TERRITORY OF ALASKA
DEPARTMENT OF MINES

REPORT

OF THE

COMMISSIONER OF MINES

TO THE GOVERNOR

FOR THE

TWO BIENNIA ENDED DECEMBER 31, 1944

Honorable Ernest Gruening,

Governor of Alaska,

Juneau, Alaska.

Sir:

I have the honor to submit to you, and through you to the Seventeenth Session of the Territorial Legislature, in accordance with Section 3, Chapter 80, Session Laws of 1935, the report of the Commissioner of Mines for the two biennia ended December 31, 1944.

Respectfully yours,

B. D. STEWART,

Commissioner of Mines.

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THE DEPARTMENT OF MINES

Administration and General Information

The activities of the Territorial Department of Mines, including the operation of the four public assay and field offices, situated at Ketchikan, Anchorage, College and Nome, are administered under the direction of the Commissioner of Mines at the headquarters office in Juneau. The Commissioner of Mines also cooperates with Federal agencies by acting as district mining supervisor for the Interior Department in connection with the supervision of mining on coal leases and permits; purchasing agent for the Metals Reserve Company in connection with its program of purchasing and stock-piling strategic minerals; emergency coordinator of mines for the War Production Board in connection with the issuance of permits to mine and priorities for the purchase of equipment and supplies; and regional officer for the U. S. Bureau of Mines in connection with the administration of the Federal Explosives Act.

At the headquarters office and at the field offices information on matters relating to mining and mineral resources is disseminated by means of personal interviews and by correspondence. Extensive files of reports on individual mining properties, prospects and small areas, which are based largely on field investigations carried on by the associate engineers, together with a complete library of publications on Alaska issued by the U. S. Geological Survey and U. S. Bureau of Mines, furnish the basis for the information that is disseminated. Consulting service is also available to the various local departments and agencies of the Federal Government and of the Territory. Results of investigations and research on strategic mineral occurrences in interior Alaska and northwestern Alaska have been issued by the Territorial Department of Mines as follows: Pamphlet No. 1, "Strategic Mineral Occurrences in Interior Alaska" by Henry R. Joesting; Pamphlet No. 2, "Supplement to Pamphlet No. 1" by the same author; and Pamphlet No. 5, "Mineral Occurrences in Northwestern Alaska" by Eskil Anderson. These publications have been distributed to interested persons.

During each of the past two biennia the Juneau office was visited by approximately 3,000 persons, all of whom were seeking

information or assistance in matters relating to the mineral industry of Alaska. No accurate record was kept at the field offices, but there were probably more than an equal number of visitors at those offices during the same periods. The visitors included prospectors, engineers and prospective investors who desired authentic information on favorable areas for prospecting or individual properties that might warrant development and financing. The interest during the first three years of the two biennia was in strategic or base metals, but during 1944 the trend of interest has been toward gold and non-metallic mineral properties for post-war development. Inquiries received by mail concerning opportunities for prospecting, mining properties, methods of operation, etc., have continued during the past two biennia at about the same rate as the preceding biennium. Incoming and outgoing mail handled by the Juneau office numbered approximately 8,000 pieces during each of the biennia. Evidently as a result of wide publicity that has been given to the natural resources of the Territory, many requests for information on prospecting and mineral resources were received in 1944 from different sections of the world, a large percentage of which were from men in the military services who are making preliminary plans for post-war vocations. Most of the inquiries were from persons wholly unfamiliar with conditions in the Territory, and to offset any misconceptions they may have concerning the difficulty of discovering and developing mineral deposits, a brief pamphlet on prospecting in Alaska was prepared for distribution late in the year.

There were some war-time restrictions on the distribution of Government maps and bulletins during the past three years and the number sold from the stock that is kept on hand for the convenience of the public at the Juneau office was somewhat less than during previous years. About 2,500 publications were distributed during the two biennia that included Government maps and bulletins, Territorial publications and sketch maps of individual properties prepared by Territorial engineers.

Field Investigations and Mine Inspection

The Act providing a Department of Mines requires a continuing survey of the mineral resources and mining operations of the Territory; dissemination of information with regard thereto;

the safeguarding of the lives and health of miners; protection of investors in the mining industry, etc. This work was carried on during the first biennium by the Commissioner of Mines and three associate mining engineers. Early in the spring of 1943 the services of one of the associate engineers with headquarters at Juneau was lost through lack of funds for his salary and adequate travel funds. His qualifications for the type of work carried on by the Department of Mines were of the highest and the loss of his services was serious. Early in 1944 a second associate engineer with headquarters at College, a highly trained geologist, who had been engaged in experimental geophysical work and other types of geological investigations, also left the employ of the Department of Mines to accept a better position. It has been impossible to replace these two men with their years of experience in Alaska and familiarity with its mining problems. Any new engineer will require years of training before he can attain their efficiency in the positions vacated.

During 1941 an associate engineer made a study of the mineral resources of the Iliamna district and Alaska Peninsula. Geophysical and other investigations were conducted on lode deposits in the Fairbanks and Livengood districts. Reconnaissance surveys were made from the vicinity of Mt. Hayes along the Alaska Range to Ferry, and in the upper Salcha-Chena region.

In 1942 investigations were confined principally to deposits containing strategic and base metals necessary in the prosecution of the war. Examinations of such deposits were made on the Alaska Peninsula, at Nuka Bay, in the Kenai Peninsula chromite area, and in the Ketchikan, Hyder, Wrangell, Petersburg, Fairbanks, Broad Pass and Palmer districts. Geophysical investigations were made of lode deposits in the Fairbanks district and of the chromite deposits at Claim Point on Kenai Peninsula. An engineer also visited the Nome district for a preliminary survey of strategic mineral occurrences on Seward Peninsula. Information on the occurrence of strategic minerals in interior Alaska was compiled from an examination of the records at the College field station and assay office and from other sources and was issued as Territorial Department of Mines Pamphlet No. 1.

Field examinations were continued in 1943 on strategic and base minerals. In southeastern Alaska such deposits were examined in the Ketchikan, Wrangell, Petersburg, Juneau and Glacier

Bay districts. Examinations were made in the interior in the Fairbanks, Fortymile, Wood River and Bonnifield districts. A magnetometer survey to supplement geologic surveys was made of the Gilmore Dome tungsten deposits in the Fairbanks district where outcrops are obscured by overburden. In northwestern Alaska an engineer investigated the molybdenite occurrences on St. Lawrence Island and various strategic and base mineral deposits in the Nome, Candle, Kobuk River and Ungalik River districts. Additional information obtained by recent investigations on strategic mineral occurrences in interior Alaska was incorporated in, and issued as Territorial Department of Mines Pamphlet No. 2, supplementing Pamphlet No. 1.

Petroleum Investigations:

For a number of years prior to 1943 intermittent reports had been received at the field office of the Territorial Department of Mines at Fairbanks, that petroleum seepages hitherto unvisited by white men, and therefore not described in existing geologic reports, were present along the Arctic Coast of Alaska and in the extensive coastal-plain region lying between the ocean and the foothills of the Brooks Range. These reports emanated for the most part from Eskimos of the Point Barrow and bordering regions, and most of them were brought to Fairbanks by Sig Wien, well known Alaska aviator with extensive experience and acquaintanceship in the Arctic regions, who was convinced of their authenticity. Other reports of similar import were conveyed by prospectors returned from exploratory work in the northern sections of the Territory, where they also had come in contact with Eskimos who knew of unreported seepages.

These reports inspired in 1943 the formation by the U. S. Bureau of Mines and Territorial Department of Mines of a reconnaissance expedition to definitely verify them. A small party was organized at Fairbanks and spent much of the late summer and fall of 1943 in carrying on investigations of the areas where seepages had been reported to occur. The party and its supplies were transported by plane with Sig Wien as pilot, whose knowledge of the localities to be visited enabled fast progress to be made in the examinations. Detailed information was obtained at the more important localities. The technically trained members of the party were Dr. Henry R. Joesting, geologist and geophysicist, who

represented the Territorial Department of Mines, and Norman Ebbley, Jr., mining engineer, who represented the U. S. Bureau of Mines.

The joint report on their observations, that was prepared by Joesting and Ebbley, provided the basis for the extensive investigation of the petroleum potentialities of the Alaska arctic region, that is being undertaken by the U. S. Navy.

