UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUMMARY OF REFERENCES TO MINERAL OCCURRENCES (OTHER THAN MINERAL FUELS AND CONSTRUCTION MATERIALS) IN THE ILIAMNA, LAKE CLARK, LIME HILLS, AND McGRATH QUADRANGLES, ALASKA

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By

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Open-file Report 76-485

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

Introduction

These summaries of references are designed to aid in library research on metallic and nonmetallic (other than mineral fuels and construction materials) mineral occurrences in the Iliamna, Lake Clark, Lime Hills, and McGrath quadrangles, Alaska. All references to reports of the Geological Survey, to most reports of the U.S. Bureau of Mines, and to most reports of the State of Alaska Division of Geological and Geophysical Surveys and its predecessor State and Territorial agencies released before January 1, 1976, are summarized.

Certain, mainly statistical, reports such as the annual Minerals Yearbook of the U.S. Bureau of Mines and the biennial and annual reports of the State of Alaska Division of Geological and Geophysical Surveys and its predecessor State and Territorial agencies are not included.

This report is divided into three parts: a section made up of summaries of references arranged alphabetically first by quadrangle and second by occurrence name; a section that lists synonyms for names in the first section, claim names, and the names of operators and owners of mines and prospects; and a section that lists, by author, all references summarized in the first section.

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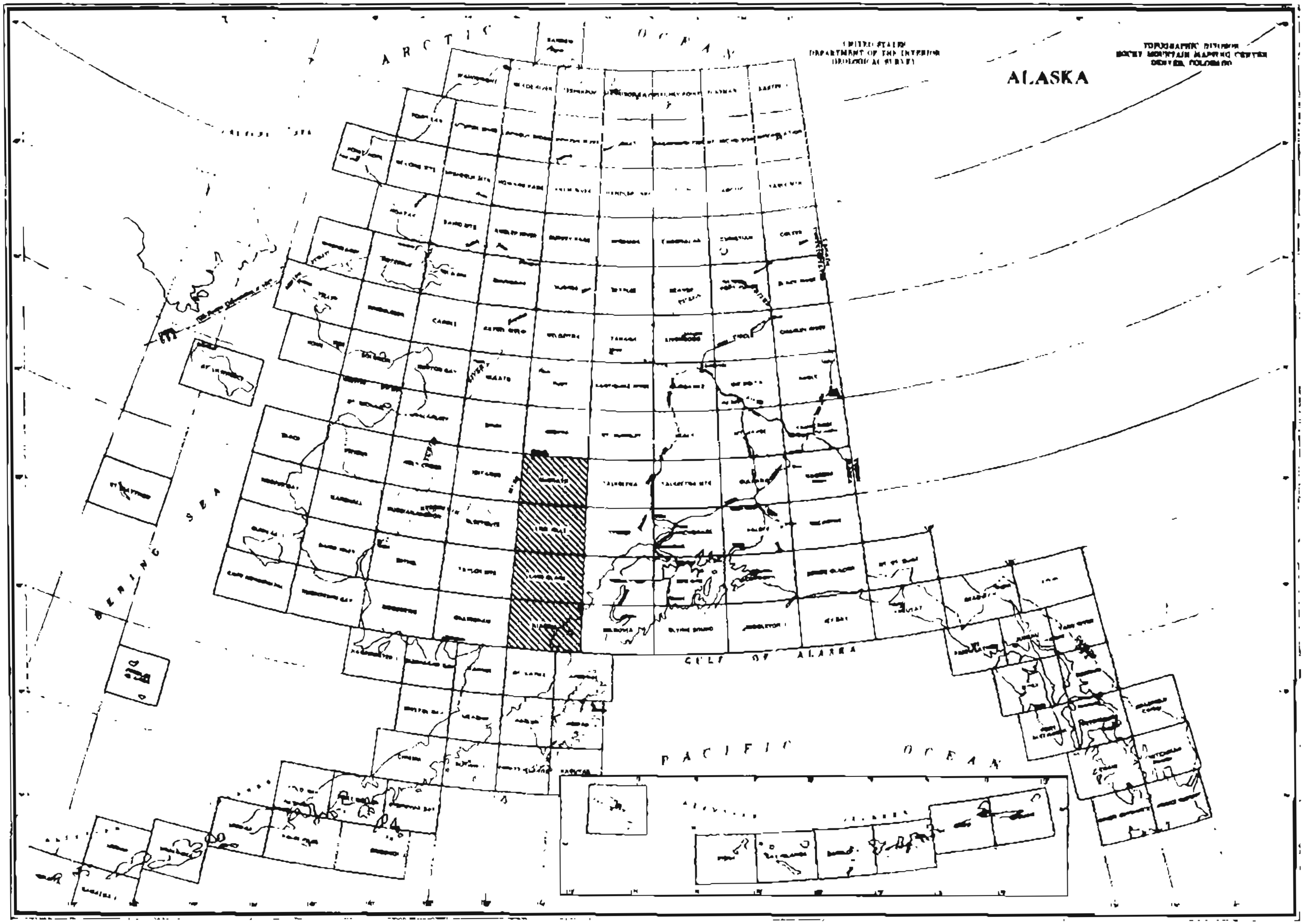
ALASKA
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GULF OF ALASKA
PACIFIC OCEAN

Summaries of References

For each mineral occurrence there is a page that gives the name of the occurrence; the mineral commodities present (listed alphabetically for metallic commodities and then for nonmetallic commodities); the mining district (Ransome and Kerns, 1954) in which the occurrence is located; the name of the 1:250,000-scale topographic quadrangle; coordinates (as described by Cobb and Kachadoorian, 1961, p. 3-4); the metallic mineral resources map number (Cobb, 1972, or Detterman and Cobb, 1972, in the reference list for each quadrangle) and the occurrence number on that map if the occurrence is shown; and the latitude and longitude of the occurrence. These data, presented at the top of the page, are followed by a short, general summary of the published information on the occurrence. This is followed (continued on additional pages, if necessary) by more detailed summaries, arranged chronologically, of all references to the occurrence. Material in brackets is interpretative or explanatory and is not in the summarized reference.

Proper names of mines, prospects, and other mineral occurrences are given if such names appear in the reports summarized. If a deposit does not have such a name, but is near a named geographic feature, the name of that feature is shown in parentheses in lieu of a proper name. If a deposit has no proper name and is not near a named geographic feature, it is titled "Unnamed occurrence" and appears at the end of the list. If a part of a proper name is not always used in a reference, that part of the name is shown in parentheses. This is most common in company names and in place names with minor variations in spelling.

Citations are given in standard bibliographic format with the exception that references to reports and maps in numbered publication series also show, in parentheses, an abbreviation for the report or map series and the report or map number. Abbreviations used are:

B	U.S. Geological Survey Bulletin
BMB	U.S. Bureau of Mines Bulletin
C	U.S. Geological Survey Circular
GC	Alaska Division of Geological and Geophysical Surveys (and predecessor State agencies) Geochemical Report
GR	Alaska Division of Geological and Geophysical Surveys (and predecessor State agencies) Geologic Report
I	U.S. Geological Survey Miscellaneous Geologic Investigations Map
IC	U.S. Bureau of Mines Information Circular
OF	U.S. Geological Survey Open-file Report (numbers are informal and used only within the Alaskan Geology Branch of the U.S. Geological Survey)
P	U.S. Geological Survey Professional Paper
RI	U.S. Bureau of Mines Report of Investigations
TDM	Alaska Territorial Department of Mines Pamphlet

Summaries are as I made them while reading the cited reports. I made no attempt to use complete sentences and did not edit for grammatical consistency, although I have tried to edit out ambiguities.

References cited only in these introductory paragraphs are:

Cobb, E. H., and Kachadoorian, Reuben, 1961, Index of metallic and nonmetallic mineral deposits of Alaska compiled from published reports of Federal and State agencies through 1959: U.S. Geol. Survey Bull. 1139, 363 p.

Ransome, A. L., and Kerns, W. H., 1954, Names and definitions of regions, districts, and subdistricts in Alaska (used by the Bureau of Mines in statistical and economic studies covering the mineral industry of the Territory): U.S. Bur. Mines Inf. Circ. 7679, 91 p.

(Augustine I.) Pumice

Redoubt district Iliamna (22.9, 6.4)
59°20'N, 153°27'W

Summary: Volcanic cone mainly of fragmental material with subordinate trachitic and andesitic lavas. A deposit of pumice at an altitude of 1,250 ft. is about 10 ft. thick, 300 ft. long, and probably about 50 ft. wide and was partly mined, as were other thinner (up to 3 ft.) deposits in lower part of island, between 1946 and 1949. Material barged to Anchorage and used for making building blocks. Coordinates above are for the large deposit. Eruptions since 1949 have caused considerable local changes and cut off road to large deposit.

Moxham, 1951 (OF 49), p. 14-16 -- Volcanic cone composed mainly of fragmental materials with subordinate trachitic and andesitic lavas. Thin (up to 3 ft.) deposits of pumice in shallow depressions in lower parts of island. Main {commercial} deposit at elevation of 1,250 ft.; pumice apparently concentrated by intermittent streams; material about 10 ft. thick and exposed along a gully for 300 ft.; maximum width (not exposed) probably 50 ft. Small lower deposits and main deposit mined 1946-49. Harbor conditions poor.

p. 20 -- Has been no systematic prospecting. Commercial development probably would hinge on development of safe harbor.

Rutledge and others, 1953 (RI 4932)), p. 72-74 -- Data essentially as in OF 49, p. 14-16. Average specific gravity of a sample was 1.3.

p. 81 -- Pumice is present.

Eckhart and Plafker, 1959 (B 1039-C), p. 34 -- Pumice was mined 1946-49 and shipped to Anchorage to make building blocks.

Detterman and Reed, 1973 (B 1368-A), p. A57 -- Deposits mined between 1946 and 1949. Reference to OF 49.

Aukney	Gold (?)
Bristol Bay region	Iliamna (6.6, 7.25) 59°25'N, 155°16'W

Summary: Claim, presumably staked as a gold prospect, on cliff of pyritiferous quartz latite tuff.

Martin and Katz, 1910 (B 442), p. 198 -- Preliminary to B 485.

Martin and Katz, 1912 (B 485), p. 125-126 -- Claim staked in 1908, presumably for gold. Quartz latite tuff strikes northeast and dips from vertical to 75°SE; contains much fine disseminated pyrite. Only work was a little blasting on cliff face at shore of Iliamna Lake.

(Battle Lake) — Copper, Gold

Bristol Bay region — Iliamna (10.15, 1.95)
MF-364, loc. 18 — 59°06'N, 154°53'W

Summary: Quartz vein in volcanics cut by intermediate dikes contains copper minerals and gold.

Berg and Cobb, 1967 (B 1246), p. 14 -- Discovered in 1964. Quartz vein in Tertiary volcanic breccia interbedded with lava flows and cut by intermediate dikes contains gold, chalcopyrite, other sulfides, and secondary copper minerals.

(Bruin Bay) Limestone

Redoubt district Iliamna (18.0, 6.35)
59°21'N, 154°00'W

Summary: Triassic limestone has silica content of 16.95 and 30.86 percent in the two samples analyzed. Note: Locality 16 should be deleted from MF-364.

Detterman, 1969 (OF 392) -- Small limestone deposit with rather high silica content (16.95 and 30.86 percent in samples).

Detterman and Reed, 1973 (B 1368-A), p. A57-A58 -- Analyses of Triassic limestone from OF 392, but without some of other data in older report.

(Chenik Mtn.) Iron

Redoubt district Iliamna (15.6, 4.4)
MF-364, loc. 22 59°15'N, 154°16'W

Summary: Magnetite deposit, probably low grade; probably contact metamorphic.

Berg and Cobb, 1967 (B 1246), p. 14 -- One of the many iron deposits staked in 1960's; most are at or near contacts between intermediate to mafic intrusive rocks and metamorphosed volcanic and sedimentary rocks. Deposits are probably large but relatively low grade; veinlets, disseminated grains, and lenses of magnetite.

