



Alaska Resource Data File, Taylor Mountains quadrangle, Alaska

By Travis Hudson ¹

Open-File Report 01-200

2001

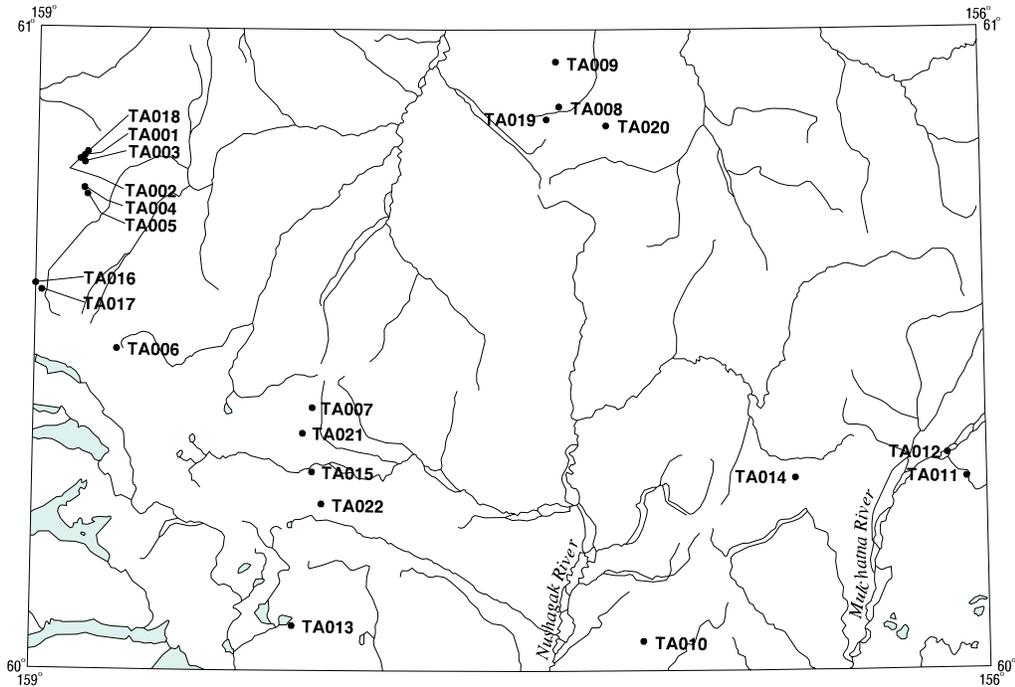
This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with the North American Stratigraphic Code. Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

¹ Sequim, Washington

Taylor Mountains quadrangle

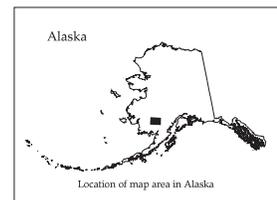
Descriptions of the mineral occurrences shown on the accompanying figure follow. See U.S. Geological Survey (1996) for a description of the information content of each field in the records. The data presented here are maintained as part of a statewide database on mines, prospects and mineral occurrences throughout Alaska.



*Distribution of mineral occurrences in the Taylor Mountains
1:250,000-scale quadrangle, Alaska*

This and related reports are accessible through the USGS World Wide Web site <http://ardf.wr.usgs.gov>. Comments or information regarding corrections or missing data, or requests for digital retrievals should be directed to: Frederic Wilson, USGS, 4200 University Dr., Anchorage, AK 99508-4667, e-mail fwilson@usgs.gov, telephone (907) 786-7448. This compilation is authored by:

Travis Hudson
Sequim, WA



This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with the North American Stratigraphic code. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Site name(s): Cinnabar Creek lode**Site type:** Mine**ARDF no.:** TA001**Latitude:** 60.800**Quadrangle:** TA D-8**Longitude:** 158.851**Location description and accuracy:**

The Cinnabar Creek lode mine is located at the head of Cinnabar Gulch (TA002), a north headwater tributary of Cinnabar Creek. The mine is at an elevation of about 1,350 feet in the NW1/4 of section 12, T 8 N, R 55 W, of the Seward Meridian. It is 0.75 mile north-northeast of the north end of the Cinnabar Creek airstrip. The site is accurately located. It is included locality 1 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Hg, Sb**Other:** Au**Ore minerals:** Cinnabar, gold, mercury, pyrite, stibnite**Gangue minerals:** Dickite, dolomite, limonite, quartz**Geologic description:**

The Cinnabar Creek lode mercury deposit was discovered by following up the headwater source of the Cinnabar Creek placer deposit (TA002). Although initial headwater exploration, including 390 feet of U. S. Bureau of Mines dozer trenching, was unsuccessful in discovering lode deposits, the potential of an upslope area underlain by mineralized mafic intrusive rock was noted (Rutledge, 1950, p. 9; Cady and others, 1955, p. 115). By 1955, lode cinnabar mineralization had been delineated along or near this mafic intrusive. Between 1955 and 1959, an open pit 160 feet long and 20 to 40 feet wide was excavated for selective mining of high-grade ore averaging 3 to 4 percent mercury (Sainsbury and MacKevett, 1965, p. 38).

Mapping of bedrock geology in the open pit shows that a branching mafic dike about 5-foot wide intrudes altered and sheared Triassic graywacke and siltstone (Sainsbury and MacKevett, 1965, Plate 4). Bedding in the pit strikes northwest and dips steeply west. Northwest-trending faults subparallel to bedding and to the contact of the mafic intrusive body shear the bedded rocks to the west and possibly hanging wall side of the mafic intrusive. The sheared zone is a few feet to 8 feet wide and over 200 feet long as exposed in the open pit. Striations on fault planes plunge 22 degrees northwest suggesting a significant component of lateral displacement. The mafic dike has been traced 1,000 feet to the

northwest in surface pits and trenches. It is locally extensively altered and associated with quartz veining and stibnite mineralization along its northwest extensions, but alteration and mineralization appear strongest in the vicinity of the open pit.