Investigations were continued in northwestern Alaska during 1944, especially in the Noatak-Kobuk district. As a result of investigations and research, Pamphlet No. 5 entitled "Mineral Occurrences in Northwestern Alaska" was issued. A new industry was started in the Kobuk River area during 1944 as a result of examinations and tests made by a Department of Mines engineer on tremolite asbestos deposits. Samples submitted for testing to a buyer of this type of material revealed that it was of chemical-filter grade, of which there is a shortage for war use. A shipment of several tons of the material was made in 1944 and increasing amounts are desired by the buyer in future years. A crew of Eskimos is employed in developing the asbestos. Considerable interest has been aroused by specimens of jade of jewelry grade obtained in the Kobuk River area by the Department of Mines engineer. Inquiries received indicate that a ready market for good quality material exists.

Safety inspections were made by the Commissioner of Mines and associate engineers at the operating mines visited. Attention was called to unsafe practices where necessary, and in most instances the managements willingly cooperated in their correction. It was necessary to employ the services of an engineer during the entire four-year period on inspections at the coal mines. In spite of close supervision there has been an upward trend in the accident rate at these mines that was brought about by efforts to increase production to meet threatened shortages of fuel. The employment of inexperienced miners always constitutes a hazard, but it was necessary at most of the mines to increase crews and to replace men drafted for military service. The services of supposedly experienced coal miners imported from the States did not prove satisfactory, as they were unfamiliar with conditions peculiar to the mines of Alaska.

Assay Offices

To the three assay offices established by the Department of Mines in 1937, an Anchorage office was added by authority of the legislative session of 1941. Following the necessary preliminary arrangements, the office was equipped and placed in operation in November of the same year. Creation of the Anchorage office at this particular time of increasing interest in the strategic and critical minerals was instrumental in relieving much of the burden which would otherwise have fallen on the assay offices at Ketchikan and College. The office at Nome was forced to close for a period of one year, until the spring of 1943, because of the resignation of the assayer-in-charge to accept other employment. In March of 1943 an assayer-engineer was appointed and the office reopened. However, its function as an assay office was very limited. It served primarily as headquarters from which field investigations in northwestern Alaska were carried on.

The national trend transferring attention from gold mining to the so-called "war minerals" was reflected in the demands made upon the assay offices. Another trend, that of the absorption by various war and defense projects of those persons normally engaged in prospecting, was more than offset by the arrival and instigation of numerous activities of the U. S. Bureau of Mines. Agreement was reached between the Bureau and the Commissioner of Mines whereby a substantial proportion of the assaying required in connection with the Alaskan projects could be performed at Territorial laboratories. A schedule of charges to defray the cost of this work was agreed upon and applied. The appreciable income that resulted was credited to the assay office fund.

As a result of arrangements between the Metals Reserve Company and the Commissioner of Mines, the services of the assay offices at College and Anchorage were also utilized to perform the necessary work in connection with purchasing, assaying, and stockpiling of strategic materials for the Government stockpile. Reserves of chromium, tin, tungsten and antimony ores and metallic mercury were thus acquired for the Federal government with a minimum of expense to the Metals Reserve Company. Stockpiling operations closed on December 31, 1944 after having continued for about twenty-nine months. Apparently, activity in the search for strategic minerals reached a peak during 1943.

The probability that newcomers to the Territory will soon largely augment the number of prospectors and also of mine operators indicates that the assay offices are destined to become even more valuable than heretofore, both in direct aid to development and as a source of information in the Territory.

In the adjoining table are listed the total numbers of determinations made during each of the last four years. The reasons previously mentioned will explain the reduced number of assays made for gold and silver, as well as the greatly expanded demand for chemical determinations of other elements. It will be of interest to note, in judging the actual labor involved, that each chemical determination requires as much time and attention as three or four gold-silver assays. The number of determinations at all assay offices during each of the four years follows:

	1941	1942	1943	1944
Gold-silver	2258	1188	274	512
Chemical determinations	828	1256	2979	2682
Identifications	517	377	414	329*
Totals	3603	2821	3667	3523

*This figure does not include 402 minerals identified in thin section or microscopic study of placer concentrates.

Cooperation with Federal Agencies

Geological Survey:

Cooperation between the Territory of Alaska and the U. S. Geological Survey in supervising coal mining operations in the Territory continued during the past two biennia on the mutually satisfactory basis that has been in effect for many years. Under this arrangement the Commissioner of Mines serves as official representative of the Survey in administering its coal leasing regulations. Effective July 1, 1944 those regulations were amended so as to embrace many provisions that formerly had been applied to coal-mining in the States, but not to operations in Alaska. This cooperative arrangment serves to avoid duplication of personnel and expenses and greatly simplifies the administration of coal-mining regulation both for the enforcing agencies and for the operators.

The following general amendment to the Coal-Mining Operating and Safety Regulations is now in effect, both in the States and Alaska:

"On and after July 1, 1944, the administration of the regulations in this part, save and except for those provisions dealing with inspections for the safety and welfare of miners engaged in mining operation on land covered by coal leases, licenses and permits shall be vested in the Geological Survey, Department of the Interior.

"Effective July 1, 1944, the function of making inspections for the safety and welfare of miners under the regulations in this part providing for such inspections shall be vested in the Bureau of Mines, Department of the Interior.

"The enforcement of the regulations in this part will remain the function of the Geological Survey."

Under these amended regulations the duty of making coal-mine inspections for the Federal Government in Alaska rests with the safety engineer of the U. S. Bureau of Mines, who serves as federal mine inspector, under the coal mine inspection Act that became effective May 7, 1941.

The enforcement of the findings and recommendations made as a result of such safety inspections remains the duty of the Commissioner of Mines, acting as agent for the Geological Survey, to whom detailed reports of safety inspections are periodically presented by the U. S. Bureau of Mines.

Metals Reserve Company:

Strategic Minerals.—Early in 1942 certain ores and metals of which our national supply was deficient were being eagerly sought by the Federal Government in order to maintain production of equipment, ordnance and supplies critically needed by the Army and Navy in the war program. The materials that were most in demand included tin, tungsten, antimony, chrome and mercury.

In order that Alaska might make as prompt and substantial a contribution of these materials as possible and as a stimulus to the search for new and the development of known but unproven deposits, the Commissioner of Mines submitted to Metals Reserve Company, which is the Government's purchasing organization, an offer to serve as its purchasing agent in Alaska and to designate as purchase depots the four Territorial assay offices at Fairbanks, Anchorage, Nome and Ketchikan. This offer was accepted and a

purchase program was initiated during the summer of 1942 which continued until December 31, 1944.

The first step in this program was the establishing of a purchase depot at Fairbanks, where, through the courtesy of the Alaska Road Commission, liberal and secure housing and storage space was made available adjacent to a trunk highway and the railway yards within the city limits. Outside the storage sheds a small but substantially built and efficient crushing and sampling plant was erected. Most of the equipment used in this plant was either loaned or rented by residents of Fairbanks. The plant was designed, assembled, erected and operated personally by A. E. Glover, assayer-in-charge of the Territorial assay office at College, under handicaps of scarcity of materials and severe weather that at times appeared insuperable.

In 1943 a second sampling plant, designed by Leo H. Saarela, assayer-in-charge of the Territorial Department of Mines office at Anchorage, was erected under his supervision near Seldovia to serve in connection with the purchase depot that was established there for acquiring and stockpiling chrome ore.

A replenishable fund in the amount of $10,000 was placed in a Juneau bank from which the Commissioner of Mines was authorized to make payment by check for lots of ore as soon as they were delivered to the purchase depots and the grade of the ore determined by the assayer-in-charge. This fund was later increased to $30,000. Replenishments as needed were made by the Federal Reserve Bank in Seattle on requisitions submitted by the Commissioner of Mines.

Schedules of attractive prices and terms, designed to encourage development and production of the desired materials in the Territory were offered by Metals Reserve Company, under which schedules Alaska producers were given very definite advantage over those in the States. These advantages included substantially higher unit prices for the metals than those that prevailed in the States; absorbing freight charges by making the price schedules apply at Alaska delivery points instead of at treatment plants in the States; by establishing a nominal charge for treatment of ores, and thus avoiding the high cost and manifold difficulties that attend negotiating for the smelting of ores in the States; and by extending the time limit within which the

higher prices offered for Alaska products prevailed beyond similar limits in the States.

