UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUMMARY OF REFERENCES TO MINERAL OCCURRENCES (OTHER THAN MINERAL FUELS AND CONSTRUCTION MATERIALS) IN THE HEALY QUADRANGLE, ALASKA

By

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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 Healy quadrangle, Alaska. References to most reports of the Geological Survey, the U.S. Bureau of Mines, and the State of Alaska Divison of Geological and Geophysical Surveys and its predecessor State and Territorial agencies released before July 1, 1978, are summarized. Certain, mainly statistical, reports such as the annual Minerals Yearbook of the U.S. Bureau of Mines and most 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.

Mineral resources maps prepared by members of the Geological Survey as parts of the Regional Alaska Mineral Resource Assessment Program (Cobb, 1977; MacKevett and Holloway, 1977) contain very little information not derived from older reports and are cited only in those few instances in which data not previously available in Federal or State reports are given. The metallic mineral resources map of the quadrangle (Clark and Cobb, 1972) and the mineral resources map by MacKevett and Holloway (1977) include locations of and data on some areas characterized by geochemical anomalies with which occurrences of specific potentially valuable minerals have not been identified; these locations are not included in this summary. Also not included are data on many claims about which little more than their locations is known (for example, MacKevett and Holloway, 1977, p. 24-26). These omissions should not be interpreted as a judgement on my part that the claims are not on valid mineral occurrences, but only that there are insufficient data to describe any mineral deposit that might be present.

This report is divided into three parts: a section made up of summaries of references arranged alphabetically first 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 in the first section and those referred to in these introductory paragraphs.

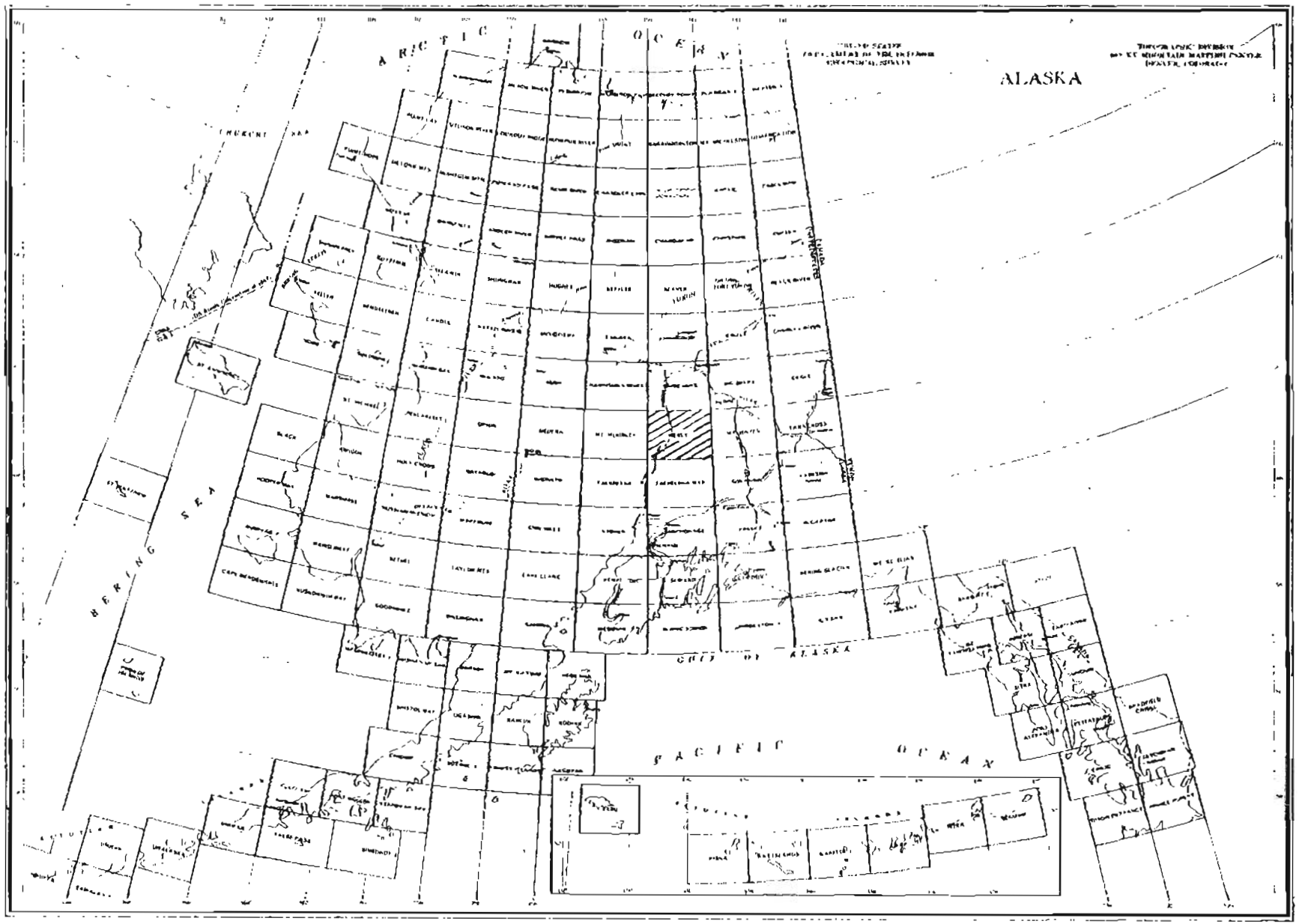
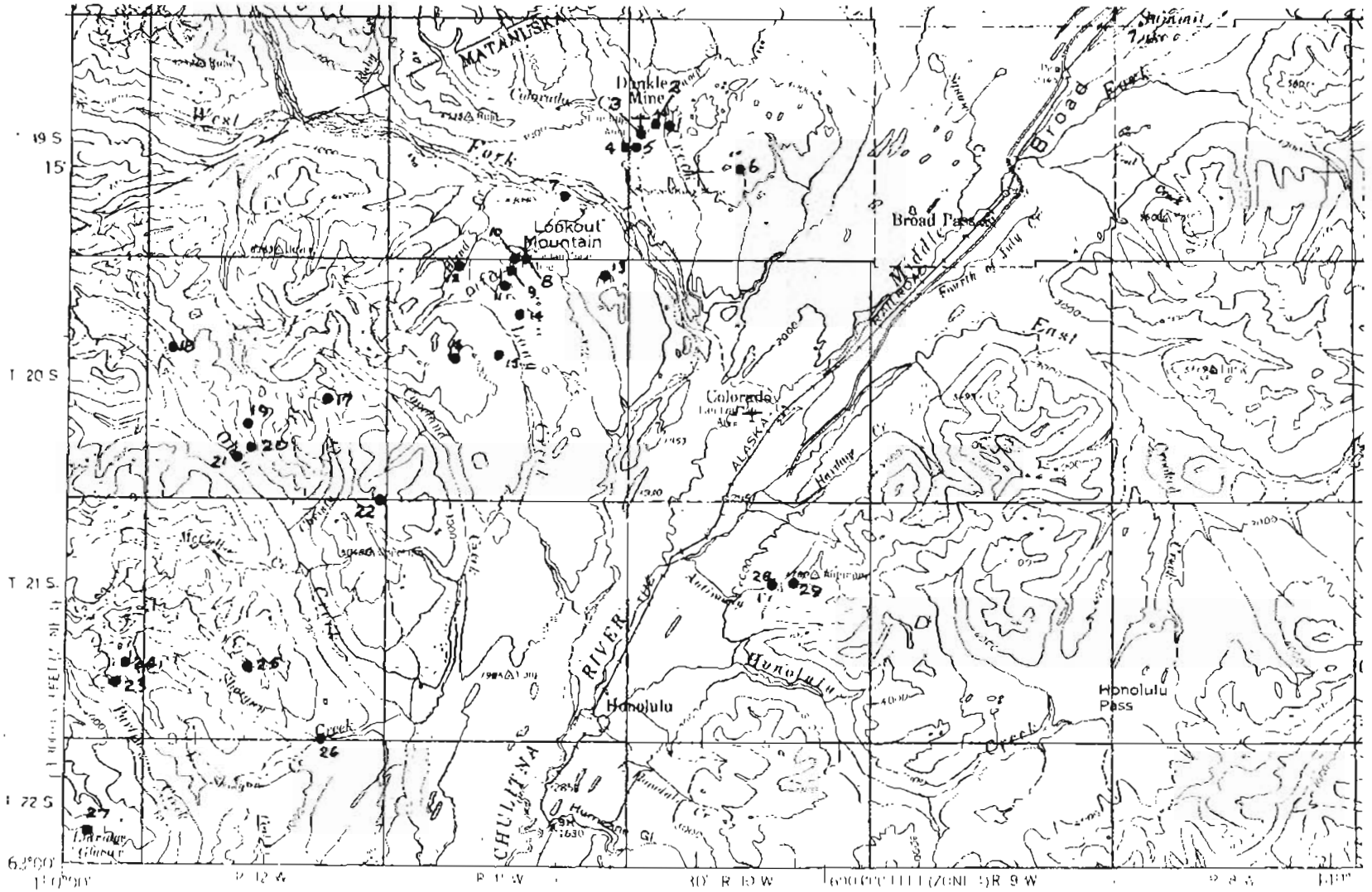


Figure 1 -- Index map.



Base Healy
1:250,000, 1956

• Mine, prospect, or mineral occurrence

5 0 5 10 MILES

Figure 2 — Mineral occurrence in Upper Chulitna area.

Summaries of References

For each mineral occurrence there is a page that gives the name of the occurrence; the mineral commodities present (listed alphabetically); the mining district (Ransome and Kerns, 1954) in which the occurrence is located; the name of the 1:250,000-scale topographic quadrangle (Healy); coordinates (as described by Cobb and Kachadoorian, 1961, p. 3-4); the metallic mineral resources map number (MF-394) and the occurrence number on that map if the occurrence is shown or the occurrence number on fig. 2 (p. 3), a more detailed map of the Upper Chulitna area; 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 references to the occurrence. Material in brackets is interpretive or explanatory and is not in the summarized reference.

Proper names of mines, prospects, and other mineral occurrences usually 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. All references to placer mining on a stream appear under the stream name rather than under the names of individual claims or of operators. 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.

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 of map series and the report or map number. Abbreviations used are:

AOF	Alaska Division of Geological and Geophysical Surveys Open-file Report
B	U.S. Geological Survey Bulletin
BMB	U.S. Bureau of Mines Bulletin
C	U.S. Geological Survey Circular
GQ	U.S. Geological Survey Geologic Quadrangle Map
GR	Alaska Divison of Geological and Geophysical Surveys (and predecessor State agencies) Geologic Report
IC	U.S. Bureau of Mines Information Circular

OF	U.S. Geological Survey Open-file Report (numbers with a hyphen in them are formal; numbers without a hyphen are informal and used only within the Alaskan Geology Branch of the U.S. Geological Survey)
MF	U.S. Geological Survey Miscellaneous Field Studies Map
P	U.S. Geological Survey Professional Paper
RI	U.S. Bureau of Mines Report of Investigations
SR	Alaska Division of Geological and Geophysical Surveys Special Report
TDM	Alaska Territorial Department of Mines Pamphlet
USBM OF	U.S. Bureau of Mines Open-file Report

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 avoid ambiguities.

(Moose Cr.) Gold

Bonnifield district Healy (13.8-14.0, 17.55-17.7)
MF-394, loc. 59 64°00'N, 148°12'W approx.

Summary: Placer mining reported, 1930. See also (Moose Cr., trib. Nenana R.) Fairbanks quad. Many references to placer mining on Moose Cr. in Bonnifield district could be to either Moose Cr.; there was more mining on the Moose Cr. tributary to Nenana R. (Fairbanks quad.).

Moffit, 1933 (B 836), p. 345 -- Mining, 1930.
Smith, 1933 (B 836), p. 41 -- Mining, 1930.

Accident — Gold, Lead, Zinc

Valdez Creek district — Healy (21.6, 3.8)
MF-394, loc. 53 — 63°11'N, 147°16'W

Summary: Decomposed slate intruded by siliceous fine-grained igneous rock; rusty vein quartz contains galena, sphalerite, and a little fine gold. Pyrite in igneous rock. No record of mining other than a little small-scale placer recovery of gold from gully wash a little above exposed lode from material similar to that in lode.

Moffit, 1912 (B 498), p. 57 -- Country rock is decomposed slate intruded by fine-grained siliceous igneous rock containing considerable pyrite; rusty vein quartz contains galena, sphalerite, and a little fine gold. Some gold recovered with a rocker from wash in gully upstream from lode outcrop; wash similar to lode material.

Tuck, 1938 (B 897-B), p. 119 -- Reference to above.

(Alaska Cr.)(Gulch) Gold

Bonnifield district Healy (9.3, 15.25)
MF-394, loc. 63 63°52'N, 148°48'W

Summary: Gold derived from Nenana Gravel, in which stream has excavated its valley. No economic mining; nuggets worth $2 to $3 [maximum of about 0.15 fine oz.] have been found.

Brooks, 1915 (B 622), p. 65 -- Small-scale mining, 1914.
Maddren, 1918 (B 662), p. 376, 378 -- Stream cut entirely in Nenana Gravel; stream gravel contains gold, but there has been no mining because of water shortage; nuggets worth from $2 to $3 have been found.

Alaska Exploration & Mining Co. Copper, Gold, Silver

Valdez Creek district Healy (20.65, 3.6)
MF-394, loc. 54 63°11'N, 147°24'W

Summary: Several shear zones in diorite contain quartz lenses with associated calcite and carry pyrrhotite and smaller amounts of pyrite, chalcopyrite, and ilmenite. Smaller veins and sheared diorite next to them carry a little free gold; assays show as much as 3.96 oz. a ton gold and 0.80 oz. a ton silver; most considerably lower. Has been some underground development and a little ore extracted and milled. Production not known, but must have been very small; in 1930's. Includes references to Timberline.

Ross, 1933 (B 849-H), p. 461-463 -- Group of prospects on hill between Timberline and Valdez Creeks; on several quartz veins in sheared dioritic rocks; explored by several pits, few more than 10 ft. deep. Some of what appear to be separate veins may be offset segments of a single vein. Veins are as much as 8 ft. wide and at least one can be traced for about 1,000 ft. Contain pyrite, arsenopyrite, pyrrhotite, and a little chalcopyrite; free gold visible in places. Assays show from a trace to 3.96 oz. a ton gold and from a trace to 0.80 oz. a ton silver. Values (gold at $20 and silver at 30¢) range up to $79.44 a ton; most assay values are considerably less than $14 a ton. Diorite between quartz bodies in veins contains disseminated pyrite.

Smith, 1936 (B 868-A), p. 25-26 -- Prospecting and development, 1934. 16-ton ball mill installed and operated for a short time.

Smith, 1937 (B 880-A), p. 29 -- About 125 ft. of tunnel driven; mill operated; most ore free milling; some sulfides in concentrates, which were saved, but not shipped; 1935.

Smith, 1938 (B 897-A), p. 34 -- Some development; no significant production; 1936.

Tuck, 1938 (B 897-B), p. 114-117 -- Several deposits each several feet wide along shear zones in diorite contain quartz lenses with some associated calcite and carrying pyrrhotite with lesser amounts of pyrite and chalcopyrite and a little ilmenite. Two of vein deposits can be traced on surface as shallow depressions for more than 1,000 ft.; the others are shorter. The long veins strike N 65°-85° W and are vertical or dip steeply N; the other veins trend generally north of east. Very little gold and silver in larger veins; smaller ones contain some free gold, as does sheared diorite adjacent to one of them. Small tonnages of ore were mined from veins and sheared diorite and milled with recovery said to have been satisfactory. Several hundred feet of underground workings. Exploration and mining (not continuous) between 1926 and 1936. [No data on total production, which undoubtedly was small.]

Smith, 1939 (B 910-A), p. 30-31 -- Some development, 1937; no significant production.

Alaska Exploration & Mining Co. -- Continued

Kaufman, 1964 (GR 4), p. 5 -- Only lode production from area has been from a few extremely small high-grade pockets in quartz and carbonate veins cutting quartz diorite at Timberline Cr. and about 3 mi. to the east.

Berg and Cobb, 1967 (B 1246), p. 26-27 -- In district only a few tons of ore has been milled; most was from this prospect.

Smith, 1970 (OF 441), p. 43-44 -- Mine and geochemical anomaly maps of Timberline adit. Pyrite, pyrrhotite, and anomalous amounts of gold in shear zones in altered quartz diorite.

Alaska Range Mining & Development Co. Gold

Valdez Creek district — Healy (20.6, 3.7) (?)
63°11'N, 147°24'W (?)

Summary: Company organized in 1927 to develop known lode deposits in the region.

Smith, 1930 (B 810), p. 17-18 -- Organized in 1927 to develop known lodes in the region.

(Blind Cr.)	Gold, Silver
Valdez Creek district	Healy (2.45, 3.75)
Fig. 2, loc. 12	63°13'N, 149°41'W

Summary: Traces of gold and silver in quartz in fault zone in volcanic siltstone and conglomerate.

Hawley and Clark, 1968 (C 564), p. 9, 11, 16 -- Samples from quartz veins and associated pyritic quartz-cemented breccia material in fault zone in volcanic siltstone and conglomerate contained 0.06~0.30 ppm gold and 0.5~1.5 ppm silver.

(Bryn Mawr Cr.) Gold

Valdez Creek district Healy (2.85, 3.8)
Fig. 2, loc. 8 63°13'N, 149°38'W

Summary: Placer gold discovered immediately downstream from (later discovered) Golden Zone lode mine. Very little placer mining was done; only reported production was in 1909.

Capps, 1919 (B 692), p. 208 -- Placer gold reported to have been discovered in 1907.

p. 221 -- Site of first claim staked in region (in 1907); was worked in 1909. The only mineral production from the area was placer gold from this claim.

p. 231 -- Small amount of placer gold recovered in 1909.

Capps, 1933, (B 836), p. 295-296 -- Gold discovered and a little mined in 1909. As of 1930, was only production from region.

Ross, 1933, (B 849-E), p. 322 -- A little placer gold was mined immediately downstream from Golden Zone; returns so meager that work was soon abandoned.

Mulligan and others, 1967 (USBM of 9-67), p. 11 -- Placer gold has been mined.

Cobb, 1973 (B 1374), p. 18-19 -- A little placer gold recovered in early 1900's.

Hawley and Clark, 1973 (P 758-A), p. A6 -- Placer gold deposit was prospected.