Mineralization includes irregular cinnabar and stibnite veinlets in graywacke, siltstone, and locally in the mafic dike. Cinnabar and native mercury accompany quartz along fault zones and in brecciated siltstone and graywacke. Some cinnabar is colloiddally dispersed through cryptocrystalline quartz and disseminated through altered rocks. Cinnabar, stibnite, and some pyrite fill fractures in quartz and locally replace quartz and graywacke. Clay minerals including dickite, replace breccia fragments and in places are replaced by cinnabar. The graywacke, siltstone, and mafic dike are altered. The graywacke and siltstone are iron-stained, sheared, and argillized. The mafic dike is locally extensively replaced by combinations of clay (including dickite), quartz, dolomite or ankeritic dolomite, and some pyrite, and is cut by limonite veinlets.

Selected high-grade ore averaging 3 to 4 percent mercury was recovered from the open pit and transported along a dozer trail to a small retort on Cinnabar Creek during the 1955 to 1960 mining operations. This period of operations produced several hundred flasks of mercury (Sainsbury and MacKevett, 1965, p. 35). A sample of ore from the Cinnabar Creek lode containing 6.53 percent Hg also contained 0.14 ppm Au and greater than 10,000 ppm Sb (Hawley and others, 1969).

Alteration:

Silicification, argillization, oxidation and iron-staining.

Age of mineralization:

Cretaceous or Tertiary. Inferred to be similar in age to other mercury deposits of southwest Alaska that postdate deposition of mid-Cretaceous clastic sedimentary rocks and intrusion of Upper Cretaceous or Tertiary igneous rocks.

Deposit model:

Cinnabar and native mercury in veins, breccia, and replacements (Hot-spring Hg ?; Cox and Singer, 1986; model 27a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

27a?

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:

The Cinnabar Creek mine was explored by surface pits and trenches in the 1950s and by at least some diamond drilling in 1961 (Sainsbury and MacKevett, 1965, p. 35). A dozer trail connects the mine with a retort, airstrip and other facilities less than a mile to the southwest along Cinnabar Creek. Additional surface examination, mapping, sampling, and trenching was completed in 1986-87. Clark and others (1971 [OF 458]) reported results of a reconnaissance stream sediment survey in the Taylor Mountains D-8 quadrangle.

gle. This survey included data on mercury, and replicate analyses confirmed anomalous Hg concentrations in several areas; no samples were collected in the Cinnabar Creek drainage.

Production notes:

Production from 1955-60 amounted to several hundred flasks of mercury (Sainsbury and MacKevett, 1965, p. 35).

Reserves:**Additional comments:****References:**

Rutledge, 1950; Cady and others, 1955; Sainsbury and MacKevett, 1965; Hawley and others, 1969; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606); Clark and others, 1971 (OF 458).

Primary reference: Sainsbury and MacKevett, 1965

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Cinnabar Creek placer**Site type:** Prospect**ARDF no.:** TA002**Latitude:** 60.795**Quadrangle:** TA D-8**Longitude:** 158.864**Location description and accuracy:**

This placer cinnabar prospect is located in a northeast headwater tributary of Cinnabar Creek locally called Cinnabar Run and Cinnabar Gulch. The placer is about 1 mile long from its origin as a residual deposit over the Cinnabar Creek lode deposit (TA001) at the head of Cinnabar Gulch. The map site is the approximate midpoint of the placer on Cinnabar Run, in the SW1/4 of section 12, T 8 N, R 55 W, of the Seward Meridian. It is 0.5 mile north-northeast of the north end of the Cinnabar Creek airstrip. This prospect is accurately located. It is locality 9 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Hg**Other:** Sb**Ore minerals:** Cinnabar, stibnite**Gangue minerals:** Quartz**Geologic description:**

Russell Schaeffer and Harvey Winchell found this placer cinnabar deposit in 1941, the year they staked placer claims on Cinnabar Creek, Cinnabar Run, and Cinnabar Gulch (Rutledge, 1950, p. 3). The deposit was subsequently explored by dozer cuts in its upper part and by many test pits. The alluvium in the drainage is only about 100 to 150 feet wide, and in places the paystreak is only about 25 feet wide. The paystreak is at least 3,100 feet long. It is covered by up to 18 feet of colluvium/alluvium in Cinnabar Gulch and by about 7 feet of alluvial gravel along Cinnabar Run and Cinnabar Creek. Although Cady and others (1955) reported that the paystreak was only about 2 to 6 inches thick, test pits indicate that the minable section commonly is 5 feet thick and in the upstream part of the deposit, up to 14 feet thick (Rutledge, 1950, fig. 7). The placer contains many coarse nuggets to fist size of finely crystalline cinnabar, and many nuggets of cinnabar intergrown with quartz, stibnite, and breccia fragments of siltstone. The nuggets are angular in Cinnabar Gulch and well-rounded downstream along Cinnabar Run. Data from 14 test pits, mostly along Cinnabar Run, show that the paystreak is continuous, although locally narrow, and contains 0.21 to 0.84 percent Hg over mining sections varying from 5 to 14

feet thick (Rutledge, 1950, fig. 7). A few nuggets were obtained from a remnant bench placer deposit 40 feet above the Cinnabar Run flood plain.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Alluvial placer cinnabar

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: Undetermined.

