	J. L. Harper
Mount Andrew Mining Co.	Mount Andrew	Ketchikan	W. J. Rogers
Nestor Mining Co.	Nestor	Hadley	John Wick
Northland Development Co.		Craig	P. A. Tucker
Pacific Coast Gypsum Co.	Gypsum	Gypsum	D. C. Stapleton
Princeton Mining & Milling Co.		Dolomi	B. A. Eardley
Ready Bullion Mining Co.	Ready Bullion	Hollis	H. W. Webber
Rush & Brown		Kasaan	U. S. Rush
Sea Level Mine	Sea Level	Ketchikan	

TABLE NO. VII. (Continued)

OPERATOR	MINE	Local Address	MANAGER
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
Great Northern Devel. Co.	Gray's Cop. Mt.	Phillips	E. F. Gray
Hubbard-Elliot Copper Co.	Hubbard-Elliot	Elliot Cr. via Strelna	A. J. Elliott
Kennecott Copper Corporation	Bonanza-Jumbo	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	E. D. Reiter
Alice Mines, Ltd.	Alice	Valdez	M. J. Callaghan
Bennett-Daley Mine	Bennett-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	Jefferson Divinney
Ellamar Mining Co.	Ellamar	Ellamar	L. L. Middelkamp
Ellis Imperial Mining Co.		Valdez	H. E. Ellis
Fidalgo Mining Co.	Fidalgo	Ellamar	Wm. Mackintosh
Galena Bay Mining Co.	Galena Bay	Valdez	Chas. Simonstead
Gold King Mine	Gold King	Valdez	Owners: Frank Gustaveson, Angus Chishom, Gus Nelson

TABLE NO. VII. (Continued)

OPERATOR	MINE	Local Address	MANAGER
Granby Con. M., S., & Power Co.	Midas	Valdez	Palmer J. Cook
Granite Gold Mining Co.	Granite	Valdez	W. R. Millard
Irish Cove Copper Co.	Irish Cove	Ellamar	W. A. Dickey
Kennecott Copper Corporation	Beatson-Bonanza	Latouche	E. T. Stannard
Landlock Bay Copper Company	Landlock Bay	Ellamar	W. A. Rystrom
Mineral King Mining Co.	Mineral King	Valdez	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.		Latouche	Archie Hancock
Sea Coast Mining Co.	Sea Coast	Valdez	
Sealey-Davis Mining Co.	Sealey-Davis	Valdez	E. C. Sealey—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	— Saint
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	J. R. Hyden
Lucky Strike Mine	Lucky Strike	Seward	John Hirshey
Moose Pass Mining Co.	Moose Pass	Seward	Henry Salisbury
Primrose Mine	Primrose	Seward	Chas. Hubbard
Ronan & James		Seward	
Slater, John B.		Seward	John B. Slater
Scheen-Lechner Mine	Scheen-Lechner	Seward	H. Hoben
Stetson Creek Mining Co.		Seward	

TABLE NO. VII. (Continued)

OPERATOR	MINE	Local Address	MANAGER
	Willow Creek		
Alaska Free Gold Mining Co. (See Martin, Wm.)			
Brooklyn Development Co.		Knik	
Bold Bullion Mine (See Willow Creek Mines)			
Independence Gold Mines Co.	Independence	Knik	L. S. Robe
Mable Milling, Mining & P. Co.		Knik	W. E. Bartholf
Martin, William (Lessee, Alaska Free Gold property.)			Wm. Martin
Willow Creek Mines (Lessee Gold Bullion property)	Gold Bullion	Knik	J. H. Collier
	Fairbanks		
American Eagle Mine	American Eagle	Fairbanks	
Bondholder Mine, The	Bondholder	Fairbanks	E. Tyndall
Chatam Mining Company		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. Gilmour & — Stevens
Mizpah Mine	Mizpah	Fairbanks	A. Hess
McArthur, W. T.		Berry	W. T. McArthur
McCarthy Mine	McCarthy	Fairbanks	John McCarthy
McNeil-Huddleson Mine	McNeil-Huddleson	Fairbanks	Mike McNeil
Newsboy Mining Co.	Newsboy	Fairbanks	Louis Golden
Poz & Contadi		Olnes	Joe Poz—John Contadi
Reliance Mining Co.	Reliance	Fairbanks	— Spalding
Rhoads-Hall Mining Co.	Rhoads-Hall	Fairbanks	L. B. Rhoads
Tanana Hydraulic & Quartz M. Co.		Fairbanks	