Hawley and Clark, 1974 (B 758-B), p. B14 -- Native gold has been found in placer prospect.

p. B33 -- Discovered in about 1907; led to discovery of Golden Zone lode deposit.

(Butte Cr.) Copper, Gold, Iron

Valdez Creek district Healy (18.55-18.95, 0.45-1.1)
MF-394, locs. 36-40, 41 (in part) 63°00'-63°02'N, 147°37'-147°40'W

Summary: Copper minerals, mainly chalcopyrite, but with malachite, azurite, and bornite in some instances, in volcanic rocks (probably Triassic Nikolai Greenstone) south of creek. One copper occurrence is in a fault zone in limestone and argillite. Magnetite in talus probably derived from an amphibolite (contact metamporphic (?)) in contact with argillite and limestone. Coordinates given above are for these occurrences. Placer gold in amounts too small for profitable mining reported from somewhere on Butte Cr.

Moffit, 1912 (B 498, p. 53-54 -- Gold discovered in creek, 1903; not enough to satisfy prospectors.

Moffit, 1915 (B 592), p. 305 -- Placer gold has been found. Copper in lava flows south of creek.

Moffit, 1915 (B 608), p. 76 -- Placer gold present. Olivine basalt with disseminated chalcopyrite in at least one place south of creek.

Saunders, 1961, p. 38 -- Specimens of chalcopyrite- or bornite-bearing rocks (mainly float) were found. Most in basic igneous rocks, but one from a fault zone in limestone and argillite near an igneous contact.

Kaufman, 1964 (GR 4), p. 10 -- Malachite and azurite associated with quartz and epidote in volcanics [probably Nikolai Greenstone]. Magnetite zone in talus; apparently localized along a faulted contact between interbedded argillite and limestone on one side and amphibolite cut by basic dike rocks on other; amphibolite may represent a zone of contact metamorphism. Copper carbonate minerals in carbonate veins in amphibolite.

Berg and Cobb, 1967 (B 1246), p. 28-29 -- Small amounts of magnetite and secondary copper minerals have been found in mountains south of Butte Cr. Magnetite is along contact between amphibolite and interbedded argillite and limestone; sparse malachite and azurite in carbonate veins in amphibolite. Float specimens of volcanic rocks carrying secondary copper minerals, quartz, and epidote in same general area.

Campbell & Boedeker	Gold, Silver
Valdez Creek district	Healy (20.75, 3.45)
MF-394, loc. 54	63°10'N, 147°23'W

Summary: 20-ft. tunnel did not penetrate weathered zone; deposit is a 2-ft.-thick vein of sheared diorite and quartz that contains much pyrite; pyrite also impregnates massive diorite wall rock. Assays show 1.9 oz. a ton gold and 1.5 oz. a ton silver in sample of pyrite and 0.18 oz. a ton gold in sheared diorite.

Tuck, 1938 (B 897-B), p. 117-118 -- Vein composed of 2 ft. of sheared diorite and quartz strikes N 85°E, dips 68°N, is in massive diorite, and contains as much as 50 percent pyrite, which also in places impregnates wall rock. Explored by 20-ft. tunnel which did not get beneath weathered zone. Sample of sulfide contained 1.9 oz. a ton gold and 1.5 oz. a ton silver; sample of sheared diorite contained 0.18 oz. a ton gold. Some of gold is free; may have been liberated from sulfides during weathering.

Berg and Cobb, 1967 (B 1246), p. 26 -- Sample data from above.

(Cantwell Cr.) Manganese

Bonnifield district Healy (8.45, 6.9)
MF-394, loc. 7 63°23'N, 148°51'W

Summary: Outcrop 8 ft. wide contains crushed and partially recrystallized rhodochrosite, other manganese minerals in smaller quantities, and quartz. A sample contained 33.35 percent manganese.

Berg and Cobb, 1967 (B 1246), p. 203 -- Discovered in 1926. Nearly vertical outcrop of light gray rock about 8 ft. wide contains pink, green, and black manganese minerals. Sample assayed 33.35 percent Mn, mostly in rhodochrosite. Other minerals include quartz, hydrous manganese silicate(?), and manganese oxide(?). Rhodochrosite shows evidence of crushing and partial recrystallization.

(Canyon Cr.) Copper, Gold, Lead, Silver

Valdez Creek district Healy (1.15, 2.6-2.8)
Fig. 2, locs. 19, 20 63°09'N, 149°52'W

Summary: Basalt, interlayered with limestone, and minor hornfelsed argillite contain disseminations of sulfides and quartz veins containing sulfides, including chalcopyrite, arsenopyrite, pyrite, and tetrahedrite(?). Spectrographic analyses indicate the presence of considerable Sn, but no tin mineral has been identified. Presence of tin may indicate an underlying pluton. Small amounts of gold (as much as 0.4 ppm) and silver (as much as 500 ppm) in some samples. See also Ready Cash.

Hawley and others, 1969 (C 617), p. 8 -- Country rock is basalt and interlayered limestone with minor amounts of hornfelsed argillite. Disseminated sulfides and quartz veins carrying sulfides. Anomalous amounts of several metals, including tin, in samples.

p. 11-12 -- Sulfides include chalcopyrite, arsenopyrite, pyrite, and tetrahedrite(?); samples contained as much as 0.4 ppm gold and 500 ppm silver. Sn (by spectrographic analysis) in all but one sample; largest amount was greater than 1,000 ppm; [cassiterite not noted as having been identified].

Hawley and Clark, 1974 (P 758-B), p. B12-B16 -- Vein-disseminated type of epigenetic lode deposit in argillite-basalt-limestone wall rocks. High Sn content may reflect an underlying pluton. Cassiterite or another discrete tin mineral has not been identified, but probably is present. Chalcopyrite present as disseminations and vesicle fillings in basalt; some malachite also. Gold (0.3 ppm) and silver (maximum 150 ppm) in analyzed samples.

p. B44-B45 -- Samples contained gold (as much as 0.4 ppm) and silver (as much as 500 ppm). Sn in all but one of analyzed samples.

Center Star	Copper
Valdez Creek district Fig. 2, loc. 3 approx.	Healy (3.6, 4.6) approx. 63°16'N, 109°33'W approx.

Summary: Bluish dike rock contains disseminated arsenopyrite, pyrite, and chalcopyrite. No data on possible gold content. May be on the same group of claims as Liberty.

Capps, 1919 (B 696), p. 230 -- Bluish dike rock exposed by open cuts and strippings contains disseminated arsenopyrite, pyrite, and chalcopyrite.

(Chulitna R., West Fork)

Chromite(?), Manganese(?)

Valdez Creek district

Healy
W½SW¼ quad.

Summary: Claims reported to have been staked for manganese which is said to occur in seams in slate and serpentine. No location data other than West Fork of Chulitna; no adequate description of occurrence. Chromite reported to have been discovered in 1918. No other data.

Capps, 1919 (B 692), p. 230 -- Claims reported to have been staked for manganese, which is said to occur in seams in slate and serpentine; surface material soft and decomposed and no excavations have been made.

Martin, 1920 (B 712), p. 23 -- Report that chromite has been discovered, 1918.

(Chute Cr.) Gold, Silver

Bonnifield district Healy (17.45, 16.75) approx.
MF-394, loc. 4 63°56'N, 147°45'W approx.

Summary: Disseminated pyrite in altered rhyolite porphyry in schist; mineralized material sampled averaged about 0.435 oz. gold a ton; trace of silver in at least one assay. Explored by 30-ft. adit. Small mill operated for a month in 1909. No data on amount of production.

Brooks, 1910 (B 442), p. 36-37 -- Mineralized zone in sheared and altered rhyolite contains pyrite. Owners report assays of $5 in free gold and $4 in concentrates. Assay of "unpromising looking fragment of rock" showed $1.03 in gold and a trace of silver. Adit driven and some ore put through a prospecting mill.

Capps, 1911 (B 480), p. 230 -- Preliminary to Capps, 1912 (B 501).

Capps, 1912 (B 501), p. 53 -- Altered rhyolite porphyry in schist is mineralized with pyrite and carries some gold. Prospect discovered in 1908; 3-stamp mill installed in 1909 and operated for about a month; average value of ore processed reported to have been $5 a ton in free gold and $4 a ton in tailings; average of assays of outcrop samples said to have been $9 a ton. 30-ft adit driven in 1910. Mineralized zone more than 100 ft. wide; strikes about north and dips steeply.

Berg and Cobb, 1967 (B 1246), p. 202 -- Gold associated with disseminated pyrite in altered rhyolite porphyry that cuts schist. Assays of richest material averaged about $9 a ton.

(Cody Cr.)	Antimony
Bonnifield district	Healy (?) NE¼ quad.(?)

Summary: Plan for development of antimony deposit during winter of 1937-38. Probably refers to antimony on Cody Cr., Fairbanks quad., or to deposit on Kansas Cr. See also: (Cody Cr.) Fairbanks quad., (Kansas Cr.).

Smith, 1939 (B 910-A), p. 103 -- Report that M. P. Kirk & Sons would take over under option "a deposit of antimony ore on Cody Creek, near the head of the Wood River in the Bonnifield district" during the winter of 1937-38.

(Colorado Cr.)	Bismuth, Gold
Valdez Creek district	Healy (3.5, 4.5) approx.
Fig. 2, loc. 4	63°15'N, 149°33'W approx.

Summary: Placer concentrate samples contained bismuthinite, marcasite, and a few flakes of rather coarse gold. See also Silver King.

Ross, 1933 (B 849-E), p. 310 -- Bismuthinite and marcasite identified in placer concentrate.
p. 314 -- A few flakes of rather coarse gold in concentrate.
Hawley and Clark, 1974, (P 758-B), p. B14 -- Bismuthinite identified in placer concentrate from near Silver King.

Copper King	Copper, Gold, Molybdenum, Silver
Valdez Creek district	Healy (2.8, 3.5)
Fig. 2, loc. 14	63°12'N, 149°39'W

Summary: Hornfelsed locally calcareous siltstone cut by small dikes and plugs of quartz porphyry. Shallow trenches expose lensoid masses of chalcopyrite and pyrrhotite locally 5 ft. thick. Silica veinlets in quartz porphyry and adjacent hornfels contain sparse molybdenite, chalcopyrite, and pyrite. Samples taken at various times contained as much as 7.34 percent copper, 4.9 oz. a ton silver, and 0.22 oz. a ton gold. Located in 1914. No record of production. Includes references to Hector.

Capps, 1919 (B 692), p. 227-228 -- Located in 1914. Shallow open cuts on isolated outcrops of cherts, graywacke, and argillite and metamorphosed rocks that originally probably were siliceous shales, graywacke, and tuff; cut by many dikes and small sill-like bodies of acidic intrusive rocks. Abundant sulfides (mainly chalcopyrite and pyrrhotite) have replaced some beds and occur in dike rocks. Quartz and calcite veinlets are present, but do not seem to have influenced mineralization. Called Hector in this reference.

Capps, 1924 (B 755), p. 135 -- Data from above.

Ross, 1933 (B 849-#), p. 310-311 -- Lode characterized by replacement along bedding. Pyrrhotite and chalcopyrite almost only sulfides present.

p. 320-321 -- Lenses and seams of massive pyrrhotite and chalcopyrite replaced limestone that contains chlorite and probably other silicates. Larger masses parallel bedding (N 20°-55°E). In one trench mineralization exposed at intervals for 70 ft; massive sulfides 2-3 ft. thick in one place; sample assayed 0.22 oz. a ton gold, 4.90 oz. a ton silver, and 7.34 percent copper. Material in other trenches and pits barren except for a little oxidized sulfide material.

Berg and Cobb, 1967 (B 1246), p. 26 -- relatively massive sulfide deposit formed by replacement of silicified limestone beds. A sample assayed 0.22 oz. a ton gold, 4.90 oz. a ton silver, and 7.34 percent copper.

Hawley and Clark, 1968 (C 564), p. 1 -- Main copper concentration in Long Cr. area at Copper King prosepct; sparse chalcopyrite, molybdenum, and pyrite in nearby quartz porphyry plugs.

p. 9-11 -- Several shallow trenches expose copper minerals. Massive chalcopyrite and pyrrhotite in a lensoid mass about 5 ft. thick. Trenches all in hornfelsed locally calcareous siltstone cut by small dikes and plugs of quartz porphyry. Quartz prophyry and adjacent hornfels cut by siliceous veinlets on several fracture trends; veinlets contain sparse molybdenite, chalcopyrite, and pyrite; suggestion of zonal distribution of copper around quartz porphyry masses. Samples contain 1-3 oz. a ton silver and $1 -$8 a ton in gold. Spectrographic analyses indicate detectable amounts of Bi, Zn, and Sn.

Copper King -- Cont.

Hawley and Clark, 1974 (P 758-B), p. B12-B15 -- Sulfide-rich pods 2-3 ft. wide are present; massive sulfide type of deposit. No arsenopyrite; pyrrhotite major sulfide; abundant chalcopyrite; secondary copper-bearing limonite.

p. B31 -- Prospect in Golden Zone area.

p. B33 -- Granitic rocks present.

p. B44 -- Prospect in contact-metamorphosed hornfels derived from locally calcareous siltstone cut by small dikes and plugs of quartz porphyry. Several shallow trenches expose massive chalcopyrite and pyrrhotite in lensoid bodies locally 5 ft. thick. Numerous silica veinlets in both quartz porphyry and adjacent hornfels contain sparse molybdenite, chalcopyrite, and pyrite. Sample data the same as in Hawley and Clark, 1968 (C 564), p. 10.

(Costello Cr.) Copper, Gold, Silver

Valdez Creek district Healy (4.2, 4.4)
Fig. 2, loc. 6 63°15'N, 149°28'W

Summary: Fine-grained locally garnetiferous hornblende diorite porphyry. Sulfides (arsenopyrite, pyrite, pyrrhotite, and chalcopyrite) on fracture surfaces and very sparsely disseminated in porphyry. Sulfides estimated to make up one percent to three percent of some samples. Analyses indicate no more than 7 ppm silver, 0.4 ppm gold, and 0.1 percent copper. Little if any physical exploration and no recorded production.

Hawley and others, 1969 (C 617), p. 9, 14-15 -- Fine-grained locally garnetiferous diorite porphyry contains sulfides on fracture surfaces and disseminated in porphyry over an area about 0.25 mi. by 0.75 mi.; part of a Tertiary stock in Paleozoic and Mesozoic graywacke (some metamorphosed) and argillite. Sulfides identified are arsenopyrite, pyrite, pyrrhotite, and chalcopyrite; estimated to make up one to two percent of some samples. Analyses of samples show no more than 7 ppm Ag, 0.4 ppm Au, and 1,000 ppm [0.1 percent] Cu; detectable amounts of several other metals.

Hawley and Clark, 1974 (P 758-B), p. B12-B14 -- Copper-bearing disseminated epigenetic deposit with dominant small-scale fracture control. Sulfides on fracture surfaces and very sparsely disseminated in porphyry.

p. B26 -- Essentially the same data as in Hawley and others, 1969 (C 617); a few more analytical data. Host rock called hornblende diorite porphyry.

(Dry Cr.) Gold

Bonnifield district Healy (20.8, 17.2) approx.
MF-394, loc. 60 63°57'N, 147°18'W approx.

Summary: Gravels 4-8 ft. deep on schist bedrock; returns as high as $3.50 [about 0.17 oz.] per square yard of bedrock. Mining hampered by large boulders and wet ground. Only mining reported was 1910 or earlier.

Capps, 1911 (B 480), p. 228-229 -- Preliminary to Capps, 1912 (B 501).
Capps, 1912 (B 501), p. 51 -- Upper part of stream course cut in schist. Gravels 4-8 ft. deep; returns as high as $3.50 per square yard of bedrock have been obtained; mining hampered by large boulders and wet ground (bedrock drain needed).

Eagle	Antimony, Copper, Gold, Silver, Zinc
Valdez Creek district	Healy (3.75, 4.7)
Fig. 2, loc. 1	63°16'N, 149°32'W

Summary: Quartz-sulfide vein between walls of basalt and gabbro or serpentinite has been traced for 700 ft.; probably extends about that much farther; maximum thickness about 4 ft. Contains sulfide pods and mineralized quartz masses. Sulfides include arsenopyrite, pyrite, chalcopyrite, sphalerite, and a little stibnite. Sample taken (probably in 1931) across a 4-ft. width contained 0.18 oz. a ton gold and 2.10 oz. silver. Recent sampling indicated considerably silver, but galena was not reported. Minimum estimate of resource is 12,000 tons of material worth $5-$10 a ton above level of Costello Cr. Prospect was explored by tunnel about 60 ft. long. Includes references to Northern Light.

Capp, 1919 (B 692), p. 221 -- Northern Light lode discovered in 1911.
p. 223-224 -- Country rock is much altered tuff, impure limestone, and shale cut by dike rocks. Mineralized rock appears to be a limy bed partially replaced by sulfides and containing veins and bunches of mineralized quartz; strikes about N 65°W, dips 70° SE, is as much as 30 ft. thick, and has been traced on surface for about 800 ft. Sulfides include arsenopyrite, pyrite, chalcopyrite, sphalerite, and a little stibnite; encouraging gold and silver assays reported. Explored by tunnel 64 ft. long. Called Northern Light in this reference.

Capps, 1924 (B 755), p. 133 -- Data from above.

Ross, 1933 (B 849-E), p. 311-313 -- See Ready Cash sheet for general statement on this type of deposit.
p. 329-330 -- Explored by tunnel 62 ft. long and several small open cuts. If all cuts are on the same lode, it is at least 300 ft. long with a vertical range of at least 185 ft.; mineralized shear zones 1 to 10 ft. wide, containing quartz and sulfides deposited along fractures. Sample taken across a quartz lens somewhat more than 2 ft. thick contained 0.20 oz. a ton gold and 6 oz. a ton silver; sample across 4 ft. of exposed lode contained 0.18 oz. a ton gold and 2.10 oz. a ton silver. Reference to Capps, 1919 (B 692), p. 224, for data on mineralogy. Estimated to contain 12,000 tons of mineralized rock above creek level.

Berg and Cobb, 1967 (B 1246), p. 26 -- This is one of several prospects that are on tabular or lenticular lodes consisting mainly of sheared altered country rock impregnated with quartz, carbonate, and sulfides; individual quartz masses only a few tens of feet thick; commonly en echelon; locally cut by postmineralization faults.