Copper King

Copper, Iron

Redoubt district
MF-364, loc. 7

Iliamna (20.8, 12.15)
59°41'N, 153°39'W

Summary: Marble inclusions in granite. Garnet- and magnetite-bearing rock contains disseminated chalcopyrite. No record of mining. Includes references to Keyes.

Martin and Katz, 1910 (B 442), p. 194 -- Located in 1905. Two prospect holes near contact between hornblende granite and greenstone. Surface exposures are irregular masses of garnet rock and crystalline limestone; garnet rock cut by small veins of quartz and epidote. Ore body is magnetite impregnated with chalcopyrite.

Martin and Katz, 1912 (B 485), p. 121 -- Nine claims on steep slope. Crystalline limestone with maximum thickness of 20 ft. in hornblende granite; also nonpersistent masses of garnet rock and magnetite cut by veins of quartz and epidote. Prospective ore, said to be rich but in small bodies, is magnetite rock impregnated with chalcopyrite.

Capps, 1935 (B 862), p. 91 -- Data from B 485.

Bain, 1946 (IC 7379), p. 33 -- Copper prospect.

Moxham and Nelson, 1952 (C 207), p. 2 -- Small masses of garnet- and magnetite-bearing rock impregnated with chalcopyrite along contact between granite and greenstone. Abandoned for many years.

Detterman and Reed, 1964 (I-407) -- Copper occurrence.

Berg and Cobb, 1967 (B 1246), p. 22-23 -- Deposit in marble inclusions (as much as 20 ft. thick) in granite. Irregular masses of garnet and magnetite-bearing rock that locally contains disseminated chalcopyrite. Marble also cut by quartz-epidote veins. Some high-grade material in bodies too small to mine.

(Diamond Point) — Copper, Gold, Silver

Redoubt district — Iliamna (21.05, 11.7)
MF-364, loc. 8 — 59°39'N, 153°38'W

Summary: Granite locally intruded by small porphyry dikes. Shattered zone in which granite is impregnated with veins and stringers of pyrite. Copper minerals, gold (about 0.1 oz. per ton), and silver reported.

Martin and Katz, 1910 (B 442), p. 194 -- Preliminary to B 485.

Martin and Katz, 1912 (B 485), p. 125 -- Granite locally intruded by small porphyry dikes. A few hundred feet to NW is a large mass of greenstone. Shattered and weathered zone in which granite is crushed and impregnated with narrow veins and stringers of pyrite. Some assays are rumored to have been $2 per ton in gold.

Detterman and Reed, 1964 (I-407) -- Complex association of gold, silver, copper, and other minerals.

Berg and Cobb, 1967 (B 1246), p. 23 -- Traces of copper and other metals in sulfide-bearing bedrock.

Durand — Copper, Iron

Bristol Bay region — Iliamna (17.65, 12.65)
MF-364, loc. 4 — 59°43'N, 154°00'W

Summary: A quartz vein 10 ft. wide in schistose greenstone was explored by 2 pits before 1909. Vein contains pyrite, chalcopyrite, malachite, and azurite. In same area a magnetite occurrence has been staked as an iron prospect; probably similar to the occurrence at Chenik Mtn.

Martin and Katz, 1910 (B 442), p. 197 -- Preliminary to B 485.
Martin and Katz, 1912 (B 485), p. 123 -- Two claims. Shallow prospect pits on 10-ft. quartz vein in schistose greenstone. Vein contains fairly uniformly disseminated masses of chalcopyrite and pyrite; malachite and azurite where weathered.
Capps, 1935 (B 862), p. 91-92 -- Data from B 485.
Bain, 1946 (IC 7379), p. 33 -- Copper prospect.
Wedow and others, 1952 (OF 51), p. 75-76 -- Summary of data in B 485 via B 862.
Detterman and Reed, 1964 (I-407) -- Copper occurrence.
Berg and Cobb, 1967 (B 1246), p. 14-16 -- Mineralized vein 10 ft. thick in schistose greenstone contains scattered masses of chalcopyrite and pyrite and small amounts of malachite and azurite. A possible extension of the lode has been found 2 miles to the south. Magnetite in the area covered by this prospect has also been staked for iron.

Duryea (& Duryea)

Gold, Lead, Silver, Zinc

Bristol Bay region
MF-364, loc. 6

Iliamna (18.4, 12.3)
59°41'N, 153°56'W

Summary: Mineralized zone along contact between limestone and greenstone is made up of argentiferous galena, sphalerite, and pyrite fracture fillings in brecciated limestone. Extensive underground workings (caved in 1949), but no recorded production. Assays showed as much as 196 oz. Ag, about an ounce Au per ton and 50% Pb and 20% Zn. Includes reference to Duryea & McNeil.

Martin and Katz, 1910 (B 442), p. 196-197 -- Data essentially as in B 485 except that an assay of 3 oz. gold per ton is reported here only.

Martin and Katz, 1912 (B 485), p. 124-125 -- Country rock is limestone cut by many small (3 or fewer feet thick) vertical [porphyritic andesite?] dikes normal to strike of limestone. Manganiferous iron oxide on surface above argentiferous galena-sphalerite bodies along apparently vertical fissures in limestone that is brecciated and slickensided. Minor pyrite. Some of limestone impregnated with sulfides. No prospect opening got below oxidation zone. Claim owners reported that samples contained 80-196 oz. Ag per ton, 0-$20 worth of Au per ton, 35-50 percent Pb, and 15-20 percent Zn.

Brooks, 1913 (B 542), p. 38-39 -- Two tunnels driven. Intersected galena ore at depth of 150 ft. and a body of arsenopyrite and lead-zinc ore.

Brooks, 1914 (B 592), p. 64 -- A little work in 1913.

Brooks, 1915 (B 622), p. 47 -- Developments in 1914.

Brooks, 1923 (B 739), p. 27 -- Development work and plans for a test shipment, 1921.

Brooks and Capps, 1924 (B 755), p. 32-33 -- Underground development and trail work, 1922.

Capps, 1935 (B 862), p. 93-94 -- Data from B 485.

Bain, 1946 (IC 7379), p. 33 -- Copper prospect.

Moxham and Nelson, 1952 (C 207), p. 3-4 -- Ore body along contact between limestone and greenstone. Argentiferous galena, sphalerite, and pyrite fracture fillings in brecciated limestone. Assays up to 196 oz. Ag and $20 in Au per ton; 35-50 percent Pb, 15-20 percent Zn. Extensive underground and surface work (caved in 1949). No ore known to have been shipped.

Wedow and others, 1952 (OF 51), p. 75-76 -- Data from B 485 via B 862.

Berg and Cobb, 1967 (B 1246), p. 14-15 -- Data same as in C 207.

Dutton (Mining & Development Co.) — Copper, Gold (?), Molybdenum, Silver (?)

Bristol Bay region — Iliamna (18.1, 12.15)
MF-364, loc. 5 — 59°41'N, 153°58'W

Summary: Skarn in brecciated limestone (now largely marble) along contact with greenstone (altered diorite), both cut by small porphyritic andesite dikes. Skarn laced by inch-thick veinlets containing quartz, calcite, chalcopyrite, and pyrite. A little molybdenite and malachite also present. Marble also contains lenses and beds of magnetite-rich rock. Extensive development 1902-05, but no ore shipped.

Martin and Katz, 1910 (B 442), p. 194-196 -- Underground development in 1904-05 consisted of 3 short adits and a shallow shaft with 46 ft. of drifts (all inaccessible in 1909) and numerous surface cuts. Owners claim average values in ore are 4-6 percent Cu and 2 oz. Ag and $1.50 in Au per ton.

Martin and Katz, 1912 (B 485), p. 117-121 -- Discovered in 1901. Along contact between limestone and greenstone that may be an altered diabase. Chloritic schist bands in limestone (may have been infolded or infaulted). Porphyritic andesite dikes cut limestone and greenstone. Prospective ore bodies in zone averaging 200 ft. wide; some in greenstone, but mainly in schist. Mineralization in greenstone and some of dikes is small stringers of pyrite and minor chalcopyrite; in limestone is garnet rock, magnetite rock, or a mixture of the two with pyrite, chalcopyrite, and, less commonly, molybdenite.

Brooks, 1914 (B 592), p. 64 -- No work except sampling in 1913.

Capps, 1935 (B 862), p. 91 -- Data from B 485.

Smith, 1942 (B 926-C), p. 191-192 -- Data from B 485.

Bain, 1946 (IC 7379), p. 33 -- Copper prospect.

Moxham and Nelson, 1952 (C 207), p. 2-3 -- Veins injected along contact between Triassic limestone and greenstone. Mineralized zone, about 200 ft. wide, consists of an aggregate of epidote and calcite with quartz veinlets. Chalcopyrite only copper mineral observed. Extensive development, 1902-05; no ore known to have been shipped.

Wedow and others, 1952 (OF 51), p. 75 -- Data from B 485 and C 207.

Berg and Cobb, 1967 (B 1246), p. 15 -- Extensive development between 1902 and 1905, On contact between limestone (now largely marble) and greenstone (probably originally dioritic); most of mineralization in limestone. Many small porphyritic andesite dikes cut both limestone and greenstone. Largest lode, about 200 ft. wide and 3,000 ft. long, consists of skarn laced with inch-thick veinlets of quartz, calcite, chalcopyrite, and pyrite; a little molybdenite and malachite also present. Lenses and layers of magnetite-rich rock in marble not closely associated with copper lodes.

(Fog Pond) — Copper (?), Gold

Bristol Bay region — Iliamna (14.6, 9.1)
MF-364, loc. 14 — 59°31'N, 154°22'W

Summary: Mafic volcanic rocks intruded by felsic dikes (?) and possibly by quartz porphyry; all are now altered. Porphyry contains widespread pyrite and scattered grains that are probably chalcopyrite, though analyses of samples taken in geochemical reconnaissance are low in copper. Selected specimens from shear zones contain pyrite stringers and as much as 37.7 ppm gold.

Reed, 1967 (OF 272), p. 9-12 -- Tertiary mafic volcanic rocks were intruded by felsic dikes(?) (now altered) and possibly by quartz porphyry. All rocks altered. Porphyry contains widespread pyrite and scattered grains of probable chalcopyrite. Low Cu values in geochemical samples suggest that original chalcopyrite content of rock was low. Gold values of analyzed samples of selected specimens with pyrite stringers (from shear zones) were as high as 37.7 ppm.

(Frying Pan Lake) — Iron, Vanadium

Bristol Bay region — Iliamna (5.95, 15.1)
MF-364, loc. 1 — 59°52'N, 155°20'W

Summary: Plutonic breccia is 50-90 percent pyroxenite blocks made up largely of pyroxene and magnetite. Analyses showed iron as FeO, 16-24 percent; TiO_2 about 1.3%, P_2O_5 0.1-3.2 percent; vanadium 0.1-0.15 percent. Includes reference to (Iliamna Lake).

Reed and Detterman, 1965 (OF 260) -- A plutonic breccia related to the intrusion of a granodioritic body thought to be of Jurassic [now Cretaceous/Tertiary] age is 50-90 percent pyroxenite blocks made up largely of pyroxene and magnetite; some magnetite in crystal aggregates up to 1 in. across. Pyroxenite is older than granodiorite. Analyses of 16 samples showed: iron as FeO, 16-24 percent; TiO_2 about 1.3%, P_2O_5 0.1-3.2 percent; and V 0.1-0.15 percent.

Fischer, 1975 (P 926-B), p. B5 -- Table indicates 12-19 percent Fe, 1.3% TiO_2, 0.02% V_2O_5, "ore" resources of 7,000 millions of tons, vanadium resources of 7,000 thousands of tons of V. [One of references cited is OF 260, which gives no estimate of resources. Other reference is a document not readily available to me, but from title and author is obviously a secondary source. I cannot duplicate Fischer's figures on the basis of Reed and Detterman's data. Deposit called Iliamna Lake in P 926-B.]