TABLE NO. VII. (Continued)

OPERATOR	MINE	Local Address	MANAGER
Thomas, Hagel, McCann & Micheally		Berry	David Thomas, Frank Hagel, Jas. McCann & John Micheally
Wyoming & Colorado Mine	Wyoming & Colo.	Cleary	Tony Goeseman
Wood, Richard	Eagle Antimony	Fairbanks	Richard Wood

TABLE NO. VIII. **PLACER MINES**

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
		Chisana	
Best & Green	No. 7	Bonanza	Chisana
Hill & Jensey		Sargent	Chisana
James & Nelson		Bonanza	Chisana
McLellan & Fagelbury		Bug Gulch	Chisana
Murie & Costello	No. 10	Bonanza	Chisana
Stanley, L. V.		Bonanza	Chisana
Taylor & McLellan	No. 3	Bonanza	Chisana
Whitman, Carl	No. 2	Little Eldorado	Chisana
Wright & McNutt	No. 11	Bonanza	Chisana
		Circle	
Adamik, Martin			Woodchopper
Anderson, J. P.			Miller House
Armstrong, Charles			Woodchopper
Bayless, Otto G.			Deadwood
Beatson & Nelson			Woodchopper
Berry, C. J.			Miller House
Bloom, Pete			Deadwood
Boyle, Charles			Woodchopper
Boyle, John			Woodchopper
Clark, A. P.			Miller House
Cochran, John Doe			Woodchopper
De Michael, Michael			Circle

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Erickson, Riley			Deadwood
Fenlanson, Chris			Woodchopper
Fisher, August			Woodchopper
Garner & Berry			Miller House
Gibbon, Billy			Woodchopper
Greep, Harry			Deadwood
Holstrum, John			Woodchopper
Ingalsbe, Al			Deadwood
Kelly, J. F.			Miller House
Kronjaeger, Alfred			Deadwood
Larson, Chris			Woodchopper
Lee, O. B.			Woodchopper
Marigold Mining Co.			Miller House
Matthews, Dave			Woodchopper
Morel & Johnson			Deadwood
Phillips, Thos.			Deadwood
Pompal, Jos.			Deadwood
Powers, George			Woodchopper
Sather, Antone A.			Deadwood
Scesniak, Frank			Woodchopper
Slaven, Frank			Woodchopper
Van Bibber, Pat			Deadwood
	Copper River		
Bergman, Fred		Big Four Gulch	Dempsey
Brooks, E. W.		Jolly Gulch	Nazina
Canaille Bros.		Big Four Gulch	Dempsey
Carvey, Bert		Rex	Nazina
Dan Creek Mining Co.		Dan	McCarthy
Elmer, J. M.		Slate	Dempsey
Esterly & Andrus		Chititu-Rex	Nazina

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Grosh, John		Miller Gulch	Dempsey
Holmes & Brail		Upper Chesna	Dempsey
Kraemer, Hemple & Leavell		Slate-Miller Gulch	Dempsey
Miller, John S.		Slate-Miller Gulch	Dempsey
Meyer & Prolig		Slate	Dempsey
Schroeder, William		Miller Gulch	Dempsey
	Crow Creek		
Alaska Crow Creek Mining Co.		Crow	Girdwood via Anchorage
	Fairbanks		
Atwood, Harry	No. 11	Goldstream	Fox
Bean, Z. C.	No. 3	Wolf	Cleary
Bleeker, Fred	No. 4	Goldstream	Fox
Bostrom, Gus	No. 5	Cleary	Cleary
Buren, Isaac	No. 6	Cleary	Cleary
Burns & Gorgens		Head of Chatam	Cleary
Canning, James	No. 3	Dome, 2nd Tier	Olnes
Casalegno Bros.			Fairbanks
Christainsen, Sam	Gold Hill	Ester	Berry
Connelly, Frank	No. 15 below	Cleary	Chatanika
Cook, Henry	Oregon Asso.	Vault	Vault
Cook, Nick	No. 11 bench	Goldstream	Fox
Dixon, Wm.	No. 15 below	Cleary	Chatanika
Driscoll Brothers	No. 14 below	Cleary	Chatanika
Edmonds & Broadhurst	No. 1 below	Little Eldorado	Eldorado
Erickson & Anderson	No. 3 below	Little Eldorado	Eldorado
Erickson, Chas.	No. 2 above	Wolf	Cleary
Foster, W. H.	Frac. bet. Nos. 11 & 12 below	Cleary	Chatanika
Fraker & Nelson	No. 7 above	Little Eldorado	Eldorado
Froseth, A. C.	No. 7 below	Cleary	Cleary