Site Status: Undetermined

Workings/exploration:

Many test pits and some dozer trenches, including one 390 feet long and up to 18 feet deep excavated by the U. S. Bureau of Mines, have explored this placer deposit.

Production notes:

Production from this placer deposit has not been reported; it is not clear if mining has taken place (Sainsbury and MacKevett, 1965, p. 42).

Reserves:

It is possible that much of this deposit is still in place. If the deposit is 4,000 feet long, 25 feet wide, 5 feet thick, and averages 0.4 pounds of Hg per cubic yard, then the contained resource is about 2,200 pounds of mercury.

Additional comments:

References:

Rutledge, 1950; Cady and others, 1955; Sainsbury and MacKevett, 1965; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Rutledge, 1950

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Schaeffer**Site type:** Prospect**ARDF no.:** TA003**Latitude:** 60.79**Quadrangle:** TA D8**Longitude:** 158.85**Location description and accuracy:**

The Schaeffer prospect is located on the ridge north of Cinnabar Creek (TA002). The map site is at an elevation of about 1,550 feet, in the NE1/4 of section 13, T 8 N, R 55 W, of the Seward Meridian. It is 0.8 mile southeast of Cinnabar Gulch (TA001). This is locality 2 of Cobb 1972 [MF 384]; 1976 [OF 76-606].

Commodities:**Main:** Hg**Other:** Sb**Ore minerals:** Cinnabar, marcasite (?), pyrite (?), stibnite**Gangue minerals:** Limonite, quartz**Geologic description:**

This prospect was discovered by Russell Schaeffer in 1958 and subsequently explored by a few shallow, hand-dug (?) trenches (Sainsbury and MacKevett, 1965, p. 40). The deposit is cinnabar- and stibnite-bearing, quartz-cemented breccia of Triassic chert and siltstone. The breccia is irregular in thickness and trends N 20 W, parallel to bedding in the host rocks. Cinnabar and stibnite are irregularly disseminated in the breccia and locally replace quartz and breccia fragments; the owner reported to Sainsbury that fossils replaced by cinnabar had been found at this prospect. The richest ore contains 1 to 2 percent cinnabar. The breccia is limonite-stained, but pyrite and/or marcasite has only been observed in the altered siltstone.

Alteration:

Silicification and limonite-staining.

Age of mineralization:

Cretaceous or Tertiary. Inferred to be similar in age to other mercury deposits of southwest Alaska that postdate deposition of mid-Cretaceous clastic sedimentary rocks and intrusion of Upper Cretaceous or Tertiary igneous rocks.

Deposit model:

Cinnabar and stibnite disseminated in quartz-cemented breccia (Hot-spring Hg ?; Cox and Singer, 1986; model 27a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

27a?

Production Status: None

Site Status: Undetermined

Workings/exploration:

A few shallow trenches were dug on this prospect.

Production notes:

Reserves:

Additional comments:

References:

Sainsbury and MacKevett, 1965; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Sainsbury and MacKevett, 1965

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Lucky Day**Site type:** Mine**ARDF no.:** TA004**Latitude:** 60.75**Quadrangle:** TA C-8**Longitude:** 158.85**Location description and accuracy:**

The Lucky Day mine is on the divide between the headwaters of locally named Canary Gulch and Cinnabar Creek (TA002), a west tributary to Beaver Creek. The map site is at an elevation of about 1,850 feet, near the west end of the boundary between sections 25 and 36, T 8 N, R 55 W, of the Seward Meridian. The mine is 1.5 miles west of the north end of the Beaver Creek airstrip. It is locality 3 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Hg, Sb**Other:****Ore minerals:** Cinnabar, mercury, pyrite, stibnite**Gangue minerals:** Carbonate, dickite, limonite, quartz**Geologic description:**

The Lucky Day mine area includes cinnabar- and stibnite-bearing deposits along the west side of upper Canary Gulch and at the divide between Canary Gulch and Cinnabar Creek (Rutledge, 1950). During WWII, 3,600 pounds of cinnabar-rich materials recovered from residual colluvial deposits at the head of Canary Gulch yielded 26 flasks of mercury (Rutledge, 1950, p. 4; Cady and others, 1955, p. 114). The lode deposits are in sedimentary and igneous rocks inferred to be part of a Paleozoic and Mesozoic sedimentary and volcanic sequence; several Triassic fossil localities are in the Cinnabar Creek area about 3 miles north of the Lucky Day mine (Sainsbury and MacKevett, 1965).

The Lucky Day mine area has been explored by many surface pits, dozer trenches, and shallow shafts (Rutledge, 1950; Cady, 1955). In the 50-foot wide and 350-foot long mineralized zone along the west side of upper Canary Gulch, cinnabar, quartz, and stibnite form thin and sparse films along bedding plane faults, fractures, and joints, and occur as fillings between graywacke and shale fragments in breccia; some native mercury is also present (Rutledge, 1950). Three samples of the highest grade material in this zone respectively contained 0.31, 0.18 and 0.07 percent Hg and 0.16, 0.19, and 0.15 percent Sb (Rutledge, 1950, p. 6). Seven samples collected from this zone by the owners contained

a trace to 0.10 percent Hg (Rutledge, 1950, p. 6).