(Iliamna Bay) — Limestone

Redoubt district — Iliamna (21.15-21.4, 10.8-11.1)
59°36'-59°37'N, 153°03'-153°07'W

Summary: Triassic limestone cut by dikes and interbedded with greenstone. Some may be suitable for use as cement raw material.

Detterman, 1969 (OF 392) -- Large deposit; 450-500 ft. of interbedded limestone and greenstone. Locally cut by dikes, but very little of limestone appears to have been altered. Part of deposit probably is sufficiently pure to be used as a cement raw material.

Detterman and Reed, 1973 (B 1368-A), p. A57-A58 -- Analyses of Triassic limestone from OF 392, but without some of data in older report.

(Iniskin Bay) Iron

Redoubt district Iliamna (22.95, 13.6)
MF-364, loc. 11 59°45'N, 153°24'W

Summary: Small occurrences of magnetite in volcanic rocks near younger granitic rocks.

Detterman and Hartsock, 1966 (P 512), p. 75 -- Small occurrences of magnetite about 2 mi. from where granitic rocks intruded Talkeetna Fm. (agglomerate, breccia, andesite flows, minor metasedimentary rocks).

(Iniskin R.)

Copper

Redoubt district
MF-364, loc. 9

Iliamna (22.6, 14.5)
59°48'N, 153°27'W

Summary: Copper sulfide occurrence.

Detterman and Reed, 1964 (I-407) -- Copper occurrence
Berg and Cobb, 1967 (B 1246), p. 23 -- Sulfide-bearing bedrock.

Knutson — Copper, Gold, Silver (?)

Bristol Bay region — Iliamna (15.2, 14.9)
MF-364, loc. 3 — 59°50'N, 154°17'W

Summary: A quartz vein 3-8 ft. thick cuts granite; contains copper minerals, gold, and probably silver. A 40-ft. tunnel was driven in 1912, but there has been no recorded production.

Martin and Katz, 1910 (B 442), p. 197 -- Quartz vein in granite with copper minerals, gold, and silver.

Martin and Katz, 1912 (B 485), p. 123-124 -- Vein of white quartz 3-8 ft. wide that is slightly mineralized with "copper ores and gold." Country rock is granite.

Brooks, 1913 (B 542), p. 39 -- 40-ft. tunnel driven in 1912.

Wedow and others, 1952 (OF 51), p. 76 -- Reference to B 485.

Berg and Cobb, 1967 (B 1246), p. 15-16 -- Nonproductive copper deposit consists of a quartz vein 3-8 ft. thick that cuts granite and contains sparse copper minerals. A similar vein is said to be a quarter mile from the prospect.

(Koktuli R.) Gold

Bristol Bay region Iliamna
NW1/4 quad.

Summary: Fine flour gold on river bars.

Martin and Katz, 1912 (B 485), p. 133 -- Fine flour gold on all river bars.

(Lake Fork area) — Copper, Gold, Silver

Redoubt district — Iliamna (13.65, 4.45)
MF-364, loc. 17 — 59°15'N, 154°29'W

Summary: Sulfide-rich samples from shear zone in quartz diorite on analysis show gold and silver values of more than an ounce per ton. Copper values greater than 5,000 ppm suggest strongly that at least one of the sulfides must be a copper sulfide.

Reed, 1967 (OF 272), p. 13 -- Selected sulfide-rich specimens from a shear zone in quartz diorite yield gold and silver values in excess of 1/2 oz. per ton. From analyses of geochemical bedrock samples it appears that a copper sulfide must be present as 4 out of 5 samples contained more than 5,000 ppm Cu. A partially caved adit in breccia along contact between intrusive diorite and gabbro shows meager sulfide mineralization. Area was staked in 1964 during a flurry of iron exploration.

(Marsh Cr.) Copper, Iron

Redoubt district Iliamna (23.25, 14.8)
MF-364, loc. 10 59°49'N, 153°22'W

Summary: Small magnetite occurrence in Triassic metamorphosed sedimentary and volcanic rocks in a fault block. A vein of malachite and azurite 6-12 in. thick in marble.

Detterman and Reed, 1964 (I-407) -- Copper occurrence.
Detterman and Hartsock, 1966 (P 512), p. 75 -- Small magnetite occurrence in Upper (?) Triassic metamorphosed sedimentary and volcanic rocks in fault block that also contains younger granitic rocks. A vein of malachite and azurite 6-12 in. thick cuts marble nearby. Blue and green stain 20-30 ft. on either side of vein.
Berg and Cobb, 1967 (B 1246), p. 23 -- Sulfide-bearing rock.

McNeil(-Cook) — Copper, Gold, Silver

Redoubt district — Iliamna (12.3, 2.45)
MF-364, loc. 20 — 59°08'N, 154°38'W

Summary: Contact-metamorphic deposit at contact of calcareous sedimentary rocks with intermediate to mafic volcanic rocks. Actinolite-epidote-garnet-quartz-calcite tactite contains veins and masses of chalcopyrite, secondary copper minerals, and minor pyrite and magnetite. Developed 1913-1920, claims dropped in 1926, relocated in 1953. Developed by pits and a 60-ft. tunnel. Test shipments of ore in 1914 and 1916 (about 12 tons) averaged 17.55% Cu, gold worth $2.50 per ton, and 15 oz. silver per ton. Includes references to Cook & Bornland, (Okchiak Cr.); see also (Paint R.).

Brooks, 1913 (B 542), p. 39 -- Copper-bearing pyrite reported to have been found, 1912.

Brooks, 1914 (B 592), p. 64 -- Chalcopyrite said to carry considerable gold. Open cuts and an adit 23 ft. long, 1913.

Brooks, 1915 (B 622), p. 47 -- Development, 1914.

Brooks, 1918 (B 662), p. 49 -- Test shipment of ore, 1916.

Martin, 1920 (B 712), p. 35 -- Development work continued and test shipment of copper ore made, 1918.

Brooks and Martin, 1921 (B 714), p. 78 -- Development work, 1919.

Brooks, 1925 (B 773), p. 39 -- Work, 1923.

Mather, 1925 (B 773), p. 173-174 -- Calcareous schist and marble cut by many basalt and granite or granodiorite dikes. Prospect pits and tunnel about 60 ft. long from which some ore has been mined. Ore in pockets in metamorphosed sediments near intrusive bodies. Some pockets contain very coarse calcite surrounded by garnet rock; a few inches of rich chalcopyrite separated from garnet rock by a few inches of amphibole (actinolite?). A ton of ore from tunnel gave $6.08 in gold, 10.93 oz. silver, and ran 18.19% Cu. Shipment of 10-1/2 tons of selected ore from various parts of property gave smelter returns of $2.50 in gold and 15 oz. Ag per ton and 17.55% Cu.

Bain, 1946 (IC 7379), p. 33 -- Copper prospect

Moxham and Nelson, 1952 (C 207), p. 2-3 -- Copper sulfides with calcite and epidote gangue deposited along contact between Paleozoic gneiss and schist and granitic intrusive rocks. Reference to B 773, p. 174.

Wedow and others, 1952 (OF 51), p. 77 -- Reference to B 773, p. 173.

Richter and Herreid, 1965 (GR 8), p. 1 -- Claims located 1911, a few tons of ore mined, and claims dropped by about 1926; mineralization spotty and transportation costly. Claims relocated in 1953.

Berg and Cobb, 1967 (B 1246), p. 22 -- Lode of contact-metamorphic origin at contact of calcareous sedimentary rocks and intermediate to mafic volcanic rocks not far from intermediate intrusive rocks. Lode is veins and masses of chalcopyrite, secondary copper minerals, and minor pyrite and magnetite in tactite (actinolite-epidote-garnet-quartz-calcite rock). Developed by pits and a 60-ft. tunnel. About 12 tons of ore shipped early in century averaged 17.55% Cu and $2.50 in Au and 15 oz. Ag per ton.

Millet — Copper, Gold, Silver

Bristol Bay region — Iliamna (13.2, 13.9)
MF-364, loc. 2 — 59°47'N, 154°31'W

Summary: Contact-metamorphic deposit in brecciated limestone near contact with diorite intrusive rock is 20-40 ft. thick and has been traced on surface for about 3,500 ft. Metallic minerals are chalcopyrite, pyrite, and hematite in gangue that includes epidote and garnet. Was developed before 1915 by open cuts and a shallow shaft. No production. Extensive USBM trenching and drilling program in 1949-50. Assays indicated 0.54-1.43 percent copper, a little silver, and a trace of gold. An old (early 1900's) assay of a picked sample showed $2 per ton in gold and 10% copper.

Martin and Katz, 1910 (B 442), p. 197-198 -- Staked in 1906. Seven open cuts 4-5 ft. deep and a 16-ft. shaft. Prospect is on dense bluish-white crystalline limestone parallel to an unexposed contact with an altered basaltic rock; both overlain nearby by tuff and flows. The mineralized zone is cut by shear zones across it at 1-10 ft. intervals. Stringers up to 10 ft. thick; some contain pyrite and chalcopyrite and others calcite and quartz with sulfide oxidation products. Picked sample assayed $2 in gold per ton and 10% Cu.

Martin and Katz, 1912 (B 485), p. 116-117 -- Contact metamorphic deposit in limestone.

p. 122-123 -- Description same as in B 442, but without details of exploration work, and with following summary of mineralization. Sulfides impregnate limestone, but most are with calcite as vein fillings. Veins broken, crumpled, slickensided, and fractures refilled by calcite, quartz, and sulfides.

Brooks, 1913 (B 542), p. 39 -- Further discoveries said to have been made in 1912.

Brooks, 1914 (B 592), p. 64 -- A little work in 1913.

Smith, 1917 (B 655), p. 150 -- Quotation from B 485, p. 116-117.

Capps, 1935 (B 862), p. 92 -- Data from B 485.

Moxham and Nelson, 1952 (C 207), p. 2-4 -- Copper sulfides and calcite gangue have recemented shattered limestone in a zone 20-40 ft. wide that has been traced 3,500 ft. No ore has been shipped.

Rutledge and Mulligan, 1952 (RI 4890) -- Three patented claims. Owners dug trenches and sunk a 38-ft. shaft. No production. USBM trenching, drilling, and sampling program, 1949-50. Deposit is contact metamorphic in Triassic limestone near contact with Jurassic diorite porphyry. Only sulfides are chalcopyrite and pyrite; gangue minerals include garnet, epidote, amphibole, calcite, quartz. Dikes cut limestone near or at concentrations of copper mineralization. Mineralized zones average 0.54 to 1.43 percent Cu. USBM project dug 6,229 ft. of trenches and put down 6 diamond drill holes (2,298.5 ft.). Some assays for silver were 0.2 oz. per ton; most were lower. All gold assays were less than 0.01 oz. per ton; most were 0.005 or less.

Wedow and others, 1952 (OF 51), p. 76 -- Data from B 485 via B 862.

Berg and Cobb, 1967 (B 1246), p. 15 -- Contact-metamorphic deposit that consists of calcite veins as much as a foot thick in brecciated limestone near contact with dioritic intrusive rocks. Metallic minerals are chalcopyrite, pyrite, and hematite in gangue that includes epidote and garnet. Mineralized zone is 20-40 ft. thick and has been traced for about 3,500 ft. USBM exploration program in 1949-50 indicated lodes containing 0.54-1.43% Cu, a little silver and a trace of gold.

(Mirror Lake)	Copper
Bristol Bay region	Iliamna (11.3, 4.2) approx. 56°15'N, 154°44'W approx.

Summary: Chalcopyrite in quartz veins in shear zone in volcanic rocks.

Mather, 1925 (B 773), p. 172 -- Fissure zone in volcanic rocks near Mirror Lake. Pyrite and chalcopyrite abundant in quartz veins. Copper content low and volume of copper-bearing rock probably small.