Hawley and Clark, 1973 (P 758-A), p. A9 -- Reference to Ross, 1933 (B 849-E).

Eagle -- Cont.

Hawley and Clark, 1974 (P 758-B), p. B12-B16 -- Quartz-sulfide vein type of epigenetic deposit; not associated with sulfides disseminated in host rocks. Vein can be traced for 700 ft. and reasonably projected for about twice that distance. Maximum width of vein is about 4 ft., contains arsenopyrite pods as much as a foot thick and quartz-rich masses as much as 2.5 ft. in diameter. Assays of 3 samples showed 6.6-38 ppm gold and 100-500 ppm silver. Walls are basalt and gabbro or serpentinite. Stibnite reported. Sample contained 300 ppm Ag, more than 10,000 ppm As, 38 ppm Au, 7,000 ppm Sb, 1,500 ppm Zn, and detectable amounts of several other metals.

p. B30-B32 -- Prospect on a set of NE-striking veins subparallel to a segment of a major regional fault. Reference to Ross, 1933 (B 849-E); Ross's estimate of 12,000 tons of $5-$10 rock appears to be minimal; Ross calculated for much less than traceable length of deposit. Sample contained 500 ppm Ag, more than 10,000 ppm As, 6.6 ppm Au, 2,000 ppm Cu, 7,000 ppm Pb, 3,000 ppm Sb, and 10,000 ppm Zn.

(Edgar Cr.) Copper

Bonnifield district Healy (16.3, 11.4)
63°38'N, 147°54'W

Summary: Malachite along fractures and foliation of metamorphic rocks. No other data.

Sherwood and others, 1976 (SR 14), p. 4, 7 (near loc. 16) -- Malachite along fractures and foliation of metamprphic rocks. No other data.

(Eldridge Glacier)	Copper, Gold, Nickel, Silver
Valdez Creek district	Healy (0.15, 0.2)
Fig. 2, loc. 27	63°01', 149°59'W

Summary: Massive pyrite and chalcopyrite in irregular and veinlike masses in serpentinite; contain small amounts of gold and silver and as much as 1,500 ppm (0.15 percent) nickel; highest copper analysis was 7.5 percent. One analysis showed 2,000 ppm Cr, but chromite was not reported.

Hawley and others, 1969 (C 617), p. 4-6 -- Serpentinite contains as much as 7.5 percent Cu; cut by irregular and veinlike zones of massive pyrite and chalcopyrite at least 3 ft. across. Analyses of samples showed as much as 15 ppm Ag, 0.1 ppm Au, 2,000 ppm Cr, and 1,500 ppm [0.15 percent] Ni.

Hawley and Clark, 1974 (P 758-B), p. B12-B16 -- Epigenetic massive-sulfide type of copper deposit; in serpentinite. Abundant chalcopyrite and some malachite. Sample contained 15 ppm Ag, 0.1 ppm Au, 75,000 ppm Cu, 50 ppm Ni.

p. B45 -- Analyses of samples (some more than 50 percent sulfides) showed as much as 15 ppm silver, 0.1 ppm gold, 75,000 ppm [7.5 percent] copper, and detectable amounts of many other metallic elements.

Flaurier	Gold, Silver
Valdez Creek district Fig. 2, loc. 7 approx.	Healy (3.1, 4.25) approx. 63°14'N, 149°36'W

Summary: Altered chert, argillite, tuff, and possibly limestone cut by acidic dikes contain impregnation of sulfides (which ones not specified); samples taken over a considerable area of these rocks said to show a few dollars a ton in gold and silver. Only development is a few open cuts.

Capps, 1919 (B 692), p. 230 -- Five claims next to Riverside; country rock is group of cherts, argillites, tuffs, and possibly limestone cut by dikes of medium-grained acidic rock. Open cuts expose altered material that locally contains considerable sulfides [which ones not specified] that appears to be impregnating rock rather than occurring as a segregated replacement deposit. Assays of samples taken over a considerable area of this material said to show a few dollars a ton in gold and silver.

(Fox Gulch) (Cr.) Gold

Bonnifield district Healy (11.1, 17.3)
MF-394, loc. 57 63°59'N, 148°34'W

Summary: Placer claims staked in 1903; creek considered to be mined out by 1910. Stream flows near contact between schist (with quartz veins) and intrusive andesitic rock.

Maddren, 1918 (B 662), p. 395-397 -- Stream flows near contact between disintegrated schist and andesitic intrusive rock; quartz veins in schist. Placer claims staked in 1903 and worked for a few years; considered to be mined out by about 1910.

(French Gulch) Gold

Bonnifield district Healy (9.5, 15.3)
MF-394, loc. 64 63°52'N, 148°46'W

Summary: Gold derived from Nenana Gravel, into which gulch was cut. Not enough water for mining. Report of mining on Moon Cr. in 1913 may be in error; description of location of Moon Cr. matches location of French Gulch. Includes reference to (Moon Cr.).

Brooks, 1915 (B 622), p. 65 -- Six men mining on Moon Cr. in 1913.
Maddren, 1918 (B 662), p. 376, 378 -- Stream course cut entirely in Nenana Gravel. Gold present, but was not mined because of water shortage.

(Gagnon Cr.) Gold

Bonnifield district Healy (9.85, 15.65)
MF-394, loc. 65 63°53'N, 148°44'W

Summary: Fairly coarse gold derived from Nenana Gravel mined for about 4 years beginning in 1913. Total amount recovered probably not much more than 190 fine oz. Schist at head of creek does not seem to have contributed gold. Includes references to (Home Cr.), the old name for Gagnon Cr.

Brooks, 1915 (B 662), p. 65 -- Small-scale mining, 1914.
Maddren, 1918 (B 662), p. 376-378 -- Most of course of Home Cr. in Nenana Gravel; headwaters in schist. Gold probably all derived from gravel; headwaters seem to have stripped gravel off of schist rather than to have eroded much into schist; stream follows a fault line marking contact between schist and gravel. Mining near mouth began in 1913 and continued for 4 years; gold fairly coarse and worn; total production probably not more than $4,000 [about 194 fine oz.].

(Glory Cr.) Antimony, Gold, Lead, Silver, Zinc

Bonnifield district Healy (19.35, 15.15)
MF-394, loc. 6 63°51'N, 147°30'W

Summary: Stibnite float and a lode containing galena, sphalerite, pyrite, silver, and gold. Not other data. Wahrhaftig [1970 (GQ-804)] shows bedrock as Precambrian or Paleozoic Birch Creek Schist.

Joesting, 1943 (TDM 2), p. 13 -- Stibnite float on bench 1½ mi. above mouth of creek on north side. Nearby lode contains galena, sphalerite, pyrite, silver, and gold.

Berg and Cobb, 1967 (B 1246), p. 203 -- Several small lodes contain stibnite and subordinate galena, sphalerite, pyrite, silver, and gold. [Only source of data is Joesting, 1943 (TDM 2), p. 13, so statement of stibnite lode is not correct; it was float only.]

(Gold Cr.) Gold

Valdez Creek district Healy (17.4, 2.1) approx.
MF-394, loc. 68 63°06'N, 147°49'W approx.

Summary: Small amount of gold was found in 1903. No record of mining.

Moffit, 1912 (B 498), p. 53-54 -- Placer gold discovered in 1903, but not in sufficient quantity to satisfy prospectors.
Cobb, 1973 (B 1374), p. 18 -- Small amount of gold was found.

Golden Zone (Mine, Inc.)	Antimony, Copper, Gold, Lead, Silver Tin, Zinc
Valdez Creek district	Healy (2.75-2.85, 3.75-3.85)
Fig. 2, loc. 8-10	63°13'N, 149°38'- 149°39'W

Summary: Country rock is mainly volcanic siltstone and conglomerate of pre-Permian, Permian, and Triassic age intruded by latest Cretaceous or earliest Tertiary rocks ranging in composition from ultramafic to granite. Mineral deposits associated with quartz diorite porphyry stock and dikes. Golden Zone ore body is in the marginal zone of a vertical breccia pipe 200-300 ft. in diameter that probably extends to a depth of more than 1,000 ft. Pipe is in a small quartz diorite porphyry stock about 1,000 ft. by 600 ft. in cross section. Minerals in marginal zone of pipe, in leaner core of pipe, and in surrounding envelope of shattered and altered porphyry include arsenopyrite, pyrite, chalcopyrite, sphalerite, galena, stibnite, chalcocite, a little cassiterite, and secondary iron and copper minerals. Developed, mainly between 1936 and 1942, by about 1,900 ft. of underground workings on two levels, an opencut, and rises connecting all of them. A lower crosscut for a third level (500-ft. level) was not completed and did not reach pipe. In 1941-42 about 1,730 tons of ore yielded 869 tons of bulk flotation concentrate containing 1,581 oz. gold, 8,617 oz. silver, 42,659 lbs. copper, and 2,976 lbs. lead; richer than to be expected from sample data. Only work since 1942 was a USBM drilling and sampling program in 1950-51 and annual assessment work. Other deposits on Golden Zone and adjoining Mayflower properties are veins in porphyry or altered layered country rock; all contain about the same suite of metallic minerals (except for cassiterite) as breccia-pipe deposit; generally less rich; very little exploration beyond surface excavations and a shallow (now caved) shaft on Mayflower prospect; no production. Mayflower not a part of Golden Zone property, but they are usually discussed together. Includes reference to: Dunkle, East vein, Golden Zone Extension, Little Lead (vein), Mayflower.

Capps, 1919 (B 692), p. 221 -- First staked in 1909; holding by present owners dates from 1912.

p. 226-227 -- Conspicuous hill is acidic intrusive body oxidized red on surface; intruded into tuff, marble, and shale; generally impregnated with scattered sulfides; in places heavily mineralized and cut by many small quartz veinlets. Where heavily mineralized is much altered and broken into slabs separated by fine material. Sulfides include arsenopyrite, pyrite, sphalerite, galena, and stibnite(?); some malachite. Average material from workings contains several dollars a ton in gold and silver; some rather high assays. Developed by small opencuts, one large opencut, and 221 ft. of under ground workings.

Golden Zone (Mine, Inc.) -- Continued

p. 230 -- On Golden Zone Extension altered tuff, chert, and argillite are cut by dike rocks in which locally there is disseminated arsenopyrite.

Capps, 1924 (B 755), p. 135 -- Data from above.

Capps, 1933 (B 836), p. 298-300 -- Most of data from above. Only assessment work from 1917 to 1930. Assay data show widely distributed gold and silver; as much as 2.58 oz. gold and 11.60 oz. silver a ton and 33% arsenic.

Ross, 1933 (B 849-E), p. 309-310 -- Golden Zone is disseminated type of deposit. Stibnite may be present.

p. 311-313 -- See Ready Cash sheet for general statement on Little Lead and Mayflower lodes.

p. 321-326 -- In small stock of biotite-quartz diorite porphyry intruded into argillite and breccias. Almost all of stock contains disseminated pyrite; most of stock is partly silicified and some of it is fractured and sheeted. Explored by tunnel about 150 ft. long, a short partly caved drift from it, and numerous surface excavations. Assays of 35 samples from Golden Zone proper showed from a trace to 2.58 oz. a ton gold, from 0.03 to 11.60 oz. a ton silver, and as much as 33.22% arsenic. Data on mineralogy from Capps, 1919(B 692), p. 227. On Mayflower claims bedrock seems to be the same as on Golden Zone proper; brecciated, iron stained, and "soaked with quartz." Explored by a few pits. Sample across 32-in. shear zone contained 0.07 oz. a ton gold and 2.60 oz. a ton silver; considerable chalcopyrite in some specimens. 4 samples assayed by USBM contained 0.06-0.34 oz. a ton gold and 1.20-15.80 oz. a ton silver; one sample contained 5.3% copper.

Smith, 1937 (B 880-A), p. 29 -- Testing of property reported, 1935.

Smith, 1938 (B 897-A), p. 43 -- Active development, 1936. Power plant being installed; other surface improvements.

Smith, 1939 (B 910-A), p. 30 -- Considerable exploration, including diamond drilling, 1936-37.

Smith, 1939 (B 917-A), p. 29 -- Preparatory work, 1938.

Smith, 1941 (B 926-A), p. 27 -- Preparatory work, including mill construction, 1939.

Smith, 1942 (B 933-A), p. 27 -- Mine and mill about ready to start on a production basis, 1940.

Wedow and others, 1952 (OF 51), p. 74 -- Reference to Ross, 1933 (B 849-E), p. 321-325.

Wells, 1956 (RI 5245), p. 1 -- Selective flotation of 0.97% Cu ore gave a copper concentrate containing 26.6% Cu at 82% recovery; same treatment of 0.24% Cu ore gave a concentrate containing 13.4% Cu at 67% recovery.

p. 6-8 -- Ore from upper level contained arsenopyrite, chalcopyrite, sphalerite, cerussite, pyrite, smithsonite, sericite, quartz, calcite, limonite, and chlorite. Ore from lower level was similar except that it contained no sphalerite and less chalcopyrite. Flotation tests of ore from upper level (0.97% Cu, 0.018 oz. a ton Au, and 3.40 oz. a ton Ag) yielded a copper concentrate containing 26.6% Cu (82.3% of heads), 3.12 oz. a ton Au (57.9% of heads), and 59.9 oz. a ton Ag (60.9% of heads); and an arsenic concentrate containing 0.85% Cu (10.9% of heads),

Golden Zone (Mine, Inc.) -- Continued

0.48 oz. a ton Au (37.2% of heads), and 5.9 oz. a ton Ag (25.0% of heads). High-arsenic ore from lower level (0.24% Cu) was less amenable to treatment.

Berg and Cobb, 1967 (B 1246), p. 26 -- Disseminated deposit from which an unknown but probably small tonnage of concentrates was shipped in 1941. Assays of ore made in 1925 and 1931 showed trace to 2.52 oz. a ton gold and 0.14-11.60 oz. a ton silver. Mayflower and Little Lead deposits are two of several that are tabular or lenticular lodes consisting mainly of sheared altered country rock impregnated with quartz, carbonate, and sulfides; individual quartz masses only a few tens of feet long and a few feet thick; commonly en echelon; locally cut by postmineralization faults.

Mulligan and others, 1967 (USBM OF 9-67) -- USBM channel sampled Golden Zone and Mayflower in 1950-51. Diamond drilling was attempted, but was difficult and gave inconclusive results; had to be abandoned. Golden Zone proper is in a sheared and (in places) sheeted small diorite stock in which sulfide mineralization is concentrated along fractures. Shallow surface weathering; no secondary enrichment. Principal sulfides are arsenopyrite, pyrrhotite, chalcopyrite, sphalerite, and galena; gold and silver associated with sulfides. Ore ranges in value downward from about $10 or $12 a ton (gold at $35 an ounce). Production, all in 1941-42, was 869 tons of bulk flotation concentrate that contained 1,581 oz. gold, 8,617 oz. silver, 42,659 lbs. copper, and 2,976 lbs. lead. Mine has not operated since 1942. Mines developed on 2 levels and an open pit, all connected by raises and stopes. Third level designed to be a haulage way and to block out ore at depth did not reach deposit. Workings (excluding 3rd level) aggregate about 1,900 ft. [scaled from mine maps in report]. East Vein explored by shallow trenches for strike length of about 300 ft.; 1-8 ft. wide with indefinite walls and erratically distributed sulfides. Mayflower vein explored by several trenches and 2 shallow shafts; traced "with fair accuracy" for strike length of about 350 ft. Wall rock in one exposure is brecciated, altered, iron-stained, fine-grained argillite. Main sulfides are pyrite, arsenopyrite, chalcopyrite, and sphalerite; some gold and silver; mineral distribution erratic and discontinuous. Report gives detailed descriptions of USBM work and of preliminary ore beneficiation tests.

Hawley and Clark, 1968 (C 564), p. 1 -- Main mineralization is in a breccia-pipe deposit 200-300 ft. across and probably extending to a depth of more than 1,000 ft. Grade uncertain; deposit probably contains more than $10,000,000 worth of metals, mainly gold, silver, and copper; anomalous amounts of Sn, Mo, Bi, Cd, and B.

p. 4-9 -- Nearly circular breccia pipe in a small tadpole-shaped (in cross-section) quartz diorite porphyry stock with very steep walls. Stock intruded into volcanic siltstone and conglomerate of Permian or Triassic age. Mineral deposit in shattered periphery of pipe and adjacent porphyry. Sulfides (in approximate order of abundance) are arsenopyrite, pyrite, chalcopyrite, sphalerite, and galena; cassiterite has also been identified. Deposit explored by open cut, 2 adit levels, and numerous diamond-drill holes from lower (200-ft.) level. Ore minerals in fractured marginal zone of pipe, where they fill spaces between

silicified and sericitized blocks (some slightly rotated) of porphyry; marginal zone between weakly mineralized core of pipe and an outer halo of altered weakly mineralized rock. Inner boundary of marginal zone probably gradational; outer boundary is a fault contact. Data from actual production (869 tons of concentrate from 1,730 tons of ore) indicate that the ore is richer than assays of samples would indicate. Resource data summarized on p. 1.

Hawley and others, 1968 (OF 305) -- Most of data essentially as in Hawley and Clark, 1968 (C 564) and older reports. East vein, Little vein, and Mayflower vein have been little explored; all contain various sulfides, gold, and silver. Dike of fresh biotite quartz diorite porphyry parallel to and exposed in same trenches as veins at Mayflower. Sulfides include arsenopyrite, chalcopyrite, pyrite, galena, and sphalerite. Same system of veins probably extends from Riverside on NE to or beyond old Lindfors(?) to SW.

Hawley and Clark, 1973 (P 758-A), p. A4 -- Rich gold-arsenopyrite on the Golden Zone and several other deposits on the Upper Chulitna district in quartz diorite, diorite, or quartz (granite) porphyry host rocks.

p. A6-A7 -- Reference to Hawley and Clark, 1974 (P 758-B). Tin content much greater than crustal abundance.

p. A9 -- Reference to Hawley and Clark, 1968 (C 564).

