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Development and Production sections of this report.

WESTERN REGION

The western region includes historic placer gold districts on the Seward Peninsula and the lower Koyukuk and middle Yukon River basins, where approximately 233,275 kg (7.5 million oz) of gold have been produced since the early 20th century. In addition, several favorable metallogenic terranes, as summarized by Hawley (1982) and Nokleberg and others (1987), contain a variety of base and precious metal deposits and rare earth element uranium associations.

However, exploration expenditures declined precipitously from $7.8 million in 1990 to $2.4 million in 1991, a 70% decrease (table 4). The chief reason for the decline was the cessation of large placer and lode gold exploratory projects in the Nome district and generally reduced hardrock gold exploration north of McGrath.

Metals

Kennecott Exploration, in partnership with Bering Straits Native Corporation (BSNC), and Hawley Resource Group, conducted geological mapping, geochemical sampling, and hardrock drilling of the Aurora Creek stratiform zinc deposit in the Sinuk River drainage. (Herreid, 1970, described the geology of this mineral district.) The joint venture partnership also explored the Gold Hill gold system north of Nome. BSNC independently completed staking and mapping activities in the Bluff and Mount Distin gold and base-metal mineralized areas. According to Stevens (1991a), previous exploration work by BHP-Utah has shown that three structurally controlled mineralized areas—Daniels Creek, the Saddle prospect, and Koyana Creek—have the potential to contain at least 5.9 million tonnes (6.5 million tons) grading 3.4 g/tonne (0.1 oz/ton) gold. Stevens (1991b) also describes the mineral potential of the Mount Distin area about 19 km (12 mi) north of Nome, where thrust-fault-controlled gold, arsenic, and antimony values occur over a strike length of 6 km (4 mi) and widths of up to 610 m (2,000 ft).

Aspen Exploration applied for permits in late 1991 to test-mine a gold deposit at the Sophie Gulch-Rock Creek mineral zone. Previous exploration drilling by Placer Dome U.S. Inc. identified a nearby deposit containing 6.1 million tonnes (6.7 million tons) grading 2.4 g/tonne (0.07 oz/ton) gold.

North Pacific Mining Company continued exploration efforts to confirm and expand reserves at the Illinois Creek prospect southwest of the Kaiyuh Hills in the Yukon River basin. The deposit is an impressive gossan originally discovered by Anaconda Minerals in 1980 (fig. 8). Illinois Creek is the largest of several polymetallic, gold-bearing gossans in a 14-km (9 mi) stratigraphic belt in the Kaiyuh Hills (Gillerman, 1988). Three major deposits and many prospects are hosted in Paleozoic quartzite and are aligned parallel to the N. 70°E Kaltag fault system.

North Pacific Mining completed 1,564 m (5,130 ft) of diamond drilling during the 1991 season, finished a trenching program, and is in the process of acquiring mine permits (fig. 9). Geological reserves (all categories) using a cutoff grade of 0.7 g/tonne (0.02 oz/ton) are 1,858,440 tonnes (2,049,600 tons) grading 2.4 g/tonne (0.07 oz/ton) gold and 58.0 g/tonne (1.69 oz/ton) silver.

Five placer mining firms explored new paystreaks in anticipation of future mine operations—a sign that miners in the western region are acquiring future reserves for mining needs. Flat Creek Mining Company (Pete Haggland) explored for placer paystreaks and lode gold prospects on Timber and Flat Creeks in the Ruby-Poorman district with 823 m (2,700 ft) of reverse circulation drilling.

Allen Vezey, with Stevens Exploration and Management Corporation, drilled for placer gold and mapped potential sand and gravel resources in the Solomon district on the Seward Peninsula. If results continue to be favorable, anticipated mine development would involve production of 57,350 m³ (75,000 yd³) annually of gravel for the construction market and recovery of a significant byproduct of placer gold.

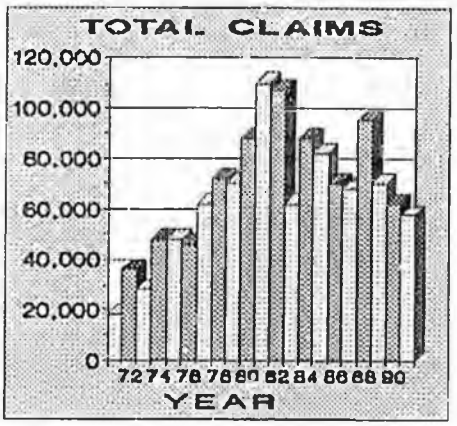


Figure 6. *Claim assessment work filed, 1970-91.*

Innoko River Enterprises prospected for gold on its Native allotment at Cripple Landing in the Innoko-Tolstoi district north of McGrath.

Tolstoi Mining Company (Doug Sherrer) thawed, sunk a shaft, drifted, and panned for placer gold and platinum on Boob Creek and in tributaries on Mount Hurst west of McGrath.

Interest in Norton Sound offshore gold placers near Nome resulted in issuance of Outer Continental Shelf Permits M91-06 and M92-01 to U.S. Deep Ocean Inc. by the U.S. Minerals Management Service in August 1991. The permits involve acquisition of core samples and high resolution seismic data in Federal waters offshore Nome.

EASTERN INTERIOR REGION

The eastern Interior includes many of the State's largest placer districts and a variety of metallogenic terranes including volcanogenic massive sulfide (VMS), plutonic gold, and sedimentary exhalative (SEDEX) and Mississippi Valley type (MVT) base metal environments of Paleozoic and Mesozoic age.

Exploration expenditures for the eastern Interior totaled $5.4 million in

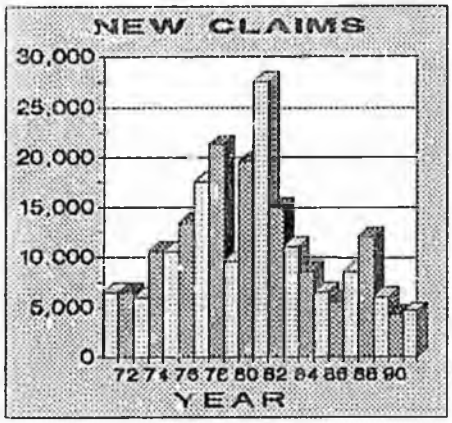


Figure 7. *New claims, 1970-91.*

1991, down from nearly $16 million spent in 1990, a reduction of nearly 66% (table 4). Fort Knox, the largest exploration project of 1990, shifted to development in 1991.

Metals

There were two major exploration efforts on Ester Dome near Fairbanks during 1991—both for hardrock gold. Citigold Alaska Inc. (Citigold) operator for La Teko Resources Ltd.'s Ryan Lode project, drilled 23,170 m (76,000 ft) to confirm reserves in the main northeast-trending vein structure and in the subparallel Curlew area. The Ryan Lode deposit has been confirmed to depths of 305 m (1,000 ft) with proven and probable reserves totaling about 2.7 million tonnes (3 million tons) grading 2.3 g/tonne (0.068 oz/ton) gold. These new reserve estimates are based on data from 221 reverse circulation drill sites on 30.5 m (100 ft) centers. The Curlew area appears to contain about 0.907 million tonnes (1 million tons) of ore at grades of 2.0 g/tonne (0.06 oz/ton) gold and recoverable silver. Citigold also began to neutralize about 272,100 tonnes (300,000 tons) of spent cyanide leach pads and impoundment waters from previous operations. Citigold contracted Inco Exploration and Technical Services Inc., a subsidiary of Inco Ltd., to use the Inco SO_2/air cyanide destruction process (fig. 10). Inco's process reduced cyanide and contained metals in

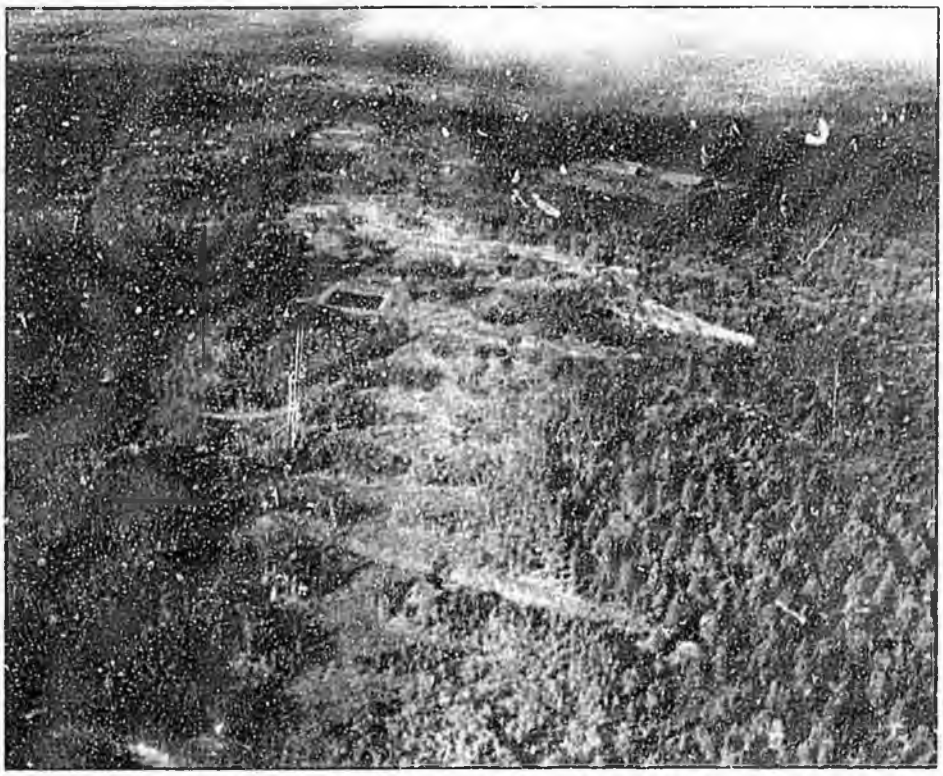


Figure 8. *Mineralized zone at Illinois Creek deposit in the Kaiyuh Hills district of western Alaska. High metal content of the mineral deposit prevents plant growth and creates a naturally occurring vegetation "kill zone." Exploration trenches crosscut this kill zone at uniform intervals. (Photo by John Wood)*

Figure 9. *This excavator has been used to trace mineralization for an additional 366 m (1,200 ft) along strike at the covered Illinois Creek deposit, Kaiyuh Hills, western Alaska (Photo by North Pacific Mining Company)*

pond waters to near drinking-water quality standard in a few days. More cyanide neutralization work will continue in 1992. In 1991, La Teko provided a $10,000 grant to the Mine Design Software Laboratory of the School of Mineral Engineering at University of Alaska Fairbanks.

Following an aerial geophysical survey and exploration conducted in 1990, American Copper and Nickel Co. (ACNC) explored target areas on Ester Dome and at Eagle Creek near Fairbanks (fig. 11). ACNC continued to evaluate the Grant Mine vein system in a joint venture with Silverado Mines Ltd. By year's end, the company defined 15 separate gold targets on a 36-km² (14-mi²) area of Ester Dome and drilled selected targets. Silverado reported that an area 2,440 m (8,000 ft) long, and 150 m (500 ft) wide contains anomalous gold in soils. Geochemical analyses of eight rock samples within the soil grid area ranged from 0.7 g/tonne (0.02 oz/ton) to 2.0 g/tonne (0.06 oz/ton) gold. ACNC continued to evaluate 13 km² (5 mi²) of State claims at Eagle Creek, a plutonic-hosted gold prospect north of Fairbanks. The company acquired this property from Canex several years ago.

ACNC has reclaimed former production pits and exploration trenches on Ester Dome and won praise from local residents for their efforts. In all, ACNC has spent $10 million in exploration in Alaska since 1987 and continues to carry on long-term property evaluations throughout the state.

Amax Gold Inc. explored Pedro Dome north of Fairbanks and at the Liberty Belle copper-bismuth-gold deposit east of Healy.

Tri-Valley Corporation, in an innovative joint venture with TsNIGRI (Central Research Institute of Geological Prospecting for Base and Precious Metals) of Moscow, Russia, fielded a nine-member crew in the Richardson district about 112 km (70 mi) east of Fairbanks during much of the summer and part of the fall. Their work included detailed geological mapping and intensive soil, stream sediment, and rock geochemical surveys. TsNIGRI had proposed using an Antonyev-AN2 biplane to conduct aerial geophysical surveys prior to the commencement of field work, but the Department of Defense objected to the deployment of the aircraft in Alaska. This impasse may be resolved in 1992. The professional dedication exhibited by the Russian team drew admiration from visiting Alaskan mineral geologists and mining engineers.

Figure 10. *Inco Exploration and Technical Services Inc. neutralize cyanide at the heap leach project at the Ryan Lode on Ester Dome. (Photo by R.C. Swainbank)*

Central Alaska Gold Company, in partnership with Caithness Gold Mining, conducted site-specific and regional reconnaissance exploration throughout eastern interior Alaska utilizing geological mapping and geochemical sampling surveys.

BHP-Utah conducted geochemical and geological mapping studies on bulk minable gold and polymetallic massive sulfide deposits in the Circle district.

Freegold Recovery reviewed the lode gold and silver potential in the Cleary Summit-Pedro Dome area in the Fairbanks district. Late in the year, the company announced that a major exploration effort would begin in the vicinity of the old Newsboy Mine, a former producer of hardrock gold on the north side of Cleary Summit. Freegold Recovery leases from Fairbanks Exploration Inc., which controls much of the ground in the Cleary Hill-Pedro Dome area.

In late 1991 Montague Gold entered into an agreement with ASA Inc., a company that has an agreement with Doyon Ltd., the Interior Native regional corporation. ASA has an agreement to explore 1.62 million ha (4 million acres) of Doyon land in central Alaska. Montague Gold has indicated that it will invest approximately $2.8 million in the program during the next two years.

Lodestar Exploration (VSE) researched the potential of the Taurus copper-gold-molybdenum porphyry system in the Tanacross Quadrangle about 73 k (46 mi) from the Alaska Highway in eastcentral Alaska. The company announced plans to undertake a 2,135 m (7,000 ft) drill program in 1992. Exploration by previous operators in the 1970s intersected 268 m (878 ft) grading 0.32% copper, 46 m (151 ft) 0.40% copper, 125 m (410 ft) 0.22% copper, and 0.55 g/tonne (0.016 oz/ton) gold, all in the East Taurus deposit. The larger 1,830 x 760 m (6,000 x 2,500 ft) West Taurus zone is judged to need more follow-up exploration before reserves can be determined.

Figure 11. *Drill program underway at Eagle Creek Property about 19 km (12 mi) north of Fairbanks. The gold mineralization is found with associated antimony in small granite porphyry bodies. (Photo by John Wood)*

Drilling estimates for the East Taurus zone are 126 million tonnes (140 million tons) grading about 0.30% copper and 0.34 g/tonne (0.01 oz/ton) gold.

Small firms and partnerships also searched for lode and placer deposits of gold and base metals in the eastern Interior region. Grateful Dog Mining examined the mineral potential of the Treasure Creek drainage and the old Love Site military installation in the Fairbanks district. Placer mining firms that conducted drilling, testing, and miscellaneous ground testing in the eastern Interior included: D'Log Industries in the Bonnifield district; Herning Exploration and Mining on Palmer Creek in the Chena River drainage; Sweepstakes Mining on Kokomo and Grouse Creeks in the Fairbanks district; Lyle College in the Circle district (unspecified location); 45-Pup Mining in the Fortymile district; Greenhorn Mining on Ketchum Creek in the Circle district; Windy Hill Mining on Little Boulder and Silverbow Creeks in the Tofty district; Alder Creek Mines on Fairbanks Creek in the Fairbanks district; Jensen Mining on Sears Creek in the Delta district; Rainbow Mining on Flat Creek in the Circle district; and Polar Mining on lower Goldstream Creek (Fairbanks district) and on Hinkley Gulch (Richardson district).

Several small mining firms examined the drift mining potential of deeply buried gold placer deposits in the Fairbanks district. RCL Mining (Ray Vogt) leased several levels of bench placers on lower Dome Creek and reopened underground workings, conducted surface drilling, and pumped out and repaired old drift shafts. Late in the year, ACE General Contractors Inc. began a drift exploration program in lower Goldstream valley near Fox, in anticipation of stockpiling pay in 1992.

SOUTHCENTRAL REGION

Exploration in the southcentral region increased more than in any other part of the State. Exploration expenditures increased from $2.9 million in 1990 to $6.2 million in 1991, an increase of about 115% (table 4). The total region-wide effort included a well balanced evaluation of placer, bulk minable, and high-grade vein gold, and kuroko-like, massive sulfide polymetallic deposits.

Metals

Work continued at the Johnsen River mineralized area in the southern Alaska Range, 200 km (125 mi) west of Anchorage. Originally discovered by Anaconda Minerals in 1983, the Johnson River zinc-gold-silver deposit consists of a metal-bearing stockwork of quartz-sulfide veinlets in sedimentary and volcanic rocks that are thought to be the same age as the Talkeetna Formation. Howard Keck from Cook Inlet Region (CIRI) leases the property and Hunt, Ware and Proffett manages it. During 1991, the search for a faulted section of the ore body involved 3,140 m (10,300 ft) of diamond drilling and detailed geological and geochemical mapping. Cumulative exploration of the Johnson River deposit(s) has shown a resource of about 16,795 kg (540,000 oz) of gold and 126,980 tonnes (140,000 tons) of zinc. This includes a 453,500 tonne (500,000 ton) zone that contains 19 g/tonne (0.62 oz/ton) gold and 9% zinc. The 1991 work showed favorable values north of the main mineralized zone.

A joint venture of Cathedral Gold, Pacific Sentinel and North Pacific Mining Company (NPMC) searched for copper-gold porphyry targets and in Jurassic units for deposits similar to the Johnson River deposit on the west side of Cook Inlet. The project used geological mapping, stream sediment, soil, and rock geochemical surveys, along with aerial photographic interpretation.

NPMC independently explored Chugach Alaska Corporation lands on the Kenai Peninsula employing various surface-sampling surveys. NPMC also conducted an extensive surface evaluation of their Toklat massive sulfide prospect in the Talkeetna Mountains, which is similar to the Johnson River deposit.

Placer Dome U.S. Inc. leased ground from Cominco Alaska Inc. and drilled the newly discovered Deadman Mountain deposit about 16 km (10 mi) south of the Denali Highway near the Valdez Creek mine. The company

drilled seven holes totaling 823 m (2,700 ft) to explore the high-grade gold-arsenic-antimony-silver deposit, which is hosted in biotite schist and gneiss of the McKlaren metamorphic belt.

Newmont Exploration conducted reconnaissance investigations for gold in the southcentral region, but did not report specific localities.

Ahtna Minerals Company, a subsidiary of Ahtna Corporation, initiated a minerals exploration program on Ahtna lands in the Copper River valley. Company goals for the future include: commence grassroots exploration; rating final land selections with an emphasis on economic values; and generate private sector interest in exploration.

Chugach Alaska Corporation continued reconnaissance level exploration for unspecified commodities in the Katalla, Port Graham, and English Bay areas.

Gold Tech Resources Inc. and KDT Exploration and Mining Company looked for both lode and placer deposits of platinum and gold in the Valdez Creek and Pass Creek areas north of Denali Highway; some of their 1991 work included reverse circulation drill programs.

The Polaris Group, an Alaska-based venture-capital fund, invested $300,000 through purchase of shares of NovaGold Resources, owner of the Cliff Gold Mine on Valdez Arm about 10 km (7 mi) west of Valdez. The financing includes a 15% net profit interest in the Cliff Mine property. In the last five years Watts, Griffis and McQuatt (WGM) has explored the formerly productive Cliff Mine, a high-grade gold-quartz deposit that intrudes meta-sedimentary rocks of the Valdez Group. WGM has dewatered the underground workings to a depth of nearly 150 m (500 ft) below sea level and sampled the old stopes to estimate the future underground ore potential of this historic gold property. Etruscan Enterprise, the financial partner of the project, anticipates that WGM Inc.'s exploratory work can prove up 1,866 kg (60,000 oz) in the next exploratory phase.

Historic placer mining camps throughout the southcentral region were explored for placer deposits. Cambior Alaska Inc., operator of Alaska's largest gold mine at Valdez Creek, conducted drill programs at two sites in the region—in the Valdez Creek fan-delta target, a downstream extension of the ancestral channels currently being exploited, and in the Windy Creek drainage south of Valdez Creek valley.

Randy Elliott mapped and prospected for placer gold in several undisclosed locations in the McCarthy Quadrangle.

John Whitney prospected in the old Sunrise district of the Kenai Peninsula in the search of small high-grade pockets of placer gold. Crow Creek Mine conducted dredging and mapping surveys on their placer prospects in the Girdwood area near Anchorage.

The Rowallan Mine Partnership continued a thorough assessment of a promising placer deposit near the confluence of White and Valdez Creeks upstream from the Cambior Alaska Inc. operation. A large reverse circulation drilling program that began several years ago has revealed a deposit containing at least 1,772 kg (57,000 oz) gold within a 364 ha (900 acre) claim block. Rowallan has leased the property to Caprock Corporation of Denver, Colorado. Caprock has rechecked the previous drill program with infill drilling and expanded minable ground with its own reverse circulation grid. In 1991, Caprock completed the exploratory drilling phase and started a pit design. Production could begin in 1992 or 1993.

Arnold and Sally Echola prospected for placer gold on Gold Creek in the Nelchina district by excavating small cuts and mapping placer pay exposures.

Lake Creek Placers continued evaluating gold-platinum placer deposits in Tertiary fluvial sediments of the Kenai Group at Lake Creek in the Cache Creek district west of Talkeetna. Lake Creek Placers has found, through careful channel sampling and follow-up analytical work, that quartz-pebble conglomerate near the base of the section contains the best precious-metal values. TC Mining also explored in the Cache Creek district on Cache Creek itself.

Finnbear Mining Company continued its ten-year program of assessing hardrock and placer gold-platinum potential of the Finnbear claims in the Kaniltna drainage southeast of Rainy Pass. Finnbear plans to use winter roads to haul heavy equipment during the 1992-93 season.

Coal

Hobbs Industries completed various exploratory activities on two coal properties in the Matanuska Valley, the Evan Jones Mine near Sutton, and the Castle Mountain Mine near Chickaloon. Both mines previously supplied high quality, low-sulfur bituminous coal, which was sold to local markets including several military power plants near Anchorage. Hobbs drilled, trenched, excavated, and completed landslide remediation studies at the Evan Jones Mine. The company also transported about 635 tonnes (700 tons) of bulk sample and waste-pit coal from the Castle Mountain Mine to the Evan Jones Mine storage site, which will become a focus of future company activities. More of Hobbs's 1991 work is described in the development section.

SOUTHWESTERN REGION

The southwestern region includes many of Alaska's historic bush placer camps including the Innoko, Iditarod, Aniak, and Goodnews Bay districts. Grassroots exploration continues to concentrate on assessing the potential for bulk minable gold-polymetallic deposits associated with Cretaceous-early Tertiary plutons and volcanic fields. In addition, new base and precious metal reserves have been discovered in the Lake Iliamna region. Reported expenditures for 1991 were $1.87 million, compared with about $2.14 million in 1990 (table 4).

Metals

The most noteworthy exploration results in the southwestern region

centered on the promising results reported by Cominco Alaska at their Pebble Copper deposit west of Newhalen and about 24 km (15 mi) north of Lake Iliamna. Discovered by Cominco geologists in 1989, Pebble Copper is a disseminated porphyry copper-gold-molybdenum deposit associated with a 90-95-million-year-old composite stock of granodiorite composition that intrudes Mesozoic flysch of the Kahiltna terrane. The mineralized granodiorite is actually part of a complex, multiphased intrusion that ranges in composition from pyroxenite to granite, with associated and overlying dacite and andesite tuffs and flows. Stockwork-style, quartz-sulfide mineralization is found in the adjacent volcanics and hornfels as well as in the intermediate intrusive rocks (St. George, 1991). In the last two years drill holes spaced 150-305 m (500-1,000 ft) apart and averaging about 120 m (400 ft) deep have delineated a reserve of 453 million tonnes (500 million tons) grading 0.35% copper, 0.41 g/tonne (0.012 oz/ton) gold, and a probable byproduct of molybdenum in the 0.03 to 0.04% range.

Cominco initiated permitting and prefeasibility studies in mid-1991 (fig. 12) after definition drill programs had enlarged the estimated size of the deposit to favorable economic status. If Pebble Copper or another similar mineral property in the Bristol Bay-Iliamna region were developed, the need would exist to acquire 50-70 megawatts of electric power for mine and mill operation. This need could spur interest in a local electric power grid to service area communities where electric power is currently generated by costly diesel-powered plants. Cominco is also studying options of how to transport metal concentrates from mine site to a seaport facility. Alternatives range from constructing road access to Bristol Bay to barging across Lake Iliamna and using the existing Pile Bay road from the lake to lower Cook Inlet.

Another significant new discovery was explored on Vinasale Mountain about 29 km (18 mi) south of McGrath. Operator Central Alaska Gold Company and Placer Dome U.S. Inc. conducted a drill program to evaluate a disseminated gold-polymetallic deposit hosted in a 69-million-year-old quartz monzonite intrusion (Solie and others, 1991). In the 1920s a small placer deposit was developed in Alder Gulch on the south side of the Vinasale Mountains. Bismuth-gold-tungsten lode mineralization in the Alder Gulch area has also been described by Bundtzen (1986). Recent industry exploratory work on lands owned by Doyon Ltd. has shown good potential for large mineralized zones. Concealed deposits, referred to by Central Alaska as the central and northeast zones, were initially found by Central Alaska Gold with a detailed, soil-grid, geochemical survey. Structural style and mineralogical composition of the mineralization on Vinasale Mountain are similar to that in bulk-minable gold prospects in the nearby Iditarod-Flat, Donlin, Russian Mountains, and Candle Creek areas. All are hosted in Late Cretaceous-early Tertiary volcanic-plutonic complexes of the Kuskokwim region. After completing 4,800 m (16,000 ft) of diamond drilling and expending $1.6 million, the Placer Dome-Central Alaska joint venture announced that the central and northeast deposits contained an estimated 31,100 kg (1,000,000 oz) gold. The property, which is located on lands owned by Doyon Ltd., is expected to see more exploration activity in 1992.

Calista Corporation reported on two small reconnaissance exploration programs in the Donlin Creek area north of Crooked Creek on the Kuskokwim River, and at the Stuyahok placer camp in the Marshall district of the lower Yukon river drainage.

Battle Mountain Exploration carried out reconnaissance mapping and sampling at unspecified locations in the Iditarod Quadrangle.

Small placer firms were not only exploring placer paystreak but were also testing potential lode sources for possible hardrock reserves. Jualin Creek Mining Company explored for placer and lode gold in the Jualin Creek drainage

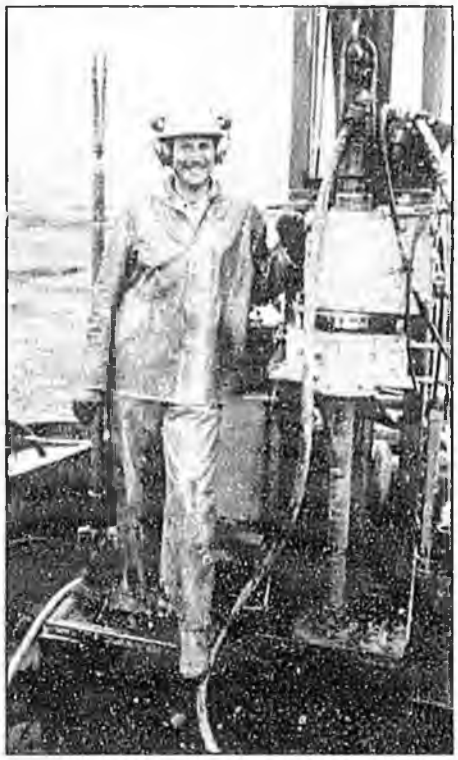


Figure 12. *Dan Franklin on drill rig at Cominco Alaska's Pebble Copper project near Iliamna. Since 1989, Cominco Alaska Exploration has identified about 454 million tonnes (500 million tons) of copper-gold-molybdenum mineralization hosted in a porphyry environment. (Photo by Phil St. George, Cominco Alaska Exploration)*

using a backhoe and an E-Z Panner gold-recovery unit. The company expects most of its 1992 work to be exploratory in nature, in contrast to its production activity of the last several years.

Little Creek Mine (Paul Sayer) searched for and proved up reserves of placer gold and scheelite in Little and Ester Creeks in the historic Ophir district.

Misco-Walsh Mining Company (Misco-Walsh) continued its multi-year effort to explore and develop the Golden Horn semi-residual deposit of gold-tungsten-silver in the Iditarod district. The company's 1991 efforts included trenching, sampling, and mineral processing with a rod mill, jig, and wilfley table. Late in 1991, Misco-Walsh began to work with Doyon Ltd., which owns several core townships in the Iditarod district, ASA Inc., and Placer Dome

U.S. Inc. to develop a systematic exploration program to assess the entire district for its bulk minable, gold-polymetallic potential.

Flat Creek Placers explored placer deposits in upper Flat Creek in the Iditarod district. In 1991 the company bulk-sampled various tailing sites left over from pre-1920 dredging activities of the Yukon Gold Company, which mined rich pay in the early gold rush years. The testing results showed that the tailings might yield enough gold to cover expenses of a mechanized placer mine and that bedrock missed by the dredge could yield a profit.

Howard Bowman, longtime southwestern Alaska miner, pilot, and prospector on Portage Creek along the shore of Lake Clark, received patents for four Federal mining claims on December 10, 1991. Since the early part of the 20th century the Bowman claim group has been active through the work of Howard and his father, Fred, one of the first blacksmiths in the gold rush town of Fairbanks.

ALASKA PENINSULA REGION

Exploration expenditures in the Alaska Peninsula region were down considerably from previous years—to only $327,000 in 1991 (table 4). Major mining firms have shown limited interest in developing the epithermal gold-silver and porphyry copper deposits in this region.

Metals

Battle Mountain Exploration Company mapped, sampled, and drilled (1,200 m; 4,000 ft) on Unga Island near the old Alaska Apollo gold mine.

Battle Mountain pioneered modern exploration of epithermal gold-silver deposits in the Alaska Peninsula region and identified significant resources at such properties as Centennial, Cathedral, and Mount Dana. In the mid 1980s, Battle Mountain also helped rediscover the economic potential of the high-grade deposits of gold, copper, and bismuth skarn at Nixon Fork near Medfra in the western region. Central Alaska Gold Company is currently developing these deposits. However, late in 1991, Battle Mountain announced that it would be leaving the Alaskan exploration scene and would not have a program in 1992.

Industrial Minerals

Koniag Inc. conducted exploratory work with pit-run rock production at quarries on Womens Bay and Afognak Island.

SOUTHEASTERN REGION

Although generally lacking in placer resources, the southeastern region contains the State's widest variety of metallogenic terranes. Deposits include volcanogenic massive sulfide deposits, uranium rare earth element resources in alkalic igneous rocks, platinum and iron-titanium resources in mafic-ultramafic complexes, and mother lode gold belts like the Juneau and Chichagof mining districts. The region contains copper-precious metal skarns on Prince of Wales Island and porphyry copper-molybdenum systems near Ketchikan and in Glacier Bay. Additionally, some of the State's most promising exports of marble and carbonate industrial mineral resources exist on Dall, Prince of Wales, Heceta, and Coronation Islands in the southeastern Panhandle.

The mineral exploration industry has not ignored the region s rich endowment and readily accessible terrane. Since 1984, the Panhandle has led other Alaska regions in exploration expenditures and total drill footage. The 1991 calendar year was no exception when southeastern Alaska projects accounted for $22.8 million, 57% of total statewide exploration expenditures (table 4).

Metals

Hyak Mining of Juneau explored in northern southeast Alaska. Assessment work was undertaken at the Enterprise Mine, located to the north of Limestone Inlet, some 48 km (30 mi) southeast of Juneau. This small gold deposit lies along a shear zone in granitic rocks. Past production at the Enterprise was on the order of 3.1 kg (100 oz) of gold. Hyak's reconnaissance activities concentrated on northeastern Chichagof Island, where anomalous gold was found in pan concentrate samples at the East Point prospect, south of Freshwater Bay. This prospect is in an area where Newmont Mining reportedly drilled a copper-nickel anomaly in the 1950s. Hyak conducted follow-up soil sampling to further delineate the gold anomalies and plans additional exploration in the area during the 1992 season.

Hecla Mining dropped its option on the Red Diamond gold prospect, owned by Hyak and AJT Mining, located on southern Douglas Island above Nevada Creek. Gold mineralization at the prospect is contained in pyritiferous felsic schists with local quartz lenses and stringers. Drilling by Hecla during 1991 reportedly returned favorable results, but Hecla has decided to discontinue mineral exploration in Alaska in favor of exploration in Mexico and South America. Hyak and AJT continued with assessment work and exploration on the Red Diamond prospect during 1991.

Ivanhoe Partners conducted assessment work and exploration on the Ivanhoe prospect, north of Juneau. The Ivanhoe consists of at least four discontinuous quartz veins, with the largest vein ranging from 0.3 to 2.7 m (1 to 9 ft) thick. Past production (prior to 1903) was 10.5 kg (340 oz) gold.

Red Dodson of Ketchikan continued exploration at Bokan Mountain on southern Prince of Wales Island. Bokan Mountain is a past producing uranium-thorium deposit in southern Prince of Wales Island, west of Stonerock Bay. Recent work conducted by the U.S. Bureau of Mines (Barker and Warner, 1987) shows that a substantial resource of rare earth elements accompanies the radioactive metallogeny.

Cominco Alaska Exploration conducted exploration on the Big Harbor volcanogenic massive sulfide base metal deposit to the north of

Trocadero Bay, southeast of Craig on Prince of Wales Island. Mineralization at Big Harbor has been developed by multiple adits and levels, with several thousands of feet of underground workings, most of which are still accessible. Sealaska Corporation owns the surface and subsurface of Big Harbor. Cominco conducted surface diamond drilling at Big Harbor in the 1950s or 1960s, but has kept the results of this drilling confidential. Exploration in 1991 concentrated on geophysical prospecting. Previous aerial geophysical exploration in the Trocadero Bay area identified numerous VLF conductors that have not been drill tested, but includes some of the known mineralized horizons at the Big Harbor deposit.

Cominco Alaska Exploration also worked near the Alaska-British Columbia border, west of Haines. This area, near the Mount Henry Clay and Glacier Creek deposits, contains numerous Kuroko-like massive sulfide and barite deposits along with gold skarns (Still and others, 1992). Mineralization has been located on both sides of the border. Exploration has been ongoing in this region for a number of years, though no prospect has advanced beyond the exploration stage.

Guy Comer of Ketchikan continued exploration at the Lucky Nell Mine near Hollis on Prince of Wales Island. Comer is attempting to reopen this small vein-gold deposit which was intermittently mined in the late 1930s and early 1940s. Work to date shows that a high value sulfide concentrate can be readily produced on site by gravity techniques. Exploration and metallurgical work, along with early permitting activity, is continuing.

During 1991 U.S. Borax ended its years of frustration with the Quartz Hill molybdenum deposit east of Ketchikan and sold the mineral rights to Cominco Ltd. for an undisclosed price. From its discovery by Borax in the early 1970s, the Quartz Hill deposit was taken from a raw prospect to a completely evaluated deposit that is estimated to contain up to one-sixth of the world's known molybdenum reserves. Borax obtained Federal patents on core claims that cover the deposits. Cominco has not announced its immediate intentions or long-term timetable for development of the property. Undoubtedly, future molybdenum price projections along with tailing disposal issues will be of vital importance in the eventual development of this world-class ore deposit.

Salisbury and Associates continued exploration and assessment on the PEEJ Claim Group near Point Couverden, 32 km (20 mi) west of Juneau. Stratiform base-metal and vein-type precious-metal mineralization are known in this area. Salisbury also continued as operator for American Copper and Nickel in the Dotomi district on Prince of Wales Island, where base- and precious-metal deposits are being investigated. During the year Salisbury donated an abridged collection of drill core from the Mirror Harbor nickel-copper-cobalt deposit to the Alaska Geological Materials Center in Eagle River, Alaska. Previous exploration had delineated several million tonnes of strategic metal mineralization in a gabbro pluton.

Kennecott Exploration crews from its Salt Lake City office explored for volcanogenic massive sulfide deposits in the Wrangell area. The geology of this area is similar to the Greens Creek Mine region. Some believe that the Triassic stratigraphy hosting the Greens Creek mineral deposits are found also in the Wrangell area due to offset along the Chatham Strait transcurrent fault.

Alaska-Dano Mines continued surface exploration on its 26 unpatented and 31 patented claims near Funter Bay, on northern Admiralty Island, west of Juneau. Several sets of quartz veins have been identified on the property, some of which host sulfide and gold mineralization. Work in 1991 was based on previous soil surveys which defined zoned base and precious metal anomalies. Several generations of veins were delineated. In addition, the 1991 program involved field mapping and surface geochemical sampling with the express purpose of ascertaining which vein sets were mineralized.

Juneau prospectors Roger Eichman, Floyd Branson, and Dale Henkins continued work on their claim groups at their Dream Mine in the Chilkat Range and Peterson Mine on the mainland north of Juneau. Widespread vein and stratiform(?) base- and precious-metal mineralization has been identified at Dream; however, work thus far has focused on gold-enriched massive sulfide pods (Bull, 1991).

Claim owners of the Peterson Mine conducted detailed stream sediment and pan concentrate sampling that defined several gold anomalies which they continue to investigate. The Peterson's mineralization consists of gold in quartz veins in black slates. Past production was approximately 6.2 kg (200 oz) gold from 1916 to 1921.

Dale Henkins and Roger Eichman continued surface sampling at the Gold Fork prospect on Carlson Creek northeast of Juneau. This fairly high-grade vein gold deposit was examined several years ago by Curator International under option from Henkins and Eichman. A major mining company has reportedly acquired a lease on the property for 1992 work. Mineralization at the Gold Fork prospect consists of sheared quartz veins in amphibolite grade schists. Veins pinch and swell but are readily traceable for approximately 914 m (3,000 ft) along strike.

Hyak Mining of Juneau holds the Jualin gold property which is 72 km (45 mi) northwest of Juneau, adjacent to the Kensington Mine. Placer Dome U.S. Inc. held an option to earn an equity interest in the property through various levels of work commitment and expenditure. During the year, Placer Dome continued work on the property drilling the Berners Tunnel anomaly, the upper Jualin soil anomalies, and the Empire dike to investigate potential gold resources. The company also conducted a geological evaluation of the high grade 4W vein system and geological

mapping and sampling at the DZ and 4W occurrences northwest of the Jualin deposit. Placer Dome relogged much of the core of the Main and Empire zones, which resulted in a revised geologic interpretation for these mineralized portions of the Jualin property. During the 1991 season Placer Dome's 10 diamond-drill holes totaled 1,864 m (6,115 ft). The total drilling on the property is now 25,100 m (82,337 ft) in 126 core holes (fig. 13).

Work by Placer Dome and others shows similarities between the Empire dike at Jualin and the Treadwell dike, which hosted the mineralization at the Treadwell Mine near Juneau. The Treadwell dike produced about 90,200 kg (2.9 million oz) gold at an average grade of 3.7 g/tonne (0.11 oz/ton) gold. Both the Empire and Treadwell dikes are thick felsic intrusives which dip steeply and intrude near major lithologic contacts. Both show albitic alteration and local quartz-sericite-pyritic alteration. Gold mineralization in the Empire dike is contained in ore shoots that exhibit a definable rake that needs to be further explored.

By the end of the year Placer Dome dropped its option on Jualin. Although considerable potential exists on the property, as shown by targets such as the Empire dike, Placer Dome was facing significant financial commitments and made the decision to relinquish the property without attaining an equity interest.

Kennecott Greens Creek Mining Company completed at least 15,245 m (50,000 ft) of core drilling at its Greens Creek Mine and succeeded in increasing reserve estimates. Proven, probable, and inferred reserve estimates have increased from 4.3 million tonnes (4.7 million tons) in 1990 to nearly 12.5 million tonnes (13.8 million tons) of high grade lead-zinc-silver-gold massive sulfide ores by the end of the 1991 season. Kennecott and consultant On-Line Exploration also expended considerable effort mapping and sampling prospective areas of the Mansfield Peninsula, northwest of Greens Creek Mine. The peninsula is thought to be an extension of the volcanic-sedimentary stratigraphic package hosting the known massive sulfide deposits at Greens Creek.

Boomer and Company Inc. acquired the Kaigani claim group on south Dall Island from Lac Minerals and Noranda Exploration. In 1991, Placer Dome U.S. Inc. completed assessment work for Boomer, and, if financing can be arranged, will design a drill program for the property.

Lac Minerals USA Inc. completed a small drilling program at the Niblack Anchorage on southern Prince of Wales Island. The stratiform copper-zinc deposit is enriched with precious metals. The company also relogged core from previous drill programs and worked up a regional geological map with consultant Dihedral Exploration.

Sealaska Corporation continued its aggressive assessment of mineral potential on its ANCSA-awarded lands throughout the southeastern Panhandle. Sealaska's 1991 efforts included geological mapping, sampling, geophysical surveying, and drilling (762 m, 2,500 ft) for base, precious metal, and rare-earth-element deposits at various locations on their lands. Currently Sealaska has one mineral agreement in place and two in negotiation with private mineral firms.

Klukwan Inc., a southeast Alaska Native village corporation, investigated diversifying its interest into minerals development during 1991. Klukwan has a fee-simple title to 9,310 ha (23,000 acres) of land, including both surface and subsurface ownership, throughout southeast Alaska. Klukwan hired a mineral manager and investigated metallic and industrial mineral opportunities on corporation lands. By years end, Klukwan had decided that the corporation would not actively pursue mineral development of its lands at this time. However, the corporation may enter into joint ventures or exploration agreements with private firms.

The Metlakatla Indian community requested the Bureau of Indian Affairs (BIA) and U.S. Geological Survey (USGS) to undertake a mineral assessment project on the Annette Island Reserve, 24 km (15 mi) south of Ketchikan. Preliminary results of these investigations were released in late 1991 (Horton and others, 1991). Following these government-sponsored investigations, the Metlakatla Indian community expressed interest in entering into exploration agreements with private partners to further identify and develop mineral deposits on the Reserve. Conclusions of the work by the BIA and

Figure 13. *Neil MacKinnon of Hyak Mining Company examining core recovered by Placer Dome U.S. Inc. at Jualin Mine, southeastern Alaska. (Photo by A.H. Clough)*

USGS identify high to moderate potential for vein-gold mineralization associated with major structural features. In addition, the Reserve has moderate potential for significant volcanogenic massive sulfide mineralization.

One small company searched for placer accumulations of precious metals. Snow Lion Mining Company (Jerry Fabrizio) worked on small placer and lode deposits in the Porcupine Creek drainage near Haines.

ADVANCED EXPLORATION PROJECTS

Kensington Project

Echo Bay, Alaska Inc., operator of the Echo Bay Mines-Coeur' Alaska Kensington joint venture, continued drilling and underground development at the Kensington Mine, 80 km (50 mi) north of Juneau. Through late 1991 the joint venture spent $78 million on all phases of exploration at Kensington. By November 1991, estimates for proven and indicated ore reserves had increased to 10.4 million tonnes (11.5 million tons) grading 4.9 g/tonne (0.143 oz/ton) gold. Underground work continued on the property in an effort to increase the ore reserve base (fig. 14) and also explored the relatively new, so-called "Horrible" ore body which is not part of the main Kensington vein system. The Horrible deposit, which was intersected by the main haulage drift, contains an additional inferred reserve of 3.56 million tonnes (3.93 million tons) grading 3.8 g/tonnes (0.11 oz/ton) gold (fig. 15). These reserves are not included in reserve estimates given above for Kensington. A review of the geology and exploration results of the Kensington deposit was summarized recently by Harvey and Kirkham (1991).

The Echo Bay Mines-Coeur Alaska Kensington joint venture also worked on environmental and permitting issues. The U.S. Forest Service, the lead Federal agency overseeing the project and responsible for the environmental impact statement (EIS), released the draft in June 1991. The final EIS

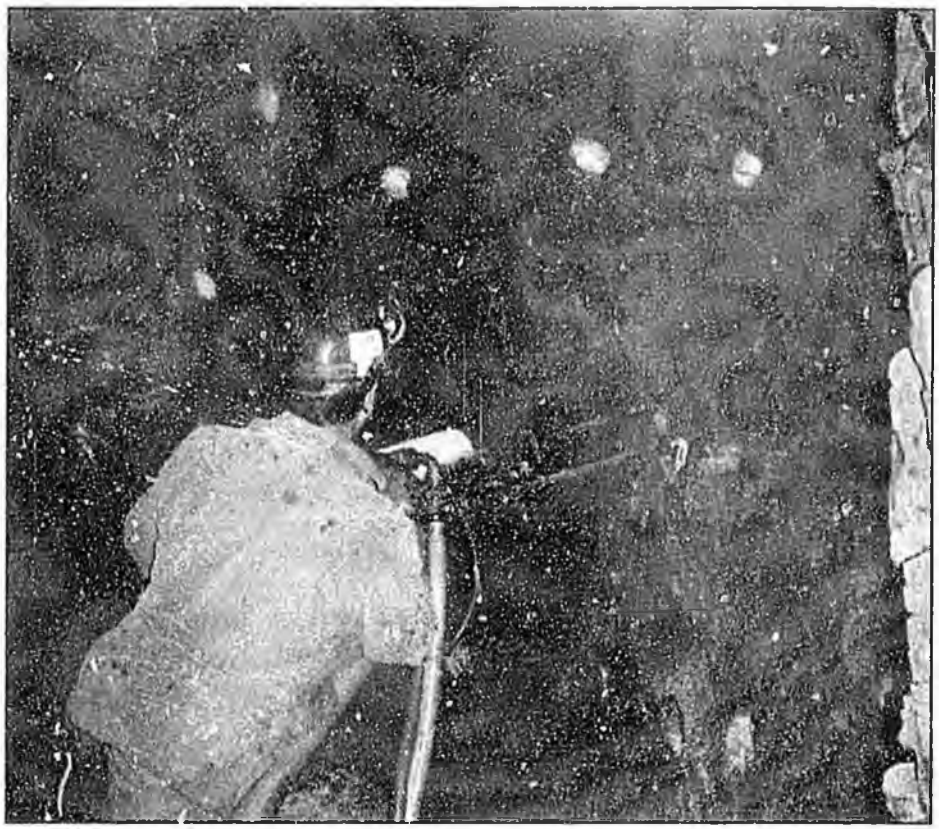


Figure 14. *Drilling out a round at an exploration face in the Kensington Mine, southeastern Alaska. Explosives will be put in each hole and when detonated, blast will remove the rock face. (Photo by Maggie Kuhleve, UAS Institute of Mining)*

Figure 15. *Low profile dump truck unloads waste rock from main haulage drift at Kensington Mine, southeast Alaska. (Photo by A.H. Clough)*

and record of decision was released in February 1992. Economic feasibility studies released by Echo Bay for the draft EIS show mine capital investment requirements at $205 million, with mine costs at $29/tonne ($26/ton) or $6.84/g ($213/oz) gold. Permitting activities are continuing and the joint venture partners are deciding at this time whether or not to develop the project to a producing mine.

The City and Borough of Juneau Planning Commission became actively involved in the Kensington project during 1991. Since the mine will be within the Juneau Borough, its development and operation are regulated under the Borough mining ordinance. The planning commission, which oversees development within the Borough, held numerous meetings on mine-related issues throughout the year in preparation for Echo Bay Alaska-Coeur Alaska joint venture development decision.

Alaska-Juneau Project

Echo Bay continued its six-year exploration program of the historic Alaska-Juneau (A-J) Mine, the State's largest past producer of lode gold (fig. 16). Proven and probable reserves at the A-J Mine are 61.6 million tonnes (68 million tons) of 1.8 g/tonne (0.052 oz/ton) gold, with 30.03 million tonnes (33.4 million tons) grading 1.6 g/tonne (0.048 oz/ton) gold as possible ore. These reserves exceed Echo Bay's requirements for undertaking mine development, therefore, Echo Bay will not continue exploration as in previous years.

During 1991, A-J activity was focused on acquiring permits, working on the final draft of the environmental impact statement, and continuing metallurgical testing. This testing concentrates on milling and gold recovery. Echo Bay provided a $111,980 grant to the Mineral Industry Research Laboratory at the University of Alaska Fairbanks to assist in this work.

The final EIS and record of decision by the Bureau of Land Management, the lead Federal agency, is expected in late spring 1992. Until this key environmental document is released, a decision whether or not to proceed with mine development will not be made. Late in 1991, Echo Bay purchased the remaining 15% of the A-J unit from WGM Inc. This unit includes the Treadwell deposit and gives Echo Bay Alaska total control of both properties.

Echo Bay announced a major change in mine facility design during the year. Previously, Echo Bay had planned to conceal much of the mine infrastructure underground and behind berms. Following public comment and recommendations of a design group, the company is considering making the facility an architectural asset with the surface facilities located on Gastineau Channel in full view of the community. According to this plan, facility design would focus on the history of mining in Juneau. The plan includes an adjacent tourism facility with classroom space to serve as the permanent home of the University of Alaska Southeast Institute of Mining Technology and would operate in conjunction with the institute's ongoing mine training program.

INDUSTRIAL MINERALS

Ashgrove Cement West of Portland, Oregon, continued exploration and feasibility studies on its Oswego limestone claims. These claims are at View Cove on eastcentral Dall Island, west of Prince of Wales Island in southern southeast Alaska. View Cove offers a well protected deep water port. The Oswego limestone is pure and suitable for Portland Cement.

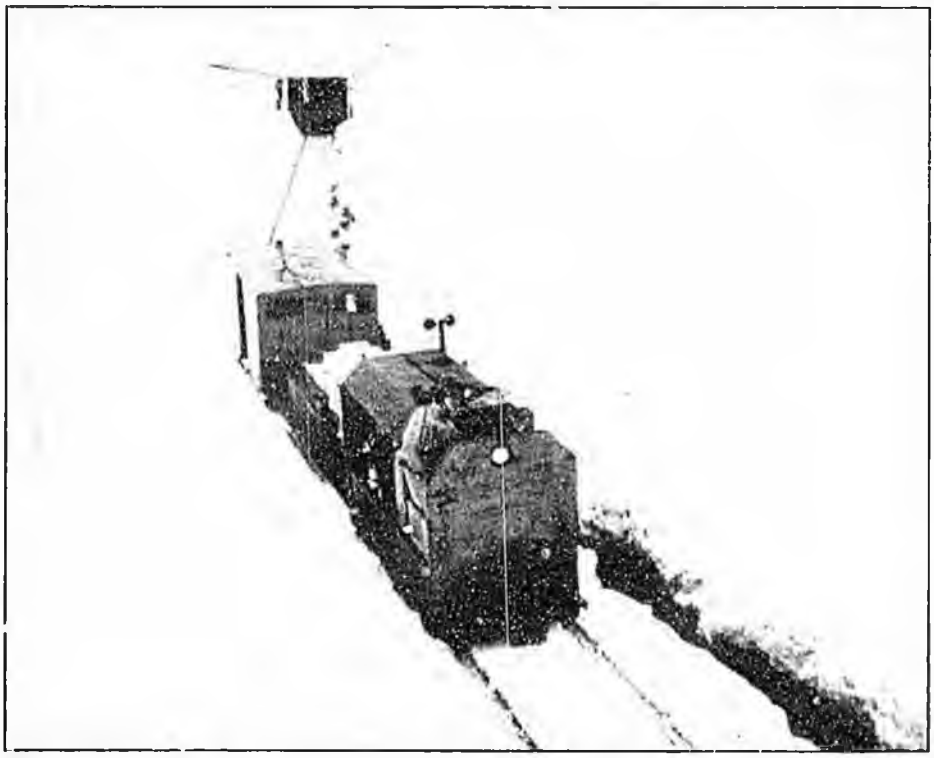
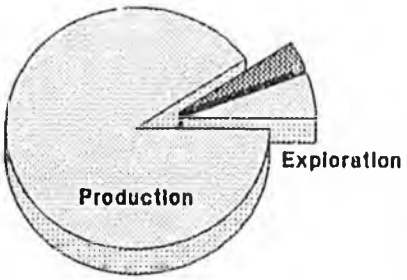


Figure 16. *Low profile underground train enters the Sheep Creek Portal at the Alaska-Juneau Mine near Juneau. (Photo by Lance Miller, Echo Bay Alaska Inc.)*



DEVELOPMENT

Mineral development expenditures grew by more than 70% to $25.6 million in 1991. A major gold property is being developed near Fairbanks. Coal properties were seriously studied for export and domestic markets.

Alaskan mineral development expenditures increased nearly 79% from $14.3 million in 1990 to $25.6 million in 1991, and the number of jobs in mineral development increased from 95 to 133 (tables 5 and 6). Increased activities are centered around anticipated large-scale gold mining in the Fairbanks area, coal and placer gold development in the southcentral region, and development, drilling, and geotechnical analysis at the Greens Creek Mine near Juneau (fig. 17).