Under this program very substantial tonnage of the ores of chrome and antimony; of high-grade ores and concentrate of tungsten; and a few small lots of tin concentrate; as well as large quantities of metallic mercury in flasks, were purchased from numerous Alaska operators and were stockpiled at or near the purchase deposits. Within a period of less than two and one-half years the sum of approximately half a million dollars was paid out to local operators by the Commissioner of Mines, acting as agent for Metals Reserve Company.

War Production Board:

Since September, 1941 the Territorial Commissioner of Mines has served as coordinator of mines in Alaska for the War Production Board. In this capacity assistance has been given mining operators in securing legitimate requirements for their operations through the application of needful priorities.

Effective October 8, 1942 all gold mines in the United States, including Alaska, except those that had been granted serial numbers under the mine preference rating order P-56, were declared to be non-essential operations in the war program and were ordered closed.

In April, 1943 an appeal in behalf of operators of small gold-placer mines in Alaska was filed by the Territorial Commissioner of Mines, asking that a blanket grant be provided authorizing him to issue on behalf of the War Production Board mining permits to such gold-placer operators as would agree to comply with the terms of the grant.

In response to this appeal such a grant was bestowed effective April 27, 1943. Under its terms the permits to be issued by the Commissioner of Mines were valid only for the year 1943 and authorization could be given for the employment of crews of not more than five men. In October, 1943 this grant was liberalized by increasing from five to seven the number of men that might be authorized in a crew and by making the permits valid for an indefinite period.

In February, 1944 the Commissioner of Mines was authorized, under a new grant, to issue similar permits to operators of lode-gold mines in the Territory.

Up to the close of the year 1944 ten Alaska gold-placer operators and three gold-lode operators had received permits to operate with crews ranging in number from 10 to 200 men. Such permits are issued at Washington, D. C. on applications that are first referred to the Commissioner of Mines for verification and recommendation.

As of December 31, 1944 permits to mine gold in Alaska had been issued as follows:

Permits issued	Number of Operators	Number of Employees Authorized
Gold-placers:		
For crews of 5 or more men	44	669
For crews of less than 5 men	42	102
Totals	86	771
Gold-lodes:		
For crews of 5 or more men	9	119
For crews of less than 5 men	2	6
Totals	11	125
All gold mines	97	896

U. S. Bureau of Mines:

In the summer of 1942 there was made available to the U. S. Bureau of Mines by the War Production Board a special fund of approximately $350,000 to be used in exploring and testing certain known Alaska deposits of the strategic minerals antimony, copper, chromite, mercury, molybdenum, nickel, tin, and tungsten. Later these funds were supplemented by allotments to the Alaska work from the U. S. Bureau of Mines appropriations and other sources, and similar exploratory work was authorized and undertaken on deposits of coal, iron and zinc.

The work done by the Bureau of Mines under this program has included diamond-drilling, shaft-sinking, tunneling and trenching, as well as thorough sampling of the deposits.

To a considerable extent the preliminary information with regard to many such deposits in Alaska upon which this exploratory program was based has been obtained by the U. S. Bureau

of Mines from the files of the Territorial Commissioner of Mines, who cooperated fully in making such information available.

The Commissioner of Mines further cooperated in this program by making available to the U. S. Bureau of Mines the services of the four public assay offices that are operated by the Territory. A mutually satisfactory schedule of fees was arranged to cover the cost of this service.

Reference is made elsewhere in this report to the joint exploratory expedition, that investigated oil seepages throughout the Arctic Coastal region in 1943 and the report thereon prepared jointly by a representative of the Territorial Department of Mines and one of the U. S. Bureau of Mines, on which report is based the oil-drilling program that has been initiated by the Navy in that region.

THE MINING INDUSTRY

Record values for the annual output of gold were set in each of the three years 1938, 1939 and 1940. In 1941 early indications were for a continued increase in production. However, the first strong impact of the war on the mining industry came early in the summer of 1941. Large construction programs and abnormally high wages drew men from the mines to various government projects. Accompanying labor difficulties closed several of the major operations in the placer districts in June, 1941. From that time until late in 1942 more and more men and equipment were drawn from the gold mining industry into various defense projects. War Production Board order L-208 virtually stopped gold mining in October, 1942. A few mines, specifically exempted from the effects of the order, remained in operation during the winter. In 1943 production and employment in the industry as a whole reached a new low. The gradual lifting of the War Production Board ban on gold mining resulted in a slight increase in employment during 1944. Present indications are that a gradual increase in the number of active operations will continue in 1945 and that the mining industry will undergo considerable expansion as soon as conditions permit.

During the past four years the search for and development of strategic mineral deposits have become an important phase of

the industry. New mineral deposits have been disclosed, some of which will contribute to future economic development of the Territory.

Alaska holds first rank in the United States in the production of platinum and tin. Important quantities of mercury, tungsten, chromium, antimony, and asbestos have been produced for war-time use.

During 1943 and 1944 Metals Reserve Company, through assay offices of the Territorial Department of Mines, made purchases of mercury, tungsten, chromium, antimony and tin totalling about half a million dollars. Premium prices were paid to Alaskan producers of these metals.

Coal production has increased steadily from about 150,000 tons yearly for several years before 1941 to nearly 350,000 tons in 1944. Increasing civilian and military needs resulted in serious coal shortages during the winters of 1942-3 and 1943-4. Continually increasing production facilities have now apparently alleviated any immediate danger of further serious shortages.

Future of the Industry

As soon as war-time restrictions can be removed and men and materials again become freely available, the revival of mining in the Territory undoubtedly will be rapid.

Restoration of activity will be most prompt and complete in the gold-mining industry, the condition of which has profound effects in all parts of the Territory.

Most of the gold mines that were productive prior to their closing down in 1942 are being maintained in a standby condition and operations will be resumed promptly when existing restrictions are removed or are sufficiently relieved.

Widespread and keen interest in the opportunities and attractions still afforded in the exploration and development of the extensive gold fields of the Territory is evident. New gold-mining enterprises of major proportions, both in the field of lode and placer operations, have already been initiated and the equipping and manning of them will proceed as rapidly and extensively as conditions permit.

Every mail brings to the office of the Commissioner of Mines inquiries as to mining opportunities in the Territory, particularly to gold mining. These come from prospective investors as well as from workers in war industries in many states and from soldiers, not only throughout the States and Alaska, but at many foreign war fronts and stations. Many of these inquirers have families and most of them announce their fixed intention of coming to Alaska to make their homes after the war and their choice of mining as a vocation when they reach here.

A favorable future for the gold-mining industry appears certain.

Although the supply of most ores and metals that have been listed as strategic or critical by the War Production Board during the past three years, including antimony, chrome, tungsten and mercury, was regarded as sufficient for anticipated military and civilian needs and their purchase from domestic sources by the Government ceased on or before December 31, 1944, some of them already are again in demand. As a result of unforeseen military requirements, shortages already have developed in supplies of both antimony and mercury. Alaska can furnish significant quantities of both of these materials and may again be called upon to do so before the war ends.

Although quite extensive testing operations conducted by the U. S. Bureau of Mines during the past two years has failed to demonstrate deposits of tin-bearing material of sufficient extent and adequate richness to justify establishing a tin-mining enterprise in northwestern Alaska, the results of the work are reported to be sufficiently encouraging to warrant continued exploration of lode-tin occurrences at one locality on Seward Peninsula. Recent studies conducted at the Territorial assay office at Fairbanks on the contents of placer concentrates from many scattered localities in the Territory show the hitherto unsuspected presence of significant percentages of tin in regions where it has not been known to occur. The results of this research give encouragement to the belief that tin-bearing ores may be of more widespread occurrence than heretofore has been thought and that prospecting for the material in regions other than those where it already has been reported may be warranted.

Similar research will continue to be undertaken by the Territorial assayers and engineers to determine whether other rare minerals of high value, such as beryl, columbite and tantalite occur in the Territory and if so at what localities.

There are in Alaska many known bodies of ores of the "non-ferrous" group of metals, which includes copper, lead and zinc. Some of these known deposits are of major proportions. The prevalence in almost every principal section of the Territory of geological conditions favorable for the occurrence of deposits of ores of the non-ferrous group affords assurance that new and important discoveries of such ores may be anticipated with confidence. A mounting scarcity of the metals of the non-ferrous group appears to be developing as a result of the long-continued heavy drain on existing reserves that the prosecution of the war has required. A continuance of this trend, or more favorable economic and transportation conditions, may be expected to bring about the development of Alaska deposits of these most useful ores.