(Paint R.) Copper, Iron

Redoubt district Iliamna (12.2, 2.6)
MF-364, loc. 19 59°08'N, 154°39'W

Summary: Contact-metamorphic deposits of tactite bodies in volcanic and sedimentary rock at or near contact with granodiorite. One large body is epidote-garnet rock with actinolite, calcite, quartz, pyrite, and chalcopyrite. Other bodies are mainly magnetite and quartz. See also McNeil.

Richter and Herreid, 1965 (GR 8), p. 11-14 -- Contact-metamorphic deposits consist of tactite bodies in volcanic and sedimentary rocks at or near contacts with granodiorite. One large tactite body is epidote-garnet rock with abundant actinolite and lesser amounts of calcite, quartz, pyrite, and chalcopyrite. Other tactites are magnetite and quartz. Chalcopyrite is in sulfide lenses that may be as large as 3 ft. x 10 ft. and contain more than 7% Cu, or may be disseminated. Magnetite-quartz bodies are as large as 75 ft. x 10 ft. containing very little quartz or smaller bodies with 50% quartz.

Berg and Cobb, 1967 (B 1246), p. 22 -- Generally similar to McNeil deposit. Sparse chalcopyrite and pyrite; some conspicuous layers and lenses of magnetite-rich rock.

(Upper Copper Lake)

Molybdenum

Bristol Bay region
MF-364, loc. 13

Iliamna (16.9, 10.5)
59°35'N, 154°06'W

Summary: Small disseminated molybdenite flakes in altered light-gray intrusive. Note: Locality 12 should be deleteed from MF-364. Gold should be deleted as a commodity for locality 13.

Reed, 1967 (OF 272), p. 12 -- At loc. 13, MF-364, a small stream cuts across about 400 ft. of altered and highly pyritized light-gray intrusive rock cut by a mafic dike. X-ray diffraction study of samples of altered intrusive indicates the presence of pyrite, molybdenite, and several nonmetallic minerals. Exposures contain small disseminated flakes of molybdenite.

(Ursus Cove) — Copper

Redoubt district — Iliamna (19.85, 9.45)
MF-364, loc. 15 — 59°31'N, 153°46'W

Summary: Bedrock occurrence of copper sulfide mineral. Symbol for locality 15, MF-364 is 1.25 mi. SW of actual location of occurrence as shown on I-407.

Detterman and Reed, 1964 (I-407) -- Copper occurrence.
Berg and Cobb, 1967 (B 1246), p. 23 -- Sulfide-bearing bedrock.

Unnamed prospect	Iron
Redoubt district	Iliamna (13.8, 4.55)
MF-364, loc. 21	59°15'N, 154°28'W

Summary: Magnetite deposit, probably low grade; probably contact metamorphic.

Berg and Cobb, 1967 (B 1246), p. 14 -- One of the many iron deposits staked in 1960's; most are at or near contacts between intermediate to mafic intrusive rocks and metamorphosed volcanic and sedimentary rocks. Deposits are probably large but relatively low grade; veinlets, disseminated grains, and lenses of magnetite.

Unnamed prospect	Iron
Redoubt district	Iliamna (18.95, 9.3)
MF-364, loc. 23	59°31'N, 153°52'W

Summary: Magnetite deposit, probably low grade; probably contact metamorphic.

Berg and Cobb, 1967 (B 1246), p. 14 -- One of the many iron deposits staked in 1960's; most are at or near contacts between intermediate to mafic intrusive rocks and metamorphosed volcanic and sedimentary rocks. Deposits are probably large but relatively low grade; veinlets, disseminated grains, and lenses of magnetite.

Unnamed prospect — Iron

Bristol Bay region — Iliamna (17.3, 11.75)
MF-364, loc. 24 — 59°39'N, 154°03'W

Summary: Magnetite deposit, probably low grade; probably contact metamorphic.

Berg and Cobb, 1967 (B 1246), p. 14 -- One of the many iron deposits staked in 1960's; most are at or near contacts between intermediate to mafic intrusive rocks and metamorphosed volcanic and sedimentary rocks. Deposits are probably large but relatively low grade; veinlets, disseminated grains, and lenses of magnetite.

Unnamed prospect	Iron
Redoubt district	Iliamna (19.9, 12.1)
MF-364, loc. 25	59°41'N, 153°45'W

Summary: Magnetite deposit, probably low grade; probably contact metamorphic.

Berg and Cobb, 1967 (B 1246), p. 14 -- One of the many iron deposits staked in 1960's; most are at or near contacts between intermediate to mafic intrusive rocks and metamorphosed volcanic and sedimentary rocks. Deposits are probably large but relatively low grade; veinlets, disseminated grains, and lenses of magnetite.

Unnamed prospect	Iron
Redoubt district	Iliamna (21.5, 12.6)
MF-364, loc. 26	59°42'N, 153°34'W

Summary: Magnetite deposit, probably low grade; probably contact metamorphic.

Berg and Cobb, 1967 (B 1246), p. 14 -- One of the many iron deposits staked in 1960's; most are at or near contacts between intermediate to mafic intrusive rocks and metamorphosed volcanic and sedimentary rocks. Deposits are probably large but relatively low grade; veinlets, disseminated grains, and lenses of magnetite.

Unnamed prospect — Iron

Bristol Bay region — Iliamna (18.1, 13.2)
MF-364, loc. 27 — 59°44'N, 153°58'W

Summary: Magnetite deposit, probably low grade; probably contact metamorphic.

Berg and Cobb, 1967 (B 1246), p. 14 -- One of the many iron deposits staked in 1960's; most are at or near contacts between intermediate to mafic intrusive rocks and metamorphosed volcanic and sedimentary rocks. Deposits are probably large but relatively low grade; veinlets, disseminated grains, and lenses of magnetite.

(Bonanza Cr.) Gold

Bristol Bay region
MF-378, locs. 1, 6

Lake Clark (9.2-11.5, 12.15-13.25)
60°42'-60°45'N, 154°40'-154°51'W

Summary: Principal site of prospecting in Mulchatna basin, but production probably less than 150 oz. gold, including that from tributaries. Bedrock is shale, argillite, and graywacke cut by granitic dikes. A mineralized shear zone contains quartz veins with pyrite, arsenopyrite, and a little gold. Includes references to (Big Bonanza Cr.).

Brooks, 1913 (B 542), p. 44 -- Encouraging prospects from benches reported in 1912.

Brooks, 1915 (B 622), p. 47 -- Hand drills used to test placer ground, 1914.

Smith, 1915 (B 622), p. 257, 263 -- Preliminary to B 655.

Smith, 1917 (B 655), p. 136-137 -- Only prospecting in Mulchatna basin in 1914 was on Bonanza Cr. Gold in a hole sunk 65 ft. to bedrock. In the hills south of the creek granitic rocks cut shale.

Capps, 1932 (B 824), p. 154 -- Preliminary to B 862.

Capps, 1935 (B 862), p. 94-95 -- Small gold-placer stampede took place about 1912. Some prospects found, but only a few dollars' worth of gold recovered.

Jasper, 1961 -- Bedrock is shale, argillite, and graywacke, cut by fine-grained porphyritic granitic dikes. Many quartz veins in shear zone that contains pyrite, arsenopyrite, and a little gold. Valley bottom is 300-700 ft. wide between steep walls; gravel as much as 60 ft. thick. Gold scattered in gravel and in remnants of old channel in north valley wall. Has been sporadic prospecting and mining since 1914 [1912, according to Brooks, B 542]. If enough gold is present, could be a dredging proposition.

Cobb, 1973 (B 1374), p. 12 -- Has been extensive prospecting, but total production, including from tributaries, was probably less than 150 oz. Valley might be capable of supporting a small dredge or a dragline operation.

(Franklin Gulch) Gold

Bristol Bay region Lake Clark
S1/2NE1/4 quad.

Summary: Gold prospects have been found in this and other headwaters of the Kijik R.

Martin and Katz, 1912 (B 442), p. 200 -- In headwaters of Kijik R. Alluvium reported to be auriferous (1909).
Martin and Katz, 1912 (B 485), p. 126 -- Prospects have been found.
Smith, 1915 (B 622), p. 263-264 -- Preliminary to B 655.
Smith, 1917 (B 655), p. 137 -- Quotation from B 485.

(Ingersol Gulch) Gold

Bristol Bay region Lake Clark
S1/2NE1/4 quad.

Summary: Gold prospects have been found on this and other headwaters of the Kijik R.

Martin and Katz, 1910 (B 442), p. 200 -- In headwaters of Kijik R. Alluvium reported to be auriferous (1909).
Martin and Katz, 1912 (B 485), p. 126 -- Prospects have been found.
Smith, 1915 (B 622), p. 263-264 -- Preliminary to B 655.
Smith, 1917 (B 655), p. 137 -- Quotation from B 485.

(Kasna Cr.) Copper, Iron, Zinc

Bristol Bay region
MF-378, loc. 5

Lake Clark (17.0, 3.0)
60°09'N, 154°03'W

Summary: Lenticular body (possibly discontinuous) of limestone and dolomite between volcanic rocks and cut off on south end by granodiorite is cut by dikes and sills of porphyritic basalt. Parallel zones as much as 250 ft. wide and 1,050 ft. long were contact metamorphosed to skarn consisting of specular hematite, chalcopyrite (that contains fine grains of sphalerite), magnetite, pyrite, amphibole, chlorite, calcite, garnet, and quartz. U.S. Bureau of Mines sampling (after exclusion of a less rich zone in one body) indicated 0.95% Cu, 27.5% Fe. Has been considerable drilling and trenching but no production. No good estimate of resources available. Includes references to Hardenberg and to claims near Kontrashibuna Lake.

Martin and Katz, 1910 (B 442), p. 198-199 -- Claims staked in 1906. Bands of specular hematite with a little quartz and chalcopyrite; others of specular hematite, chalcopyrite, quartz, and calcite in a gangue that is in part amphibole; and others of small irregular stringers of chalcopyrite, pyrite, and quartz -- all in much shattered dense limestone. Contacts of mineralized zone with limestone country rock all covered. Chalcopyrite may make up 8% of mineralized mass. No secondary minerals. No exploratory work by 1909.

Martin and Katz, 1912 (B 485), p. 121-122 -- Country rock is various kinds of limestone, some crystalline and some now marble, in a belt about 2,000 ft. wide. Ore body is a zone about 75 ft. wide containing hematite, chalcopyrite, pyrite, quartz, calcite, amphibole. Chalcopyrite content estimated to be less than 5%. Only secondary minerals are thin films of limonite and copper carbonates.

Brooks, 1913 (B 542), p. 39 -- Development work reported, 1912.

Brooks, 1914 (B 592), p. 64 -- Some work reported, 1913.

Smith, 1917 (B 655), p. 150-151 -- Quotation from B 485.

Capps, 1935 (B 862), p. 92-93 -- Data from B 485.

Bain, 1946 (IC 7379), p. 33 -- Copper claims about 2 mi. above Lake Kontrashibuna.

Warfield and Rutledge, 1951 (RI 4828) -- Nine patented claims. Contact-metamorphic deposits in limestone belt 1,500 ft. wide between rhyolite porphyry on east and diorites (?) on west and south. Mineralization consists mainly of specular hematite, amphibole, chlorite, calcite, and quartz with scattered grains, lenses, and small veins of nearly pure chalcopyrite. Numerous inclusions of sphalerite in chalcopyrite. Deposits are on right limit of Kasna Cr. between 2,350 and 2,650 ft. in altitude. Two main deposits are 1,000 or more ft. in strike length. U.S. Bureau of Mines trenched and sampled the deposits in 1948-49. Average analyses of the two major deposits were 0.69 and 1.14% Cu. Elimination of a lower grade part of one deposit gave a total average analysis of 0.95% Cu, 27.5% Fe, and 30.1% SiO_2.

Moxham and Nelson, 1952 (C 207), p. 3-4 -- Radiometric tests gave negative results.