METALS

Major development projects were reported at the Fort Knox deposit near

Table 5. *Reported mineral development expenditures in Alaska by commodity, 1982-91*

	Base metals	Precious metals	Industrial minerals	Coal and peat	YEARS TOTAL
1982	$ 10,270,000	$ 19,320,000	$ 4,251,000	$ 7,750,000	$ 41,591,000
1983	19,500,000	7,112,500	1,000,000	250,000	27,862,500
1984	10,710,500	15,058,555	579,000	27,000,000	53,348,055
1985	13,000,000	16,890,755	1,830,000	2,400,000	34,120,755
1986	7,260,800	16,417,172	124,000	530,000	24,331,972
1987	62,080,000	37,640,848	188,000	342,000	100,250,848
1988	200,000,000	74,945,500	--	--	274,945,400
1989	118,200,000	6,876,350	7,000,000	2,196,000	134,272,350
1990	4,101,600	7,136,500	30,000	3,079,000	14,346,500
1991	4,000,000	18,994,350	262,000	2,318,000	25,574,350
TOTAL	$449,122,300	$220,392,530	$15,264,000	$45,643,730	$730,643,730

-- = No expenditures reported.

Table 6. *Reported mineral development expenditures and employment in Alaska, 1991*

	Northern	Western	Eastern interior	South-western	South-central	Alaska Peninsula	South-eastern	TOTAL
Exploration expenditures								
Base metals	$ --	$ --	$ --	$ --	$ --	$ --	$ 4,000,000	$ 4,000,000
Precious metals								
Placer	79,000	2,050,000	308,300	1,090,000	5,338,000	--	--	8,865,300
Lode	--	--	6,000,000	--	119,050	--	4,010,000	10,129,050
Coal and peat		--		--	2,318,000	--	--	2,318,000
Industrial minerals	--	110,000	150,000	--	--	--	2,000	262,000
TOTAL	$79,000	$2,160,000	$6,458,300	$1,090,000	$7,775,050	$ --	$8,012,000	$25,574,350
Exploration employment								
Employment								
Workdays	633	940	12,613	290	13,420	--	6,700	34,598
Workyears[a]	2	3	49	1	52	--	26	133
Number of companies reporting[b]	3	2	10	3	9	0	3	30

-- = No expenditures reported.
[a]Based on a 260-day workyear.
[b]Some companies were active in several areas.

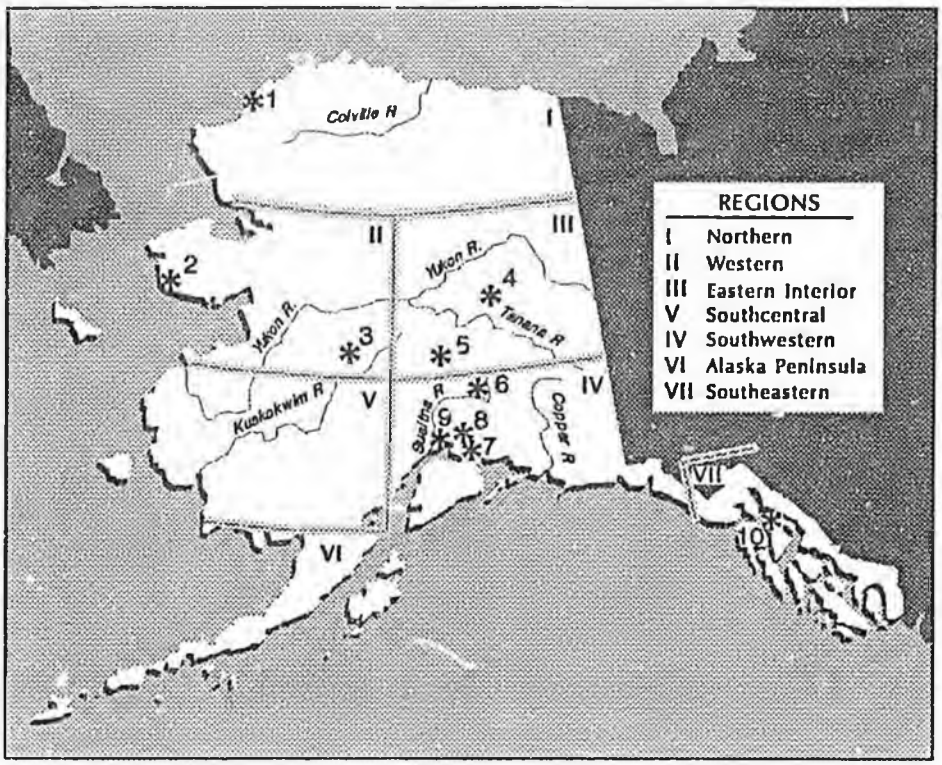
Fairbanks, at the Valdez Creek Mine near Cantwell, and the Greens Creek Mine. In addition, many smaller placer mines reported at least some development in 1991.

In the northern region near Wild Lake, Mick and Cecilia Manns continued to work their thawed placer ground and expand their recreational tourist mining operation. Paul Dionne, who mines underground on Nolan Creek, spent about a month cleaning out settling ponds and reclaiming previously mined ground.

In the western region, Alaska Gold Company continued thaw-field drilling and stripping in the Nome area, preparatory to operating two dredges in 1992 on its gold placer property. Central Alaska Gold Company operated a large condemnation and geotechnical program at the high-grade gold skarn deposit at Nixon Fork to assure that the placement of the airstrip and surface facilities will not interfere with the progress of the project. The company identified ore reserves (all categories) of the Nixon Fork skarn as 317,450 tonnes (350,000 tons) grading 30.85 g/tonne (0.9 oz/ton) gold, and 0.8% copper.

In the eastern Interior region, Fairbanks Gold Ltd. completed 9,340 m (32,600 ft) of RVC drilling at its Fort Knox deposit about 24 km (15 mi) northeast of Fairbanks. The geotechnical work during the year consisted mainly of condemnation drilling to ascertain where to locate a mill, tailings pond, and other support facilities for a proposed mine (fig. 18). Bulk sampling tests designed to assist in milling design continued (fig. 19). Fairbanks Gold reports that the Fort Knox deposit contains 99,520 kg (3.2 million oz) gold in proven and probable categories within about 113 million tonnes (125 million tons) of granite-hosted ore. The Fort Knox deposit is located on Alaska State lands where reclamation laws are rigorously enforced. During 1991 Fairbanks Gold reclaimed former exploration trenches and mine pits (figs. 20 and 21).

Late in the year Amax Gold Inc. announced its intention to purchase all assets of Fairbanks Gold Ltd. in a stock transfer worth about $150 million.



I NORTHERN REGION
1. Arctic Slope Consulting Gr.
Deadfall syncline—coal marketing studies, fire testing

II WESTERN REGION
2. Alaska Gold Co.
Nome district—placers, thaw-field drilling
3. Central Alaska Gold Co.
Nixon Fork deposit—airstrip/surface condemnation studies

III EASTERN INTERIOR REGION
4. Fairbanks Gold Mining Ltd.
Fort Knox deposit—geotechnical and condemnation drilling
5. Usibelli Coal Mine Inc.
Healy Clean Coal Project

IV SOUTHCENTRAL REGION
6. Cambior Alaska
Valdez Creek—stream diversion project
7. Hobbs Industries Inc.
Evan Jones mine site bonding, road access studies
8. Idemitsu Alaska
Wishbone Hill—engineering design, environmental studies
9. Diamond Chuitna
Beluga Coal Field—market studies

VII SOUTHEASTERN REGION
10. Kennecott Greens Creek Mining Company
Greens Creek—mill studies, reserve development

Figure 17. *Selected mineral development projects.*

Amax Gold plans to continue development work on the property, acquire necessary permits, conduct environmental assessments, and proceed toward production in late 1994 or early 1995. Mine development costs are estimated at $200 million. A work force of 250 would produce 9,330 kg (300,000 oz) gold annually, more than double Alaska's current gold production.

Development work was reported at many of the placer mines in the Interior. In the Circle district Stan Gelvin of Greenhorn Mining Co. and Steve Weber of Magic Circle Mining stripped overburden on Ketchum Creek preparing for mining in 1992. James Wilde reported stripping activity and some

Figure 18. *Drilling equipment at Fort Knox deposit near Fairbanks. Most of the drilling on the property in 1991 was condemnation drilling carried out so that future mining activity would not be compromised by the mine's infrastructure. (Photo by Fairbanks Gold Ltd.)*

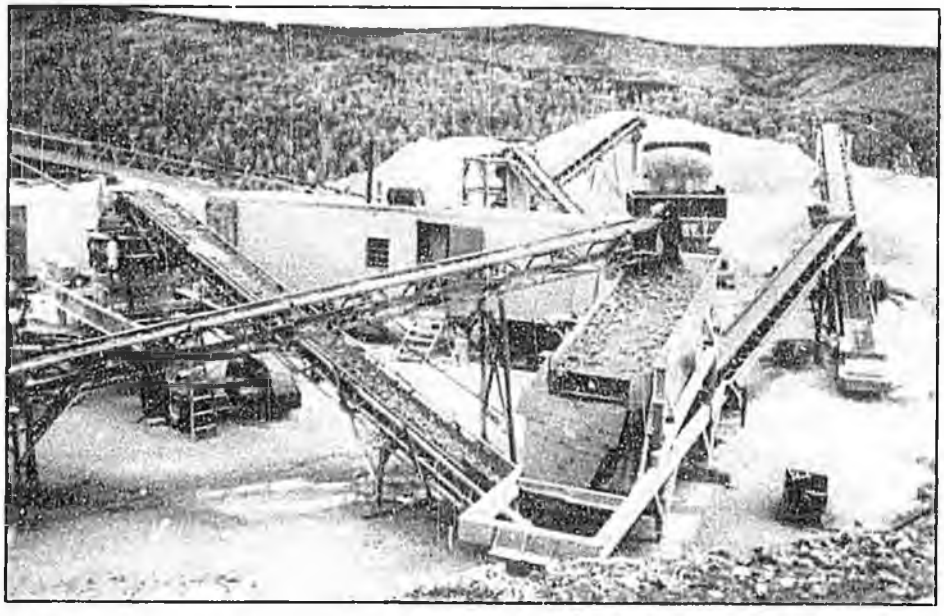


Figure 19. *Sampling conveyor and tower system used to evaluate bulk samples from Fort Knox deposit near Fairbanks. A local firm, H&H Contractors, operated the sizing and classifying equipment. (Photo by Fairbanks Gold Ltd.)*

reclamation on Switch Creek. Charles Cleveland constructed a bypass ditch on Harrison Creek.

In the Manley area Ed Salter stripped overburden on Joe Bush Creek. In the Fortymile area Charles Hammond of Fortyfive Pup Mining stripped ground on Fortyfive Pup Creek.

In the Fairbanks mining district Cooks Mining used a D9-L Caterpillar to strip 3-4 m (10-15 ft) of overburden on Deep Creek near the mouth of Fairbanks Creek. Roberts Mining continued drift mining and drift development on Dome Creek. Ray Vogt of RCL Mining reported development on Dome Creek, removing ice and muck from old workings. Earl Voytilla began drift mining on the right limit of Dome Creek using a road header rather than drilling and blasting.

In southwest Alaska, the Fullerton family performed development work in the old tailings on Flat Creek in the Iditarod district. Paul Sayer of Little Creek Mine stripped overburden on Little Creek near Ophir.

R.H. Hanson Inc. conducted extensive tests on clay-rich pay zones at its Goodnews Bay placer platinum properties and constructed flotation cells to improve platinum metal recovery. Previous operators determined that significant platinum remained in the clay-rich tailings. Dave Penz experimented with new water-recycling technologies at his Kako Creek Mine in the Marshall district (fig. 22).

In southcentral Alaska, Cambior Alaska constructed a major diversion ditch at its Valdez Creek Mine to channel the water around the openpit operations that are progressing up the valley. The diversion cost about $6.9 million, was completed in late spring of 1991, and full-scale mining resumed. Development activity at the mine consisted of a substantial reverse-circulation drill program and stripping of overburden.

Similar activity was reported by several other placer mining companies operating in Southcentral. Randy Elliot reported overburden removal at McCarthy. Ed Ellis's company Lake Creek Placers, evaluated conglomerate reefs in the Kenai Group rocks at Lake Creek in the Yentna Tertiary Basin. Gary McCarthy of Girdwood Mining Co. reported bulk sampling of placer ground

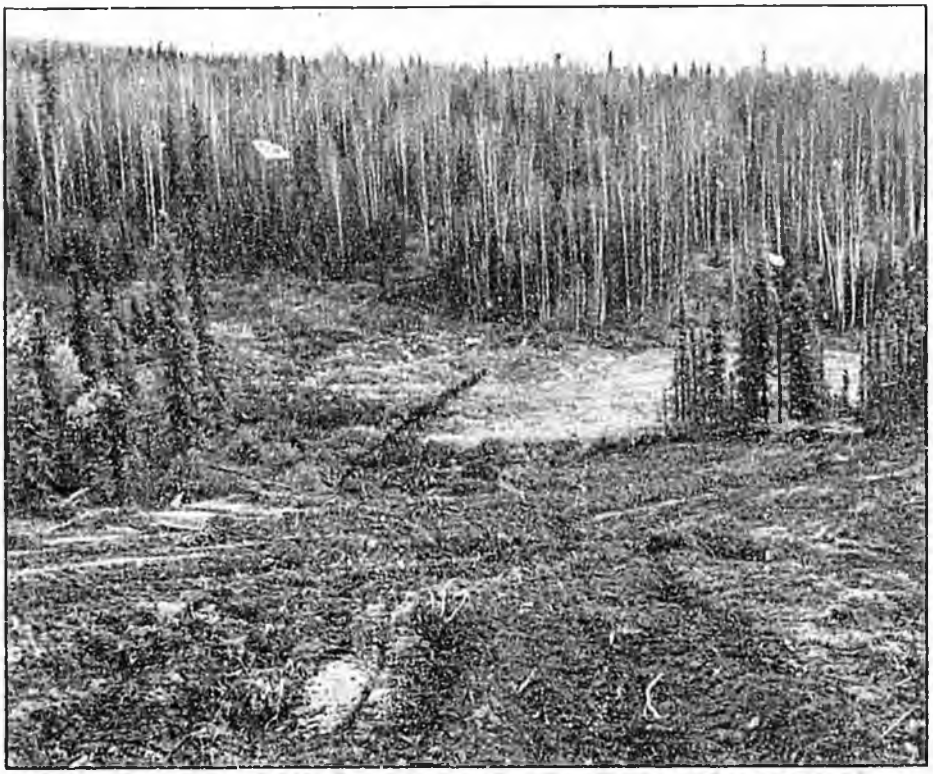


Figure 20. *Reclamation work in Nugget Creek, Fairbanks district, by Fairbanks Gold Inc. The company has filled in trenches and open pits and reseeded the area. Newly enacted State regulations require reclamation of all mined land in Alaska. (Photo by Fairbanks Gold)*

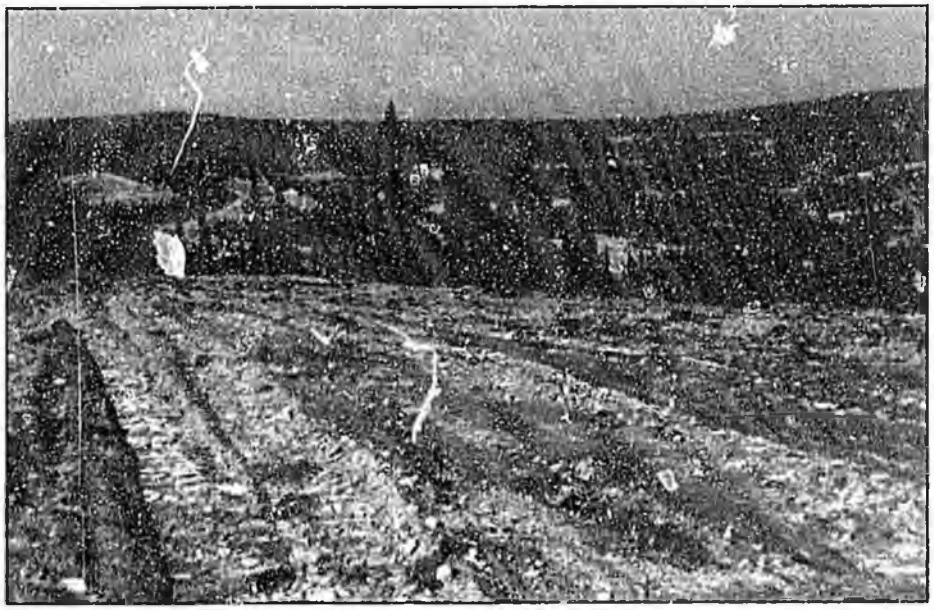


Figure 21. *A large exploration trench has been filled-in east of Melba Creek. Monte Cristo Creek near the Fort Knox deposit. (Photo by Fairbanks Gold Inc.)*

at Girdwood. Kevin Thompson of Gold Tech Resources Inc. reported development work in the Valdez Creek and Pass Creek drainages east of Cantwell.

Even though bears tried to share the kitchen table, Arne Murto of Finnbear Mining Co. Inc. managed to do further evaluation of precious and platinum-group metal placers in the Kahiltna River drainage.

There was no development activity on the Alaska Peninsula in 1991. In southeast Alaska, Jerry Fabrizio of Snow Lion Mining Co. reported stripping of vegetation and doing some testing on Porcupine Creek.

Kennecott Greens Creek Mining Company continued development on Greens Creek Mine west of Juneau, where more than 1,830 m (6,000 ft) of drifting now provides access to the greatly expanded ore reserves identified by drilling in the past two years. Pending approval from the U.S. Forest Service, the company also intends to upgrade the milling facility at the mine in the near future.

COAL

In spite of political and economic problems coal development was reported in northern, eastern interior, and southcentral Alaska in 1991.

In northern Alaska the Arctic Slope Consulting Group conducted extensive coal marketing studies as part of its proposed development of the Aluaq Mine in the Deadfall syncline area near Cape Beaufort. In 1991 the Alaska legislature awarded $2 million to Arctic Slope Regional Corporation to continue exploration and feasibility studies. During the year bulk samples were shipped to facilities in Pennsylvania and Taiwan for testing. Export market possibilities include the Far East and Europe via a northern Arctic Ocean sea route.

In interior Alaska, Usibelli Coal Mine Inc. along with five other private and public organizations continued to work on the Healy Clean Coal Project (HCCP). The HCCP plant is estimated to cost $194 million, with about 50% of the cost to be supplied through a U.S. Department of Energy grant. The Alaska Industrial Development and Export Authority administers the State's investment.

Usibelli Coal Mine will provide the coal and Golden Valley Electric Association will purchase the power

from HCCP. The project will begin construction in spring 1993, with startup testing of plant facilities scheduled for late 1995. When completed, the HCCP plant will generate 50 megawatts of electric power using state-of-the-art technologies designed to reduce sulfur, nitrogen, and particulate matter emissions.

In southcentral Alaska there was coal development work in both the Beluga and Matanuska Valley coalfields. Diamond Chuitna continued development and fulfillment of permit requirements for its 299-million-tonne (330-million-ton) coal reserve in the Beluga coalfield, northwest of Cook Inlet. Diamond Chuitna continues to examine potential Asian market opportunities for its subbituminous coal, which contains heating values and physical characteristics similar to coal produced by Usibelli Coal Mine.

During the last three years, Idemitsu-Alaska Inc. has conducted extensive development of its proposed surface coal mine and conducts ongoing environmental studies. The company continued reserve evaluation drilling, engineering design, and environmental studies at its Wishbone Hill Coal Mine northeast of Palmer in the Matanuska Valley (fig. 23). In September 1991, Idemitsu-Alaska Inc. acquired the requisite State coal-mining permit for the proposed operations. The Wishbone Hill project has been negatively affected by the Mental Health Lands litigation. Although the Asian market opportunities for steam coal have recently declined, markets are expected to improve later in the decade. Idemitsu-Alaska anticipates that mine construction could begin in 1994 or early 1995 if pending legal issues can be resolved. The mine plan calls for production of up to 1.36 million tonnes (1.5 million tons) of high-quality bituminous coal annually, employing a year-round work force of 150-200.

Farther up the Matanuska Valley, Hobbs Industries Inc. delayed development of the Castle Mountain Mine because of the Mental Health Lands injunction and the loss of an important market. The market loss was caused by the Federal government's termination of a radar site near Glennallen which would have used Castle Mountain coal for its power plant. Following this delay, Hobbs began development of the nearby Evan Jones Mine. A new portal pad was constructed during 1991 and a multiplate culvert-type portal was placed at the face of the Number-3 coal seam. By year's end, a tunnel 24 m (79 ft) long was driven using a Joy 12CM5 "continuous miner." Issues to be settled before Hobbs can put a mine into production include road access, bond payments, and market assurance.

INDUSTRIAL MINERALS

The only reported development of any sand or gravel resources was in southeast Alaska. A small amount of stripping of overburden was done at the Ludwig pit, along the Juneau-Douglas Highway near Juneau.

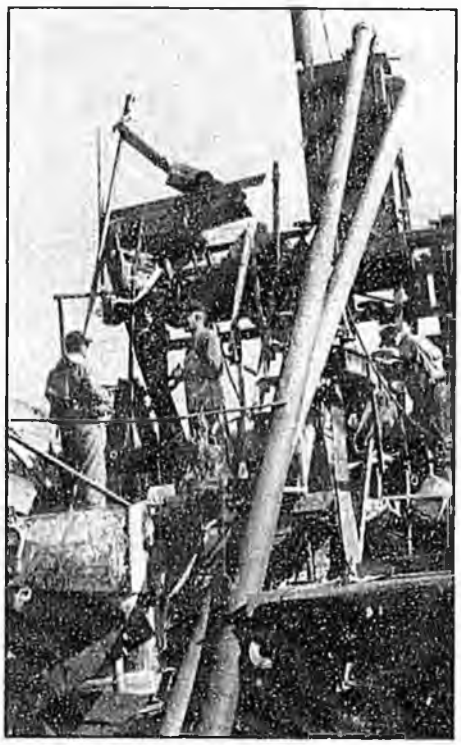
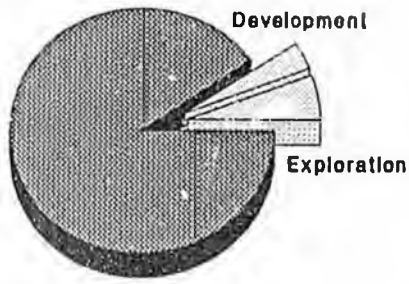


Figure 22. *Dave Penz explains his gold recovery plant to DGGS geologist Jeff Kline at his Kako Creek Mine near Russian Mission. Like many Alaskan placer miners, Penz strives to reduce water use to more easily comply with State and Federal water-quality standards. (Photo by T.K. Bundtzen)*

Figure 23. *Consulting biologists use a mild shocking technique to evaluate the effects of mineral development on the number of coho salmon in the habitat near the proposed Wishbone Hill coal mine. (Photo by McKinley Mining Consultant)*

PRODUCTION



Production volume increased from Alaska metallic mines although low metal prices hurt profitability. A net loss of sixteen placer mines occurred in the year; the industry awaits better gold prices. Alaska has become a major producer of zinc, lead, silver, and gold.

The value of mineral production in 1991 is estimated to total $546.5 million, an increase of 3% above the 1990 level of $533 million, and 98% more than the $277 million produced in 1989 (table 7). Estimated percentage of the total gross value of mineral production for each commodity is zinc 51%, gold 16%, sand and gravel 8%, silver 7%, coal 7%, lead 6%, and all other commodities 5% (fig. 24). Mineral production statistics, as summarized in table 7, originated from approximately 275 coal, placer, and lode metal mines, and sand and gravel and stone quarries and pits that were operated in every region of the State (fig. 25).

Our production estimates are based on data compiled from 177 questionnaires returned by companies, individuals, Native corporations, and government agencies; phone conversations with 19 sand, gravel, peat and stone quarry operators; regional summaries provided by the U.S. Forest Service and Alaska Department of Transportation and Public Facilities; and bullion sale volume estimates from selected precious metal refiners. Figures 26, 27, and 28 illustrate the history of the production of gold, sand and gravel, and coal. Annual production estimates for 10 metals and four nonmetallic and undifferentiated commodities are summarized in appendixes F and G. These tables show that Alaska has produced a variety of mineral commodities for over 100 years.

Metals have dominated mineral production for the last five consecutive years. The value of metals in 1991 accounted for 80% of total Alaskan mineral product value. A single commodity—zinc—dominated and accounted for 51% of the total dollar value. Gold came in second in value, but its extraction still employs the most people—1,240 or one of three mining jobs. The dominance of zinc can be attributed to production of sulfide concentrates from the Red Dog Mine in northwestern Alaska and the Greens Creek Mine on Admiralty Island. These two properties accounted for about 57% of U.S. domestic mine output of zinc, helping the country to reduce the net import reliance of this metal from 61% in 1989 to about 45% in 1991. However, lower zinc prices nearly negated the large increase in production volume.

Silver again sparkled in the sulfide concentrates of both the Red Dog and Greens Creek Mines, but low prices reduced its luster. The 281 tonne total (9,076,854 oz) accounted for nearly 16% of U.S. mine production of silver, but average bullion prices dropped by 21% from 1990 levels. When inflationary factors are considered, the 1991 average price of just over $0.14/g ($4.06/oz) is near historical lows.

Lead production, although considered a byproduct of production at the Red Dog and Greens Creek Mines, amounted to about 13% of the nations total mine output. The 28% price drop for lead that took place from 1990 to 1991, however, severely compromised the 57% increase in volume of metal from both mines.

In 1991, at least temporarily, gold mines reversed the significant downhill trend of 1989 to 1990. An estimated 202 placer and two lode mines produced 7,585 kg (243,000 oz) gold, a 5% increase in volume from the 1990 season. But because of lower prices, there was a slight decrease in value from $89.2 million in 1990 to $88.3 million in 1991. Resumption of full-scale operations by Cambior Inc. at Valdez Creek accounted for virtually all of the gold production increase. In fact, there was a net loss of 16 placer mine operations statewide, with the hardest hit areas being the western and eastern interior regions (table 8).

The decline in operations reflects generally complex interacting factors such as: (1) declining easy-to-exploit reserves in key districts such as Circle, Livengood, Bonnifield, and Manley-Eureka; (2) an 8% price decline at a time when the gold price was already considered soft (this factor mainly affected high-cost, large-scale producers who produce gold with significantly higher capital costs and energy consumption); and (3) increasing regulatory oversight concerning water quality, reclamation, and access issues that tend to add costs to operations already being negatively affected by decreasing gold prices.

The 10 largest Alaskan gold producers are (not necessarily in order) Cambior Alaska, Kennecott Greens Creek Mining Company, Alaska Gold Company, Polar Mining, NYAC Mining Company, Alaska Placer Development, Sphinx America, Thurman Oil and Mining, Rosander Mining Company, and GHD Resources. These companies produced an estimated

4,380 kg (138,900 oz) gold or 57% of the statewide total.

In previous years the 10 largest producers accounted for 49% (1990), 61% (1989), 59% (1988), and 58% (1987) of total gold output. The results in 1991 were fairly typical of the gold distribution of the industry. In 1991 lode gold accounted for 15% of the total output whereas placer sources accounted for the remaining 85%. The Alaska gold industry remains dominated by placer sources operated by relatively small, rural-based firms.

The mean average output for an average Alaska gold mine in 1991 was 37 kg (1,195 oz) compared to 28 kg

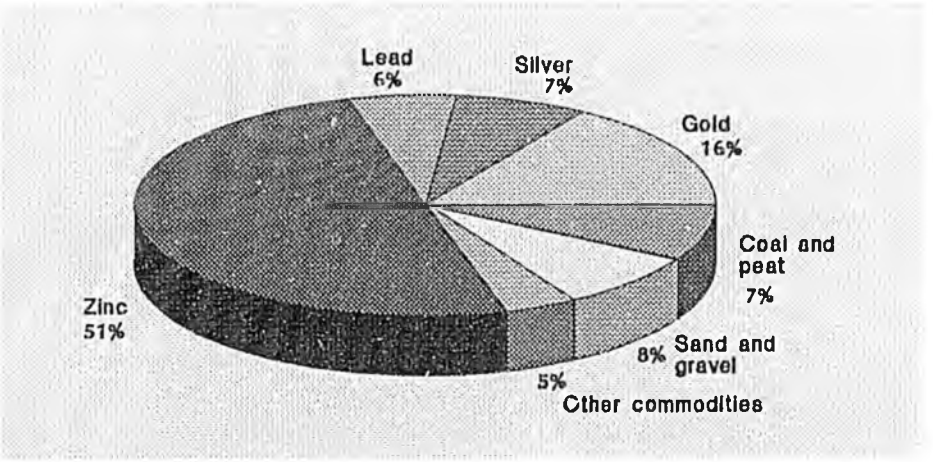


Figure 24. *Relative percentages of estimated mineral production in Alaska, 1991.*

Table 7. *Estimated mineral production in Alaska, 1989-91*[a]

	Quantity			Estimated values[b]		
	1989	1990	1991	1989	1990	1991
Metals						
Gold (ounces)	284,617	231,700	243,900	$108,723,694	$ 89,204,000	$ 88,291,800
(kilograms)	8,852	7,206	7,585			
Silver (ounces)	5,211,591	10,135,000	9,076,854	27,360,852	50,675,000	39,114,490
(kilograms)	162,102	315,199	281,382			
Platinum (ounces)	W	--	15	W	W	5,325
(grams)	W	--	465			
Lead (tons)	9,585	44,220	69,591	7,672,009	30,954,000	33,403,680
(tonnes)	8,698	40,106	63,119			
Zinc (tons)	19,843	181,200	278,221	29,383,400	253,680,000	278,221,000
(tonnes)	18,007	164,350	252,346			
Mercury (pounds)	W	--	--	W	--	--
Tin (pounds)	194,000	57,000	6,800	672,000	200,000	22,100
(kilograms)	87,988	25,855	3,084			
Subtotal				$173,811,955	$424,713,000	$439,058,395
Industrial minerals						
Jade and soapstone (tons)	57.0	W	16.0	$ 1,140,000	$ W	$ 12,000
(tonnes)	51.7	W	14.5			
Sand and gravel (million tons)	14.4	15.0	14.2	39,875,000	40,821,500	45,448,512
(million tonnes)	13.1	13.6	12.8			
Building stone (million tons)	2.9	3.2	3.0	20,340,000	22,100,000	22,500,000
(million tonnes)	2.6	2.9	2.7			
Subtotal				$61,355,000	$62,921,500	$67,960,512
Coal (tons)	1,452,353	1,576,000	1,540,000	$ 41,464,800	$ 44,990,000	$ 39,000,000
(tonnes)	1,317,574	1,429,000	1,396,780			
Peat (cubic yards)	51,000	65,000	75,000	352,000	400,000	450,000
(cubic meters)	38,995	49,699	57,345			
Subtotal				$ 41,816,800	$ 45,390,000	$ 39,450,000
TOTAL				$276,983,755	$533,024,500	$546,468,907

[a]Production data from DGGS questionnaires, phone interviews with mine operators, Alaska Department of Transportation and Public Facilities, and other sources.
[b]Values calculated from 1991 annual price averages of gold ($362/oz), zinc ($0.50/lb), lead ($0.24/lb), platinum ($355/oz), and tin ($3.25/lb) as published in the "Mining Journal"; other values supplied directly by mine operators. Coal-value estimates provided by mine operators.
-- = Not reported.
W = Withheld.

(892 oz) in 1990, 35 kg (1,143 oz) in 1989, and 40 kg (1,282 oz) in 1988. These fluctuations of average gold volumes reflect the rise and fall of production from a few major operations. For example, when the Valdez Creek Mine remained dormant for most of 1990, the average gold output dropped 22%; when it resumed operation in 1991, the average gold output jumped back up to previously established levels.

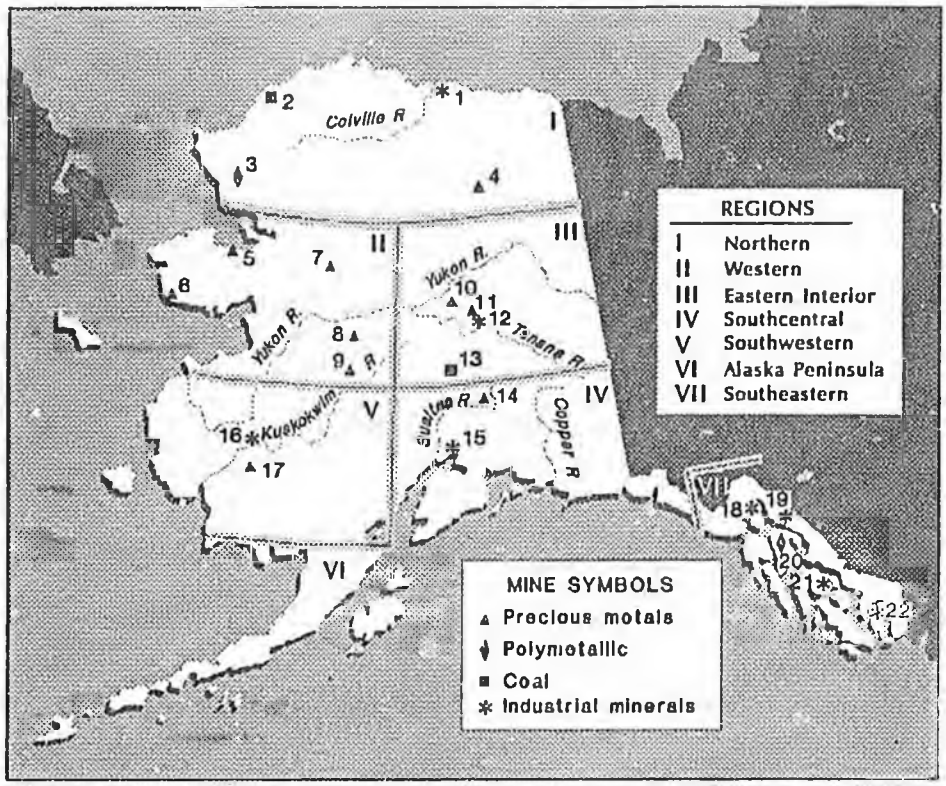
Unit-cost data of selected placer mines for 1989-91 is summarized in table 9. These figures are based on company estimates of the cost of producing an ounce of gold during the 1989-91 seasons. Although the mine population represents only 12% of the total mechanized placer mines in the three calendar years (79 cost-data estimates, 640 total mines in operation), the same general trends occurred in all three years. The largest producers continue to have higher costs than the medium- or smaller-scale producers. The average cost to produce gold during 1989-91 was $10.86/g ($338/oz).

METALS

Northern Region

From August to the close of the shipping season on October 8, 1991, Cominco Alaska Inc. shipped to market 69,463 tonnes (76,585 tons) lead concentrate, 372,508 tonnes (410,704 tons) zinc concentrate, and 30,942 tonnes (34,115 short tons) ISF composite metal concentrates milled from approximately 1.99 million tonnes (2.2 million tons) of massive sulfide ore at the Red Dog Mine in northwestern Alaska. The 472,913 tonnes (521,404 tons) of concentrates is 62% more than the 291,782 tonnes (321,700 tons) shipped during the mine's first year in 1990. Cominco indicates that 1992 production will be about the same as 1991.

Red Dog is a stratiform deposit, probably SEDEX (sedimentary exhalative) type, hosted in shale, and containing zinc, lead, and silver. It lies 145 km (90 mi) north of Kotzebue in the De Long Mountains of the northwestern Brooks Range. The mine is owned by



I NORTHERN REGION

Metallic mines 14
Industrial mineral producers 3

1. Sagavanirktok, Kuparuk, and Prudhoe Units (gravel site)
2. Aluaq Mine (coal)
3. Red Dog Mine(lead-zinc-silver)
4. Chandalar Development Inc. (gold)

II WESTERN REGION

Metallic mines 35
Industrial mineral producers 2

5. GHD Resources (gold)
6. Alaska Gold Co. (two gold dredges)
7. Taiga Mining/Hogatza (gold)
8. Sphinx America (gold)
9. Rosander Mining (gold)

III EASTERN INTERIOR REGION

Metallic mines 105
Industrial mineral producers 13

10. Alaska Placer Development (gold)
11. Polar Mining Co., Thurman Oil & Mining (gold)
12. Fairbanks Sand and Gravel and Earthmovers (gravel)
13. Usibelli Coal Mine Inc. (coal)

IV SOUTHCENTRAL REGION

Metallic mines 22
Industrial mineral producers 11

14. Valdez Creek Mine (gold)
15. Palmer/Wasilla area (gravel pits)

V SOUTHWESTERN REGION

Metallic mines 25
Industrial mineral producers 3

16. Chuathbaluk (gravel)
17. NYAC Mining Co. (gold)

VII SOUTHEASTERN REGION

Metallic mines 4
Industrial mineral producers 7

18. Red Samni Construction (gravel)
19. Hildre Sand and Gravel (gravel)
20. Greens Creek Mine (zinc, silver, gold, lead)
21. U.S. Forest Service (rock)
22. Ketchikan Gateway Borough (rock)

Figure 25. *Location of principal gold mining camps, coal mines, and industrial mineral sites in Alaska, 1991. The total number of metallic mines and industrial mineral producers is given for each region.*

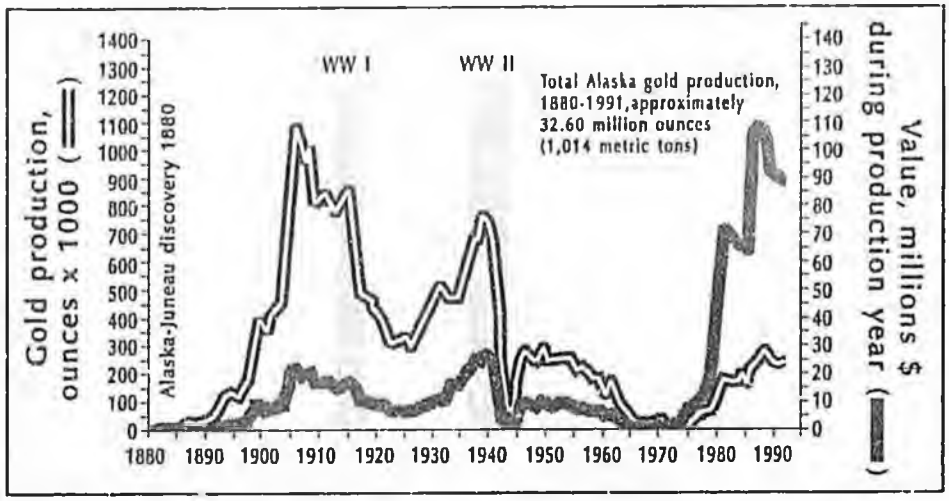


Figure 26. *Gold production in Alaska, 1880-1991.*

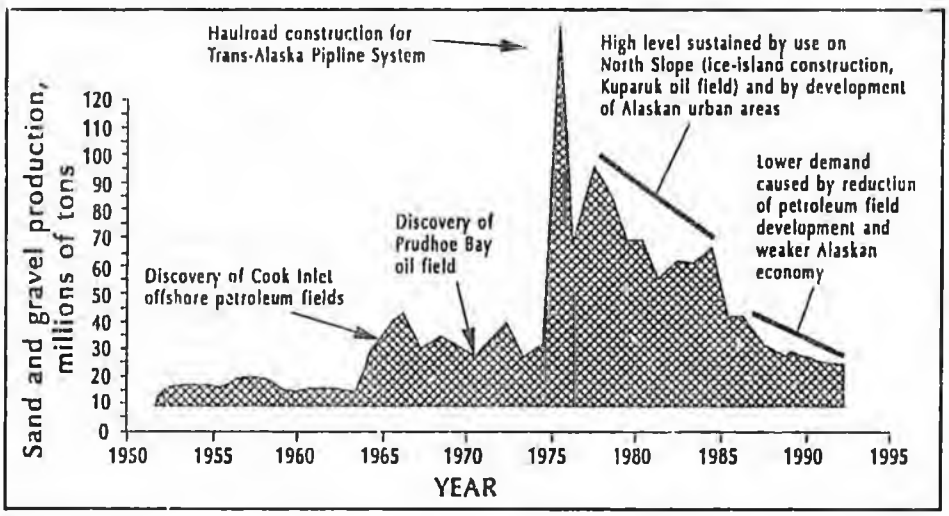


Figure 27. *Sand and gravel production in Alaska, 1950-91.*

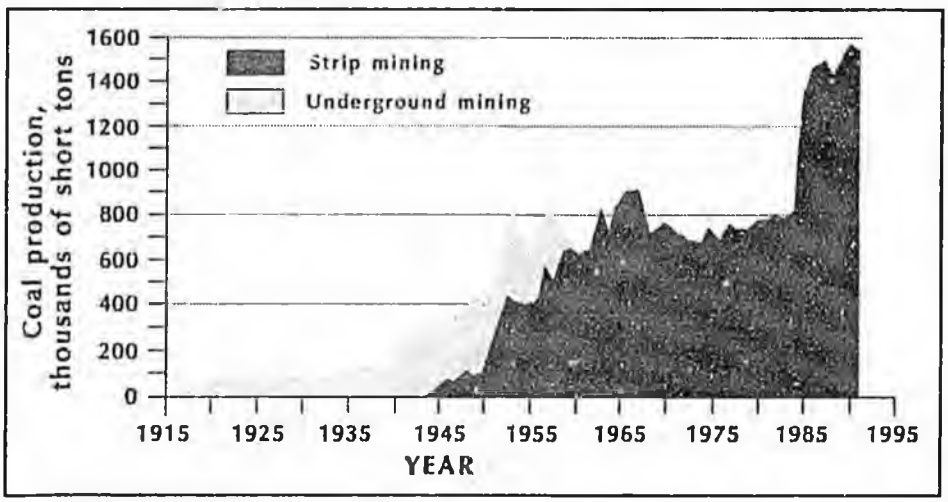


Figure 28. *Coal production in Alaska, 1915-91.*

NANA Regional Corporation and leased to Cominco, which owns and operates the mining and processing facilities. NANA is paid a royalty which will increase after the capital investment plus interest is recovered by Cominco. The mine development, which was carried out from 1987 to 1989, cost $415 million and involved the cooperation of the owner (NANA Corporation), the mine operator (Cominco), and the State of Alaska. The State financed the De Long Mountains transportation system, which is administered by the Alaska Industrial Development and Export Authority. The system includes the port near Kivalina as well as the 83 m (52 mi) mine road. About 265 employees mine and mill year round. More than half the workers are permanent residents and shareholders of the NANA Corporation.

According to Cominco's statistical summaries, the Red Dog deposits contain measured and indicated reserves of about 59 million tonnes (65 million tons) grading 18.5% zinc, 5.4% lead, and 82 g/tonne (2.4 oz/ton) silver, and an additional inferred reserve amounting to 14.5 million tonnes (16 million tons) grading 10% zinc, 2.7% lead, and 41 g/tonne (1.2 oz/ton) silver. A large and significant, but presently unrecoverable, barium resource also exists at the mine site. The nearly flat, shallow ore bodies are being mined with opencut mining methods.

Ore is milled near the mine and concentrates are trucked to the port site near Kivalina on the Chukchi Sea 84 km (52 mi) from the main camp. During a 108-day shipping season Foss Maritime Inc. of Seattle barged concentrates from shallow port-site waters to 11 ocean-going ore carriers that ranged in capacity from 25,000 to Panamax-class 60,000 tonnes. The ore carriers deliver concentrates to customers in Japan, Korea, Europe and to trains bound for the refining facility in Trail, British Columbia.

Like many base-metal producers worldwide, Cominco suffered from low product prices that averaged about $0.52/lb zinc in 1991. However, by the end of the fourth quarter of 1991, zinc

prices began to improve, which should boost Cominco's operational profitability at Red Dog in 1992.

Cominco has been experiencing problems with metallurgical recovery from the Red Dog deposit because of the complex nature of ore mineralization. These problems resulted in a significant net reduction of the amount of silver recovered from concentrates in 1990 and 1991. Cominco will implement technology that separates the different ores and will process each ore separately through the mill circuits.

All other metallic production from the northern region originated from placer gold mines in the Wiseman, Chandalar, and Kobuk River areas. Thirteen placer companies produced 183 kg (5,900 oz) of gold worth $2.12 million and employed 35 seasonal workers.

Paradise Valley Inc. (Mick and Cecilia Manns) again mined and extracted gold from an opencut mining operation on Flat Creek east of Wild Lake in the central Brooks Range. The ground is shallow and thawed and is expected to yield substantial quantities of gold in future years. Paradise Valley also operates a recreational mining enterprise that offers up to 100 recreational miners a two-week adventure panning for and recovering gold, which somtimes includes coarse nuggets.

Chandalar Development Corporation mined Tobin Creek for the second consecutive year in the historic Chandalar district east of the Trans-Alaska pipeline corridor (fig. 29). Six people worked for 148 days, using a dry-land jig recovery plant, similar to those installed aboard modern dredges. In 1991 Chandalar was the largest gold producer in the northern region for the second consecutive year.

Inside-Out Mining (Paul Dionne) spent 10 months in an underground drift operation on Nolan Creek in the Wiseman district north of Bettles. Inside-Out Mining worked the pay using low-profile excavating equipment, and stockpiled pay for summer sluicing. One unique feature of the operation is the discovery of large nuggets using a metal detector.

Frank and Vivian Willford continued their activities in the Koyukuk-Nolan district as they have in past years. In October 1991, an unknown arsonist burned down their cabin, shop, and woodshed, which will cause costly delays for the 1992 season.

Don Knutson and Mary McKinstry hand-mined placer gold on Smith Creek in the Nolan-Wiseman area.

Other placer mine operators who produced gold include Glenn Bouton (Middle Fork, Koyukuk River. Koyukuk-Nolan district); Mascot Mining Inc. (Vermont Creek, Koyukuk-Nolan district); Bill Nordeen (Emma Creek, Koyukuk-Nolan district); Light Mining (Nolan and Acme Creeks, Koyukuk-Nolan district); Mike Shupe (Boulder Creek, Chandalar district); Mitch Fleming (Myrtle Creek, Wiseman area); and Tricon Mining (Archibald Creek, Koyukuk-Nolan district).

Table 8. *Reported refined gold production, number of operators, and industry employment in Alaska, 1990-91*

Region	Number of operators		Production in ounces of gold		Number of employees	
	1990	1991	1990	1991	1990	1991
Northern	11	13	4,750 (148 kg)	5,900 (183 kg)	55	55
Western	42	35	79,100 (2,460 kg)	56,100 (1,744 kg)	400	295
Eastern interior	115	105	78,480 (2,441 kg)	73,600 (2,288 kg)	495	490
Southcentral	20	22	16,670 (518 kg)	55,070 (1,712 kg)	160	265
Southwestern	26	25	14,400 (448 kg)	15,650 (487 kg)	100	105
Southeastern	4	4	38,300 (1,191 kg)	37,560 (1,168 kg)	135[a]	170[a]
TOTAL	**218**	**204**	**231,700 (7,206 kg)**	**243,880 (7,585 kg)**	**1,325**	**1,380**

[a]Assumes that only 60 percent employment levels at Greens Creek project (other 40 percent assumed to base metal production).

Table 9. *Production costs for selected Alaskan placer gold mines, 1989-91*

Mine size	1989	1990	1991	1989	1990	1991
	Number of mines			Production in ounces		
Small[a]	11	8	21	2,977	1,856	3,582
Medium[b]	5	11	8	6,461	12,132	8,431
Large[c]	5	5	5	98,816	54,497	84,539
TOTAL	**21**	**24**	**34**	**108,254[d] (3,359 kg)**	**68,485[e] (2,124 kg)**	**96,552[f] (3,002 kg)**
	Unit cost/ounce			Total reported mine cost		
Small[a]	$263	$302	$284	$ 784,177	$ 560,600	$1,018,606
Medium[b]	238	273	298	1,538,000	3,314,000	2,518,239
Large[c]	324	348	376	31,972,300	18,990,000	31,857,228
TOTAL	**$317**	**$333**	**$366**	**$34,294,477**	**$22,864,600**	**$35,394,073**

[a]25-650 oz gold/yr
[b]650-2,500 oz gold/yr
[c]>2,500 oz gold/yr
[d]43% total placer gold.
[e]36% total placer gold.
[f]46% total placer gold.

Western Region

The western region has dominated statewide gold production for nearly a

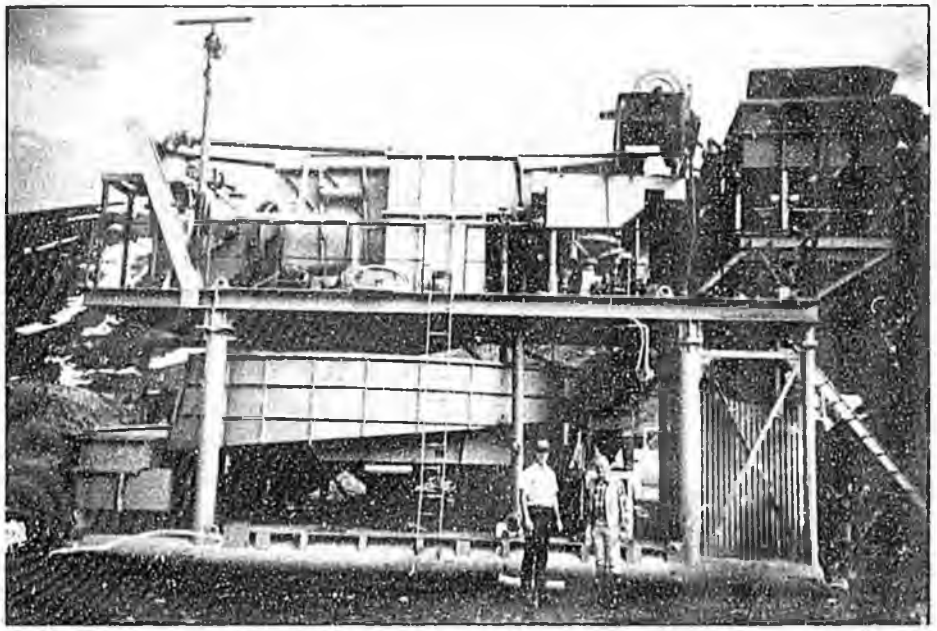


Figure 29. *Odin Strandberg Jr. and Del Ackels with HIC jig plant, that was freighted up the pipeline haul road into the Chandalar district during the 1990-91 winter season. (Photo by Eskil Anderson)*

decade. The strength of the region's gold mining industry was based on large onshore and offshore dredge and non-float placer mines in the Nome district. However, such dominance ended in 1991 when Westgold's Bima offshore dredge and the opencut mines of Anvil and Windfall Mining Companies ceased operations. The decrease in gold mining activities was precipitous—production dropped from 2,460 kg (79,100 oz) in 1990 to 1,744 kg (56,100 oz) in 1991, a decline of 29%. Employment in the region's gold mines dropped from 400 in 1990 to 295 in 1991, a loss of 105 seasonal jobs, mainly for the Nome area. There was a net loss regionwide of seven placer mining operations.

However, in the Nome district one of the mainstays of Alaska's gold mining industry, Alaska Gold Company, continued to operate two Yuba onshore floating bucketline stacker dredges. Dredge 5 worked about 5 km (3 mi) northeast of Nome on the Monroeville Beachline where it is intersected by Dry Creek (fig. 30). Dredge 6 worked further westward along an ancient strandline known as the Submarine Beach immediately west of the Nome Airport. Both have 255 liter (9 ft³) capacity buckets with displacements of 3,084 tonnes (3,400 tons) for Dredge 5 and 1,868 tonnes (2,060 tons) for Dredge 6. The electric-powered motors that operate the dredges require approximately 1,520 kw which is supplied by Alaska Gold's 5,000 kw power plant. The power plant is integrated into the Nome power grid. The company supplied 75 year-round-equivalent jobs in Nome and produced 684 kg (22,000 oz) gold in 1991. The company plans to operate both dredges in 1992 and run one thaw-point field.

GHD Resources operated the Seward Peninsula's largest opencut placer mine for the company's final year at Kiwalik Flats in the Candle district near the village of Buckland. The placer deposit at Kiwalik Flats lies at the intersection of the ancestral channel system of Candle Creek and a series of strandline deposits. Some of the placer gold currently being mined was reworked along ancient marine strandlines. An eight-man crew stripped 11,464 m³ (15,000 yd³) of overburden and washed 53,500 m³ (70,000 yd³) of pay during 857 hours of sluicing activity. Because of the flaky nature of gold on the Kiwalik Flats, GHD installed a RAHCO jig plant in 1991 to improve recovery and determine the efficiency of conventional sluice-box operations of previous years. The 12.5 tonne (11.3 ton) plant was flown into Candle aboard a C-130 Hercules aircraft. The jig proved easy to assemble and operated trouble-free for the entire season. Fed at a rate of 38 m³ (50 yd³) per hour, there were no detectable gold losses. However, a large 6,117 m³ (8,000 yd³) bulk sample of tailings from the previous year's sluicing operation that was run through the jig plant yielded only minor amounts of gold, indicating that the standard sluice box operation of previous years was probably at least 90% efficient. GHD concluded that a well designed standard sluice box is sufficient to recover the fine flaky gold found on Kiwalik Flats and, perhaps, in other Alaska mining districts.