Likewise the removal of war-time restrictions on plant construction for steel-making, and of other existing obstacles to the establishment of that industry, may be expected to encourage the development and utilization of the large bodies of iron oxide ores that are known to occur on Prince of Wales Island in southeastern Alaska. These deposits have been thoroughly explored and tested by the U. S. Bureau of Mines, whose field parties have been continuously at work during the past two years, delimiting the boundaries of the various ore bodies and determining the grade and purity of the ores. The anticipated post-war expansion of the steel-making industry on the Pacific Coast will quite certainly result in the utilization of Alaska iron ores.

Also the establishment in southeastern Alaska of pulp and paper mills, which perhaps is more imminent than that of steel mills, will require a large tonnage of sulphur, the raw material for the production of which will probably be pyrite, which is the sulphide of iron, and which occurs in large bodies at several localities in southeastern Alaska.

Production of industrial minerals, otherwise referred to as non-metallic minerals, is a type of mining that heretofore has received but scant attention in Alaska yet it is entirely possible

that the value of the output of such materials in the Territory may one day rival that of metallic minerals.

The industrial minerals include many types of building materials such as marble, dimension stone, crushed and broken stone, sand and gravel, slate and cement materials; abrasives, such as garnet, silica sand, volcanic ash and pumice; asbestos; barite; mineral pigments, such as chrome, ochers and umbers; mineral fillers, such as asphalt; clays, used in the manufacture of brick, tile, pottery and china ware; graphite; mica; gypsum; limestone; heat and sound insulators; mineral fertilizers, such as nitrates, phosphates and potash; precious and semi-precious stones; sulphur; talc; and others of lesser importance.

Many of these materials are known to occur in Alaska and a few, including gypsum, limestone and marble, have in the past been mined and quarried in large quantities in the Territory and shipped to the Pacific Coast states where a market for them then existed.

The output in Alaska of sand and gravel, large quantities of which have been used on construction projects at air fields, military bases, and on highway construction, is included for the first time by the U. S. Bureau of Mines in its report on the production of mineral substances in the Territory for the years 1943 and 1944. Already it forms a major item in that list.

As the population of the Territory increases, local markets for such industrial minerals as occur here will develop and expand and local industries of various types and size, based upon their use, will arise and grow.

During the past three years the output of coal in the Territory has been governed largely by the requirements of military establishments and projects, which have been such as to necessitate more than doubling the production within that period.

The present outlook is that the peak of this demand for coal is passed and that, until a population increase sets in, production will remain approximately at its present level. Imported fuel-oil is offering increasingly serious competition to coal, particularly for household use, even in communities adjacent to the coal fields. Lowered costs of production of coal and more careful preparation

of the product will be necessary in order successfully to meet this competition.

The coal deposits of Alaska are surprisingly widespread in their occurence and of great extent. They include all classes of coal, from lignite to anthracite and embrace so-called "smokeless" and coking varieties.

There is growing evidence that the northern coastal region lying between the Brooks Range of mountains and the Arctic Coast may prove to contain the most extensive and valuable coal deposits in Alaska. The coal-bearing formations in that region are flat lying and of vast extent. Samples that have been taken at scattered localities where coal outcrops occur indicate the presence of coals of high rank and great purity.

Contrary to formerly published findings on geological conditions affecting the occurrence of oil in the Arctic coastal region of the Territory, it now appears, as a result of investigations conducted jointly in 1943 by the U. S. Bureau of Mines and the Territorial Department of Mines, that there is sound basis for the belief that the region may contain important petroleum deposits. The results of the drilling program that has been initiated by the U. S. Navy in order to verify that belief are being awaited with keen interest. If favorable, they may have profound effects on the economy of Alaska.

Lode Mining

The number of active lode mining properties in the Territory decreased from 126 in 1941 to 34 in 1943. Forty-eight properties were active in 1944, but the total employment and production in that branch of the industry decreased steadily each year from 1941 to 1944. An order by the War Production Board in October, 1942 closed most of the gold lode operations. The Alaska Juneau Mine was excepted from the effects of the order, but gradually cut down its crew, finally shutting down completely in April, 1944 because of a War Labor Board ruling upholding a union demand for increased wages. After relaxation of the War Production Board ban, several gold lodes were reopened. The Cleary Hill Mine near Fairbanks and the Independence Mine in the Willow Creek district near Anchorage were the largest gold lodes in operation in the Territory at the end of 1944.

No ores chiefly valuable for their content of lead, copper, or silver were mined during the four-year period from 1941 to 1944. However, substantial amounts of these metals were produced as by-products in the treatment of ores whose greatest value was in the gold contained.

A greater diversity of minerals has been produced in Alaska during the present war period than ever before. Prospecting for strategic minerals has also disclosed deposits of valuable minerals which have not been mined, but which represent sources of mineral production in the future.

Antimony has been produced from a number of deposits in the Fairbanks and Kantishna districts in interior Alaska and there are many properties, in various sections of Alaska, capable of producing limited quantities of antimony in the future.

During the year 1940 significant production of mercury was commenced after many years during which the known cinnabar deposits of Alaska were unproductive. Production continued during 1941 and 1942 with a crew of from 5 to 12 men employed at the Red Devil property in the central Kuskokwim region near Sleitmut. In 1943 the New Idria Alaska Quicksilver Company of California acquired control of the property, installed a Gould 25-ton rotary furnace, and operated the mine during that year and in 1944 with a crew of from 12 to 20 men. The mine was shut down in 1944 because of a sudden drop in the price of mercury.

In 1942 the Decoursey Mountain Mining Company began production of mercury from another cinnabar property in the same general region. About five men were employed for three years and several hundred flasks of mercury were produced. Other cinnabar deposits have recently been found in the Kuskokwim region and it is probable that further discoveries of importance will be made.

The Chrome Queen Mining Company began development of a chromite deposit on Kenai Peninsula in 1942 and during 1943 and 1944 a very substantial tonnage of chromite was mined and sold to Metals Reserve Company. A crew of from 5 to 12 men was employed. Large-scale development work continued on the Red Mountain deposits, also on Kenai Peninsula, from 1941 to 1943 with 50 to 60 men employed during much of that time. No

production was made and in 1944 a maintenance crew of a few men was kept on the property. Several of the Kenai Peninsula chromite deposits are known to be of commercial grade and extent They form a valuable reserve of this important commodity which can be made available with relative ease if and when the demand is sufficient to justify the development and mining expense involved.

Tungsten deposits in two widely separated parts of Alaska were developed and became producing mines in the period between 1941 and 1944. The Cleary Hill Mining Company began development work on the Gilmore Dome tungsten deposit near Fairbanks in 1942 and sold substantial amounts of scheelite ore and concentrates during 1943 and 1944 to the Metals Reserve Company at Fairbanks. A large amount of development work has been done in the immediate vicinity of the Cleary Hill tungsten property and extensions of the scheelite-bearing zone have been uncovered. The scheelite occurs mainly in replacement-type deposits in beds of limestone and calcareous schist. The deposits are irregular in shape and tenor, but in the aggregate considerable amounts of ore are present. In June of 1944 the company suspended tungsten operations and resumed mining and milling at its nearby gold property.

Near Hyder in southeastern Alaska the Riverside Mine, previously operated as a gold-silver-lead mine, began production of tungsten ore in 1941. A crew of from 4 to 27 men was employed for four years. The mine was the only tungsten lode still in operation in the Territory at the end of 1944. Concentrates from the ore were sold to purchasers in the continental United States

The first commercial production of tremolite asbestos from Alaska was made by the Arctic Circle Exploration Company in 1944 from the Kobuk River region of northwestern Alaska. Tremolite of the type and purity found in that region is scarce and in demand, particularly for use as a filter in the chemical industry In the vicinity of Shungnak, north of the Kobuk River, scattered deposits of tremolite and chrysotile asbestos occur within a zone about 40 miles long and 5 to 20 miles wide. Further development of deposits of both tremolite and chrysotile is planned for 1945.

A mineral found in association with the asbestos-bearing rocks is the nephrite variety of jade. Material of gem quality ha

been found in streams as float and in bedrock. If enough of the gem material is found, the jade may provide the basis for a small and interesting native industry.