Mineralization on the divide between Canary Gulch and Cinnabar Creek is localized along and near the faulted contact of an altered, approximately 10-foot wide mafic dike or sill. The mafic intrusive body is almost parallel to bedding in the enclosing graywacke and siltstone, which strikes N 5-10 W and dips moderately west (Sainsbury and MacKevett, 1965). The mineralized zone is along the west contact of the mafic intrusive; it is about 900 feet long, 50 feet wide, and exposed over a vertical distance of about 130 feet (Rutledge, 1950; Cady and others, 1955; Sainsbury and MacKevett, 1965). High-grade mineralization within this zone consists of discontinuous, massive, cinnabar veins and lenses, averaging about 1 inch thick, along the intrusive contact and in narrow off-shoots along bedding plane faults in structurally overlying graywacke. Cinnabar is accompanied by quartz, stibnite, dickite, limonite, and some native mercury. Eight samples from this zone contained 0.14 to 15.7 percent Hg and 0.32 to 3.0 percent Sb (Rutledge, 1950, fig. 5). Hawley and others (1969) reported that two ore samples respectively contained 70.10 and 35.87 percent Hg, 0.008 and 0.05 ppm Au, 1,500 and 700 ppm Zn, and greater than 10,000 and 300 ppm Sb. The graywacke, siltstone, and mafic intrusive country rocks are variably altered and replaced by quartz, carbonate, and clay minerals; some pyrite is present in the altered mafic intrusive rocks but it has not been observed in association with cinnabar.

Alteration:

Variable quartz-carbonate-clay alteration of graywacke, siltstone, and mafic intrusive country rock.

Age of mineralization:

Cretaceous or Tertiary. Inferred to be similar in age to other mercury deposits of southwest Alaska that postdate deposition of mid-Cretaceous clastic sedimentary rocks and intrusion of Upper Cretaceous or Tertiary igneous rocks.

Deposit model:

Cinnabar- and stibnite-bearing veins (Hot-spring Hg? Cox and Singer, 1986; model 27a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

27a

Production Status: Yes; small

Site Status: Undetermined

Workings/exploration:

The Lucky Day mine area has been explored by many surface pits, dozer trenches, and shallow shafts (Rutledge, 1950; Cady, 1955).

Production notes:

During WWII, 3,600 pounds of cinnabar-rich materials recovered from residual colluvial deposits at the head of Canary Gulch yielded 26 flasks of mercury (Rutledge, 1950, p.

4; Cady and others, 1955, p. 114). The recovered ore was transported to Sleetmute by backpacking and boat. It was retorted at the Red Devil mine in 1942-43.

Reserves:

Additional comments:

References:

Rutledge, 1950; Cady and others, 1955; Sainsbury and MacKevett, 1965; Hawley and others, 1969; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Rutledge, 1950

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Redskin**Site type:** Prospect**ARDF no.:** TA005**Latitude:** 60.74**Quadrangle:** TA C-8**Longitude:** 158.84**Location description and accuracy:**

The Redskin prospect is at an elevation of about 1,400 feet on the ridge south of Beaver Creek. The map site is in the E1/2 of section 6, T 8 N, R 55 W, of the Seward Meridian. The prospect is at the head of locally named Alder Gulch, 1.15 miles west-southwest of the Beaver Creek airstrip. It is locality 4 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Hg**Other:****Ore minerals:** Cinnabar**Gangue minerals:****Geologic description:**

At the Redskin prospect, cinnabar occurs as sparse films along bedding planes and cross joints, and in zones of brecciation in graywacke and shale (Rutledge, 1950). This prospect has not received much study, but is reported to be similar to the mercury-bearing deposit along locally named Canary Gulch at the Lucky Day mine (TA004), 0.75 mile to the northwest (Rutledge, 1950; Cady and others, 1955, p. 115). The country rocks are inferred to be part of a Paleozoic and Mesozoic sedimentary and volcanic sequence; several Triassic fossil localities are in the Cinnabar Creek area about 4 miles to the northwest of the Redskin prospect (Sainsbury and MacKevett, 1965). Rutledge (1950) also reports that cinnabar float has been found in locally named Alder Gulch below the Redskin prospect.

Alteration:**Age of mineralization:**

Cretaceous or Tertiary. Inferred to be similar in age to other mercury deposits of southwest Alaska that postdate deposition of mid-Cretaceous clastic sedimentary rocks and intrusion of Upper Cretaceous or Tertiary igneous rocks.

Deposit model:

Cinnabar-bearing veins and fractures (Hot-spring Hg? Cox and Singer, 1986; model 27a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

27a?

Production Status: None

Site Status: Inactive

Workings/exploration:

The prospect probably has been explored by surface examination, sampling, and some shallow pits.

Production notes:

Reserves:

Additional comments:

References:

Rutledge, 1950; Cady and others, 1955; Sainsbury and MacKevett, 1965; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Rutledge, 1950

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Tippy**Site type:** Occurrence**ARDF no.:** TA006**Latitude:** 60.50**Quadrangle:** TA C-8**Longitude:** 158.74**Location description and accuracy:**

This occurrence is at an elevation of about 3,000 feet on a ridge 1,000 feet south of USGS benchmark Tippy, near the south boundary of the Taylor Mountains C-8 quadrangle. The map site is in the NW1/4 of section 27, T 5 N, R 54 W, of the Seward Meridian. It is locality 13 of Clark and others (1970) and locality 6 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Au, Cu**Other:** Ag, Hg**Ore minerals:** Arsenopyrite, chalcopyrite, malachite**Gangue minerals:** Quartz, tourmaline**Geologic description:**

At this locality, shale and graywacke, inferred to be part of the mid-Cretaceous Kuskokwim Group, is intruded and baked by a 15-foot wide, Cretaceous or Tertiary felsic dike (Clark and others, 1970). The limonite-stained dike contains some small cavities lined with apple green crystals of bindheimite (?), and small clots of acicular tourmaline. Quartz veins in the hornfels are up to 0.25 inch wide and contain 1 to 2 percent arsenopyrite and minor chalcopyrite; fracture surfaces are stained by malachite. Rock samples from this locality (Clark and others, 1970, samples AMM 777 and 799) contained up to 2,000 ppm B, 15,000 ppm Cu, 200 ppm Ag, 15 ppm Mo, 10,000 ppm Sb, 1.5 ppm Au, and greater than 10 ppm Hg. Rock samples collected up to 3,000 feet north-northwest along the ridge from this locality also contained anomalous levels of some metals, especially Ag, Cu, B, and Hg (Clark and others, 1970, sample localities 11 and 12).