Other large operations worked the ancestral channel deposits of Candle Creek. Au Mining Inc. (Mike Vial) worked ground immediately behind Candle townsite, adjacent to a similar opencut, front-end-loader-fed operation of Clara Bet Inc. (fig. 31). Both companies employed an average of 10 workers during the 140-day mining season. Several miles upstream on the left limit of Candle Creek, Alan Olson and Victor Layer worked pay left over from previous drift mine activities. Frozen newspaper print dating back to the turn of the century was found in ice within the drift shafts. The Rheinhart-Berg partnership mined Mud Creek, another possible stream placer reworked along marine strandlines. Problems handling deep overburden continue to plague this mining operation.

For the last 17 years, Jack Hoogendorn has drift mined gravels underneath Pliocene basalt lava flows in the nearby Inmachuk district south of Deering. Hoogendorn mines by hand using limited, low-profile, rail-mounted equipment; pay stockpiled in the winter is sluiced in June and July (fig. 32). Hoogendorn's only concern for the year was an invasion of willow moths that denuded the underbrush throughout the Inmachuk River drainage. Willows are under attack throughout the State from several

species of insects. According to the U.S. Forest Service (1992), the rusty tussock moth populations increased to epidemic proportions throughout areas of the Kuskokwim River drainage and portions of the Seward Peninsula. Willow along the Yukon River was primarily defoliated by leaf and blotch miners, so-called because they "mine" the cells between the surfaces of the leaves. No other mine activity was reported from the Inmachuk area.

N.B. Tweet and Sons operated their small, 58 liter (2 ft³) bucket-capacity floating dredge in the Kougarok district north of Nome. This third-generation Alaska mining venture alternates annually between dredge operation and ground preparation, which requires thawing and stripping of overburden. Dick Creek Mining operated a small opencut placer on Dick Creek also in the Kougarok district. Cheryl Jong maintained a small scale mine effort on Washington Creek also in the Kougarok district.

Other Seward Peninsula placer mines that reported production include: Ed Hatch (Sweepstake Creek, Koyuk district); Homer Hoogendorn (Buster Creek, Nome district); D.B. Parent (Bear Creek, Koyuk district); Roger Nordlum (Candle Creek, Candle district); Swanson Mining (Dime Creek, Koyuk district); the Dozette and Gardner operations (Bear Creek, Koyuk district); Ed Schwoyer (Bluestone River, Port Clarence district); the Global Resources American Creek Dredge (Cripple Creek; Nome district) and Dave Gerke (Solomon district). Pat Bliss did not operate his 113 liter (4 ft³) bucketline dredge on the Ungalik River north of Unalakleet in 1991. This floating dredge last produced gold in 1987 or 1988.

Further east of the Seward Peninsula and into the Yukon River Basin, placer mining activities were maintained at about the same level as in previous years. Taiga Mining Company Inc. (Jerry Birch and Kevin Greenfield) again leased and operated the Alaska Gold Company Hogatza Dredge on Bear Creek of the Middle Koyu'uk River Drainage. This 170 liter (6ft³) bucketline, stacker dredge originally worked in the Livengood district, was transported to Hogatza by the USSR&M Company in the mid-1950s, and was operated continuously until 1975 and again from 1981 to 1983. During past production years the operation provided jobs to residents of Selawik, Huslia, and other villages in this remote area of the Alaska bush. Taiga reactivated the Hog River dredge two years ago and is working extensions of bench pay left by previous operators.

Flat Creek Mining Co. (Pete Haggland) mined on Federal claims on Flat Creek in the Ruby Mining district south

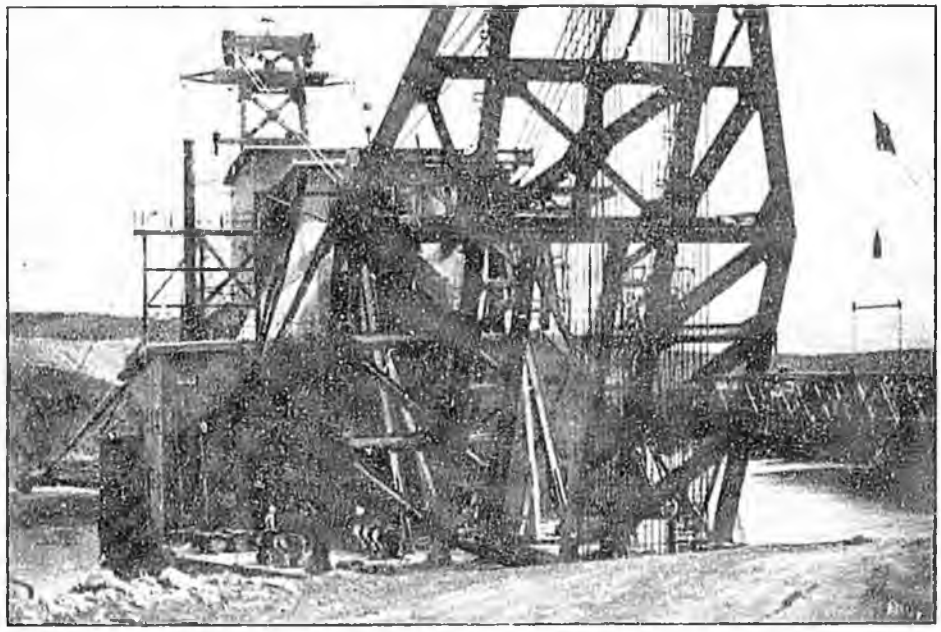


Figure 30. *Alaska Gold Company's Gold Dredge 5 working the Monroeville Beachline, an ancestral gold-bearing shoreline of the Bering Sea near Nome. (Photo by T.K. Bundtzen)*

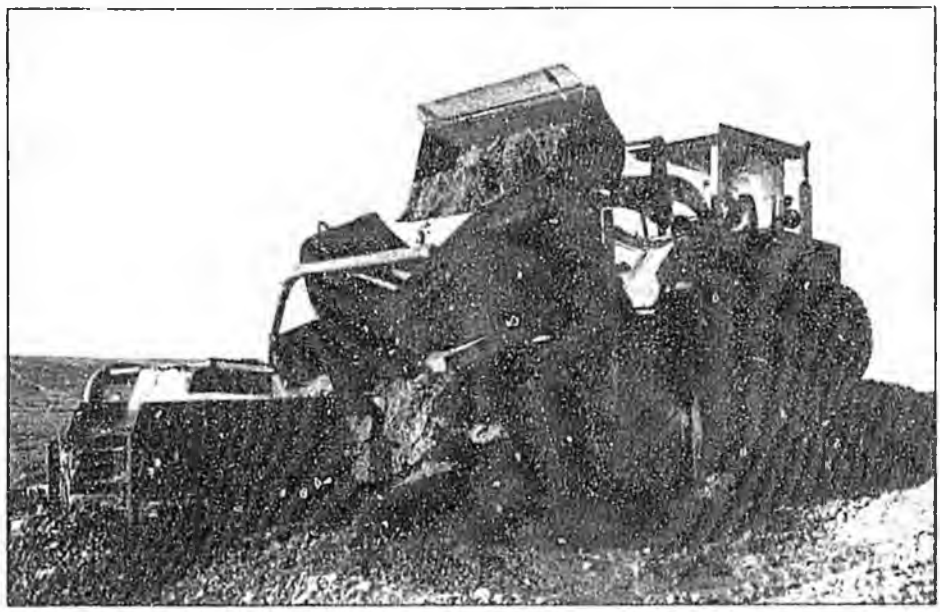


Figure 31. *Clara Bea Mining feeding-and-washing plant on the mine site at Candle bench, an ancestral channel system in the Candle district on the Seward Peninsula. (Photo by T.K. Bundtzen)*

Figure 32. *Jack Hoogendorn inspects the entrance to his underground drift mine on the right limit of the Inmachuk bench in the Inmachuk district near Deering on the Seward Peninsula. Jack covers the entrance to prevent the frozen gravels from thawing and caving during summer months. (Photo by T.K. Bundtzen)*

of the Yukon River (fig. 33). In this district, wind-blown loess buries many paystreaks, and the locations of some ancestral channels of major trunk streams in the Sulatna River drainage continue to elude mining firms.

Other operators active in the Ruby-Poorman district include: 7.5 Ounce Mining (Trail Creek); Short Gulch Mining (Ophir Creek); Sphinx Mining Inc. (Monument Creek); Swift Creek Mining Company (Swift Creek); Tilleson Mining and Reclamation (California Creek); Miscovich Mining Company (Poorman Creek); and Green Mining and Exploration (Long Creek).

Alamin Mining Company continued activities on its Bear Creek claims in the Innoko-Tolstoi district, as in past years. Middle Fork Mining optioned Bear Creek ground from Alamin in 1988 and operated throughout that season; the agreement was terminated at the end of the year. In 1989 Shell Mining Company of Arizona optioned the

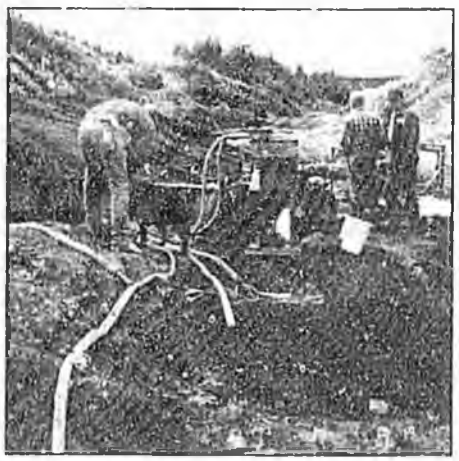


Figure 33. *Pete Haggland (far right) preparing for production on Flat Creek in the historic Ruby-Poorman district of western Alaska. (Photo by Flat Creek Mining Co.)*

property, sluiced pay, and conducted bulk sampling tests. Alamin reprocessed the ground at the end of 1989 and conducted production tests and drill programs in 1990 and 1991. Remaining pay is found on both Crippie and Bear Creeks, which are part of the same drainage system that erodes the mineralized Cripple Mountains.

Over the hill from Alamin's ground is the operation of Rosander Mining Company on Colorado Creek, one of Alaska's most successful family-operated placer mines. Since 1979 Rosander Mining Company has worked several ancestral channels on the right bench of Colorado Creek, a northerly drainage from the Cripple Mountains. In late 1982 the company discovered the preserved remains of a mammoth in muck overburden. Rosander Mining contacted the University of Alaska Fairbanks museum, and a museum crew went to the site to excavate the mammoth remains and investigate the stratigraphy of the site. Results of the mammoth excavation are described in Thorson and Guthrie (1992) and Betts (1985). The "Rosander mammoth skull" is now on display as a centerpiece exhibit at the University of Alaska Museum in Fairbanks. In 1991 Rosander Mining continued to mine upstream from the broader alluvial-filled valley and is no longer developing ground in the area that is rich with fossils.

Bob and Manzie Magnuson mined pay at Madison Creek northwest of the old mining town of Ophir. Doug Sherrer recovered gold and platinum in production tests at Boob Creek near the Madison Creek operation. Yukon Mining Company (Joel Ramsted) was again active on Golden and Illinois Creek in the Kaiyuh Hills district near Kaltag.

Eastern Interior Region

The eastern Interior region includes the following districts: Fairbanks, Circle, Hot Springs, Fortymile, Tolovana, Rampart, Richardson, Kantishna and Bonnifield. Since the late 19th century 351,461 kg (11.3 million oz) gold has been mined, mainly from placer deposits.

The Interior region took over as the number-one producer of gold in Alaska in 1991; however, this was more a function of production losses in the western region than gains in the eastern Interior. Gold production in 1991 totaled 2,288 kg (73,600 oz) compared with 2,441 kg (78,480 oz) in 1990, a decline of about 6%. Employment remained at about the same level during the two years (495, 1990; 490, 1991). However, a number of mechanized placer mines decreased from 115 in 1990 to 105 in 1991, a decrease of 9%. Several large operations in the Fairbanks district offset mine losses in the Circle, Bonnifield, and Fortymile camps.

The Fairbanks district was again the largest producing placer camp in the eastern Interior. Significantly, the district is seeing an increasing focus on exploration and development for hard-rock minerals. We estimate that 23 placer mines produced 914 kg (29,400 oz) gold and 182 kg (5,850 oz) byproduct silver and employed 175 workers on a year-round equivalent basis.

Polar Mining operated two large placer mines on lower Goldstream and Fish Creeks in the Fairbanks district.

The eastern Interior region's largest gold producer, Polar Mining, ranked fourth statewide behind Cambior Mines at Valdez Creek, Kennecott Greens Creek Mining Company near Juneau, and Alaska Gold Company at Nome. During 1991, the lower Goldstream operation processed about 458,750 m^3 (600,000 yd^3), during the summer production season. About 680,400 kg (1.5 million lbs) of ANFO explosive was used to blast frozen overburden during winter months. About 119,000 m^3 (155,000 yd^3) pay was processed at Fish Creek, which, like lower Goldstream, requires year round employment. Mine activities include winter drilling, blasting, removal of overburden, and summer pay extraction (fig. 34). By the end of 1991, Polar Mining had 57 employees on its payroll (fig. 35).

Thurman Oil and Mining also operated a large opencut placer mine on Fairbanks Creek, employing a crew of 15 to strip overburden and process pay. Cook's Mining employed five workers for four-and-a half months in an opencut placer venture on Fairbanks Creek downstream from the old hardrock McCarty Mine (fig. 36). Cook's Mining also prepared ground on Deep Creek for future production. Patricia Franklin (Alder Creek Mines) cleaned a small section of bedrock 18 x 24 m (60 x 80 ft) on Fairbanks Creek to determine whether or not it would be worthwhile to work old dredge tailings. Placers on Fish Creek are derived in part from lodes in the recently discovered Fort Knox deposit (fig. 37).

Al Hopen worked two placer mines in the Fairbanks district, one on Cleary Creek near the Cleary Hill Mine mill and the other on Little Eldorado Creek, a stream which was formerly dredged and drift mined. Both are on patented mining claims controlled by the Alaska Gold Company, a major land owner in the Fairbanks North Star Borough.

T.J. Mining worked Homestake Creek at 74 Mile Steese Highway on the northeastern edge of the Fairbanks district and reported that heavy equipment breakdowns were its biggest 1991 concerns.

Herning Exploration and Mining and operator Doug Clark mined Palmer Creek in the upper Chena River drainage. The company intends to initiate patent procedures on Federal claims and lease parts of other claim blocks in 1992.

Other opencut placer operators in the Fairbanks area were: Don Stein (Twin Creek); Lucky Seven Mining (Fish Creek); Jack Neubauer (Fox Gulch); Andy Miscovich Sr. (Chatham Creek); Andy Miscovich Jr. (Dome Creek, new operation); Layne Gardner (Dome Creek, new operation); Goldstream Exploration (Gilmore Creek); Gerald Hassel (Ester Creek); John McLain (Ester Creek, new operation); Vince Monzualla (Virginia Creek); and Carson Holt (Ester Creek).

Interest continued to grow in drift mining of deep frozen placer in the Fairbanks district (fig. 38). Roberts Mining mined 11,470 m^3 (15,000 yd^3) of rich placer pay at its Dome Creek Drift Mine, reworking old drifts and removing side pay left by the early 20th century hand miners. Roberts Mining drilled with a jack leg, blasted with ANFO explosive, and hauled pay to stockpiles with low profile, diesel haul trucks. RCL Mining hauled test runs of drift gravels to the surface from reactivated drift shafts on lower Dome Creek downstream from the Roberts Mining operation. Increased levels of activities are expected from this venture in 1992. Don Read continued a mining venture using a decline to access gravels on Vault Creek. EVECO-ACE Construction began a drift operation on Goldstream Creek near the U.S. Corps of Engineers's Fox permafrost tunnel.

For seven of the last eleven years the Circle district was the largest producer of gold in the eastern Interior. However, starting in 1990, the number of placer mines began a slow decline but it is hoped that better bullion prices will reverse this downward trend. In 1991, there were 24 active placer mines that employed 95 miners, compared with 36 placer mines that employed an estimated 144 miners in 1990.

Magic Circle Inc. (Steve Weber) finished a multi-year project on Deadwood Creek and processed 19,115 m^3 (25,000 yd^3) during a 165-day sluicing season. The company will begin development of its new property on Ketchum Creek in 1992.

Greenhorn Mining (Stan Gelvin) worked pay on Ketchum Creek for 120 days. Paul and Company, Mack Rite, and Harold Dunham leased placer ground on Porcupine Creek from Helen Warner and George Horner and worked for most of the season processing pay. Jim Wilde completed a small test on Switch Creek and expects to be in full production during 1992 or 1993.

Other operators in the Circle district were: George Seuffert (Butte Creek); Steve Olsen (Eagle Creek); Ed Lapp and Earl Beistline (Mastodon Creek); Mike Dugger (North Fork, Harrison Creek); John Sipes (Deadwood Creek); Ed Gelvin (Crooked Creek); Fred Wilkenson (Ketchum Creek); Bob Cacy, Eddra Ziegler, and John Cole (Portage Creek); Vern Stepp (Bottom Dollar Creek); and Sam Koppenberg (Faith Creek; sometimes listed as in the Fairbanks district).

Activity levels in the Rampart and Eureka-Manley areas were at about the same levels as in previous years. Shoreham Resources again operated its opencut placer operation on the Sullivan Bench in the historical Tofty-Hot Springs district west of Manley Hot Springs. Shoreham stripped 237,026 m^3 (310,000 yd^3) of overburden, sluiced 79,518 m^3 (104,000 yd^3) of pay, and recovered 54 kg (1,746 oz) gold, 10 kg (324 oz) silver, and 3,084 kg (6,800 lb) tin metal as cassiterite during 1,004 hours of sluicing (fig. 39).

Bob Bettisworth (Eleven Pup Mining) worked a small placer deposit on Hunter Creek in the Rampart district and will try again in 1992 in spite of disappointing 1991 results. Ed Salter and Associates mined gold on Joe Bush Creek in the Eureka-Manley area. Their biggest obstacle was the removal of 1.8 m (6 ft) of blue clay just above the pay

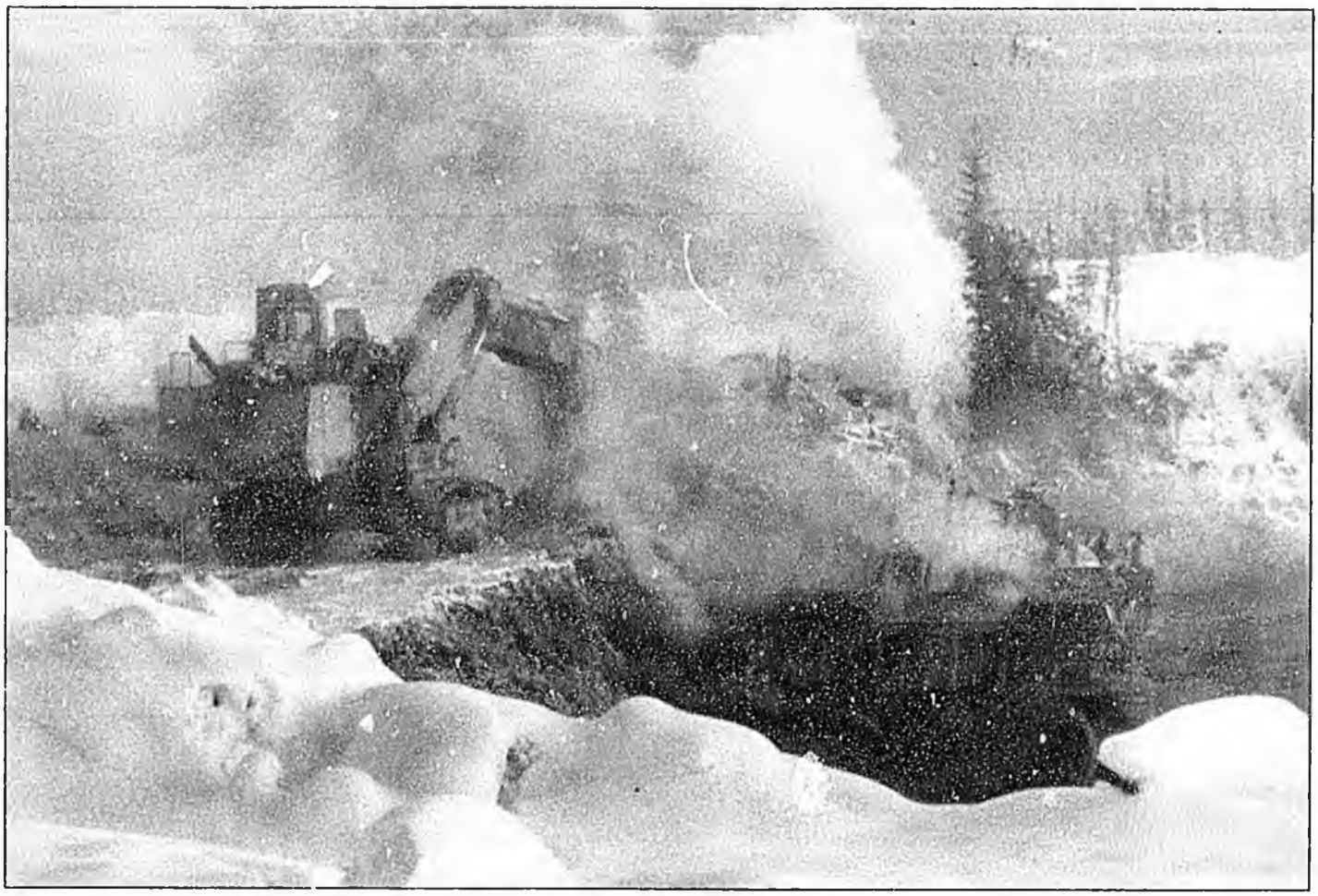


Figure 34. *Overburden removal at -40°F on Lower Goldstream Creek, Fairbanks district, by Polar Mining Inc. Large scale, year-round operations have made Polar Mining one of Alaska's largest producers of gold and a significant employer in the Fairbanks North Star Borough. (Photo by Don May)*

gravels. The clay had to be excavated carefully to preserve the auriferous zones.

Kelly Mining recovered placer gold from his claim on North Fork Creek near Eureka but reported pay values were lean and overburden averaged 12 m (40 ft) in depth.

Ross Novak finished his developed pay zone on the Pioneer Bench and began to move his operation to Eureka Creek. Don Delima and Jeff Knaebel continued to work American Creek.

Other operations in the Rampart and Hot Springs districts include the following: Williams Mining (Ruby Creek); Lucas Mining (Hoosier Creek); Steve Losonsky (Hunker Creek); Munsell Mining (Little Minook Creek, new operator); Thurman Oil and Mining (Eureka Creek); Rick Swenson (Doric Creek); and J.L. Wood (Little Boulder Creek).

Only two operations reported activities in the Livengood district, but one was among Alaska's largest placer mines. Alaska Placer Development employed eight workers during a 155-day season to exploit a relatively high-grade paystreak on the Livengood Bench just north of the old townsite of Livengood. The operation processed about 91,750 m^3 (120,000 yd^3) of auriferous gravel after hydraulically removing and containing overburden.

Heflinger Mining and Equipment Company (Carl Heflinger) took out a small cut on Livengood Creek during a two-month mining season. Exploration has proven about 30,584 m^3 (40,000 yd^3) of pay covered by about 97,870 m^3 (128,000 yd^3) of overburden. As contractor to an Alaskan environmental cleanup effort, Heflinger spent the remainder of his summer removing gasoline tanks and contaminated soil.

The Fortymile district functioned at about the same level of activity as in previous years, with an estimated 24 small placer mines at work. Ham Mining Company, with a crew of two, mined from a small opencut operation on Chicken Creek. Fortyfive Pup Mining (Charles Hammond) again mined two small cuts on Fortyfive Pup, using a newly constructed trommel to wash pay. The trommel worked well in its first year of operation. Hammond reported that using screening and sizing principles advocated by Clarkson (1990) has resulted in a significant increase in gold recovery—maybe as much as 45% better efficiency for his washing plant.

Alice Bayless and Kachemak Mining (Mike Buzby) mined a Chicken

Creek placer gold paystreak, which they leased from the Alaska Gold Co.

Other producers in the Fortymile area include: John Burns (Chicken Creek); Dennis Eich and Angess Purdy (Meyers Fork); G.A. Hanks and Sons (Lost Chicken Creek); Brandt Goodall (Mosquito Fork); Forest Hayden (Baby Creek); Fred Heflinger (Walker Fork); Harold Nevers (American Creek); Leo Regner (Ingle Creek); Robert Roberts (Skookum Creek); and the Boundary VIA Company (Walker Fork).

Activity in the Bonnifield and Delta districts continued at about the same level as in previous years, but some paystreaks appear to be playing out and operators are moving elsewhere. Alaska Unlimited Inc. (Warren Taylor) on Gold King Creek was again the largest placer mine in the district. The gold mined by Alaska Unlimited is believed to be derived from the Tertiary Nenana Gravel. Tom Faa worked pay on upper Moose Creek, one of the district's historically largest producers of gold. Jackson Mining Company continued to extract fine-grained gold from high energy, modern placers of the Totatlanika River. Jim Roland worked his Annebelle Property on Lower Moose Creek. Former longtime Bonnifield district operator Jack LaCross removed his efficient plant from the California Creek drainage after exhausting minable reserves and moved to the Cache Creek-Collinsville area of southcentral Alaska. Jensen Mining and Construction (Don Jensen) of Delta Junction mined his McCumber Creek properties near the Granite Mountains south of Delta Junction. He estimates that only one more year of reserves remain there.

Southcentral Region

The southcentral region experienced the only significant increase in Alaskan gold production, when the 1990 total climbed from 518 kg (16,670 oz) to 1,712 kg (55,070 oz) in 1991, an increase of more than 200%. All this increase was due to the resumption of fullscale mining by Cambior Alaska Inc. at Valdez Creek, which began in the fall of 1990. About 22 mines employing 265 workers operated regionwide.

Cambior Alaska Inc. recovered 1,339 kg (43,057 oz) refined gold (1,572 kg; 50,537 oz raw gold) from 372,360 m^3 (487,000 yd^3) of processed pay at their Valdez Creek Placer Mine approximately 88 km (55 mi) east of Cantwell (fig. 40). An estimated

Figure 35. *Concerned citizens, legislators, local government officials, and regulatory personnel visit the operation of Polar Mining on lower Goldstream Creek, Fairbanks district. In the right center is the late Senator Bettye Fahrenkamp, a longtime advocate of responsible mineral resource development in Alaska. (Photo by Polar Mining Inc.)*

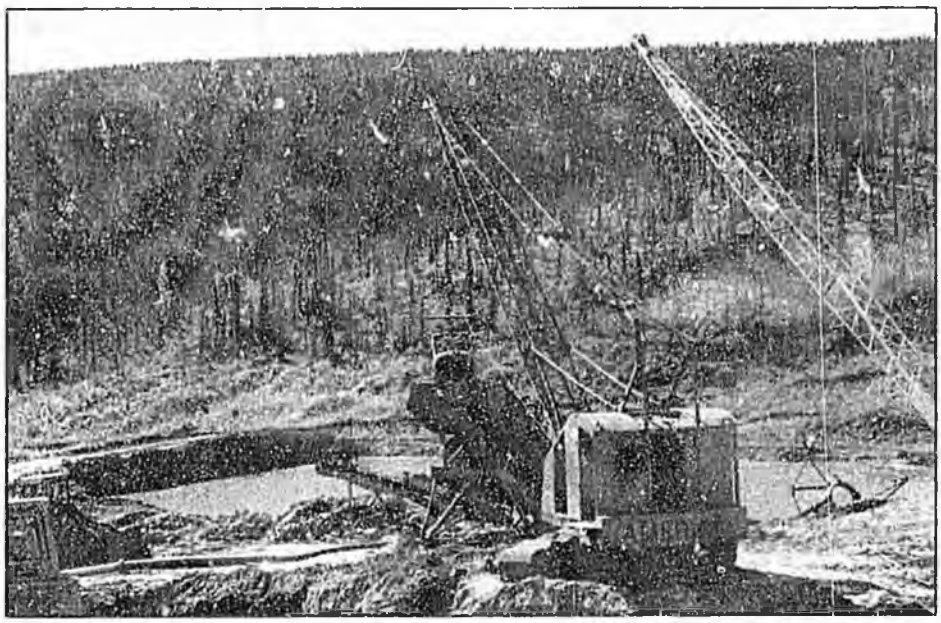


Figure 36. *Cooks Mining operation in the upper Fairbanks Creek drainage of the Fairbanks district. This efficient operation illustrates the effectiveness of a dragline. (Photo by T.K. Bundtzen)*

5,661,860 m^3 (7,405,000 yd^3) of overburden was stripped off the pay zone resulting in a stripping ratio of about 15:1. The company mines rich pay (1991 average grade = 3.0 g/tonne [.088 oz/yd^3] gold) from several superimposed ancestral channels of Valdez Creek which are now buried by colluvium and glacial drift. The Valdez Creek placer mine has been Alaska's largest producer of placer gold for six of the last seven years. The company provided 219 full-time-equivalent mining jobs during 1991. An expensive stream diversion project was required by the Alaska Department of Fish and Game. The company hopes to expand production substantially in 1992 to offset low gold prices and costly stream diversion efforts.

Figure 37. *Melba Creek stamp mill and circular concentrating table that was in operation prior to World War II. Left to right: Bob Tsigonis, Charlie Lazeration, Glenn Hanneman, Jack Williams, and Jim Moody. Lazeration was one of the early prospectors who recognized the significance of mineralization at Fort Knox. (Photo by Earl Beistline)*

Hoffman Mining (Russell Hoffman) again mined on the middle fork of the Chistochina River with a crew of three during a 150-day-season. Hoffman estimates that indicated gold resources on his properties are sufficient for another six to eight years.

Mrak Placer Mine (William Mrak) worked about 100 days with a two-person crew in the Willow Creek drainage near Hatcher Pass. This longtime, small-scale operator conducted some flotation testing under contract to Lakefield Research and Alaska Assay Inc. in order to improve recovery by liberation of previously unrecoverable gold.

Randy Elliott mined patented claims at Dan Creek within Wrangell-St. Elias National Park Preserve. Elliott

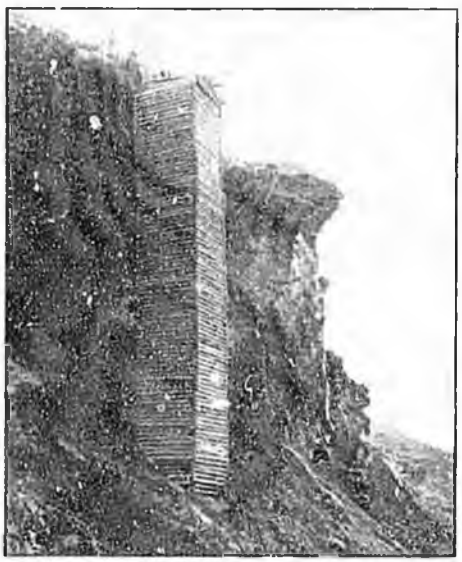


Figure 38. *Cribbed shaft exposed in Fish Creek drainage, Fairbanks district, during overburden removal. In early days, hundreds of these shafts penetrated the deep frozen overburden of the Fairbanks district in search of rich, but deeply buried, placer gold deposits. (Photo by Bob Tsigonis)*

Figure 39. *Hydraulic removal of overburden at Shoreham Resources' Tofty operation, Hot Springs district. This time-tested method can still be used to efficiently move overburden, provided effluents are contained and water quality maintained. (Photo by Shoreham Resources)*

June 1 to September 30 with a crew of four. Little Creek Mine (Paul Sayer) continued his longtime venture on Little Creek in the Innoko district for a total of nearly 200 days using a crew of four.

Tragedy struck the Innoko Camp mid-way through the summer when veteran placer miner John O'Carroll was killed in an airplane crash while flying to McGrath from his mine. O'Carroll had been mining on Spruce Creek since 1982 and was preparing ground on Dodge Creek west of the old mining town of Ophir at the time of his death. He will be missed by his family, colleagues, and friends in the Innoko district.

Larry Wilmarth (Julian Creek Mine) and partners worked out the paystreak on Julian Creek in the George River using a work force of two. Later in the year Wilmarth prospected the placer and lode potential of the area. Better bullion prices and larger equipment are needed to resume placer production.

Misco-Walsh Mining Company continued production testing and processing of a complex gold-silver-tungsten-antimony-mercury concentrate at the Golden Horn deposit in the Iditarod district. Misco-Walsh used a rod mill, jigs, and wilfley tables to process and concentrate ore minerals.

John and Tad Fullerton (Flat Creek Placers Inc.) recovered gold from dredge tailings in Flat Creek of the Iditarod district. He concluded that if the mine is carefully engineered and operated, selective remining of tailings left over from the pre-1920 Yukon Gold Dredging operation there could be profitable.

Dick Wilmarth continued mining on lower Chicken Creek near its confluence with Bonanza Creek. Like the Fullerton operation, careful exploration is required to determine the location of remaining, unmined fractions in the previously mined stream drainage.

Alvin Agoff again took out a cut in Prince Creek on the south side of Chicken Mountain also in the Iditarod district. Agoff has now begun to develop ancestral channels of Prince Creek as opposed to his previous emphasis on auriferous modern stream channels.

Dave Penz mined an ancestral paystreak of Buster Creek, tributary to Kako Creek in the old Marshall district of lower Yukon River (fig. 41). With a crew of three, Penz had to remove more overburden than expected to get to the edge of his pay zone. He evidently was off-center from the paystreak while preparing ground in the previous year. Now that he knows the pay configuration, Penz believes that his production will increase in the future.

Ernie Chase of Anvik operated on Stuyahok River in the easternmost Marshall district. A lease from Calista Corporation made it possible to resume mining several years ago.

Southeastern Region

For the third consecutive year, mineral production in the southeastern region was dominated by the activities of Kennecott Greens Creek Mining Company on Admiralty Island about 29 km (18 mi) west of Juneau.

During 1991, the Greens Creek Mine produced 236,380 kg (7.6 million oz) silver, 1,150 kg (37,000 oz) gold, 37,966 tonnes (83,700,000 lb) zinc, and 15,330 tonnes (33,800,000 lb) lead from approximately 344,660 tonnes (380,000 tons) of ore. The company employed 238 year-round workers and continues to provide a significant boost to the Juneau economy (fig. 42). Despite the high metal output, the mine reported a financial loss during the year, mostly due to low metal prices. The company reported receiving the following prices for silver, $4.04/oz; gold, $354.86/oz; zinc, $0.49/lb; and lead, $0.24/lb. Another problem concerns the quality of the complex sulfide concentrates produced; current concentrate shipments are assessed large penalties at customer smelters.

Greens Creek Mine requires additional waste-rock disposal sites. Excavation and disposal of unstable marine clays produced during mill construction used much of the capacity of areas originally designated as waste rock disposal sites. Ground stability problems were eventually solved by excavation and drilling a series of horizontal dewatering wells.

Greens Creek Mine was originally developed and awarded permits for a

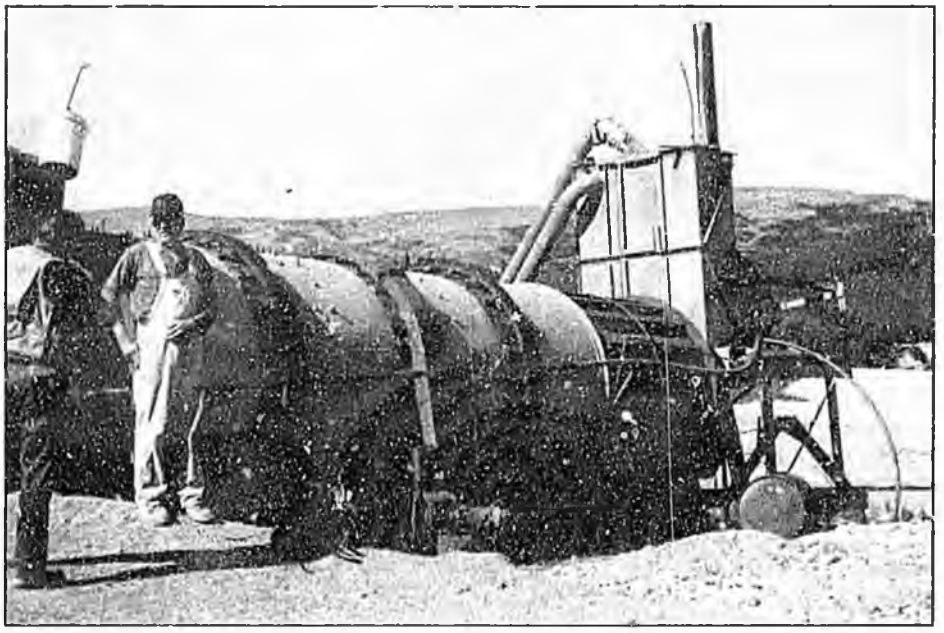


Figure 41. *Dave Penz describes the operation of his trommel-equipped washing plant at Kako Creek near Russian Mission to Greg Laird, DGGS. (Photo by T.K. Bundtzen)*

3.17 million tonne (3.5 million ton) ore body. In 1991 estimates of minable reserves were expanded significantly to 12.5 million tonnes (13.8 million tons). In order to deal with large increases in cumulative waste rock disposal, an environmental assessment was prepared by the U.S. Forest Service to identify waste disposal issues and locate additional storage and disposal sites.

In addition, during 1991 Kennecott began to make major mill improvements and upgrades. The addition of tower mills and column flotation cells into the overall mill circuit will improve grinding capabilities. With these changes in the mill, Greens Creek Mine will produce a higher value and more readily saleable concentrate. This upgrade, which is estimated to cost over $7.5 million, began in late 1991 and should be completed by late spring 1992. These improvements are designed specifically to improve concentrate quality and will not significantly change annual mill production.

A few small placer mining companies reported production activities. Big Nugget Mine operated on State and Federal ground in the Porcupine Mining district near Haines. Approximately 3,058 m^3 (4,000 yd^3) pay was processed during a 100-day season; the mine duration also included ground preparation and heavy equipment repair.

Jerry Fabrizio produced minor amounts of placer gold on Porcupine Creek from a 2 ha (4 acre) stripped pay zone.

INDUSTRIAL MINERALS

Production of industrial minerals, mainly sand and gravel and building stone, continued at about the same level as during the last several years. We based our estimates on information provided by 42 sand and gravel firms and 16 stone quarry companies. We estimate that in 1991 the Alaska industry produced 12.8 million tonnes (14.2 million tons) of sand and gravel worth $45.4 million and 2.7 million tonnes (3.0 million tons) of stone worth $22.5 million, a marginal value increase of about 8% from 1990 levels (tables 7 and 10).

Figure 42. *Ore face being drilled at Greens Creeks Mine, Admiralty Island. (Photo by Kennecott Greens Creek Mining Company)*

Industrial mineral production remained stable through large highway construction or repair efforts near Anchorage and Fairbanks. Infrastructure development in the Alaska Peninsula Region also generated industrial mineral demand. The development is in support of the onshore processing facilities servicing Alaska's large commercial fishing fleet.

Northern Region

ARCO Alaska used 571,410 tonnes (630,000 tons) of gravel to service

Table 10. *Reported sand and gravel production and industry employment in Alaska by region, 1991*

Region	Companies reporting[a]	Tons	Estimated unit value[b] ($/ton)	Total value	Number of employees
Northern	3	1,509,977	$3.96	$ 5,979,512	125
Western	2	427,350	1.17	500,000	35
Eastern Interior	13	4,389,939	3.28	14,399,000	175
Southwestern	3	570,000	4.50	2,565,000	55
Southcentral	11	4,862,745	3.06	14,880,000	165
Alaska Peninsula	3	750,000	4.00	3,000,000	50
Southeastern	7	1,650,000	2.50	4,125,000	80
TOTAL	**42**	**14,160,011 (12,846,000 tonnes)**	--	**$45,448,512**	**685**

[a]27 returned questionnaires and 15 phone canvas responses.
[b]Values are based on price and cost estimates made available to us by about 45 percent of the operators.

production facilities and site facilities at Prudhoe Bay and about 253,960 tonnes (280,000 tons) for similar purposes at the Kuparuk field facilities. ARCO announced river flood-plain reserves of about 7.6 million tonnes (8.4 million tons) of gravel at the Prudhoe Bay unit and 3.17 million tonnes (3.5 million tons) at the Kuparuk River unit. ARCO recycled 57,141 tonnes (63,000 tons) of reclaimed gravel facilities and washed drill cuttings for use in pad construction. BP Exploration Alaska used 67,900 tonnes (74,860 tons) of gravel for construction and maintenance purposes.

Neither oil firm predicted any increased need for sand and gravel in the near future. Both firms lease materials from the State of Alaska at approved extraction sites. Excavation of sand and gravel in some areas on the Sagavanirktok River flood plain has created large artificial lakes, which have been found to be excellent winter rearing habitat for arctic char, grayling, and other northern fish species.

The remaining sand and gravel and riprap from the northern region was used to repair roads, tailings, dams, and mill support structures at the Red Dog Mine north of Kotzebue.

NANA Corporation continued to produce high quality jade from its properties in the Jade Mountains of upper Kobuk River area. The large boulders of jade extracted from this area are slabbed with large diameter diamond saws and eventually made into saleable products by its Kotzebue operational subsidiary, Jade Mountain Products Inc. (fig. 43).

Western Region

The Alaska Department of Transportation and Public Facilities (DOTPF) expanded airport facilities at Teller and Nome and began to rebuild major of portions of the Nome-Kougarok and Nome-Council road systems.

Bering Straits Native Corporation supplied the gravel for a 16 km (10 mi) section of the Nome-Council road project. Total volume of gravel from the western region (387,606 tonnes; 427,350 tons) was provided to three operations involved in DOTPF funded work.

Eastern Interior Region

The eastern Interior region again accounted for a large part of total sand and gravel and building stone consumption. Fourteen companies and two government agencies used a total of 3.98 million tonnes (4.39 million tons) gravel and about 426,290 tonnes (470,000 tons) stone, 31% and 16% of statewide estimates respectively. The Geist Road-Johansen Expressway, a new major modern highway trunk in central Fairbanks, was the largest single project and accounted for nearly one-third of the total gravel used in the eastern Interior. Repair work along the Alaska Highway for the 50-year celebration of the road construction effort also accounted for sand and gravel and stone use.

Earthmovers Inc. operated three gravel pits in the Fairbanks area and produced approximately 1.36 million tonnes (1.5 million tons) for DOTPF construction projects. H&H Contractors also mined pit run sand and pea gravels and some tailings for similar government-funded construction.

Fairbanks Sand and Gravel Inc., owned by Sealaska Corporation, mined 86,929 tones (95,843 tons) of pit-run sand and gravel with their floating clamshell dredge and used their product for road fill, landscaping, and manufacture of concrete block at their south Fairbanks plant. Late in the year, owner Sealaska Corporation announced that Fairbanks Sand and Gravel was for sale, and if there are no bids, the long-active gravel producer may close. Many Interior contractors and builders have used Fairbanks Sand and Gravel products for various construction projects. Since 1981 Fairbanks Sand and Gravel has provided us with valuable information for this report series, and they will be missed.

ACE General Contractors (ACE) produced and sold about 63,490 tonnes (70,000 tons) of dredge tailings in the Fox area near Fairbanks. Great Northwest Inc. leased ground from the University of Alaska and produced sand, gravel, and peat from the College Road mine site in Fairbanks. R.B. Gravel (Jerry Hassel) produced gravel and a byproduct of gold from its mine in Goldstream Valley.

Popo Agee Inc. again operated at Dry Creek on the George Parks Highway and supplied gravel to local Healy markets. Harold Dell (Caswell Creek Aggregate) mined at Mile 85 on the Parks Highway, but reported that business was slow during the year. Delta Concrete Production Inc. mined gravel from the Delta River and screened and washed it for concrete aggregate and D-1 road metal applications.

Alyeska Pipeline Service Company used about 90,700 tonnes (100,000 tons) of sand, gravel, and rock along unspecified locations of the Trans-Alaska Pipeline right-of-way north of Fairbanks and south of the Yukon River.

The Alaska Department of Transportation and Public Facilities extracted

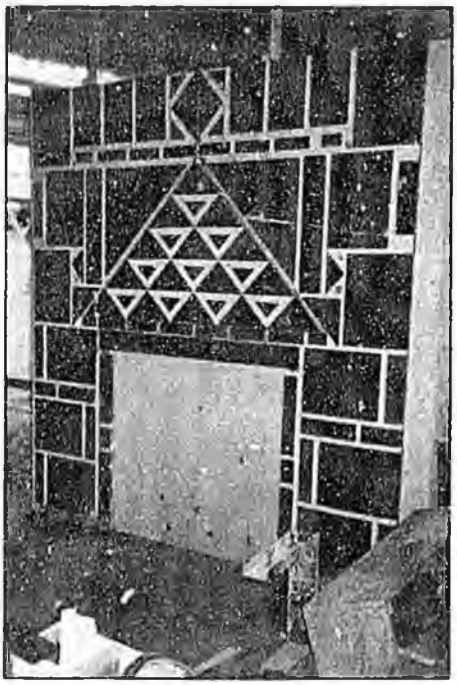


Figure 43. *Jade-faced wall being built for a client by Jade Mountain Products, a subsidiary of NANA Regional Corporation. Jade Mountain designs walls and murals from jade slabs. (Photo by NANA Regional Corporation)*

185,890 tonnes (204,952 tons) of gravel from BLM pits; 737,570 tonnes (813,200 tons) from ADL pits (State of Alaska sites); and 160,490 tonnes (176,948 tons) from unspecified locations throughout the eastern Interior region. DOTPF used most of the material for Alaska Highway repair and airport construction.

Southcentral Region

The southcentral region used the largest amount of sand, gravel, and stone in the entire State during the heavy summer construction season. Eleven companies, the Alaska Railroad, and DOTPF indicated total production of 4.40 million tonnes (4.86 million tons) of gravel and about 353,730 tonnes (390,000 tons) of stone, about 34% and 13% respectively of total statewide output.

The Alaska Railroad hauled 1,745,600 tonnes (1,925,000 tons) of gravel from the Palmer-Wasilla area to Anchorage markets. This amount is down from the 2,222,150 tonnes (2,450,000 tons) hauled in 1990 but is about the same level as 1989. Most of the gravel was used to rebuild portions of the Seward Highways and additional [illegible].

DOTPF reported that approximately 544,200 tonnes (600,000 tons) of combined sand, gravel, and 136,050 tonnes (150,000 tons) of stone were used in construction of the controversial Cordova Road. Because this road is utilizing portions of the old Copper River and Northwestern railroad bed, new-materials use is not as high as one might expect.

Jackson Construction mined, washed, and screened gravel from pits in the Kenai-Soldotna area. This company, which formerly provided 40 year-round jobs and now provides work for seven, reports that new restrictions and regulations and weak markets have forced them to scale down the size of its business.

Rock Products Inc. reported only modest activity at its Wasilla area material sites. The company rented much of its heavy equipment for DOTPF-funded soils reclamation work in scattered areas of southcentral Alaska. SAFAR Construction, operating on State of Alaska leases, extracted gravel from its Portage River valley pit near Girdwood. J. Harold Michael of Valdez used gravel to build roads into Fireweed Mountain subdivision, though most of this work was completed in 1990.

Herman Brothers Construction Company Inc. of Palmer continued its long active gravel pit venture in Palmer but reported that weakness in the gravel market has limited its growth in recent years. AAA Valley Gravel Inc. of Wasilla also continued its longtime venture on Trunk Road near Palmer, expecting 1992 sales to be about the same as 1991 (about 90,700 tonnes [100,000 tons]). Spring Creek Sand and Gravel depleted its Chugiak sand and gravel pit; reclamation efforts should be completed in 1992.

K's Concrete Service and Luke's Mining Company of Homer both reported only minor activity at their material sites near Homer. Weak local markets have limited their work to sporadic production to satisfy single construction contracts.

Southwestern Region

Approximately 172,330 tonnes (190,000 tons) of sand and gravel were produced from Calista Corporation lands mainly for unspecified airport construction needs.

Bristol Bay Native Corporation and village corporation partners mined 122,450 tonnes (135,000 tons) of gravel for airport and road maintenance in and north of Dillingham.

DOTPF processed and used 222,215 tonnes (245,000 tons) of gravel, sand, and riprap for road maintenance in the Dillingham area and for airport repairs at McGrath.

Alaska Peninsula Region

The increasing use of stone, sand, and gravel for construction in the fish processing industry helped boost the economy of the Alaska Peninsula Region. About 680,250 tonnes (750,000 tons) of sand and gravel and 544,200 tonnes (600,000 tons) of riprap-grade stone were employed mainly for these purposes. In addition, some road maintenance also took place near villages and for timber extraction.

Koniag Inc. produced pit run rock from Women's Bay and Afognak Island. The Women's Bay rock pit is leased to Brechan Inc. and consists of graywacke rock used primarily for local driveway and roadbed subgrade. The Afognak Native Corporation and Koncor Ltd. use similar pitrun rock for logging roads and log transfer sites on the coast. In addition, small villages throughout the Koniag Region utilized pit-run sand and gravel and graywacke for many community needs.

Bristol Bay Native Corporation and Choggiung Ltd. in Dillingham provided sand and gravel for State capital improvement projects throughout the Bristol Bay region, with the largest demand in King Salmon and Neilman.

Westwood Foods is completing its Unalaska Fish Processing Facility and used nearly 200,000 tonnes (220,500 tons) of basalt rock for harbor armoring to protect the facility from winter storms. Similar work was completed on St. Paul Island where storms destroyed part of a seawall constructed several years ago.

Southeastern Region

Use of materials in the southeastern region increased about 10% from 1990 levels, due mainly to construction related to the logging industry. About 1.39 million tonnes (1.54 million tons) of stone and 1.49 million tonnes (1.65 million tons) of sand and gravel amounted to 51% and 12% of total

statewide extraction efforts. The largest outlets were contractors working on Tongass National Forest road and log transfer sites.

Hildre Sand and Gravel (Scott LaFavour) mined 52,600 tonnes (58,000 tons) of pit-run gravel and sand, which was sold to Juneau Ready Mix for processing and product upgrades. LaFavour reported that three years of reserves remain at his Acme Pit Mine site.

Red Samm Construction Company of Bellevue, Washington, operated on private lands at unspecified sites throughout the Panhandle. Ron Thomas mined gravel from a State lease at the head of Portland Canal, and sold it to an unspecified contractor. Three years ago the company built a dock for Kennecott Greens Creek Mining Company on Admiralty Island but in 1991 W.S. Construction Inc. operated at maintenance level only. The city of Thorne Bay produced shot rock and gravel at the South Thorne Bay and Deer Creek subdivision sites for U.S. Forest Service and other unspecified users. Bruce Morley mined pit-run gravel from his Ludwig pit for repair work on the Douglas Highway. Contractors continued to extract shot rock from various pits in the Ketchikan Gateway Borough (fig. 44).

The Wrangel and Petersburg offices of the Forest Service mined pit-run rock and gravel for road construction in the Stikine area of the Tongass Forest.

COAL AND PEAT

Usibelli Coal Mine Inc. produced nearly all coal mined in Alaska during 1991. Approximately 1.39 million tonnes (1.54 million tons) of subbituminous coal mined in the Healy coal field fueled six interior Alaska power plants and the Korean Electric Power Company power house in Honam, South Korea. Usibelli mined 226,750 tonnes (250,000 tons) from its Gold Run pit and 1,173,660 tonnes (1,294,000 tons) from the main extraction site at its Poker Flats pit. The company operates on land leased from the State of Alaska. About half the coal is destined for export and half stays in Alaska for power generation (fig. 45). The coal is rated subbituminous-C with extremely low sulfur, but moderate to high ash and high moisture, factors that have contrasting marketability issues for the world's coal users. Usibelli's low pollutant coal characteristics may eventually become premium qualities in an increasingly environmentally sensitive market place.