(Kasna Cr.) -- Continued

Wedow and others, 1952 (OF 51), p. 77 -- Reference to B 862.

Berg and Cobb, 1967 (B 1246), p. 14-16 -- Reportedly contact-metamorphic deposit in limestone cut by dikes and sills of porphyritic basalt. Several parallel zones as much as 250 ft. wide and 1,050 ft. long that contain specular hematite, subordinate chalcopyrite, and minor sphalerite, megnetite, and pyrite in a gangue of amphibole, chlorite or talc, calcite, and quartz. Northeast strike and northwest dip. Data on grade from RI 4828.

Reed, 1967 (OF 272), p. 14-16 -- Contact-metamorphic deposit in limestone that is covered by glacial deposits to north and is terminated by hornblende-biotite granodiorite to south. Skarn mineralization is chiefly specular hematite, chalcopyrite, magnetite, pyrite, amphibole, calcite, garnet, and quartz. Stream-sediment sampling was done to give "basis of reference" for studies in neighboring Iliamna quadrangle.

Eakins, 1970 (GC 20), p. 2-14 -- First staked in 1906. Has been sampling and diamond drilling; some geochemical sampling. Rocks in area are predominantly metasedimentary and volcanic rocks, smaller units of fragmental volcanic rocks and carbonates, and large masses of granitic to granodiorite intrusives. Carbonate rocks at Kasna Cr. are gray limestone and dolomite; may be discontinuous rather than one body; may be a lenticular mass in volcanics or, possibly, infaulted. Contact-metamorphosed zone in carbonate rocks contains irregular lenses and pods of specular hematite, chalcopyrite, chlorite, calcite, and quartz that have replaced limestone and dolomite; parallel to bedding. Stream-sediment and stream-bank sampling and analyses showed anomalous Cu, Pb, and Zn.

(Kellet Cr.) Gold

Bristol Bay region Lake Clark
S1/2NE1/4 quad.

Summary: Gold prospects have been found on this and other headwaters of the Kijik R.

Martin and Katz, 1910 (B 442), p. 200 -- In headwaters of Kijik R. Alluvium reported to be auriferous (1909).
Martin and Katz, 1912 (B 485), p. 126 -- Prospects have been found.
Smith, 1915 (B 622), p. 263-264 -- Preliminary to B 655.
Smith, 1917 (B 655), p. 137 -- Quotation from B 485.

(Kijik R.)

Copper, Gold, Lead, Molybdenum, Silver, Zinc.

Bristol Bay region
MF-378, locs. 2-4, in part

Lake Clark (13.75-14.6, 6.25-6.5) approx.
60°21'-60°22'N, 154°19'-154°25'W approx.

Summary: A shear zone in granitic rocks (MF-378, locs. 3, 4) contains arsenopyrite with a little argentiferous galena, chalcopyrite, sphalerite, and pyrite in a gangue of calcite and rhodochrosite. Granite float (MF-378, loc. 2) contains some molybdenite and, possibly, a little gold. Placer gold is present in alluvium of some headwater tributaries. Includes references to: Gleason, (Keejik R.), (Kijak R.), Thompson. See also: (Franklin Gulch), (Ingersol Gulch), (Kellet Cr.), (Lincoln Gulch).

Brooks, 1913 (B 542), p. 39 -- New discoveries of silver-lead ores said to have been made, 1912.

Brooks, 1914 (B 592), p. 64 -- Some work reported, 1913.

Smith, 1915 (B 622), p. 257, 268 -- Preliminary to B 655.

Smith, 1917 (B 655), p. 137 -- Quartz vein reported to cut granitic rocks is probably a pegmatite. Gold content reported to be high enough to make mining profitable. Also small, irregularly distributed crystals of molybdenite.

p. 153 -- Molybdenite and gold in pegmatite (?) vein on Kijik R. about 10 mi. NW of extreme N end of Lake Clark.

Smith, 1942 (B 926-C), p. 190-191 -- Reference to B 655 and statement that when Capps traversed much of the Kijik R. valley in 1929 he saw no signs of prospecting, no showings of molybdenum minerals, and no granitic rocks in area where molybdenite had been reported.

Moxham and Nelson, 1952 (C 207), p. 3-4 -- Highest eU from samples or heavy-mineral fractions was 0.004%. No radioactive minerals. Thompson silver-lead claims [MF-378, locs. 3, 4] are on a shear zone about 200 yds. wide in granitic country rock. Deposit is arsenopyrite with a little galena, chalcopyrite, sphalerite, and pyrite in a gangue of calcite and rhodochrosite. [As this is called a silver-lead prospect, the galena is assumed to be argentiferous.] Another Thompson prospect [MF-378, loc. 2] is near top of Kijik Mtn.; samples of molybdenite-bearing granite float were not radioactive. [Probably the same occurrence as that reported by Smith (B 655, p. 137) to contain gold.]

Wedow and others, 1952 (OF 51), p. 77 -- Reference to B 655.

Berg and Cobb, 1967 (B 1246), p. 14 -- Data from C 207 [but reference not cited].

Eakins, 1970 (GC 20), p. 5 -- At Thompson claims a shear zone in granitic rocks contains silver, galena, sphalerite, chalcopyrite, and pyrite. Placer gold has been found on tributaries.

(Koksetna R.) Gold

Bristol Bay region Lake Clark
SW1/4 quad.

Summary: Fine gold has been found. No mention of mining. Includes references to (Caribou Cr.).

Martin and Katz, 1910 (B 442), p. 200 -- Fine gold, but no pay, is reported from Caribou Cr. (1909).
Martin and Katz, 1912 (B 485), p. 126 -- Prospects have been found.
Smith, 1915 (B 622), p. 257, 263-264 -- Preliminary to B 655.
Smith, 1917 (B 655), p. 137 -- Quotation from B 485.

(Kontrashibuna Lake)

Molybdenum

Bristol Bay region
MF-378, loc. 10

Lake Clark (17.7, 2.9)
60°09'N, 153°59'W

Summary: Scattered flakes of molybdenite in piece of granite float.

Eakins, 1970 (GC 20), p. 18 -- Piece of granite float in small stream contained scattered flakes of molybdenite.

(Lincoln Gulch) Gold

Bristol Bay region Lake Clark
S1/2NE1/4 quad.

Summary: Gold prospects have been found on this and other headwaters of the Kijik R.

Martin and Katz, 1910 (B 442), p. 200 -- In headwaters of Kijik R. Alluvium reported to be auriferous (1909).
Martin and Katz, 1912 (B 485), p. 126 -- Prospects have been found.
Smith, 1915 (B 622), p. 263-264 -- Preliminary to B 655.
Smith, 1917 (B 655), p. 137 -- Quotation from B 485.

(Mulchatna R.) Gold

Bristol Bay region Lake Clark
NW1/4 quad.

Summary: Gold, not in paying quantities, in most river bars. Some gold on bedrock on some of smaller tributaries. Most prospecting in 1890's and, possibly, early 1900's. See also (Bonanza Cr.).

Spurr, 1900, p. 261 -- Gold, too flaky and fine to save, found 200 mi. from mouth as early as 1890. Other prospecting in 1898 also found fine colors.

Brooks, 1904 (B 255), p. 48 -- Gold has long been known in upper reaches of river, but not in paying quantities. Placers said to yield $4-5 per day per man, but area too remote for mining (1903). [May mean placers of Bonanza Cr.]

Katz, 1910 (B 442), p. 202 -- Preliminary to B 485.

Martin and Katz, 1912 (B 485), p. 133 -- Fine flour gold on all the river bars above Koktalee R. Above the forks of the Mulchatna gold is coarser and there is said to be some pay. Prospecting on some of smaller tributaries, where pay is practically all on bedrock, which is chiefly slate with some limestone and "porphyry."

Smith, 1915 (B 622), p. 262-263 -- Preliminary to B 655.

Smith, 1917 (B 655), p. 136 -- Quotations from Spurr, 1900, and B 485.

Cobb, 1973 (B 1374), p. 12 -- Source of very small amounts of gold in late 1800's and early 1900's.

(Pass Cr.) Gold

Bristol Bay region Lake Clark (11.2, 13.2)
MF-378, loc. 8 60°45'N, 154°41'W

Summary: Has been some ground sluicing. Coarse gold reported. Tributary of Bonanza Cr.

Jasper, 1961, p. 60-61 -- A little ground sluicing has been done; unconfirmed reports of coarsest gold in area (nuggets up to $4.00?).
Cobb, 1973 (B 1374), p. 12 -- Prospecting, but not much mining.

(Portage Cr.) Gold

Bristol Bay region
MF-378, loc. 9

Lake Clark (17.0, 6.55-6.7)
60°22'N, 154°03'W

Summary: Tributary of Lake Clark. Large glacial boulders in gravel. Reports indicate mining before 1909, 1910-14, 1917-18, and after World War II. Production probably worth only a few thousand dollars.

Martin and Katz, 1910 (B 442), p. 200 -- One man said to have done considerable work before 1909. Production, all coarse gold, worth $40. Alluvium 12 ft. thick; large glacial boulders.

Martin and Katz, 1912 (B 485), p. 126 -- Two men have netted a few hundred dollars in coarse gold.

Brooks, 1913 (B 542), p. 44 -- A little coarse gold mined, 1912.

Brooks, 1914 (B 592), p. 64 -- A few hundred dollars' worth of gold recovered, 1913.

Smith, 1915 (B 622), p. 264 -- Preliminary to B 655.

Smith, 1917 (B 655), p. 137 -- Quotation from B 485 and statement that operations were very minor in 1914.

Martin, 1919 (B 692), p. 33 -- Mining in 1917.

Martin, 1920 (B 712), p. 35 -- Mining in 1918.

Capps, 1932 (B 824), p. 154 -- Preliminary to B 862.

Capps, 1935 (B 862), p. 94 -- For the summers of 1910-12 several men worked 4 claims in lower part of creek and recovered about $2,000. No recent mining.

Smith, 1941 (B 926-A), p. 37 -- Hydraulicking in 1939.

Eakins, 1970 (GC 20), p. 5 -- Reference to B 862.

Cobb, 1973 (B 1374), p. 12 -- Mining 1910-12 and for a few years after World War II. Total production probably worth only a few thousand dollars.

(Ptarmigan Cr.)

Gold (?)

Bristol Bay region

Lake Clark
SE1/4NW1/4 quad.

Summary: Reportedly encouraging results from prospecting benches in 1912.

Brooks, 1913 (B 542), p. 44 -- Encouraging results reported from benches, 1912. [Location on creek not given. No other mention of this creek, so report is suspect.]

(Scynneva Cr.) Gold

Bristol Bay region Lake Clark (11.15, 12.45)
MF-378, loc. 7 60°42'N, 154°42'W

Summary: Tributary of Bonanza Cr. from which one man mined gold worth about $1,200 from 800-900 cu. yds. of gravel. Large boulders; claims were abandoned.

Jasper, 1961, p. 60-61 -- One-man operation at mouth rumored to have recovered $1,200 from 800-900 yards of gravel.
p. 64 -- Large boulders were too hard to handle and claims were abandoned.
Cobb, 1973 (B 1374), p. 12 -- Tributary of Bonanza Cr.; minor production.

(Chilligan R.)

Redoubt district
MF-412, loc. 15

Lead, Zinc

Lime Hills (23.35, 8.45)
61°27'N, 153°13'W

Summary: Sphalerite, galena, and pyrite in altered quartz monzonite float.

Reed and Elliott, 1970 (OF 413), p. 14, 20 -- Altered quartz monzonite float containing 5 to 20 percent sulfide minerals is abundant on a narrow medial moraine. Sulfides are sphalerite, galena, and pyrite as small irregular-shaped clots up to 2 cm in diameter, as disseminated grains, and as thin veinlets up to 5 mm wide.