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Fuller & Dunlap	Crackerjack b'nch	Chatanika River	Chatanika
Griffen & Grille	No. 5 below	Fairbanks	Meehan
Guis, Charles		Gilmore	Gilmore
Guis, Louis	No. 5	Pedro	Gilmore
Hanot, Charles	No. 1 below	Pedro	Golden
Hanson & Nelson	Serpentine Asso.	Chatanika River	Chatanika
Hess, Hans	Eldorado Asso. Middle	Little Eldorado	Eldorado
Hilty, Al	No. 1 below	Cleary	Cleary
Holm, Gust	Gold Hill	Ester	Berry
Holmlund, A. J.	No. 2 tier bench	Chatanika River	Chatanika
Hoover & Larson	Hope Bench	Chatanika River	Chatanika
Housdale & McDonald	No. 3 above	Little Eldorado	Eldorado
Iversón, O.	No. 5 below	Little Eldorado	Eldorado
Johnson, George	No. 13, b., 2nd Tier bench	Cleary	Chatanika
Johnson Ludvig	No. 17	Goldstream	Fox
Kellen & Dalton	Discovery	Little Eldorado	Eldorado
Keys & Sons, E. M.	No. 1	Ready Bullion	Berry
King & Nelson		Pedro	Gilmore
Kleinsmith, Victor	Niggerhead Asso.	Dome	Olnes
Leach, Jack	No. 13 below	Cleary	Chatanika
Leach & Bernard	No. 1 above	Ester	Berry
Leedy, William	No. 4 above	Ester	Berry
Letender, Jack	No. 3 above, Ist Tier	Dome	Olnes
Lokka, Jack	No. 3 below	Dome	Olnes
Maisingseth, M.	Nigger Baby Fraction	Cleary	Chatanika
Martin, M. J.	No. 6 below	Fairbanks	Meehan

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Martin & Blake	No. 15 b. 2d Tier Bench	Cleary	Chatanika
Marx, Guy	No. 9	Goldstream	Fox
Morris, T.	No. 17 below	Cleary	Chatanika
McPike, John	Discovery	Goldstream	Gilmore
Nelson, Frank	No. 1 above	Little Eldorado	Eldorado
Nerland, C. O.	No. 2 above	Dome	Olnes
Oberg & Furland	No. 3 below	Dome Cr'k Bench	Olnes
Parker, Fred	No. 3 above	Fairbanks	Meehan
Pearson & Jacobson	No. 5 below	Fairbanks	Meehan
Quirk, Tom	No. 11 below	Dome	Olnes
Raymond & Carey	No. 11 below	Cleary	Chatanika
Rehn, Theodore		Little Eldorado	Eldorado
Rogge, Leo W.	No. 6 above	Cleary	Cleary
Sagen, Alois	Paystreak Frac.	Ester	Berry
Sather, Martin	No. 12 below	Fairbanks	Meehan
Scannell, Tim	No. 14 b. 1st Tr Bench	Cleary	Chatanika
Schon, C. E.	No. 12 below	Cleary	Chatanika
Sjolseth, J. L.	Top of the Ridge	Ester	Berry
Skoftland, Tom	No. 5 below	Little Eldorado	Eldorado
Smith & McGlone	Mohawk Extension	St. Patricks	Berry
Soderbloom, Gus	No. 15 below	Fairbanks	Meehan
Stewart, Tool, Powell & Williams	No. 18 below	Fairbanks	Meehan
Stutt, George	Gold Hill	Ester	Berry
Sullivan & Olson	No. 1 above	Ester	Berry
Sundine, John	No. 6 below	Fairbanks	Meehan
Takkle, Isaac	No. 4 below	Dome	Olnes
Thompson, A. D.	Steer Bench	Chatanika River	Chatanika
Thomas, Theodore	No. 12	Goldstream	Fox