Placer Mining

With the approach of war-time conditions, placer mining in 1941 began a swift decline from the peak production and employment reached in 1940 (Table II). The lowest number of active operations and the lowest number of men employed was reached in 1943. In 1941 there were 554 active placer operations employing about 3925 men, while during 1943 there were 142 active placer mines employing 480 men. The number employed during 1944 rose again to 632 men working on 203 separate placer operations. During 1941 and 1942 the heavy demand by defense industries for dirt-moving equipment and labor caused the decline in placer mining. The War Production Board order closing most gold mines in October, 1942 brought the industry to its lowest ebb. Relaxation of the War Producton Board order in 1944 permitted some of the miners to resume operations, but shortages of men, equipment, and supplies prevented any rapid improvement of the situation.

In 1941 there were 50 dredges in operation, in 1942 there were 32, and in 1943 and 1944 ten were active, including the platinum-producing dredge of the Goodnews Bay Mining Company. Five dredges operated during 1944 on Seward Peninsula, three in the Yukon Basin and two in the lower Kuskokwim region. Mechanized plants were mainly bulldozer and hydraulic operations. Most of the draglines in the interior were being used on defense projects, but a few were still active in 1944.

Although Alaska produces nearly all of the tin mined in the United States, the output is very small. Production, which has come mainly from one small property near Cape Prince of Wales at the westerly tip of Seward Peninsula, became negligible after 1941 when that operation was discontinued. Small quantities of high-grade tin concentrates produced in the Hot Springs and Ruby districts of the Yukon Basin and from Cape Prince of Wales were sold to the Metals Reserve Company. The occurrence of placer tin is known at several other widely separated localities in Alaska, but no production has been made from these sources.

From 1942 to 1944 an extensive drilling program was carried out by the U. S. Bureau of Mines to determine the tin reserves in the Cape Prince of Wales and Lost River areas near the tip of Seward Peninsula. Placer drilling of several streams near Cape Mountain and diamond drilling on lodes at Lost River and Cape Mountain were very nearly complete at the end of the 1944 season.

In Alaska are found the only important deposits of metals of the platinum group in the United States. The large-scale production of platinum metals, begun in 1935, continues in the Goodnews Bay region near the mouth of the Kuskowim River. A large dredge and a dragline were operated during the four years from 1941 through 1944 and as platinum has been considered a strategic mineral the operation was not hampered by the war-time restrictions imposed on gold mining companies. During the past four years production from this district has continued at a high and uniform rate. As a result of this large Alaska output the United States has maintained a high rank among the world's producers of platinum. Dime Creek in the Koyuk district on Seward Peninsula continued to yield a small output of placer platinum. This stream has been a minor source of the metal for many years.

Coal Mining

Within the past two biennia the annual tonnage of coal produced in Alaska has more than doubled, and within the same period the total value of the annual output has more than quadrupled. This is because the average price per ton, f.o.b. mine, as well as the tonnage, has more than doubled.

The total coal output for the calendar year 1940 amounted to 173,850 tons, of which the estimated value per ton at the mine was $3.49.* The total output for the year 1943 amounted to 300,000 tons with an average value per ton of $7.10.†

During the year 1944 production amounted to approximately 350,000 tons. Authentic information on the average price received for coal during that year is not yet in hand as this is written. It is certain, however, that the value per ton was equally

*—U. S. Bureau of Mines, Minerals Yearbook, 1941, p. 826.
†—U. S. Bureau of Mines, Table I.

as great as in 1943, and probably it was greater. It is known that under some contracts as much as $10 per ton, f.o.b. mine, was allowed for bituminous coal of high rank.

In the fall of 1942 an underground fire in the workings on No. 3 Seam in the Suntrana mine of the Healy River Coal Corporation, in the Nenana coal field, got out of control and, as a result of an explosion of accumulated gas generated by the fire, spread to the main haulageway, to the old workings on No. 2 Seam West and to the fan-tunnel which conducted the ventilating current into the mine from the main fan on the surface . As a result of this disaster the Suntrana mine, which theretofore had been the largest producer in the Territory and upon which dependence had been placed for the greatest percentage of the output necessary to meet the emergency needs of the winter, which was then at hand, was forced to close down temporarily. Fortunately, it was possible for the operator of the mine to open promptly new workings from the surface on a series of coal seams that lie underneath those on which the main Suntrana mine had been opened and whose outcrops are adjacent to railway tracks in the Suntrana yards. These measures, together with prompt and effective work in controlling and sealing off the fires in the workings of the main mine, averted what otherwise might have been a disastrous fuel famine in interior Alaska. As an additional means of safeguarding military needs a very large tonnage of coal was shipped from the eastern States by the Army and was distributed and stored along the Alaska Railway line northward from Seward.

In order to achieve the objective of doubling during 1943 the production of the previous year, a Coal Commission, composed of officers of the Quartermaster Corps of the Army recruited in the States, was assigned to the Alaska Department by that agency with headquarters at Anchorage. This commission was given broad emergency powers of control over all coal mining operations in the Territory that was exercised in various ways during the years 1943 and 1944.

Investigations were conducted of several outcrops of large coal veins in the Nenana field that lie within a few miles of the Railroad and that afford opportunity for obtaining quickly relatively large tonnages of coal by open-pit excavations at the surface.

Under Army contract two such surface pits were opened. One of these is situated about 5 miles west of Healy Fork station, from which point a road was constructed to the site and approximately 26,000 tons of subbituminous coal was excavated by means of heavy mechanical equipment, transported to the railway by truck and shipped to Army bases. The quality of the coal proved to be inferior and the project was abandoned.

The other pit was started on an outcrop of one of the beds of the Suntrana series near the easterly boundary of the leasehold of the Healy River Coal Corporation and adjacent to Alaska Creek, a northerly tributary of Healy River. Operations at this pit, which are also conducted under Army contract, have been quite successful and still continue to supply a substantial tonnage.

Another project for quickly increasing output was at the Costello Creek coal mine in the Broad Pass district. Preparatory to enlarged operations at this mine, a power line was constructed leading to the property from the hydro-electric plant on the West Fork of the Chulitna River several miles distant that served the Golden Zone metal mine. With funds procured on loan from Federal sources there was acquired and delivered at the property plant and mine equipment, including shaking conveyors, with which it was planned to produce from two flat-lying seams of clean and high-grade subbituminous coal that had been partly developed, about 200 tons per day. However, a diamond-drilling program that had been conducted in the meantime by the U. S. Bureau of Mines, demonstrated that glacial erosion had removed the coal seams from much of the area beneath which mining operations were to have been conducted. This revelation, along with an unusually deep fall of snow that blocked the auto-truck road leading to the mine from Colorado Station on the railroad about 10 miles distant, lead to the abandonment of the entire project in the winter of 1943 before production was started.

A fourth project that was sponsored by the Coal Commission in the effort to quickly double production was the financing, equipping and providing engineering advice and management for the Buffalo Mine in the Moose Creek district of the Matanuska field. This mine during previous years had been opened and developed on a very small scale by its discoverer, Frank Colobuffalo and partners. Their work had demonstrated the presence

of a series of valuable seams of high-grade bituminous coal at the site of their workings. However, that section of the field is extensively faulted and there has been much uncertainty as to the continuity and regularity of these seams. Under a project designed to dispel this uncertainty that was initiated in 1942 by the Territorial Commissioner of Mines, with the assistance of then Delegate to Congress, A. J. Dimond, the U. S. Bureau of Mines undertook a diamond-drilling program, which by the summer of 1943, had assured very large reserves of coal in a continuously minable block on the Buffalo property.

The Army Commission's plans contemplated rapid development of the mine to achieve quickly an output of at least 200 tons of coal per day. Camp and mine equipment, which included shaking conveyors for use in driving gangways on the lower level of the slope workings, were provided, erected and installed during the fall and winter of 1943. Operation of the shaker-conveyor equipment over a period of many months demonstrated that the type chosen was unsuited for the use to which it had been put under conditions that exist at the Buffalo property. These include steeply pitching beds, minor faults, and other disturbances of the alinement of the beds. With the methods and equipment used, the maximum production achieved by the Buffalo Company, owners and contract operators, up to the end of the year 1944 was less than half the amount that had been planned . By that date coal requirements had substantially diminished and the Army accordingly relinquished its sponsorship of the Buffalo enterprise and canceled its existing contract for coal from that source.