Hawley and Clark, 1974 (P 758-B), p. B12-B16 -- Quartz-sulfide vein and breccia-pipe types of epigenetic deposits. Also a deposit in Bryn Mawr fault zone on property. Little vein not associated with disseminated sulfides in host rocks; reference to Ross, 1933 (B 849-E), p. 324; gold content from 0.16 to 2.58 oz. a ton; silver content from 2.4 to 11.6 oz. a ton. Disseminated sulfides in altered parts of quartz diorite stock about 1,000 ft. by 600 ft. in cross-section, but main deposit is a vertically plunging breccia pipe 200-300 ft. in diameter in which the outer part is broken and brecciated with rotated blocks cemented by sulfides and in which the inner core is shattered and carries sulfides disseminated and on fracture surfaces. Minerals present include arsenopyrite, pyrite, chalcopyrite, sphalerite, galena, stibnite, chalcocite, cassiterite, and various secondary iron and copper minerals; bismuth and molybdenum minerals probably present, but have not been found. Samples of arsenopyrite-rich veins contained as much as 30 ppm Ag, 36 ppm Au, 2,000 ppm Cu, 5,000 ppm Pb, 700 ppm Sb, and more than 10,000 ppm As. Sample from arsenopyrite-rich breccia contained 105 ppm Ag, 14.8 ppm Au, much Cu, Zn, and As, 700 ppm Pb, and 500 ppm Sb. Sample from East vein contained 4.2 ppm Au, 100 ppm Ag, 15,000 ppm Pb, more than 10,000 ppm As and Zn, 1,000 ppm Sb, and smaller concentrations of several other metals.

p. B20-B21, B23 -- Suggestion of peripheral and possibly upward enrichment of copper or copper and gold relative to arsenic in Golden Zone ore body. Also a suggestion that, on a larger scale, zinc, lead, and possibly silver contents are higher to east and south of Golden Zone ore body; Mayflower and East veins and rocks in Bryn Mawr fault zone are higher in galena, sphalerite and locally silver than the breccia-pipe and Little veins.

p. B31-B35 -- Area underlain by layered rocks of pre-Permian,

Golden Zone (Mines, Inc.) -- Continued

Permian, and Triassic age that were folded, faulted, and locally intruded by rocks of ultramafic to granite composition and of probable Tertiary age; Golden Zone stock in quartz diorite porphyry. Golden Zone deposit discovered after placer gold had been found in Bryn Mawr Dr.; most work in 1915 and 1934-42. Descriptions of deposit and workings and data on production and grade about the same as in several older reports. Ore milled was higher grade (about 0.91 oz. a ton gold, 5 oz. a ton silver, and 1.2% copper) than indicated by sampling; only highest grade ore was stoped. USBM exploration and sampling, 1950-51; otherwise only assessment work since World War II. Little vein probably cut by 200-ft.-level crosscut; in porphyry; strikes NNE (approximately parallel to nearest contact of Golden Zone stock); samples assayed 0.16-2.58 oz. a ton gold, 2.4-11.6 oz. a ton silver, and 18.10%-33.22% arsenic. East vein intersected in 500-level crosscut; 1-8 ft. wide; strikes about N 25° E and dips 75° NW; exposed in Bryn Mawr Cr.; on surface a 1-ft. width is about 80% sulfides (pyrite, arsenopyrite, sphalerite, galena, and chalcopyrite); 8-ft. width in crosscut contains as much as 1.5 oz. a ton gold and some silver and copper. Mayflower is a set of NE-trending veins exposed in shallow excavations; shallow shaft caved. Wall rock is calcitized and contact-metamorphosed volcanic conglomerate with disseminated pyrite and arsenopyrite cut by at least one dike of fresh biotite quartz diorite porphyry. Main vein from a few inches to 15 ft. wide and can be traced for about 600 ft.; arsenopyrite, chalcopyrite, and pyrite visible locally. Analyses of samples showed very low to moderate values in gold, silver, copper, lead, and zinc; one 5-ft. channel sample contained 0.14 oz. a ton gold, 0.25 oz. a ton silver, 0.1% copper, and traces of lead and zinc; sample from caved shaft reported to have contained about 10% combined base metals and about 3 oz. a ton silver and a trace of gold.

p. B36-B37, B40 -- Assay maps and tabular presentation of analytical data summarized above.

Swainbank and others, 1977 (GR 55), p. 23 -- Breccia pipe in biotite quartz diorite porphyry contains copper mineralization.

p. 25 -- Production records indicate ore grades of 1.4% copper, 0.99 oz. a ton gold, and 4.5 oz. a ton silver in periphery of pipe.

p. 28 -- Mineralization latest Cretaceous or earliest Tertiary.

MacKevett and others, 1978 (OF 78-1-E), p. 31 -- Production was about 48 kg (1,580 oz.) gold, 268 kg (8,620 oz.) silver, 19 t (21 st) copper, and a little lead from breccia pipe. Some identified resources.

Greathouse	Copper
Valdez Creek district	Healy (20.8, 2.2)
MF-394, loc. 45	63°06'N, 147°23'W

Summary: Malachite-stained bornite and chalcocite with quartz, epidote, and calcite along vertical shear zone in basaltic lava (probably Nikolai Greenstone) cut by a thin quartz diorite dike. Shear zone several thousand ft. long, but mineralized part as much as 3 ft. thick is less than 100 ft. long. Chip sample across this body contained 11% copper.

Kaufman, 1964 (GR 4), p. 4-6 -- Malachite-stained bornite and chalcocite associated with quartz, epidote, and calcite along a vertical shear zone with a maximum width of 3 ft. that strikes N 55° W in basaltic lava (with thin limestone interbeds) cut by a narrow quartz diorite dike that strikes northwesterly. Shear zone can be traced for several thousand feet along strike, but the 3-ft. width of mineralized section is less than 100 ft. long; mineralized sections of zone thin and erratic elsewhere. Chip sample across 3-ft. width indicates that tenor is as high as 11% Cu. [Lava probably Nikolai Greenstone.]

Berg and Cobb, 1967 (B 1246), p. 28 -- Summary of above.

(Grizzly Cr.)	Gold
Bonnifield district	Healy (15.25, 13.25) approx. 63°45'N, 148°02'W approx.

Summary: Placer mining reported, 1936. No other data.

Smith, 1938 (B 897-A), p. 55-56 -- Mining reported, 1936.

(Healy Cr.) Gold(?)

Bonnifield district Healy
NE 1/4 NW 1/4 quad.

Summary: Placer gold mining reported in 1918. Probably was on a tributary. See also: (Alaska Cr.), (French Gulch), (Gagnon Cr.).

Martin, 1920 (B 712), p. 44 -- Placer gold mining reported, 1918.

(Homestake Cr.) Gold

Bonnifield district
MF-394, loc. 57

Healy (11.1-11.2, 17.3-17.6)
63°59'-64°00'N, 148°33'-148°34'W

Summary: Heads in basin containing Nenana Gravel and Tertiary coal-bearing rocks between ridges of schist. Canyon cut in schist and andesite near mouth. Mining in and above canyon. Mined from 1906 to as recently as 1968. Includes references to (Platt(e) Cr.). See also (Homestake Cr.) Fairbanks quad.

Prindle, 1907 (B 314), p. 209 -- Upper part of valley open and flat and underlain by coal-bearing rocks; lower part of valley in a canyon cut in andesite. Most mining has been at upper end of canyon and about a half mile upstream; deposits 2-6 ft. thick; gold, some coarse, found in 2-3 ft. of gravel; gold well worn; one piece worth $15.

Brooks, 1910 (B 442), p. 44 -- Mining in Platt Cr., 1909.

Brooks, 1911 (P 70), p. 172-173 -- Same as Prindle, 1907 (B 314), p. 209.

Capps, 1911 (B 480), p. 223-224 -- Preliminary to Capps, 1912 (B 501).

Capps, 1912 (B 501), p. 44-46 -- Stream heads in basin containing Nenana Gravel and Tertiary coal-bearing rocks between schist ridges. Placers in and above canyon cut in schist and andesite near mouth; gravels about 6 ft. deep on bedrock; carry (above canyon) about $3 a yrd.^{3} and (in canyon) $3-$9 per yd.^{2} of bedrock; gold fairly coarse. Pay-streaks 25-50 ft. wide. Mined since 1906; production about $50,000 [about 2,420 fine oz.]. Gold probably concentrated from high gravels.

Maddren, 1918 (B 662), p. 387-388 -- Most of gold from Totatlanika basin has come from Homestake and July Creeks.

p. 395-397 -- Data essentially as given by Capps, 1912 (B 501), p. 44-46. Gold discovered in 1905 and mined from 1906 to present [1916]; production from Homestake Cr. and Fox Gulch probably worth about $80,000 [about 3,870 fine oz.].

Brooks and Capps, 1924 (B 755), p. 40 -- Mining on Platte Cr., 1922.

Smith, 1930 (B 813), p. 35 -- Small-scale mining on Platte Cr., 1928.

Smith, 1933 (B 844-A), p. 41 -- Mining on Platte Cr., 1931.

Smith, 1934 (B 857-A), p. 38 -- Mining on Platte Cr., 1932.

Smith, 1934 (B 864-A), p. 42 -- Mining on Platte Cr., 1933.

Smith, 1936 (B 868-A), p. 44 -- Mining on Platte Cr., 1934.

Smith, 1937 (B 880-A), p. 46 -- Mining on Platte Cr., 1935.

Smith, 1938 (B 897-A), p. 56 -- Mining on Platte and Homestake Creeks, 1936.

Smith, 1941 (B 926-A), p. 51 -- Mining, 1939.

Smith, 1942 (B 933-A), p. 48-49 -- Mining on Platte Cr., 1940.

Cobb, 1973 (B 1374), p. 111 -- Small nonfloat operation on Platte Cr., 1968.

Jumbo	Copper
Valdez Creek district Fig. 2, loc. 7 approx.	Healy (3.1, 4.2) approx. 63°14'N, 149°36'W

Summary: Scattered sulfides (mainly pyrrhotite; some pyrite and chalcopyrite) in fine-grained conglomerate.

Capps, 1919 (B 692), p. 230 -- Adjoins Riverside. Large open cut shows fine-grained conglomerate with bunches and specks of sulfides, mainly pyrrhotite; some pyrite and chalcopyrite.

(Kansas Cr.) — Antimony, Gold(?), Lead, Zinc

Bonnifield district — Healy (17.1-18.45, 15.35-15.6)
MF-394, locs. 3, 5 — 63°51'-63°52'N, 146°37'-147°47'W

Summary: Stibnite float discovered; contains small amount of lead and zinc [galena and sphalerite(?)]; trenching uncovered stibnite lenses and bodies (one as much as 6 ft. thick). At least 200 tons of high-grade ore recoverable from overburden; 50% antimony product probably could be hand sorted from material in bedrock by rejecting quartz and schist fragments. Country rock quartzitic schist, many small granitic intrusions in neighborhood. Stibnite prospect at 63°51'N, 147°37'W (18.45, 15.35). At about 63°52'N, 147°47'W (17.1, 15.6) gold was reported from a 90-ft. tunnel driven in about 1910 or earlier in pyritic quartzitic rock. No other data.

Capps, 1911 (B 480), p. 230-231 -- Preliminary to Capps, 1912 (B 501).

Capps, 1912 (B 501), p. 54 -- 90-ft. tunnel reported to have been driven in a quartzitic rock containing pyrite; no assay data, but gold reported.

Joesting, 1942 (TDM 1), p. 11 -- Much high-grade stibnite float with small content of lead and zinc; no gold or silver. Parent vein (covered by talus) apparently strikes NE and is about 5 ft. wide. Country rock is dark quartzitic schist; small granitic intrusions nearby.

Joesting, 1943 (TDM 2), p. 12 -- In 1942 deposit was explored by several trenches dug through 6 ft. of overburden; at least 200 tons of high-grade ore recoverable from overburden; in at least one place ore body is more than 6 ft. wide. Picked sample contained 63% Sb; careful sorting could probably result in a product containing 50% Sb by rejecting vein quartz and schist.

Ebbley and Wright, 1948 (RI 4173), p. 5 -- Deposit was examined by Mertie.
p. 36-37 -- Lenses of stibnite with or without quartz in crushed quartz zones. Bedrock is schist with rhyolite and granitic intrusives. Stibnite deposits and veins of barren glassy quartz apparently are parallel to schistosity of country rock.

Berg and Cobb, 1967 (B 1246), p. 203 -- Lode contains stibnite and minor galena and sphalerite [probably; see Joesting, 1942 (TDM 1), p. 11]. Concentrate containing about 50% antimony probably could be hand sorted from deposit.

Liberty	Gold, Silver
Valdez Creek district Fig. 2, loc. 3	Healy (3.6, 4.6) 63°16'N, 149°33'W

Summary: Cherty strata in shear zone that splits into 2 divergent branches contain some arsenopyrite; assays indicate 0.06-0.14 oz. a ton gold and 1.20-8.60 oz. a ton silver. Analyses of samples showed 1,000 or more ppm of Cu, Pb, and Sb; but no copper, lead, or antimony minerals are reported. Explored, probably in 1930 or earlier, by an open pit; no record of production.

Ross, 1933 (B 849-E), p. 310-311 -- Lode characterized by replacement along bedding.

p. 328 -- Pit exposes altered cherty strata that strike N 30° E and dip 70° NW cut by a shear zone that strikes N 50° W and dips 75° NE. Shear zone splits; one part swings to become parallel to bedding. Assays of samples across parts of shear zone showed 0.06-0.14 oz. a ton gold and 1.20-8.60 oz. a ton silver; better assays from shear zone that cuts across bedding.

Berg and Cobb, 1967 (B 1246), p. 26 -- Representative of replacement lodes consisting of silicified limestone beds partly replaced by sulfides.

Hawley and Clark, 1974 (P 758-B), p. B31-B32. Weakly auriferous material in NE- and NW-oriented vein sets. Samples contained as much as 10 ppm Ag, 1.7 ppm Au, 1,000 ppm Cu, 1,000 ppm Pb, and 1,500 ppm Sb; more than 10,000 ppm As. Only metallic mineral listed is arsenopyrite. Country rock shown on pl. 1 as pre-Permian argillite and argillite-graywacke(?).

(Lignite Cr.) — Antimony(?), Gold

Bonnifield district — Healy (8.0, 16.0) approx.
63°55'N, 148°58'W approx.

Summary: Placer gold reported about 3 mi. above mouth. Valley mainly in Tertiary coal-bearing rocks. Report of stibnite lodes (exact locations not known) is probably in error.

Maddren, 1918 (B 662), p. 369 -- Creek basin mainly in Tertiary coal-bearing rocks; separated on south from Healy Cr. valley by ridge of schist. Bordered on north by ridge of coal-bearing rocks and overlying [Nenana] gravel. Gold prospects reported about 3 mi. above mouth and on tributaries.

Joesting, 1942 (TDM 1), p. 12 -- 2 stibnite lodes reported; no information on exact location.

Lindfors	Copper, Gold, Zinc
Valdez Creek district	Healy (2.75, 3.7)
Fig. 2, loc. 11	63°12'N, 149°39'W

Summary: Quartz-sulfide veins in terrane of altered tuff and marble are 1 in. to 1-2 ft. thick and are parallel to a biotite quartz diorite porphyry dike. Veins contain arsenopyrite, pyrite, chalcopyrite and sphalerite. Explored before 1920 by prospect pits, stripped surfaces, and a shallow shaft. Analyses of recently collected samples show 0.2-14 ppm gold, as much as 150 ppm silver, and considerable As, Sb, Pb, and Zn; no antimony or lead minerals reported. No record of production. See also Golden Zone.

Capps, 1919 (B 692), p. 226 -- Adjoins Golden Zone. Exploration consists of open cuts and stripped surfaces. Altered tuffs, marbles, and dike rocks contain arsenopyrite (one body is vein 4-20 in. thick between a decomposed dike and altered tuff), pyrite, chalcopyrite, and sphalerite. Some rich gold assays reported. Some of sulfides and quartz replaced calcareous sediments; some impregnated different types of country rock.

Capps, 1924 (B 755), p. 134-135 -- Data from above.

Ross, 1933 (B 849-E), p. 321 -- Data mainly from above. Prospect restaked in 1931.

Hawley and others, 1968 (OF 305), p. 11-13 -- Lindfors(?) mentioned in discussion of veins on and near Golden Zone property. Steeply dipping veins strike generally NE and are parallel to biotite quartz diorite porphyry dike. Has been very little prospecting, some might be justified.

Hawley and Clark, 1974 (P 758-B), p. B13 -- Veins in shear zone.

p. B16 -- Sample contained 150 ppm Ag, 4.0 ppm Au, 10,000 ppm Zn, more than 10,000 ppm each As and Sb, 15,000 ppm Pb, and 500 ppm Cu.

p. B35-B36, B38 -- Poorly exposed veins in prospect pits and shallow shaft excavated before 1920. References to Capps, 1919 (B 692), p. 226, and Ross, 1933 (B 849-E), p. 321. Veins strike NE, dip steeply, and parallel a dike of biotite quartz diorite porphyry; exposed for about 1,000 ft. along strike and over a width of at least 100 ft.; individual veins from 1 in. to 1 or 2 ft. thick. Samples from vein or from dumps contained from 0.2 to 14 ppm gold. Consistently contain Pb and Zn; locally strongly anomalous amounts of Sb; trace amounts of Bi, Cd, and Sn. Nearby ground-sluiced trenches may be on old Golden Zone Extension claims.

(Long Cr.)

Copper, Gold, Lead, Silver, Zinc

Valdez Creek district
Fig. 2, loc. 15

Healy (2.7, 3.2)
63°11'N, 149°40'W

Summary: Hornfelsed argillite intruded by a small plug and dikes of quartz porphyry. Massive quartz arsenopyrite veins and parts of country rock carry sulfides (1%-2% in some of country rock), including arsenopyrite, galena, sphalerite, pyrite, and chalcopyrite. As much as 700 ppm silver and 11 ppm gold. No antimony, bismuth, or tin minerals have been identified, although samples contain as much as 3,000 ppm Sb, 1,000 ppm Bi, and 700 ppm Sn. Explored by pits and trenches; no record of production.

Hawley and others, 1969 (C 716), p. 11-12 -- Country rock hornfelsed conglomerates, breccias, and shale cut by a small plug and dikes of quartz porphyry; metamorphosed country rock contains 1%-2% disseminated sulfides (pyrite, arsenopyrite, and minor chalcopyrite); intrusives limonite stained and locally contain abundant pyrite and arsenopyrite. Massive quartz-arsenopyrite veins carry minor amounts of galena, sphalerite, pyrite, chalcopyrite, and gold. More Bi, Sb, and Sn than in most nearby deposits. Most exposures in pits and trenches (some caved).

p. 15, 17 -- Analyses of 21 samples showed as much as 700 ppm Ag, 11 ppm Au, 1,000 ppm Bi, 3,000 ppm Cu, 3,000 ppm Pb, 3,000 ppm Sb and 700 ppm Sn; more than 10,000 ppm As and Zn.