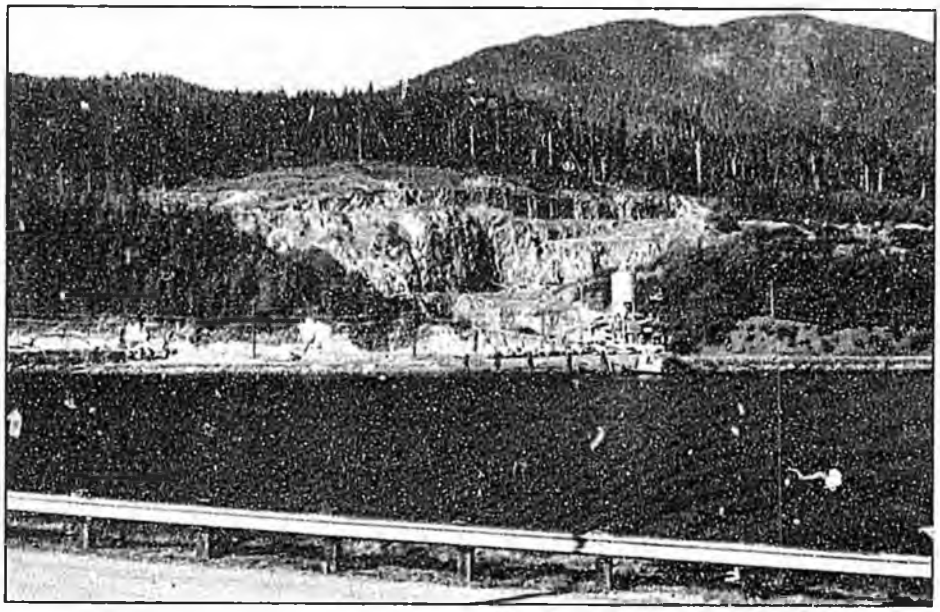


Figure 44. *Greenstone rock quarry operated by Ketchikan rock producers provides riprap and material for road construction in Ketchikan Gateway Borough. (Photo by T.K. Bundtzen)*

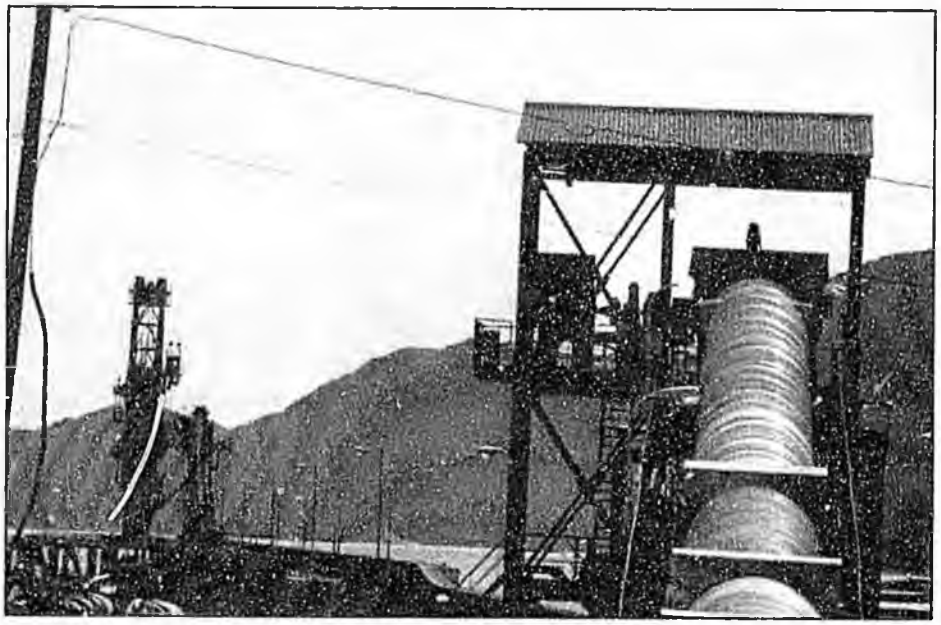


Figure 45. *Coal loading facility of the Sun Eel Shipping Company at Seward. From here, about 680,250 tonnes (750,000 tons) of coal from the Healy Coal Field are loaded onto Panamex carriers bound for the Korean Electric Power Company power plant at Honam, South Korea. (Photo by C.B. Green)*

Progress continues to be made on the Healy Clean Coal Project, which will result in construction of a state-of-the-art power plant capable of decreasing gaseous and particulate matter emissions to extremely low levels.

Arctic Slope Consulting Group (ASCG) mined 454 tonnes (500 tons) of bituminous coals at their Aluaq mine site in the Deadfall syncline area of northwest Alaska. Most of this coal was used in local north slope villages as part of an ongoing effort to supply local heating fuels and offset the demand for expensive petroleum-based fuels in this remote region.

A portion of the Aluaq coal is undergoing laboratory tests as part of an ongoing international marketing effort to supply coal to Far Eastern and European markets. The ASCG coal resource is of high grade (bituminous to semi-anthracite), contains low sulfur values, and is close to potential tidewater shipping sites.

Peat production continues to improve slightly from low levels following the 1985-1988 Alaskan economic recession. Most of Alaska's peat resources are used in horticultural applications (gardens, landscaping, golf courses), although some remote villages have researched the possibility of its use as an energy resource.

Great Northwest Inc., which leases peat bogs from the University of Alaska, was the largest producer in the Fairbanks area. Peat producers in the Matanuska Valley-Anchorage area include A&A Services, The Dirt Company, and Landscape Supply Corporation. These four companies mined all the peat reported in this survey (table 7).

DRILLING ACTIVITY

The total reported drill footage in Alaska in 1991 was 156,950 m (514,796 ft), a decrease of 47% from the 293,927 m (964,080 ft) drilled in 1990. Most of the reduction was caused by a shift in emphasis from advanced exploration to acquiring permits and continuing development work at the Kensington, Alaska-Juneau, and Fort Knox deposits, and the Greens Creek Mine.

Twenty-four companies reported significant drilling programs in 1991, nine fewer than in 1990. There were four coal projects (two categorized as exploration and two as development), seven placer programs (five exploration, one development, and one production), and the remaining 13 were hardrock drill programs (one development and 12 exploration). Some companies had programs in more than one region or category.

Table 11 compares drilling footage reported from 1982 through 1991. Geographic distribution of drilling in 1991 is reported in table 12. Note that 153,660 m (504,000 ft) of blast-hole drilling reported is not included in the totals. Table 13 lists the companies that reported drilling programs in Alaska in 1991.

PLACER DRILLING

Thawfield drilling at 39,635 m (130,00 ft) was up slightly from the 32,012 m (105,000 ft) reported in 1990, but exploration drilling was down 35% from 1990. The downward trend was statewide, and only in southwestern and southcentral Alaska were there any major placer drilling programs. Much of the southcentral drilling done by Cambior Alaska Inc. at Valdez Creek was developmental, rather than strictly exploratory. Cambior's work accounted for almost 80% of the 1991 placer drilling in the State. Flat Creek Mining in southwestern, Polar Mining in the eastern interior, and Kowallen Mine Partnership upstream of Cambior's operation in southcentral Alaska were the other significant placer drill projects reported.

COAL DRILLING

In 1991, Idemitsu-Alaska Inc. and Hobbs Industries reported drill programs in southcentral Alaska. Usibelli Coal Mines Inc. had a small program in interior Alaska. Arctic Slope Regional Corporation had a substantial exploratory program in the Deadfall syncline of northwest Alaska, accounting for 50% of all 1991 coal drilling.

HARDROCK DRILLING

Core drilling (62,740 m; 205,800 ft) continued to be the preferred method for hardrock exploration. However, the largest drill project in Alaska in 1991 was a reverse circulation drill program at the Ryan Lode on Ester Dome near Fairbanks by Citigold Alaska Inc. American Copper and Nickel Company had a large diamond-drill program in the same area of interior Alaska.

In western Alaska, North Pacific Mining Company continued its evaluation of the Illinois Creek deposit with a drilling program. Central Alaska Gold Company, in a joint venture with Placer Dome U.S. Inc., had a large drilling project on Vinasale Mountain in southwest Alaska. Cominco Alaska Exploration Inc. was active at its Pebble Copper porphyry deposit north of Lake Iliamna, in southcentral Alaska. This diamond-drilling program was designed to confirm and expand estimates of reserves. About 128 km (80 mi) to the east, Hunt Ware and Proffett continued exploration of the Johnson River polymetallic deposit with a major diamond-drill program.

The second largest hardrock drilling program in the State in 1991 was the Echo Bay and Coeur Alaska joint venture diamond-drill program at the Kensington Mine in southeast Alaska. Placer Dome U.S. Inc. also had a substantial drilling program at the nearby Jualin Mine about 80 km (50 mi) north of Juneau. The third largest drilling project was that of Kennecott at the Greens Creek Mine southwest of Juneau. In terms of purely exploratory drilling, southeast Alaska continued to lead other areas of the State, with the eastern Interior a close second.

The only hardrock developmental drilling reported was a condemnation and geotechnical program using reverse-circulation drilling by Fairbanks Gold Ltd. at its Fort Knox deposit northeast of Fairbanks.

Table 11. *Drilling footage reported in Alaska, 1982-91*

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Placer exploration	30,000	23,000	31,000	46,000	32,400	50,250	152,000	97,250	78,930	51,247
Placer thawfield	94,000	30,000	98,000	34,000	227,000	130,000	300,000	210,000	105,000	130,000
Subtotal	**124,000**	**53,000**	**129,000**	**80,000**	**259,400**	**180,250**	**452,000**	**307,250**	**183,930**	**181,247**
Coal	80,000	12,000	25,700	8,700	28,800	19,900	26,150	38,670	18,195[a]	16,894[a]
Subtotal	**80,000**	**12,000**	**25,700**	**8,700**	**28,800**	**19,900**	**26,150**	**38,670**	**18,195**	**16,894**
Hardrock (core)	--	--	--	--	--	95,600	223,630	242,440	648,600	205,805
Hardrock (rotary)	--	--	--	--	--	19,500	130,220	89,790	112,355	110,850[a]
Subtotal	**200,000**	**180,500**	**176,000**	**131,700**	**50,200**	**115,100**	**353,850**	**332,230**	**760,955**	**316,655**
TOTAL (feet)	**404,000**	**245,500**	**330,700**	**220,400**	**338,400**	**315,250**	**832,000**	**678,170**	**963,080**	**514,796**
TOTAL (meters)	**123,139**	**74,828**	**100,797**	**67,177**	**103,144**	**96,088**	**253,593**	**206,700**	**293,547**	**156,910**

[a]503,885 feet of blasthole drilling not included.
-- = Not specifically reported. Prior to 1987 no distinction was made in reporting hardrock core and hardrock rotary drilling footage.

Table 12. *Drilling footage by region in Alaska, 1991*

Type of drilling	Northern	Western	Eastern interior	South-central	South-western	Alaska Peninsula	South-eastern	TOTAL
Placer exploration	--	5,300	1,950	43,997	--	--	--	51,247
Placer thawfield	--	130,000	--	--	--	--	--	130,000
Subtotal	**--**	**135,300**	**1,950**	**43,997**	**--**	**--**	**--**	**181,247**
Coal	8,400	--	750[a]	7,744	--	--	--	16,894
Subtotal	**8,400**	**--**	**750**	**7,744**	**--**	**--**	**--**	**16,894**
Hardrock core	550	5,130	21,500	43,500	16,000	--	119,125	205,805
Hardrock rotary	--**	--	106,850	--	--	4,000[b]	--	110,850
Subtotal	550	5,130	128,350	43,500	16,000	4,000[b]	119,125	316,655
TOTAL (feet)	**8,950**	**140,430**	**131,050**	**95,241**	**16,000**	**4,000[b]**	**119,125**	**514,796**
TOTAL (meters)	**2,728**	**42,803**	**39,944**	**29,030**	**4,877**	**1,219**	**36,309**	**156,910**

-- = No activity reported.
[a]Does not include 503,885 feet of blasthole drilling.
[b]Auger

METAL RECYCLING

Alaskan metal recyclers again battled low commodity prices and complex economic and political factors during 1991. Estimated 1991 value of recycled metals was $2,634,650, a decrease of 26% from the $3,570,000 we estimated for the 1990 effort. We emphasize that our lower values and volume figures are influenced by both weak commodity prices—which discouraged metal recycling especially by small operators—and by fewer industry replies. Only 5 of the 20 outlets that we know are exporting metals provided production and activity data. However, Alaska's four largest exporters of metal products did share with us detailed information about their operations. We hope this narrative offers interested readers a brief glimpse of the Alaskan metal recycling industry. Volume and value estimates summarized for both 1990 and 1991 are regarded as conservative (table 14).

K&K Recycling of Fairbanks and the Anchorage Recycling Center (ARC) were probably responsible for about 75% of nonferrous output in Alaska, excluding lead (fig. 46). Both indicated that activity levels were approximately

the same as 1990. ARC continues to expand rural transfer locations and has received non-baled material from many of Alaska's remote villages as well as from several hundred small outlets in the Anchorage area.

K&K Recycling bales most of the aluminum- and copper-based product in the Fairbanks area and transfers materials in tractor trailers to consignment buyers in the lower 48.

Alaskan Battery Supply (Fairbanks) and Battery Specialists Inc. (Anchorage) continue to lead Alaska in the recycling of lead-based batteries.

Former battery recycler Earl Romans is using technology he developed in Alaska to manufacture batteries in the Russian Far East, despite difficulties encountered with the Russian bureaucracy. Alaskan Battery Supply (ABS) continues to make a high quality Alaskan battery in Fairbanks for sale throughout Alaska.

Only two companies, K&K Recycling and BP Exploration, provided information on ferrous metal exports. Most of the material is derived from scrap on the North Slope and shipped to the Port of Anchorage via the Dalton Highway and Alaska Railroad.

STATE LAND SELECTION PROJECT

As a result of the 1959 Alaska Statehood Act, the State of Alaska gained selection rights to 42.6 million ha (104.6 million acres) of land from the U.S. Government, nearly 28% of the total land area of Alaska. Congress made available this land grant in order to foster future economic and resource development, which would make the future State independent of Federal support assistance. The Statehood Act confirmed four territorial land grants (Mental Health, School, University, and University-Tanana) totaling about 494,000 ha (1.22 million acres) leaving 41.0 million ha (102.6 million acres) of general grant lands and 323,760 ha (800,000 acres) of community grant lands available for selection. In 1976 the State of Alaska received an additional 283,290 ha (700,000 acres) of land to select as part of the "Cook Inlet Land Exchange" (Public Law 94-204), which conveyed lands to Cook Inlet Region Incorporated (CIRI) (table 15).

The general grant lands were to be selected by the State within 25 years of the passage of the Statehood Act. However, a ten-year extension was granted to the State mainly as the result of the 1971 Alaska Native Claims Settlement Act (ANCSA) and the 1980 Alaska National Interest Conservation Act (ANILCA), which froze Alaska's selection rights for previously open Federal lands. So far, Alaska has received title to 34.4 million ha (85.1 million acres), which leaves approximately 8 million ha (20 million acres) of land to acquire.

Table 13. *Companies reporting significant drilling projects, 1991*

Alaska Gold	Fairbanks Gold
AMAX Gold Exploration	Flat Creek Mining
American Copper and Nickel	Hobbs Industries
Arctic Slope Regional Corporation	Hunt Ware & Proffett
Battle Mountain	Idemitsu Alaska
Cambior Alaska	Kennecott Greens Creek
Central Alaska Gold Co.	North Pacific Mining Co.
Citigold Alaska Inc.	Placer Dome U.S. Inc.
Cominco Exploration	Polar Mining
Cominco Red Dog Mine	Rowallen Mine Partnership
Echo-Bay-AJ	Sealaska Corporation
Echo Bay-Kensington	Usibelli Coal Mine

Table 14. *Reported scrap metal exports from Alaska, 1990-91*

Commodity	1990 Quantity pounds	1990 Quantity kilograms	1990 Value[a]	1991 Quantity pounds	1991 Quantity kilograms	1991 Value
Aluminum	1,500,000	679,650	$ 580,000	1,340,000	607,824	$ 536,000
Copper	585,000	265,064	600,000	482,100	218,680	520,650
Brass	--	--	--	49,012	22,230	85,000
Radiators	--	--	--	17,393	7,889	35,000
Stainless steel	6,475	2,933	30,000	851	386	8,000
Lead	3,600,000	1,634,040	1,260,000	3,000,000	1,360,800	750,000
Ferrous scrap	25,000,000	11,327,500	1,100,000	4,630,860	2,100,560	700,000
TOTAL			$3,570,000			$2,634,650

- - = None reported.
[a]Values determined from average price levels of refined commodities, and by information provided by four recycling companies.

Figure 46. *Baled aluminum at Anchorage Recycling Center facility in Anchorage. Metal recyclers battled low metal prices in 1991. (Photo by Tom Turner, Anchorage Recycling Center)*

The final deadline for the State of Alaska to file for its remaining lands under the Statehood Act is January 3, 1994.

Mining and the Alaskan economy have been interwoven since the United States purchased the Territory from Imperial Russia in 1867. Total value of Alaska's past mineral production—excluding oil and gas—amounts to nearly $19 billion at 1991 commodity prices. Gold, copper, platinum, coal and other commodities were all important to the Territory's economy prior to statehood. Today, zinc, gold, silver, lead, and coal make important contributions to the economic welfare of many of Alaska's citizens, particularly in rural areas.

With the continuing decline of Prudhoe Bay petroleum production, Alaska will be faced with steady revenue declines and reduced job opportunities in the private and public sectors. One of the most important actions of State government is to identify and select additional lands that can generate revenues, supply jobs, ensure access, provide for future business opportunities, and guarantee traditional uses of land such as farming, hunting, fishing, trapping, petroleum production, and mining. Table 16 summarizes the resource values of lands now owned by the State of Alaska.

PROGRAM ORGANIZATION

The Department of Natural Resources Divisions were directed by former Commissioner Harold Heinze to establish a selection team to review remaining Federal lands that are eligible for State selection and to finalize or relinquish existing (but unpatented) State selections by the 1994 deadline. The team consists of the Divisions of Land, Water, Oil and Gas, Forestry, Mining, Geological & Geophysical Surveys, Parks and Outdoor Recreation, the State Pipeline Coordinators Office (SPCO), the Departments of Fish and Game, Transportation and Public Facilities, Commerce and Economic Development, Community and Regional Affairs, and the Alaska Energy Authority.

The Division of Geological & Geophysical Surveys has been assigned the task of evaluating the eligible Federal lands for their mineral and energy potential and providing SPCO with geotechnical information for potential transportation corridors.

SELECTION METHOD

The selection team is reviewing approximately 21.1 million ha (52 million acres) of Federal public domain land managed by the U.S. Bureau of Land Management. These lands are shown in figure 47; also shown are areas where DGGS staff made field investigations in 1991 and where they anticipate doing field work in 1992. The Federal lands have been subdivided into 35 separate tracts on the basis of legal and geographic characteristics. The largest blocks of land are found in the western and southwestern parts of the State.

MINERAL ASSESSMENT

Mineral resource assessment is a key element in the land selection project. Separate phases of the mineral assessment program are shown in figure 48. The first phase of each tract evaluation involves compiling previously published geologic, geochemical, and geophysical information. The most comprehensive source of broad, regional geologic data has been the U.S. Geological Survey's Alaska Mineral Resource Assessment Program (AMRAP), which provides regional geological mapping and geochemical, geophysical, and radiometric age-dating coverage for about 30% of the land selection areas. Other important data sources are the

Table 15. *Total Statehood entitlement summary*[a]

	Acres	Hectares
Statehood Grants		
General Grant	102,550,000	41,501,985
Community Grant	400,000	161,880
National Forest Grant	400,000	161,880
Territorial Grants		
Mental Health	1,000,000	407,700
University	100,000	40,470
School (rounded)	104,000	42,088
University-Tanana (rounded)	11,000	4,451
Other Grants		
ANILCA School Lands	75,000	30,352
Cook Inlet Land Exchange (net, rounded)	691,000	279,648
Other (rounded)	1,000	408
TOTAL	**105,332,000**	**42,614,910**

[a]Data from Alaska Division of Lands

Table 16. *Table illustrating overlapping resource values of land currently owned by the State of Alaska (84.6 million acres; 34.2 million hectares)*[a]

Values[b]	Percent	Acres (million)	Hectares (million)
Settlement	4	3.39	1.37
Agriculture	≤1	.74	.30
Grazing	25	20.80	8.42
Forestry	7	5.92	2.40
Public recreation	16	13.23	5.35
Wildlife habitat	26	21.96	8.89
Minerals	16	13.31	5.39
Oil and gas	28	24.13	9.77
Coal	10	8.50	3.44
General uses	27	22.46	9.09
Low values	16	13.50	5.46

[a]Data from Alaska Division of Lands

[b]The value and percentage relates to the primary land value recognized; under the principles of multiple use, other values are also implied.

NOTE: Some State lands are assigned multiple values, therefore, the total is greater than 100% and greater than the 84.6 million acres (34.2 million hectares) that has been selected by the State of Alaska.

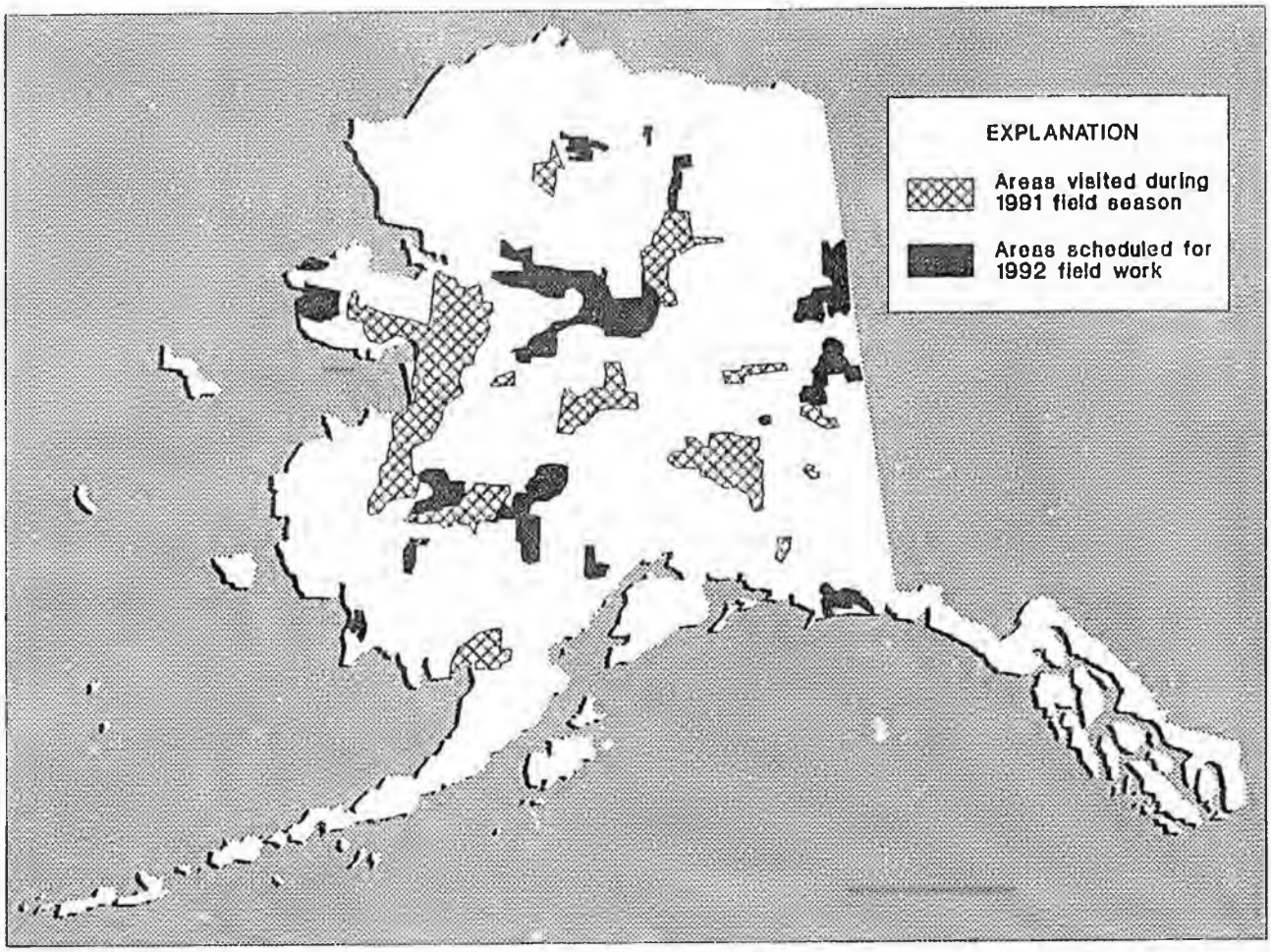


Figure 47. *Location of lands available for State selection that have been evaluated by geologists of the Division of Geological & Geophysical Surveys.*

U.S. Department of Energy's National Uranium Resource Evaluation (NURE) project, which provides regional geochemical and geophysical coverage for many of the land tracts, and the U.S. Bureau of Mines computerized mineral deposit MAS data file. Detailed geological and mineral deposit studies conducted by DGGS in southeastern Alaska (Haines-Skagway project), in southcentral Alaska (Clearwater Mountains and northern Talkeetna Mountains), on the Seward Peninsula (Sinuk and Bendeleben areas) in southwestern Alaska (Iditarod, Innoko, and Farewell districts) and in the pipeline corridor (Wiseman district) cover portions of six land selection areas, and are valuable sources of detailed mineral endowment information (fig. 49).

Claim information is coordinated through the Alaska Division of Mining and the U.S. Bureau of Mines; a computerized, section-level map of Alaska showing current and most historical claim activity has recently been produced on the DGGS computer system in Fairbanks for the endowment analysis.

Data for geothermal resources, construction materials, and coal are derived mainly from USGS and DGGS geological reports and DOTPF file reports.

The compilation of existing and newly acquired data is depicted on a series of overlays for each land selection area, which allows the respective mineral assessment teams to integrate all the data and arrive at specific conclusions concerning mineral deposit and terrane classification schemes.

The biggest problem facing the project is the lack of quality information for many selection areas in the State, particularly for large tracts in remote western and northern Alaska where only brief, reconnaissance geological surveys have been conducted. We estimate that only about 7% of Alaska has been geologically mapped at a scale of 1:63,360 or better—an obvious shortcoming for a project like this.

Field work began in 1991 and will continue through 1992. About 55% of the selection tracts have been investigated by DGGS staff, and we expect to complete the remaining areas during 1992 (fig. 47). Because of the time constraints and the enormous scope of the project, our field investigations have concentrated on acquiring data to outline permissive mineral terranes and to define mineral deposit types that occur in each land selection tract. This task has proved difficult in areas where little previous geological information is

available. However, progress was made in delineating mineral terrane and mineral deposit trends in virtually all land selection areas examined in 1991 (figs. 50, 51).

DGGS is using probabilistic modelling to estimate mineral endowment in the eligible Federal land areas. The DGGS endowment model (which was originally developed with the U.S. Bureau of Mines) is known as ROCKVAL and is one of several such models used by economic geologists at this time. The U.S. Geological Survey independently developed its own probabilistic mineral endowment model, which was used in the evaluation of mineral potential for the Tongass Timber Reform Act (Brew and others, 1991) and earlier in an evaluation of tin resources of the Seward Peninsula (Reed and others, 1989). We emphasize that our mineral endowment estimates do not determine economic viability of the mineral resources, but instead define a range of gross in-place values for comparisons between tracts of land.

The strength or weakness of the probabilistic method depends on how well understood the mineral deposit types or mineral terranes are in a given area (fig. 48). If the existing or newly acquired information cannot establish specific deposit classifications, then the method is replaced by more traditional methods of assessing mineral potential. When we are confident of deposit classification, we can compare the deposit and its host terrane with other worldwide examples as summarized in studies by Cox and Singer (1986), Laznika (1985), Nokleberg and others (1987), Hawley (1982), and Root and Scott (1988). Assignment of deposits and terranes to specific classifications permits comparisons of size, grade, and overall quality with thousands of ore deposits all over the world, and the computer simulation provides a range of sizes and grades (mineral content) of each deposit or terrane in the land tract

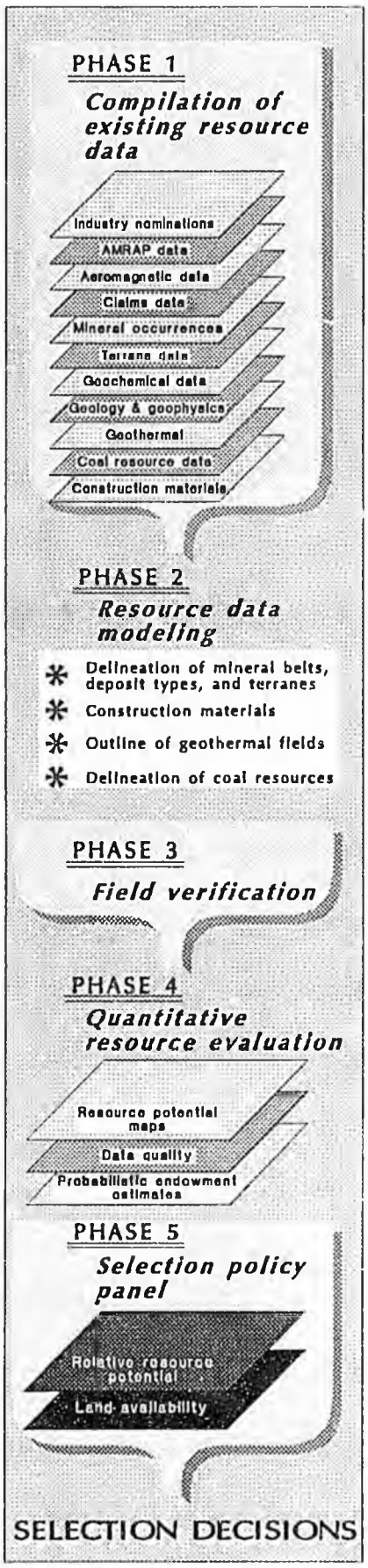


Figure 48. *Method used in compiling data for State Land Selection Program.*

Figure 49. *Haines barite deposit examined by Jan Still (U.S. Bureau of Mines) and Wyatt Gilbert (DGGS) in land selection area near Haines. The U.S. Bureau of Mines and DGGS conducted joint investigations on these lands through much of the 1980s. (Photo by T.K. Bundtzen)*

Figure 50. *Heavy-mineral concentrate being collected in the surf in State land selection area, north of Unalakleet. (Photo by T.K. Bundtzen)*

Figure 51. *G.M. Laird of DGGS samples a material site along the Kuskokwim River in State land selection area. (Photo by T.K. Bundtzen)*

evaluated. This portion of the land selection effort benefits from voluminous deposit information compiled by Dr. Rainer Newberry and his students at the Department of Geology of the University of Alaska in Fairbanks.

In addition, DGGS is using new discriminant models developed by Newberry and others (1990) from worldwide deposits. These models estimate the favorability of gold-bearing plutonic rocks.

PRIVATE SECTOR INPUT

Last spring DGGS sent 124 land-selection mineral questionnaire packets to mining companies, consultants, and Native regional corporations to solicit their direct input into the State land selection process. The Alaska Miners Association (AMA) assisted us in formulating the mailing lists and information request. The Division of Mining provided additional land-status information. The packets contained a Series E Alaska Land Status Map (scale 1:2,500,000) which contains color-coded land status information. The mineral questionnaire asked for nonconfidential land nominations, mineral deposit type or terrane information, identification of specific mineral commodities in each nominated tract, a relative mineral-potential ranking, and any comments that might help the State select valuable mineral lands. We also supplied the questionnaire recipients with a mineral deposit summary published by Nokleberg and others (1987) that compared Alaskan ore deposits with the models of Cox and Singer (1986).

As this report is being written (June 1992), 14 mining companies and consultants and two Native corporations have identified mineralized areas, suggested priorities for access, and helped clarify land status questions in key areas. This information will be used along with mineral information from other sources. We thank all participants who responded to our questionnaire and hope that more will do so before the land selections are made.

SUMMARY

By January 1994, mineral, energy, and construction material synopses of candidate lands will be forwarded to the land selection steering committee. The information used to arrive at tract boundaries, deposit types, and mineral endowment estimates will ultimately be released as a DGGS Public-data file report and made available to the general public.

LAND AVAILABLE FOR MINERAL DEVELOPMENT

The following discussion summarizes an earlier U.S. Bureau of Mines (USBM) summary report by Bottgé (1989) entitled *Availability of Land for New Mineral Entry and Development in Alaska: A Summary Report*. The USBM study conducted between 1983 and 1987 investigated the Federal, State and private lands then available for mineral exploration and development in Alaska. All land status research was done at the 1:250,000 scale, and reflects accuracy to the section level. Acreage figures include bodies of water because the water area could not be accurately deleted at the scale used. USBM recently reviewed its summary data and concluded that the percentages of land ownership and availability had not varied by more than 1% or 2% since the Bottgé (1989) effort. Three regional reports (Roberts, 1985; Bottgé and Northam, 1987; and Bottgé, 1987) consist of three parts: (1) a review of the land ownership and availability of State, Federal, and private land for new mineral entry and development in Alaska, (2) a comparison of mineral terranes and land availability categories, and (3) a comparison of mineral deposits and mineral terranes to land availability categories.

Table 17 contains a detailed synopsis of land availability and ownership in Alaska, and shows that in 1986, 67% of Alaska land was Federally owned, 23% State owned, and 10% was privately owned. Private land in Alaska is 99% owned by Native corporations or individual Natives. The remaining land is municipality land or private land obtained for homesite, trade and manufacturing site, homestead, patented mining claim, or headquarters sites. By way of comparison, land ownership in the 11 western states is approximately 50% Federal, 7% State, and 43% private. By the year 2000, when all land selections have been adjudicated, the Federal Government will own about 60% of Alaska, the State 28% and Alaska Natives 11.5%. All other privately-owned land in Alaska will amount to about 0.5%.

While most of the land in Alaska is currently administered by the Federal government (103 million ha, 255 million acres), most of the land available for development is administered by the State (nearly 32.6 million ha, 78 million acres). While 80% of the Federal land is unavailable for new mineral entry, approximately 90% of the State-owned land is available. Approximately one-third of the land administered by the Bureau of Land Management and two-thirds of the Forest Service land is available or available with restrictions. None of the land administered by the Department of Defense, the Fish and Wildlife Service, or the National Park Service was considered available for new mineral location and development (fig. 52). Some of the BLM land that has been closed by the selection process will be available once all selections are adjudicated. All land owned by the Native corporations was deemed available with restrictions.

As part of this project, land underlain by currently recognized mineral terranes was compared with the various land categories. A mineral terrane is an assemblage of related rocks likely to contain mineral deposits that formed under similar geologic processes. A knowledge of the relationships between mineral occurrences and terranes can greatly aid in the exploration for new mineral deposits. This same knowledge can be useful to determine the types of minerals that can likely be found if exploration is encouraged. For purposes

Table 17. *Approximate availability of lands open to mineral entry in Alaska in 1989 (in millions of acres, millions of hectares)*

	Available	Available with restrictions	Unavailable	Total acres	Percent of total land
Federal lands					
Bureau of Land Management	29.1	2.2	63.3	94.6	25.0
Fish and Wildlife Service	0	0	81.2	81.2	21.4
National Park Service	0	0	54.3	54.3	14.4
Forest Service	10.2	5.1	8.0	23.3	6.1
Department of Defense	0	0	1.8	1.8	0.4
Subtotal (acres)	39.3	7.3	208.6	255.2[a]	67.3
Subtotal (hectares)	15.9	3.0	84.3	103.3	
State lands					
Division of Lands	75.7	0	5.1	80.8	21.4
Division of Parks and Outdoor Recreation	0	0	3.0	3.0	1.0
Division of Forestry	2.0	0	0	2.0	0.5
Department of Fish and Game	0	0	1.8	1.8	0.4
Subtotal (acres)	77.7	0	9.9	87.6	23.3
Subtotal (hectares)	31.4	--	4.0	(35.5)	
Private land[b,c]					
Native corporations	0	34.9	0	34.9	9.2
Municipalities	0	0	.5	.5	0.2
Subtotal (acres)	0	34.9	.4	35.3	9.4
Subtotal (hectares)	0	14.1	0.2	14.3	
TOTAL (acres)	117.0	42.2	218.9	378.1[d]	100.0
(Percent of total Alaska land)	(31%)	(11%)	(58%)		
TOTAL (hectares)	47.3	17.0	88.6	153.0	

SOURCE: Modified from Bottgé, 1989.

[a]Includes 54,828,000 acres selected by the State of Alaska or Native corporations under the appropriate laws. In thousands of acres (thousands of hectares):

Nativelands	13,653	(5,525)
State lands	13,622	(5,513)
State and Native lands	7,638	(3,091)
Native selections in closed Federal lands	16,157	(6,539)
State selections in closed Federal lands	2,837	(1,148)
State and Native selections in closed Federal lands	921	(373)
TOTAL	54,828	(22,189)

[b]Federal lands selected for conveyance to individuals in all land categories under "Federal lands" above, and cannot be separated from the U.S. Bureau of Land Management, U.S. Fish and Wildlife Service, and National Park Service lands listed. In thousands of acres (thousands of hectares):

Native allotments, selected	1,136	(460)
Native allotments, conveyed	185	(75)
Other private lands, selected	447	(181)
Other private lands, conveyed	970	(393)
TOTAL	2,738	(1,109)

[c]Information on State land transferred to private ownership is not available.

[d]Includes 365.2 million acres (147.8 million hectares) of land and 12.9 million acres (5.2 million hectares) of water.

of this study, a generalized mineral terrane map of Alaska adopted from Hawley's 1982 *Mineral Terranes of Alaska* was used as the source document. According to Hawley, only one-third of the State's mineral terranes were recognized at the time of the 1982 study.

Table 18 shows the availability of land underlain by recognized mineral terranes for new mineral exploration and development. The Federal government, which once owned all of Alaska, still owns two-thirds of the land and retains 70% of the land underlain by mineral terranes. Only 15% of the 37.4 million ha (92.5 million acres) of mineral terranes underlaying Federal land is

available for new mineral exploration and development (6.4 million ha, 15.7 million acres) versus approximately 91% of the mineral terrane encompassed by State-owned land (10.4 million ha, 25.72 million acres). All Native-owned land is designated here as land available with restrictions. Even if all of the land selected by the State government and the Native corporations is conveyed to them, two-thirds of the Federal land underlain by mineral terranes will be closed to mineral entry.

If one-third of the State is underlain by mineral terranes, and one-third of that land is actually available for new mineral exploration and development, then for all of Alaska, just over 10% of the land is both underlain by mineral terranes and also available for mineral exploration and development, 15%, if the Native lands are included. Bottgé (1989) also included the preparation of a data base that contains a total of 6,192 mineral deposits and occurrences in the State. Tabulations were made comparing the mineral deposits and mineral terranes against land availability categories . These tabulations are summarized by land category in table 19.

This database shows that the largest number of known mineral deposits is on Federal land (3,310), but there are more than twice as many mineral deposits on available State land (1,979) as there are on available Federal land (940).

Table 18. *Number of mineral deposits in each land available category, by deposit type. (From Bottgé 1989)*

Land category	Placer	Lode	Total
Available			
Open Federal	267	673	940
Open State	1,170	809	1,979
Total available	1,437	1,482	2,919
Available with restrictions			
Open Federal	135	133	268
Patented Native	253	402	655
Total restricted	388	535	923
Unavailable			
Closed Federal	348	744	1,092
State/Native select	564	446	1,010
Total Federal	912	1,190	2,102
Closed State	78	71	149
Closed municipality	21	78	99
Total State/municipality	99	149	248
Total unavailable	1,011	1,339	2,350
TOTAL	2,836	3,356	6,192

Table 19. *Recognized mineral terranes (in millions of acres). (From Bottgé, 1989)*

Land category	Volcanic rocks	Intrusive	Sediments	Total	% of total Alaska land (365.3)	% of recognized mineral terrane (132.9)
Available						
Open Federal	7.78	3.01	3.25	14.04		
Open State	7.47	5.24	13.01	25.72		
Total available	15.25	8.25	16.26	39.76	10	30
Available with restrictions						
Open Federal	0.48	0.86	0.32	1.66		
Patented Native	4.14	1.27	6.78	12.19		
Total restricted	4.62	2.13	7.10	13.85	5	10
Unavailable						
Closed Federal	17.65	6.68	31.11	55.44		
State/Native select	7.67	3.82	9.83	21.32		
Total Federal	25.32	10.50	40.94	76.76	20	58
Closed State	.72	.38	1.13	2.23		
Closed municipality	.11	.01	.15	.27		
Total State/municipality	.83	.39	1.28	2.5	1	2
Total unavailable	26.15	10.89	42.22	79.26		
TOTAL	46.02	21.27	65.58	132.87	35	100

SUMMARY

As of July 1986, expressed as a total of Alaska's 153 million ha (378.2 million acre) area, 47.3 million ha (116.9 million acres) (31%) of the study areas were available for new claim location and development; 17.0 million ha (42.2 million acres) (11%) were available with restrictions; and 88.7 million ha (219.1 million acres) (58%) were unavailable for mineral development.

About one-third of the State (16.1 million ha; 132.9 million acres) is underlain by currently recognized mineral terranes. Only one-third of the lands underlain by mineral terranes (16.1 ha, 39.8 million acres) is open for new claim location and development. Therefore, only 10% of the State is currently recognized as being both available and favorable for mineral exploration.

A total of 6,192 recognized metallic mineral deposits and occurrences are found in the State—3,356 lode and 2,836 placer deposits. The greatest number of deposits occur on Federal land, but two thirds of those deposits are unavailable for new mineral entry and development. More than twice as many deposits occur on available State land as on available Federal land.

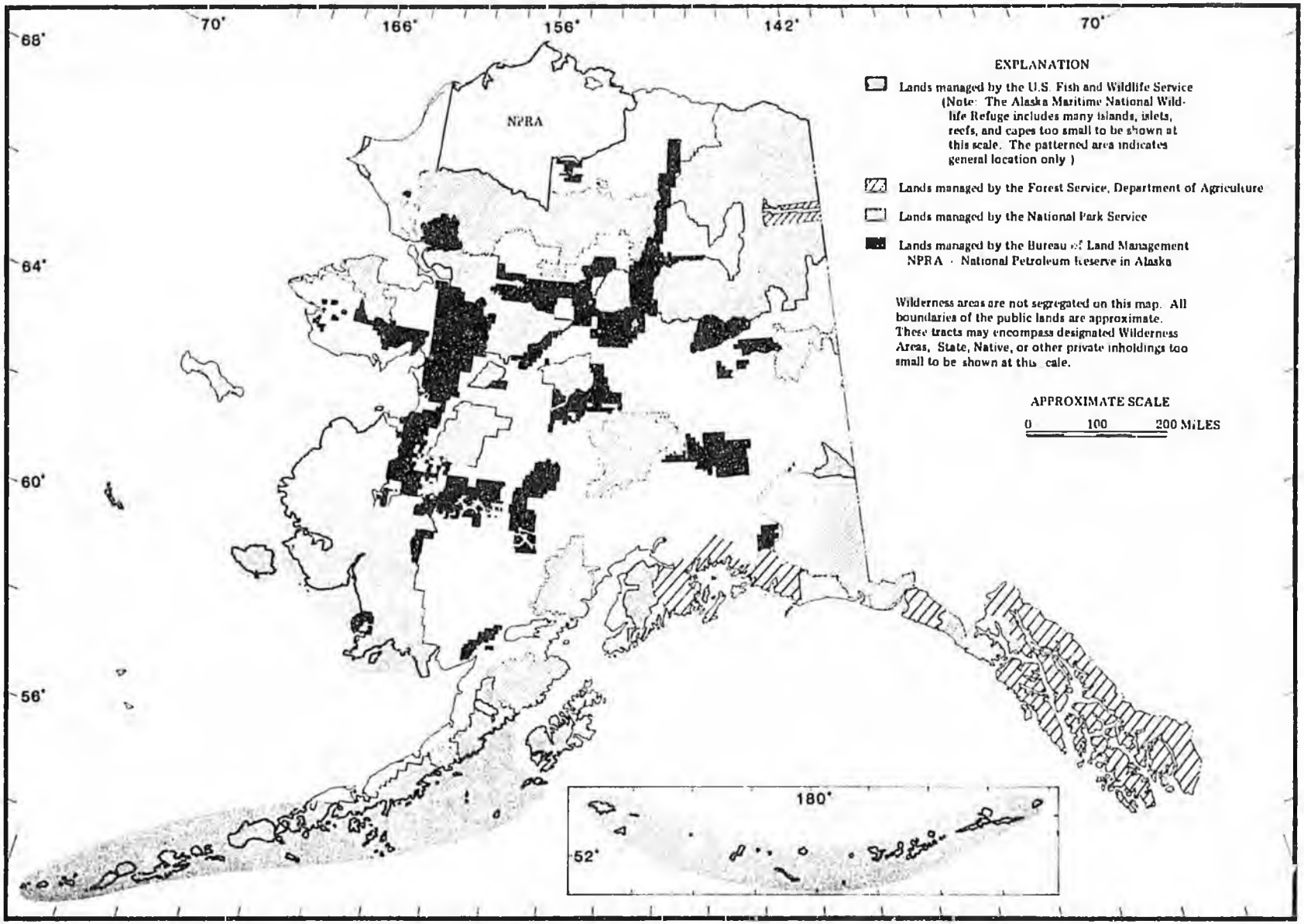


Figure 52. *Federal land ownership in Alaska.*

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APPENDIX A
Total active claims and new claims staked in 1989, 1990, and 1991[a] (listed by quadrangle)[b]
Compiled by Erik Hansen (DOM)

		Active claims assessment work			New claims staked						Total active claims[c]		
					Federal			State					
	Quadrangle	1989	1990	1991	1989	1990	1991	1989	1990	1991	1989	1990	1991
13	Umiat	0	0	0	0	0	15	0	0	0	0	0	15
14	Sagavanirktok	0	0	0	0	0	0	0	1	0	0	0	0
15	Mt. Michelson	0	0	0	0	0	0	0	0	0	0	0	0
17	Point Hope	0	0	0	0	0	0	0	0	0	0	0	0
18	De Long Mts.	1,350	1,386	1,388	0	0	0	107	0	0	1,457	1,386	1,388
23	Phillip Smith Mts.	9	9	5	2	2	3	1	1	2	12	12	10
26	Noatak	187	66	66	0	0	0	0	0	0	187	66	66
27	Baird Mts.	130	114	126	0	0	0	0	2	0	130	116	126
28	Ambler River	104	110	111	0	0	0	0	7	0	104	117	111
29	Survey Pass	37	34	34	0	0	0	0	0	0	37	34	34
30	Wiseman	1,393	1,385	1,346	3	4	2	90	90	7	1,486	1,479	1,355
31	Chandalar	828	752	645	0	0	17	8	24	12	836	776	674
32	Christian	2	1	2	0	0	0	0	0	0	2	1	2
35	Kotzebue	0	0	0	0	0	0	0	0	0	0	0	0
36	Selawik	0	0	0	0	0	0	0	0	0	0	0	0
37	Shungnak	6	1	28	0	0	0	0	0	0	6	1	28
38	Hughes	54	54	54	0	0	0	0	0	0	54	54	54
39	Bettles	366	298	360	48	29	5	0	4	0	414	331	365
43	Teller	380	488	382	0	0	0	98	30	60	478	518	442
44	Bendeleben	1,107	839	819	2	0	0	249	32	75	1,358	871	894
45	Candle	453	486	470	0	0	8	16	16	7	469	502	485
47	Melozitna	131	125	117	0	0	0	9	4	0	140	129	117
48	Tanana	1,296	1,027	914	0	0	0	123	117	168	1,419	1,144	1,082
49	Livengood	3,578	3,335	4,187	0	0	0	328	116	143	3,906	3,502	4,330
50	Circle	4,582	3,394	3,296	0	41	8	446	301	270	5,028	3,736	3,574
51	Charley River	146	183	182	0	0	0	18	0	0	164	183	182
52	Nome	687	697	625	0	0	61	103	33	64	790	730	750
53	Solomon	329	396	332	0	0	0	256	16	95	585	412	427
54	Norton Bay	91	110	110	0	0	0	0	0	0	91	110	110
55	Nulato	3,175	3,175	1,632	0	0	0	78	0	0	3,253	3,175	1,632
56	Ruby	1,057	846	764	0	0	0	52	1	18	1,109	847	782
57	Kantishna River	244	243	133	1	9	15	0	0	0	245	252	148
58	Fairbanks	2,209	2,158	2,252	0	0	0	303	206	149	2,512	2,364	2,401
59	Big Delta	2,430	1,998	2,677	0	10	541	105	398	789	2,535	2,406	4,007
60	Eagle	2,480	1,973	1,268	0	1	5	113	129	84	2,593	2,103	1,357
63	Unalakleet	0	0	0	0	0	0	0	0	0	0	0	0
64	Ophir	654	657	365	0	0	0	36	9	12	690	666	377
65	Medfra	250	281	254	0	0	0	9	24	1	259	305	255
66	Mt. McKinley	313	233	338	0	0	0	0	20	25	313	253	363
67	Healy	3,301	4,307	3,536	135	605	42	187	84	204	3,623	4,996	3,782
68	Mt. Hayes	3,273	2,871	3,339	41	240	16	188	15	23	3,502	3,126	3,378
69	Tanacross	1,185	1,144	1,360	0	0	0	79	19	166	1,264	1,163	1,526
72	Holy Cross	0	5	6	0	0	0	0	0	0	0	5	6
73	Iditarod	1,586	1,399	664	54	0	0	63	10	6	1,703	1,409	670
74	McGrath	348	329	75	0	0	0	0	0	0	348	329	75
75	Talkeetna	2,197	1,758	1,514	0	0	0	141	111	89	2,338	1,869	1,603
76	Talkeetna Mts.	1,528	770	629	0	3	0	177	120	109	1,705	893	738
77	Gulkana	24	20	18	0	0	0	2	0	10	26	20	28
78	Nabesna	189	354	304	0	0	0	71	4	39	260	358	343
81	Russian Mission	48	51	44	0	0	0	0	0	0	48	51	44
82	Sleetmute	267	185	155	0	0	0	0	0	0	267	185	155
83	Lime Hills	122	102	12	0	0	0	0	0	3	122	102	15

[a]Total count based on all documents recorded through January 1, 1992.
[b]Quadrangles numbered northwest to southeast according to DGGS-DOM numbering and Kardex systems.
[c]Excluding an undetermined number of claims on State selected land.

APPENDIX A—Continued

	Quadrangle	Active claims assessment work 1989	1990	1991	New claims staked Federal 1989	1990	1991	State 1989	1990	1991	Total active claims 1989	1990	1991
84	Tyonek	5,340	5,137	4,307	0	0	0	11	26	44	5,351	5,163	4,351
85	Anchorage	407	689	607	2	0	17	89	181	182	498	870	806
86	Valdez	414	465	268	145	10	4	20	7	41	579	482	313
87	McCarthy	186	103	193	0	0	0	0	0	0	186	103	193
91	Bethel	485	380	59	0	0	0	48	0	2	533	380	61
92	Taylor Mts.	273	263	290	0	0	0	12	0	0	285	263	290
93	Lake Clark	588	387	386	0	0	0	10	0	1	598	387	387
94	Kenai	12	14	12	0	0	0	0	0	0	12	14	12
95	Seward	2,024	1,484	1,523	131	38	141	20	36	5	2,175	1,558	1,669
96	Cordova	0	0	2	1	0	1	0	0	0	1	0	3
97	Bering Glacier	283	274	298	0	0	0	0	0	4	283	274	302
101	Goodnews	39	75	39	0	0	0	0	0	0	39	75	39
102	Dillingham	0	0	0	0	0	0	0	0	0	0	0	0
103	Iliamna	700	780	1,194	0	0	0	133	86	450	833	866	1,644
104	Seldovia	9	10	2	0	0	0	0	0	0	9	10	2
105	Blying Sound	1	1	0	0	0	0	0	0	0	1	1	0
107	Icy Bay	4	0	0	0	0	0	0	0	0	4	0	0
108	Yakutat	1	1	1	0	0	0	2	0	0	3	1	1
109	Skagway	485	473	493	2	27	1	19	0	0	506	500	494
111	Mt. Fairweather	4	4	2	0	4	0	0	2	0	4	10	2
112	Juneau	3,251	3,947	2,807	293	255	174	49	54	1	3,593	4,056	2,982
113	Taku River	0	0	0	0	0	0	0	0	0	0	0	0
114	Sitka	432	289	379	0	94	11	0	4	0	432	387	390
115	Sumdum	143	121	176	19	97	38	0	0	0	162	218	214
116	Port Alexander	184	107	1	1	0	0	0	0	0	185	107	1
117	Petersburg	480	448	482	23	89	26	0	0	2	503	537	510
118	Bradfield Canal	107	361	294	262	134	2	0	0	0	469	495	296
119	Craig	905	943	938	262	24	115	0	0	0	1,167	967	1,051
120	Ketchikan	391	391	398	137	107	32	1	51	15	529	549	445
121	Dixon Entrance	181	186	184	0	65	0	0	0	0	181	251	184
122	Prince Rupert	0	0	0	0	0	0	0	0	0	0	0	0
123	Hagemeister Island	374	216	240	0	0	0	0	0	0	374	216	240
126	Mt. Katmai	0	0	0	0	0	0	0	0	0	0	0	0
127	Afognak	2	2	2	0	0	0	0	36	0	2	38	2
130	Karluk	0	0	0	0	0	0	0	0	0	0	0	0
133	Chignik	71	71	71	0	0	0	0	0	0	71	71	71
135	Trinity Islands	437	380	373	0	0	0	49	83	14	486	463	387
138	Port Moller	17	16	17	0	0	0	9	0	0	26	16	17
143	Unalaska	0	0	0	0	0	1	0	0	0	0	0	1
	TOTAL	64,123	58,067	52,976	1,664	2,573	1,299	8,062	1,888	3,391	67,948	62,528	57,666

APPENDIX B
1991 Prospecting sites on State lands
Compiled by Erik Hansen (DOM)

	Quadrangle	New sites	Extensions	Total
23	Philip Smith Mts.	3	0	3
27	Baird Mts.	7	0	7
30	Wiseman	0	4	4
31	Chandalar	1	6	7
44	Bendeleben	8	0	8
45	Candle	21	0	21
48	Tanana	57	0	57
49	Livengood	33	1	34
50	Circle	131	58	189
52	Nome	18	7	25
53	Solomon	0	9	9
57	Kantishna River	6	0	6
58	Fairbanks	25	16	41
59	Big Delta	154	63	217
60	Eagle	41	0	41
64	Ophir	2	0	2
67	Healy	17	11	28
68	Mt. Hayes	14	20	34
69	Tanacross	23	7	30
73	Iditarod	1	0	1
75	Talkeetna	27	0	27
76	Talkeetna Mts.	30	0	30
78	Nabesna	8	0	8
82	Sleetmute	3	0	3
84	Tyonek	51	0	51
85	Anchorage	28	18	46
91	Bethel	8	0	8
95	Seward	8	0	8
103	Iliamna	0	14	14
135	Trinity Islands	3	0	3
TOTAL		728	234	962

APPENDIX C

State and Federal agencies, and private interest groups involved in mineral development activities, 1991

(Note: The *1992 Service Directory of the Alaska Miners Association* lists technical and professional consultants and companies available for work in Alaska. The report is available for $12 from the Association's Anchorage office. See p. 61 for the address.)