The largest increase in production of coal within the four-year period from 1941 to 1944, inclusive, was made by the Jonesville mine in the Matanuska field, where washed bituminous coal is produced. Within that period the output of the mine was increased to 86 percent above that of the year 1940. Management of the Jonesville mine during the period within which the property was equipped and developed for this achievement was vested in an associate engineer of the Territorial Department of Mines, Harry L. Fieldler, who, on request of Army officials, was granted a leave of absence from his official duties with the Territory in order to undertake and carry out the task. During the period of this incumbency notable repairs and permanent improvements were accomplished in the surface plant and washery, as well as in the

underground workings, and a larger reserve of developed coal than had ever before existed in the mine was built up through vigorous advance development work in the gangway and associated workings.

A uniform and substantial production of coal has been maintained at the Government-owned Eska mine in the Matanuska field during the past four years. This mine is operated by the Alaska Railroad and the output is used almost exclusively for locomotive operation on the railway. Outstanding improvements during the four-year period include the erection of a modern washery, a new power plant and a large dormitory and mess-hall that comfortably accommodates the large crew engaged.

Underground fires and their after effects have seriously handicapped production at the Suntrana mine in the Nenana field throughout much of the past two biennia. Much of the output of the past two years has come from new workings, referred to as the Hill mine, that have been driven on an underlying series of beds adjacent to the main Suntrana mine and lying between it and Healy River. The development of these new workings, along with intensified development in certain sections of the old mine since the underground fires were brought under control and effectively sealed off, have enabled the owner, the Healy River Coal Corporation, to maintain its output at such a level as to supply satisfactorily the needs of its principal market, which is Fairbanks and adjacent regions. Production by this company in 1944 was somewhat less than in each of the three previous years, but was greater than in 1940 or any previous year.

Operations on a very small scale were resumed in 1941 at the Premier mine on Moose Creek in the Matanuska field. These operations were commenced by the Anchorage Coal Company on the Premier series of beds between water level in the old slope workings that had been permanently flooded in 1933 and the surface outcrops. About 15,000 tons of high-grade bituminous coal was recovered from these workings within the period of renewed operations which terminated in August, 1943.

The problem of carrying out rapidly and successfully the program for adequately augmenting the output of coal in the Alaska Railroad belt was rendered very difficult by the existence of great handicaps. Foremost among these was lack of experienced

In submitting an estimate for this requirement it is contemplated that in order to make its provisions apply more satisfactorily to changed conditions and their requirements, amendment of the existing law may be desirable.

It is further suggested that consideration be given by the Legislature to the advisability of providing for other forms of assistance to returning soldiers to whom some form of mining activity and training would afford the most desirable and effective means of establishing a self-supporting civilian status. Camps for training prospectors and miners in regions known to be mineralized where training could be given in the practical application of methods taught by qualified instructors are suggested. Camps of that type were successfully operated for a period of several years prior to the war in British Columbia, whose Provincial Legislature appropiated for use during the year 1944 the sum of $50,000 to be expended in providing grubstakes and transportation to prospectors.

Where used as a means of assisting returning soldiers, measures of the above type might be undertaken as cooperative projects administered by the Territorial Department of Mines with personnel drawn from its own staff, adequately enlarged, and from the faculty of the University of Alaska so far as feasible, but otherwise largely financed by the Federal Government somewhat as have been agricultural projects carried on by the University of Alaska under applicable laws. Legal authority for the Commissioner of Mines to negotiate cooperative arrangements with Federal agencies in matters beneficial to the mining industry has been given in Section 6, Chapter 79, Session Laws of Alaska, 1935.

Geologic Maps and Reports

Valuable geologic maps and reports were furnished to the prospector and field engineer, over a period of many years, by the U. S. Geological Survey. Prior to the war inadequate supplies were available due to lack of funds for reprinting and many excellent maps and reports were out of print. With our entry into the war even greater restrictions were imposed, for security reasons, and as a result very few have been obtainable. Considering the diminishing stock of these valuable references and the greatly enlarged demand and need for them it is evident that immediate steps should be taken to replenish the supply.

If furnished with adequate funds and authority to employ the necessary help, many reports and maps of small areas not covered in Geological Survey publications could be prepared by the Department of Mines from its files of unpublished reports. Other information supplementing that obtained and published by the Survey could also be prepared for general distribution.

Safety Measures

Indications are that gold and other metal mining will be resumed on a scale equal to or exceeding that which existed before the present war-time restrictions became effective. The former experienced employees are scattered far and wide and the majority of operators will be compelled to employ new crews who may be unfamiliar with conditions and with safety measures. This will create hazards that must be met by close supervision and inspection, and by accident prevention training programs, if the accident rate is to be kept at a minimum. It is the duty of the Department of Mines to carry on inspections and to enforce compliance with Territorial regulations governing safe mining practices and the protection of the health and safety of miners It will therefore be necessary to include in the staff of the Department men well qualified for this type of work. Safety training programs, including courses in first aid and mine rescue, are carried on by the U. S. Bureau of Mines. The staff of that Bureau now stationed in the Territory for this purpose is limited to only one man whose duties also include those imposed by the Federal Coal Mine Inspection Act and the Federal Explosives Act. It is evident that the present staff will be insufficient to meet the needs for safety training when normal mining operations are resumed.

Transportation

Gradual additions and improvements to the existing transportation systems of the Territory are essential, not only to the mining industry, but to the general welfare of Alaska as a whole. The past two biennia have witnessed the construction and improvement of many miles of new roads and numerous landing fields, all of which will stimulate and aid the search for, and development of, mineral wealth. However, the need for additional road building is obvious when the comparative isolation of many of the Territory's most promising mining districts is considered. As a means of lowering operating costs, no other single factor will accomplish

as much. Exploitation of industrial minerals, which would serve to encourage local industries, might result from improved transportation facilities. Adequate roads and reduced costs are critical factors when applied to utilization of the industrial minerals, most of which possess relatively low unit value.

Development of an abundance of cheap hydroelectric power in Washington, Oregon and California, together with the practicability of its utilization by electro-metallurgical and electrochemical industries, presents an opportunity to Alaska for future expansion of its mining industry to include production of the mineral raw materials required by those new industries. Many such materials do not exist in the western States. If obtainable in Alaska, certain of them might well compete with those now requiring importation from foreign ports by steamer or that involve transcontinental rail deliveries. Except for those deposits ideally situated on the coast, the only possibility for profitable development of others will depend largely upon cheap transportation to tidewater. In the past very little attention has been given this possibility, but the interest being expressed at the present time indicates the need for more thought and planning.

PRODUCTION

The trend of Alaskan mineral production from 1941 to the end of 1943 is displayed in the following table. Complete statistics are not yet available for 1944, but it is indicated that the total production for that year will be about 75 percent of the 1943 production. As has been noted elsewhere, the gold output of the industry was adversely affected by the imposition, on October 8, 1942, of the Federal limitation order and by the shift of labor and equipment to war-time construction projects. Increased requirements resulted in a record production of strategic minerals for export and emergency stockpiling, and the value and amount of coal mined advanced to a record high. Additional increases, on which accurate and complete figures are difficult to obtain, were noted in the use of sand, gravel and stone.

Preliminary estimates of production for 1944, as released by the U. S. Bureau of Mines, place a value of $1,779,400 upon the gold marketed during that year. Value of coal produced during the year will undoubtedly exceed that of gold for the first time in the history of mining in Alaska.

TABLE I
Mineral Production of Alaska, 1941-1943

Product	1941 Quantity	1941 Value	1942 Quantity	1942 Value	1943 (subject to revision) Quantity	1943 (subject to revision) Value
Antimony ore (concentrates) ..... short tons	*	*	*	*	*	*
Arsenic ..... short tons	†	†	†	†	†	†
Chromite ..... short tons	.....	.....	.....	.....	*	*
Coal ..... short tons	233,960	$ 944,588	260,893	$ 1,623,264	300,000	$ 2,130,000
Copper ..... pounds	144,000	16,992	44,000	5,324	54,000	7,020
Gold ..... troy ounces	695,467	24,341,345	487,621	17,066,735	99,583	3,485,405
Lead ..... short tons	662	75,468	415	55,610	200	30,000
Mercury ..... flasks (76 pounds)	*	*	*	*	786	153,435
Ores (crude) etc.						
Copper ..... short tons	144	‡	.....	.....	8	‡
Dry and siliceous (gold and silver) ..... short tons	4,480,364	‡	2,816,668	‡	1,483,519	‡
Platinum metals (crude) ..... troy ounces	24,800	1,078,000	*	*	*	*
Sand and gravel ..... short tons	530,997§	87,116§	*	*	*	*
Silver ..... troy ounces	191,552	136,193	119,704	85,123	42,788	30,427
Stone ..... short tons	.....	.....	.....	.....	*	*
Tin (metallic equivalent) ..... short tons	52	*	*	*	*	*
Tungsten ore (60-percent concentrates) ..... short tons	.....	.....	*	*	.....	.....
Miscellaneous¶	.....	129,678	.....	1,258,204	.....	3,489,498
Total value, eliminating duplications	.....	$26,809,380	.....	$20,094,260	.....	$ 9,325,785

*—Value included under "Miscellaneous."
†—Figures not available.
‡—Not valued as ore; value of recoverable metal content included under the metals.
§—"Government-and-contractor." Value of "Commercial" included under "Miscellaneous."
¶—Includes minerals indicated by "*" and "§" above.