Hawley and Clark, 1973 (P 758-A), p. A7 -- Tin in arsenopyrite-bearing veins.

Hawley and Clark, 1974 (P 758-B), p. B12-B16 -- Vein-disseminated type of epigenetic deposit in contact-metamorphosed argillite with small porphyry bodies. Minerals reported include arsenopyrite and sphalerite. Some tin mineral should be present, but has not been discovered. Samples average about 3 ppm gold. 3 samples contain as much as 700 ppm Ag, 3.2 ppm Au, 3,000 ppm Cu, 3,000 ppm Pb, 3,000 ppm Sb, and 700 ppm Sn; more than 10,000 ppm As and Zn; detectable amounts of several other metals.

p. B41-B42, B44 -- About the same data as in Hawley and others, 1969 (C 617); more analytical data in older report.

(Lookout Mtn.)	Lead, Silver, Zinc
Valdez Creek district	Healy (3.4, 3.7)
Fig. 2, loc. 13	63°13'N, 149°34'W

Summary: Tertiary quartz porphyry and felsite body probably about 1,200 ft. in diameter intruded sheared pre-Permian argillite and quartzite. Argentiferous sulfides, mainly galena and sphalerite, deposited along small fractures and in shear zone and breccia in or bordering intrusive; as much as 30 ppm silver and 50 ppm tin (no tin mineral identified). Samples from surrounding argillite and quartzite practically barren. No development or production.

Hawley and others, 1969 (C 617), p. 9-11, 15-16 -- Description about the same as in Hawley and Clark, 1975 (P 758-B), except that no data on mineralogy are presented here.

Hawley and Clark, 1974 (P 758-B), p. B12-B14 -- Silver-lead-zinc bearing epigenetic deposit with dominant control small-scale fractures. Disseminated galena present.

p. B17-B18 -- Disseminated galena and sphalerite present. Analyses of 3 samples showed 10-30 ppm Ag, no more than 0.04 ppm Au, 10-150 ppm Cu, 150-700 ppm Pb, and as much as 500 ppm Zn; traces of a few other metals.

p. B23 -- Mineralized rock characterized by Ag, Zn, and Pb.

p. B33 -- Quartz porphyry and felsite present.

p. B39, B41-B42 -- Scattered outcrops suggest a quartz porphyry and felsite intrusive body [of Tertiary age] about 1,200 ft. in diameter emplaced in [pre-Permian] sheared argillite and quartzite. Samples from the intrusive and from a shear zone bordering it contain as much as 30 ppm Ag, a trace of gold, 150 ppm Cu, 750 ppm Pb, 700 ppm Zn, and 50 ppm Sn. Samples from surrounding argillite and quartzite practically barren; no more than 1 ppm Ag.

(Lucky Gulch) (Cr.) Gold

Valdez Creek district Healy (21.6, 3.9)
MF-394, loc. 73 63°12'N, 147°16'W

Summary: Small, steep stream with subangular angular slate gravel and choked with slide rock from hillsides. Gold of local derivation; coarsest and most angular in Valdez Creek area. Small-scale mining, including some winter drifting, from early 1900's to as recently as 1939. Mining hampered by lack of water; most from melting snowdrifts. Production probably not much more than 1,000 fine oz. of gold.

Moffit, 1909 (B 379), p. 159-160 -- Gravels about 4-1/2 ft. deep; much coarse gold; largest nugget recovered worth about $970. Yield reported to be about $40 per man per day.
Brooks, 1911 (P 70), p. 168-169 -- Extracted from above.
Moffit, 1911 (B 480), p. 119, 122 -- Preliminary to Moffit, 1912 (B 498).
Moffit, 1912 (B 498), p. 55-56 -- Small north-flowing tributary of Valdez Cr. Bedrock is slate that dips north and in places is intruded by fine-grained light-colored igneous rock. Gold is abnormally coarse and some nuggets are rought with spines and protuberances; of local derivation. Gold can be panned from decomposed veins in bedrock near gulch.

p. 63 -- Small, steep stream; most of water from melting snow; gulch is narrow and deposits are deep; gold in paystreak in bottom of gulch on bedrock; mined from deep open cut. Some large nuggets; largest weighed 52 oz. Stream wash mainly slate; no diorite boulders as on Valdez Cr.

Moffit, 1914 (B 592), p. 307-308 -- Mining, 1913.
Brooks, 1918 (B 662), p. 49 -- Mining, 1916.
Capps, 1924 (B 755), p. 137 -- Data from Moffit, 1912 (B 598).
Smith, 1926 (B 783), p. 12 -- 3 claims being mined, 1924.
Smith, 1929 (B 797), p. 17-18 -- Work, 1926.
Smith, 1930 (B 813), p. 26 -- Mining, 1928.
Smith, 1932 (B 824), p. 31 -- Mining, 1929.
Ross, 1933 (B 849-H), p. 454-455 -- Production through 1931 probably did not exceed $20,000 [about 970 fine oz.] by much. Fan at mouth is probably potential placer ground, as well as is the creek-bed gravel. Data on gold from Moffit, 1912 (B 598), p. 63.
Smith, 1933 (B 836), p. 29 -- Mining, 1930.
Smith, 1936 (B 868-A), p. 34 -- Mining, 1934.
Smith, 1937 (B 880-A), p. 37 -- Mining, 1935.
Tuck, 1938 (B 897-B), p. 124-125 -- Placer formed since glaciation. Gold from local sources on hillsides on either side of creek. Channel choked with slide debris, so stream rarely gets down to bedrock.

p. 129 -- Gravel mainly subangular slate. Gold is coarsest and roughest in area. Very little water; mainly from melting snowdrifts. Most mining by "booming" with an automatic dam; a little winter drift mining. Gravel of present bed of creek is about worked out. Quotation from Ross, 1933 (B 849-H), p. 454.
Smith, 1939 (B 910-A), p. 42 -- Mining, 1937.

(Lucky Gulch) (Cr.) -- Continued

Smith, 1939 (B 917-A), p. 40 -- Mining, 1938.
Smith, 1941 (B 926-A), p. 36 -- Mining, 1939.
Cobb, 1973 (B 1374), p. 18 — Has been small-scale mining.

Lucky Top	Gold, Lead
Valdez Creek district	Healy (21.8, 3.75)
MF-394, loc. 52	63°11'N, 147°15'W

Summary: Quartz vein from a few inches to a foot thick between slate walls contains arsenopyrite, galena, and spectacular specimens of free gold. Found by tracing gold-quartz fragments uphill from placer in Lucky Gulch. Minor exploration and no record of mining.

Tuck, 1938 (B 897-B), p. 119-120 -- Discovered by tracing gold-quartz float from Lucky Gulch to top of hill. Vein consists of from a few inches to a foot of banded comb quartz between walls of slate; gouge and slickensiding indicate postmineralization movement along vein. Vein contains arsenopyrite and flakes of galena and spectacular specimens of free gold. Vein has been traced for several hundred feet down hill toward Lucky Gulch. Explored by a few pits; crosscut to undercut lode has been started.

Berg and Cobb, 1967 (B 1246), p. 26 -- A piece of quartz about the size of a teacup contained almost 2 oz. of free gold.

Lucrata — Copper, Gold, Silver

Valdez Creek district — Healy (3.7, 4.7)
Fig. 2, loc. 2 — 63°16'N, 149°32'W

Summary: On Lucrata fault zone in gabbro-basalt unit. Sulfide-rich pods contain quartz, much arsenopyrite, and specks of chalcopyrite. Pod about 3 ft. by 3 ft. contained 1.26 oz. a ton gold and 3.8 oz. a ton silver. Recently collected sample contained 1,000 ppm (0.1%) Bi, no bismuth mineral reported. Explored before 1920 by 15-ft. tunnel. No record of production. Includes references to Lucrative.

Capps, 1919 (B 692), p. 224 -- Tunnel driven 15 ft. S 70° W follows a rusty mineralized vertical quartz stockwork in a mass of intrusive rock; stockwork 15-18 in. wide; bordered on both sides by gouge and sharp slickensided walls. Abundant arsenopyrite and some specks of chalcopyrite in bluish banded quartz. No data on gold and silver content. Called Lucrative in this reference.

Capps, 1924 (B 755), p. 133-134 -- Data from above.

Ross, 1933 (B 849-E), p. 311-313 -- See Ready Cash sheet for general statement on this type of lode.

p. 328-329 -- Zone of mineralization about 15 ft. long, 3 ft. wide, and 7 ft. high exposed in a cut; contains quartz and bunches of partly oxidized sulfides; cut off at one end by lamprophyre dike about 2 ft. thick; another small lens exposed in cliff beyond dike. Sulfides relatively abundant; sample assayed 1.26 oz. a ton gold, 3.80 oz. a ton silver, and 21.25% arsenic. Exposed mineralized mass too small to be mined.

Hawley and Clark, 1974 (P 578-B), p. B12-B16. Fault-zone epigenetic deposit. Fault zone 50-100 ft. wide is exposed or can be confidently projected for about 2,000 ft.; probably extends for another 7,000 ft. to SW. Two random samples across fault zone [neither at Lucrata prospect] showed 0.1 ppm Au, 2.5 ppm Ag, 500 ppm Cu, and traces of Bi. Considerable arsenopyrite at prospect. Sample from a gash(?) vein contained 100 ppm Ag, 50 ppm Au, 1,000 ppm Bi, and smaller amounts of several other metals. Disseminated pyrrhotite in gabbro.

p. B28-B32 -- Deposit in pyritic shear zone in gabbro and basalt of probable Tertiary age; sulfide-rich pods as much as 4 ft. by 5 ft. A pod about 3 ft. by 3 ft. assayed 1.26 oz. a ton gold, 3.8 oz. a ton silver, and 21.25% arsenic. Analysis given on p. B16 repeated.

(Marguerite Cr.) Gold

Bonnifield district Healy (10.7, 17.1)
MF-394, loc. 56 63°58'-148°37'W

Summary: Placer mining, all small scale, from 1928 to as recently as 1940. Creek is a tributary of Totatlanika R. that drains an area underlain by rocks of the Tertiary coal-bearing group, Precambrian or Paleozoic schist, and a hornblende dacite pluton [Wahrhaftig, 1970 (GQ-806)]. No data on amount of production.

Smith, 1930 (B 813), p. 35 -- Mining, 1928.
Smith, 1932 (B 824), p. 40 -- Mining, 1929.
Moffit, 1933 (B 836), p. 345 -- One man mining part of summer, 1930.
Smith, 1933 (B 836), p.41 -- Small-scale mining, 1930.
Smith, 1933 (B 844-A), p. 41 -- Mining, 1931.
Smith, 1934 (B 857-A), p. 38 -- Mining, 1932.
Smith, 1934 (B 864-A), p. 42 -- Mining, 1933.
Smith, 1936 (B 868-A), p. 44 -- Mining, 1934.
Smith, 1937 (B 880-A), p. 46 -- Mining, 1935.
Smith, 1938 (B 897-A), p. 55-56 -- Mining, 1936.
Smith, 1939 (B 910-A), p. 55 -- Mining, 1937.
Smith, 1939 (B 917-A), p. 54 -- Mining, 1938.
Smith, 1941 (B 926-A), p. 51 -- Mining, 1939.
Smith, 1942 (B 933-A), p. 48-49 -- Mining, 1940.

McCall

Lead, Silver

Kantishna district
MF-394, loc. 1

Healy (2.1, 12.15) approx.
63°41'N, 149°44'W

Summary: Very little information. Samples said to have assayed more than 6 oz. silver per ton and about 55% lead.

Berg and Cobb, 1967 (B 1246), p. 230 -- In Mt. McKinley National Park near Sushana R. Samples said to have assayed more than 6 oz. a ton silver and about 55% lead.

(McCuen Gulch) Gold

Bonnifield district Healy (12.05, 17.4)
MF-394, loc. 58 63°59'N, 148°27'W

Summary: Small gulch in schist intruded by at least one granitic dike; iron-stained quartz veins near dike and quartz veinlets in dike. No data on gold content, if any. Probably less than 100 oz. of placer gold recovered from poorly sorted gravel and rock fragments in 1,500 ft. of gulch above mouth between 1905 and about 1916.

Maddren, 1918 (B 662), p. 387-388 -- Gold discovered, 1905.

p. 397-398 -- Small tributary of Totatlanika that is eroded in schistose rocks intruded by one or more granitic dikes; iron-stained quartz veins in schist near dike and quartz veinlets in dike. Lower part of gulch entrenched about 100 ft. in sloping bedrock bench of Totatlanika; gulch contains about 5-10 ft. of poorly sorted gravel and rock fragments and fine material; 50-100 ft. wide. All mining small scale and within 1,500 ft. of mouth. Total production through 1915 probably not over $2,000 [less than 100 fine oz.]. Of interest because gold in gulch appears to have been derived from a source in schist rather than reconcentrated from Nenana Gravel, as is most of placer gold in area.

Overbeck, 1918 (B 662), p. 351 -- Gold quartz claim has been staked.

p. 355 -- Siliceous dike near lode prospect. [No statement that there is any gold at prospect.]

(Newman Cr.) Gold

Bonnifield district
MF-394, loc. 61

Healy (21.1, 17.0) approx.
63°57'N, 147°16'W approx.

Summary: A little gold in high gravels (Nenana Gravel) and in creek gravels. Schist, high gravels, and coal-bearing rocks in basin. No record of mining.

Capps, 1911 (B 480), p. 229 -- Preliminary to Capps, 1912 (B 501).
Capps, 1912 (B 501), p. 52 -- Drains basin that includes schist, high gravels [Nenana Gravel], and coal-bearing rocks. Some gold in creek gravel. High gravels contain gold also; 3-4 cents per yd.[3] near top and somewhat more lower down; appears to be some concentration in bed of clean white gravel at base. Has been no mining; some planned for 1911.

North Carolina — Antimony, Gold

Valdez Creek district — Healy (4.55, 1.8)
Fig. 2, locs. 28, 29 — 63°06'N, 149°26'W

Summary: Stibnite in lenses or pods in graywacke and argillite near felsite dikes carry as much as 0.18 oz. a ton gold. Gold also reported from border of a dike near antimony occurrence. Stibnite prospect explored by a short tunnel; several tons of ore mined but not shipped in about 1918. Includes references to (Antimony Cr.).

Capps, 1919 (B 692), p. 229-230 -- Country rock shale or argillite, slate, limestone, and graywacke cut by at least one basic dike. 2 tunnels and some surface excavations. Lower tunnel 40 ft. long along footwall of dike that strikes S 65° W and dips 60° SE; pyrite in gouge and altered sedimentary rocks; gold reported. Upper tunnel 10 ft. long; dump contains several tons of stibnite ore, some pieces with considerable quartz gangue and some with oxidized coatings. Owners report that stibnite is in lenses or kidneys as much as 2 ft. thick and a few feet long and that stibnite carries some gold.

Capps, 1924 (B 755), p. 135-136 -- Data from above.

Joesting, 1942 (TDM 1), p. 12 -- Reference to above.

Joesting, 1943 (TDM 2), p. 14-15 -- Prospected in about 1918 by a tunnel 20 ft. long. 3 tons of partly sacked ore on old dump; representative sample assayed 37.5% antimony. 8-inch vein of stibnite pinched out 5 ft. from face; in pit dug in floor of tunnel vein narrowed to 3 in. at a depth of 4 ft.

Wedow and others, 1952 (OF 51), p. 74 -- Reference to Capps, 1919 (B 692), p. 229.

Berg and Cobb, 1967 (B 1246), p. 29 -- Probably consists of quartz-stibnite veins in slate and graywacke. Stibnite reported to occur in short lenses as thick as 2 ft., said to carry gold. Deposit discovered in early 1900's; explored by 2 short tunnels and some open cuts; no reported production. Nearby a fault cutting altered shale contains pyrite and a little gold; pyrite disseminated in limestone beds near fault.

Hawley and others, 1968 (OF 337) -- Country rock graywacke-argillite and siliceous dense argillite cut by steeply dipping NE-striking felsite dikes and a small pyroxenite plug. Most data on prospect from Capps, 1919 (B 692), p. 230, and an unpublished report summarized in Joesting, 1943 (TDM 2), p. 14-15. Samples collected from dump and talus in 1967 contained more than 10,000 ppm Sb and about 6 ppm (0.18 oz. per ton) gold.

(Ohio Cr.) — Niobium, Silver, Tantalum, Tin

Valdez Creek district — Healy (0.7, 3.25)
Fig. 2, loc. 18 — 63°11'N, 149°55'W

Summary: Muscovite- and tourmaline-bearing greisen and pegmatitic quartz arsenopyrite veins in tourmaline-bearing granite stock contain fine (generally less than 100-mesh size), rare grains of cassiterite. Even rarer wodginite (niobium-tantalum mineral) in one sample. Analyses show trace amounts of gold, as much as 20 ppm silver, more than 1,000 ppm (0.1%) tin, and detectable amounts of several other metals.

Hawley and others, 1969 (C 617), p. 8-9 -- Muscovite- and tourmaline-bearing greisen and quartz-arsenopyrite veins in tourmaline-bearing granite stock about 1 mi. long and 1/2 mi. wide. Zone of tourmaline greisen as much as 10 ft. thick adjacent to a biotite-rich inclusion contains as much as 300 ppm Sn and grades into muscovite-bearing greisen as much as 3 ft. thick containing more than 1,000 ppm [0.1%] Sn; other samples of greisen and of pegmatitic quartz-arsenopyrite veins in granite near and parallel to contact with enclosing rocks [Mesozoic and Tertiary(?) argillite, graywacke, and conglomerate unit] also contain more than 1,000 pm Sn. Samples contain measurable amounts of Ag, Au, Cu, Pb, Zn, and W. [Only metallic mineral specifically identified as arsenopyrite.]

p. 13 -- Analyses summarized above.

Hawley and Clark, 1974 (P 758-B), p. B12-B16 -- Disseminated epigenetic deposit in which lithologic control is dominant. Only greisen occurrence known in district. Few to moderately abundant grains of arsenopyrite and a few very fine grains of cassiterite disseminated in quartz-muscovite greisen and in veinlike bodies marginal to the greisen; in a granite stock. Cassiterite in very fine (mainly less than 100-mesh) dark brown grains; accompanied by rare grains of wodginite, a rare niobium-tantalum mineral. Only trace amounts of gold; in pegmatitic quartz-arsenopyrite veins. Sample contained 20 ppm Ag, more than 10,000 ppm As, 0.04 ppm Au, more than 1,000 ppm Sn, and detectable amounts of several other metals.

p. B45-B46 -- Essentially the same data as in Hawley and others, 1969 (C 617); analyses given in more detail.