Alteration:

Silicification (quartz veining in hornfels) and oxidation.

Age of mineralization:

Late Cretaceous or Tertiary. Mineralization postdates deposition and deformation of

mid-Cretaceous clastic sedimentary rocks and emplacement of Upper Cretaceous or Tertiary intrusive rocks.

Deposit model:

Polymetallic veins (Cox and Singer, 1986; model 22c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c

Production Status: None

Site Status: Active?

Workings/exploration:

At least surface examination and sampling has taken place.

Production notes:**Reserves:****Additional comments:****References:**

Clark and others, 1970; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Clark and others, 1970

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Shotgun (Mose)**Site type:** Prospect**ARDF no.:** TA007**Latitude:** 60.41**Quadrangle:** TA B-6**Longitude:** 158.12**Location description and accuracy:**

The Shotgun prospect is in the south part of the Shotgun Hills, a rugged, glaciated upland at the divide between the King Salmon and Kogrukluk/Holitna River drainages. The map site is in the NW1/4 of section 27, T 4 N, R 51 W, of the Seward Meridian. It is on the crest and eastern slope of a northwest-trending ridge at an elevation of about 2,575 feet.

Commodities:**Main:** Au**Other:****Ore minerals:** Arsenopyrite, bismuth, Bi-Te sulfides, chalcopyrite, chalcocite, copper, covellite, gold, lollingite, marcasite, pyrite, pyrrhotite, scheelite, sphalerite**Gangue minerals:** Albite, carbonate, quartz, sericite, tourmaline**Geologic description:**

This prospect was discovered in the 1980s as a result of a regional exploration program by Cominco Alaska in a joint venture with ENSTAR. They named this prospect Mose and completed surface mapping, sampling, and the drilling of six shallow diamond drill holes. In the 1990s, ENSTAR's interest was sold to NovaGold Resources Inc., the prospect was renamed Shotgun, and a renewed exploration effort took place. This exploration included extensive diamond drilling in 1998 that included 19 drill holes totaling 10,170 feet (Novagold Resources Inc., 2000).

The Shotgun prospect is an intensely quartz-veined felsic porphyry stock that sharply crosscuts biotite hornfels developed in mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group (Rombach, 2000). As exposed along the ridge crest and downslope to the east, the stock is an irregularly shaped composite intrusive that is about 1,000 feet long in a northwest direction and over 500 feet long in a northeast direction. The hornfels near the stock and across the ridge crest to the southwest commonly is breccia healed by a tourmaline-rich matrix and locally cut by veinlets that contain arsenopyrite, pyrite, and some chalcopyrite. In the stock, some zones near the contact are extensively silicified; quartz replacement is massive and complete in these zones. Elsewhere, the stock is cut

by quartz veins that in places form an intense, anastomosing stockwork. Albite-sericite-quartz +/- carbonate replacement of host intrusive rocks accompanies the quartz veining. The deposit is deeply oxidized and iron-staining is widespread. Ore minerals identified at Shotgun include arsenopyrite, primary native gold and bismuth, Bi-Te sulfides, chalcopyrite, lollingite, pyrrhotite, pyrite, scheelite, sphalerite, and supergene covellite, chalcocite, native copper, and marcasite (Rombach, 2000).

Vapor-rich and saline-rich fluid inclusions coexist in the quartz veins. The vapor-rich inclusions contain, in order of abundance, water, carbon dioxide, and methane; these inclusions homogenize to vapor at about 360 degrees C. The saline-rich inclusions have salinities of 40 to greater than 60 weight percent NaCl equivalent and homogenize to liquid at 280 to more than 600 degrees C (Rombach, 2000).

Surface rock samples define a large geochemical anomaly with several areas where gold values exceed 1 ppm. Examples of drill hole intercepts include 233 feet grading 0.077 ounce of Au per ton, 399 feet grading 0.050 ounce Au per ton, and 43 feet grading 0.155 ounce of Au per ton (NovaGold Resources Inc., 2000; all drill hole intercepts are listed online at <http://www.nrigold.com/shotgun.htm>). Preliminary metallurgical tests indicate that gold recoveries of more than 93 percent can be achieved using conventional cyanidation. A resource estimate, using a 0.018 ounce of Au per ton cutoff, is 32,765,000 tons grading 0.033 ounce of Au per ton. The mineralization is open to the north, west, and at depth. Airborne and ground magnetometer surveys have been used in conjunction with extended mapping and sampling to evaluate the potential for additional mineralization in surrounding areas.

A large granitic pluton makes up the core of the Shotgun Hills. The contact between this pluton and the hornfels that surrounds the Shotgun prospect coincides with a north-west-trending linear swale and drainage less than 0.5 mile north of the prospect. The shallow-seated intrusive environment south of this contact (extensive hornfels locally cut by fine-grained porphyry) compared to that to the north, suggests that this contact is a large, down-to-the-south fault. K/Ar and Ar/Ar dating of intrusive rocks and mineralization in the Shotgun prospect area indicate that magmatism and mineralization is latest Cretaceous in age, about 68 to 70 Ma (Rombach, 2000; Travis Hudson, unpublished data, 2000).