(Jimmy Lake) — Copper, Lead, Molybdenum, Zinc

McGrath district — Lime Hills (23.3, 13.45)
MF-412, loc. 11 — 61°44'N, 153°12'W

Summary: Pieces of altered biotite granite float contain galena, sphalerite, molybdenite, and a trace of chalcopyrite. Granite stock probably intruded Tertiary volcanics as well as older sedimentary rocks.

Reed and Elliott, 1970 (OF 413), p. 12-13, 19 -- Mineralization in altered parts of a biotite granite stock that intruded sedimentary rocks and probably overlying Tertiary volcanic rocks. Stock contains fluorite as an accessory mineral. A float boulder is altered granite consisting chiefly of quartz, sericite, kaolinite, albite, and less than 5% disseminated galena and sphalerite. Another piece of float contains thin veinlets (1/8 to 1/4 in. wide) of quartz, galena, sphalerite, arsenopyrite, and a trace of chalcopyrite. A third piece of altered granite float contains a 1-inch-wide quartz-molybdenite vein.

(Styx R.) Gold, Lead, Zinc

McGrath district
MF-412, loc. 14, in part

Lime Hills
E1/4NE1/4 quad.

Summary: Placer gold present in lower basin, but was not found in minable quantities. Altered felsic intrusive rock (MF-412, loc. 14) contains generally less than 1% sulfide minerals; pyrite, sphalerite, and galena.

Capps, 1935 (B 862), p. 95 -- Coarse gold in small amounts in lower basin. A little prospecting found no paying ground.

Reed and Elliott, 1970 (OF 413), p. 15, 20-21 -- An altered and intensely iron-stained felsic intrusive rock on a tributary [MF-412, loc. 14] is exposed for about 200 ft. along the creek. Rock is chiefly quartz and sericite with minor K-feldspar and altered biotite, and generally less than 1% sulfide minerals. Pyrite is most common and occurs as disseminations in the felsite and in quartz veins up to 2 in. wide. Sphalerite and galena occur as thin veinlets up to 2 mm wide and, rarely, as finely disseminated grains.

Unnamed occurrences	Antimony
McGrath district MF-412, loc. 4	Lime Hills (20.2, 11.75) 61°39'N, 153°35'W

Summary: Massive stibnite float blocks. Bedrock source, which must be very close, probably is localized along faults or shear zones in argillite with interbedded graywacke.

Reed and Elliott, 1970 (OF 413), p. 18, 22 -- Massive stibnite blocks up to a foot across in frost-heaved rubble near top of a ridge and in talus. Area underlain by argillite and interbedded graywacke. Float samples probably very close to source. Occurrence is probably localized along faults or shear zones.

Unnamed occurrences	Copper
McGrath district MF-412, loc. 8	Lime Hills (21.05, 9.5) 61°31'N, 153°29'W

Summary: Chalcopyrite in brecciated quartz diorite and diorite gneiss boulders.

Reed and Elliott, 1970 (OF 413), p. 22 -- Boulders of brecciated quartz diorite and diorite gneiss contain tourmaline and chalcopyrite (15%). One sample contained 5% pyrite.

Unnamed occurrences

Copper

McGrath district
MF-412, loc. 10

Lime Hills (22.45, 10.45)
61°34'N, 153°19'W

Summary: Small body of quartz monzonite contains traces of disseminated chalcopyrite and sparse fractures filled with quartz, chalcopyrite, and minor amounts of other sulfide minerals (which ones not specified).

Reed and Elliott, 1970 (OF 413), p. 14, 20 -- A small body of quartz monzonite cuts slates and graywacke and a monzonite stock. The quartz monzonite contains traces of disseminated chalcopyrite and sparse fractures (one is 1 cm wide) locally contain quartz, chalcopyrite, and minor amounts of other sulfide minerals.

Unnamed occurrence

Copper

McGrath district
MF-412, loc. 5

Lime Hills (20.2, 10.8)
61°36'N, 153°35'W

Summary: A quartz vein in relatively unmetamorphosed sedimentary rocks contains 10% arsenopyrite and minor chalcopyrite.

Reed and Elliott, 1970 (OF 413), p. 17, 22 -- Veins and float contain sulfide minerals, including pyrite, arsenopyrite, chalcopyrite, and pyrrhotite. The area is underlain by relatively unmetamorphosed shale, argillite, and graywacke that are cut by a series of faults or shears spaced about 300-500 ft. apart. A small granitic body is about a mile to the southwest. A sample of 3-foot-wide quartz vein contained 10% arsenopyrite and minor chalcopyrite.

(Unnamed occurrences) — Copper

McGrath district — Lime Hills (24.6, 12.5)
MF-412, loc. 12 — 61°41'N, 153°03'W

Summary: Shear zone in granodiorite contains chalcopyrite and other sulfides; malachite and azurite stains and traces of chalcopyrite near shear zone. Float downslope from small oxidized zones contain disseminated chalcopyrite, bornite, other sulfides, and tourmaline.

Reed and Elliott, 1970 (OF 413), p. 13, 19 -- Granodiorite is cut by northwest-trending shear zones and quartz-feldspar porphyry dikes. A shear zone 3-5 ft. wide with an exposed length of 30 ft. contains clots of iron oxide minerals and up to 10% sulfide minerals (chiefly pyrite and chalcopyrite); traces of chalcopyrite in granodiorite up to 10 ft. from shear zone; malachite and azurite stains more than 10 ft. from shear zone. Float downslope from a nearby iron-stained zone contains small amounts of disseminated pyrite, chalcopyrite, arsenopyrite, bornite, and tourmaline. Float is sparse and oxidized zones appear to be small.

Unnamed occurrences

Copper, Lead

Redoubt district
MF-412, loc. 16

Lime Hills (24.75, 9.0)
61°29'N, 153°03'W

Summary: Float samples contained chalcopyrite, galena, and other sulfides; malachite on some fracture surfaces.

Reed and Elliott, 1970 (OF 413), p. 21 -- Float sample of a mafic rock contained 30% massive chalcopyrite and pyrite. Float sample of tourmaline-quartz rock contained 20% disseminated arsenopyrite, pyrite, and chalcopyrite. Float sample of altered felsic rock contained 3% disseminated pyrite and galena; limonite and malachite on fracture surfaces.

Unnamed occurrence

Aniak district
MF-412, loc. 7

Copper, Lead, Zinc

Lime Hills (19.25, 8.45)
61°28'N, 153°42'W

Summary: Boulder 60% sulfide minerals; chiefly galena, with sphalerite, bournonite, chalcopyrite, and pyrite.

Reed and Elliott, 1970 (OF 413), p. 23 -- Boulder, 2 ft. in diameter, of sulfide breccia that contains angular fragments of volcanic rock. 60% sulfide minerals, chiefly galena, with subordinate sphalerite, bournonite, chalcopyrite, and pyrite. Volcanic rocks in nearby cirque are locally altered.

Unnamed occurrence	Copper, Lead, Zinc
McGrath district MF-412, loc. 13	Lime Hills (24.7, 12.15) 61°40'N, 153°02'W

Summary: Float samples from a small cirque contained chalcopyrite, galena, sphalerite, and iron sulfides.

Reed and Elliott, 1970 (OF 413), p. 14, 20 -- Mineralized float in a small cirque. Samples of granodiorite, altered felsic rock, sulfides, and vein quartz contained chalcopyrite, pyrrhotite, sphalerite, galena, and pyrite.

Unnamed occurrences	Copper, Molybdenum, Zinc
McGrath district MF-412, loc. 9	Lime Hills (21.1, 9.0) 61°29'N, 153°29'W

Summary: Sphalerite, molybdenite, chalcopyrite, and iron sulfides in quartz cobbles.

Reed and Elliott, 1970 (OF 413), p. 22-23 -- Three quartz cobbles contained (1) less than 2% molybdenite; (2) less than 10% sphalerite and pyrite in veinlets 1-3 mm wide; and (3) 40% pyrrhotite and minor chalcopyrite.

Unnamed occurrences — Copper, Zinc

McGrath district — Lime Hills (20.3, 10.8)
MF-412, loc. 6 — 31°36'N, 153°34'W

Summary: Relatively unmetamorphosed sedimentary rocks cut by faults or shear zones contain disseminated sulfide minerals, narrow veins of massive sulfide minerals, and quartz veins with minor sulfide contents. Sulfides in samples include arsenopyrite, pyrite, pyrrhotite, chalcopyrite, and (in one probably exotic boulder) sphalerite.

Reed and Elliott, 1970 (OF 413), p. 17-18, 22 -- Veins and float contain sulfide minerals, including pyrite, arsenopyrite, chalcopyrite, pyrrhotite, and (in a quartz porphyry boulder) sphalerite. Area is underlain by relatively unmetamorphosed shale, argillite, and graywacke that are cut by a series of faults or shears spaced about 300-500 ft. apart. A small granitic body is about a mile away. Types of mineralization are: (1) clastic rocks containing disseminated sulfides near shear zones; (2) narrow veins of arsenopyrite and(or) pyrite with minor chalcopyrite along shears; and (3) minor sulfides in quartz veins. Many quartz veins are barren of sulfides; the sulfide content of those with any sulfide minerals is seldom more than 10%.

Unnamed occurrence

Molybdenum

McGrath district
OF 412, loc. 3

Lime Hills (19.3, 13.05)
61°44'N, 153°41'W

Summary: Less than 2% molybdenite in a 2-inch quartz vein in quartz diorite.

Reed and Elliott, 1970 (OF 413), p. 22 -- A quartz vein 2 in. wide in quartz diorite contains less than 2% finely disseminated molybdenite.

Unnamed occurrence

Monazite (?), RE

McGrath district
MF-412, loc. 2

Lime Hills (15.85, 8.2)
61°27'N, 154°07'W

Summary: Accessory allanite and monazite and(or) xenotime in biotite granite.

Reed and Anderson, 1969 (OF 355), p. 2 -- Sample of biotite granite contained abundant accessory allanite and also monazite and(or) xenotime, which are characteristic accessory minerals of the main batholithic mass.

Unnamed occurrence	Monazite (?), RE
McGrath district	Lime Hills (14.8, 9.8)
MF-412, loc. 1	61°33'N, 154°14'W

Summary: Accessory allanite and monazite and(or) xenotime in biotite granite.

Reed and Anderson, 1969 OOF 355), p. 2 -- Sample of biotite granite contained abundant accessory allanite and also monazite and(or) xenotime, which are characteristic accessory minerals of the main batholithic mass.

(Alder Cr.) (Gulch)

Antimony, Bismuth, Gold, Tungsten

McGrath district
MF-379, loc. 21

McGrath (2.35, 12.15)
62°42'N, 155°43'W

Summary: Geologically similar to Candle Cr. About 65 oz. gold mined 1929-33. Concentrates contained scheelite, magnetite, stibnite, bismuth in addition to gold. See also (Candle Cr.).

Smith, 1933 (B 836), p. 43 -- Productive mining reported, 1930.
Smith, 1933 (B 944-A), p. 43 -- Mining, 1931.
Smith, 1934 (B 864-A), p. 45 -- Mining, 1933. [This reference is mixed up; Alder Cr. and Vinasale are both listed, even though they are really the same occurrence.]
Cobb, 1973 (B 1374), p. 52 -- Geologically similar to Candle Cr. Between 1929 and 1933 about 65 oz. of gold was mined from a cut of about 13,600 sq. ft. Large boulders hampered the hand operation. Concentrates contained considerable scheelite, some magnetite, stibnite, and bismuth, and no cinnabar.

(Black Cr.) Gold

McGrath district (?) McGrath (?)

Summary: Mining in 1930 reported. Location of creek not known.

Smith, 1933 (B 836), p. 43 -- "A small amount of productive mining was also reported to have been done on Moore and Black Creeks and Alder Gulch." [Location of creek not known; may not be in McGrath quad.]. (1930.)

(Bowser Cr.)