(Partin Cr.) Antimony, Copper, Gold, Silver

Valdez Creek district Healy (0.3-0.4, 1.1-1.15)
Fig. 2, locs. 23, 24 63°04'N, 149°57'-149°58'W

Summary: Sulfides disseminated in contact-metamorphosed argillite-basalt-limestone series intruded by a very small body of quartz diorite porphyry; also as vesicle fillings in basalt. Sulfides mainly arsenopyrite, pyrite, pyrrhotite, and chalcopyrite; stibnite reported. Samples contained as much as 0.7% copper, 0.7% antimony, 300 ppm silver, and 63 ppm gold. Little if any physical exploration and no reported production.

Hawley and others, 1969 (C 617), p. 8-10 -- Country rock is interlayered basalt and limestone; faulted against red beds, argillite, and limestone to east. Sulfides in a zone at least 3,000 ft. long and as much as 1,000 ft. wide and generally parallel to NE-SW regional structure. Rocks contain visible pyrite, arsenopyrite, pyrrhotite, and chalcopyrite; local limonitic gossans on calcareous rocks. Sulfides fresh in basalt; occur as disseminations and veinlets and, locally, as vesicle fillings. Samples contained as much as 0.7% Cu, 300 ppm Ag, and 63 ppm Au; detectable amounts of several other metals and more than 10,000 ppm As in one sample.

Hawley and Clark, 1973 (P 758-A), p. A6 -- Lode gold present.

p. A9 -- Resources of one vein probably comparable to those of Eagle and Ready Cash.

Hawley and Clark, 1975 (B 758-B), p. B12-B14 -- Vein-disseminated type of epigenetic deposit in contact-metamorphosed argillite-basalt-limestone wall rocks. Very small mass of quartz diorite porphyry crops out at prospect. Minerals present include arsenopyrite, chalcopyrite (disseminated and as vesicle fillings), pyrrhotite (disseminated in basalt), and stibnite (unpublished data of Thurmond, 1918).

p. B16 -- Analysis of sample showed 1 ppm Ag, 63 ppm Au, more than 10,000 ppm As, 7,000 ppm Cu, 7,000 ppm Sb, and detectable amounts of several other metals.

p. B45-B46 -- Data about the same as in Hawley and others, 1969 (C 617), p. 8-9; more analytical data here.

(Pass Cr.) Copper

Valdez Creek district Healy (22.7, 2.95)
MF-394, loc. 50 63°08'N, 147°08'W

Summary: Disseminated stratiform copper deposit consisting mainly of chalcopyrite and pyrite with local minor bornite, chalcocite, and native copper; some copper carbonates in small gossans. Mainly in argillaceous and calcareous sedimentary rocks near interfingering contacts with Triassic lavas. Active prospect in 1977. Includes references to Denali copper prospect.

Kaufman, 1964 (GR 4), p. 6-7 -- Fragmental unit (apparently a volcanic breccia) consisting of limestone fragments in an andesitic matrix interbedded with greenstone and cut by irregular gabbroic dikes. 2 small gossans with limonite, malachite, azurite, and minor visible chalcopyrite. Some mineralization consists of zone of replaced limestone fragments (33 ft. wide) and some of a zone along fractures in andesitic matrix (2 ft. wide). Zones strike N 40°-60° E and dip steeply. Mineralized float along a talus slope assays 25% Cu. Chip sample across full width of thicker zone assays 2.9% Cu.

p. 12 -- Occurrence should be trenched. Limestone in area should be prospected carefully.

Rose, 1966, p. 47 -- Reference to above. Since Kaufman's examination prospect has been trenched, drilled, and had some overburden sluiced off. Chalcopyrite and pyrite are the principal sulfides. Mineralized zone is near the top of a thick sequence of basalts overlain by a great thickness of phyllite, argillite, and minor limestone. Diorite pluton intruded sedimentary rocks about a mile north of prospect.

Berg and Cobb, 1967 (B 1246), p. 28 -- Data from Kaufman, 1964 (GR 4), p. 6-7, summarized.

Smith, 1970 (OF 441), p. 2 -- Recently discovered copper prospect.

p. 53 -- At a fault intersection along a major shear zone.

MacKevett and Holloway, 1977 (OF 77-169A), p. 23 -- Disseminated, stratiform deposit containing chalcopyrite, pyrite, and locally minor bornite, chalcocite, and native copper; mainly in argillaceous and calcareous sedimentary rocks near interfingering contacts with Triassic lavas. [Data from Seraphim, R. H., 1975, Denali - a nonmetamorphosed stratiform sulfide deposit: Economic Geology, v. 70, no. 5, p. 949-959].

(Popovich Cr.) — Gold(?)

Bonnifield district — Healy (9.0, 16.3) approx.
63°55'N, 148°50'W approx.

Summary: Placer gold reported; no other data on occurrence. Creek drains area of Tertiary coal-bearing rocks and Nenana Gravel.

Maddren, 1918 (B 662), p. 369-370 -- Creek drains area of coal-bearing rocks overlain by [Nenana] gravel. Gold reported; a little prospecting in 1916.

(Portage Cr.) Gold

Bonnifield district
MF-394, loc. 62

Healy (22.1, 16.4) approx.
63°55'N, 147°08'W

Summary: Creek drains basin in high gravels; no hard bedrock exposed; gold on clay bedrock. Mining from about 1906 to about 1911 and from 1933 to as recently as 1940. No data on total production.

Capps, 1911 (B 480), p. 229 -- Preliminary to Capps, 1912 (B 501).
Capps, 1912 (B 501), p. 44 -- Mining, 1910.
p. 52 -- Basin in high gravels east of head of Newman Cr.; no hard bedrock exposed in basin. Mining carried on continuously for 5 years; production to 1911 estimated at $10,000 [about 484 fine oz.]. Gold on clay bedrock.
Smith, 1934 (B 864-A), p. 42 -- Mining, 1933.
Smith, 1938 (B 897-A), p. 55-56 -- Mining, 1936.
Smith, 1939 (B 910-A), p. 55 -- Mining, 1937.
Smith, 1939 (B 917-A), p. 54 -- Mining, 1938.
Smith, 1941 (B 926-A), p. 51 -- Mining, 1939.
Smith, 1942 (B 933-A), p. 48-49 -- Mining, 1940.

Ready Cash	Copper, Gold, Lead, Silver, Zinc
Valdez Creek district	Healy (1.05, 2.6)
Fig. 2, loc. 21	63°09'N, 149°52'W

Summary: Lodes in shear zones consist of altered country rock (basalt, limestone, contact-metamorphosed argillite), quartz, calcite, and sulfides (arsenopyrite, galena, pyrite, chalcopyrite, pyrrhotite, sphalerite, covellite, and argentite). Low gold and some high silver assays. Explored by two tunnels and a short drift; total length 245 ft. Little if any work since early 1930's; no record of production. Antimony and tin reported in analyses; no antimony or tin minerals identified. See also (Canyon Cr.).

Capps, 1919 (B 692), p. 228-229 -- Country rock interbedded argillite, graywacke, and greenstone tuff. Quartz vein 8-10 ft. wide strikes N 15° E and is vertical. Crosscut driven 170 ft. did not reach vein, but did intersect a few thin veins. Another tunnel driven 75 ft. on vein, where it is 10-15 in. wide and is said to carry abundant galena and to show high assays in silver. Pieces of ore that probably came from this tunnel carry quartz, calcite, abundant arsenopyrite, pyrite, chalcopyrite, and galena.

Capps, 1924 (B 755), p. 135 -- Data from above.

Ross, 1933 (B 849-E), p. 311-313 -- Ready Cash, Eagle, Lucrata, Little Lead, and Mayflower lodes tend to be tabular or lenticular and in irregular shear zones that only exceptionally and locally have definite walls; altered country rock impregnated with quartz, carbonate, and sulfides makes up most of lode matter. At Ready Cash lodes are much disturbed by postmineralization faulting. Little Lead of Golden Zone appears to be uninterrupted for a length of as much as 1,000 ft. At Eagle lodes are discontinuous and irregular because of irregular original deposition and later faulting. At Lucrata original deposition was confined to small lenses. Individual masses of quartz lenticular and tend to be en echelon. Arsenopyrite most common sulfide; approaches löllingite in composition in places. Galena and sphalerite more common at Ready Cash than at other prospects; argentite forms films on cleavage cracks in galena. Chalcopyrite widespread, but not abundant enough to be considered to make an ore except possibly at Mayflower.

p. 316 -- Data from Ready Cash indicate that lodes containing fairly conspicuous quartz, galena, and sphalerite are relatively low in gold and silver.

p. 318-320 -- Bedrock is an altered andesitic rock; sheared and brecciated in places. 3 segments of quartz veins, which may be dislocated parts of a single vein. Sulfides present include arsenopyrite, galena, pyrite, chalcopyrite, pyrrhotite, and sphalerite; some secondary covellite. Samples assayed trace to 0.01 oz. a ton gold and 0.70 to 4.20 oz. a ton silver. Developed by 2 tunnels and a short drift (total length 245 ft.).

Wedow and others, 1952 (OF 51), p. 73 -- Reference to Ross, 1933 (B 849-E), p. 318-320.

Ready Cash -- Continued

Berg and Cobb, 1967 (B 1246), p. 26 -- Some of data from Ross, 1933 (B 849-E), p. 311-313, summarized.

Hawley and others, 1969 (C 617), p. 8 -- F. L. Thurmond (unpublished data, 1918) reported a maximum silver assay of 183 oz. a ton on selected galena and a range of 5-120 oz. a ton on other selected sulfide-rich samples. Maximum silver content of samples collected during present investigation was 15 oz. a ton. Helicopter reconnaissance suggests that there are several distinct veins rather than faulted segments of a single vein.

p. 11 -- Sample of chalcopyrite-arsenopyrite vein contained 0.3 ppm gold and 150 ppm silver.

Hawley and Clark, 1973 (P 758-A), p. A9 -- Reserves estimated by Thurman (unpublished data, 1918) to be in range from $50,000 to $200,000.

Hawley and Clark, 1974 (P 758-B), p. B14 -- Veins or breccia fillings consist mainly of arsenopyrite at a number of prospects, including Ready Cash. Chalcopyrite locally abundant; sphalerite present; galena abundant, both in massive-sulfide and in quartz-rich veins. Argentite reported.

p. B44-B45 -- Most of data from Ross, 1933 (B 849-E), p. 318-320. Country rock interlayered basalt and limestone; some contact-metamorphosed argillite. Thurmond (unpublished data, 1918) reported that a surface sample of an 8-ft. width of a sulfide-bearing vein (strike N 20° W, dip about 60° NE) assayed 0.04 oz. a ton gold, 25 oz. a ton silver, 1.5% copper, and 5% lead; underground samples of same vein were leaner. Sulfide vein exposed in Canyon Cr. near portal of lower adit contains visible arsenopyrite, chalcopyrite, and galena; spectrographic and atomic absorption analyses showed presence of Bi, Cd, Sb, Sn, and Zn; gold 0.3 ppm and silver 150 ppm.

Riverside — Copper, Gold, Lead, Silver, Zinc

Valdez Creek district — Healy (3.1, 4.25)
Fig. 2, loc. 7 — 63°14'N, 149°36'W

Summary: Two replacement lodes in Triassic limestone that is cut by at least 2 acidic dikes of Tertiary age contain an average of about 3 ft. of ore. Sulfides present are arsenopyrite, pyrrhotite, pyrite, chalcopyrite, and, locally, galena and sphalerite; some supergene chalcocite. As much as 0.82 oz. a ton gold and 2.1 oz. a ton silver. Reported to have been explored by open cuts, short tunnels, and a shallow shaft; all caved in late 1960's. No record of any production.

Capps, 1919 (B 692), p. 225-226 -- Beds of tuff, chert, and calcareous rocks all somewhat contact metamorphosed by many medium-grained acidic dikes; calcareous beds partially replaced by quartz and sulfides, including arsenopyrite, pyrite, chalcopyrite, galena, and probably sphalerite; specks of sulfides without quartz also present. Average assays taken across 12 ft. of marble reported to have shown several dollars a ton in gold and silver. Developed by several large open cuts, a 10-ft. tunnel, a 15-ft. shaft, and a caved tunnel (length not known).

Capps, 1924 (B 755), p. 134 -- Data from above.

Capps, 1933 (B 836), p. 297-298 -- Data essentially as above.

Ross, 1933 (B 849-E), p. 310-311 -- Lode characterized by replacement along bedding.

p. 326-327 -- 2 nearly parallel lodes; replacement deposits that approximately follow bedding of limestone country rock. Lodes strike N to N 15° W and dip from 70° NE to vertical. Ore averages about 3 ft. in thickness. Lodes have been traced 60-80 ft. along strike. Lodes mainly irregular bunches and lenses of vein quartz with sulfides (arsenopyrite, pyrrhotite, pyrite, chalcopyrite, and, locally, galena and sphalerite; some supergene chalcocite). Samples contained 0.02-0.72 oz. a ton gold and 0.30-2.10 oz. a ton silver. Explored by numerous small cuts, pits, and short tunnels. Average value of mineralized material is somewhat over $7 a ton [1931 prices].

Berg and Cobb, 1967 (B 1246), p. 26 -- Representative of replacement lodes consisting of silicified limestone beds partly replaced by sulfides.

Hawley and Clark, 1974 (P 758-B), p. B14 -- Arsenopyrite present.

p. B35 -- Area overgrown and pits caved. Reference to Ross, 1933 (B 849-E).

p. B41 -- Sketch map by Harry Townsend (unpublished data, 1925). 2 veins with maximum width of about 12 ft. Country rock mainly [Triassic] limestone, some silicified, cut by 2 [Tertiary] thin dikes in and bordering a segment of one vein. Explored by several open cuts and a shallow shaft. Samples assayed as much as 0.82 oz. a ton gold and 0.04 oz. a ton silver; 5.79%-27.95% arsenic.

(Rock Cr.) — Antimony

Bonnifield district — Healy (17.05, 16.05) approx.
MF-394, loc. 2 — 63°53'N, 147°47'W approx.

Summary: Small stibnite prospect reported. No other data. Wahrhaftig [1970 (GQ-804)] shows country rock as stretched-pebble conglomerate of Precambrian or Paleozoic Keevey Peak Formation.

Joesting, 1943 (TDM 2), p. 13 -- Small stibnite prospect reported to be 1 mi. up Rock Cr. from mouth.
Berg and Cobb, 1967 (B 1246), p. 203 -- Small stibnite prospect.

(Rusty Cr.) Gold

Valdez Creek district Healy (21.3, 3.75)
MF-394, loc. 71 63°11'N, 147°19'W

Summary: Gold placer prospecting began in about 1910; little if any activity since 1920's. Bedrock mainly slate. Placer deposit probably postglacial. See also (White Cr.).

Moffit, 1911 (B 480), p. 119, 122-123 -- Preliminary to Moffit, 1912 (B 498).
Moffit, 1912 (B 498), p. 57 -- Was prospecting, 1910.
p. 64-65 -- Prospecting, 1908-10, consisted of washing out a cut several hundred feet long and as much as 25 ft. deep in places. Creek heads in complex of slates, tuff, and basalt; lower part of course in slate that dips downstream; valley choked with glacial debris over sorted gravel and cross-bedded coarse sand. Fairly coarse bright gold on bedrock projections on east wall of placer cut and in bottom of cut (bedrock not reached in bottom).
Capps, 1924 (B 755), p. 137 -- Data from Moffit, 1912 (B 498).
Ross, 1933 (B 849-H), p. 453 -- Has been a little small-scale mining.
Tuck, 1938 (B 897-B), p. 129 -- Largest tributary of White Cr. Placers almost certainly postglacial. Has been no mining for several years.

(Sanderson Cr.) Gold(?)

Bonnifield district Healy (10.8, 16.1) approx.
63°55'N, 148°38'W approx.

Summary: Placer claims located and relocated, but no evidence of mining of any consequence. Stream heads in schist, then follows contact between schist and coal-bearing rocks, and is entirely in coal-bearing rock in lower part of course.

Maddren, 1918 (B 662), p. 369-371 -- Headwater branch Lignite Cr.; headwaters in schist, middle part of course follows contact between schist and coal-bearing rocks; lower part of course in coal-bearing rocks. Placer claims located and relocated, but no mining of any consequence seems to have been done; claims mainly in middle part of course, which is not as hopeful looking as headwaters.

(Shotgun Cr.) Gold

Valdez Creek district Healy (1.6, 0.8) approx.
Fig. 2, loc. 26 approx 63°03'N, 149°48'W approx.

Summary: Placer gold present, but mining has not been successful.

Capps, 1919, (B 692), p. 231 -- Placer gold present, but mining has not been successful.
Cobb, 1973 (B 1374), p. 18-19 -- A little placer gold recovered in early 1900's.
Hawley and Clark, 1973 (P 758-A), p. A6 -- Placer gold deposit was prospected.
Hawley and Clark, 1974, (P 758-B), p. B14 -- Native gold in placer prospect in lower part of creek.

Silver King	Antimony, Copper, Gold, Silver
Valdez Creek district	Healy (3.55, 4.5)
Fig. 2. loc. 5	63°15'N, 149°33'W

Summary: Veins in hornfels and tactite in Triassic and younger(?) sedimentary rocks intruded by Tertiary quartz diorite porphyry dikes contain masses of sulfides (pyrrhotite, arsenopyrite, pyrite, chalcopyrite, and stibnite); as much as 70 ppm silver and 200 ppm gold. Traces (or more) of many other metals, including cobalt, lead, zinc, bismuth, and tin, but no minerals containing these elements were identified. Developments, mainly if not entirely before 1930, were trenches and pits. No record of production. Investigation in 1931 concluded that the irregularity and sparseness of mineralization were not encouraging. Includes references to lode occurrences in Colorado Creek area unless specifically to another prospect. See also (Colorado Cr.).

Capps, 1919 (B 692), p. 224-225 -- Explored by surface excavations that have not reached undisturbed bedrock. Center of mineralization appears to be a highly altered dike that probably cuts calcareous sediments; apparently there is a large mass that contains abundant sulfides, including arsenopyrite, pyrite, chalcopyrite, pyrrhotite, and stibnite. No assays available, so gold and silver content are not known.