Alteration:

Silicification and albite-sericite-quartz +/- carbonate replacement of host intrusive rocks.

Age of mineralization:

Latest Cretaceous. K/Ar and Ar/Ar dating of intrusive rocks and mineralization in the Shotgun prospect area indicate that magmatism and mineralization is latest Cretaceous in age, about 68 to 70 Ma (Rombach, 2000; Travis Hudson, unpublished data, 2000).

Deposit model:

Gold-bearing quartz-stockwork veining in felsic porphyry

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Active

Workings/exploration:

This prospect was discovered in the 1980s as a result of a regional exproation program by Cominco Alaska in joint venture with ENSTAR. They named this prospect Mose and completed surface mapping, sampling, and the drilling of six shallow diamond drill holes. In the 1990s, ENSTAR's interest was sold to NovaGold Resources Inc., the prospect was renamed Shotgun, and a renewed exploration effort took place. This exploration included extensive new diamond drilling in 1998 that included 19 drill holes totaling 10,170 feet. Airborne and ground magnetometer surveys have been used in conjunction with extended mapping and sampling to evaluate the potential for additional deposits in surrounding areas.

Production notes:

Reserves:

Novagold Resources Inc. (2000) has made the following resource estimates: using a cutoff pf 0.018 ounce of Au per ton, the resource is 32,765,000 tons grading 0.033 ounce of Au per ton; using a cutoff of 0.026 ounce of Au per ton, the resource is 16,550,000 tons grading 0.045 ounce of Au per ton; using a cutoff of 0.035 ounce of Au per ton, the resource is 11,650,000 tons grading 0.05 ounce of gold per ton.

Additional comments:

References:

NovaGold Resources Inc., 2000; Rombach, 2000.

Primary reference: Rombach, 2000

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Taylor Creek**Site type:** Mine**ARDF no.:** TA008**Latitude:** 60.88**Quadrangle:** TA D-4**Longitude:** 157.34**Location description and accuracy:**

Taylor Creek is the main drainage on the southeast side of the Taylor Mountains. Taylor Creek flows east and north from headwaters 3.75 miles south of the highest peak (3,581 feet elevation) in the Taylor Mountains. Placer gold mining has occurred along at least the upper 3 miles of Taylor Creek, although prospects have been noted as far as 1.5 miles below the mouth of Fork Creek, a south tributary. The map site is at the principal mine buildings, in the NW1/4 of section 18, T 9 N, R 46 W, of the Seward Meridian. This is locality 11 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Au**Other:** Hg, Sn**Ore minerals:** Cassiterite, cinnabar, gold, pyrite**Gangue minerals:****Geologic description:**

Placer gold mining has occurred along at least the upper 3 miles of Taylor Creek, although prospects have been noted as far as 1.5 miles below the mouth of Fork Creek, a south tributary (Cady and others, 1955, Plate 1). The alluvial gravels are about 10 feet thick, the paystreak is about 250 feet wide, and bedrock is mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group. The heavy-mineral concentrates contain cinnabar and cassiterite; pyrite is abundant in concentrates from below the mouth of Fork Creek (Cady and others, 1955, p. 119). Cady and others (1955) reported that the Taylor Creek mine had produced a total of \$90,000 worth of gold (about 2,500 ounces), mainly in 1950 and 1951. The mine has been active at different times since Cady and others' report, including small-scale mining and prospecting through the 1990s (M. Henning, personal commun., 2000).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

39a

Production Status: Yes; small

Site Status: Active

Workings/exploration:

Placer gold mining has occurred along at least the upper 3 miles of Taylor Creek although prospects have been noted as far as 1.5 miles below the mouth of Fork Creek, a south tributary (Cady and others, 1955, Plate 1). An airstrip, water ditch, and mine buildings are present. Taylor Creek has been explored for a distance of about 1.5 miles downstream of the mouth of Fork Creek. The mine has been active at different times since Cady and others' report, including small-scale mining and prospecting through the 1990s (M. Henning, personal commun., 2000).

Production notes:

Cady and others (1955) reported that the Taylor Creek mine had produced a total of \$90,000 worth of gold (about 2,500 ounces), mainly in 1950 and 1951.

Reserves:**Additional comments:****References:**

Cady and others, 1955; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Cady and others, 1955

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Unnamed (ridge west of Stevens Creek)

Site type: Occurrence

ARDF no.: TA009

Latitude: 60.95

Quadrangle: TA D-4

Longitude: 157.35

Location description and accuracy:

Stevens Creek flows northeast from headwaters in the highest part of the Taylor Mountains. This occurrence is on the ridge on the west side of Stevens Creek. The map site is at an elevation of 2,400 feet, in the SE1/4 of section 13, T 10 N, R 46 W, of the Seward Meridian. It is approximately located, perhaps within 1 mile. This occurrence is locality 7 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:

Main: W

Other:

Ore minerals: Wolframite

Gangue minerals: Quartz

Geologic description:

The core of the Taylor Mountains is an Upper Cretaceous or Lower Tertiary granite pluton that sharply crosscuts and thermally metamorphoses mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group (Cady and others, 1955, p. 83, 121). Quartz veins are common in the pluton near its border and in the contact-metamorphic rocks. Wolframite was identified in vein quartz float that apparently weathered from the contact-metamorphic zone on the ridge west of Stevens Creek.

Alteration:

Hornfels is developed in the country rocks adjacent to the Taylor Mountain pluton. Quartz veining is common in the border of the pluton and in the hornfels.

Age of mineralization:

Late Cretaceous or Early Tertiary, the age of the Taylor Mountain pluton.