NOTE: Above statistics compiled and furnished by Mineral Production Section, Economics and Statistics Branch, U. S. Bureau of Mines.

MINING OPERATIONS

Distribution by judicial divisions of active mining operations of various types during each of the past four years, and the average number of men employed, are displayed in the following Table No. II. This table is self-explanatory and shows a decrease from 1943 to 1944 of the number of men employed in the first and third divisions which contain the principal lode mines of the Territory. On the other hand, increases are shown in the number of men employed in the second and fourth divisions which contain the most important placer operations.

TABLE II

Active Mining Operations by Divisions

	1941		1942		1943		1944	
	No.	Men	No.	Men	No.	Men	No.	Men
First Division:								
Lode	31	1,094	23	590	4	324	5	289
Placer	2	9	.....	.....	.....	.....	.....	.....
Non-metallic	1	20	.....	.....	.....	.....	.....	.....
	34	1,122	23	590	4	324	5	289
Second Division:								
Lode	7	11	2	2	4	4	4	27
Placer	120	1,138	75	535	57	205	58	225
Coal Permit	1	1	1	1	1	1	1	1
	128	1,150	78	538	62	210	63	253
Third Division:								
Lode	35	515	27	331	9	144	11	47
Placer	67	298	46	169	16	36	22	51
Coal Mines	5	149	5	169	7	243	5	285
	107	962	78	669	32	423	38	383
Fourth Division:								
Lode	53	178	51	142	17	57	18	83
Placer	365	2,476	265	1,518	69	239	121	356
Coal Mines	2	68	3	79	2	94	3	102
	420	2,722	319	1,739	88	390	142	541
Totals	689	5,956	498	3,536	186	1,347	248	1,466

EMPLOYMENT AT MINES

The total number of men employed at all mines in the Territory during any year for which records are available reached an all-time low in 1943. Reasons for this decrease in employment have been discussed elsewhere. The only steady increase in employment during the past four years was at the coal mines. The number of men employed at placer mines in 1944 increased by approximately 18 percent over the number employed in 1943, but there was a continued decline in employment at lode mines. The following Table No. III shows the trend of employment in the mining industry from 1914, the first year for which records are available, through 1944:

TABLE III

Employment at Mines, 1914 to 1944, Inclusive

Number of Men Employed at:

Year	Placers	Lode Mines and Milling Plants	Coal and Other Mines	Totals
1914	4,400	3,500	140	8,040
1915	4,400	3,850	160	8,410
1916	4,050	4,200	340	8,590
1917	3,550	3,220	270	7,040
1918	3,000	1,897	400	5,297
1919	2,180	1,757	310	4,247
1920	1,990	1,880	360	4,230
1921	2,150	1,681	400	4,231
1922	2,198	1,623	280	4,101
1923	2,080	1,500	270	3,851
1924	2,500	1,978	175	4,653
1925	2,700	1,745	116	4,561
1926	2,332	1,663	108	4,103
1927	2,325	1,930	114	4,141
1928	2,234	1,668	109	4,011
1929	2,354	1,605	89	4,048
1930	2,220	1,502	98	3,820
1931	2,163	1,323	78	3,564
1932	2,180	1,496	78	3,754
1933	2,063	1,246	68	3,377
1934	2,195	1,451	79	3,725
1935	2,323	1,665	89	4,077
1936	2,605	1,867	105	4,577
1937	3,136	1,957	92	5,185
1938	3,470	2,071	218	5,759
1939	3,928	1,986	229	6,143
1940	4,240	1,974	149	6,363
1941	3,965	1,805	218	5,988
1942	2,175	1,065	249	3,489
1943	556	581	312	1,449
1944	658	489	393	1,540

ACCIDENTS AT MINES

Accidents cause human suffering and financial loss. Constant care is necessary to avoid them. The prevention of accidents is best accomplished by close cooperation between the operator of a mine and his employees. It is the duty of the management to provide safe working conditions, and competent, strict and continuous supervision of safety practices. The employee should perform his work carefully and should constantly avoid acts that endanger himself and fellow employees. Accidents and employment at the various types of mines are shown for each of the four years covered by this report in the following tables numbered IV and V.

The accident frequency rate is the number of accidents per million man-hours of employment and is given for Alaska in order that a comparison may be made with the rate for the United States or any individual mining district or state. Comparison of the rate for Alaska with that of the United States as a whole, at all metal and non-metal mines, is given in Table VI. The rate for lode-gold mines in Alaska for the past ten years is shown in Table VII. The number of man-shifts, fatal and non-fatal accidents, and time lost in mines of various types in Alaska, in each year for which records are available, are indicated in Table VIII.

TABLE IV

Summary of Accidents and Employment at Mines in Alaska 1941—1942

(1941)

Number of Mines	Group	Number of Men Employed	Number Shifts Worked	RESULTS OF ACCIDENTS Fatal	Serious	Slight	Total Time Lost (Days)
	PLACER MINES:						
50	Dredges	1,741	372,092	0	42	109	1,978
53	Draglines	683	102,450	0	0	0	0
215	Hydraulic	971	97,100	0	0	0	0
248*	Others	570	85,500	1	0	0	0
566		3,965	657,142	1	42	109	1,978
7	**COAL MINES:**						
	Underground	155	38,173	0	12	20	531
	Surface	63	16,606	0	2	4	99
7		218	54,779	0	14	24	630
	LODE MINES:						
120*	Metal	1,429	417,590	1	94	205	4,694
1	Non-metal	20	3,051	0	0	0	0
121		1,449	420,641	1	94	205	4,694
	MILLS:						
49*	Metal	356	96,706	0	10	16	375
743		5,988	1,229,268	2	160	354	7,577

(1942)

Number of Mines	Group	Number of Men Employed	Number Shifts Worked	RESULTS OF ACCIDENTS Fatal	Serious	Slight	Total Time Lost (Days)
	PLACER MINES:						
32	Dredges	1,015	211,035	1	24	47	1,123
36	Draglines	336	50,400	0	0	0	0
144	Hydraulic	537	53,700	0	0	1	6
162*	Others	287	43,050	1	0	0	0
374		2,175	358,185	2	24	48	1,129
9*	**COAL MINES:**						
	Underground	177	47,687	2	19	14	636
	Surface	72	20,906	0	3	5	110
9		249	68,593	2	22	19	746
	LODE MINES:						
102*	Metal	841	231,888	2	56	69	2,883
	MILLS:						
36*	Metal	224	68,897	0	3	21	119
521		3,489	727,563	6	105	157	4,877

*Includes prospecting and small intermittent operations.

TABLE V

Summary of Accidents and Employment at Mines in Alaska 1943—1944

(1943)

Number of Mines	Group	Number of Men Employed	Number Shifts Worked	RESULTS OF ACCIDENTS Fatal	Serious	Slight	Total Time Lost (Days)
	PLACER MINES:						
10	Dredges	208	39,430	0	1	0	54
10	Draglines	74	11,100	0	0	0	0
62	Hydraulic	177	17,700	0	0	0	0
70*	Others	97	14,550	0	0	0	0
152		556	82,780	0	1	0	54
9*	**COAL MINES:**						
	Underground	190	54,311	1	17	16	541
	Surface	122	30,383	0	3	1	94
9		312	84,694	1	20	17	635
	LODE MINES:						
46*	Metal	465	117,463	3	23	48	1,158
	MILLS:						
14	Metal	116	37,907	0	4	7	180
221		1,449	322,844	4	48	72	2,027

(1944)

Number of Mines	Group	Number of Men Employed	Number Shifts Worked	RESULTS OF ACCIDENTS Fatal	Serious	Slight	Total Time Lost (Days)
	PLACER MINES:						
10	Dredges	235	40,367	0	0	0	0
9	Draglines	53	8,010	0	0	0	0
81	Hydraulic	199	23,880	0	0	0	0
114*	Others	171	25,860	0	0	0	0
214		658	98,117	0	0	0	0
9*	**COAL MINES:**						
	Underground	250	67,402	0	29	44	1,910
	Surface	143	34,207	0	1	15	147
9		393	101,609	0	30	59	2,057
	LODE MINES:						
56*	Metal	380	65,910	1	4	9	196
	MILLS:						
14	Metal	109	15,336	0	1	4	190
293		1,540	280,972	1	35	72	2,443

*Includes prospecting and small intermittent operations.