Capps, 1924 (B 755), p. 134 -- Data from above.

Ross, 1933 (B 849-E), p. 310 -- Example of type of lode formed by replacement along bedding.

p. 327-328 -- Prospect explored by trenches and pits; had been abandoned for several years as of 1931. On hillock of biotite-quartz diorite porphyry that intruded sedimentary beds, in part cherty. Pyrrhotite and pyrite, with some chalcopyrite and arsenopyrite and, in one pit, considerable stibnite. Two samples of stibnite contained a little gold and silver. Irregularity and sparseness of mineralization not encouraging.

Hawley and Clark, 1968 (C 564), p. 1-4 -- In Colorado Cr. area a small stock of hornblende-biotite quartz diorite porphyry is exposed in bottom of canyon of creek about 750 ft. WSW of Silver King; intruded into hornfelsed metasedimentary rocks; contains arsenopyrite, chalcopyrite, gold, and anomalous amounts of Bi, Co, and Sn. A short distance downstream two veins make up the borders of a composite lode in a 10-ft-wide shear zone; one vein (4 ft. wide) contains stibnite and a little gold. Old pits of Silver King prospect expose sulfidized hornfels with veins containing stibnite and locally gold; anomalous Cu and As. One body in area seems to be a breccia pipe similar to that at Golden Zone.

Silver King -- cont.

Hawley and others, 1968 (OF 337), p. 7 -- Stibnite-rich veins occur with gold, arsenic, copper, and trace amounts of other elements; associated with porphyritic dikes.

Hawley and Clark, 1974 (P 758-B), p. B12-B16 -- Vein-disseminated type of epigenetic lode deposit in contact-metamorphosed argillite; disseminated sulfides on fracture surfaces in hornfels adjacent to small porphyry dikes. Minerals reported include arsenopyrite, pyrrhotite, and stibite. Samples of arsenopyrite-rich veins contained as much as 50 ppm Ag, 200 ppm Au, 700 ppm Co, 1,500 ppm Cu, 200 ppm Pb, 500 ppm Sb, 200 ppm Zn, and detectable amounts of other metals; more than 1,000 ppm Bi; more than 10,000 ppm As. A sample of a stibnite-rich vein near Silver King contained 10 ppm Ag, 23 ppm Au, 200 ppm Cu, 300 ppm Pb, 1,500 ppm Zn, more than 10,000 ppm Sb, and 7,000 ppm As.

p. B27-B30 -- In area of hornfels and tactite cut by NE-trending Tertiary quartz diorite porphyry dikes. Tactite developed in Triassic calcareous argillite and hornfels in Triassic or younger (?) altered conglomerate and breccia. Pyrrhotite is principal sulfide; arsenopyrite locally abundant; some stibnite. Analyses of 45 samples showed as much as 70 ppm Ag, 7.3 ppm Au, 10,000 ppm Cu, 1,500 ppm Pb, 500 ppm Zn, and more than 10,000 ppm As and Sb (one sample only; all others 2,000 or less). Bi detected in more than half of samples; more than 300 ppm in only one. Sn in many samples; all 100 ppm or less.

(Timberline Cr.) Gold

Valdez Creek district Healy (20.3, 3.6)
MF-394, loc. 70 63°11'N, 147°27'W

Summary: Does not drain area considered to be very good source of placer gold. Glaciated; any preglacial placers probably removed. Has been a little prospecting; some gold present, but evidently not enough for profitable mining. See also Campbell and Boedeker. Note: Incorrectly shown on MF-394 as at loc. 67.

Moffit, 1911 (B 480), p. 124 -- Preliminary to Moffit, 1912 (B 498).
Moffit, 1912 (B 498), p. 55 -- Creek rises in hills south of Valdez Cr.; bedrock is slates intruded by diorite and related porphyritic rocks. Fair prospects have been found.
p. 65 -- Probably does not cross area postulated to be the source of gold in Rusty and White Creeks. Has been little prospecting for several years (as of 1910).
Smith, 1929 (B 797), p. 17-18 -- Prospecting, 1926.
Tuck, 1938 (B 897-B), p. 128 -- Has been no recent placer mining. Any preglacial auriferous deposits probably did not survive glaciation; any placer deposits are likely to be in lower part of valley and to have formed since deglaciation.

(Trixey Cr.)	Gold
Bonnifield district	Healy(?) N½ quad.(?)

Summary: Placer mining reported, 1937. Location not given; may be in Fairbanks quad.

Smith, 1939 (B 910-A), p. 55 -- Placer mining reported, 1937.

(Valdez Cr.) Gold, Monazite(?), Platinum(?)

Valdez Creek district
MF-394, loc. 70

Healy (19.9-20.35, 3.2-3.7)

63°10'-63°11'N, 147°26'-147°29'W

Summary: Mesozoic metamorphic rocks, mainly argillite, graywacke, and phyllite, cut by granitic intrusive bodies, contain many small auriferous lodes (probably none minable), the source of the gold in placers in area. Gold discovered on creek bars in 1903; mining began in 1904 and has continued to the present. Most of production has been an old channel (Tammany Channel) and benches cut during a Pleistocene interglacial stage and buried by outwash when local base level was raised by advance of glacier down Susitna Valley. New erosion cycle initiated when glacier front retreated; stream cut down below level of old drainage system. Fill in old channel and bench gravels contains gold through entire thickness, with concentration in the bottom of old channel and in top layer of disintegrated bedrock. Gold in bars of present creek largely derived from old channel and bench deposits. Old channel mined by drifting and hydraulicking; all other mining except for smallscale work in present creek by hydraulicking. Production (including that from tributaries) about $7,000,000 (gold at $130 an ounce), or about 53,850 oz. Unconfirmed, report of platinum; monazite questionably identified in concentrates. Includes references to: Carlson and associates, Folk, Tammany (channel), Valdez Creek Placer Mining Company.

Mendenhall, 1905 (P 41), p. 117-118 -- Gold discovered in 1903 and about 100 oz. taken out in 2 weeks.

Brooks, 1908 (B 345), p. 37-38 -- Discovery of rich ground reported, 1907; nugget worth $1,000 reported.

Brooks, 1909 (B 379), p. 52 -- Mining, 1908.

Moffit, 1909 (B 379), p. 159-160 -- Creek has cut through thick bench gravels into underlying schist. Most production from old channel about 60 ft. above present one. Gold in creek gravels probably derived from bench gravels. Production 1903-08 from Valdez and Lucky Creeks estimated at $175,000-$200,000 [about 8,465-9,675 fine oz.].

Brooks, 1910 (B 442), p. 42-43 -- About 100 men mining in area in 1909; production between $50,000 and $75,000. Ground not frozen.

Brooks, 1911 (P 70), p. 167-169 -- Data from Moffit, 1909 (B 379).

Moffit, 1911 (B 480), p. 114-121 -- Preliminary to Moffit, 1912 (B 498).

(Valdez Cr.) -- cont.

Moffit, 1912 (B 498), p. 53-62 -- Gold discovered in creek gravels in 1903 and in old (Tammany) channel in 1904. Production from area (about half from Tammany channel), 1903-10, was about $275,000 [about 13,000 fine oz.]. Gold derived from gold- and sulfide-bearing quartz veins in slate-schist-graywacke terrane of hills south of creek; many small bodies of fine-grained light-colored igneous rock. Gold in creek gravels in lower part of stream course also in part derived from old channel fill. Many large diorite boulders (glacially introduced) in creek gravels, which are generally 5-8 ft. thick. Gold associated with much red garnet (ruby sand) and a little black sand. Tammany channel is an old course of Valdez Cr. about 60 ft. above present stream level that is intersected by present valley. Mined from a tunnel 700 ft. long in 1910; channel filled with about 110 ft. of gravel; no surface expression on top of bench. Most of gold in bottom 5 ft. of gravel, but some distributed through entire thickness. In places gravel mined for width of 70 ft.; generally 25-35 ft.

Brooks, 1913 (B 542), p. 44 -- Mining, 1912. Several formerly active claims were idle.

Brooks, 1914 (B 592), p. 67 -- Hydraulic plant installed, 1913.

Moffit, 1914 (B 592), p. 307-308 -- Monahan tunnel in Tammany channel extended to length of 1,200 ft. since 1910. Claims consolidated under one management and hydraulic plant installed to mine old channel near entrance to Monahan tunnel; plan to install a larger plant in 1914. A little mining of creek claims in 1913.

Brooks, 1915 (B 622), p. 49 -- Large hydraulic plant installed and some sluicing accomplished, 1914.

Brooks, 1916 (B 642), p. 56 -- Mining, 1915.

Smith, 1917 (BMB 153), p. 42-43 -- Mining, 1916.

Brooks, 1918 (B 662), p. 49 -- Mining, 1916.

Martin, 1919 (B 692), p. 22 -- Unconfirmed report of platinum.

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

Brooks, 1922 (B 722), p. 39 -- Plans for reopening large hydraulic operation, which had been idle for several years, 1920. Was other mining.

Brooks, 1923 (B 739), p. 26-27 -- Has been mining since 1903. Hydraulic mine operating in bench gravels, 1921. One other mine in district [many not have been on Valdez Cr.].

Brooks and Capps, 1924 (B 755), p. 32 -- Mining, 1922.

Capps, 1924 (B 755), p. 137 -- Data extracted from Moffit, 1912 (B 498).

Smith, 1929 (B 797), p. 17-18 -- Mining and ditch construction, 1926.

Smith, 1930 (B 810), p. 23 -- Bench claims being mined, 1927; also considerable prospecting.

Smith, 1930 (B 813), p. 26 -- Bench being mined, 1928.

Smith, 1932 (B 824), p. 31 -- Mining, 1929.

(Valdez Cr.) -- cont.

Ross, 1933 (B 849-H), p. 427-428 -- Gold discovered, 1903; serious mining began the next year. Most of placer ground consolidated under one company in 1912. Hydraulic operations, mainly in Tammany Channel, 1913-24. Tammany Channel has previously been drift mined, and was again after 1924 upstream from hydraulic cut. In 1928 hydraulicking began on Folk claim on other side of Valdez Creek below Tammany Channel. Total production through 1930 was about $560,000 [about 27,000 fine oz.].

p. 437 — Heavy-sand concentrates (probably mainly derived from schist) contain much granet, hornblende, magnetite, and pyrite; less abundant zircon and apatite; some staurolite, sillimanite, kyanite, and biotite; and rare epidote, hypersthene, sphene, and probably monazite.

p. 444-453 — Old drainage system (mainly within 5 mi. of present mouth of Valdez Cr.) of streams flowing in narrow, V-shaped channels (e.g., Tammany Channetl) was choked and buried by gravel deposits as a result of a rise in local base level, probably caused by ice or fill of glacial material in neighboring parts of Susitna Valley. Fill all carries some gold, but the richest placers are on bedrock in the channels and elsewhere on the old surface. Last episode in filling was deposition of glacial material near and at present surface. After deglaciation the present stream system, superposed from gravel fill, cut down to its present position, randomly intersecting the old channels. Placers of present stream contain small amounts of gold derived from local bedrock sources and (below old channels) large amounts of gold reconcentrated from older placers. All gold evidently originally derived from small lodes, none of which has proved rich enough to mine. First mining was of creek gravels, but later mining and most of production was from older gravels, particularly those in Tammany Channel. Debris from hydraulicking in Tammany Channel buried any unmined placers downstream. Bench gravels on Folk claim were hydraulicked and yielded about $57,000 [about 2,760 fine oz.], 1928-30 [no data on amount recovered in 1931]. Gravels about the same as and as rich as those in Tammany Channel; not in an old channel. Some small, but rich, deposits on bench both above and below mouth of Timberline Cr. were sluiced out.

Smith, 1933 (B 836), p. 29 -- Mining, 1930.

Smith, 1933 (B 844-A), p. 29-30 -- Mining bench and creek claims, 1931.

Smith, 1934 (B 857-A), p. 28 -- Mining bench and creek claims, 1932.

Smith, 1934 (B 864-A), p. 32 -- Mining bench and creek claims, 1933; mainly hydraulicking.

Smith, 1936 (B 868-A), p. 34 -- Mining 1934.

Smith, 1937 (B 880-A), p. 37 -- Mining 1935.

(Valdez Cr.) -- cont.

Tuck, 1938 (B 897-B), p. 113 -- Gold discovered on bars on creek, 1903, and in buried (Tammany) channel in 1904. Production of district through 1936 was worth $720,000 [not enough data to convert to ounces].

p. 122-127 -- Base level changed several times. Probably were at least two episodes of glaciation; the last may have involved ice backing up from Susitna Valley only. Gold in Tammany Channel may have been reconcentrated from an older drainage than that which cut Tammany Channel itself. Principal source of gold in present stream below Tammany Channel was deposits in channel; upstream from channel creek placers are much leaner. Small bench placers and recent creek deposits were (and are being) mined upstream from Tammany Channel. Most of production has been from Tammany Channel and from a probable extension of it across Valdez Creek and 3,000 ft. downstream from the principal deposit. In 1936 Tammany Channel was being drift mined; ground ran about $2 per bedrock foot; probable extension [Folk claim] was being hydraulicked.

Smith, 1939 (B 910-A), p. 42 -- Drift mining in Tammany Channel and surface mining on supposed extension on other side of creek, 1937. An extremely good season.

Smith, 1939 (B 917-A), p. 40 -- Large-scale drift and hydraulic mining of bench claims (Cora [Joplin] and Folk Benches); small-scale mining farther upstream, 1938. Production greater than year before.

Smith, 1941 (B 926-A), p. 36 -- Mining in 1939 at the same places as in 1938.

Smith, 1942 (B 933-A), p. 36 -- Mining, 1940. Shortage of water reduced amount of production.

Kaufman, 1964 (GR 4), p. 5 -- Placer production from Valdez Creek district [meaning immediate vicinity of Valdez Cr.] has been more than $500,000. References to Moffit, 1912 (B 498) and Ross, 1933 (B 849-H).

Koschmann and Bergendahl, 1968 (P 610), p. 12 -- Data from Ross, 1933 (B 849-H) and Tuck, 1938 (B 897-B).

Smith, 1970 (P 700-D), p. D146-D152 -- Bedrock is [Mesozoic] metamorphic rocks that grade northward from argillite and graywackes to phyllites. Bedding and foliation, compicated by small folds and many faults, dip gently northward. Bench gravels include alluvium on bedrock bench adjacent to Valdez Cr. and deposits in old channels deeply incised into bench. Early mining mainly in Tammany channel and near down stream extension on Dry Creek cut. Gold distributed throughout gravels; concentrated in old channel, particularly in top thin layer of decomposed bedrock. All components of gravel derived from Valdez Cr. drainage basin. Old stream cut down to level of bottom of old channel (possibly during an early Pleistocene

(Valdez Cr.) cont.

interglacial stage), then aggraded when local base level was raised, probably by advance of glacier down Susitna Valley, depositing fluvial gravels in old channel and on benches. Gravel probably was part of a proglacial outwash plain or valley train below terminus of Valdez Cr. glacier. Rapid advance and retreat of Valdez Cr. glacier mantled aggraded surface with thin (generally less than 10 ft) ground moraine. As Susitna glacier retreated, Valdez Creek rapidly cut down to present position (about 20 ft. below old drainage). Bench gravels (exclusive of old channel fills) are generally 45-75 ft. thick (determined by exposures, drill holes, and seismic survey). Total volume of unmined old channel and bench gravels is probably at least 35,000,000 yds^3 with at least $0.50 worth of gold [0.0143 oz.] per yd^3 or a resource value of more than $17,000,000 with gold at $35 an oz. [somewhat less than half a million oz.]. Gold content of gravel mined from old channel was about $1.10 per yd^3 (gold at $35) and from bench gravels was about $1.20 per yd^3. Data from drill-hole sampling and from panning a vertical channel sample of about 16 yd^3 show average contents, respectively, of $1.27 and $0.50 per yd^3.

Cobb, 1974 (B 1374), p. 18 -- Gold locally derived. Data from Smith, 1970 (P 700-D), p. D146-D152, summarized. Most mining was by drifting in old channels and by hydraulicking.

MacKevett and Holloway, 1977 (OF 77-169A), p. 24 -- Production in excess of $7,000,000 [gold at $130 per oz.]; large potential resources. Gold mainly in bedrock pockets, buried channels, and bench gravels. In terrane of metamorphosed Mesozoic rocks cut by local granitic plutons.

Wagner and associates	Gold
Valdez Creek district	Healy (21.9, 3.75)
MF-394, loc. 51	63°10'N, 147°14'W

Summary: Country rock mainly argillite intruded by two small bodies of igneous rock of intermediate composition. Prosepct at intersection of two major faults; shearing and movement both before and after intrusion. Auriferous quartz veins in larger intrusive body; as much as 86 ppm gold in samples from smaller. Explored by about 220 ft. of underground workings, mainly in smaller body and between it and larger body. No data on possible production. Includes reference to (Black Cr.).

Tuck, 1938 (B 897-B), p. 120-121 -- Claims staked in 1936 on small knoll where large quartz boulders carry free gold. Bedrock source not certainly found. Some small gold-bearing veinlets in tuff bedrock.

Smith, 1970 (OF 441), p. 45-47, 50-51 -- Country rock at prospect mainly argillite; some metagraywacke nearby; intruded by two small bodies of altered intrusive rock of intermediate composition. At intersection of two major faults. Rocks highly sheared before emplacement of intrusives; further fault movement after emplacement. Pyrite, pyrrhotite, and their alteration products ubiquitous. Auriferous quartz veins in larger intrusive body; gold values as high as 86 ppm in smaller body. Explored by adit and short drifts [total length about 220 ft.; scaled from fig. 22] that crosscut smaller body, but did not reach larger body.

(West Fork Glacier)	Copper, Zinc
Valdez Creek district	Healy (19.15, 8.5) 63°28'N, 147°36'W

Summary: Chalcopyrite and sphalerite disseminated in Paleozoic metamorphic rocks; submarine volcanogenic deposit. No other data.

MacKevett and Holloway, 1977 (OF 77-169A), p. 25, loc. 91 -- Chalcopyrite and sphalerite disseminated in Paleozoic metamorphic rocks; submarine volcanogenic type of deposit. No other data.