STATE OF ALASKA AGENCIES

DEPARTMENT OF COMMERCE AND ECONOMIC DEVELOPMENT
State Office Building, 9th Fl.
P.O. Box 110800 (mailing)
Juneau, AK 99811-0800
(907) 465-2500
Commissioner-Paul Fuhs (Acting)

Function: *Promotes economic development in Alaska.*

Division of Economic Development
State Office Building, 9th Fl.
P.O. Box 110804 (mailing)
Juneau, AK 99811-0804
(907) 465-2017
Acting Director-Diane Mayer
Deputy Director Vacant
Development Specialist- Al Clough

1001 Noble St., Ste. 360
Fairbanks, AK 99701
(907) 452-7464
Development Specialist-Richard Swainbank

Function: *Primary advocacy agency in state government for economic growth. Researches and publishes economic data on Alaska's mining industry. Provides information and assistance to new or developing businesses. Attracts capital investment by advertising Alaska's resources potential. Provides research staff aid for the Alaska Minerals Commission.*

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
410 Willoughby Ave., Ste. 105
Juneau, AK 99801-1795
(907) 465-5000
Public Information (907) 465-5060
Commissioner-John A. Sandor
(907) 465-5050

Function: *Issues permits for activities, including mining, that affect air or water quality or involve land disposal of wastes. Sets air- and water-quality standards. Inspects, monitors, and enforces environmental quality statutes, regulations, and permits. Reviews all federal permits.*

Northern Regional Office
1001 Noble St., Ste. 350
Fairbanks, AK 99701
(907) 451-2101
Regional Supervisor-William McGee

Southcentral Regional Office
601 C St., Ste. 1334, Frontier Bldg.
Anchorage, AK 99503
(907) 563-6529
Permit Information (907) 563-6529
(collect calls accepted)
Regional Administrator-Svend Brandt-Ericksen

Nome District Office
P.O. Box 1815
Nome, AK 99762
(907) 443-2600
(907) 443-5961(fax)
District Manager-Randy Romenesko

Southeastern Regional Office
410 Willoughby Ave., Ste. 105
Juneau, AK 99801-1795
(907) 465-5350
Permit Information (907) 465-2615
(collect calls accepted)
Regional Administrator-Dick Stokes

DEPARTMENT OF FISH AND GAME
Capital Office Park
P.O. Box 25526 (mailing)
Juneau, AK 99802-5526
Commissioner-Carl L. Rosier
(907) 465-4100

Habitat Division Director-Frank Rue
(907) 465-4105

Function: *Protects habitat in fish streams and manages refuges, sanctuaries, and critical habitats. Requires permits for any work involving: the blockage of fish passage; equipment crossings or operation in streams with anadromous fish; use, diversion, or pollution of streams containing anadromous fish; construction, exploration, or development work in state game refuges, game sanctuaries, and critical habitat areas.*

Central Regional Office
Habitat Division
1300 College Rd.
Fairbanks, AK 99701
(907) 451-6192
Regional Supervisor-Alvin Ott

Southcentral Regional Office
Habitat Division
333 Raspberry Rd.
Anchorage, AK 99518-1599
(907) 267-2335
Regional Supervisor-Lance Trasky

Southeastern Regional Office
Habitat Division
803 3rd St., 1st Fl.
P.O. Box 240020 (mailing)
Douglas, AK 99824
(907) 465-4290
Regional Supervisor-Rick Reed

OFFICE OF MANAGEMENT AND BUDGET
Division of Governmental Coordination
431 North Franklin St.
P.O. Box 110030 (mailing)
Juneau, AK 99811-0030
(907) 465-3562
Director-Paul Rusanowski

Function: *Conducts coordinated state review of permits for mining projects within Alaska's Coastal Management Zone. Provides information to applicants on project design for consistency with the policies and standards of the Alaska Coastal Management Program. Coordinates state response to direct federal actions, including proposed regulations, that affect Alaska's mining industry.*

Northern Regional Office
675 Seventh Ave.
Station H (mailing)
Fairbanks, AK 99701-4596
(907) 451-2818
Project Coordinator-Patti Wightman

Southcentral Regional Office
3601 C St., Ste. 370, Frontier Bldg.
Anchorage, AK 99503-2798
(907) 561-6131
Fax: (907) 561-6134
Project Review Coordinator-
Molly K. Birnbaum

Southeastern Regional Office
431 North Franklin St.
P.O. Box 110030(mailing)
Juneau, AK 99811-0030
(907) 465-3562
Project Review Coordinator-
Lorraine Marshall

DEPARTMENT OF NATURAL RESOURCES
400 Willoughby Ave., 5th Fl.
Juneau, AK 99801
(907) 465-2400
Commissioner-Glenn A. Olds

Division of Forestry
3601 C St., Ste. 1058, Frontier Bldg.
P.O. Box 107005 (mailing)
Anchorage, AK 99510-7005
(907) 762-2501
Director-Malcolm R. Dick, Jr.

Function: *Establishes guidelines to manage mining in state forests.*

Northern Regional Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2660
Regional Forester-Lester Fortune

Southcentral Regional Office
3601 C St., Ste. 1008, Frontier Bldg.
P.O. Box 107005 (mailing)
Anchorage, AK 99510-7005
(907) 762-2117
Regional Forester-Dave Wallingford

Southeastern Regional Office
400 Willoughby Ave., 5th Fl.
Juneau, AK 99801
(907) 465-2491
Regional Forester-Jim McAllister

Division of Geological & Geophysical Surveys
794 University Ave., Ste. 200
Fairbanks, AK 99709-3645
(907) 474-7147
State Geologist-Thomas E. Smith

Function: *Conducts geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, fuels, and geothermal resources; locations and supplies of construction materials; potential geologic hazards to buildings, roads, bridges, and other installations and structures; and other surveys and investigations as will advance knowledge of the geology of Alaska and general geologic inventories. Publishes a variety of reports that contain the results of these investigations. Advises the public and government agencies on geologic issues. Maintains a library of geologic bulletins, reports, and periodicals. Maintains a drill-core storage facility at Eagle River.*

Southcentral Regional Office
400 Willoughby Ave., 3rd Fl.
Juneau, AK 99801
(907) 465-2520
Geologist-Roman J. Motyka

Division of Land
3601 C St., Ste. 814, Frontier Bldg.
P.O. Box 107005 (mailing)
Anchorage, AK 99510-7005
(907) 762-2692
Director-Ron Swanson

Function: *Manages surface estate and resources, including materials (gravel, sand, and rock). Handles statewide and regional land-use planning. Issues leases, material-sale contracts, mill-site permits, land-use permits, and easements for temporary use of State land and access roads.*

Northern Regional Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2700
Regional Manager-Rick Smith

Southcentral Regional Office
3601 C St., Ste. 1080, Frontier Bldg.
P.O. Box 107005 (mailing)
Anchorage, AK 99510-7005
(907) 762-2253
Regional Manager-Richard Thompson

Southeastern Regional Office
400 Willoughby Ave., Ste. 400
Juneau, AK 99801
(907) 465-3400
Regional Manager-Andrew Pekovich

Division of Mining
3601 C St., Ste. 800, Frontier Bldg.
P.O. Box 107016 (mailing)
Anchorage, AK 99510-7016
(907) 762-2165
Acting Director-Sam Dunaway
Mining Information-Bob Stuvek

Function: *Principal agency for management of mining and reclamation on state land in Alaska. Maintains a mining information office in Fairbanks. Issues property rights to leasable minerals; adjudicates locatable mineral filings. Issues permits for hard-rock and placer-mining activity. Maintains records of mineral locations, permits, and leases. Provides technical, legal, and land-status information. Administers the Alaska Surface Mining Control and Reclamation Act (ASMACRA), which includes permitting and inspection of coal mining activity and reclamation of abandoned mines.*

Northern Regional Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2790
Regional Manager-John Wood
Mining Information-Erik Hansen

Division of Parks and Outdoor Recreation
3601 C St., Ste. 1200, Frontier Bldg.
P.O. Box 107001 (mailing)
Anchorage, AK 99510-7001
(907) 762-2600
Director-Neil Johannsen

Function: *Manages approximately 3,000,000 acres of state park lands primarily for recreational uses, preservation of scenic values, and watershed. Responsible for overseeing mining access, recreational mining activity, and valid mining claim inholdings within state park lands.*

Northern Regional Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2695
Regional Manager-Mike Lee

Southcentral Regional Office
3601 C St., Ste., 1280, Frontier Bldg.
P.O. Box 107001 (mailing)
Anchorage, AK 99510-7001
(907) 762-2617
Regional Manager-Al Meiners

Southeastern Regional Office
400 Willoughby Ave., 3rd Fl.
Juneau, AK 99801
(907) 465-4563
Regional Manager-William Garry

History and Archaeology Section
3601 C St., Ste. 1278, Frontier Bldg.
P.O. Box 107001 (mailing)
Anchorage, AK 99510-7001
(907) 762-2626
Section Chief and State Historic Preservation Officer-Judith Bittner
State Archaeologist-Robert Shaw

Division of Water
3601 C St., Ste. 822, Frontier Bldg.
P.O. Box 107005 (mailing)
Anchorage, AK 99510-7005
(907) 762-2575
Director-Ric Davidge

Function: *Manages water resources of the State; issues water-appropriation permits and certificates; responsible for safety of all dams in Alaska; conducts surveys to determine the locations, quantity, and quality of ground and surface water.*

Northern Regional Office
3700 Airport Way
Fairbanks, AK 99709-4699
(907) 451-2772
Hydrologist-Scott Ray
Water Quality Lab-474-7713

Eagle River Office
18225 Fish Hatchery Road
P.O. Box 772116 (mailing)
Eagle River, AK 99577-2116
(907) 696-0070
Section Chief-William E. Long

Southeastern Regional Office
400 Willoughby Ave., 3rd Fl.
Juneau, AK 99801
(907) 465-2533
Hydrologist-Rick Noll

DEPARTMENT OF PUBLIC SAFETY
450 Whittier St.
P.O. Box 111200 (mailing)
Juneau, AK 99801-1200
(907) 465-4322
Commissioner-Richard Burton

Division of Fish and Wildlife Protection
5700 East Tudor Rd.
Anchorage, AK 99507
(907) 269-5509
Director-Jack W. Jordan

Function: *Enforce state laws, in particular AS Title 16. Acts as enforcement arm for Alaska Department of Fish and Game.*

DEPARTMENT OF REVENUE
State Office Bldg.
11th Fl., Entrance A
P.O. Box 110400 (mailing)
Juneau, AK 99811-0400
(907) 465-2300
Commissioner-Darrel Rexwinkel

Income and Excise Tax Audit Division
State Office Bldg.
P.O. Box 110420 (mailing)
Juneau, AK 99811-0420
(907) 465-2320
Audit Office Supervisor-Nestor Catli

Function: *Issues licenses (including mining) for production and sale of minerals.*

Division of Audit
550 W. 7th Ave., Ste. 320A
Anchorage, AK 99501
(907) 276-5364
Director-Larry E. Meyers

Function: *Administers mining-license tax, which is based on net income, including royalties. On application, will grant certificate of tax exemption for first year of new mining operations, except for mining of sand and gravel. Tax returns must be filed annually.*

UNIVERSITY OF ALASKA
Fairbanks, AK 99775-0760

College of Natural Sciences
Department of Geology & Geophysics
408 Brooks Building
(907) 474-7565
Department Head-Samuel E. Swanson

Function: *Provides undergraduate and graduate education in geology and geophysics and conducts basic and applied research in geologic sciences. Offers B.S., M.S., and Ph.D. program options in general geology, economic geology, petroleum geology, geophysics, and ice-snow-permafrost geophysics.*

School of Mineral Engineering
Duckering Bldg., Rm. 437
(907) 474-7366
Acting Dean-Russell Ostermann

Function: *Provides undergraduate and graduate education programs in geological engineering, mining engineering, mineral preparation engineering, and petroleum engineering. Offers mining extension programs in both urban and rural areas. Through research programs conducts laboratory and field studies to promote mineral and energy development.*

Mineral Industry Research Laboratory (MIRL)
O'Neill Resources Bldg., Rm. 212B
(907) 474-7135
Acting Director-Russell Ostermann
Associate Director-P.D. Rao

Function: *Conducts applied and basic research in exploration, development, and utilization of Alaska's mineral and coal resources with emphasis on coal characterization, coal preparation, mineral beneficiation, fine gold recovery, hydrometallurgy, and environmental concerns. Publishes reports on research results and provides general information and assistance to the mineral industry.*

Mining Extension Program
Duckering Bldg., Rm. 401
(907) 474-7702

Function: *Offers prospecting and introductory mineral and mining courses under an open admissions policy.*

Mining and Petroleum Training Service
University of Alaska Anchorage
155 Smithway, Ste. 101
Soldotna, AK 99669
Director-Dennis D. Steffy
Asst. Director-Debbie J. Kendrick
(907) 262-2788

Function: *Provides direct training and assistance to mine operators, service and support companies and governmental agencies in mine safety and health, mining extension, vocational mine training and technical transfer. Specialized training services in hazardous materals, first aid and CPR, industrial hygiene and professional safety education and consulting are available on demand.*

University of Alaska Southeast
Institute of Mining Technology
Airport Office Center
9085 Glacier Hwy, Suite 301
Juneau, AK 99801
(907) 463-4840
Director-Lee Paavola
Chief Instructor-Robert Greig

Function: *The IMT is designed to train students for entry level positions in the mining industry. Students receive classroom and hands on underground mine experience in the Institute's training mine. The Maggie-Kathleen Program graduates complete all required SHA training for certification.*

FEDERAL AGENCIES

U.S. DEPARTMENT OF THE INTERIOR
Office of the Secretary
1689 C St., Ste. 100
Anchorage, AK 99501-5151
(907) 271-5485
Special Assistant to the Secretary-Curtis V. McVee
Staff Coordinator-Ronald B. McCoy

Function: *Coordinates the Department of the Interior's policy and stewardship with DOI bureaus for the management of over 200 million acres of public land in Alaska. The Special Assistant to the Secretary also serves as the Chairman of the Federal Subsitence Management Board.*

Bureau of Land Management
Alaska State Office
22 West 7th Ave., #13
P.O. Box 13 (mailing)
Anchorage, AK 99513-7599
State Director-Edward F. Spang
Mineral Resources Deputy State Director-John Santora
(907) 271-3343
Mineral Law Branch Chief-Ruth Stockie
(907) 271-3791
Public Room - (907) 271-5960

Function: *Administers federal public lands (except national parks, wildlife refuges, national monuments, national forests, and military withdrawals). Issues leases for all federal leasable minerals including oil and gas, coal, phosphates, and oil shale. Arranges for sale of minerals other than leasable or salable materials, including sand, gravel, or stone. Issues right-of-way and special-use permits. Monitors mining operations to insure protection of surface resources. Maintains land-status plats and issues patents. Records federal mining claims and annual assessment affidavits.*

Anchorage District Office
6881 Abbott Loop Rd.
Anchorage, AK 99507
(907) 267-1248
District Manager-Dick Veminen

Arctic District Office
1150 University Ave.
Fairbanks, AK 99709-3844
(907) 474-2302
District Manager-Dee Ritchie

Nome Field Office
P.O. Box 925 (mailing)
Nome, AK 99762
(907) 443-2177
Natural Resource Specialist-Norm Messenger

Glennallen District Office
P.O. Box 147 (mailing)
Glennallen, AK 99588
(907) 822-3217
District Manager-Gene Keith

Kobuk District Office
1150 University Ave.
Fairbanks, AK 99709-3844

(907) 474-2332
District Manager-Helen Hankins

Steese-White Mountain Office
1150 University Ave.
Fairbanks, AK 99709-3844
(907) 474-2352
District Manager-Roger Bolstad

Kotzebue Field Office
P.O. Box 1049 (mailing)
Kotzebue, AK 99752
(907) 442-3430
(907) 442-2720 (fax)
Natural Resource Specialist-Larry Whalon

Tok Field Office
P.O. Box 309 (mailing)
Tok, AK 99780
(907) 883-5121
Manager-Bob Burritt

Fairbanks Support Center and Land Information Office (Public Room)
1150 University Ave.
Fairbanks, AK 99709-3844
(907) 474-2250
Support Center Manager-James Murray

Function: *Primary contact for information on Interior and northern regions.*

U.S. Bureau of Mines
Alaska Field Operations Center
3301 C. St., Ste. 525
Anchorage, AK 99503-3935
(907) 271-2455
Chief - Donald P. Blasko
Branch Chief-Martin D. Conyac

Function: *Alaska programs are designed to aid development of a viable mineral industry in Alaska with emphasis on field programs focused towards the identification of type, amount and distribution of mineral deposits in Alaska. The field information is augmented by other Bureau programs which provided information on beneficiation technologies (research); economic feasibility studies (potential supply); and economic and environmental effects of mineral development (policy analysis). Information is provided to other government agencies to aid land planning and land use decisions, and to the private sector to identify targets of opportunity for further exploration and/or development.*

Anchorage Branch - AFOC
3301 C. St., Ste. 525
Anchorage, AK 99501
(907) 271-2455
Contact Person-Donald W. Baggs

Juneau Branch - AFOC
P.O. Box 20550 (mailing)
Juneau, AK 99802-0550
(907) 364-2111
Branch Chief-R. David Cames

U.S. Fish and Wildlife Service
Region 7 Office
1011 East Tudor Rd.
Anchorage, AK 99503
(907) 786-3542
Regional Director-Walter O. Stieglitz
Assistant Regional Director (Fish and Wildlife Enhancement)-
Rowan W. Gould

Function: *Administers the federal public lands in national wildlife refuges, issues special-use permits for activities on refuges, reviews permits and applications for various mining activities on all private and public lands and waters, and provides information to regulatory agencies on fish and wildlife and their habitat. Makes recommendations to regulatory agencies to mitigate adverse environmental impacts.*

Fairbanks Fish and Wildlife Enhancement
Ecological Service/Endangered Species Branch
101 12th Ave., Rm. 232
Box No. 20 (mailing)
Fairbanks, AK 99701
(907) 456-0203
Field Supervisor-Patrick Sousa

Juneau Fish and Wildlife Enhancement
Federal Bldg., Rm. 417
P.O. Box 21287 (mailing)
Juneau, AK 99802
(907) 586-7240
Field Supervisor-Nevin Holmberg

Anchorage Fish and Wildlife Enhancement
605 West 4th Ave., Rm. 62
Anchorage, AK 99501
(907) 271-2787
Field Supervisor-Dave McGillivary

U.S. Geological Survey
Geological Division
4200 University Dr.
Anchorage, AK 99508-4663
(907) 786-7495
Chief, Branch of Alaskan Geology-
Willis H. White

Water Division
4230 University Dr.
Anchorage, AK 99508
(907)786-7100

Alaska Distribution USGS Section
(for maps and brochures)
Federal Bldg.
101 12th Ave.
Fairbanks, AK 99701
(907) 456-0244

U.S. Geological Survey Earth Science Information Center
Geologic Division
4230 University Dr., Rm. 101
Anchorage, AK 99508-4667
(907) 786-7012

Function: *Investigates and reports on physical resources; configuration and character of land surface; composition and structure of underlying rocks; and quality, volume, and distribution of water and minerals. Conducts 1:250,000-scale geologic mapping under the auspices of the Alaska Mineral Resource Assessment Program (AMRAP). Publishes and distributes nearly all available topographic maps of Alaska.*

National Park Service
Alaska Regional Office
2525 Gambell St.
Anchorage, AK 99503
(907) 257-2634
Regional Director-John Moorehead
Chief, Minerals Management-Floyd Sharrock
(907) 257-2626
Mining Engineer-Lynn S. Griffiths
(907) 257-2629

Function: *Administers lands within the national park system in Alaska. Manages valid prior-right mining claims in parklands through plans of operation under Mining in Parks Act, National Park Service regulations, and other applicable federal and state laws and regulations.*

U.S. DEPARTMENT OF LABOR

Mine Safety and Health Administration
117 107th Ave. NE., Rm. 100
Bellevue, WA 98004
(206) 442-7037
Bellevue Field Office Supervisor-
Walter Turner (administers portions of Alaska south of Yukon River)

Juneau Field Office
Federal Building
107 West 9th
P.O. Box 22049 (mailing)
Juneau, AK 99802
(907) 586-7165
Inspector-Bob Casey

Mine Safety and Health Administration
205 North 4th St., Rm. 103
Coeur d'Alene, ID 83814
(208) 667-6680
Coeur d'Alene Field Office Supervisor-
Coltin Galloway (administers portions of Alaska north of Yukon River)

Function: *Administers health and safety standards to protect the health and safety of metal, nonmetal and coal miners. Cooperates with the State to develop health and safety programs and develops training programs to help prevent mine accidents and occupationally caused diseases. Under agreement with the Coal Mine Safety and Health Office, the MSHA metal/nonmetal section has assumed responsibility for enforcement and training activities at coal mines in Alaska.*

Mine Safety and Health Administration
Coal Mine Safety and Health, District 9
P.O. Box 25367
Denver, CO 80225
(303) 231-5458
District Manager-William A. Holgate

Function: *Administers health and safety standards according to the Code of Federal Regulations to protect the health and safety of coal miners; requires that each operator of a coal mine comply with these standards. Cooperates with the State to develop health and safety programs and develops training programs to help prevent coal or other mine accidents and occupationally caused diseases in the industry.*

U.S. DEPARTMENT OF AGRICULTURE

U.S. Forest Service
Regional Office
Federal Bldg.
P.O. Box 21628 (mailing)
Juneau, AK 99802-1628
(907) 586-7847
Regional Forester-Michael A. Barton

Function: *Helps meet national mineral and energy needs by encouraging and supporting environmentally sound mineral enterprises on national forest system lands. Provides joint administration of general mining laws on national forest system lands with the Bureau of Land Management. Cooperates with Department of Interior agencies in the review and issuance of mineral leases. Issues permits for disposal of sand, gravel, and stone.*

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 10 Regional Office
1200 6th Ave.
Seattle, WA 98101
(206) 553-1200
Regional Administrator-Dana Rasmussen

Function: *Issues National Pollutant Discharge Elimination System (NPDES) permits under the Clean Water Act to regulate effluent discharges. Maintains regulatory and review authority over wetland and NEPA/EIS-related issues.*

Alaska Operations Office
222 West 7th Ave., #19
Anchorage, AK 99513
(907) 271-5083
Assistant Regional Administrator-
Alvin L. Ewing

Alaska Operations Office
410 Willoughby Ave., Ste. 100
Juneau, AK 99801
(907) 586-7619
Chief, State Operations Section-
Steven Torok

U.S. DEPARTMENT OF THE ARMY

Corps of Engineers
Regulatory Branch
P.O. Box 898
Anchorage, AK 99506-0898
District Engineer-Col. John W. Pierce
Write: Attention: NPACO-R-S, or CENPA-CO-R
Call: Chief of Compliance Section
(907) 753-2712 or (800) 478-2712
(in Alaska only)

Function: *Regulates work in navigable waters of United States and discharge of dredged or fill material into United States waters, including wetlands. Examples of regulated mining activities include construction of berms, dikes, diversion pads, stockpiles, and reclamation activities.*

COOPERATIVE STATE-FEDERAL AGENCIES

Alaska Public Lands Information Center
250 Cushman St., Ste. 1A
Fairbanks, AK 99701
(907) 451-7352
Manager-Karla Zervos
Assistant Manager-Lenore Heppler

Function: *Clearinghouse for general information on outdoor recreation in Alaska. Information sources include U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, U.S. Geological Survey, Alaska Departments of Natural Resources and Fish and Game, and Alaska Division of Tourism.*

BOARDS AND COMMISSIONS

Alaska Minerals Commission
P.O. Box 80148
Fairbanks, AK 99708
(907) 479-6240
Chairman-Earl H. Beistline

Function: *The Mineral Commission was created by the Alaska State Legislature in 1986 to make recommendations to the Governor and the Legislature on ways to mitigate constraints on the development of minerals in Alaska. The Commission has published annual reports since 1987.*

Citizens' Advisory Commission on Federal Areas
250 Cushman St., Ste. 4H
Fairbanks, AK 99701
(907) 456-2012
Chairperson-Lou Williams
Executive Director-Stan Leaphart

Function: *The Citizens' Advisory Commission on Federal Areas was established in 1981 by the Alaska Legislature to protect the rights of Alaskans to continue their traditional uses of federal lands throughout the state. This was done in response to Congressional enactment in December 1980 of the Alaska National Interest Lands Conservation Act (ANILCA), which placed millions of acres of federally owned lands into conservation system units with restrictive land-use and management requirements.*

Alaska Water Resources Board
P.O. Box 107005
Anchorage, AK 99510
Acting Chairperson-Stosh Anderson
(907) 762-2575

Function: *The Alaska Water Resources Board serves as an advisory group to the Governor on all matters relating to use and appropriation of water in theState of Alaska. The board has been particularly supportive of water resources legislation, including amendments to the Alaska Water Use Act for reservations of water and instream uses, basin-wide water rights adjudications, and housekeeping amendments to improve water-rights adjudication. The board has taken a keen interest in the state's water quality programs and water quality standards.*

Alaska Science & Technology Foundation
550 West 7th Ave., Ste. 360
Anchorage, AK 99501-3555
(907) 272-4333
Executive Director-John W. Sibert

Function: *The Foundation was created to make public funds available for long-term investment in economic development and technological innovation within theState and to improve the health status of its residents. Through the awarding of grants for basic and applied research, the Foundation will enhanc the State's economy and help build its science and engineering capabilities.*

CHAMBERS OF COMMERCE

Alaska State Chamber of Commerce
415 E St., Ste. 201
Anchorage, AK 99501
(907) 278-2722
Chairman-Margy Johnson
Vice President-Kathleen Tarr

Function: *The State Chamber of Commerce researches and formulates positions on Alaskan resource development. Recommendations for consideration are submitted to the State Chamber of Commerce board of directors.*

Juneau Chamber of Commerce
1107 W. 8th, Suite #1
Juneau, AK 99801

(907) 586-6420
Executive Director-Joe Poor

Greater Fairbanks Chamber of Commerce
709 2nd Ave.
Fairbanks, AK 99701
(907) 452-1105

Anchorage Chamber of Commerce
437 E St., Ste. 300
Anchorage, AK 99501
(907) 272-2401

NONGOVERNMENTAL GROUPS AND ASSOCIATIONS

Alaska Miners Association, Inc.
Statewide Office
501 West Northern Lights Blvd., Ste. 203
Anchorage, AK 99503
(907) 276-0347
Statewide President-Tom Crafford
Executive Director-Steven C. Borell

Anchorage Branch
Chairman-Joe Ruzicka
P.O. Box 190509
Anchorage, AK 99519-0509
(907) 243-2856

Fairbanks Branch
Chairman-Josh Moore
P.O. Box 82524
Fairbanks, AK 99708
(907) 455-6777

Juneau Branch
Chairman-Dennis DeBolt
Sealaska Corp.
1 Sealaska Plaza, Ste. 400
Juneau, AK 99801
(907) 586-1512

Kenai Branch
Chairman-Mike Busby
Kachemak Mining
47660 Falls Creek Dr.
Homer, AK 99603
(907) 235-6396

Nome Branch
Chairman-Irene Anderson
P.O. Box 1974
Nome, AK 99762
(907) 443-5296

Alaska Women in Mining
Fairbanks Branch
President-Sandra Stillion
P.O. Box 83542
Fairbanks, AK 99708
(907) 455-6208

Anchorage Branch
President-Ronna Bissonette
P.O. Box 240334
Anchorage, AK 99524
(907) 276-6762

Society of Mining Engineers
P.O. Box 625002
Littleton, CO 80162-5002
(303) 973-9550

Alaska Section
Chairman-Richard Swainbank
1001 Noble St., Ste. 360
Fairbanks, AK 99701
(907) 452-7464

Secretary Treasurer John Rishel
1505 Atkinson Dr.
Anchorage, AK 99504
(907) 337-0511

American Institute of Professional Geologists
7828 Vance Dr., Ste. 103
Arvada, CO 80003
(303) 431-0831
President-Erik Opstad

Alaska Section
P.O. Box 9-2082
Anchorage, AK 99509
(907) 562-3279

Miners Advocacy Council
President-John Korobko
P.O. Box 73824
Fairbanks, AK 99707
(907) 479-0471

Northwest Mining Association
President-David Holmes
414 Peyton Bldg.
Spokane, WA 99201
(509) 624-1158

Placer Miners of Alaska
P.O. Box 83151
Fairbanks, AK 99708

Resource Development Council for Alaska, Inc.
President-Bill Schneider
Executive Director-Becky L. Gay
121 N. Fireweed, Ste. 250
Anchorage, AK 99503
(907) 276-0700

Western Mining Council
Kenai Peninsula Chapter
President-Oscar H. Bailey
Old Nash Rd.
Seward, AK 99664
(907) 224-5963

ORGANIZED MINING DISTRICTS

Circle Mining District
Helen "Beaver" Warner
P.O. Box 80674
Fairbanks, AK 99708
(907) 488-6058

Fairbanks Mining District
President-Don Stein
105 Dunbar
Fairbanks, AK 99701
(907) 456-7642

Forty-Mile Miners Association
President-Mike Busby
47660 Falls Creek Dr.
Homer, AK 99603
(907) 235-6396

Haines Mining District
John Schnabel
P.O. Box 149
Haines, AK 99827
(907) 766-2228

Iditarod Mining District
President-John Miscovich
General Delivery
Flat, AK 99384
(907) 561-1591

Juneau Mining District
President-Roger Eichman
P.O. Box 20765
Juneau, AK 99802
(907) 789-4065

Kantishna Mining District
Dan Ashbrook
P.O. Box 84608
Fairbanks, AK 99708

Koyukuk Mining District
Bill Nordeen
P.O. Box 9142
Coldfoot, AK 99701

Livengood-Tolovana Mining District
President-Rose Rybachek
P.O. Box 55698
North Pole, AK 99707
(907) 488-6453

Valdez Creek Mining District
Kevin Thompson
P.O. Box 875534
Wasilla, AK 99687-5534

Yentna Mining District
President-John Jacobsen
13004 NE 9th Ave.
Vancouver, WA 98685

MINERAL EDUCATION PROGRAM

ALASKA MINERALS AND ENERGY RESOURCE EDUCATION FUND (AMEREF)
P.O. Box 190927
Anchorage, AK 99519-0927
(907) 274-2211

Function: *A nonprofit corporation formed to help prepare students in grades four through*

eight to make informed decisions about Alaska's mineral and energy resources.

Alaska Department of Education
801 W. Pent St., Ste. 200
Juneau, AK 99801-1894
(907) 465-2841
Commissioner-Jerry Covey
Educational Specialist-Terri Campbell,
State C[illegible]dinator of AMEREF

ENVIRONMENTAL ORGANIZATIONS

Note: *The following two organizations submitted addresses to be included in this appendix. They have been actively involved in statewide mining issues including water quality, reclamation, rent, and royalty reform. Litigation has been sometimes used and resulted in court rulings. Both organizations state their primary interests and perspective as maintenance of environmental quality and adherence to environmental laws and regulations.*

Trustees for Alaska
725 Christensen Dr., Ste. 4
Anchorage, AK 99501
Executive Director-Randall M. Weiner

Alaska Environmental Assembly
419 - 6th St., Ste. 328
Juneau, AK 99801
Executive Director-Karla Hart

NATIVE REGIONAL CORPORATIONS

ATHNA INCORPORATED
Main Office
P.O. Box 649
Glennallen, AK 99588-0649
(907) 822-3476
(907) 822-3495 (fax)
President & CEO-Wilson Justin
Lands & Resource Manager-John Davenport

Anchorage Office
406 Fireweed Lane
Anchorage, AK 99503
(907) 274-7662
(907) 274-6614 (fax)

THE ALEUT CORPORATION
4000 Old Seward Hwy, #300
Anchorage, AK 99503
(907) 561-4300
(907) 563-4328 (fax)
President-Alice Petrivelli
Director of Lands & Resources-
Robert Stanton
Lands & Real Estate Assistance-Lisa Evans

ARCTIC SLOPE REGIONAL CORPORATION
P.O. Box 129
Barrow, AK 99723-0129
(907) 852-8633
(907) 852-5733 (fax)
President-Jacob Adams
CAO-Conrad Bagne
Lands-William Thomas

Anchorage Office
301 Danner Ave., Suite 200
Anchorage, AK 99518
(907) 349-2369
(907) 349-5476

BERING STRAITS NATIVE CORPORATION
P.O. Box 1008
Nome, AK 99762-1008
(907) 443-5252
(907) 443-2985 (fax)
President-Jack Carpenter
Land Manager-Guy Martin
Resource Development Specialist-Thomas Sparks

BRISTOL BAY NATIVE CORPORATION
800 Cordova Street
Anchorage, AK 99501
(907) 248-3602
(907) 276-3924 (fax)
President & CEO-James W. Hart
Land-John C. Moores and Paul C. Roehl

CALISTA CORPORATION
601 W. 5th Ave., Suite 200
Anchorage, AK 99501
(907) 279-5516
(907) 272-5060 (fax)
President & CEO-Johnny T. Hawk
V.P. Lands & Natural Resources-Mike Miemeyer

CHUGACH ALASKA CORPORATION
3000 A St., Suite 400
Anchorage, AK 99503
(907) 563-8866
(907) 563-8402 (fax)
President-Neil Anderson
Manager Lands Division-Paul Twelten

COOK INLET REGION INC.
P.O. Box 93330
Anchorage, AK 99509-3330
(907) 274-8638
(907) 279-8836 (fax)
President & CEO-Roy Huhndorf
Senior V.P.-Carl Marrs
Lands Manager-Mike Franger

DOYON LTD.
201 1st Ave.
Fairbanks, AK 99701
(907) 452-4755
(907) 456-6785 (fax)
President & CEO-Morris Thompson
V.P. Lands & Resources-Jim Mery
Natural Resources Manager-Harry Noyes

KONIAG INCORPORATED
4300 B St., Suite 407
Anchorage, AK 99503
(907) 561-2668
(907) 562-5258 (fax)
President-Frank Pagano
CEO-Uwe L. Gross
Lands-John Merrick

NANA REGIONAL CORPORATION
P.O. Box 49
Kotzebue, AK 99752
(907) 442-3301
(907) 442-2866
President-Ross Schaeffer
V.P. Resources-John Rense
V.P. Lands-Walter Sampson

Anchorage Office
1601 E. Benson Blvd.
Anchorage, AK 99508
(907) 265-4100
(907) 265-4311

SEALASKA CORPORATION
One Sealaska Plaza
Juneau, AK 99801
(907) 586-1512
(907) 586-9223 (fax)
President & CEO-Byron Mallott
V.P. Planning & Administration-
Richard Harris
Lands Manager-Ernie Hillman

APPENDIX D
Selected significant mineral deposits in Alaska (locations shown in figures 53-55)*

Map no.

1 **Lik-Su** - Major strata-bound massive sulfide (Zn-Pb-Ag-Ba) deposits in black shale and chert. Proven reserve (Lik) estimate of 21.77 million tonnes (24 million tons) of 9% Zn, 3.1% Pb, and 48 g/tonne (1.4 oz/ton) Ag (fig. 53).

2 **Red Dog** - At least two major strata-bound massive sulfide deposits hosted in Pennsylvanian or Mississippian shale; similar to locality 1. Prior to mining, main deposit at Red Dog contained proven, probable, and inferred reserves of at least 77 million tonnes (85 million tons) of 17.1% Zn, 5% Pb, 82 g/tonne (2.4 oz/ton) Ag; nearby Hilltop deposit contains significant undisclosed reserves (fig. 53).

3 **Drenchwater** - Mississippian and Pennsylvanian shales and cherts contain three strata-bound base metal occurrences spatially related to acid volcanics. In the lowest unit a siliceous mudstone contains a 0.6 m (2-ft) layer with up to 23% Zn. An overlying gray chert contains up to 11% Zn and up to 5% Pb with some Ag in fracture fillings. At the top of the overlying tuffaceous layer, Ag-bearing Zn and Pb mineralization outcrops discontinuously for at least 1,982 m (6,500 ft), and contains up to 26% Zn and 51% Pb in grab samples (fig. 53).

4 **Ginny Creek** - Epigenetic, disseminated Zn-Pb-Ag deposits with barite in sandstone and shale of Noatak Sandstone of Late Devonian through Early Mississippian age. Random grab samples of surface float contain 0.3% to 3.0% Zn and highly variable amounts of Pb and Ag (fig. 53).

5 **Story Creek** - Epigenetic replacement deposits of Zn-Pb-Ag-Cu-Au hosted in brecciated zones in Devonian Kanayut Conglomerate or Lower Mississippian Kayak Shale. Grab samples of high-grade material contain up to 0.43% Cu, 34% Pb, 28.8% Zn, 1.4 g/tonne (0.04 oz/ton) Au, and 1,028 g/tonne (30 oz/ton) Ag ((fig. 53).

5a **Kivliktort Mountain** - Mineralized float is widespread on the north flanks of the mountain, apparently spatially related to the contact between shales at the base of the hills and coarse-grained siliceous clastic rocks on the upper slopes. Rock samples containing up to 30% Zn have been reported (fig. 53).

6 **Whoopee Creek** - Epigenetic replacement deposits of Zn-Pb-Cu-Ag-Au-Cd in breccia zones in Devonian Kanayut Conglomerate or Lower Mississippian Kayak Shale. Random grab samples of mineralized material contain 0.24% Cu, 0.37% Cd, 46% Zn, 44% Pb, 4.8 g/tonne (0.14 oz/ton) Au, and 507 g/tonne (14.8 oz/ton) Ag (fig. 53).

7 **Omar** - Epigenetic replacement deposits of Paleozoic age; include bedded barite occurrences. Grab samples contain 15.3% Cu, 0.15% Pb, 0.95% Zn, 0.05% Co, and 10 g/tonne (0.3 oz/ton) Ag (fig. 53).

7a **Frost** - Possible 8.2 million tonnes (9 million tons) barite in pods, lenses, and wavey-banded quartz-calcite-barite veins. Chalcopyrite and galena occur in the veins which cross cut Paleozoic limestone and dolomite for a minimum distance of 1.6 km (1 mi). Selected samples contain up to 13.2% Zn (fig. 53).

8 **Bornite** - Major strata-bound Cu-Zn deposit in brecciated carbonate rock of Devonian age; 4.56 million tonnes (5.0 million ton) orebody contains 4.0% Cu and accessory Zn and Co. Larger reserve estimate of 36.2 million tonnes (40 million tons) of about 2% Cu and undisclosed amount of Zn and Co. At grade of 1.2% Cu, reserves are 91 million tonnes (100 million tons) (fig. 53).

9 **Arctic** - Major volcanogenic (Cu-Zn) massive sulfide deposit hosted in sequence of metarhyolite, metatuff, and graphitic schist of Devonian age; indicated reserves of 36.3 million tonnes (40 million tons) grade 4.0% Cu, 5.5% Zn, 0.8% Pb, 55 g/tonne (1.6 oz/ton) Ag, and .69 g/tonne (0.02 oz/ton) Au (fig. 53).

10 **Sun** - Major (Cu-Pb-Zn-Ag) massive sulfide deposit in sequence of middle Paleozoic metarhyolite and metabasalt. Average grades are 1 to 4% Pb, 6 to 12% Zn, 0.5 to 7% Cu, 103 to 377 g/tonne (3 to 11 oz/ton) Ag (fig. 53).

11 **Smucker** - Middle Paleozoic volcanogenic massive sulfide deposit; 915 m (3,000 ft) long and up to 58 m (190 ft) wide contains significant tonnage of Cu-Pb-Zn ore that grades 1.5% Pb, 5 to 10% Zn, 103 to 343 g/tonne (3 to 10 oz/ton) Ag, with minor Au (fig. 53).

12 **Avan Hills** - Disseminated chromite in layered ultramafic rocks; grab samples contain up to 4.3% Cr with 0.51 g/tonne (0.015 oz/ton) PGM (fig. 55).

13 **Misheguk Mountain** - Chromite occurrences similar to those in Avan Hills (fig. 55).

14 **Klery Creek** - Lode and placer Au deposits worked intermittently from 1909 through 1930s. Total production through 1931, mostly from placer deposits, estimated at 974 kg (31,320 oz) Au (fig. 55).

15 **Ernie Lake** - (Ann Creek) Strata-bound massive sulfide occurrence in metarhyolite, metatuff, and marble. Gossan zones strongly anomalous in Cu-Pb-Zn and Ag (fig. 53).

16 **Koyukuk-Nolan mining district** - Major placer Au district; from 1893 to 1991, produced an estimated 9,900 kg (318,300 oz) Au. Significant deep placer reserves remain (fig. 55).

17 **Chandalar mining district** - Major Au producing district; substantial production in excess of 1,894 kg (60,908 oz) Au from lode and placer sources; lode Au found in crosscutting quartz veins that intrude schist and greenstone. Active development of placer deposits and lodes in progress. Inferred lode reserves estimated to be 40,800 tonnes (45,000 tons) with grade of 69 g/tonne (2 oz/ton) Au (fig. 55).

18 **Porcupine Lake** - Stratiform fluorite occurrences and argentiferous enargite, tetrahedrite associated with felsic volcanic rocks of late Paleozoic age. Reported grades of up to 25% to 30% fluorite (CaF_2) reported, with grab samples of 4.8% Cu (fig. 54).

19 **Wind River** - Strata-bound Pb-Zn massive sulfide prospects; reported grades of up to 5% Pb (fig. 53).

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*This generalized summary does not describe all of the known 6,400 mineral deposits in Alaska. In cooperation with DGGS, the USGS released Bulletin 1786, "Significant metalliferous lode deposits and placer districts in Alaska," which describes 262 significant mineral deposits and 43 placer districts.

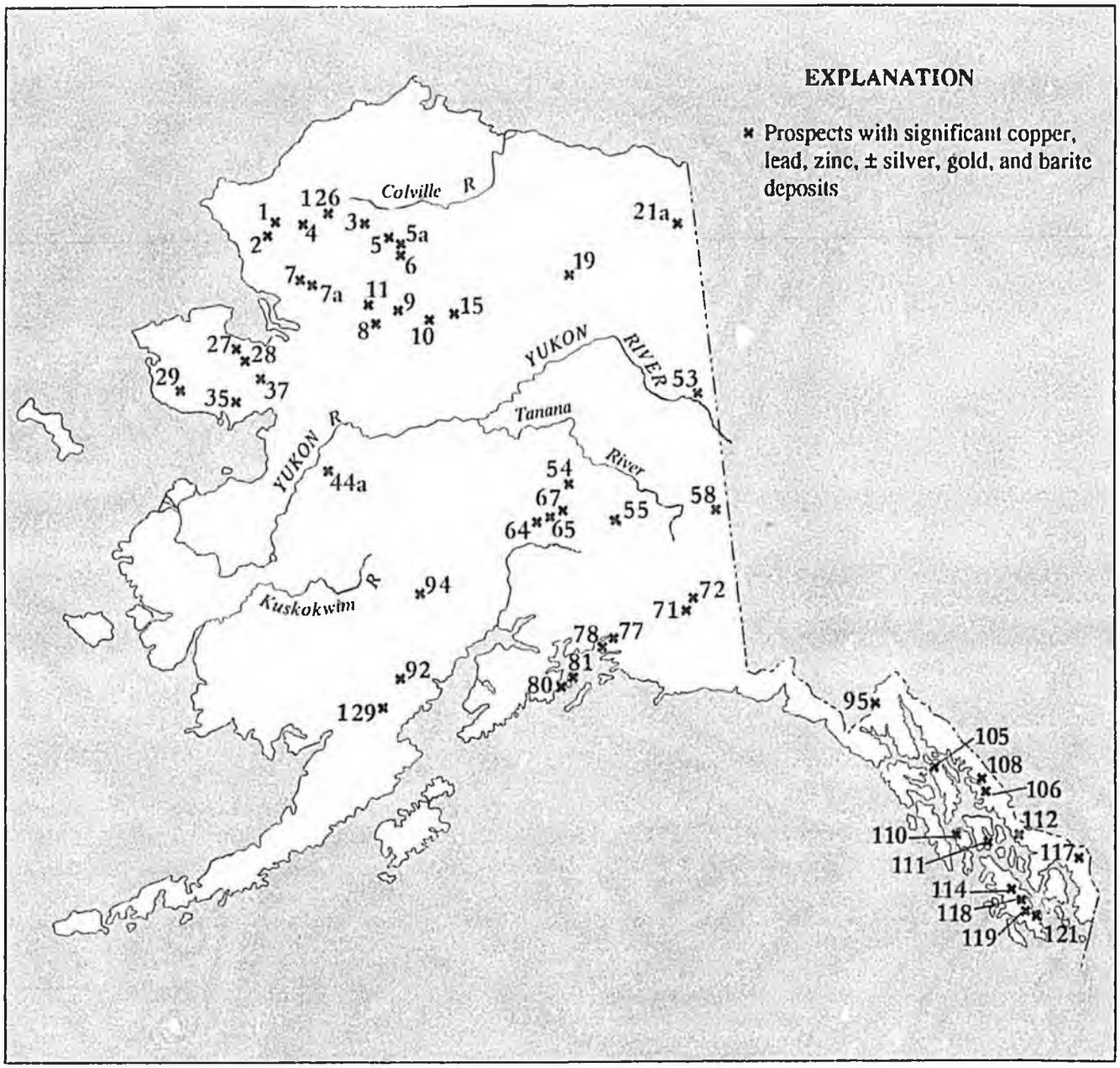


Figure 53. *Significant copper, lead, zinc with credits of silver, gold, and barite deposits in Alaska, 1991.*

20 **Esotuk Glacier** - Disseminated Mo-Sn-W-Pb-Zn mineralization in skarns associated with Devonian(?) schistose quartz monzonite. Grab samples contain up to 0.08% Sn and 0.15% W (fig. 54).

21 **Bear Mountain** - Major stockwork Mo-W-Sn occurrence in intrusive breccia. Rock samples containing up to 0.8% Mo and 0.6% W occur within a 14 ha (35 acre) area where soil samples average more than 0.2% MoS_2, and an adjacent 10 ha (25 acre) area where rubble contains wolframite has soils averaging greater than 0.12% WO_3. Rubble crop in this area indicates a Tertiary porphyry system as the source of the Mo and W (fig. 54).

21a **Galena Creek** - Steeply dipping veins contain up to 21% Cu, 3.5% Zn, and 1.3% Pb with 189 g/tonne (5.5 oz/ton) Ag on the east side of the creek, and a large area of disseminated mineralization and veinlets contains predominantly Zn on the ridge west of the creek (fig. 53).

22 **Cape Creek** - Major placer Sn producer. More than 454 tonnes (500 tons) Sn produced from 1935 to 1941; from 1979 to 1990, produced 940 tonnes (1,040 tons) Sn. Derived from Cape Mountain in contact zone of Cretaceous granite and limestone (fig. 54).

23 **Buck Creek** - Major placer Sn producer. More than 998 tonnes (1,100 tons) Sn produced from 1902 to 1953 (fig. 54).

24 **Lost River** - Major Sn, fluorite, W, and Be deposit associated with Cretaceous Sn granite system. More than 317 tonnes (350 tons) Sn produced from skarn and greisen lode sources. Measured reserves amount to 22.3 million tonnes (24.6 million tons) that grade 0.15% Sn, 16.3% CaF_2, and 0.03% WO_3, based on 13,720 m (45,000 ft) of diamond drilling (fig 54).

25 **Ear Mountain** - Placer Sn district and Sn-Cu-Au-Ag-Pb-Zn skarn mineralization of Cretaceous age. Area also anomalous in U (fig. 54).

26 **Kougarok Mountain** - Sn deposit hosted in quartz-tourmaline-topaz greisen of Cretaceous age. Grades may average 0.5% Sn and 0.01% Ta

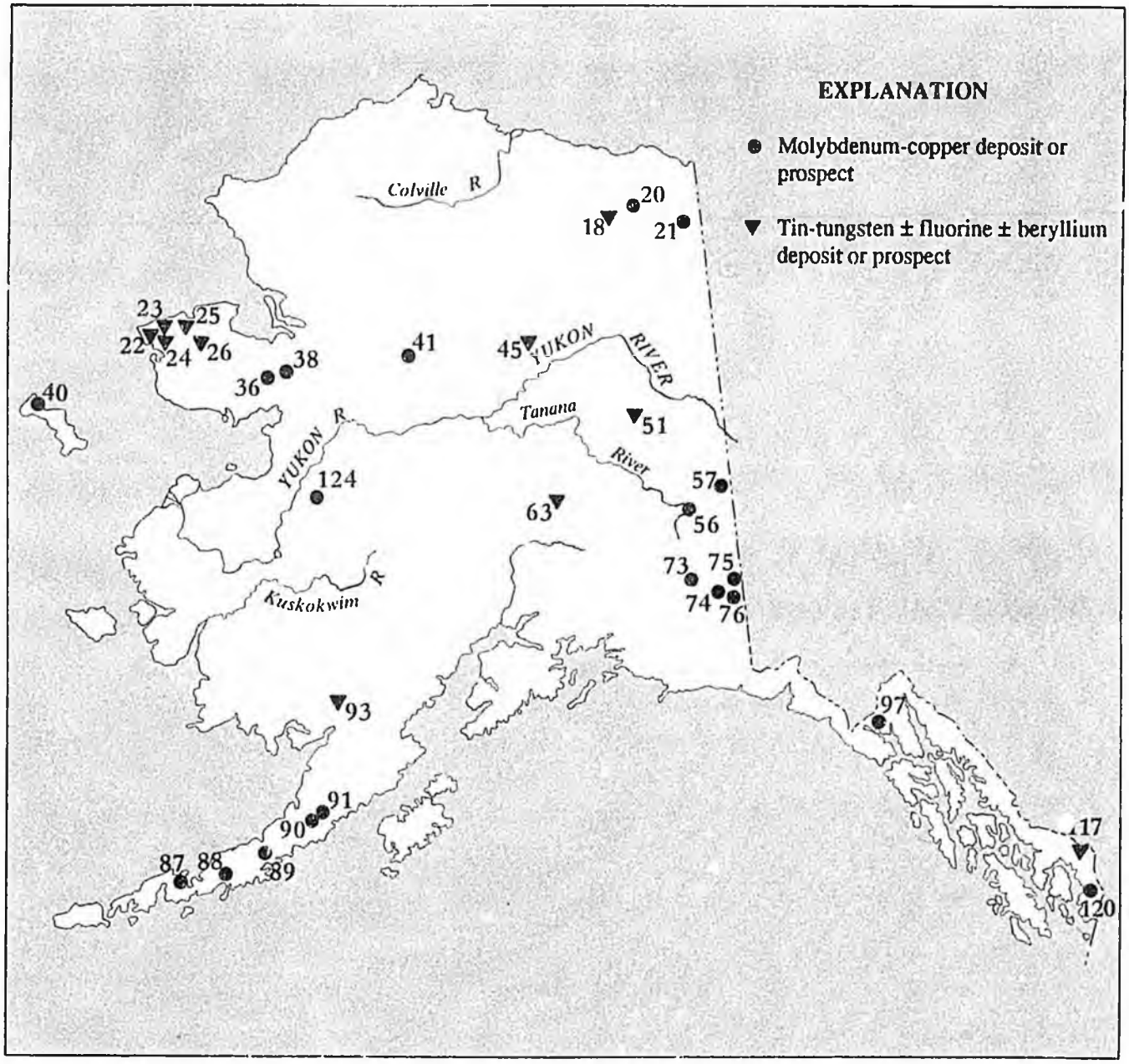


Figure 54. *Significant molybdenum-copper, and tin-tungsten with credits of fluorite and beryllium deposits in Alaska, 1991.*

and Nb, but a high grade resource of 136,050 tonnes (150,000 tons) grading 1% + Sn has been identified, with incrementally higher tonnage at lower grades (fig. 54).