Copper, Gold, Lead, Silver, Zinc

McGrath district
MF-379, locs. 11-13

McGrath (18.75-18.9, 3.45-3.7)
62°11'-62°12'N, 153°42'-153°43'W

Summary: Argentiferous galena, sphalerite, pyrrhotite, and minor chalcopyrite in replacement bodies and fissure veins in Paleozoic limestone intruded by igneous breccia, body of granodiorite porphyry, and felsic and mafic dikes. Hornfels developed around some intrusives. Samples contained as much as 3.4 ppm Au.

Reed and Elliott, 1968 (C 559) -- Country rock is lower Paleozoic argillite, limestone, and siltstone with interbedded shale and limestone cut by Tertiary (?) intrusive breccia and a small body of granodiorite porphyry. Many felsic and mafic dikes. Limestone and pelitic rocks converted to hornfels with a hundred or so feet of some intrusive bodies. Mineral deposits are replacement bodies (skarns) and fissure veins in limestone and fracture fillings in igneous breccia. Ore minerals are argentiferous galena, sphalerite, minor chalcopyrite, pyrrhotite. Deposits are discontinuous. Samples contained 0.02-3.4 ppm Au, 0.2-309.8 oz. Ag per ton, 0.2-2.44 percent Cu, 0.02-60.0 percent Pb, 0.03-22.1 percent Zn.

Reed and Elliott, 1968 (C 569), p. 2-4 -- Fault that has been traced more than 20 mi. may have influenced intrusion of breccias with associated deposits of lead, silver, and zinc. Data summarized from C 559. Metal concentrations in stream-sediment samples decrease rapidly downstream from known bedrock occurrences.

(Candle Cr.) — Gold, Mercury, Monazite (?), Tungsten

McGrath district — McGrath (1.55-1.85, 15.3-15.75)
MF-379, loc. 20 — 62°53'-62°54'N, 155°46'-155°49'W

Summary: Small quartz monzonite pluton intruded Cretaceous shale and sandstone. Basalt at extreme head of creek. Richest part of creek underlain by quartz monzonite. Concentrates contained gold (including nuggets weighing 1-2 oz.), much cinnabar (some saved and retorted), magnetite, scheelite, and monazite (?). Gold discovered in 1913 and mined until World War II. Dredge operated 1917-26. No data on production.

Brooks, 1914 (B 592), p. 70 -- Extensive prospecting, 1913; results near head of creek said to be good. Country rock reported to be granite.
Brooks, 1915 (B 622), p. 67 -- 22 men mining and prospecting, 1914.
Smith, 1915 (B 622), p. 257 -- Gold lodes said to be being prospected, 1914.
p. 261 -- Placer deposit similar to those at Flat [Iditarod quad.]. Prospecting, winter of 1913-14, by drilling and shaft sinking gave good returns. Gold near head of creek in residual granitic sand. Deposits 10 to 56 ft. deep.
Mertie and Harrington, 1916, p. 238, 251-252, 265 -- Preliminary to B 754.
Smith, 1917 (B 655), p. 131 -- Gold lodes said to be being prospected in 1914.
Smith, 1917 (BMB 153), p. 55 -- Dredge being shipped in did not arrive in 1916. Other mining reported to have given good returns in 1916.
Brooks, 1918 (B 662), p. 60 -- Dredge being shipped in did not arrive in 1916.
Martin, 1919 (B 692), p. 40 -- Mining in 1917.
Martin, 1920 (B 712), p. 50 -- Dredge began working in 1918, but had mechanical problems.
Brooks, 1921 (B 714), p. 39 -- Cinnabar in placer as accessory mineral.
Brooks and Martin, 1921 (B 714), p. 67, 93 -- Dredge operated all season, 1919.
Brooks, 1922 (B 722), p. 11 -- Dredge operated, 1920.
p. 60 -- Dredge operated May to October; 22 men; 74,597 $yd.^3$ gravel handled.
Brooks, 1923 (B 739), p. 9, 42 -- Dredge operated, 1921.
Mertie, 1923 (B 739), p. 157 -- Mineralization in or close to quartz monzonite.
Brooks and Capps, 1924 (B 755), p. 14, 47 -- Dredge operated, 1922.
Mertie and Harrington, 1924 (B 754), p. 83 -- Cinnabar in concentrates has been retorted and the mercury used locally.
p. 107-108 -- Mining begun in 1914 and continued in 1915. Dredging 1918-1921. Divide at head of creek is basalt; spurs on each side are Cretaceous sandstone and shale. Bedrock in upper part of stream course is a pear-shaped body of quartz monzonite 3 mi. long with small end pointed downstream. Gravel 9-15 ft. thick in upper part of creek; thickens downstream. Gold irregularly distributed through gravel in grains worth about 1¢. Richest ground is where bedrock is quartz monzonite. Concentrates mainly cinnabar and magnetite. Gold undoubtedly derived from veins and(or) mineralized zones in or near quartz monzonite.
Brooks, 1925 (B 773), p. 27, 48 -- Dredge operated, 1923.
Smith, 1926 (B 783), p. 15,18 -- Dredge operated, 1924.
Moffit, 1927 (B 792), p. 20, 25 -- Dredge operated, 1925.
Smith, 1929 (B 797), p. 24-25, 30 -- Dredge operated, 1926; part of season only.

(Candle Cr.) - Continued

Smith, 1930 (B 810), p. 31 -- Dredge idle, but other types of mining, 1927.
Smith, 1930 (B 813), p. 36-37 -- Dredge idle, but other types of mining, 1928.
Smith, 1932 (B 824), p. 42 -- Small-scale mining, 1929.
Smith, 1933 (B 836), p. 43 -- Dredge idle (some of machinery reported to have been moved to Innoko district). Small-scale mining, 1930.
Smith, 1933 (B 844-A), p. 43 -- Dredge partly dismantled; no other mining reported, 1931.
Smith, 1934 (B 857-A), p. 40-41 -- Small-scale mining, 1932, in areas that the old dredge had missed.
Smith, 1934 (B 864-A), p. 45 -- Small-scale mining in 1933.
Mertie, 1936 (B 864-C), p. 197-198 -- Creek sharply incised in a well-defined bench that begins in upper valley and continues downstream for about 5 mi. Walls of valley largely Cretaceous sandstone and shale; divide at head is basalt. Just downstream from divide quartz monzonite crops out in a ham-shaped body; shank extends downstream for about 3 mi. and terminates 3 or 4 claim lengths above Discovery. Gold derived from small quartz veins in pluton and from mineralized rock adjacent to it. Gold discovered in 1913. Mining was from a few claims above Discovery to head of creek. Much cinnabar in concentrates. Fineness of gold - 914 Au, 78 ag.
Smith, 1936 (B 868-A), p. 46 -- Small-scale mining, 1934.
Smith, 1937 (B 880-A), p. 48 -- Small-scale mining, 1935.
Smith, 1938 (B 897-A), p. 57 -- Hydraulicking, 1936.
Smith, 1939 (B 910-A), p. 60 -- Non-float mining on a large scale; mainly dead work in 1937.
Smith, 1939 (B 917-A), p. 58-59 -- A major producer in 1938. Much cinnabar in concentrates; some of gold nuggets 1 or 2 oz.
Smith, 1941 (B 926-A), p. 56 -- Major producer in 1939.
Joesting, 1942 (TDM 1), p. 25-26 -- Abundant cinnabar in placers.
Smith, 1942 (B 933-A), p. 52 -- Mining in 1940; handicapped by lack of water early in season.
Webber and others, 1947 (RI 4065), p. 5 -- Reference to TDM 1.
Wedow and others, 1951 (OF 51), p. 89 -- Has been successful gold mining. Radiometric tests of samples were negative.
White and Killeen, 1953 (C 255), p. 16, 18 -- No mining in 1947. Concentrate sample contained cinnabar, scheelite, and monazite (?); eU of heavy fraction - 0.003%.
Malone, 1962 (IC 8131), p. 7, 57 -- Reference to B 642 (same as B 754].
Malone, 1965 (IC 8252), p. 53 -- Reference to IC 8131 and to an incorrectly identified US Geol. Survey Bull.
Overstreet, 1967 (P 530), p. 111 -- Reference to C 255.
Cobb, 1973 (B 1374), p. 52 -- Gold discovered, 1913. Dredge operated 1917-1926. Gold, some in nuggets of 1-2 oz., derived from veins in quartz monzonite and Cretaceous shale and sandstone adjacent to intrusive body. Cinnabar abundant in concentrates; some was saved and retorted, and the mercury sold locally. Other heavy minerals included magnetite, scheelite, and monazite (?).

Chip Loy

Nickel

McGrath district
MF-379, loc. 18

McGrath (13.35, 3.05)
62°10'N, 154°23'W

Summary: Nickel-bearing pyrrhotite in limestone next to a diabase intrusive body. Not much high-grade ore.

Herreid, 1968 (GR 26), p. 1 -- Nickel prospect.

p. 8 -- Irregular steeply dipping layer of massive to disseminated pyrrhotite in mineralized zone 1,100 ft. long. Massive pyrrhotite "up to 11 feet wide." Disseminated pyrrhotite "up to 100 ft. wide." In banded silicified limestone along diabase pipe (?). Samples lost. "The nickel grade is not high for any amount of ore."

(Fluorite Cr.)

Gold, Silver; Fluorite

McGrath district
MF-479, loc. 25

McGrath (14.3-15.05, 2.9-3.35)
62°09'-62°11'N, 154°10'-154°15'W

Summary: A single fluorite cobble was found. Assay of gossan material showed 0.06 oz. Au and 0.16 oz. Ag per ton.

Herreid, 1968 (GR 26), p. 9 -- Float of gossan material in creek. Sample assayed 0.06 oz. Au per ton, 0.16 oz. Ag per ton. One 5-in. cobble of fluorite was found.

(Hippie Cr.) Lead, Silver

McGrath district
MF-379, loc. 9

McGrath (19.1, 5.0)
62°16'N, 153°40'W

Summary: Calcite vein in limestone near felsic intrusives contains pyrite, argentiferous galena, and minor arsenopyrite.

Reed and Elliott, 1968 (C 569), p. 2 -- Vein of calcite, argentiferous galena, and pyrite.

p. 5-8 -- Dike swarms and small stocklike bodies of porphyritic felsic rocks in limestone with small amounts of argillite and siltstone. Calcite vein in limestone contains pyrite and argentiferous galena in scattered grains and discontinuous bands 1-10 in. wide; minor arsenopyrite. Gold less than 0.02 ppm.

(Hippie Cr., S. Fork) — Lead, Silver

McGrath district — McGrath (18.7, 4.15)
MF-379, loc. 10 — 62°13'N, 153°43'W

Summary: Narrow shear zone in limestone parallel to and 2 ft. from felsite sill contains calcite, pyrite, and argentiferous galena.

Reed and Elliott, 1968 (C 569), p. 2 -- Small shear zone near igneous bodies that may have been localized by a fault contains pyrite and argentiferous galena.

p. 6-7 -- Narrow shear containing sulfides in massive gray limestone is 2 ft. from contact and parallel to 20-ft.-thick pyrite-bearing felsite porphyry sill. Shear is discontinuously mineralized; chiefly calcite, pyrite, galena. Silver greater than 1,000 ppm.

(Ozzna Cr.) Lead, Zinc

McGrath district McGrath (17.0, 5.7)
MF-379, loc. 23 62°19'N, 153°55'W

Summary: Stream and talus boulders contain magnetite and various sulfides, including sphalerite and galena. Small intrusive at head of creek.

Reed and Elliott, 1968 (C 569), p. 4 -- Stream heads in small, probably quartz diorite, intrusive. Boulders of pyrrhotite and sphalerite, pyrite-pyrrhotite-galena-sphalerite-arsenopyrite, or pyrite and magnetite in stream and talus slopes.

p. 6-7 -- Stream cobble (pyrite-sphalerite-gelana in silicated limestone) high in Pb and Zn.