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Wagner, Henry	No. 6	Goldstream	Fox
Weiss, Sam	No. 14 b. 3d Tier Bench	Cleary	Chatanika
	Hot Springs (Manley)		
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 & Dawson	No. 1 below	Otter	Flat City
Brevis, J. L.		Willow	Flat City
McKinzie & Mathewson		Chicken	Flat City
McMillan, R.	Discovery Bench	Otter	Flat City
Manley, Frank		Willow	Flat City
Rilley & Marston		Otter & Black	Flat City
Strandberg ,Dave	Link, Madden Bench and Upgrade Placer		Flat City

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Welch, Al		Happy	Flat City
	Innoko		
Greer & McNulty		Boob	Cooper
Harling, Tom		Yankee	Ophir
Pitcher & Van Orsdale		Tolstoi	Cooper
Reich, John	No. 5 below	Gaines	Ophir
Schwasball, Andy		Tolstoi	Cooper
Snailey Brothers		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 Corp.			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)		
Anderson, Johnsen & Dahl	No. 1	Fox Gulch	Fortuna Ledge
Betsch, Jean, McGrath & McDonald	No. 1 above	Willow	Fortuna Ledge

TABLE NO. VIII. (Continued).

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Heckman & Webber	Lower Discovery	Willow	Fortuna Ledge
Mack & McKinzie	Upper Discovery	Willow	Fortuna Ledge
Nelson, Nels	No. 4 above	Willow	Fortuna Ledge
Pilcher, George M.		Elephant	Fortuna Ledge
Smith & Giacherio	No. 2 above	Willow	Fortuna Ledge
Waskey, Frank	Bumblebee	Willow	Fortuna Ledge
	Ruby		
Anderson & Johnson	No. 3 above	Long	Long City
Bittle & Lindegarde		Spruce	Poorman
Black & Leveredge	No. 4	Flat	Poorman
Buckley Brothers	Novikaket Asso.	Long	Long City
Cook, Charles		Poorman	Poorman
Coyle Bros. & O'Donnell		Poorman	Poorman
Coyle, John		Spruce	Poorman
Felton, Alex	No. 3	Tenderfoot	Poorman
Gidling & Anderson	No. 2	Bear Pup	Long City
Graham & Walker	Novikaket Asso.	Long	Long City
Hegstrom & Nelson	No. 1	Straight	Long City
Herman & McKinnon	No. 2	Duncan	Poorman
Jones & Lundin	Alabama Asso.	Birch	Long City
Kells, A.	Windy Bench	Long	Long City
Kigbush, Davis & Olson	Hagan Fraction	Poorman	Poorman
LaBelle, Joseph		Tamarack	Poorman
Larson, Alex	No. 1 above	Long	Long City
Matheson, Girlund & Wicl		Spruce	Poorman
Miller & Pike	Wedge Frac. bet. No. 2 & No. 3	Bear Pup	Long City
		Spruce	Poorman
Monahan, John		Flat	Poorman
McCloud, D.	Windy Claim	Poorman	Poorman
Nixon & Manual		Spruce	Spruce
Neihoff, Knute & Ditz			

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Salch, Walker & Ditz	Matcott Bench	Long	Long City
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	Long City
Ward, Drake & Kells	Novikaket Asso.	Long	Long City
Ward & Bishop		Tamarack	Poorman
Willeke, Herman	Surprise Fraction	Poorman	Poorman
Wyman & Balanger	O. K.	Head of Flat	Poorman
Yukon Gold Co.		Greenstone	Long
	Seward Peninsula		
Arctic Mining Co.		Bangor	Nome
Brown, Robert		Sweepstake	Haycock
Candle Ditch Co.	Bully Hill		Candle
Carlson, Gabe		Tundra n'r Nome	Nome
Clark, Harry		Dexter	Nome
Coggins, Bernard		Dexter	Nome
Connely & Jensen		Gold Bottom	Nome
Connelly & Bros., Tom		Dexter	Nome
Cordovado, A. V.	Bessie Bench	Holyoke	Nome
Dakota-Alaska		Boulder	Nome
Fairhaven Mining Co.		Inmachuck R.	Deering
French, A. E.		Jump	Candle
Gewiler & Gloor		Dime	Haycock
Gillette & McMillan		Center	Nome
Gum, Henry		Center	Nome
Gunderson, Lars		Dime	Haycock
Hanson, Olson & Evans		Candle	Candle
Jepson, Carl		Sweepstake	Haycock