Deposit model:

Wolframite in quartz veins

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:

Cady and others, 1955; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Cady and others, 1955

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Sleitat Mountain**Site type:** Prospect**ARDF no.:** TA010**Latitude:** 60.046**Quadrangle:** TA A-3**Longitude:** 157.080**Location description and accuracy:**

The Sleitat prospect is centered on a saddle at an elevation of 1,725 feet, between the two high peaks of Sleitat Mountain (1,979 and 1,903 feet elevation). Sleitat Mountain is the highest part of northeast-southwest trending uplands between the valleys of Harris Creek and the Nushagak River. This prospect is accurately located. It is locality 8 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Sn, W**Other:** Ag**Ore minerals:** Arsenopyrite, bismite, cassiterite, chalcopyrite, ferrotantalite, loellingite, pyrite, sphalerite, stannite, wolframite**Gangue minerals:** Clay, muscovite, quartz, topaz, tourmaline, zinnwaldite**Geologic description:**

The occurrence of granite and peripheral gold-bearing quartz gash veins was reported on Sleitat Mountain by Mertie (1938, p. 91), but subsequent exploration has shown that the principal mineral deposit is a tin-, tungsten-, and silver-bearing sheeted greisen system (Farnstrom, 1991; Burleigh, 1991; Hudson and Reed, 1997). The greisen deposit was discovered by a Cominco Alaska regional exploration program in 1983, and subsequently evaluated in the mid-1980s by detailed surface mapping, sampling, and diamond drilling (Farnstrom, 1991).

A composite granite stock that hosts most of the greisen sharply crosscuts and thermally metamorphoses mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group. The stock has a discontinuous border zone of medium-grained biotite granite and biotite-muscovite granite, and a core of fine-grained zinnwaldite granite. Felsic porphyry dikes crosscut hornfels peripheral to the stock. A K/Ar age of 56.8 +/- 2.8 Ma on muscovite from a late veinlet was reported by Burleigh (1991, p. 6). Greisen sheets trend east-west and are developed within the biotite-muscovite granite, zinnwaldite granite, and hornfels.

The east-west trending cassiterite-bearing greisen zones are nearly vertical quartz-topaz-tourmaline +/- white mica veins and tabular bodies that vary from inches to 20 feet in

thickness and coalesce to greater thicknesses in places. They are concentrated in the north half of the stock and in a second zone along the south border that includes some greisen sheets in peripheral hornfels. The individual greisen sheets are granular, massive, separated by less-altered granite, have disseminated clay-lined voids, and have cores that locally contain a few inches of coarse quartz veins carrying high concentrations (50 to 60 percent) of cassiterite (Burleigh, 1991, p. 14). Cassiterite is disseminated in the greisen, concentrated in cores of greisen veins, and in quartz-topaz veins that fill fractures in hornfels. Cassiterite-bearing veins in hornfels are up to 1.5 feet wide and a few hundred feet long. Small amounts of wolframite are disseminated in the greisen but it also occurs with arsenopyrite in quartz veins, especially in hornfels peripheral to greisen zones. Arsenopyrite is common in the greisen and veins. Up to 5 percent loellingite with inclusions of bismite has been identified as disseminations in biotite-muscovite granite (Burleigh, 1991, p. 16). Sphalerite is a minor but common constituent of the greisen and some stannite and chalcopyrite are associated with the sphalerite. One small grain of ferrotantalite was identified during SEM analysis of the greisen (Burleigh, 1991, p. 16). Individual greisen zones locally have high tin grades. For example, one 47.7 foot (true) drill intercept averaged 1.56 percent tin, and included a 5-foot (true) thick section grading 12.6 percent tin and 5.7 ounces of Ag per ton (Farnstrom, 1991; Burleigh, 1991, p. 18). An 1,800 pound bulk sample contained 0.37 percent tin, 0.04 percent W, and 17 ppm Ag; the Sleitat deposit is estimated to contain a total of 28.6 million tons with the average grade of this bulk sample (Burleigh, 1991). This size and grade is consistent with that found in other large cassiterite-bearing greisen deposits around the world (Menzie and Reed, 1986).

The Sleitat prospect is a deeply eroded tin-bearing system. The sheeted greisens, particularly those on the north side of the stock, are expected to diminish in size and in intensity of cassiterite mineralization at depth. However, mineralization in the relatively wide hornfels zone on the south side of the stock may indicate that the upper contact of the granite body is not steeply dipping there, or that a mineralizing zinnwaldite granite cupola could be present at depth (Hudson and Reed, 1997, p. 461). Burleigh (1991) showed that much of the eroded tin-bearing material had migrated downslope and along the small streams that head against the lode deposit.

Alteration:

Greisenization, late clay development, oxidation including iron- and scorodite-staining.

Age of mineralization:

Early Tertiary. A composite granite stock that hosts most of the greisen sharply cross-cuts and thermally metamorphoses mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group. A K/Ar age of 56.8 +/- 2.8 Ma on muscovite from a late veinlet was reported by Burleigh (1991, p. 6).

Deposit model:

Sn greisen deposits (Cox and Singer, 1986; model 15c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

15c

Production Status: None

Site Status: Active

Workings/exploration:

The Sleitat prospect was discovered and explored by Cominco Alaska in the 1980s. This work included detailed surface mapping, sampling, and some diamond drilling (Farnstrom, 1991). In 1989, the U. S. Bureau of Mines conducted additional surface examinations, geochemical sampling, surface magnetometer and radiometric surveys, and a pan concentrate survey in nearby drainages (Burleigh, 1991).