(Ozzna Cr. tributary) | Lead, Silver, Zinc

McGrath district | McGrath (16.8, 5.4)
MF-379, loc. 3 | 62°18'N, 153°57'W

Summary: Breccia pipe (?) and felsic and mafic dikes cut complexly folded argillite, limestone, and siltstone. Pods and lenses of sulfide minerals contain sphalerite and argentiferous galena.

Reed and Elliott, 1968 (C 569), p. 4-8 -- Stream drains part of a circular igneous body 2 mi. in diameter that is surrounded by complexly folded argillite, limestone, and siltstone. Talus chiefly igneous breccia. Felsic and mafic dikes (relations to breccia, which may be a pipe, are not known) cut sedimentary rocks. Sulfide minerals exposed in valley wall; small pods and lenses of pyrrhotite (containing euhedral pyrite crystals), sphalerite, and argentiferous galena; selected sample contained 52.2 oz. Ag per ton; chip sample less than 1/2 oz. Ag per ton, 1.5% Pb, and 1% Zn. Another lens is along a fault zone that shows intensive hydrothermal alteration; contains pyrrhotite, sphalerite, and argentiferous galena. Selected sample contained 70.4 oz. Ag per ton.

(Post R., W. Fork)

Copper, Zinc

McGrath district
MF-379, loc. 19

McGrath (17.45, 0.55)
62°01'N, 153°53'W

Summary: Minor chalcopyrite and sphalerite in small lenses and disseminations of pyrrhotite in mafic dikes in argillite adjacent to a small stock. Lithology of stock not reported.

Reed and Elliott, 1968 (C 569), p. 2 -- Small stock with pyrrhotite and chalcopyrite may have been emplaced along a fault.

p. 6-7 -- Scattered small lenses and disseminations of pyrrhotite in mafic dikes that cut argillite adjacent to a small stock. Minor chalcopyrite and sphalerite.

(Roundabout Mtn.) Copper, Nickel

McGrath district McGrath (3.25, 15.7) approx.
MF-379, loc. 1 62°54'N, 155°35'W approx.

Summary: Sample sent to U.S. Geological Survey contained pyrite, chalcopyrite, and a trace of nickel.

Brooks and Martin, 1921 (B 714), p. 93 -- Sample sent to Survey by Dr. W. F. Green contained pyrite, chalcopyrite, and a trace of nickel.
Berg and Cobb, 1967 (B 1246), p. 97 -- Same as B 714, p. 93.

(Sheep Cr.)

Zinc

McGrath district
MF-379, locs. 6, 7

McGrath (18.0-18.15, 5.65-5.9)
62°19'N, 153°47'-153°48'W

Summary: Small pods of sphalerite and pyrrhotite in shear zones in dikes near small granitic stock.

Reed and Elliott, 1968 (C 569), p. 5-8 -- Small stock of quartz monzonite or granodiorite porphyry cuts limestone, siltstone, and argillite. Shear zones in dikes near north side of stock contain small lenses of sphalerite and pyrrhotite.

(Sheep Cr., Rat Fork)

Copper, Lead, Silver, Zinc

McGrath district
MF-379, locs. 4, 5

McGrath (17.3-17.85, 5.8-6.3)
62°19'-62°20'N, 153°49'-153°53'W

Summary: Quartz diorite porphyry dikes cut limestone and argillite. Skarn zones contain sulfides, including sphalerite and chalcopyrite. Boulders in stream and talus slopes contain magnetite and sulfides, including galena and sphalerite. One boulder assayed 9.6 oz. Ag per ton.

Reed and Elliott, 1968 (C 569), p. 4 -- Small intrusive (quartz diorite (?)) near head. Quartz diorite porphyry dikes cut limestone and argillite in cirque walls near head; skarn zones 2-10 ft. wide contain pyrrhotite, sphalerite, and chalcopyrite. Boulders of pyrrhotite and sphalerite, pyrite-pyrrhotite-galena-sphalerite-arsenopyrite, or pyrite and magnetite near headwaters and in talus slopes. One boulder assayed 9.6 oz. ag per ton, more than 10% Pb, and 7% Zn.

p. 6-7 -- Analyses summarized above.

(Tin Cr. tributary)

Copper, Zinc

McGrath district
MF-379, locs. 2, 22

McGrath (18.95, 8.5)
62°28'N, 153°40'W

Summary: Sphalerite, chalcopyrite, and some malachite stains in veinlets and along shear zones.

Reed and Elliott, 1968 (C 569), p. 5-7 -- Sulfide minerals in veinlets and along shear zones include pyrrhotite, sphalerite, and chalcopyrite; some malachite staining.

(White Mtn.) Mercury

McGrath district
MF-379, locs. 14-16

McGrath (9.3-9.4, 2.95-3.3)
62°10'-62°11'N, 154°51'-154°52'W

Summary: Cinnabar mineralization has been localized along subsidiary faults near and northwest of the main break of the Farewell fault, which separates lower Paleozoic carbonates, shale, and argillite on the NW from Cretaceous (?) conglomerate. Cinnabar (only sulfide mineral) is in brecciated dolomitized limestone, commonly near contact with shale. One basaltic dike altered to clay, carbonate minerals, and silica was uncovered in a prospect trench. No other intrusive rocks in immediate vicinity. Mining from 1964 to as recently as 1973. No data on amount of production.

Sainsbury and MacKevett, 1960 (P 400-B), p. B38 -- Ore control is steep faults essentially parallel to bedding. Cinnabar in pods of brecciated, silicified, and dolomitized limestone adjacent to faults. Very close to and NW of Farewell fault. Ore not closely associated with altered dikes.

Jasper, 1961, p. 65 -- Promising prospect located in 1958.
p. 75-77 -- Discovered as a result of finding cinnabar in nearby creek bed. Cinnabar mineralization in shear zones in dolomite.

Malone, 1962 (IC 8131), p. 45-46 -- Zone of highly faulted dolomitic limestone and shale is about 2,000 ft. wide, strikes N30E, and is exposed for a strike length of 20,000 ft. Cinnabar at both ends and for 10,000 ft. in middle of strike length. Cinnabar in creeks draining eastern side of zone.

Malone, 1965 (IC 8252), p. 46 -- Same as IC 8131.
p. 54 -- Reference to IC 8131.

Sainsbury and MacKevett, 1965 (B 1187), p. 21-35 -- In Middle (?) Ordovician mainly calcareous rocks NW of main Farewell fault; Silurian or Devonian limestone and dolomite to NW. SE of fault is Cretaceous (?) conglomerate. Ore localized along SE-dipping faults that presumably are part of Farewell fault zone. Small Tertiary granite pluton about 2 mi. S of main prospects. Altered dike (clay and carbonate minerals, fine-grained silica) in one prospect trench. Tectonic breccia probably indicates post-Late Cretaceous or Tertiary flat faulting and hydrothermal activity. Cinnabar (only sulfide mineral) in brecciated dolomite and limestone (some dolomitized), commonly at contact with shale, near base of Ordovician sequence. Some hematite and limonite with cinnabar, which replaced some dolomite as well as having been deposited in open spaces.
p. 80 -- Semiquantitative spectrographic analyses of specimens; no As and practically no Sb.

Berg and Cobb, 1967 (B 1246), p. 96 -- Discovered in 1958; lodes of cinnabar in brecciated and dolomitized Paleozoic limestone along subsidiary faults west of Farewell fault. Mercury has been recovered, mainly since 1963.

Maloney, 1967 (RI 6892) -- Details of U.S. Bureau of Mines trenching and drilling program. Geologic data summarized in B 1187.

(White Mtn.) - Continued

Hawley and others, 1969 (C 615), p. 16, 18-20 -- Mining began in 1964. The main deposits are in a northeasterly trending zone about 1,600 ft. WNW of the main break of the Farewell fault. Zone of deposits coincides with a subsidiary fault system that cuts Ordovician shales and limestones. Dolomitized or silicified limestones in main productive zones. No trace elements other than Hg are abundant in ore, but gouge zones contain anomalous amounts of Ti, As, Sb, B, Cr, and Zr.

Alaska Division of Geological and Geophysical Surveys, 1974, p. 45 -- Mining in 1973.

Unnamed creek	Copper, Lead, Zinc
McGrath district MF-379, locs. 8, 24	McGrath (19.2, 6.5) 62°21'N, 153°39'W

Summary: Sulfide minerals in small veinlets and along shear zones include galena, chalcopyrite and sphalerite.

Reed and Elliott, 1968 (C 569), p. 5-7 -- Sulfide minerals in small veinlets and along shear zones. Samples contained pyrrhotite, pyrite, galena, chalcopyrite, and sphalerite.

Unnamed occurrence	Copper
McGrath district	McGrath (13.3, 3.05)
MF-379, loc. 18	62°10'N, 154°23'W

Summary: Pyrrhotite (?) and copper minerals in vein in silicified limestone-slate.

Herreid, 1968 (GR 26), p. 8, 16 -- Narrow, gossan-capped vein of pyrrhotite (?) and chalcopyrite in silicified limestone-slate bedrock. Malachite and azurite present.

Unnamed occurrence	Copper, Nickel
McGrath district MF-379, loc. 17	McGrath (12.75, 3.6) 62°12'N, 154°27'W

Summary: Minor amounts of scattered copper-nickel sulfides in partially serpentinized peridotite.

Reed and Elliott, 1968 (OF 310), p. 3 -- "A small body of partially serpentinized peridotite contains minor amounts of scattered copper-nickel sulfide minerals." Maximum exposed dimension is 50 ft.; intrudes complexly folded limestone and argillite; may have been emplaced along a segment of Farewell fault.

Synonyms, Claim Names, Operators, and Owners

Many mines and prospects have undergone changes in both their own names and in the names of their operators and owners. All names that appear in the cited references appear in this summary either in the first section as occurrence names or in this as synonyms. Descriptions of placer deposits commonly give little information on the location of individual mines or claims, so the names of all operators and owners of placer mines and claims are in this section with a notation to refer to the description of the stream that was mined or prospected.

For the Lime Hills quadrangle only one name for each deposit appears in the literature. Therefore, this section of this report has no page for the Lime Hills quadrangle.

Barnes -- see (Kasna Cr.)
Belle -- see (Kasna Cr.)
(Big Bonanza Cr.) -- see (Bonanza Cr.)
Bowman -- see (Portage Cr.)
Brooks & von Hardenberg -- see (Kasna Cr.)

(Caribou Cr.) -- see (Koksetna R.)
Cook -- see (Kasna Cr.)
Cyanide -- see (Kasna Cr.)
Edwards -- see (Kasna Cr.)
Gill -- see (Bonanza Cr.)

Gilt Edge -- see (Kasna Cr.)
Gleason -- see (Kijik R.)
Hardenberg -- see (Kasna Cr.)
(Keejik R.) -- see (Kijik R.)
Kendall -- see (Kasna Cr.)

(Kijak R.) -- see (Kijik R.)
King -- see (Kasna Cr.)
Melish, Walker & King -- see (Mulchatna R.)
Millett -- see (Bonanza Cr.)
Morris -- see (Kasna Cr.)

Peary -- see (Kasna Cr.)
Platsburg -- see (Kasna Cr.)
St. Eugene Mining Corp., Ltd. -- see (Kasna Cr.)
Shamrock Ledge -- see (Kasna Cr.)
Thompson -- see (Kijik R.)

Blackburn & Eldridge -- see (Candle Cr.)
Cordero Mining Co. -- see (White Mtn.)
Egnati -- see (White Mtn.)
Egnaty -- see (White Mtn.)
Ignaty -- see (White Mtn.)

Kuskokwim Dredging Co. -- see (Candle Cr.)
Lyman -- see (White Mtn.)
Mary Margaret -- see (White Mtn.
Mary Margie -- see (White Mtn.)
Peggy Barbara -- see (White Mtn.)

Red Devil -- see (Candle Cr.)
Strandberg & Sons, Inc. -- see (Candle Cr.)
(Vinasale) -- see (Alder Cr.)

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