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Kronquist ,F. S.		Candle	Candle
Landstrom, A. J.		Little	Nome
Lee Brothers & Halloran		Candle	Candle
Lovell, C. O.		Dime	Haycock
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
Nordlund Brothers		Candle	Candle
Olson Brothers		Dime	Haycock
Olson, Otto W.	Tundra Asso.	Little	Nome
Orhem & Brown		Dexter	Nome
Peterson, Peter X.		Buster	Nome
Pioneer Mining Co.		Little	Nome
Porter, Wallace		Dime	Haycock
Ravenkilda & Jenson		Jess	Nome
Reed, C. T.		Mountain	Nome
Regling & Olson		Dime	Haycock
Roberts, E. A.		Crooked	Council
Rouse, Thomas		Inmachuck R.	Deering
Ryden, A.		Bear	Candle
Smith, Sam		Dime	Haycock
Stewart, A. C.		Sledge	Nome
Stonehouse, John		Buster	Nome
Sunset Mining Co.		Sunset	Teller
Sutton, W. L.		Dime	Haycock
Swanberg & Lee		Osborne	Nome
Valentine & Anderson		Dime	Haycock
Vogel, Charles	Diamond L		Nome

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Warsing, Frank	Diamond L		Nome
Watson, Thomas		Center	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	Valdez Creek via Gulkana
Eberhart & Anderson		Falls	Cache Creek via Susitna
Francis & Foster		Long	Cache Creek via Susitna
Funk, J. C.		Falls	Cache Creek via Susitna
Gage & Mack		Thunder	Cache Creek via Susitna
Giedaken, Wm.		Bird	Cache Creek via Susitna
Gray, John		Treasure	Cache Creek via Susitna
Hamersmith, Charles		Bird	Cache Creek via Susitna
Hansen, Chris		Willow	Cache Creek via Susitna
Harper Brothers		Nugget	Cache Creek via Susitna
Jenkins, Frank		Willow	Cache Creek via Susitna
Kast ,Nelson & Larsen		Poorman	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 Creek Mining. Co (M. A. Ellis, Mgr.)		Thunder-Windy	Cache Creek via Susitna
Valdez Placer Mines Co.		Valdez	Valdez Creek via Gulkana
Van Eiderstein & Zindel		Peters	Cache Creek via Susitna

TABLE NO. VIII. (Continued)

OPERATOR	CLAIM	CREEK	LOCAL ADDRESS
Weatherall & Andersen		Gold	Cache Creek via Susitna
Wolf & Maloche		Spruce	Cache Creek via Susitna
	Tolovano		
Allendale, William		Livengood	Brooks
Craig & McKinnon	Hidden Treasure Asso.	Livengood	Brooks
Crook, Henry	Ready Bullion	Livengood	Brooks
Dooling & Paterson	Discovery Bench	Livengood	Brooks
Johnson & Bostrom	Gold Dollar Asso.	Livengood	Brooks
Jorgenson & Patton	Eldorado Bench	Livengood	Brooks
Kelly, Sampson & Colbert	Gold Dollar Asso.	Livengood	Brooks
Kettleson & Curry	No. 17 above	Livengood	Brooks
Koebach & Eagler	No. 16 above	Livengood	Brooks
Lind, Pierce & Cramer	Gan Association	Livengood	Brooks
Paterson & Finley	Deep Channel Asso.	Livengood	Brooks
Peterson & Anderson	Marriettee Bench	Livengood	Brooks
Peterson & McKinnan	Gold Dollar Asso	Livengood	Brooks
Peterson & Nelson	Virginia Asso.	Livengood	Brooks
Price & Camos	Eagle Bench	Livengood	Brooks
Revis, Nash, Miller & Clausen	Fish Association	Livengood	Brooks
Shaw & Doggett	Sunnyside Bench	Livengood	Brooks
Zuber & Altman	Sunnyside Bench	Livengood	Brooks