(White Cr.) Copper, Gold, Lead, Silver

Valdez Creek district Healy (21.3S, 3.7)
MF-394, loc. 72 63°11'N, 147°18'W

Summary: Stream drains area underlain mainly by slate intruded by at least one basic dike and containing many quartz lenses and veins that were probable source of the gold in the stream and bench placers; some gold may have been reconcentrated from glacial deposits. Heavy minerals in concentrates include gold, hessite (a silver telluride), pyrite, galena, arsenopyrite, magnetite, pyrrhotite, realgar, orpiment, and native copper. Gold distributed through creek gravels and slide rock that chokes creek; both run about 30¢ a cubic yard. Mining, all fairly small scale, from as early as 1924 to as recently as 1940. See also (Rusty Cr.)

Moffit, 1911 (B 480), p. 119, 123 -- Preliminary to Moffit, 1912 (B 498).
Moffit, 1912 (B 498), p. 55, 64-65 -- Creek has promise; gold present; most work in basin has been on Rusty Cr., a tributary. Drains mineralized area that was probably source of gold in Valdez Cr.
Brooks, 1918 (B 662), p. 49 -- Systematic prospecting, 1916.
Capps, 1924 (B 755), p. 137 -- Data from Moffit, 1912 (B 498).
Smith, 1926 (B 783), p. 12 -- One claim being mined, 1924.
Smith, 1929 (B 797), p. 17-18 -- Mining and(or) development, 1926.
Ross, 1933 (B 849-H), p. 453-454 -- Mining in basin since 1908; mining in 1931 was about 1-1/2 mi. above mouth, where bedrock is slate intruded by an irregular basic dike a few feet wide. Quartz lenses exposed in placer cut and farther upstream; these and similar veins were the probable source of the placer gold. Total production from White and Rusty Creeks was about $10,000 [about 485 fine oz.]. Concentrates contain gold, hessite [a silver telluride], pyrite, galena, arsenopyrite, magnetite, pyrrhotite, realgar, orpiment, and native copper.

p. 457-458 -- Veins contain calcite. Gold coarse; must have been locally derived. Hessite abundant in panningsj has not been recognized in bedrock exposures.

Smith, 1933 (B 844-A), p. 30 -- Mining, 1931.
Smith, 1934 (B 857-A), p. 28 -- Mining, 1932.
Smith, 1934 (B 864-A), p. 32 -- Mining, 1933.
Smith, 1936 (B 868-A), p. 34 -- Hydraulicking bench gravels, 1934.
Tuck, 1938 (B 897-B), p. 124-125 -- Gold-bearing gravels are postglacial. Gold probably derived both from glacial deposits and from bedrock sources on Gold Hill.

p. 128-129 — Mining for many years 1.5 mi. above mouth in bench gravel along right limit; gravel more than 15 ft. deep and largely slate covered by and mixed with slate slide rock. Gold is rough, many pieces with adhering quartz. Hessite (silver telluride) fairly common in concentrates. Gold throughout both gravel and slide rock; both run about 30¢ per yard^3. In most of mining bedrock was not reached. Much of gold has come from Gold Hill (east and southeast of creek).

(White Cr.) -- Continued

Smith, 1939 (B 910-A), p. 42 -- Mining, 1937.
Smith, 1939 (B 917-A), p. 40 -- Mining, 1938.
Smith, 1941 (B 926-A), p. 36 -- Mining, 1939.
Smith, 1942 (B 933-A), p. 36 -- Mining, 1940.
Cobb, 1973 (B 1374), p. 18 -- Has been intermittent mining in stream and bench gravels.

(Wickersham Cr.) Gold

Valdez Creek district Healy (18.3, 2.2) approx.
MF-394, loc. 69 63°07'N, 147°41'W approx.

Summary: A little placer gold was found in 1903; attempt to mine it was not successful.

Moffit, 1912 (B 498), p. 54 -- Gold found in 1903, but not in sufficient quantity to satisfy prospectors.
Moffit, 1914 (B 592), p. 305 -- Placer gold present.
Moffit, 1915 (B 608), p. 76 -- Placer gold present; attempt to mine it was not successful [date of attempt not given].
Cobb, 1973 (B 1374), p. 18 -- Small amount of gold has been found.

(Windy Cr.) Copper

Valdez Creek district Healy (20.3-22.65, 1.9-2.6)
MF-394, locs. 42-44, 46-49 63°05'-63°07'N, 147°09'-147°27'W

Summary: Copper minerals, mainly chalcopyrite, bornite, and malachite, in Nikolai Greenstone (probably) and in float derived from it. Little lateral continuity to exposures. Very little exploratory work. See also: Greathouse, (Pass Cr.).

Saunders, 1961, p. 38 -- Veins, some carrying quartz, chalcopyrite, and bornite and some carrying bornite and malachite, have been found; also copper-bearing float. Thickest vein found is 3 ft. wide; exposed in a trench. Another vein is 30 in. thick, but tapers abruptly in both directions along strike.

Kaufman, 1964 (GR 4), p. 5-6 -- Several occurrences of copper in altered basaltic and andesitic volcanic rocks in place and in float. [Volcanic rocks probably Nikolai Greenstone.]

Yellowhorn	Gold, Lead, Silver
Valdez Creek district	Healy (21.6, 3.8)
MF-394, loc. 53	63°11'N, 147°16'W

Summary: Mineralized zone parallel to schistosity of country rock contains 1-3 ft. of schist with quartz lenses and veinlets and an overlying quartz vein as much as 1 ft. thick; all weathered. Mineralized zone carries a little pyrite, galena, and small particles of free gold; weathered material pans well, but channel samples contain no more than 0.04 oz. a ton gold and 0.1 oz. a ton silver. Has been a little exploration, but no recorded production.

Moffit, 1912 (B 598), p. 56 -- Small open cut in talus material was partly filled with slump material when visited in 1910. Fine gold panned from material on dump.

Tuck, 1938 (B 897-B), p. 118-119 -- Discovered in 1906 and restaked at least twice since then. Work consisted of some surface excavation, a short tunnel, and a 60-ft. tunnel that is so low that it cannot hit the lode. Lode consists of 1-3 ft. of schist mineralized with quartz veinlets and lenses and an overlying quartz vein as much as a foot thick. Mineralized zone parallel to schistosity of country rock; strike N 75° W, dip 18° N; carries a little pyrite, galena, and small particles of gold (visible only with hand lens). All material exposed is weathered. Weathered material pans well, but channel samples contained no more than 0.04 oz. a ton gold and 0.1 oz. a ton silver. At several other places in neighborhood weathered material pans a little gold.

Smith, 1939 (B 910-A), p. 30-31 -- Some work in 1937; report that a small testing mill was set up; little if any gold produced.

Unnamed occurrence	Antimony, Zinc
Bonnifield district	Healy (7.4, 8.25) 63°28'N, 149°04'W

Summary: Veinlets of stibnite, sphalerite, and pyrite from 0.2 to 1 inch thick cut silicified and pyritized sedimentary rock of Permian or Pennsylvanian(?) age. May be related to a quartz diorite stock or to an unexposed felsic intrusive.

Hickman and Craddock, 1976 (SR 13), p. 3-4 (loc. 3) -- Small area of silicified and pyritized sedimentary rocks (Permian or Pennsylvanian(?) in age) are cut by a few veinlets of stibnite, sphalerite, and pyrite 0.2 to 1 in. thick; mineralization may be related to a quartz diorite stock to west or to an unexposed felsic intrusive.

Unnamed occurrence	Chromite, Nickel, Platinum
Valdez Creek district Fig. 2, loc. 22	Healy (1.95, 2.25) 63°08'N, 149°45'W

Summary: Talus blocks of massive chromite in area underlain by serpentinite locally altered to quartz-carbonate rock; sample contained 39.5% Cr_2O_3 (chrome-iron ratio of 3.1:1) and trace of platinum-group metals, mainly rhodium. Some garnierite stain.

Hawley and others, 1969 (C 617), p. 4-6 8 (sample 10) — Massive chromite associated with serpentinite that locally is altered to quartz-carbonate rock containing disseminated pyrite and stained with garnierite; chromite not exposed in place, talus blocks as much as a foot across. A sample estimated to be more than 95% chromite contained 39.5% Cr_2O_3; chrome-iron ratio of 3.1:1; contains a trace of platinum-group metals, principally rhodium (0.019 ppm Rh), and 1,000 ppm Ni.

Hawley and Clark, 1974 (P 758-B), p. B8 -- Talus blocks of chromite as much as a foot across contained 39.5% Cr_2O_3.

p. B15 -- Chromite strongly sheared; in polished section lensoidal masses as much as 2 in. long seen to be enclosed in a matrix of crushed chromite-rich material.

Unnamed occurrence	Cobalt, Copper
Bonnifield district	Healy (6.7, 8.2) 63°28'N, 149°09'W

Summary: Isolated small masses of pyrrhotite and minor chalcopyrite in skarn zone 3-9 ft. thick between quartz diorite stock and Devonian limestone and argillite. Some staining by limonite, malachite and erythrite.

Hickman and Craddock, 1976 (SR 13), p. 1, 3-4 (loc. 1) -- Skarn zone 3-9 ft. wide along contact between small quartz diorite stock and Devonian limestone and argillite. Discontinuous 1-3 ft. zones of pyrrhotite and minor chalcopyrite in isolated masses along fractures. Local limonite, malachite, and erythrite staining.

Unnamed occurrence	Copper
Valdez Creek district	Healy (17.85, 2.05) 63°06'N, 147°45'W

Summary: Chalcopyrite in sample of albite porphyry.

Smith and others, 1975 (AOF-69), loc. 8 -- Sample of albite porphyry contained chalcopyrite.

Unnamed occurrence	Copper
Valdez Creek district	Healy (18.25, 2.25) 63°07'N, 147°42'W

Summary: Chalcopyrite in sample from altered intrusive; no other data.

Smith and others, 1975 (AOF-69), loc. 13 -- Sample of altered intrusive contained chalcopyrite.

Unnamed occurrence	Copper
Bonnifield district	Healy (9.6, 9.0) 63°30'N, 148°47'W

Summary: Small amounts of bornite and dignite in small grains in Permian or Pennsylvanian greenstone.

Hickman and Craddock, 1976 (SR 13), p. 1, 4 (loc. 5) -- Small exposure of Permian or Pennsylvanian greenstone (altered basalt or andesite). Bornite and digenite in intergrown grains as much as 0.2 in. in size make up probably less than 1% of rock.

Unnamed occurrence	Copper
Bonnifield district	Healy (18.2, 12.4) 63°41'N, 147°40'W

Summary: Visible chalcopyrite in sulfide-bearing metasediments and(or) gabbro. No other data.

Sherwood and others, 1976 (SR 14), p. 7, 11 (loc. 22) -- "Sulfide-bearing metasediments, gabbro; chalcopyrite visible."

Unnamed occurrence	Copper, Gold
Bonnifield district	Healy (17.7, 12.7) 63°43'N, 147°44'W

Summary: 0.5 ppm gold in sample from hydrothermal zone. Malachite along fractures and foliation of metamorphic rocks.

Sherwood and others, 1976 (SR 14), p. 4, 7, 11 (loc. 16) -- Sample of stained hydrothermal zone contained 0.5 ppm gold. Malachite along fractures and foliation of metamorphic rocks.

Unnamed occurrence	Copper, Gold
Bonnifield district	Healy (18.9, 13.3) 63°44'N, 147°34'W

Summary: Malachite in fractures in sedimentary rocks near gossan on gabbro. Sample contained 1.0 ppm gold [source of sample may have been either gossan or sedimentary rock; no data].

Sherwood and others, 1976 (SR 14), p. 5, 11 (loc. 5) -- "Heavy gossan stain in gabbro; malachite in fractures of sediments." Sample contained 1 ppm gold.

Unnamed occurrence	Copper, Gold, Platinum
Valdez Creek district	Healy (1.15, 1.2)
Fig. 2, loc. 25	63°04'N, 149°51'W

Summary: Along a fault zone sheared serpentinite and malachite-stained basalt contain pyrite and chalcopyrite and as much as 0.06 ppm gold; traces of platinum-group metals.

Hawley and others, 1969 (C 617), p. 4-6 (sample 7) -- Sheared serpentinite and malachite-stained basalt along a fault zone. Samples contain traces of platinum-group metals and as much as 0.06 ppm Au, 1,500 ppm Cr, 7,000 ppm Cu, and 1,000 ppm Ni.

Hawley and Clark, 1974 (P 758-B), p. B45-B46 (sample 36-C) — Pyrite and chalcopyrite in serpentinite. As much as 0.06 ppm Au and 7,000 ppm Cu.

Unnamed occurrence	Copper(?), Gold, Platinum
Valdez Creek district	Healy (2.45, 3.2)
Fig. 2, loc. 16	63°11'N, 149°41'W

Summary: Sheared serpentinite contains traces of platinum-group metals and iron and(or) copper sulfides; 3,000 ppm Cu, so it seems likely that chalcopyrite is present. 0.3 ppm gold.

Hawley and others, 1969 (C 617), p. 4-6 (samples 12, 13) -- Sheared serpentinite locally contains as much as 20% pyrite. Sample contains traces of platinum-group metals and as much as 3,000 ppm Cu and 0.3 ppm Au.

Hawley and Clark, 1974 (P 758-B), p. B45-B46 (sample 35), Pyrite or chalcopyrite in serpentinite. 3,000 ppm Cu and 0.3 ppm Au.

Unnamed occurrence	Copper, Gold, Silver, Zinc
Valdez Creek district Fig. 2, loc. 17	Healy (16.5, 2.95) 63°10'N, 149°48'W

Summary: Sample of hornfels from area underlain by basalt and limestone and intruded by a small diorite body contained pyrrhotite, chalcopyrite, and sphalerite; total sulfides less than 2% of sample. Small amounts of gold and silver also present.

Hawley and others, 1969 (C 617), p. 8 -- Sulfide occurrences.

p. 11-12 -- Country rock is basalt and limestone intruded by a small diorite body. Sample of hornfels contained less than 2% total sulfides (pyrrhotite, chalcopyrite, sphalerite). This and other samples collected from a small area contained as much as 0.9 ppm gold and 3 ppm silver; one sample contained considerable Sb [no antimony mineral reported].

Hawley and Clark, 1974 (P 758-B), p. B44-B45 -- Same analytical data as above, but with no data on mineralogy.

Unnamed occurrence	Gold
Bonnifield district	Healy (20.1, 12.6) 63°42'N, 147°25'W

Summary: A little (0.2-0.5 ppm) gold in samples from a gossan near a gabbro sill. No other data.

Sherwood and others, 1976 (SR 14), p. 7, 11 (loc. 10) -- 0.2-0.5 ppm gold in samples from a gossan near a gabbro sill.

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.

Alaska Central Mining & Exploration Co. -- see (White Cr.)
American Smelting & Refining Co. -- see Golden Zone
Anaconda Copper Co. -- see Golden Zone
(Antimony Cr.) -- see North Carolina
Babel and associates -- see (Lucky Gulch)

Babel & McDonald — see (Lucky Gulch)
Babel, McDonald, Johnson & Johnson -- see Lucky Top
Banner -- see Riverside
Beckstrom -- see (Cantwell Cr.)
Beckwith -- see Golden Zone

(Black Cr.) -- see Wagner and associates
BOB -- see Golden Zone
Boedeker & MacGahn -- see Yellowhorn
Boedeker & McGahan -- see Yellowhorn
Bucke -- see (Valdez Cr.)

Caribou -- see (Partin Cr.)
Carlson and associates -- see (Valdez Cr.)
Carlson, Fairfield & Ohman -- see (Valdez Cr.)
Cemco -- see Golden Zone
Coffee, Wells & Wells — see (Bryn Mawr Cr.)

Coffield and associates — see Wagner and associates
Coffield, Duff & Olsen — see American Exploration & Mining Co.
Combination — see (Partin Cr.)
Cora -- see (Valdez Cr.)
Denali — see Alaska Exploration & Mining Co., (Pass Cr.)

Dunkle -- see Golden Zone
East Vein -- see Golden Zone
Fairfield and associates — see (Valdez Cr.)
Fairfield & Ohman -- see (Valdez Cr.)
Folk -- see (Valdez Cr.)

Frates -- see Yellowhorn
Giske -- see (Portage Cr.)
Golden Zone Extension -- see Golden Zone
(Gold Hill) -- see Accident, Yellowhorn
Greene -- see Golden Zone

Hector -- see Copper King
Hill Top -- see Lindfors
Holt -- see (Grizzly Cr.)
(Home Cr.) -- see (Gagnon Cr.)
Jerome -- see (Chute Cr.)

Joplin -- see (Valdez Cr.)
Kirk, M. P., & Sons, Inc. -- see (Cody Cr.)
Little Vein -- see Golden Zone
Lucky Strike -- see Lindfors
Lucrative -- see Lucrata

Madson & Maurer -- see North Carolina
Mayflower -- see Golden Zone
McCallie -- see Ready Cash
McKinley Gold Placers Co. — see (Valdez Cr.)
McKinley Placer Mining Co. -- see (Valdez Cr.)

Monahan — see (Valdez Cr.)
Moneta-Porcupine Mines Ltd. -- see (Pass Cr.)
(Moon Cr.) -- see (French Gulch)
Morning Glory -- see Lindfors
Muir -- see (Marguerite Cr.)

Nicola -- see (Valdez Cr.)
Northern Light -- see Eagle
Pardners' Mines -- see Golden Zone
Partin -- see (Partin Cr.)
(Platte Cr.) -- see (Homestake Cr.)

Powless -- see Alaska Exploration & Mining Co.
Ridge Claim -- see (Kansas Cr.)
Ringstad -- see Copper King
Rogers -- see (Chute Cr.)
Smith & Wickersham -- see Yellowhorn

Sparks -- see (Kansas Cr.), North Carolina
Stevens -- see Golden Zone
Stevens & Colvin -- see Liberty
Stibnite -- see Silver King
Tammany (Channel) -- see (Valdez Cr.)

Tammy -- see (Valdez Cr.)
Tangel, Frisley, Murry & Miller -- see Ready Cash
Tennessee Corp. -- see (Pass Cr.)
Timberline -- see Alaska Exploration & Mining Co., Campbell & Boedeker
Tommy -- see (Valdez Cr.)

Tunnell Mining Co. -- see (Valdez Cr.)
Valdez Creek Placer Mines Co. -- see (Valdez Cr.)
Valdez Creek Placer Mining Co. -- see (Valdez Cr.)
Wells -- see Golden Zone, Riverside
Wells Bros. -- see Golden Zone

Wickersham Bros. -- see (Lucky Gulch), (White Cr.)

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