27 **Hannum** - Stratiform, carbonate-hosted Pb-Zn-Ag massive sulfide deposit of mid-Paleozoic age in heavily oxidized zone that ranges from 9 to 46 m (30 to 150 ft) thick. Mineralized zone reported to assay up to 10% Pb, 2.2% Zn, 1.4 g/tonne (0.04 oz/ton) Au, and 60.3 g/tonne (1.76 oz/ton) Ag (fig. 53).

28 **Independence Creek** - Pb-Zn-Ag massive sulfide deposit; high-grade ore shipped in 1921 contained 30% Pb, 5% Zn, up to 5,141 g/tonne (150 oz/ton) Ag. Mineralization restricted to shear zone in carbonates (fig. 53).

29 **Sinuk River** - Stratiform Pb-Zn-Ag-Ba-F massive sulfide deposits and layered Fe deposits of Paleozoic age. Mineralized zones extend over 2,440 m (8,000 ft) along strike. Stratiform Zn deposit at Aurora Creek thought to extend for at least 1,220 m (4,000 ft) along strike (fig. 53).

30 **Nome mining district** - Major placer Au producer. Production in excess of 148,336 kg (4,769,219 oz) Au all from placers. Sporadic Sb and W production in past (fig. 55).

31 **Rock Creek** - About 6.6 million tons grading 2.5 g/tonne (0.072 oz/ton) Au in vein swarms and stringers in an area 457 m (1,500 ft) long, 152 m (500 ft) maximum width and 91 m (300 ft) deep (fig. 55).

32 **Big Hurrah** - Epigenetic vein deposit in black slate and metasedimentary rocks of York Slate. Deposit contains some W mineralization and has produced over 840 kg (27,000 oz) Au from nearly 45,350 tonnes (50,000 tons) milled ore. Proven, inferred, and indicated reserves total 94,328 tonnes (104,000 tons) that grade 21 g/tonne (0.61 oz/ton) Au, 19 g/tonne (0.55 oz/ton) Ag, and credits of WO_3 (fig. 55).

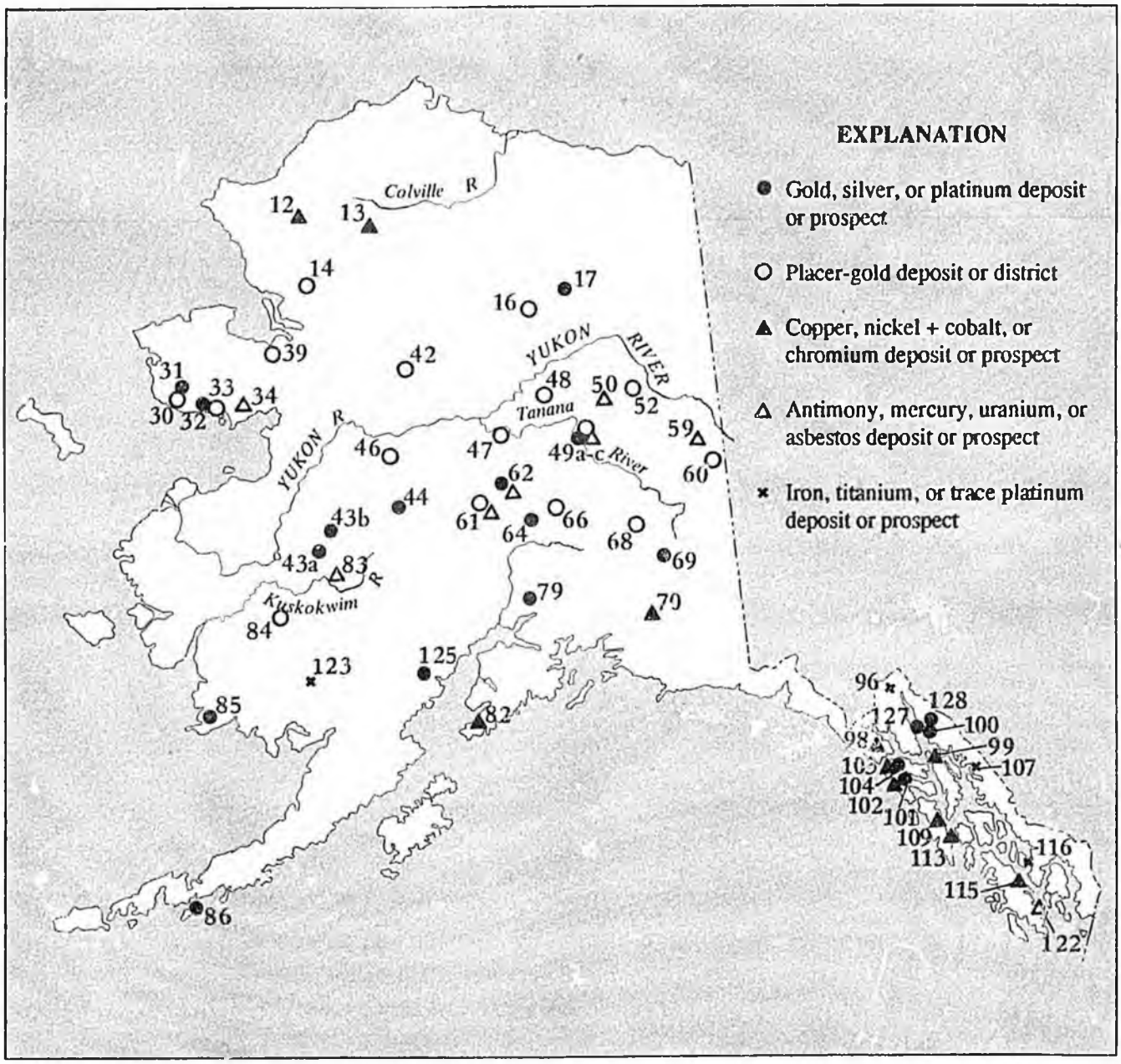


Figure 55. *Significant gold, silver, platinum, and strategic mineral deposits in Alaska, 1991.*

33 **Solomon mining district** - Major placer Au district; produced over 12,449 kg (400,250 oz) Au. Three structurally controlled Au deposits in Bluff area—Daniels Creek, Saddle, and Koyana Creek—contain minimum inferred reserves of 5.9 million tonnes (6.5 million tons) grading 3.4 g/tonne (0.1 oz/ton) Au (fig. 55).

34 **Kachaufk** - U prospect in Cretaceous alkalic intrusive rocks. Highly anomalous geochemical values and U concentrations of 1,000 ppm reported (fig. 55).

35 **Omalik** - Vein-type Pb-Zn-Ag massive sulfide prospect in Paleozoic carbonate rocks; from 1881 to 1900, produced 363 tonnes (400 tons) of Pb-Zn ore that averaged about 10% Pb and 1,371 g/tonne (40 oz/ton) Ag. Grades of oxidized Zn ore reported to be up to 34% Zn (fig. 53).

36 **Windy Creek** - Disseminated Mo-Pb-Zn mineralization in quartz veins and skarns with reported values as high as 0.15% Mo (fig. 54).

37 **Quartz Creek** - Significant Pb-Zn-Ag mineralization; reported grades of 15% combined Pb-Zn and 343 g/tonne (10 oz/ton) Ag (fig 53).

38 **Placer River** - Significant Mo-F mineralization disseminated in intrusive rocks. Reported values of 0.2% Mo (fig. 54).

39 **Candle Creek** - Placer Au deposits with 7,559 kg (243,040 oz) of past Au production from placers; significant reserves remaining in a large ancestral channel system. Large base metal sulfide concentrations and U values in concentrates (fig. 55).

40 **Poovookpuk Mountain** - Porphyry Mo mineralization. Reported grades of up to 0.25% Mo (fig. 54).

41 **Purcell Mountain** - Mo and Ag occurrences associated with Cretaceous alkalic igneous plutons, alaskite, and bostonite dikes (fig. 54).

42 **Koyukuk-Hughes mining district** - Production of 6,878 kg (221,140 oz) Au from 1930 to 1975, mainly from Alaska Gold dredging operation at Hogatza; dredge reactivated in 1981, but deactivated in 1984, and reactivated again in 1990. Nonfloat mechanized operation on Utopia Creek produced significant amount of placer Au from 1930 to 1962 (fig. 55).

43a **Iditarod district** - Major placer Au district; produced 48,368 kg (1,555,100 oz) Au through 1990. Significant reserves of lode-Au and lode-W at Golden Horn deposit Chicken Mountain, and other known lodes in region associated with shear zones and monzonite intrusive rocks of Late Cretaceous age (fig. 55).

43b **Innoko-Tolstol mining district** - Major placer Au district with significant lode Au-Sb-Hg potential; lode sources for placers are volcanic-plutonic complexes of Late Cretaceous and dike swarms that intrude Mesozoic flysch; mining district produced 18,170 kg (584,182 oz) Au almost all from placer deposits. New discovery on Vinasale Mountain south of McGrath is Au-polymetallic deposit in monzonite stock (fig. 55).

44 **Nixon Fork** - Promising Au-Cu deposits; Nixon Fork mine produced 1,851 kg (59,500 oz) Au from Late Cretaceous skarns associated with quartz monzonite-Devonian limestone contact zones. Indicated reserve of about 10,886 kg (350,000 oz) Au in 258,500 tonnes (285,000 tons) of ore (fig. 55).

44a **Illinois Creek** - Reserves (all categories) of about 1,858,440 tonnes (2,049,000 tons) grading 2.4 g/tonne (0.07 oz/ton) Au and 58 g/tonne (1.69 oz/ton) Ag (fig. 53).

45 **Bonanza Creek** - Skarn-type W mineralization along intrusive contact; no published information available (fig. 54).

46 **Ruby mining district** - Placer Au-Sn district; produced more than 14,220 kg (457,200 oz) Au from 1931 to 1991; mining district also contains Pb-Ag prospects with grades reportedly as high as 2,811 g/tonne (82 oz/ton) Ag (fig. 55).

47 **Hot Springs mining district** - Placer Au-Sn district; produced more than 16,919 kg (543,958 oz) Au and over 326,590 kg (720,000 lb) cassiterite through 1990. Includes Eureka and Tofty subdistricts (fig. 55).

48 **Livengood-Tolovana mining district** - Placer Au district; produced more than 14,631 kg (470,413 oz) Au since discovery in 1914to 1991. Substantial reserves remain mainly on Livengood Bench, a Pliocene ancestral channel (fig. 55).

49 **Fairbanks mining district** - Nationally ranked Au-producing district; largest producer in Alaska. Produced about 245,890 kg (7,905,721 oz) Au from placer deposits. Major lode-Au and lode-Sb producer; produced more than 9,472 kg (304,548 oz) Au and over 1.8 million kg (4 million lb) Sb from veins and shear zones through 1990. Production of W exceeded 4,000 STU since 1915, all derived from skarn near Cretaceous quartz monzonite (no map reference).

49a **Fort Knox** - Disseminated Au deposit within granodiorite/quartz monzonite pluton near Fairbanks. Prefeasibility study in 1990 indicates proven or probable resource of 96,418 kg (3.1 million oz), in about 113 million tonnes (125 million tons) of intrusive-hosted ores (fig. 55).

49b **Ryan lode** - Complex shear zone with high-grade gash-veins in schist with estimated inferred reserves of 3.0 million tonnes (3.3 million tons) of auriferous veins and shears. Work in 1990 identified the shear at a depth of 309 m (1,000 ft), and demonstrated a subparallel Au-bearing shear within monzodioritic igneous rocks open along strike and at depth. Most recent drilled-out reserve is 2,660,503 tonnes (2,933,300 tons) grading 2.6 g/tonne (0.076 oz/ton) Au with waste-ore ratio of 4.6/1 in the Ryan Lode, and about 907,000 tonnes (1,000,000 tons) grading 2.1 g/tonne (0.06 oz/ton) Au in the igneous-hosted Curlew area (fig. 55).

49c **Grant Mine** - A series of subparallel Au-bearing quartz veins in the schist and quartzite of Ester Dome. Indicated reserves, 1990, on one vein system, the O'Dea, are 192,285 tonnes (212,000 tons) of 12 g/tonne (0.36 oz/ton) Au. Other similar vein systems have been identified within the property (fig. 55).

50 **Mt. Prindle** - Significant U-rare-earth mineralization in Mesozoic alkaline igneous rocks. Rock geochemical values of up to 0.7% U; up to 15% rare-earth elements reported (fig. 55).

51 **Twin Mountain** - Significant W mineralization associated with skarn development along contact zone of quartz monzonite stock of Cretaceous age (fig. 54).

52 **Circle mining district** - Currently one of Alaska's largest producing placer-Au district; produced 31,077 kg (999,155 oz) Au since discovery in 1893 to 1991. Has significant potential for Sn, W, and Au mineralization from variety of lode sources (fig. 55).

53 **Three Castle Mountain, Pleasant Creek, Cascu VABM** - Strata-bound Pb-Zn massive sulfide mineralization. Reported grades of up to 17% Zn and 2% Pb (fig. 53).

54 **Bonnifield District massive sulfide deposits (Anderson Mountain, Dry Creek, Sheep Creek, Virginia Creek, BT, Liberty Belle)** - Significant volcanogenic Cu-Pb-Zn-Ag massive sulfide deposits of Devonian to Mississippian age in Bonnifield mining district. Potential for high-grade deposits reported. Includes Liberty Bell strata-bound Au-B deposit and mineralization in Sheep Creek; latter contains Sn as well as base metals (fig. 53).

55 **Delta massive sulfide belt** - Contains at least 30 known volcanogenic massive sulfide deposits and occurrences. Grades from 0.3% to 1.1% Cu, 1.7% to 5.7% Zn, 0.5% to 2.3% Pb, 24 to 69 g/tonne (0.7 to 2.0 oz/ton) Ag, and 0.61 to 2.1 g/tonne (0.018 to 0.061 oz/ton) Au; estimated potential reserve of 34.6 million tonnes (40 million tons) for all deposits (fig. 53).

56 **Mosquito, Petermle** - Porphyry Mo prospects of early Tertiary age; reported grades of up to 0.17% Mo (fig. 54).

57 **Taurus** - Significant major porphyry Cu-Au prospect of Paleocene age. East Taurus Zone contains inferred reserves of 126 million tonnes (140 million tons) grading about 0.30% Cu and .34 g/tonne (0.01 oz/ton) Au, and 0.03% Mo (fig. 54).

58 **Big Creek, Ladue** - Strata-bound Pb-Zn-Ag massive sulfide prospects in metavolcanic rocks (fig. 53).

59 **Slate Creek** - At least 50 million tonnes (55 million tons) of 6.3%, high-quality chrysotile asbestos in serpentinized ultramafic rocks of Permian(?) age (fig. 55).

60 **Fortymile mining district** - Major placer Au district. Produced over 16,272 kg (523,154 oz) placer Au since discovery in 1886 to 1991 (fig. 55).

61 **Kantishna mining district** - Major placer Au and lode Ag-Au-Pb-Zn-Sb-W district. Produced 3,089 kg (99,307 oz) placer and lode-Au, about 9,549 kg (307,000 oz) lode Ag, and 2.3 million kg (5million lb) Sb from shear zones and vein deposits hosted in metamorphic units of Yukon-Tanana terrane. Nearly 90 lode deposits have been identified; potential exists for significant Ag-Au-Pb-Zn resources. Metalliferous strata-bound base metal deposits occur in schist and quartzite (fig. 55).

62 **Stampede mine** - Major Sb deposit; produced more than 1.42 million kg (3.5 million lb) Sb from large shear zone in polymetamorphic rocks of Yukon-Tanana terrane (fig. 55).

63 **Coal Creek** - Greisen-hosted Sn-Cu-W deposit in "McKinley" age pluton (55 million-year-old). Reported reserves of 4.54 million tonnes (5 million tons) of ore that grade 0.28% Sn and 0.3% Cu with credits of W, Ag, and Zn (fig. 54).

64 **Golden Zone mine** - Major Au-Cu-Ag deposits in Late Cretaceous breccia pipe. Produced more than 49 kg (1,581 oz) Au, 268 kg (8,617 oz) Ag, and 79,051 kg (42,000 lb) Cu. Estimated reserves are 7,153 kg (230,000 oz) of Au in about 1.8 million tonnes (2 million tons) ore (figs. 53 and 55).

65 **Nim Prospect** - Porphyry Cu-Ag-Au deposit of Late Cretaceous age. Reported grades of up to 5.0% Cu and 309 g/tonne (9 oz/ton) Ag (fig. 53).

66 **Valdez Creek** - 9,526 kg (306,263 oz) of past production through 1991; about 7,776 kg (250,000 oz) of proven placer reserves and 11,819 kg (380,000 oz) Au in possible or inferred category. Alaska's largest Au producer (Cambior Inc.) currently in operation (fig. 55).

67 **Denali Prospect** - At least six small, strata-bound Cu lodes in volcanic sedimentary rocks of Triassic age that may contain 4.54 million tonnes (5 million tons) ore that grade about 2% Cu with credits of Ag (fig. 53).

68 **Chistochina** - Porphyry Cu prospects of Tertiary age and placer-Au district; produced more than 5,594 kg (179,851 oz) Au and small amount Pt from placer deposits (fig. 55).

69 **Nabesna mine** - Classic high-grade Au skarn that envelopes quartz diorite of Jurassic(?) age; produced over 2,068 kg (66,500 oz) Au from about 79,816 tonnes (88,000 tons) of ore from 1930 to 1941 (fig. 55).

70 **Spirit Mountain** - Massive and disseminated Cu-Ni mineralization in mafic-ultramafic complex (fig. 55).

71 **Kennecott deposits** - Major stratiform Cu-Ag massive sulfide deposits localized near contact between Chitistone Limestone and Nikolai Greenstone of Triassic age; contained some of highest grade Cu lodes mined in North America. From 1911 to 1938, produced more than 544 million kg (1.2 billion lb) Cu and 311,028 kg (10 million oz) Ag from 4.35 million tonnes (4.8 million tons) ore. Some reserves remain (fig. 53).

72 **Binocular and other prospects** - Kennecott-type Cu-Ag massive sulfide deposits (fig. 53).

73 **Bond Creek - Orange Hill** - Two major porphyry Cu-Mo deposits of Late Cretaceous age; reported inferred reserves of 770 million tonnes (850 million tons) ore that grade 0.3 to 0.5% Cu and 0.03% Mo (fig. 54).

74 **Carl Creek** - Porphyry Cu prospect in altered intrusive complex; similar to locality 73 (fig. 54).

75 **Boultoff** - Porphyry Cu prospect in altered intrusive rocks; inferred reserves of 132 million tonnes (145 million tons) of 0.20% Cu similar to locality 73 (fig. 54).

76 **Horsfeld** - Porphyry Cu prospect; similar to locality 73 (fig. 54).

77 **Midas mine** - Significant strata-bound Cu (Ag-Au-Pb-Zn) massive sulfide deposit in volcanic sedimentary rocks of Tertiary Orca Group. Produced more than 1.5 million kg (3.3 million lb) Cu from 44,760 tonnes (49,350 tons) ore (fig. 53).

78 **Ellamar** - Strata-bound Cu-Zn-Au massive sulfide deposit in sediment of Eocene(?) Orca Group. Produced more than 7.3 million kg (16 million lb) Cu, 1,595 kg (51,307 oz) Au, and 5,960 kg (191,615 oz) Ag from about 273,764 tonnes (301,835 tons) ore (fig. 53).

79 **Willow Creek, Independence, Lucky Shot, War Baby** - Major lode-Au (Ag-Cu-Pb-Zn-Mo) in veins that cut Mesozoic quartz diorite. Produced more than 18,860 kg (606,400 oz) Au from lode sources and about 1,729 kg (55,600 oz) Au from associated placer deposits (fig. 55).

80 **Latouche, Beatson** - Major strata-bound Cu-Zn-Ag massive sulfide deposits in Orca Group sedimentary rocks and mafic volcanic rocks. Produced more than 93 milion kg (205 million lb) Cu from 5.4 million tonnes (6 million tons) ore. Inferred reserves of 4.53 million tonnes (5 million tons) ore that grade 1% Cu, 1.5% Pb+Zn (fig 53).

81 **Rua Cove** - Major strata-bound Cu-Zn massive sulfide deposit in complex ore shoots enclosed in mafic volcanic rocks of Orca Group. Reported reserves of over 1 million tonnes (1.1 million tons) ore that grade 1.25% Cu (fig. 53).

82 **Red Mountain and Claim Point** - Significant Cr occurrence associated with layered ultramafic complexes of Tertiary age at Red Mountain near Seldovia. More than 35,419 tonnes (39,951 tons) metallurgical-grade ore shipped through 1976; huge low-grade Cr resource may remain, of which 27 million tonnes (30 million tons) grade 5.1% Cr_2O_3 (fig. 55).

83 **Red Devil** - Major Hg-Sb deposit; high-grade epithermal Hg-Sb deposit hosted in shear zones in Kuskokwim Group sedimentary rocks. More than 1.24 million kg (35,000 flasks) Hg produced from 68,025 tonnes (75,000 tons) ore (fig. 55).

84 **Aniak/Nyac mining district** - Significant placer Au district. Aniak mining district produced 16,358 kg (525,920 oz) Au from placer deposits, mainly from the NYAC and Donlin Creek areas (fig. 55).

85 **Goodnews Bay** - Major placer Pt district; estimated to have produced over 16,796 kg (540,000 oz) refined PGE metals from 1934 to 1976; one of the largest known PGE metal resources in United States. Possible resources of 45 million m^3 (60 million yd^3) of deep, PGE-bearing gravels remain. Lode source believed to be Alaskan-type zoned ultramafic complex of Jurasssic or Cretaceous age. Possible significant offshore placer potential (fig. 55).

86 **Apollo-Sitka mines** - Major lode Au deposits; produced more than 3,347 kg (107,600 oz) Au from ore that averaged about 7.5 g/tonne (0.22 oz/ton) Au. Inferred reserves are 678,440 tonnes (748,000 tons) grading 26 g/tonne (0.76 oz/ton) Au, 74 g/tonne (2.16 oz/ton) Ag, with base metal credits (fig. 55).

87 **Pyramid** - Late Tertiary porphyry Cu-Mo deposit; inferred reserves of 113 million tonnes (125 million tons) ore that grade 0.4% Cu and 0.03% Mo reported (fig. 54).

88 **Ivanof** - Late Tertiary porphyry Cu prospect; grades of up to 0.72% Cu reported. Potential for large tonnages (fig. 54).

89 **Weasel Mountain, Bee Creek** - Porphyry Cu-Mo prospect of late Tertiary to Quaternary age; grades of up to 0.48% Cu and 0.035% Mo reported. Potential for moderate tonnages of low-grade mineralization (fig. 54).

90 **Mike deposit** - Porphyry Mo prospect of late Tertiary age; grades of up to 0.21% Mo reported. Potential for large tonnages of low-grade Mo mineralization (fig. 54).

91 **Rex deposit** - Porphyry Cu prospect similar to locality 90; grades of up to 0.3% Cu reported. Potential for moderate reserves of low-grade mineralization (fig. 54).

92 **Kasna Creek** - Major stratiform Cu-Pb-Zn and skarn-sulfide deposits of Mesozoic age in mafic, volcanic, and sedimentary rocks; reported reserves

of over 9,070,000 tonnes (10 million tons) ore that grade more than 1% Cu (fig. 53).

93 **Sleitat Mountain** - High-grade east-west-trending, Sn-W-Ag topaz-quartz greisen system hosted in 59 million-year-old old binary granite and in hornfels. Zone up to 1,915 m (3,000 ft) long and 152 m (500 ft) wide. One drill-hole showed 26 m (85 ft) of 1.8% Sn, and 0.4% W. Inferred resources are 58 to 96 million kg (128 to 212 million lb) Sn in 26.3 million tonnes (29 million tons) ore (fig. 54).

94 **Jimmy Lake** - Complex Cu-Ag-Sn mineralization of late Tertiary(?) age; reported grades of up to 3,599 g/tonne (105 oz/ton) Ag and 3% Cu (fig. 53).

95 **Haines Barite** - Major stratiform Ba-Pb-Zn-Cu-Ag deposit in pillow basalt-dominated section of Paleozoic or Triassic age; consists of 15- to 18-m (48- to 60-ft)-thick zone of 60-percent barite with upper zone [0.6 to 2.4 m (2 to 8 ft) thick] of massive sulfides that contain 2% Pb, 3% Zn, 1% Cu, up to 137 g/tonne (4 oz/ton) Ag, and 4 g/tonne (0.12 oz/ton) Au. Estimated to contain 680,250 tonnes (750,000 tons) of 65% barite with Zn and Ag credits (fig. 53).

96 **Klukwan** - Major Fe-Ti deposits in zoned ultramafic complex of Mesozoic age; reported to contain 2.7 billion tonnes (3 billion tons) of material that contains 16.8% Fe and 1.6 to 3.0% Ti (fig. 55).

97 **Nunatak** - Porphyry Mo deposit; reported reserves of 7.7 million tonnes (8.5 million tons) ore that grades 0.125% Mo and 117 millions tonnes (129 million tons) of 0.04% Mo (fig. 54).

98 **Brady Glacier** - Major Ni-Cu deposit in layered gabbro-pyroxenite complex of Tertiary age. Proven reserves of 91 million tonnes (100 million tons) ore that grade 0.5% Ni, 0.3% Cu reported and about 0.03% Co; also contains PGE concentrations (fig. 55).

99 **Mertie Lode and Funter Bay mining district** - Contains substantial reserves of lode Au mineralization. Past production totaled about 466 kg (15,000 oz) Au. Deposits also contain significant Ni-Cu and Pb-Zn-Ag mineralization. Funter Bay deposit contains reported reserves of 507,920 tonnes (560,000 tons) that grade 0.34% Ni, 0.35% Cu, and 0.15% Co in gabbro-pipe system (fig. 55).

100 **Alaska-Juneau** - Major lode Au deposit that consists of 30 to 90 m (100- to 300-ft) wide zone that contains en echelon, Au-bearing quartz veins in metamorphic rocks; produced more than 109,482 kg (3.52 million oz) Au from 80 million tonnes (88.5 million tons) ore from 1893 to 1944. Reserves (all categories), of 96 million tonnes (105.7 million tons) of 1.7 g/tonne (0.05 oz/ton) Au remain (fig. 55).

101 **Chichagof and Hirst Chichagof** - Major lode-Au deposits in quartz veins that cut Mesozoic graywacke; produced more than 23,949 kg (770,000 oz) Au, most of which was produced at Chichagof mine. Inferred leased reserves estimated to be 3,110 kg (100,000 oz) Au (fig. 55).

102 **Mirror Harbor** - Ni-Cu mineralization in layered-gabbro complex of Mesozoic age; reported proven reserves of 7,256 tonnes (8,000 tons) of 1.57% Ni and 0.88% Cu and reported inferred reserves of several million tons ore that grade 0.2% Ni and 0.1% Cu (fig. 55).

103 **Bohemia Basin** - Major Ni-Cu-Co mineralization in layered mafic complex similar to locality 102; reported reserves of 20 million tonnes (22 million tons) ore that grade 0.33 to 0.51% Ni, 0.21 to 0.27% Cu, and 0.02% Co, all of which are recoverable with standard flotation technology (fig. 55).

104 **Apex-El Nido** - Significant lode Au-W deposits that occur as crosscutting veins in graywacke; produced more than 1,555 kg (50,000 oz) Au (fig. 55).

105 **Greens Creek** - Major sediment-hosted Pb-Zn-Cu-Ag-Au volcanogenic massive sulfide deposit of Devonian or Triassic age; most recent reserve estimate is about 12.5 million tonnes (13.8 million tons) ore that grades about 456 g/tonne (13.3 oz/ton) Ag, 4.1 g/tonne (0.12 oz/ton) Au, 12.8% Zn, and 4.0% Pb (fig. 53).

106 **Sumdum** - Volcanogenic Cu-Pb-Zn massive sulfide deposit in Mesozoic metamorphic complex with potential strike length of over 3,048 m (10,000 ft). Inferred reserves of 24 million tonnes (26.7 million tons) ore that grade 0.57% Cu, 0.37% Zn, and 10 g/tonne (0.3 oz/ton) Ag reported (fig. 53).

107 **Snettisham** - Fe-Ti deposit in mafic zoned-intrusive complex; reported grades of about 18.9% Fe and 2.6% Ti (fig. 55).

108 **Tracy Arm** - Strata-bound Cu-Zn-Pb massive sulfide prospect in Mesozoic schist; over 335 m (1,100 ft) long and up to 3.7 m (12 ft) thick. Reported grades of 1.5% Cu, 3.9% Zn, 26 g/tonne (0.76 oz/ton) Ag, and 0.44 g/tonne (0.013 oz/ton) Au (fig. 53).

109 **Red Bluff Bay** - Significant chrome mineralization in Mesozoic ultramafic complex (probably ophiolite); reported reserves of 517 tonnes (570 tons) of material that grade 40% Cr and 26,303 tonnes (29,000 tons) that grade 18 to 35% Cr (fig 55).

110 **Cornwallis Peninsula** - Volcanogenic Cu-Pb-Zn-Ag-Ba massive sulfide deposit of Triassic(?) age; reported grades of up to 20% Pb-Zn and 788 g/tonne (23 oz/ton) Ag 9 (fig. 53).

111 **Castle Island** - Stratiform barite deposit of Triassic age hosted in carbonate and pillow basalt; about 776,390 tonnes (856,000 tons) of raw and refined barite produced from 1963 to 1980; also contains Zn, Pb, and Cu sulfides. Reported to be mined out (fig. 53).

112 **Groundhog Basin** - Area contains several massive sulfide prospects in Mesozoic schist and gneiss whose origins are now thought to be plutonic associated. Reported grades of up to 8% Pb, 994 g/tonne (29 oz/ton) Ag, and 17 g/tonne (0.5 oz/ton) Au. Sn has also been recently identified. Area also contains potential for porphyry Mo deposits (fig. 53).

113 **Snipe Bay** - Ni-Cu deposit in zoned mafic-ultramafic complex; inferred reserves of 390,000 tonnes (430,000 tons) of 0.3% Ni, 0.3% Cu, and 4.4 g/tonne (0.13 oz/ton) Ag reported (fig. 55).

114 **Kasaan Peninsula** - Major skarn-type Cu-Fe-Au massive sulfide deposit of Jurassic age; area has produced over 12.7 million kg (28 million lb) Cu, and 1,711 kg (55,000 oz) Ag. Reported reserves of 3.6 million tonnes (4 million tons) ore that grade 50% Fe and less than 2% Cu (fig. 53).

115 **Salt Chuck** - Cu-PGM-Ag-Au deposit in contact zone between pyroxenite and gabbro within Alaskan-type zoned mafic-ultramafic pluton. From 1900 to 1941, 2.3 million kg (5 million lb) Cu, over 622 kg (20,000 oz) PGM, and Au and Ag credits were produced from 294,775 tonnes (325,000 tons) ore (fig. 55).

116 **Union Bay** - Significant Fe-Ti mineralization in ultramafic complex; area also contains Pt and V concentrations (fig. 55).

117 **Hyder mining district** - Area produced more than 22,675 tonnes (25,000 tons) high-grade W-Cu-Pb-Zn-Ag ore from 1925 to 1951 from crosscutting ore shoots in Texas Creek granodiorite of Tertiary age. Area also contains potential for porphyry Mo-W mineralization and massive sulfide-skarn Pb-Ag-Au-W deposits (figs. 53 and 54).

118 **Jumbo** - Cu-Fe-Mo-Ag skarn deposit; produced more than 4.5 million kg (10 million lb) Cu, 8,708 kg (280,000 oz) Ag, and 218 kg (7,000 oz) Au from 113,375 tonnes (125,000 tons) ore. Zoned magnetite-Cu skarns are associated with epizonal granodiorite pluton of Cretaceous age. Reported

reserves of 589,550 tonnes (650,000 tons) ore that grade 45.2% Fe, 0.75% Cu, 0.3 g/tonne (0.01 oz/ton) Au, and 2.74 g/tonne (0.08 oz/ton) Ag (fig. 53).

119 **Copper City** - Stratiform Cu-Zn-Ag-Au massive sulfide deposit hosted in late Precambrian or earliest Paleozoic Wales Group. Reported grades of up to 12.7% Cu, 2.7% Zn, 86 g/tonne (2.5 oz/ton) Ag, and 6.9 g/tonne (0.2 oz/ton) Au (fig. 53).

120 **Quartz Hill** - World-class porphyry-Mo deposit in composite felsic pluton (25 million-year-old); proven reserves of 1.36 billion tonnes (1.5 billion tons) ore that grades 0.136% MoS_2, including 444 million tonnes (490 million tons) with grades of 0.219% MoS_2 (fig. 54).

121 **Niblack** - Volcanogenic Cu-Pb-Au-Ag massive sulfide deposit hosted in Precambrian(?) Wales Group or Ordovician to Silurian Descon Formation; produced more than 635,000 kg (1.4 million lb) Cu, 342 kg (11,000 oz) Au, and 467 kg (15,000 oz) Ag (fig. 53).

122 **Bokan Mountain** - Numerous U-Th prospects associated with Jurassic peralkaline intrusive complex; from 1955 to 1971, produced more than 108,840 tonnes (120,000 tons) ore that graded about 1% U_3O_8. Contains inferred reserves of about 36.2 million tonnes (40 million tons) of 0.126% Nb and up to 1% REE metals (fig. 55).

123 **Kemuk Mountain** - Magmatic Fe-Ti deposit hosted in Cretaceous(?) pyroxenite. Inferred reserves of 2.17 billion tonnes (2.4 billion tons) that average 15 to 17% Fe, 2 to 3% TiO_2, and 0.16% P_2O_5 (fig. 55).

124 **McLeod** - Porphyry Mo deposit that contains quartz-molybdenite fissure veins in quartz-feldspar porphyry. Chip samples contain up to 0.09% Mo (fig. 54).

125 **Johnson River** - Epigenetic(?) quartz-sulfide stockwork or massive sulfide deposit hosted in volcaniclastic, pyroclastic, and volcanic rocks of Jurassic Talkeetna Formation. Deposit has drilled out reserves containing 16,795 kg (540,000 oz) Au and 126,980 tonnes (140,000 tons) of Zn (fig. 55).

126 **Nimiuktuk River** - Small hill of massive, high-grade barite estimated to contain at least 1.36 million tonnes (1.5 million tons) barite. Widespread stream-sediment Ba anomalies in area indicate further barite potential (fig. 53).

127 **Kensington** - Stockworks of quartz veins in sheared and chloritized quartz diorite produced 9,886 tonnes (10,900 tons) grading 6 g/tonne (0.18 oz/ton) Au prior to 1930. Recent reserve estimates indicate at least 10.4 million tonnes (11.5 million tons) grading 4.9 g/tonne (0.143 oz/ton) Au. Subparallel Horrible vein system contains 3.56 million tonnes (3.93 million tons) grading 3.7 g/tonne (0.11 oz/ton) Au (fig. 55).

128 **Juneau** - Five quartz-fissure veins in Cretaceous quartz diorite, more than 4,573 m (15,000 ft) of underground workings; produced 1,505 kg (48,387 oz) Au, mainly prior to 1930. Reserves estimated at 0.97 million tonnes (1.07 million tons) of 12 g/tonne (0.349 oz/ton) Au (fig. 55).

129 **Pebble Copper** - Cu-Au porphyry with identified resource of 454 million tonnes (500 million tons) grading 0.35% copper and 0.4 g/tonne (0.012 oz/ton) Au with Mo in the 0.03% to 0.04% range (fig. 53).

APPENDIX E

Mining licenses issued by and received from the Alaska Department of Revenue, 1991

[The entries include in this order: company name, (region), address, resource, site of operation, mining district, and licence number. Alaska Peninsula Region (APR), Eastern Interior Region (EIR), Northern Region (NR), Southcentral Region (SCR), Southwestern Region (SWR), Southeastern Region (SER),Undistributed (UR), Western Region (WR), and - - indicates specific site or district not provided.]

Alamin Mining Co. (WR)
112 Park Ave.
Int'l Falls, MN 56649
Gold
Bear, Cripple, and Graham Creeks
Innoko District
ML 91 0221 1

Alaska Aggregate Corp. (SCR)
240 W 68th Ave.
Anchorage, AK 99518
Sand and gravel
--
Palmer District
ML 91 0254 1

Alaska Apollo Gold Mines Ltd. (APR)
P.O. Box 10438
Phoenix, AZ 85064
Gold
Unga Island
Point Moller District
ML 91 0216 1

Alaska Cab Garage (WR)
Board of Trade Inc.
P.O. Box 967
Nome, AK 99762
Sand and gravel
Cape Nome
Nome District
ML 91 0442

Alaska Gold Co. (WR)
P.O. Box 640
Nome, AK 99762
Gold
Submarine Beach
Nome District
ML 91 0088 1

Alaska Gold Co. (WR)
P.O. Box 640
Nome, AK 99762
Gold
3rd Beachline
Nome District
ML 91 0089 1

Alaska Gold Co. (WR)
Taiga Mining Co. Inc.
P.O. Box 640
Nome, AK 99762
Gold
Bear Creek
Hughes/Nulato District
ML 91 0092 1

Alaska Gold Co. (EIR)
Alf Hopen
P.O. Box 74246
Fairbanks, AK 99707
Gold
Cleary Creek
Fairbanks District
ML 91 0054 1

Alaska Mining & Minerals Inc. (SWR)
4159 Hood Ct.
Anchorage, AK 99517
Gold
Fortyseven Creek
Aniak District
ML 91 0465

Alaska Placer Development Inc. (EIR)
P.O. Box 81467
Fairbanks, AK 99708
Gold
Livengood Bench
Livengood/Tolovana District
ML 91 0386 1

Alaska Unlimited Co. (EIR)
Warren W. Taylor
P.O. Box 60782
Fairbanks, AK 99706
Gold
Gold King Creek
Bonnifield District
ML 91 0112 1

Albert Creek Mining (SCR)
Clavin W. Hutcheson
P.O. Box 1258
Seward, AK 99664
Gold
Albert Creek
Nelchina District
ML 91 0421 1

Aleutian Materials Inc. (APR)
James H. Graham
P.O. Box 223
Kodiak, AK 99615
Sand and gravel
Bells Flats Tracts B1
Kodiak District
ML 91 0376 1

AMAX Gold Exploration Inc. (EIR)
350 Indiana St., Suite 800
Golden, CO 80401
Gold
Fort Knox Project
Fairbanks District
ML 91 0370 1

American Copper and Nickel Co. Inc. (EIR)
4860 Robb St.
Wheat Ridge, CO 80033
Gold
Ester Dome
Fairbanks District
ML 91 0384 1

American Copper & Nickel Co. Inc. (EIR)
P.O. Box [illegible]359
Fairbanks, AK 99708
Gold
Old Murphy Dome Rd.
Fairbanks District
ML 91 0389 1

American Copper & Nickel Co. Inc. (SWR)
F.G. Kruger
2690-666 Burrard St.
Vancouver, BC, Canada V6C 2X8
Gold
Canyon Creek/Paint River
Iliamna District
ML 91 0301 1

Gerald Irvin Anderson (SCR)
8225 Hartzell Rd.
Anchorage, AK 99507
Yacko Creek
Nelchina District
ML 91 0425 1

Anderson & Son Mining (SWR)
Allan G. Anderson
P.O. Box 277
McGrath, AK 99627
Gold
Yankee Creek
Innoko District
ML 91 0006 1

Annabelle Mine (EIR)
James Roland
710 McGrath Rd.
Fairbanks, AK 99712
Gold
Moose Creek
Bonnifield District
ML 91 0167 1

Anvil Mining Inc. (WR)
Noel S. Tanner
P.O. Box 1369
Nome, AK 99762
Gold
Anvil Creek
Nome Distnct
ML 91 0342 1

AOS Mining & Engineering (EIR)
Roy W. Ferrenbach
1215 Bunnell, Apt. 11
Fairbanks, AK 99701
Gold
Cleary, Eora, and Lulu Creeks
Fairbanks District
ML 91 0368 1

Adam Arnariuk, Sr (APR)
P.O. Box 95
Togiak, AK 99678
Gold
--
Bristol Bay Region
ML 91 0299 1

Merwin Arnesen (SCR)
P.O. Box 737
Palmer, AK 99645
Sand and gravel
--
Various Districts
ML 91 0297 1

Aspen Exploration Corp. (WR)
5031 S. Ulster, Suite 310
Denver, CO 80237
Gold
Rock Creek and Sophi Gulch
Nome District
ML 91 0274 1; ML 91 0275 1

Associated Construction (SCR)
Joseph J. Rollins
P.O. Box 266
Anchor Point, AK 99556
Sand and gravel
Mile 160
Homer District
ML 91 0341 1

AU Mining Inc. (WR)
Michael L. Vial
General Delivery
Candle, AK 99728
Gold
Candle Creek, Kewalik River
Fairhaven District
ML 91 0466

B.C. Mining (EIR)
Cliff Knowlton
2245 John Evans Lane
Fairbanks, AK 99712
Gold
Half Dollar Creek
Circle District
ML 91 0047 1

Back Pack Mining Co. (SCR)
Paul Barry
HC 32 Box 6665-A5
Wasilla, AK 99687
Gold
Mills Creek and Tributaries
Yentna District
ML 91 0314 1

George Bailey (EIR)
P.O. Box 2052
Fairbanks, AK 99707
Gold
Eureka Creek
Kantishna District
ML 91 0360 1

Randolph Bailey/Edwin Grover (SCR)
7031 Gibbs Hill Circle
Anchorage, AK 99504
Gold
East Fork of Chulitna River
Valdez Creek District
ML 91 0150 1

Barnett's Precious Metal (SCR)
Steve Barnett
P.O. Box 86
Sand Point, AK 99661
Gold
Little Dollar and Stony Creeks
Yentna District
ML 91 0445 1

Alice Bayless/Michael Bushy (EIR)
Drawer F
Copper Center, AK 99573
Gold
Chicken Creek
Fortymile District
ML 91 0168 1

Beaver Loop Sand & Gravel (SCR)
Patrick and Mary Doyle
HC01 Box 1225
Kenai, AK 99611
Sand and gravel
Beaver Loop Rd.
Kenai District
ML 91 0285 1

Beaver State Mining (EIR)
Becky McCallum
1108 California Ave.
Libby, MT 59923
Gold
Gold Dust Creek
Circle District
ML 91 0105 1

Beehive Mining (EIR)
Layne Gardner
1967 Yankovich Rd.
Fairbanks, AK 99709
Gold
Bear and Sheridan Creeks
Koyuk District
ML 91 0354 1

Beehive Dome (EIR)
Stanley C. Rybachek
1967 Yankovich Rd.
Fairbanks, AK 99709
Gold
Cleary Creek
Fairbanks District
ML 91 0483

W.J. Beerman (SCR)
2416 S. First St.
Yakima, WA 98901
Gold
Big Four Creek
Chistochina District
ML 91 0263 1

Donald D. Belew (EIR)
Tom Domeier
P.O. Box 1231
Palmer, AK 99645
Gold
Confederate Creek
Fortymile District
ML 91 0077 1

Rhinehart Berg (WR)
General Delivery
Candle, AK 99728
Gold
Short and Independance Creeks
Fairhaven District
ML 91 0353 1

Arthur and Jeanne Berglund (SCR)
HC01, Box 6275
Palmer, AK 99645
Gold
Willow Creek
Willow Creek District
ML 91 0004 1

Bering Straits Native Corp. (WR)
Thomas S. Sparks
P.O. Box 1008
Nome, AK 99762
Sand and gravel
--
Nome District
ML 91 0489

Bering Straits Native Corp. (WR)
Thomas S. Sparks
P.O. Box 1008
Nome, AK 99762
Sand and gravel
Nome River
Nome District
ML 91 0490

Big G Mining Inc. (EIR)
Hank Gradney
P.O. Box 7400
Fairbanks, AK 99707
Gold
Deadwood Creek
Circle District
ML 91 0046 1

Russell Birdsell (EIR)
P.O. Box 1908
Cave Creek, AZ 85331
Gold
Cherry Creek
Fortymile District
ML 91 0170 1

Black Velvet Mining Co. (EIR)
Ray Thomas George
General Delivery
Chicken, AK 99732
Gold
South Fork Fortymile River
Fortymile District
ML 91 0407 1

Patrick Bliss (WR)
c/o Howard Grey & Associates
711 H St., Suite 450
Anchorage, AK 99501
Gold
Ungalik River
Koyuk District
ML 91 0325 1

Robert Wayne Blondeau (SCR)
P.O. Box 602
Valdez, AK 99686
Gold
Mineral Creek
Prince William Sound District
ML 91 0003 1; ML 91 0016 1

Bonanza Mining (EIR)
Douglas L. Miller
P.O. Box 127
Central, AK 99737
Gold
Bonanza Creek
Circle District
ML 91 0022 1

Glenn D. and Lela Bouton (NR)
665 Farmers Loop Rd.
Fairbanks, AK 99712
Gold
Middle Fork/Koyukuk River
Koyukuk District
ML 91 0026 1; ML 91 0430 1

Curl A. Bracale, Jr. (WR)
733 W. 4th Ave., #605
Anchorage, AK 99501
Gold
Camp Creek
Hughes District
ML 91 0205 1

Charlotte Bradley/Todd Baur (SCR)
P.O. Box 871501
Wasilla, AK 99687
Gold
Mills Creek
Yentna District
ML 91 0306 1

Brooks Range Exploration Co. Inc. (NR)
Wallace Gordon
3035 Madison Way
Anchorage, AK 99508
Gold
Spring and Hilltop Creeks
Koyukuk District
ML 91 0249 1

Brooks Range Ventures (NR)
Wallace E. Gordon
3035 Madison Way
Anchorage, AK 99508
Gold
Lake Creek
Koyukuk District
ML 91 0238 1

Broxson Mining Co. (EIR)
Richard Knudson
2900 Boniface Parkway, Suite 511
Anchorage, AK 99504
Gold
East Broxson Gulch
Delta District
ML 91 0366 1

Ken Bruhn (SCR)
P.O. Box 784
Cooper Landing, AK 99572
Gold
Cresent Creek
Seward District
ML 91 0415 1

Norman R. Bucy (SCR)
3638 Dunkirk Court
Anchorage, AK 99502
Gold
Canyon Creek
Seward District
ML 91 0317 1

John Burns (EIR)
P.O. Box 5
Chicken, AK 99732
Gold
Davis Creek
Fortymile District
ML 91 0209 1

Al & Paula Bute (SCR)
Gary & Linda Superman
HCO 1510
Kenai, AK 99611
Gold
Stetson Creek
Seward District
ML 91 0118 1

CM Mining (EIR)
Joe Cange
SVL Box 7626
Victorville, CA 92392
Gold
Olive Creek
Livengood District
ML 91 0468

Robert J. Cacy, Jr. (EIR)
P.O. Box 106
Central, AK 99730
Gold
Portage Creek
Circle District
ML 91 0327 1

Calista Corp. (SWR)
Ernest Marvin Chase
P.O. Box 141
Anchorage, AK 99558
Gold
Stuyahok River
Marshall District
ML 91 0084 1

Camp Creek Mining (EIR)
Eric, Alvin and Elizabeth Kile
P.O. Box 140424
Anchorge, AK 99514
Gold
Canyon, Camp, and Woods Creeks
Fairbanks District
ML 91 0248 1

Carlo & Sons Mining Co. (EIR)
William Carlo (now deceased)
2113 Southern
Fairbanks, AK 99701
Gold
Hunter Creek
Rampart District
ML 91 0152 1

Robert Carlson (SCR)
P.O. Box 771375
Eagle River, AK 99577
Gold
Upper Cache Creek
Yentna District
ML 91 0378 1

Caswell Creek Sand & Gravel (SCR)
Harold Bell
P.O. Box 147
Willow, AK 99688
Sand and gravel
--
Matanuska-Susitna District
ML 91 0064 1

CEK Co. (SCR)
Clifford Leach, Jr.
102 Drake Mews
Sonoma, CA 95476
Gold
Chisna River
Chistochina District
ML 91 0149 1

Chandalar Mines (NR)
Del Ackels
P.O. Box 72151
Fairbanks, AK 99707
Gold
Tobin Creek
Chandalar District
ML 91 0239 1

Ernest M. Chase (SWR)
P.O. Box 141
Anvik AK 99558
Gold
Stuyahok River
Marshall District
ML 91 0463

Jim Childs (EIR)
P.O. Box 56587
North Pole, AK 99705
Gold
Nugget Creek
Fairbanks District
ML 91 0185 1

Li-Hsiang Chiou (EIR)
P.O. Box 98513
Des Moines, WA 98188
Gold
Boulder Creek
Hot Springs District
ML 91 0208 1

Chugach Rock Corp. (SCR)
P.O. Box 91219
Anchorage, AK 99509
Sand and gravel
Placer River
Seward District
ML 91 0441 1

Circle Mining Co. (EIR)
Frank R. Warren
P.O. Box 58077
Fairbanks, AK 99711
Gold
Crooked Creek
Circle District
ML 91 0098 1

Citigold Alaska Inc. (EIR)
2173 University Ave., Suite 101
Fairbanks, AK 99709
Gold
Nome Creek
Fairbanks District
ML 91 0460 1

Clara Bea Inc. (WR)
D.B. Vial and B.W. Comstock
P.O. Box 853
Kotzebue, AK 99752
Gold
Candle Creek
Fairhaven District
ML 91 0159 1

Douglas M. Clark (EIR)
711 H Street, Suite 450
Anchorage, AK 99501
Gold
Palmer Creek/Middle Fork, Chena River
Fairbanks District
ML 91 0429 1; ML 91 0433 1

Joann Clark (EIR)
Roger Sayer
P.O. Box 73513
Fairbanks, AK 99707
Gold
Pine Creek
Richardson District
ML 91 0040 1

Joseph L. Cloud (NR)
Mike C. Shupe
HCO-1 Box 875
Kenai, AK 99611
Gold
Boulder Creek
Chandalar District
ML 91 0106 1

Lyle Colledge (EIR)
P.O. Box 60478
Fairbanks, AK 99706
Gold
Bottom Dollar Creek
Circle District
ML 91 0336 1

Cominco Alaska Exploration (SWR)
5660 B Street
Anchorage, AK 99518
Gold
--
Iliamna District
ML 91 0121 1

Cominco Alaska Inc. (NR)
P.O. Box 1230
Kotzebue, AK 99752
Zinc
Red Dog Mine
Noatak District
ML 91 0375 1

Compass Mining Co. (NR)
John B. Hall
P.O. Box 9052
Coldfoot, AK 99701
Gold
Linda Creek
Koyukuk District
ML 91 0153 1

Congdon Construction & Mining (EIR)
Carl J. Congdon
925 Commerce St.
Fairbanks, AK 99701
Gold
Quail Creek
Livengood/Tolovana District
ML 91 0103 1

Colin Conkle (EIR)
Marvin Mahrt
P.O. Box 56044
North Pole, AK 99705
Gold
Dry Creek
Bonnifield District
ML 91 0251 1

Ron J. Conner (SCR)
P.O. Box 875228
Wasilla, AK 99687
Gold
Peters Creek
Yentna District
ML 91 0212 1

James Conway (EIR)
HC02 Box 7660
Palmer, AK 99645
Gold
Bullfrog Creek
Fairbanks District
ML 91 0334 1

Fred Cook (EIR)
P.O. Box 311
Delta Junction, AK 99737
Gold
Portage Creek
Fairbanks District
ML 91 0404 1

Cook's Mining (EIR)
John Cook
P.O. Box 70393
Fairbanks, AK 99707
Gold
Deep Creek
Fairbanks District
ML 91 0067 1

Cook's Mining (EIR)
Patricia S. Franklin
P.O. Box 70393
Fairbanks, AK 99707
Gold
Fairbanks Creek
Fairbanks District
ML 91 0068 1

Cooper Landing (SCR)
Ed Ellis/Sherman C. Smith
P.O. Box 824
Cooper Landing, AK 99572
Gold
Lake Creek
Yentna District
ML 91 0063 1

Bobby G. Corder, Sr. (SCR)
1508 W. 32nd St.
Anchorage, AK 99503
Gold
Quartz Creek
Seward District
ML 91 0060 1

Frank Arthur Couch (SCR)
149 Farnsworth Blvd.
Soldotna, AK 99669
Gold
Stetson Creek
Seward District
ML 91 0009 1

Patrick and Clair Coyle (SCR)
290 S. Park St.
Anchorage, AK 99508
Gold
Kahiltna River
Yentna District
ML 91 0277 1

Crawford Walsh Construction (WR)
John D. Walsh
P.O. Box 2095
Nome, AK 99762
Gold
Dry Creek
Nome District
ML 91 0491

Bill Croley (EIR)
P.O. Box 191
Tok, AK 99780
Gold
Liberty Creek
Fairbanks District
ML 91 0131 1

Crooked Dog Mine (SCR)
Byron Henshaw/Charles Barnes
P.O. Box 193
Cantwell, AK 99729
Gold
Grogg Creek
Valdez Creek District
ML 91 0414 1

Verl Douglas Cushman, Sr. (EIR)
445 Riverton Rd.
Blackfoot, ID 83221
Gold
40 Mile River
Fortymile District
ML 91 0206 1