FATALITIES

Year 1941:

During the year 1941 there were only two fatalities that resulted from accidents at mines in Alaska. One of these occurred at a gold lode mine and one at a placer operation. In no previous year for which statistics are available has the number of fatalities in the mining industry of Alaska been so low.

The causes of these two fatalities and the properties at which they occurred are as follows:

1. Crushed between motor and timber truck when motor went through switch onto track where loaded timber truck was standing—Willow Creek Mines 1

2. Presumed to have been suffocated by fumes from wood fire used in thawing frozen gravel in bottom of placer shaft—drift mine of the deceased, J. E. H. Woll, near Wiseman 1

2

Year 1942:

During the year 1942 there were six fatalities that resulted from accidents at mines in Alaska, two of which occurred at gold lode mines, two at placer operations and two at a coal mine.

The causes of these fatalities and the properties at which they occurred are as follows:

1. Fell down oreway, cause unknown—Alaska Juneau Mine 1

2. Fell down stope raise, cause unknown — Hirst Chichagof Mine 1

3. Covered by falling muck in placer prospect shaft—partnership operation of Otto Lieman (the deceased) and Fred Robinson on Chatham Creek near Fairbanks 1

4. Trapped by mine fire or explosion—Healy River Coal Corporation Mine 2

5. Fell down digging ladder of dredge into well-way —Fairbanks Department, U. S. S. R. & M. Company 1

6

Year 1943:

During the year 1943 there were four fatalities that resulted from accidents at mines in Alaska, three of which occurred at a gold lode mine and one at a coal mine.

The causes of these fatalities and the properties at which they occurred are as follows:

1. Struck by muck and water from chute — Alaska Juneau Mine 2

2. Fell down oreway while barring on the grizzly without safety belt attached—Alaska Juneau Mine 1

3. Walked into unguarded shot — Evan Jones Coal Company Mine 1

4

Year 1944:

There was only one fatality at mines in Alaska during 1944. It occurred at the Alaska Juneau Mine as a result of a run of muck in the draw-hole of a bulldoze chamber while the miner was placing a charge to blast a hang-up.

TABLE VI

Summary of Accidents at all Metal and Non-Metal Mines(Mills not included) During the Period January 1, 1941 to December 31, 1944

ALASKA

Year	Type of Operation	Men Employed	Man-shifts Worked	Man-hours Worked	ACCIDENTS Fatal	ACCIDENTS Non-fatal	ACCIDENT FREQUENCY RATES Fatal	ACCIDENT FREQUENCY RATES Non-fatal	Time Lost (Days)
1941	Placer	3,965	657,142	5,914,278	1	151	0.17	25.53	1,978
	Lodes	1,429	417,590	3,340,720	1	299	0.30	89.50	4,694
	Non-metal	20	3,051	24,408	0	0	0	0	0
		5,414	1,077,783	8,279,406	2	450	0.24	54.35	6,672
1942	Placers	2,175	358,050	3,222,245	2	73	0.62	22.65	1,129
	Lodes	841	231,888	1,855,104	2	125	1.08	67.38	2,883
		3,016	589,938	5,077,349	4	198	0.79	39.00	4,012
1943	Placers	556	82,780	748,940	0	1	0	1.33	54
	Lodes	465	117,463	939,704	3	71	3.19	75.55	1,158
		1,021	200,243	1,688,644	3	72	1.78	42.64	1,212
1944	Placers	658	98,117	900,436	0	0	0	0	0
	Lodes	380	65,910	527,280	1	13	1.90	24.65	196
		1,038	164,027	1,427,716	1	13	0.70	9.11	196

UNITED STATES*

1937	118,429	29,856,610	239,554,432	219	18,055	0.91	75.37
1938	103,027	23,505,864	188,170,166	156	12,722	0.83	67.61

*For comparison—latest records available.

TABLE VII

Summary of Accidents at Lode-Gold Mines During 10-Year Period Ending December 31, 1944

Year	Men Employed	Man-Shifts Worked	ACCIDENTS Fatal	ACCIDENTS Non-Fatal	ACCIDENT FREQUENCY RATES Fatal	ACCIDENT FREQUENCY RATES Non-Fatal	Time Lost (Days)
1935	1,222	348,723	6	233	2.15	83.51	3,870
1936	1,362	367,411	8	232	2.72	78.93	3,192
1937	1,391	383,476	1	230	0.33	74.97	4,198
1938	1,482	430,536	5	296	1.45	85.94	4,282
1939	1,599	438,279	3	281	0.86	80.14	3,829
1940	1,560	436,247	4	297	1.15	85.10	4,130
1941	1,429	417,590	1	299	0.30	89.50	4,694
1942	841	231,888	2	125	1.08	67.38	2,883
1943	438	112,063	3	71	3.35	79.20	1,158
1944	338	56,650	1	12	2.21	26.48	166

TABLE VIII

Summary of Man-Shifts Worked, Fatal and Non-Fatal Accidents, and Time Lost in All Mines in Alaska

Year	MAN-SHIFTS WORKED AT			FATALITIES			NON-FATAL ACCIDENTS			TIME LOST (DAYS)		
	Placer Mines	Lode Mines and Mills	Coal Mines	Placer Mines	Lode Mines and Mills	Coal Mines	Placer Mines	Lode Mines and Mills	Coal Mines	Placer Mines	Lode Mines and Mills	Coal Mines
1912				6	6							
1913				10	15							
1914				5	14							
1915				4	19							
1916				7	22		27	736				
1917				9	24		11	705				
1918				1	12		0	199				
1919				0	13		5	350	5			
1920				0	9		0	302			2,831	
1921		568,615	103,389	0	12		0	249			3,519	471
1922		537,180	55,309	0	5	0	0	252			4,344	250
1923	84,948	618,359	66,927	2	9	0	7	230	42	394	3,991	673
1924	117,545	468,890	51,398	0	16	0	30	327	6	560	4,882	75
1925	405,000	592,326	34,353	0	6	0	0	303	5	No report	5,639	109
1926	418,744	563,992	51,398	1	6	1	90	365	10	1,042	5,308	75
1927	418,235	555,155	34,915	2	7	1	178	259	13	3,267	4,819	445
1928	445,707	559,081	32,766	3	6	0	152	302	2	2,048	5,981	19
1929	420,249	524,836	25,525	5	9	0	142	255	6	1,657	4,301	197
1930	484,301	486,515	30,101	0	7	0	123	271	7	1,096	3,979	221
1931	437,573	425,201	22,129	0	6	0	92	167	5	1,251	2,668	101
1932	441,335	445,876	22,267	0	5	0	67	163	14	765	2,630	250
1933	437,267	403,021	19,805	1	7	0	90	177	2	1,077	2,381	9
1934	478,908	443,265	20,514	0	6	0	95	220	7	1,313	3,784	201
1935	499,765	458,440	23,571	2	6	0	116	266	12	1,250	4,372	291
1936	496,370	515,105	27,285	2	8	0	89	284	8	1,014	3,780	149
1937	547,748	548,929	25,267	2	2	16	129	298	14	1,733	5,007	407
1938	607,624	595,520	27,744	2	5	0	112	351	20	1,365	5,091	423
1939	683,624	548,121	26,643	1	3	0	158	302	15	2,263	4,247	488
1940	718,153	552,579	34,450	4	4	0	162	313	29	1,999	4,260	721
1941	657,142	517,347	54,779	1	1	0	151	325	38	1,978	5,069	630
1942	358,185	300,785	68,593	2	2	2	72	149	41	1,129	3,002	746
1943	82,780	155,370	84,694	0	3	1	1	82	37	54	1,338	635
1944	98,117	81,246	101,609	0	1	0	0	18	89	0	386	2,057