Dan Creek Partners (SCR)
Randy Elliott
P.O. Box 401
Gig Harbor, WA 98335
Gold
Dan Creek
Nizina District
ML 91 0394 1

James Charles Dart (EIR)
P.O. Box 18
Manley Hot Springs, AK 99756
Gold
Bolder Creek
Hot Springs District
ML 91 0420 1

Delima Placers (EIR)
Don P. Delima
P.O. Box 56106
Manley Hot Springs, AK 99756
Gold
American Creek
Hot Springs District
ML 91 0204 1

Dibble Creek Rock (SCR)
Clifford Shafer
HC67 Box 530
Anchor Point, AK 99556
Sand and gravel
--
Kenai District
ML 91 0288 1

Dick Creek Mining (WR)
Robin Gumaer
P.O. Box 1682
Nome, AK 99762
Gold
Dick Creek
Kougorok District
ML 91 0056 1

Roy Diehl (SCR)
General Delivery
Anchorage, AK 99501
Gold
Lowe River
Prince William Sound District
ML 91 0308 1; ML 91 0315 1

Discovery Mining (EIR)
James W. Belford
P.O. Box 1934
Fairbanks, AK 99701
Gold
None
Fairbanks District
ML 91 025[illegible] 1

Patrick D[illegible] and Clair Edward (SCR)
290 South Park
Anchorage, AK 99508
Gold
Lake Creek
Yentna District
ML 91 0129 1

Clifford H. Driscall (SCR)
Tod Bauer
P.O. Box 871502
Wasilla, AK 99687
Gold
Gold Creek
Nelchina District
ML 91 0081 1

Michael B. Dugger (EIR)
5218 Half Moon Dr.
Colorado Springs, CO 80915
Gold
Mastadon Creek
Circle District
ML 91 0261 1

Dugger Mining Co. (EIR)
Michael Dugger
5218 Half Moon Dr.
Colorado Springs, CO 80915
Gold
North Fork Harrison Creek
Circle District
ML 91 0246 1; ML 91 0467
ML 91 0243 1

Eagerton Mining (EIR)
HC01M VIX 6937-V
Palmer, AK 99645
Gold
Napoleon Creek
Fortymile District
ML 91 0411 1

Ed's Gravel Pit (SCR)
Joanna Hollier
P.O. Box 366
Kenai, AK 99611
Sand and gravel
--
Kenai District
ML 91 0226 1

Dennis Elch & Angess Purdy (EIR)
Vernon Weaver
6314 W. Stockton Ave.
Atwater, CA 95301
Gold
Meyers Fork
Fortymile District
ML 91 0093 1

Robert C. Emerson (EIR)
1811 Phillips Field Rd.
Fairbanks, AK 99701
Gold
St. Patricks and Eva Creeks
Fairbanks District
ML 91 0482

Krister Erikson (SCR)
P.O. Box 103130-199
Anchorage, AK 99510
Gold
Falls Creek
Cache Creek District
ML 91 0310 1

Thomas E. Faa (EIR)
P.O. Box 666
Wamic, OR 97063
Gold
Moose Creek
Bonnifield District
ML 91 0021 1

Fairbanks Exploration (EIR)
Ronald Thole
P.O. Box 82549
Fairbanks, AK 99708
Gold
Bonanza Trend
Circle District
ML 91 0159 1

Fairbanks Gold Inc. (EIR)
P.O. Box 73726
Fairbanks, AK 997[illegible]
Gold
Fish Creek Draina[illegible]e
Fairbanks District
ML 91 0391 1

Fairbanks Gold Inc. (EIR)
P.O. Box 73726
Fairbanks, AK 99707
Gold
Melba and Monte Cristo Lodes
Fairbanks District
ML 91 0241 1

Fairbanks Mining Co. (EIR)
James L. Munsell
P.O. Box 81155
Fairbanks, AK 99708
Gold
Little Minook and Junior Creeks
Rampart District
ML 91 0074 1

Fairbanks Sand & Gravel (EIR)
P.O. Box 1511
Fairbanks, AK 99707
Sand and gravel
2-Mile Pit, Old Rich.
Fairbanks District
ML 91 0262 1

Mark C. Farrar (SWR)
P.O. Box 1032
Hood River, OR 97031
Gold
Fortyseven Creek
Aniak-Sleetmute District
ML 91 0464

Herbert F. Fassler (SCR)
P.O. Box 670181
Chugiak, AK 99567
Gold
Willow Creek
Willow Creek District
ML 91 0117 1

Flat Creek Mining Co. (WR)
James P. Haggland
P.O. Box 81464
Fairbanks, AK 99708
Gold
Flat Creek
Ruby District
ML 91 0247 1

Flats Creek Placers (SWR)
John E. Fullerton
16935 Maplewild S.W.
Seattle, WA 98066
Gold
Flat Creek
Iditarod District
ML 91 0307 1

Flat Pick Mining (EIR)
Gordon Fulton
P.O. Box 115
Central, AK 99730
Gold
Switch Creek
Circle District
ML 91 0267 1

Mitch Fleming (NR)
P.O. Box 9102
Coldfoot, AK 99701
Gold
Myrtle Creek
Koyukuk District
ML 91 0268 1

James L. and Sharon Fogarty (EIR)
3034 Dyke Rd.
North Pole, AK 99705
Gold
Walker Creek
Fairbanks District
ML 91 0027 1

James Fogarty/Frank Darnell (EIR)
3034 Dyke Rd.
North Pole, AK 99705
Gold
Myrtle Creek
Livengood/Tolovana District
ML 91 0328 1

Randi Forester (SCR)
General Delivery
Cooper Landing, AK 99572
Gold
Dry Creek
Seward District
ML 91 0443 1

Fortune Mining Co. (SCR)
Ernest Bennett and Rena Harrell
2025 Village Drive
Wasilla, AK 99687
Gold
Willow Creek
Seward District
ML 91 0114 1

Elmer Foss/Harold Osborg (EIR)
P.O. Box 73252
Fairbanks, AK 99707
Gold
Bedrock Creek
Circle District
ML 91 0473

Four Brothers Mining (EIR)
Clark H. Billings
P.O. Box 81117
Fairbanks, AK 99708
Gold
Totatlanika River
Bonnifield District
ML 91 0337 1

Fox Gulch Trio (EIR)
Jack Neubauer
413 Cowles
Fairbanks, AK 99701
Gold
Fox Creek
Fairbanks District
ML 91 0019 1

Franklin Exploration Mining Co. Inc. (APR)
Oliver C. Reese
10411 San Gabriel N.E.
Albuquerque, NM 87111
Gold
Unga Island
Point Moller District
ML 91 0217 1

Patricia S. Franklin (EIR)
1213 Coppet St.
Fairbanks, AK 99709
Gold
Fairbanks Creek
Fairbanks District
ML 91 0050 1

Freedom Mining & Exploration Inc. (EIR)
Roy Ruble
P.O. Box 80351
Fairbanks, AK 99708
Gold
Rebel Creek
Circle District
ML 91 0362 1

Freedom Mining & Exploration Inc. (EIR)
Roy L. Ruble
P.O. Box 80351
Fairbanks, AK 99708
Gold
Robinson Creek
Fortymile District
ML 91 0365 1

Frontier Mining Inc. (SCR)
Empire Exploration Inc.
P.O. Box 142593
Anchorage, AK 99514
Gold
All tributaries of Cotton Creek
Yentna District
ML 91 0001 1

G.A. Hanks & Sons (EIR)
P.O. Box 2533
W. Sacramento, CA 95691
Gold
Lost Chicken Creek
Fortymile District
ML 91 0190 1

Tom Gaddis/Mike Machel (EIR)
P.O. Box 82124
Fairbanks, AK 99708
Gold
Bonanza Creek
Circle District
ML 91 0469

Mark A. Gaede (SCR)
P.O. Box 2192
Soldotna, AK 99669
Gold
Canyon Creek
Seward District
ML 91 0148 1

Paul & Ann Gapen (EIR)
510 Cottonwood
Cheyenne, WY 83002
Gold
Eldorado Creek
Livengood District
ML 91 0479

Stanley M. Gelvin (EIR)
P.O. Box 30149
Central, AK 99730
Gold
Ketchum Creek
Circle District
ML 91 0075 1

Stanley M. Gelvin (EIR)
Edwin C. Gelvin
P.O. Box 30149
Central, AK 99730
Gold
Crooked Creek
Circle District
ML 91 0104 1

Geosearch Inc. (SCR)
7920 King St.
Anchorage, AK 99518
Gold
Liberty and Five Mile Creeks
Nizina District
ML 91 0423 1

David L. Gerke (WR)
4324 Thompson, Suite 2
Anchorage, AK 99508
Gold
Solomon River
Solomon District
ML 91 0324 1

GHD Resources Partners, Ltd. (WR)
Berg and Wetlesen
316 Rio Verde
El Paso, TX 79912
Gold
Kiwalik Flats
Candle District
ML 91 0087 1

Wayne E. Gibson/Lee Eastman (EIR)
1610 Southern Ave.
Fairbanks, AK 99701
Gold
Lawson Creek
Circle District
ML 91 0478

Global Resources (WR)
Perry or George Massie
P.O. Box 3040
Fallbrook, CA 92028
Gold
Cripple Creek
Nome District
ML 91 0154 1

Don Glassburn (EIR)
P.O. Box 107
Central, AK 99730
Gold
Birch Creek
Circle District
ML 91 0410 1

Phil Godfrey (SER)
P.O. Box 3097
Bellevue, WA 98009
Sand and gravel
Lemon Creek Area
Juneau District
ML 91 0142 1

Gold Gulch Co. (SCR)
9191 Old Seward Hwy., Suite 21
Anchorage, AK 99515
Gold
Kahiltna River
Yentna District
ML 91 0211 1

Gold Tech Resources Inc. (SCR)
Kevin Dale Thompson
P.O. Box 875534
Wasilla, AK 99687
Gold
North of Valdez Creek
Valdez Creek District
ML 91 0477

Goldstream Mining Co. (EIR)
John T. Larson
P.O. Box 80772
Fairbanks, AK 99708
Gold
Mastadon and Gilmore Creeks
Circle and Fairbanks Districts
ML 91 0383 1; ML 91 0475

Golovin Native Corp. (WR)
P.O. Box 62099
Golovin, AK 99762
Sand and gravel
Golovin Native Lands
Golovin District
ML 91 0059 1

Brandt N. Goodall (EIR)
Mile 64 Taylor Highway
P.O. Box 8
Chicken, AK 99732
Gold
Mosquito Fork and Fortymile River
Fortymile District
ML 91 0032 1

Brandt Goodall/Clyde Baldwin (EIR)
6330 N. Douglas Hwy.
Juneau, AK 99801
Gold
Mosquito Fork
Fortymile District
ML 91 0379 1

Gene Alfred Granath (SCR)
P.O. Box 574
Kenai, AK 99611
Gold
Falls Creek
Seward District
ML 91 0462

Grateful Dog Mining (EIR)
Roger McPherson
1100 Southwood Lane
Fairbanks, AK 99712
Gold
Unspecified
Fairbanks District
ML 91 0363 1

Scott Greger/Jamin Klopman (SWR)
P.O. Box 101
Red Devil, AK 99656
Gold
Taylor Creek
Aniak District
ML 91 0303 1

Green Mining & Exploration (WR)
Douglas Green
P.O. Box 61455
Fairbanks, AK 99706
Gold
Long Creek
Ruby District
ML 91 0335 1

Grizzlee Mining (EIR)
Dan Lee
HC03 Box 8383
Palmer, AK 99645
Gold
Liberty Creek
Fortymile District
ML 91 0329 1

Mark Gunnar (WR)
Richard Redmond
P.O. Box 157
Girdwood, AK 99587
Gold
Macklin Creek
Koyukuk District
ML 91 0055 1

Gypsy Luck Mining Co. (EIR)
Glen C. Parr
624 Maple
Shelton, WA 98584
Gold
Walker Creek
Fairbanks District
ML 91 0107 1

Albert Hagen (EIR)
P.O. Box 53
Manley Hot Springs, AK 99756
Gold
Cooney Creek
Hot Springs District
ML 91 0177 1

Joe B. Hall (EIR)
Lau Iosua
711 Hillcrest
Fairbanks, AK 99712
Gold
Rainy Creek
Delta District
ML 91 0069 1

Ham Mining Co. (EIR)
Harold Mitchell
P.O. Box 65
Chicken, AK 99732
Gold
Mosquito Fork
Fortymile District
ML 91 0192 1

Charles R. Hammond (EIR)
P.O. Box 7
Chicken, AK 99732
Gold
45 Pup
Fortymile District
ML 91 0102 1

Hard Rock Inc. (SER)
Debra J. Schnabel
P.O. Box 129
Haines, AK 99827
Sand and gravel
Mile 5 Haines Hwy.
Porcupine District
ML 91 0124 1

Michael G. Hartman (WR)
P.O. Box 74921
Fairbanks, AK 99707
Gold
Poorman Creek
Ruby District
ML 91 0023 1

Edwin L. Hatch (WR)
P.O. Box 1801
Nome, AK 99762
Gold
Sweepstake Creek
Koyuk District
ML 91 0322 1

Hawley Resource Group Inc. (WR)
#300 941 E. Dowling
Anchorage, AK 99516
Gold
Sinuk River Area; Gold Hill
Nome District
ML 91 0401 1

Hayden Exploration & Mining (EIR)
Forest Hayden
P.O. Box 110930
Anchorage, AK 99511
Gold
Baby Creek
Eagle District
ML 91 0199 1

James Henley/Greg Mallinger (SER)
P.O. Box 210212
Auke Bay, AK 99821
Gold
Boulder Creek
Juneau District
ML 91 0228 1

Heflinger Mining & Equipment Co. (EIR)
Carl F. Heflinger
665 10th Ave., # 307
Fairbanks, AK 99701
Gold
Livengood Creek
Tolovana District
ML 91 0164 1

Fred Heflinger (EIR)
P.O. Box 82390
Fairbanks, AK 99708
Gold
Walker Fork
Fortymile District
ML 91 0396 1

Jack Hendrickson (EIR)
P.O. Box 10154
Fairbanks, AK 99710
Gold
Sourdough Creek
Circle District
ML 91 0347 1

Hennya Rock & Gravel Inc. (SER)
P.O. Box 161
Klawock, AK 99925
Sand and gravel
Three Mile Creek
Ketchikan District
ML 91 0292 1

Hennya Rock & Gravel Inc. (SER)
P.O. Box 161
Klawock, AK 99925
Sand and gravel
Three Mile Creek
Ketchikan District
ML 91 0293 1

Hennya Rock & Gravel Inc. (SER)
P.O. Box 161
Klawock, AK 99925
Sand and gravel
Three Mile Creek
Ketchikan District
ML 91 0294 1

Hennya Rock & Gravel Inc. (SER)
P.O. Box 161
Klawock, AK 99925
Sand and gravel
Three Mile Creek
Ketchikan District
ML 91 0295 1

Herning Exploration & Mining (EIR)
Bruce Herning
P.O. Box 73846
Fairbanks, AK 99707
Gold
Palmer Creek
Fairbanks District
ML 91 0448 1

Martin M. and Jean A. Herzog (SCR)
3817 S. Carson St. #428
Carson City, NV 89701
Gold
Cache Creek
Yentna District
ML 91 0237 1

Hoffman Mining (SCR)
Russell Hoffman
HC 60 Box 153
Copper Center, AK 99573
Gold
Limestone Creek
Chistochina District
ML 91 0352 1

Jerry Jr. and Velma Holly (SCR)
P.O. Box 365
Soldotna, AK 99669
Gold
Peters Creek
Yentna District
ML 91 0252 1

Homer & William Hoogendorn (WR)
P.O. Box 84
Nome, AK 99762
Gold
Buster Creek
Nome District
ML 91 0157 1

Hope Mining Co. (SCR)
P.O. Box 101827
Anchorage, AK 99510
Gold
Various Creeks
Seward District
ML 91 0280 1

Alf Hopen (EIR)
P.O. Box 74246
Fairbanks, AK 99707
Gold
Little Eldorado and Cleary Creeks
Fairbanks District
ML 91 0134 1

Interior Alaskana Association (EIR)
Richard Loud
742 Bennet Rd.
Fairbanks, AK 99712
Gold
Gilmore Creek
Fairbanks District
ML 91 0132 1

Interior Alaskana Association (EIR)
Richard L. Loud
742 Bennet Rd.
Fairbanks, AK 99712
Gold
Mammoth and Independence Creeks
Circle District
ML 91 0266 1

Jackson Mining Co. (EIR)
Roy Traxler/Naimy Birklid
936 Coppet St.
Fairbanks, AK 99709
Gold
Totatlanika River
Bonnifield District
ML 91 0173 1

John Jenks; and
Glenn and Lela Bouton (NR)
200-535 Thurlow St.
Vancouver, BC, Canada V6E 3L2
Gold
Chapman Creek/Koyukuk River
Koyukuk District
ML 91 0109 1

Dan Jensen (EIR)
P.O. Box 12
Delta Junction, AK 99737
Gold
Alder Creek
Fortymile District
ML 91 0470

Daniel D. Jensen (EIR)
P.O. Box 12
Delta Junction, AK 99737
Gold
McCumber Creek
Delta District
ML 91 0419 1

Jim Cline's Enterprises (SCR)
James A. Cline
P.O. Box 2
Glenn Allen, AK 99588
N/A
N/A
N/A
ML 91 0253 1

Jim/Mar Mining Ventures (SCR)
James Luhrs/Marva DeJong
3333 Lake Shore Dr. #8
Anchorage, AK 99517
Gold
Evans Creek
Yentna District
ML 91 0318 1

Martha H. Johnson (EIR)
Curtis Johnson
602 Steward St.
Fairbanks, AK 99701
Gold
Mastadon Creek
Circle District
ML 91 0094 1

Jones & Co. (SCR)
HCR 68 Box 1120
Moose Pass, AK 99631
Gold
Roaring, Weber, and Wilson Creeks
Seward District
ML 91 0227 1

Martin Junge (EIR)
P.O. Box 981
Dillingham, AK 99576
Gold
South Fork Fortymile River
Fortymile District
ML 91 0408 1

K.C. Mining Co. (EIR)
Richard Schmoll
P.O. Box 741
Townsend, MT 59644
Gold
Faith Creek
Fairbanks District
ML 91 0171 1

K.C. Mining Co. (EIR)
Kenneth C. Hanson
P.O. Box 10657
Fairbanks, AK 99710
Gold
Faith Creek
Fairbanks District
ML 91 0138 1

K.D.T. Exploration & Mining Co. (SCR)
Kevin Thompson
P.O. Box 875534
Wasilla, AK 99687
Gold
Gold Hill
Valdez Creek District
ML 91 0312 1

Robert W. Keller (EIR)
P.O. Box 113
Healy, AK 99743
Gold
Totatlanika River
Bonnifield District
ML 91 0356 1

Kelly Mining (EIR)
Tim Kelly
2120 E. 36th Ave.
Anchorage, AK 99508
Gold
North Fork Creek
Rampart District
ML 91 0049 1

Klana Corp. (SER)
Debra J. Schnabel
P.O. Box 129
Haines, AK 99827
Sand and gravel
Mile 5 Haines Hwy.
Porcupine District
ML 91 0287 1

Tim Kiehl (EIR)
3210 Marneet Lane
North Pole, AK 99705
Gold
Gold King Creek
Bonnifield District
ML 91 0127 1

Leslie K. Kirk (EIR)
P.O. Box 261
Delta Junction, AK 99737
Gold
Rainy Creek
Delta District
ML 91 0382 1

Susan Knapman (EIR)
P.O. Box 254
Central, AK 99730
Gold
[illegible] Pup
Circle District
ML 91 0259 1

S & M Koppenberg (EIR)
T.J. Koppenberg
H.C.O. 4-9068
Palmer, AK 99645
Gold
Homestake Creek
Circle District
ML 91 0091 1

Sam Koppenberg (EIR)
P.O. Box 130
Denali, AK 99755
Gold
Faith Creek
Fairbanks District
ML 91 0350 1

Lawrence Kordecki (EIR)
300 Howland Rd. 3
Fairbanks, AK 99712
Gold
McManns Creek
Circle District
ML 91 0038 1

Kougarok Mining (WR)
Elmer Martinson
P.O. Box 452
Nome, AK 99762
Gold
Kougarok River
Kougarok District
ML 91 0346 1

Jan Kralik/Ed Schwayer (WR)
P.O. Box 1793
Nome, AK 99762
Gold
Alder and Bluestone Rivers
Port Clarence District
ML 91 0200 1

Mark Krenzke (EIR)
P.O. Box 422
Nenana, AK 99750
Gold
Eureka
Hot Springs District
ML 91 0079 1

Kristi-Phylee Mining (EIR)
James M. Parry
P.O. Box 71656
Fairbanks, AK 99707
Gold
No Grub Creek
Richardson District
ML 91 0053 1

Rudy Krizak (WR)
General Delivery
Nome, AK 99762
Gold
Dome Creek
Solomon District
ML 91 0323 1

Reginald D. Krkovich (EIR)
P.O. Box 20557
Juneau, AK 99802
Gold
Bear Creek
Koyuk District
ML 91 0422 1

Kurt's Construction (EIR)
Kurt A. Ueeck
1900 Granite View Dr.
Delta Junction, AK 99737
Sand and gravel
Milton Road Area
Fairbanks District
ML 91 0339 1

L & B Mining (WR)
DB Parent
1015 10th Ave.
Fairbanks, AK 99701
Gold
Bear Creek
Koyuk District
ML 91 0156 1

L.B.M.B. Co. (SWR)
Longbotham & Associates
1536 Martinette Ave.
Exeter, CA 93221
Gold
Murray and New York Creeks
Aniak District
ML 91 0230 1

Jack LaCross (SCR)
P.O. Box 331
Soldotna, AK 99669
Gold
Mills Creek and Tributary
Yentna District
ML 91 0151 1

Lapp & Son (EIR)
Earl H. Beistline
P.O. Box 80148
Fairbanks, AK 99708
Gold
Eagle Creek and Tributaries
Circle District
ML 91 0033 1

Lapp & Son Mining (EIR)
Ed L. Lapp
P.O. Box 117
Central, AK 99730
Gold
Eagle Creek
Fairbanks District
ML 91 0289 1

Juanita K. Larson (SCR)
George W. Zimmer
9449 Braylon Dr. #116
Anchorage, AK 99507
Gold
Quartz Creek
Seward District
ML 91 0012 1

Juanita R. Larson (SCR)
George W. Zimmer
9499 Braylon Dr. #116
Anchorage, AK 99507
Gold
Quartz Creek
Seward District
ML 91 0061 1

Donald C. Lasley (EIR)
P.O. Box 30047
Central, AK 99730
Gold
North Fork Harrison Creek
Circle District
ML 91 0080 1

James Lefto (EIR)
General Delivery
Chicken, AK 99732
Gold
40 Mile River
Fortymile District
ML 91 0330 1

Albert Lemons/WM Studebaker (EIR)
P.O. Box 73222
Fairbanks, AK 99707
Gold
Portage Creek
Circle District
ML 91 0409 1

Lester Mines (EIR)
Ray Lester
732 Old Steese Hwy.
Fairbanks, AK 99712
Gold
Birch Creek
Circle District
ML 91 0025 1

Light Mining (NR)
Bill and Clara Light
P.O. Box 74804
Fairbanks, AK 99707
Gold
Nolan and Acme Creeks
Koyukuk District
ML 91 0048 1

David Likins (EIR)
Fortymile River
Eagle, AK 99738
Gold
Fortymile River
Fortymile District
ML 91 0108 1; ML 91 0361 1

Lillian Creek Mine Inc. (EIR)
Gladys H. Blood
P.O. Box 60334
Fairbanks, AK 99706
Gold
Lillian Creek
Livengood/Tolovana District
ML 91 0388 1

George Livermore (SCR)
P.O. Box 241449
Anchorage, AK 99503
Gold
Ruby Gulch
Chitina District
ML 91 0332 1

George Livermore (SCR)
P.O. Box 241449
Anchorage, AK 99503
Gold
Shale Creek
Chistochina District
ML 91 0343 1

Lodestar Explorations Inc. (EIR)
J.H. and M.K. O'Neill
Box 39 280-815 W. Hastings St.
Vancouver, BC, Canada V6C 1B4
Gold
McCord Creek
Fortymile District
ML 91 0381 1

Lone Spruce Mining (EIR)
George Roger Strickler
16900 Ransom Ridge Rd.
Anchorage, AK 99516
Gold
Squaw Creek
Fortymile District
ML 91 0030 1

Steve Milan Losonsky (EIR)
P.O. Box 80321
Fairbanks, AK 99708
Gold
Hunter Creek
Rampart District
ML 91 0052 1

Lindon M. Loudermilk (SCR)
10441 Loudermilk Circle
Anchorage, AK 99516
Gold
Long and Coal Creeks
Yentna District
ML 91 0005 1

James G. and George H. Lounsbury (NR)
365 Henderson Rd.
Fairbanks, AK 99709
Gold
Union Gulch
Koyukuk District
ML 91 0351 1

Marin Lovs/Theodore Knutson (EIR)
2326 St. Elias Dr.
Anchorge, AK 99517
Gold
Mastadon and Mammoth Creeks
Circle District
ML 91 0309 1

Luke's Mining Co. (SCR)
Tony Neal
2396 Kachemak Bay Drive
Homer, AK 99603
Sand and gravel
Luke's Pit
Homer District
ML 91 0018 1

Lyman Resources In Alaska Inc. (SWR)
P.O. Box 192
McGrath, AK 99627
Gold
Snow Gulch/Crooked Creek
Aniak District
ML 91 0213 1

Rocky MacDonald (EIR)
P.O. Box 81035
Fairbanks, AK 99708
Gold
Treasure Creek
Fairbanks District
ML 91 0140 1

Magnuson Mining Co. (SWR)
P.O. Box 55
McGrath, AK 99627
Gold
Ganes Creek
Innoko District
ML 91 0431 1

Magnuson Mining Co. (SWR)
Warren E. Magnuson
P.O. Box 55
McGrath, AK 99627
Gold
Ganes Creek
Innoko District
ML 91 0036 1

Robert L. Magnuson, Jr. (SWR)
P.O. Box 101
McGrath, AK 99627
Gold
Madison Creek
Innoko-Tolstoi District
ML 91 0304 1

Dan Mandrones (EIR)
4212 Rose Valley Rd.
Kelso, WA 98626
Gold
Loper Creek
Circle District
ML 91 0203 1

Cecilia and Albert M. Manns (NR)
Paradise Valley
Bettles, AK 99726
Gold
Birch Creek
Koyukuk-Wild Lake District
ML 91 0066 1

Paul Manuel (EIR)
George R. Horner
P.O. Box 83102
Fairbanks, AK 99708
Gold
Porcupine Creek
Circle District
ML 91 0024 1

Paul Manuel (EIR)
Fred Wilkenson
P.O. Box 2702
Fairbanks, AK 99707
Gold
Procupine Creek
Circle District
ML 91 0111 1

Martin Mining Co. (SCR)
Edward D. Martin, Jr.
P.O. Box 521
Cooper Landing, AK 99572
Gold
Hargood Creek
Seward District
ML 91 0403 1; ML 91 0418 1

Perry Massie & Adam Anthony (WR)
P.O. Box 3040
Fallbrook, CA 92028
Gold
American Creek
Nome District
ML 91 0198 1

Mascot Mining Inc. (NR)
Thomas L. Byrant
County Rd. 1
P.O. Box 264
Ridgeway, CO 81432
Gold
Hammond River and Vermont Creek
Koyukuk District
ML 91 0197 1

Arnold J. Mason (SCR)
4545 San Roberto
Anchorage, AK 99508
Gold
North Creek
Anchorage District
ML 91 0316 1

Mark D. Matter (SWR)
P.O. Box 44
Aniak, AK 99557
Gold
Marvel Creek
Aniak District
ML 91 0220 1

Guy Matthews (EIR)
P.O. Box 241
Tok, AK 99780
Gold
Abandoned Creek
Fairbanks District
ML 91 0331 1

Guy Matthews (EIR)
P.O. Box 241
Tok, AK 99780
Gold
Kenyon Creek
Fairbanks District
ML 91 0349 1

Rocky McDonald (EIR)
P.O. Box 81035
Fairbanks, AK 99708
Gold
Frying Pan Creek
Circle District
ML 91 0472

Keith Mendenhall, Jr. (EIR)
P.O. Box 1406
Fairbanks, AK 99707
Gold
Bonnifield Creek
Bonnifield District
ML 91 0110 1

Mespelt & Almasy Mining Co. (WR)
Theodore Almasy
Nixon Fork Mine
McGrath, AK 99627
All types
Nixon Fork Mine
McKinley/McGrath District
ML 91 0291 1

Metco Inc. (SCR)
Frank Dieckgraeff
HCR 64 Box 300
Seward, AK 99664
Sand and gravel
--
Seward District
ML 91 0340 1

Miller Creek Mining Co. (EIR)
Fred D. Wilkinson
P.O. Box 1
Central, AK 99730
Gold
Ketchum Creek
Circle District
ML 91 0338 1

Minex Alaska Inc. (APR)
Yoram Palkovitch
P.O. Box 103
Girdwood, AK 99587
Gold
Trinity Islands
Kodiak District
ML 91 0143 1

The Mining Co. (EIR)
John E. and Floretta McClain
P.O. Box 436
Soldotna, AK 99669
Gold
Ester Creek
Fairbanks District
ML 91 0028 1

The Mining Management Corp. (SCR)
Stella Darlene Lavender
P.O. Box 91725
Anchorage, AK 99509
Gold
Valdez and Roosevelt Creeks
Valdez Creek District
ML 91 0085 1

Andrew W. Miscovich (EIR)
P.O. Box 1489
Fairbanks, AK 99707
Gold
Chatham Creek
Fairbanks District
ML 91 0122 1

John A. Miscovich (SWR)
General Delivery
Flat, AK 99584
Gold
Otter Creek
Iditarod District
ML 91 0083 1

John W. Miscovich (EIR)
P.O. Box 1439
Fairbanks, AK 99707
Gold
Captain, Pilot, and Cripple Creeks
Fairbanks District
ML 91 0461 1

Miscovich Mining Co. (WR)
Howard P. Miscovich
P.O. Box 262
Galena, AK 99741
Gold
Poorman Creek
Ruby District
ML 91 0135 1

M.I.T. Inc. (WR)
Howard Smith
P.O. Box 1369
Nome, AK 99762
Gold
Little Rocker Creek
Nome District
ML 91 0344 1

Mohawk Oil Co., Ltd. (EIR)
6400 Roberts St.
Burnaby, BC, Canada V5G 4G2
Gold
Pedro Dome
Livengood District
ML 91 0455 1

Melvin or Lois Montgomery (EIR)
1836 Davenport Rd.
Delta Junction, AK 99737
Gold
Gilliland Creek
Fortymile District
ML 91 0258 1

Vincent C. Monzulla (EIR)
2920 Monzulla Lane
Fairbanks, AK 99712
Gold
Victoria Creek
Fairbanks District
ML 91 0194 1

William Morgan (WR)
600 W. 58th, Unit J
Anchorage, AK 99518
Gold
Unspecified location
Nulato District
ML 91 0233 1

William Morgan (SWR)
600 W. 58th, Unit J
Anchorage, AK 99518
Gold
4th of July Creek
Iditarod District
ML 91 0234 1

William Morgan (SWR)
600 W. 58th, Unit J
Anchorage, AK 99518
Gold
Granite Creek
Iditarod District
ML 91 0235 1

William Morgan (SWR)
600 W. 58th Unit J
Anchorage, AK 99518
Gold
--
Mt. McKinley District
ML 91 0236 1

William Morterud (WR)
P.O. Box 200065
Anchorage, AK 99501
Gold
Flat and Indian Creeks
Ruby District
ML 91 0270 1

MRAK Placer Mine (SCR)
Mrak, Aklestad, and Hennon
P.O. Box 1963
Palmer, AK 99645
Gold
Willow, Craige, and Grubs Creeks
Willow Creek District
ML 91 0182 1

Mud Creek Mining (WR)
Rhiney Berg
P.O. Box 809
Fairbanks, AK 99707
Gold
Mud Creek
Candle-Fairhaven District
ML 91 0057 1

Donald E. Mullikan (WR)
P.O. Box 790
Homer, AK 99603
Gold
Black, Buzzard, and Grouse Creeks
Seward Peninsula District
ML 91 0456 1

Donald E. Mullikin (WR)
P.O. Box 790
Homer, AK 99603
Gold
Boulder Creek
Seward Peninsula
ML 91 0458 1

Nana Regional Corp. Inc. (NR)
1001 E. Benson Blvd.
Anchorage, AK 99508
Silver, Lead, Zinc
Red Dog Creek
Noatak District
ML 91 0286 1; ML 91 0010 1

N.B. Tweet & Sons (WR)
P.O. Box 1107
Nome, AK 99762
Gold
Kougarok River
Kougarok District
ML 91 0086 1

Paul W. Nelson (NR)
Rt 2, Box 753
Soldotna, AK 99669
Gold
Nugget and Victor Creeks
Koyukuk District
ML 91 0174 1

Harold A. Nevers (EIR)
8148 Pinewood Dr.
Juneau, AK 99801
Gold
American Creek
Fortymile District
ML 91 0178 1

Dick Newton, Bill Farmer (SWR)
P.O. Box 2213
Takotna, AK 99675
Gold
--
Innoko District
ML 91 0402 1

Fred Noden (SWR)
P.O. Box 47
Dillingham, AK 99576
Gold
Chunak Region
Lake Clark District
ML 91 0116 1

Noram Mining Inc. (SCR)
P.O. Box 112367
Anchorage, AK 99511
Gold
Peters Creek
Yentna District
ML 91 0393 1; ML 91 0424 1

William H. Nordeen (NR)
P.O. Box 9013
Coldfoot, AK 99701
Gold
Enuma Creek
Koyukuk District
ML 91 0031 1

Roger Nordlum (WR)
P.O. Box 171
Kotzebue, AK 99752
Gold
Candle Creek
Candle-Fairhaven District
ML 91 0345 1

North Pacific Mining Corp. (WR)
121 W. Fireweed Lane, Suite 102
Anchorage, AK 99503
Gold
Illinois Creek (Lode)
Kaiyuh District
ML 91 0387 1

Northern Lights Mining Inc. (UR)
Ben Batty
544 North 600 West
Cedar City, UT 94720
Gold
Rye and Jay Creeks
Valdez Creek District
ML 91 0029 1

Ross Novak (EIR)
P.O. Box 83200
Fairbanks, AK 99708
Gold
Eureka Creek
Hot Springs District
ML 91 0264 1

Ross Novak (EIR)
P.O. Box 83200
Fairbanks, AK 99708
Gold
Boothby Creek
Hot Springs District
ML 91 0195 1

Ross Novak (EIR)
P.O. Box 83200
Fairbanks, AK 99708
Gold
Skookum Creek
Hot Springs District
ML 91 0193 1

Nuway Mining (SCR)
Michael W. Bolstridge
P.O. Box 1455
Soldotna, AK 99669
Gold
N/A
Seward
ML 91 0281 1; ML 91 0184 1;
ML 91 0417 1

Franklin L. O'Donnell, Jr. (EIR)
7110 Canady Rd.
Salcha, AK 99714
Gold
Moose Creek
Fortymile District
ML 91 0257 1

Ol Yeller Mine (EIR)
Robert Wayne and Susan Keller
P.O. Box 113
Healy, AK 99743
Gold
Totatlanika River
Bonnifield District
ML 91 0072 1

Alan Olson & Victor Loyer (WR)
P.O. Box 165
Palmer, AK 99645
Gold
Candle Creek
Candle-Fairhaven District
ML 91 0158 1

Steven Olson (EIR)
Robert W. Ault
6.5 Old Richardson Hwy.
P.O. Box 58443
Fairbanks, AK 99711
Gold
Eagle Creek
Circle District
ML 91 0044 1

On-Line Exploration Services Inc. (EIR)
11976 Wilderness Dr.
Anchorage, AK 99516
Gold
West Fork Tolovana River
Livengood/Tolovana District
ML 91 0176

ORA-Tech (WR)
Jeff Keener
P.O. Box 1955
Nome, AK 99762
Gold
Iron and Benson Creeks
Kougarok District
ML 91 0357 1

Outsider Mining Co. (SCR)
P.O. Box 909
Girdwood, AK 99587
Gold
Canyon Creek
Seward District
ML 91 0279 1

Oxy Minerals Corp. (UR)
P.O. Box 300
Tulsa, OK 94102
Copper
Various
Various Districts
ML 91 0397 1

P & P Mining (EIR)
Paul W. White
2551 Peede Rd.
North Pole, AK 99705
Gold
Newman Creek
Fairbanks District
ML 91 0037 1

Pacific Mining Inc. (EIR)
1300 E 74th
Anchorage, AK 99518
Gold
Porcupine Creek
Circle District
ML 91 0090 1

Cacy Patton/Bedrock Co. (EIR)
Richard Loud/Int. AKN Assn.
742 Bennet Rd.
Fairbanks, AK 99707
Gold
Gilmore Creek
Fairbanks District
ML 91 0272

D. Paulson/B. Pederson/D. Rian/ Carson P. Holt (EIR)
P.O. Box 52
Fairbanks, AK 99706
Gold
Ester Creek
Fairbanks District
ML 91 0034 1

Mac Payne (EIR)
1079 Victor
North Pole, AK 99705
Gold
Hoosier Creek
Rampart District
ML 91 0447 1

Jon M. Peckenpaugh (WR)
928 Morningside Dr.
Twin Falls, ID 83301
Gold
Inmachuk River, Pinnell Creek
Candle-Fairhaven District
ML 91 0155 1

David Penz (SWR)
P.O. Box 29
Russian Mission, AK 99657
Gold
Buster Creek
Marshall District
ML 91 0017 1

Wayne M. Peppler (EIR)
1006 22nd St.
Fairbanks, AK 99701
Gold
Holdem Creek
Circle District
ML 91 0435 1

Roy Philpott (NR)
115 Charles St.
Fairbanks, AK 99701
Gold
Smith Creek
Koyukuk District
ML 91 0041 1

Pioneer Placer Co. (EIR)
Robert H. Roberts
General Delivery
Manley Hot Springs, AK 99756
Gold
Ohio, Caribou, and Flat Creeks
Hot Springs District
ML 91 0453 1

Placer Dome U.S. Inc. (WR)
Benno Patsch
5631 Silverado Way, Suite A
Anchorage, AK 99518
Various commodities
Lost River
Port Clarence District
ML 91 0395 1

Daniel and Cynthia Plano (SWR)
P.O. Box 878275
Wasilla, AK 99687
Gold
Anvil Creek
Innoko District
ML 91 0300 1

Polar Mining (EIR)
4545 Woodriver
Fairbanks, AK 99709
Gold
Goldstream and Little Nugget Creeks
Fairbanks District
ML 91 0474

Polar Mining (EIR)
Don May
4545 Woodriver Dr.
Fairbanks, AK 99709
Gold
Goldstream Creek
Fairbanks District
ML 91 0166 1

Polar Mining Co. (EIR)
Donald J. May, Jr.
4545 Woodriver Dr.
Fairbanks, AK 99709
Gold
Hinkley Gulch Extension
Richardson District
ML 91 0380 1

Portage Creek Sand & Gravel (EIR)
Robert Cacy
P.O. Box 106
Central, AK 99730
Sand and gravel
Portage Creek
Circle District
ML 91 0484

Ralph James Porter (SCR)
P.O. Box 72
Soldotna, AK 99699
Gold
Cresent Creek
Seward District
ML 91 0097 1

Willard & Ruppert H. Powers (SCR)
4202 E. University Dr.
Phoenix, AZ 85934
Gold
Johnson Creek
Yentna District
ML 91 0232 1

Prince Creek Mining Co. (SWR)
Alvin Agoff
General Delivery
Flat, AK 99584
Gold
Prince Creek
Iditarod District
ML 91 0305 1

Jerry Robert Pushcar (WR)
P.O. Box 1604
Nome, AK 99762
Gold
Lower Willow Creek
Council District
ML 91 0137 1

Quartz Creek Exploration Inc. (SCR)
Milo Ellsworth Flothe
P.O. Box 242
Sterling, AK 99672
Gold
Quartz Creek
Seward District
ML 91 0231 1; ML 91 0320 1; ML 91 0446 1

R.A. Hanson Co. Inc. (SWR)
P.O. box 7400
Spokane WA 99207
Gold
Salmon River and Tributary
Goodnews Bay District
ML 91 0013 1; ML 91 0014 1; ML 91 0015 1

RB Gravel (EIR)
Gerald L. Hassel
P.O. Box 49
Ester, AK 99725
Gold
Ready Bullion Creek
Fairbanks District
ML 91 0051 1

RCL Mining (EIR)
Ray A. Vogt/Richard T. Nelson
2108 Central Ave.
Fairbanks, AK 99701
Gold
Dome Creek
Fairbanks District
ML 91 0364 1

Rainbow Mining (EIR)
Dennis Gilbreath
P.O. Box 10048
Fairbanks, AK 99710
Gold
Flat Creek
Fairbanks District
ML 91 0371 1

Rainbow Mining & Exploration Corp. (SCR)
Walter Bangell
P.O. Box 697
Palmer, AK 99645
Gold
Peters Creek
Yentna District
ML 91 0313 1

Rasmos (SCR)
Robert D. Rasmussen
P.O. Box 875464
Wasilla, AK 99687
--
--
Palmer
ML 91 0406 1

Red Fox Mining (EIR)
James Crabb/Harold Wheelock
P.O. Box 10
Central, AK 99730
Gold
Half Dollar Creek
Circle District
ML 91 0245 1

Red Samm Construction Inc. (SER)
Phil Godfrey
P.O. Box 3097
Bellevue, WA 98009
Sand and gravel
Lemon Creek
Juneau District
ML 91 0141 1

Carl Roger Reinstorm (EIR)
Ted Leonard
P.O. Box 51
Salcha, AK 99714
Gold
Porcupine Creek/Salcha River
Richardson District
ML 91 0070 1

Leo Regner (EIR)
P.O. Box 72733
Fairbanks, AK 99707
Gold
Ingle Creek
Fortymile District
ML 91 0269 1

Leo Regner (EIR)
P.O. Box 72733
Fairbanks, AK 99707
Gold
Lilly Wig and Ingle Creeks
Steese/White Mountain District
ML 91 0165 1

Richard Busk & Family (SWR)
Richard Busk
P.O. Box 100971
Anchorage, AK 99510
Gold
Synneva Creek
Iliamna District
ML 91 0145 1

Lynn W. Rill (EIR)
215 Ellingsen St.
Fairbanks, AK 99701
Gold
Bullion Creek
Fortymile District
ML 91 0451 1

Lynn Rill/William Burke (EIR)
215 Ellinsgon St.
Fairbanks, AK 99701
Gold
Hope Creek
Fortymile District
ML 91 0452 1

John Ritter (EIR)
P.O. Box 73792
Fairbanks, AK 99707
Gold
Ketchum Creek
Circle District
ML 91 0256 1

Robbies Bonanza Mining (SWR)
Roger Roberts
P.O. Box 26
Nome, AK 99762
Gold
Ophir and Gold Run Creeks
Ophir District
ML 91 0225 1

Roberts Mining (EIR)
Mike or Ellen Roberts
P.O. Box 82182
Fairbanks, AK 99708
Gold
Dome Creek
Fairbanks District
ML 91 0196 1

Robert H. Roberts (EIR)
General Delivery
Manley Hot Springs, AK 99756
Gold
Skookum Creek
Hot Springs District
ML 91 0454 1

Robert W. Roberts (EIR)
P.O. Box 225
Tok, AK 99780
Gold
Chicken Creek
Fortymile District
ML 91 0100 1

Rock Products Inc. (UR)
Nanette E. Ameson
P.O. Box 876010
Wasilla, AK 99687
Sand and gravel
Various
Various Districts
ML 91 0298 1

Ron Roman (EIR)
P.O. Box 71614
Fairbanks, AK 99707
Gold
Fish Creek
Fairbanks District
ML 91 0283 1

John Roop (EIR)
P.O. Box 44
Chicken, AK 99732
Gold
40 Mile River
Fortymile District
ML 91 0392 1

Rosander Mining Co. (WR)
Ronald and T.J. Rosander
P.O. Box 129
McGrath, AK 99627
Gold
Colorado Creek
Innoko-Telstoi District
ML 91 0128 1

Rowallan Mine Partnership (SCR)
Vince Halverson
P.O. Box 91495
Anchorage, AK 99509
Gold
Valdez and White Creeks
Valdez Creek District
ML 91 0321 1

RSH Co. (SER)
Ralph Horecny
P.O. Box 211474
Auke Bay, AK 99821
Sand and gravel
Lemon Creek
Juneau District
ML 91 0180 1

John D. Rubel (EIR)
8183 Richardson Hwy.
Salcha, AK 99714
Gold
Democrat-Junction Creek Bench
Richardson District
ML 91 0367 1

7.5 Oz. Mining (WR)
Michael A. Sweetsir
P.O. Box 170
Ruby, AK 99768
Gold
Trail Creek
Ruby District
ML 91 0385 1

Wallace P. Saline (SCR)
P.O. Box 231
Girdwood, AK 99587
Gold
Canyon Creek
Seward District
ML 91 0123 1

Salter & Associates Inc. (EIR)
Ed Salter
P.O. Box 30
Manley Hot Springs, AK 99756
Gold
Joe Bush Creek
Hot Springs District
ML 91 0263 1

Dwayne Savage (EIR)
P.O. Box 10613
Fairbanks, AK 99710
Gold
Last Change Creek
Fairbanks District
ML 91 0373 1

Paul Sayer (SWR)
P.O. Box 10
Homer, AK 99603
Gold
Little, Bedrock, and Ester Creeks
Innoko District
ML 91 0229 1

Beatrice and Terry Schafer (EIR)
P.O. Box 55074
North Pole, AK 99705
Gold
Little Boulder Creek
Hot Springs District
ML 91 0240 1

Earl Louis Schene (EIR)
P.O. Box 66
Chicken, AK 99732
Gold
Uhler Creek
Fortymile District
ML 91 0244 1

John J. Schnabel (SER)
P.O. Box 149
Haines, AK 99827
Gold
Porcupine Creek
Porcupine District
ML 91 0065 1

David Schwegel and Richard Duthie (EIR)
2030 Yellow Snow Rd.
Fairbanks, AK 99709
Gold
Skoogie Creek
Fairbanks District
ML 91 0405 1

Jackie R. See (SCR)
541 Riviera Court
Fullerton, CA 90635
Gold
Mineral Creek
Copper River District
ML 91 0218 1

George Seuffert, Jr. (EIR)
7705 Port Orford Dr.
Anchorage, AK 99516
Gold
22 Pup
Circle District
ML 91 0188 1

George Seuffert, Jr. (EIR)
7705 Port Orford Dr.
Anchorage, AK 99516
Gold
Butte Creek
Circle District
ML 91 0191 1

Dennis Shepard (EIR)
P.O. Box 82504
Fairbanks, AK 99709
Gold
Dome Creek
Fairbanks District
ML 91 0457 1

John A. Shilling (EIR)
P.O. Box 81424
Fairbanks, AK 99708
Gold
Thanksgiving Creek
Rampart District
ML 91 0035 1

Shishmaref Native Corp. (WR)
General Delivery
Shishmaref, AK 99772
Sand and gravel
Region wide
Seward Peninsula
ML 91 0214 1

Shorham Resources (EIR)
W.L. Shaffer
316 Rio Verde
El Paso, TX 79912
Gold
Cache and Sullivan Creeks
Hot Springs District
ML 91 0189 1

Short Gulch Mining (WR)
Keith E. Tryck
P.O. Box 310
Girdwood, AK 99587
Gold
Ophir Creek
Ruby District
ML 91 0260 1

John Sipes (EIR)
2741 Perimeter Dr.
North Pole, AK 99705
Gold
Deadwood Creek
Circle District
ML 91 0097 1

Sivuqaq Inc. (WR)
P.O. Box 101
Gambell, AK 99742
Sand and gravel
Region wide
Seward Peninsula
ML 91 0002 1

Skookum Mining (EIR)
John Cole/Richard Blevins
P.O. Box 10139
Fairbanks, AK 99710
Gold
Portage Creek
Circle District
ML 91 0161 1

Sky Raven Inc. (EIR)
Norman Gordon Lafrum Boise
11 Nightingale Dr.
North Bay, ON, Canada P1A 2R1
Gold
Turch and Minnesota Creeks
Fortymile District
ML 91 0450 1

Slate Creek Mining (EIR)
M.H. Budd Williams
1724 Southgold St.
Centralia, WA 98531
Gold
Slate Creek
Rampart District
ML 91 0369 1

William Smith (SCR)
906 Cunningham
Anchorage, AK 99501
Gold
Silvertip Area
Seward District
ML 91 0224 1

Snow Lion Mining Co. (SER)
Jerry L. Fabrazio
1615 13th Ave.
Seattle, WA 98122
Gold
Porcupine Creek
Porcupine District
ML 91 0115 1

Hans Sobanja (EIR)
P.O. Box 10196
Fairbanks, AK 99710
Gold
Nome Creek
Circle District
ML 91 0372 1

Betty & Harold Soule (SCR)
2840 E. 142nd Ave.
Anchorage, AK 99516
Gold
Windy Creek
Yentna District
ML 91 0319 1

Sound Quarry Inc. (WR)
P.O. Box 2011
Nome, AK 99762
Sand and gravel
Cape Nome
Nome District
ML 91 0290 1

Spernak & Son Inc. (SCR)
James A. Spernak
8223 Sand Lake Rd.
Anchorage, AK 99502
Sand and gravel
--
Anchorage District
ML 91 0276 1

Sphinx Mining Inc. (WR)
P.O. Box 81978
Fairbanks, AK 99708
Gold
Monument Creek
Ruby District
ML 91 0471

Kelly Sprague (EIR)
Tom C. Van Ostrand
P.O. Box 314
Healy, AK 99743
Gold
Platt Creek
Bonnifield District
ML 91 0096 1

Spruce Creek Mining Co. (SWR)
John J. O'Carroll
1086 Coppet St.
Fairbanks, AK 99709
Gold
Spruce Creek
Innoko District
ML 91 0377 1

Stebbins Native Corp. (SCR)
P.O. Box 110
Stebbins, AK 99671
Sand and gravel
--
Anchorage District
ML 91 0179 1

Donald Stein (EIR)
105 Dunbar Ave.
Fairbanks, AK 99701
Gold
Twin and Pedro Creeks
Fairbanks District
ML 91 0186 1

Stepp-a-Long (EIR)
Vern Stepp/Grant Stepp
290 Pearl Dr.
Fairbanks, AK 99712
Gold
Bottom Dollar Creek
Circle District
ML 91 0101 1

Stevens Exploration (WR)
Vezey S. Allen
1048 W. Int. Airport Rd.
Anchorage, AK 99518
Gold
Hastings Creek
Nome District
ML 91 0058 1

Jackie J. Stewart (EIR)
P.O. Box 2607
Fairbanks, AK 99709
Gold
No Name Creek
Richardson District
ML 91 0071 1

Stone Boy Inc. (EIR)
WGM Inc.
P.O. Box 100059
Anchorage, AK 99510
Gold
N/A
Fairbanks District
ML 91 0432 1

Richard Stough (EIR)
P.O. Box 711
Wrangell, AK 99929
Gold
Dome Creek
Eagle District
ML 91 0078 1

Rosalyn Stowell (EIR)
177 Simpson Way
Fairbanks, AK 99712
Gold
Eureka Creek
Hot Springs District
ML 91 0163 1

Philip D. Strange (SCR)
P.O. Box 871478
Wasilla, AK 99687
Gold
Sidney Creek
Willow Creek District
ML 91 0476

Dennis Leon Stull (NR)
P.O. Box 55931
North Pole, AK 99705
Gold
Slate Creek
Koyukuk District
ML 91 0359 1

James W. Swan (NR)
452 Winter Ave.
Fairbanks, AK 99712
Gold
Gold Creek
Chandalar District
ML 91 0042 1

Ralph Swarthout (SCR)
Oscar H. Bailey
P.O. Box 14-1801
Anchorage, AK 99514
Gold
Ocean Beach
Yakataga District
ML 91 0120 1

Richard Swenson (EIR)
P.O. Box 16205
Two Rivers, AK 99716
Gold
Doric Creek
Hot Springs District
ML 91 0481

Swift Creek Mining Co. (WR)
Conrad H. House
3911 Tillison Way
North Pole, AK 99705
Gold
Swift Creek
Ruby District
ML 91 0020 1

Wayne Tachick (EIR)
P.O. Box 3503
Soldotna, AK 99669
Gold
Moose Creek
Bonnifield District
ML 91 0043 1

Joseph Taylor (EIR)
P.O. Box 80814
Fairbanks, AK 99708
Gold
Cleary Creek
Fairbanks District
ML 91 0487

Joseph Taylor (EIR)
P.O. Box 80814
Fairbanks, AK 99708
Gold
Phelan Creek
Delta District
ML 91 0271 1

Nell Thorneau (EIR)
P.O. Box 50
Chicken, AK 99732
Gold
Younger Creek
Fortymile District
ML 91 0273 1

Three M Mining (SCR)
Jack P. LaCross
P.O. Box 331
Soldotna, AK 99669
Gold
Twin Creek
Yentna District
ML 91 0113 1

Thurman Oil & Mining (EIR)
James L. Thurman
925 Aurora Dr.
Fairbanks, AK 99709
Gold
Fish Creek
Fairbanks District
ML 91 0355 1

Thurman Oil & Mining (EIR)
James L. Thurman
925 Aurora Dr.
Fairbanks, AK 99709
Gold
Eureka Creek
Hot Springs District
ML 91 0485

Robert L. Ticheval (SCR)
7808 Honey Suckle
Anchorage, AK 99502
Gold
Busch Creek
Nelchina District
ML 91 0146 1

Tilleson Mining & Reclamation (WR)
Harold C. and Naomi R. Tilleson
P.O. Box 55832
North Pole, AK 99705
Gold
California Creek
Ruby District
ML 91 0039 1

Tillcum Resources (EIR)
G. Bailey/Fred Cornelius
1615 Madison Dr.
Fairbanks, AK 99709
Gold
Fox Creek
Fairbanks District
ML 91 0130 1

Toklat Mining (SCR)
Jerry Lynn Jennings
744 E 13th, Suite 105
Anchorage, AK 99501
Gold
Bird Creek
Yentna District
ML 91 0183 1

Cynthia D. Toohey (SCR)
P.O. Box 113
Girdwood, AK 99587
Gold
Crow and Winner Creeks
Seward District
ML 91 0311 1

Totat 3 (EIR)
Thomas L. Swartwood
HC03 Box 8100-L
Palmer, AK 99645
Gold
Totatlanika River
Bonnifield District
ML 91 0374 1

Trans Alas-Can Gold (SCR)
3605 Arctic Blvd., #1382
Anchorage, AK 99503
Gold
White and Big Rusty Creeks
Valdez Creek District
ML 91 0278 1

Treasure Creek Mining (EIR)
Donald M. Read
P.O. Box 71638
Fairbanks, AK 99707
Gold
Vault Creek
Fairbanks District
ML 91 0099 1

Tri-Con Mining Inc. (NR)
P.O. Box 93730
Fairbanks, AK 99708
Gold
Nolan, Fay, and Archibald Creeks
Koyukuk District
ML 91 0413 1

Trinity Mining (WR)
Cheryl Jong
P.O. Box 1107
Nome, AK 99762
Gold
Washington Creek
Kougarok District
ML 91 0201 1

Tri-Valley Corp. (EIR)
2001 Westwind Dr.
Bakersfield, CA 93301
Gold
Democrat Creek
Richardson District
ML 91 0160 1; ML 91 0181 1

Tuluksak Dredging Ltd. (SWR)
Charles Awe, Jr.
737 E St.
Anchorage, AK 99501
Gold
Upper Tuluksak River
Aniak District
ML 91 0284 1

Tuluksak Dredging Ltd. (SWR)
NYAC Mining Co.
737 E St.
Anchorage, AK 99501
Gold
Granite Creek/Tuluksak River
Aniak District
ML 91 0119 1

Willis Umholtz (EIR)
316 Wedgewood, Apt. G-35
Fairbanks, AK 99701
Gold
Pedro Creek
Fairbanks District
ML 91 0180

Usibelli Coal Mine Inc. (EIR)
P.O. Box 1000
Healy, AK 99743
Coal
Poker Flats Mine
Bonnifield District
ML 91 0296 1

Betty K. Vellkanje (WR)
2600 Draper Dr.
Anchorage, AK 99517
Gold
Salmon River
Kougarok District
ML 91 0223 1

Rudy Vetter/Bill Studebaker (EIR)
P.O. Box 70342
Fairbanks, AK 99707
Gold
Half and Bottom Dollar Creeks
Circle District
ML 91 0412 1

Vision Valley Resources (NR)
Martha L. Warren Thomas
P.O. Box 10949
Fairbanks, AK 99710
Gold
Prospect Creek
Koyukuk District
ML 91 0126 1

Voytilla Mining Ventures (EIR)
Earl W. Voytilla
P.O. Box 58211
Fairbanks, AK 99711
Gold
Tenderfoot Creek
Richardson District
ML 91 0136 1

Betty Wagner-Krutzsch (WP)
P.O. Box 2496
Del Mar, CA 92014
Gold
Specimen Creek
Nome District
ML 91 0434 1

Wales Native Corp. (WR)
Walter Weuapuk
P.O. Box 529
Wales, AK 99783
Sand and gravel
Mile 2.6 E. Village Creek
Cape Nome District
ML 91 0398 1

Wales Native Corp. (WR)
Walter Weuapuk
P.O. Box 529
Wales, AK 99783
Sand and gravel
Mile .5 E Village Creek
Cape Nome District
ML 91 0399 1; ML 91 0400 1

James Walker/Dana Ostler (EIR)
2021 Pembroke St.
Anchorage, AK 99504
Gold
S. Fork 40 Mile River
Fortymile District
ML 91 0390 1

Jerald F. Walker (EIR)
P.O. Box 1046
Rough & Ready, CA 95975
Gold
South Fork of 40 Mile River
Fortymile District
ML 91 0210 1

Ross E. Walton (EIR)
1247 Hartzog Loop
North Pole, AK 99705
Gold
Dome Creek
Fairbanks District
ML 91 0169 1

Thomas P. Warhus (SCR)
P.O. Box 763
Cooper Landing, AK 99572
Gold
Dry Creek
Seward District
ML 91 0428 1

Helen H. Warner (EIR)
P.O. Box 80674
Fairbanks, AK 99708
Gold
Porcupine Creek
Circle District
ML 91 0162 1

Jim Watkins (SCR)
c/o Ron Mistler
P.O. Box 2871
Palmer, AK 99645
Gold
Falls Creek
Yentna District
ML 91 0302 1

Donald L. Watts (EIR)
P.O. Box 81515
Fairbanks, AK 99708
Gold
Grubstake and Pup Creeks
Bonnifield District
ML 91 0133 1

Douglas Weathers (SCR)
P.O. Box 8082
Nikiski, AK 99635
Gold
Cache Creek
Yentna District
ML 91 0326 1

Vernon Weaver (EIR)
Dennis Eich
6314 W Stockton Ave.
Atwater, CA 95301
Gold
Meyers Fork and Chicken Creek
Fortymile District
ML 91 0095 1

Steve Weber (EIR)
332 Slater Dr.
Fairbanks, AK 99701
Gold
Ketchum Creek
Circle District
ML 91 0139 1

Adrew Wescott (EIR)
1132 Lakeview Terrace
Fairbanks, AK 99701
Gold
Fox Creek
Fairbanks District
ML 91 0175 1

Western Arctic Mining (WR)
Kerry Blake
P.O. Box 543
Nome, AK 99762
Gold
Dome, Telegram, and Ready Creeks
Seward Peninsula District
ML 91 0242 1

W.G.M. Mining (SCR)
P.O. Box 187
Cantwell, AK 99729
Gold
White Creek
Valdez Creek District
ML 91 0427 1

White Bear Mining (SWR)
Harry Faulkner, Jr.
P.O. Box 1307
Bethel, AK 99559
Gold
Ophir Creek and Tributaries
Aniak District
ML 91 0416 1

Mark E. Whitmore (EIR)
P.O. Box 927
Slana, AK 99586
Gold
Moose Creek
Kantishna District
ML 91 0187 1

Wilbur or Ann Williams (SWR)
P.O. Box 93025
Anchorage, AK 99509
Gold
Granite Creek
Iditarod District
ML 91 0147 1

Wilder Construction Co. (SCR)
2006 N. State St.
Bellingham, WA 98225
Sand and gravel
--

Palmer District
ML 91 0282 1

Frank E. & Vivian D. Williford (EIR)
P.O. Box 10570
Fairbanks, AK 99710
Gold
Hoosier Creek
Rampart District
ML 91 0125 1

M.H. Budd Williams/W. Smith (EIR)
1724 South Gold St.
Centralia, WA 98531
Gold
Ruby Creek
Rampart District
ML 91 0358 1

Michael William/G. Matthews (EIR)
P.O. Box 603
Tok, AK 99780
Gold
Alien Creek
Fairbanks District
ML 91 0348 1

Willis Mine Services (EIR)
Willis Dean/Stanley M. Gelvin
P.O. Box 30063
Central, AK 99730
Gold
Ketchum Creek
Circle District
ML 91 0076 1

Willis Mine Services (EIR)
Eleanor G. Hosner
P.O. Box 30063VE
Central, AK 99730
Gold
Slate Creek, Green Horn Gulch
Hot Springs District
ML 91 0486

David L. Wilmarth and
Whaley M. Dickmann (SWR)
P.O. Box 111037
Anchorage, AK 99511
Gold
Julian Creek
Iditarod District
ML 91 0008 1

Richard Wilmarth (SWR)
P.O. Box 33
Red Devil, AK 99656
Gold
Chicken Creek
Iditarod District
ML 91 0219 1

Lavia L. Wilson-Shemel (SCR)
HC 31, Box 5187-A
Wasilla, AK 99687
Gold
Little Dollar Creek
Seward District
ML 91 0144 1

Kenneth Wise (EIR)
P.O. Box 212313
Anchorage, AK 99521
Gold
Mosquito Fork 40 Mile River
Fortymile District
ML 91 0202 1

Wolff Mining Co. (EIR)
Robert V. Wolff
Boundary Via
Tok, AK 99780
Gold
Walker Fork
Fortymile District
ML 91 0207 1

James Lee Wood (EIR)
P.O. Box 58597
Fairbanks, AK 99711
Gold
Little Boulder Creek
Hot Springs District
ML 91 0045 1

Charles B. Woodruff (WR)
P.O. Box 2278
Fairbanks, AK 99707
Gold
Bitzshtini Mountain
Mt. McKinely/McGrath District
ML 91 0333 1

Bill Woodward & Karl Schmitz (SCR)
801 Airport Heights, #297
Anchorage, AK 99508
Gold
Peters and Deep Creeks

Yentna District
ML 91 0222 1

L.E. and Marilyn Wyrick (SWR)
P.O. Box 261
McGrath, AK 99627
Gold
Granite and Homestake Creeks
Iditarod District
ML 91 0082 1

Yukon Mining Co. Inc. (WR)
P.O. Box 101454
Anchorage, AK 99510
Gold
Golden and Illinois Creeks
Gold Hill-Melozitna District
ML 91 0073 1

Yutana Construction Co. (EIR)
Lewis F. Vondra
P.O. Box 71775
Fairbanks, AK 99707
Basalt Rock
Browns Hill
Fairbanks District
ML 91 0215 1

Eddra Ziegler/T.E. Holloway (EIR)
5253 Calle Redona
Phoenix, AZ 85018
Gold
Portage Creek
Circle District
ML 91 0172 1

George Zimmer (SCR)
P.O. Box 140174
Anchorage, AK 99514
Gold
Quartz Creek
Seward District
ML 91 0062 1

George W. Zimmer (SCR)
P.O. Box 140174
Anchorage, AK 99514
Gold
Quartz Creek
Seward District
ML 91 0011 1
Fairbanks, AK 99707
Gold
Upper Dome Creek
Fairbanks District
ML 91 0250 1

APPENDIX F
Primary metals production in Alaska, 1880-1991[a]

Year	Gold		Silver		Mercury		Antimony		Tin		Lead		Zinc		Platinum		Copper		Chromium	
	(oz)	(m$)	(oz)	(t$)	(flask[b])	(t$)	(lb)	(t$)	(lb)	(t$)	(tons)	(t$)	(tons)	(m$)	(oz)	(t$)	(lb)	(m$)	(tons)	(t$)
1880-1899	1,153,889	23.85	496,101	329.0	--	--	--	--	--	--	250	17.0	--	--	--	--	--	--	--	--
1900	395,030	8.17	73,300	45.5	--	--	--	--	--	--	40	3.4	--	--	--	--	--	--	--	--
1901	335,369	6.93	47,900	28.6	--	--	--	--	--	--	40	3.4	--	--	--	--	250,000	0.04	--	--
1902	400,709	8.28	92,000	48.5	--	--	--	--	30,000	8.0	30	2.5	--	--	--	--	360,000	0.04	--	--
1903	420,069	8.68	143,600	77.8	--	--	--	--	50,000	14.0	30	2.5	--	--	--	--	1,200,000	0.16	--	--
1904	443,115	9.16	198,700	114.9	--	--	--	--	28,000	8.0	30	2.5	--	--	--	--	2,043,586	0.28	--	--
1905	756,101	15.63	132,174	80.2	--	--	--	--	12,000	4.0	30	2.6	--	--	--	--	4,805,236	0.75	--	--
1906	1,066,030	22.04	203,500	136.4	--	--	--	--	68,000	38.6	30	3.4	--	--	--	--	5,871,811	1.13	--	--
1907	936,043	19.35	149,784	98.8	--	--	--	--	44,000	16.8	30	3.2	--	--	--	--	6,308,786	1.26	--	--
1908	933,290	19.29	135,672	71.9	--	--	--	--	50,000	15.2	40	3.4	--	--	--	--	4,585,362	0.61	--	--
1909	987,417	20.41	147,950	76.9	--	--	--	--	22,000	7.6	69	5.9	--	--	--	--	4,124,705	0.54	--	--
1910	780,131	16.13	157,850	85.2	--	--	--	--	20,000	8.3	75	6.6	--	--	--	--	4,241,689	0.54	--	--
1911	815,276	16.85	460,231	243.9	--	--	--	--	122,000	52.8	51	4.5	--	--	--	--	27,267,778	3.40	--	--
1912	829,436	17.14	515,186	316.8	--	--	--	--	260,000	119.6	45	4.1	--	--	--	--	29,230,491	4.82	--	--
1913	755,947	15.63	362,563	218.9	--	--	--	--	100,000[c]	44.1[c]	6	0.6	--	--	--	--	21,659,958	3.35	--	--
1914	762,596	15.76	394,805	218.3	--	--	--	--	208,000	66.6	28	1.3	--	--	--	--	21,450,628	2.85	--	--
1915	807,966	16.70	1,071,782	543.3	--	--	520,000	W	204,000	78.8	437	41.1	--	--	--	--	86,509,312	15.14	--	--
1916	834,068	17.24	1,379,171	907.4	--	--	1,200,000	W	278,000	121.0	820	113.2	--	--	8	0.7	119,654,839	29.50	--	--
1917	709,049	14.66	1,239,150	1,020.6	--	--	500,000	W	200,000	123.3	852	146.6	--	--	53	5.5	88,793,400	24.40	1,100	W
1918	458,641	9.48	847,783	847.8	--	--	540,000	W	136,000	118.0	564	80.1	--	--	284	36.6	69,224,951	17.10	1,100	W
1919	455,984	9.42	629,708	705.3	--	--	--	--	112,000	73.4	687	72.1	--	--	569	73.7	47,220,771	8.80	--	--
1920	404,683	8.37	953,546	1,039.7	--	--	--	--	32,000	16.1	875	140.0	--	--	1,478	160.1	70,435,363	13.00	--	--
1921	390,558	8.07	761,085	761.1	45	1.5	--	--	8,000	2.4	759	68.3	--	--	40	2.7	57,011,597	7.40	--	--
1922	359,057	7.42	729,945	729.9	--	--	--	--	2,800	0.9	377	41.5	--	--	29	2.8	77,967,819	10.50	--	--
1923	289,539	5.98	814,649	668.1	--	--	--	--	3,800	1.6	410	57.4	--	--	--	--	85,920,645	12.60	--	--
1924	304,072	6.29	669,641	448.6	2	0.3	--	--	14,000	7.1	631	100.9	--	--	28	2.6	74,074,207	9.70	--	--
1925	307,679	6.36	698,259	482.4	44	3.6	W	W	28,600	15.4	789	140.6	--	--	10	1.2	73,055,298	10.30	--	--
1926	324,450	6.70	605,190	37..0	22	1.7	W	W	16,000	10.4	778	124.4	--	--	3,570	274.5	67,778,000	9.49	--	--
1927	286,720	5.97	350,430	215.0	--	--	--	--	53,400	34.0	1,008	127.0	--	--	--	--	55,343,000	7.25	--	--
1928	331,140	6.85	351,730	187.0	--	--	--	--	82,000	41.0	1,019	118.0	--	--	120	9.0	41,421,000	5.96	--	--
1929	375,438	7.76	472,900	252.0	4	0.5	--	--	77,200	35.0	1,315	166.0	--	--	475	32.0	40,570,000	7.13	--	--
1930	408,983	8.47	408,570	157.3	--	--	--	--	29,400	9.3	1,365	136.5	--	--	--	--	32,651,000	4.24	--	--
1931	459,000	9.51	352,000	102.0	15	1.2	--	--	8,200	2.0	1,660	1[illegible]	--	--	393	14.0	22,614,000	1.88	--	--
1932	493,860	10.20	234,050	66.0	8	0.5	--	--	--	--	1,260	[illegible]	--	--	--	--	8,738,500	0.55	--	--
1933	469,286	9.70	154,700	55.0	--	--	--	--	5,800	2.3	1,157	82.6	--	--	605	18.6	29,000	0.02	--	--
1934	537,281	8.78	154,700	100.0	--	--	--	--	8,200[c]	4.3	839	62.1	--	--	2,555	85.6	121,000	0.06	--	--
1935	469,495	16.43	286,600	206.0	--	--	--	--	98,800	49.8	815	65.2	--	--	8,685	259.6	15,056,000	1.25	--	--
1936	540,580	18.92	484,306	375.0	--	--	--	--	226,000	105.0	941	86.6	--	--	5,654	241.9	39,267,000	3.72	--	--
1937	627,940	21.98	494,340	382.0	--	--	962,000	147.6	372,000[c]	202.3[c]	823	97.1	--	--	9,823	313.4	36,007,000	4.74	--	--
1938	662,000	23.17	479,853	310.0	8	0.6	444,000	54.8	210,000	89.1	994	91.5	--	--	41,000	2,460.0	29,760,000	2.98	--	--
1939	676,780	23.68	201,054	136.5	--	--	210,000	25.9	66,000	38.0	937	88.1	--	--	33,900	2,034.0	278,500	0.04	--	--
1940	755,900	26.45	191,679	136.3	156[d]	130.9	306,000	42.8	92,000	52.0	840	72.0	--	--	28,886	1,093.0	110,000	0.02	--	--
1941	692,314	24.23	199,700	142.0	W	W	774,000	87.3	92,500[c]	61.0[c]	742	58.0	--	--	22,630	813.0	144,000	0.02	--	--
1942	487,657	17.07	135,200	96.0	W	W	316,000	41.0	5,600	2.5	523	44.0	--	--	22,000	779.0	48,000	0.01	--	--
1943	99,583	3.49	31,700	22.0	786	153.4	368,000	33.3	2,000[c]	1.0[c]	200	22.0	-	--	27,900	1,020.0	54,000	0.01	5,564	186.3
1944	49,296	1.73	15,240	10.8	841	165.0	70,080	30.0	--	--	44	5.8	--	--	33,616	2,017.0	4,000	0.01	1,845	64.6
1945	68,117	2.38	9,983	6.2	275	180.0	W	W	--	--	11	1.8	--	--	22,949	1,377.0	10,000	0.01	--	--
1946	226,781	7.93	41,793	26.3	699	68.7	W	W	--	--	115	25.0	--	--	22,882	1,418.7	4,000	0.01	--	--
1947	279,988	9.79	66,150	46.3	127	10.6	52,000	16.1	2,000	2.2	255	76.5	226	0.15	13,512	1,351.2	24,000	0.06	--	--
1948	248,395	8.69	67,341	58.7	108	7.8	88,000	29.3	10,000	10.8	317	88.9	226	0.15	13,741	1,209.2	28,000	0.07	--	--
1949	229,416	8.03	36,056	32.4	102	7.9	88,000	31.3	114,000	100.8	49	11.2	226	0.15	17,169	1,545.2	7,700	0.02	--	--

[a]From 34 State and Federal documents.
[b]76-lb flask.
[c]When state and federal figures differ significantly, state figures are used.
[d]Not traceable by year.
[e]Crude platinum; total production of refined metal is about 575,000 oz.

W = Withheld.
-- = Not reported.
t$ = Thousand dollars.
m$ = Million dollars.

Continued on next page

CORRECTION

THIS DOCUMENT
HAS BEEN REPHOTOGRAPHED
TO ASSURE LEGIBILITY

APPENDIX I
Primary metals production in Alaska, 1880-1991[a]

Year	Gold (oz)	Gold (m$)	Silver (oz)	Silver (t$)	Mercury (flask[b])	Mercury (t$)	Antimony (lb)	Antimony (t$)	Tin (lb)	Tin (t$)	Lead (tons)	Lead (t$)	Zinc (tons)	Zinc (m$)	Platinum (oz)	Platinum (t$)	Copper (lb)	Copper (m$)	Chromium (tons)	Chromium (t$)
1880-1899	1,153,889	23.85	496,101	329.0	--	--	--	--	--	--	250	17.0	--	--	--	--	--	--	--	--
1900	395,030	8.17	73,300	45.5	--	--	--	--	--	--	40	3.4	--	--	--	--	--	--	--	--
1901	335,369	6.93	47,900	28.6	--	--	--	--	--	--	40	3.4	--	--	--	--	250,000	0.04	--	--
1902	400,709	8.28	92,000	48.5	--	--	--	--	30,000	8.0	30	2.5	--	--	--	--	360,000	0.04	--	--
1903	420,669	8.68	143,600	77.8	--	--	--	--	50,000	14.0	30	2.5	--	--	--	--	1,200,000	0.16	--	--
1904	443,115	9.16	198,700	114.9	--	--	--	--	28,000	8.0	30	2.5	--	--	--	--	2,043,596	0.28	--	--
1905	756,101	15.63	132,174	80.2	--	--	--	--	12,000	4.0	30	2.6	--	--	--	--	4,805,236	0.75	--	--
1906	1,065,030	22.04	203,300	136.4	--	--	--	--	68,000	38.6	30	3.4	--	--	--	--	5,871,811	1.13	--	--
1907	936,043	19.35	149,784	98.8	--	--	--	--	44,000	16.8	30	3.2	--	--	--	--	6,308,786	1.26	--	--
1908	933,290	19.29	135,672	71.9	--	--	--	--	50,000	15.2	40	3.4	--	--	--	--	4,585,362	0.61	--	--
1909	987,417	20.41	147,950	76.9	--	--	--	--	22,000	7.6	59	5.9	--	--	--	--	4,124,705	0.54	--	--
1910	780,131	16.13	157,850	85.2	--	--	--	--	20,000	8.3	75	6.6	--	--	--	--	4,241,689	0.54	--	--
1911	815,276	16.85	460,231	243.9	--	--	--	--	122,000	52.8	51	4.5	--	--	--	--	27,267,778	3.40	--	--
1912	829,436	17.14	515,186	316.8	--	--	--	--	260,000	119.6	45	4.1	--	--	--	--	29,230,491	4.82	--	--
1913	755,947	15.63	362,563	218.9	--	--	--	--	100,000[c]	44.1[c]	6	0.6	--	--	--	--	21,659,958	3.35	--	--
1914	762,596	15.76	394,805	218.3	--	--	--	--	208,000	66.6	28	1.3	--	--	--	--	21,450,628	2.85	--	--
1915	807,966	16.70	1,071,782	543.3	--	--	520,000	W	204,000	78.8	437	41.1	--	--	--	--	86,509,312	15.14	--	--
1916	834,068	17.24	1,379,171	907.4	--	--	1,200,000	W	278,000	121.0	820	113.2	--	--	8	0.7	119,654,839	29.50	--	--
1917	709,049	14.66	1,239,150	1,020.6	--	--	500,000	W	200,000	123.2	852	146.6	--	--	53	5.5	88,793,400	24.40	1,100	W
1918	458,641	9.48	847,789	847.8	--	--	540,000	W	136,900	118.0	564	80.1	--	--	284	36.6	69,224,951	17.10	1,100	W
1919	455,984	9.42	629,708	705.3	--	--	--	--	112,000	73.4	687	72.1	--	--	569	73.7	47,220,771	8.80	--	--
1920	404,633	8.37	953,546	1,039.7	--	--	--	--	32,000	16.1	875	140.0	--	--	1,478	160.1	70,435,363	13.00	--	--
1921	390,558	8.07	761,085	761.1	45	1.5	--	--	8,000	2.4	759	68.3	--	--	40	2.7	57,011,597	7.40	--	--
1922	359,057	7.42	729,945	729.9	--	--	--	--	2,800	0.9	377	41.5	--	--	29	2.8	77,967,819	10.50	--	--
1923	289,539	5.98	814,649	668.1	--	--	--	--	3,800	1.6	410	57.4	--	--	--	--	85,920,645	12.60	--	--
1924	304,072	6.29	669,641	448.6	2	0.3	--	--	14,000	7.1	631	100.9	--	--	28	2.6	74,074,207	9.70	--	--
1925	307,679	6.36	698,259	482.4	44	3.6	W	W	28,600	15.4	789	140.6	--	--	10	1.2	73,055,298	10.30	--	--
1926	324,450	6.70	605,190	377.0	22	1.7	W	W	16,000	10.4	778	124.4	--	--	3,570	274.5	67,778,000	9.49	--	--
1927	296,720	5.97	350,430	215.0	--	--	--	--	53,400	24.0	1,008	127.0	--	--	--	--	55,343,000	7.25	--	--
1928	331,140	6.85	351,730	187.0	--	--	--	--	82,000	41.0	1,019	118.0	--	--	120	9.0	41,424,000	5.96	--	--
1929	375,438	7.76	472,960	252.0	4	0.5	--	--	77,200	35.0	1,315	166.0	--	--	475	32.0	40,570,000	7.13	--	--
1930	408,983	8.47	408,570	157.3	--	--	--	--	29,400	9.3	1,365	136.5	--	--	--	--	32,651,000	4.24	--	--
1931	459,000	9.51	352,000	102.0	15	1.2	--	--	8,200	2.0	1,560	126.0	--	--	393	14.0	22,614,000	1.88	--	--
1932	493,860	10.20	234,050	66.0	8	0.5	--	--	--	--	1,260	75.6	--	--	--	--	8,738,500	0.55	--	--
1933	469,286	9.70	154,700	55.0	--	--	--	--	5,800	2.3	1,157	85.6	--	--	605	18.6	29,000	0.02	--	--
1934	537,281	8.78	154,700	100.0	--	--	--	--	8,200[c]	4.3	839	62.1	--	--	2,555	85.6	121,000	0.06	--	--
1935	469,495	16.43	286,600	206.0	--	--	--	--	98,800	49.8	815	65.2	--	--	8,685	259.6	15,056,000	1.25	--	--
1936	540,580	18.92	484,306	375.0	--	--	--	--	226,000	105.0	941	86.6	--	--	5,654	241.9	39,267,000	3.72	--	--
1937	627,940	21.98	494,340	382.0	--	--	962,000	147.6	372,000[c]	202.3[c]	823	97.1	--	--	9,823	313.4	36,007,000	4.74	--	--
1938	662,000	23.17	479,853	310.0	8	0.6	444,000	54.8	210,000	89.1	994	91.5	--	--	41,000	2,460.0	29,760,000	2.98	--	--
1939	676,780	23.68	201,054	136.5	--	--	210,000	25.9	66,000	38.0	937	88.1	--	--	33,900	2,034.0	278,500	0.04	--	--
1940	755,900	26.45	191,679	136.3	156[c]	130.9	306,000	42.8	92,000	52.0	840	72.0	--	--	28,886	1,093.0	110,000	0.02	--	--
1941	692,314	24.23	199,700	142.0	W	W	774,000	87.3	93,660[c]	61.0[c]	742	58.0	--	--	22,630	813.0	144,000	0.02	--	--
1942	487,657	17.07	135,200	96.0	W	W	316,000	41.0	5,600	2.5	523	44.0	--	--	22,000	779.0	48,000	0.01	--	--
1943	99,583	3.49	31,700	22.0	786	153.4	368,000	33.3	2,000[c]	1.0[c]	200	22.0	--	--	27,900	1,020.0	54,000	0.01	5,564	186.3
1944	49,296	1.73	15,240	10.8	841	165.0	70,080	30.0	--	--	44	5.8	--	--	33,616	2,017.0	4,000	0.01	1,845	64.6
1945	68,117	2.38	9,983	6.2	275	180.0	W	W	--	--	11	1.8	--	--	22,949	1,377.0	10,000	0.01	--	--
1946	226,781	7.93	41,793	26.3	699	68.7	W	W	--	--	115	25.0	--	--	22,882	1,418.7	4,000	0.01	--	--
1947	279,988	9.79	66,150	46.3	127	10.6	52,000	16.1	2,000	2.2	255	76.5	226	0.15	13,512	1,351.2	24,000	0.06	--	--
1948	248,395	8.69	67,341	58.7	108	7.8	88,000	29.3	10,000	10.8	317	88.9	226	0.15	13,741	1,209.2	28,000	0.07	--	--
1949	229,416	8.03	36,056	32.4	107	7.9	88,000	31.3	114,000	100.8	49	11.2	226	0.15	17,169	1,545.2	7,700	0.02	--	--

[a]From 34 State and Federal documents.
[b]76-lb flask.
[c]When state and federal figures differ significantly, state figures are used.
[d]Not traceable by year.
[e]Crude platinum; total production of refined metal is about 575,000 oz.

W = Withheld.
-- = Not reported.
t$ = Thousand dollars.
m$ = Million dollars.

Continued on next page

APPENDIX F
continued

Year	Gold (oz)	Gold (m$)	Silver (oz)	Silver (t$)	Mercury (flask[b])	Mercury (t$)	Antimony (lb)	Antimony (t$)	Tin (lb)	Tin (t$)	Lead (tons)	Lead (t$)	Zinc (tons)	Zinc (m$)	Platinum (oz)	Platinum (t$)	Copper (lb)	Copper (m$)	Chromium (tons)	Chromium (t$)
1950	289,285	10.13	52,638	48.0	W	W	W	W	158,000	170.3	144	27.5	--	--	W	W	12,000	0.03	--	--
1951	239,628	8.38	32,870	29.8	28	W	1,718,000	2,061.6	138,000	198.0	21	7.2	--	--	W	W	2,000	0.01	--	--
1952	240,571	8.42	31,825	28.7	40	W	740,000	1,406.0	180,000	243.9	1	0.3	--	--	W	W	--	--	W	W
1953	253,771	8.88	35,387	32.1	1,023	270.0	W	W	98,000	105.9	--	--	--	--	W	W	--	--	W	W
1954	248,511	8.70	33,694	31.8	1,046	276.0	--	--	398,000	409.9	--	--	--	--	W	W	8,000	0.02	2,953	208.0
1955	249,294	8.73	33,693	30.4	43	12.0	--	--	172,000	182.5	1	0.3	--	--	W	W	2,000	0.01	7,082	625.3
1956	204,300	7.33	26,700	24.1	3,414	837.0	134,400	150.0	--	--	1	0.3	--	--	W	W	--	--	7,200	711.5
1957	215,467	7.54	28,862	26.0	5,461	1,349.0	71,120	80.0	--	--	9	3.0	--	--	W	W	--	--	4,207	431.0
1958	186,000	6.53	24,000	22.0	3,380	774.0	--	--	--	--	--	--	--	--	W	W	10,000	0.03	--	--
1959	171,000	5.99	22,000	20.0	3,750	852.0	--	--	--	--	--	--	--	--	W	W	72,000	0.04	--	--
1960	180,000	6.30	23,000	21.0	4,450	938.0	W	W	--	--	--	--	--	--	W	W	82,000	0.04	--	--
1961	114,228	3.99	--	--	4,080	816.0	--	--	--	--	--	--	--	--	W	W	184,000	0.06	--	--
1962	165,142	5.78	--	--	3,843	711.0	--	--	--	--	--	--	--	--	W	W	--	--	--	--
1963	99,000	3.48	6,1[illegible]9	9.0	400	76.0	W	W	--	--	5	1.1	--	--	W	W	--	--	--	--
1964	58,000	2.05	7,200	6.0	303	95.0	46,400	60.3	--	--	--	--	--	--	W	W	22,000	0.01	--	--
1965	43,000	1.51	5,000	6.0	180	104.0	46,400	60.3	--	--	14	4.0	--	--	W	W	64,000	0.03	--	--
1966	27,325	0.96	7,000	9.0	185	101.0	16,000	19.2	--	--	19	4.3	--	--	W	W	--	--	--	--
1967	22,948	0.80	6,000	9.0	161	79.0	20,000	22.0	--	--	--	--	--	--	W	W	W	W	--	--
1968	21,000	0.81	3,000	6.5	156	78.0	6,000	6.0	--	--	--	--	--	--	W	W	--	--	--	--
1969	21,227	0.88	2,000	4.2	238	100.0	94,000	100.0	--	--	2	0.5	--	--	W	W	--	--	--	--
1970	38,400	1.38	4,000	7.0	3,100	1,260.0	365,000	410.0	--	--	--	--	--	--	W	W	W	W	--	--
1971	34,000	1.36	2,000	4.0	675	285.0	68,000	74.0	34,000	47.0	--	--	--	--	W	W	--	--	--	--
1972	8,639[c]	0.56	1,000	2.0	125	44.0	160,000	185.0	W	W	--	--	--	--	W	W	--	--	--	--
1973	15,000[c]	1.86	13,200	22.0	70	52.5	420,000	515.0	10,000	12.0	6	2.0	--	--	W	W	--	--	--	--
1974	16,000[c]	2.56	1,500	3.5	70	52.5	80,000	95.0	W	W	--	--	--	--	W	W	--	--	--	--
1975	14,980[c]	3.35	6,000	25.0	--	--	120,000	145.0	22,000	60.0	--	--	--	--	W	W	--	--	--	--
1976	22,887[c]	6.90	6,500	24.0	--	--	160,000	165.0	W	W	14	6.0	--	--	W	W	--	--	8,000[c]	1,200.0[c]
1977	50,000	7.80	8,000	20.0	--	--	W	W	W	W	--	--	--	--	--	--	--	--	--	--
1978	60,000[c]	12.00	6,000	50.0	--	--	W	W	W	W	--	--	--	--	--	--	--	--	--	--
1979	65,000[c]	18.00	6,500	93.0	--	--	100,000	125.0	100,000	830.0	--	--	--	--	--	--	--	--	--	--
1980	75,000[c]	32.00	7,500	111.0	--	--	--	--	120,000	984.0	31	29.0	--	--	--	--	--	--	--	--
1981	134,200[c]	55.20	13,420	111.3	W	W	--	--	105,000	700.0	--	--	--	--	900	200.0	--	--	--	--
1982	175,000[c]	69.90	22,000	198.0	--	--	--	--	198,000	1,365.0	--	--	--	--	W	W	--	--	--	--
1983	169,000[c]	67.60	33,200	332.0	--	--	22,400	45.0	215,000	1,100.0	--	--	--	--	W	W	--	--	--	--
1984	175,000[c]	62.13	20,000	159.0	5	1.5	135,000	225.8	225,000	400.0	--	--	--	--	W	W	--	--	--	--
1985	190,000	61.18	28,500	171.0	27	10.0	65,000	98.0	300,000	650.0	--	--	--	--	--	--	--	--	--	--
1986	160,000[c]	60.80	24,000	134.4	12	2.8	45,000	67.5	340,000	890.0	--	--	--	--	W	W	--	--	--	--
1987	229,707	104.51	54,300	391.0	--	--	--	--	288,000	460.0	--	--	--	--	W	W	--	--	--	--
1988	265,50[illegible]	112.84	47,790	382.0	W	W	--	--	300,000	950.0	--	--	--	--	25	13.8	--	--	--	--
1989	284,6[illegible]	108.7	5,211,591	27,300.0	--	--	--	NR	194,000	672.0	9,585	7,700.0	19,843	29,400.0	--	--	--	--	--	--
1990	231,[illegible]00	89.20	10,13[illegible],000	50,675.0	--	--	--	--	57,000	200.0	44,220	30,954.0	181,200	253,680.0	--	--	--	--	--	--
1991	243,900	88.29	9,076,854	39,110.0					6,800	22.1	69,591	33,403.7	278,221	278,221.0	15	5.3	--	--	--	--
Other[d]	--	--	--	--	1,438	--	--	--	--	--	--	--	--	--	333,936	46,940.3	--	--	--	--
TOTAL (metric)	32,600,371 (1,014 tonnes)	1,716.51	44,441,130 (1,379 tonnes)	133,432.4	40,945 (1,411,521 kg)	9,910.5	11,070,800 (5,021 tonnes)	6,655.1	7,265,200 (3,295 tonnes)	12,467.0	149,696 (135,744 tonnes)	75,066.8	479,234 (434,665 tonnes)	561,221.4	668,537[e] (20,793 kg)	65,811.2	1,373,793,932 (632,152 tonnes)	228.04	39,951 (35,419 tonnes)	3,425.7

[a]From 34 State and Federal documents.
[b]76-lb flask.
[c]When state and federal figures differ significantly, state figures are used.
[d]Not traceable by year.
[e]Crude platinum; total production of refined metal is about 575,000 oz.

W = Withheld.
-- = Not reported.
t$ = Thousand dollars.
m$ = Million dollars.

APPENDIX G

Production of industrial minerals, coal, and other commodities in Alaska, 1880-1991

Year	Coal		Sand and gravel		Building stone[a]		Barite		Other[b]
	s. tons	m$	s. tons	m$	s. tons	m$	s. tons	t$	$
1880-1899[c]	19,429	0.14	--	--	7,510	0.04	--	--	--
1900	1,200[d]	0.02[d]	--	--	510	0.01	--	--	--
1901	1,300[d]	0.02[d]	--	--	700	0.01	--	--	500
1902	2,212[d]	0.02[d]	--	--	800	0.01	--	--	255
1903	1,447	0.01	--	--	920	0.01	--	--	389
1904	1,694	0.01	--	--	1,080	0.02	--	--	2,710
1905	3,774	0.02	--	--	970	0.02	--	--	740
1906	5,541	0.02	--	--	2,863	0.03	--	--	19,965
1907	10,139	0.05		--	3,899	0.03	--	--	54,512
1908	3,107[d]	0.01[d]	--	--	2,176	0.03	--	--	81,305
1909	2,800	0.02	--	--	1,400	0.01	--	--	86,027
1910	1,000[d]	0.01[d]	--	--	W	W	--	--	96,408
1911	900[d]	0.01[d]	--	--	W	W	--	--	145,739
1912	355[d]	0.01[d]	--	--	W	W	--	--	165,342
1913	2,300	0.01	--	--	W	W	--	--	286,277
1914	1,190	0.01	--	--	W	W	--	--	199,767
1915	1,400	0.03	--	--	W	W	--	--	205,061
1916	12,676	0.05	--	--	W	W	--	--	326,731
1917	54,275	0.27	--	--	W	W	--	--	203,971
1918	75,816	0.41	--	--	W	W	--	--	171,452
1919	60,894	0.35	--	--	50,014	0.29	--	--	214,040
1920	61,111	0.36	--	--	37,044	0.27	--	--	372,599
1921	76,817	0.49	--	--	59,229	0.31	--	--	235,438
1922	79,275	0.43	--	--	54,251	0.30	--	--	266,296
1923	119,826	0.76	--	--	83,586	0.41	--	--	229,486
1924	99,663	0.56	--	--	35,294	0.26	--	--	348,728
1925	82,868	0.40	--	--	32,193	0.19	--	--	454,207
1926	87,300	0.46	--	--	33,283	0.20	--	--	423,000
1927	104,300	0.55	--	--	41,424	0.22	--	--	--
1928	126,100	0.66	--	--	63,347	0.31	--	--	--
1929	100,600	0.53	--	--	54,766	0.26	--	--	194,000
1930	120,100	0 63	--	--	66,234	0.33	--	--	157,300
1931	105,900	0.5[illegible]	--	--	59,175	0.29	--	--	108,000
1932	102,700	0.53	--	--	54,167	0.27	--	--	223,400
1933	[illegible],200	0.48	--	--	56,291	0.28	--	--	--
1934	107,500	0.45	--	--	64,234	0.36	--	--	46,155
1935	119,425	0.50	--	--	74,049	0.38	--	--	46,755
1936	136,593	0.57	--	--	76,379	0.38	--	--	45,807
1937	131,600	0.55	--	--	50,057	0.25	--	--	147,048
1938	159,230	0.62	--	--	189,090	0.21	--	--	125,302
1939	143,549	0.60	42,332	0.02	--	--	--	--	--
1940	170,174	0.88	515,011	0.10	--	--	--	--	--
1941	241,250	0.97	530,997	0.09	--	--	--	--	1,367,000
1942	246,600	0.99	W	W	--	--	--	--	1,124,000
1943	289,232	1.84	W	W	--	--	--	--	--
1944	352,000	2.37	712,496	0.50	--	--	--	--	2,350,309
1945	297,644	1.87	W	W	--	--	--	--	5,910,704
1946	368,000	2.36	W	W	--	--	--	--	2,005,241
1947	361,220	2.55	W	W	219,000	1.00	--	--	5,927,319
1948	407,906	2.79	W	W	67,341	0.33	--	--	1,257,699
1949	455,000	3.60	W	W	W	W	--	--	7,181,886

[a]Building-stone production figures for 1880-1937 are for the southcentral and interior regions of Alaska only.
[b]Includes 2.4 million lb U_3O_8 (1955-71); 505,000 tons gypsum (1905-26); 286,000 lb WO_3 (intermittently 1916-80); 94,000 lb asbestos (1942-44); 540,000 lb graphite (1917-18; and 1942-50); and undistributed amounts of zinc, jade, peat, clay, soapstone, miscellaneous gemstones, and other commodities (1880-1985).
[c]Production not traceable by year.
[d]When state (territorial) and federal figures differ significantly, state figures are used. Figures for sand and gravel production in 1974 show state estimates (118,740,000 s. tons; 240.94 m$) and federal (42,614,000 s. tons; 88.96 m$). The federal estimate was not added to total production.
[e]Marble quarried on Prince of Wales Island, southeastern Alaska (1900-41).
m$ = Million dollars.
t$ = Thousand dollars.
-- = Not reported.
W = Withheld.

Year	Coal		Sand and gravel		Building stone[a]		Barite		Other[b]
	s. tons	m$	s. tons	m$	s. tons	m$	s. tons	t$	$
1950	421,455	3.03	3,050,020	2.38	W	W	--	--	2,100,000
1951	494,333	3.77	6,818,000	3.54	W	W	--	--	3,600,000
1952	648,000	5.77	6,817,800	3.54	W	W	--	--	9,052,000
1953	861,471	8.45	7,689,014	5.08	47,086	0.17	--	--	1,231,350
1954	666,618	6.44	6,639,638	4.90	283,734	0.47	--	--	1,572,150
1955	639,696	5.76	9,739,214	8.24	265,740	0.29	--	--	1,552,427
1956	697,730	6.37	9,100,000	8.30	50,000	0.02	--	--	1,551,500
1957	842,338	7.30	6,096,000	8.79	528,000	1.95	--	--	2,751,000
1958	759,000	6.93	4,255,000	3.87	615,000	2.07	--	--	695,000
1959	602,000[d]	5.88[d]	5,600,000	5.10	54,000	0.20	--	--	1,338,000
1960	669,000[d]	5.95[d]	5,892,000	5.35	80,000	0.30	--	--	975,000
1961	650,000[d]	5.87[d]	5,241,000	4.19	--	--	--	--	--
1962	675,000[d]	6.41[d]	5,731,000	5.36	--	--	--	--	--
1963	853,000	5.91	16,926,000	22.01	W	W	W	W	2,589,000
1964	745,000	5.01	26,089,000	18.49	W	W	W	W	4,912,000
1965	860,000[d]	5.88[d]	29,959,000	33.93	W	W	W	W	5,296,000
1966	927,000	6.53	17,457,000	21.79	W	W	44,000	350.0	6,167,000
1967	930,000	7.18	22,300,000	26.25	W	W	W	W	4,924,000
1968	812,000[d]	5.03[d]	17,515,000	20.73	W	W	91,000	W	4,117,000
1969	728,000[d]	4.65[d]	16,205,000	18.62	1,954,000	3.90	90,000	850.0	5,163,000
1970	786,000[d]	5.28[d]	20,375,000[d]	26.07[d]	6,470,000	10.01	134,000[d]	1,875.0	7,994,000
1971	748,000[d]	5.05[d]	26,391,000	41.99	2,658,000	5.07	102,000[d]	1,075.0	--
1972	720,000[d]	6.26[d]	14,187,000	15.21	652,000	3.01	W	W	--
1973	700,000[d]	6.23[d]	19,350,000	19.01	5,967,000	12.00	112,000	1,792.0	12,846,000
1974	700,000	7.34	118,740,000[d]	240.94[d]	5,484,000	12.95	110,000	1,895.0	14,495,000
			42,614,000	88.96					
1975	766,000	7.81	48,145,000	95.78	8,877,000	26.65	2,000[d]	30.0	12,731,000
1976	705,000	8.00	74,208,000[d]	204.73[d]	6,727,000	20.09	W	W	14,019,000
1977	780,000[d]	12.00[d]	66,126,000	134.25	4,008,000	17.47	--	--	14,486,000
1978	750,000	15.00	51,100,000	122.00	3,437,000	14.65	22,000	750.0	--
1979	750,000	16.00	50,900,000	104.90	3,650,000	15.45	20,000	800.0	930,000
1980	800,000	16.00	40,000,000	86.00	3,700,000	15.40	50,000	2,000.0	97,500
1981	800,000	17.60	46,000,000	88.20	4,200,000	19.30	--	--	256,000
1982	830,000	18.00	45,000,000	91.00	3,400,000	15.60	--	--	150,000
1983	830,000	18.00	50,000,000	105.00	5,270,000	25.00	--	--	242,000
1984	849,161	23.75	27,000,000	95.00	2,700,000	16.00	--	--	875,875
1985	1,370,000	39.73	28,184,000	112.06	2,500,000	12.00	--	--	559,000
1986	1,492,707	40.10	20,873,110	75.76	4,200,000	20.32	--	--	384,800
1987	1,508,927	42.35	16,696,374	42.66	1,805,000	11.62	--	--	388,400
1988	1,551,162	44.30	17,264,500	48.75	3,600,000	24.65	--	--	389,000
1989	1,452,353	41.46	14,418,000	39.88	2,914,000	20.34	--	--	1,492,000
1990	1,576,000	44.99	15,013,500	40.82	3,200,000	22.10	--	--	400,000
1991	1,540,000	39.00	14,160,011	45.45	3,000,000	22.50	--	--	462,000
Other[d]	--	--	--	--	2,300,000[r]	W	79,000	W	--
TOTAL (metric)	42,100,083 (38,184,775 tonnes)	625.2	1,055,052,095 (956,932,250 tonnes)	2,108.03	96,139,836 (87,198,831 tonnes)	377.88	856,000 (776,563 tonnes)	11,417.0	175,592,877

Table 20. *Conversion factors for U.S. customary units and International System of units (metric) of measurement*

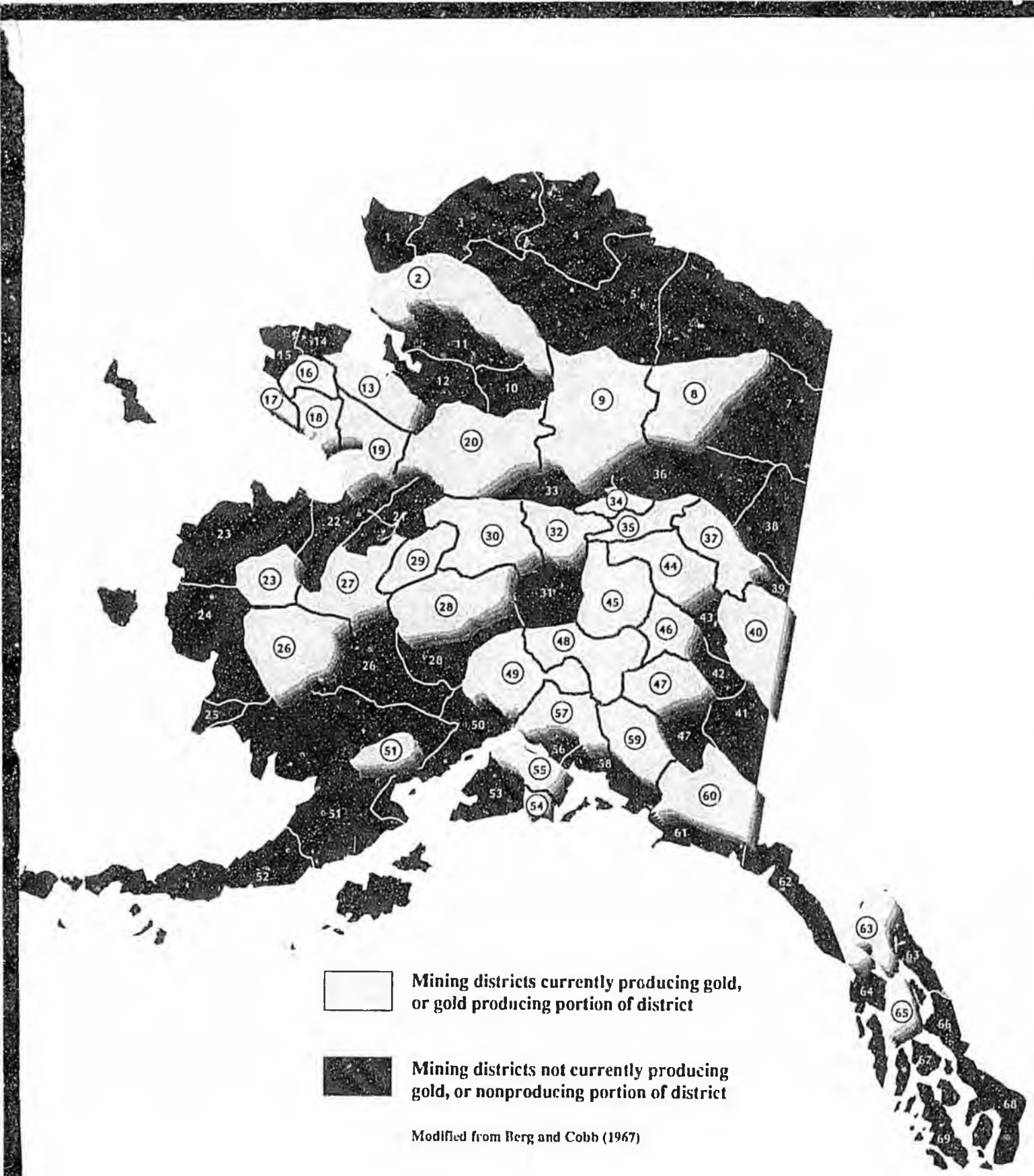
U.S. unit	Multiply by	Metric unit
	MASS	
ounce, troy (oz tr)	0.0311	kilogram (kg)
ounce, avoirdupois (oz avdp)	0.0283	kilogram (kg)
pound, avoirdupois (lb)	0.4536	kilogram (kg)
ton, short (2,000 lb)	0.9072	tonne (mg)
tonne (mg)	1.102	ton (2,000 lb)
	LENGTH	
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	AREA	
mile^2 (mi^2)	2.590	kilometer^2 (km^2)
acre	2.471	hectare
	VOLUME	
yard^3 (yd^3)	0.7646	meter^3 (m^3)
gallon	3.785	liter

SOURCE: Hansen, W.R., ed., 1991, Suggestions to authors of the United States Geological Survey (7th ed.).

NOTES

ALASKA MINING DISTRICTS

1. Lisburne district
2. Noatak district
3. Wainwright district
4. Barrow district
5. Colville district
6. Canning district
7. Sheenjek district
8. Chandalar district
9. Koyukuk district
10. Shungnak district
11. Kiana district
12. Selawik district
13. Fairhaven district
14. Serpentine district
15. Port Clarence district
16. Kougarok district
17. Nome district
18. Council district
19. Koyuk district
20. Hughes district
21. Kaiyuh district
22. Anvik district
23. Marshall district
24. Bethel district
25. Goodnews Bay district
26. Aniak district
27. Iditarod district
28. McGrath district
29. Innoko-Tolstoi district
30. Ruby district
31. Kantishna district
32. Hot Springs district
33. Melozitna district
34. Rampart district
35. Tolovana district
36. Yukon district
37. Circle district
38. Black district
39. Eagle district
40. Fortymile district
41. Chisana district
42. Tok district
43. Goodpaster district
44. Fairbanks district
45. Bonnifield district
46. Delta River district
47. Chistochina district
48. Valdez Creek district
49. Yentna district
50. Redoubt district
51. Iliamna district
52. Port Moller/Kodiak Island district
53. Homer district
54. Seward district
55. Hope district
56. Anchorage district
57. Willow Creek district
58. Prince William Sound district
59. Nelchina district
60. Nizina district
61. Yakataga district
62. Yakutat district
63. Porcupine district
64. Chichagof district
65. Admiralty district
66. Petersburg district
67. Kupreanof district
68. Hyder district
69. Ketchikan district


Mining districts currently producing gold, or gold producing portion of district
Mining districts not currently producing gold, or nonproducing portion of district
Modified from Berg and Cobb (1967)

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