Production notes:

Reserves:

An 1,800 pound bulk sample contained 0.37 percent tin, 0.04 percent W, and 17 ppm Ag; the Sleitat deposit is estimated to contain a total of 28.6 million tons of ore having the average grade of this bulk sample (Burleigh, 1991).

Additional comments:

References:

Mertie, 1938; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606); Menzie and Reed, 1986; Burleigh, 1991; Farnstrom, 1991; Hudson and Reed, 1997.

Primary reference: Burleigh, 1991

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Keefer Creek**Site type:** Occurrence**ARDF no.:** TA011**Latitude:** 60.3**Quadrangle:** TA B-1**Longitude:** 156.1**Location description and accuracy:**

Keefer Creek is an approximately 7-mile-long south tributary to the Mulchatna River. Its confluence with the Mulchatna River is about 7 miles upstream from the mouth of Mosquito River, a north tributary to the Mulchatna River. This occurrence is very approximately located, probably within several miles. For this record, the map site is on Keefer Creek at the north border of section 9, T 2 N, R 39 W, of the Seward Meridian. The occurrence was referred to as 'Keefer Creek' by Cobb (1972 [MF 384]).

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

A written communication from F. H. Waskey (1935), probably to J. B. Mertie Jr., reported that placer gold had been identified on Keefer Creek (Cobb, 1972 [MF 384]). Keefer Creek is an approximately 7-mile-long south tributary to the Mulchatna River. The Mulchatna River approximately coincides with a major structural boundary between mid-Cretaceous Kuskowim Group clastic rocks to the west and Mesozoic sedimentary and igneous rocks to the east (Decker and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:

Cobb, 1972 (MF 384); Decker and others, 1994.

Primary reference: Cobb, 1972 (MF 384)

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Mulchatna River**Site type:** Occurrence**ARDF no.:** TA012**Latitude:** 60.3**Quadrangle:** TA B-1**Longitude:** 156.1**Location description and accuracy:**

Martin and Katz (1912) reported that flour gold was present on gravel bars of the Mulchatna River above the mouth of the Koktalee (Koktuli) River. The map site of this occurrence is a gravel bar about 1.5 mile above the mouth of Keefer Creek. It is arbitrarily chosen to represent the general area of occurrences noted by Martin and Katz (1912). Cobb (1972 [MF 384]; 1976 [OF 76-606]) included these occurrences under the name 'Mulchatna River'.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Martin and Katz (1912) reported that fine flour gold was present on gravel bars of the Mulchatna River above the mouth of the Koktalee (Koktuli) River. The Mulchatna River approximately coincides with a major structural boundary between mid-Cretaceous Kuskowim Group clastic rocks to the west and Mesozoic sedimentary and igneous rocks to the east (Decker and others, 1994).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:

Martin and Katz, 1912; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606); Decker and others, 1994.

Primary reference: Martin and Katz, 1912

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Unnamed (Tikchik Mountain area)

Site type: Occurrence

ARDF no.: TA013

Latitude: 60.07

Quadrangle: TA A-6

Longitude: 158.18

Location description and accuracy:

Mertie (1938, p. 91) reported that fine placer gold was found on creeks draining the north and west sides of Tikchik Mountain. This location, on the north flank of Tikchik Mountain, is arbitrarily chosen to represent these occurrences. The map site is in the NW1/4 of section 26, T 1 S, R 52 W, of the Seward Meridian. It is very approximately located, perhaps within miles. Cobb (1972 [MF 384]; 1976 [OF 76-606]) included these occurrences under the name 'Tikchik Mountain'.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Mertie (1938, p. 91) reported that fine placer gold was found in creeks draining the north and west sides of Tikchik Mountain. Bedrock in the area of Tikchik Mountain is clastic sedimentary rocks, inferred to be part of the mid-Cretaceous Kuskokwim Group, which is intruded by Upper Cretaceous or Lower Tertiary granitic rocks (Mertie, 1938).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:

Mertie, 1938; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Mertie, 1938

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): McGeary Creek**Site type:** Occurrence**ARDF no.:** TA014**Latitude:** 60.3**Quadrangle:** TA B-2**Longitude:** 156.6**Location description and accuracy:**

McGeary Creek is a large, south tributary to the upper Nushagak River. The location is arbitrarily chosen on upper McGeary Creek. The map site is in the NW1/4 of section 29, T 3 N, R 42 W, of the Seward Meridan. It is very approximately located, perhaps within as much as 10 miles. Cobb (1972 [MF 384]; 1976 [OF 76-606]) included information about this occurrence under the name 'Pulchatnachakcharak R.' an early name for McGeary Creek.

Commodities:**Main:** Au**Other:****Ore minerals:****Gangue minerals:****Geologic description:**

Mertie (1938, p. 91) reported that colors of gold have been found on McGeary Creek. This record represents that occurrence, at an arbitrarily chosen site along upper McGeary Creek. Bedrock in this drainage is probably mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group, perhaps locally intruded by felsic igneous rocks (Decker and others, 1994).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:

Mertie, 1938; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606); Decker and others, 1994.

Primary reference: Mertie, 1938

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): King Salmon River**Site type:** Occurrence**ARDF no.:** TA015**Latitude:** 60.31**Quadrangle:** TA B-6**Longitude:** 158.12**Location description and accuracy:**

Mertie (1938, p. 91) reported that coarse gold was found in the upper valley of King Salmon River. This location is arbitrarily chosen to represent this occurrence. For this record, the map site is on the river, 1.25 miles southeast of USGS benchmark King, in the SW1/4 of section 27, T 3 N, R 51 W, of the Seward Meridian. It is approximately located, probably within a few miles. Cobb (1972 [MF 384]; 1976 [OF 76-606]) included this occurrence under the name 'King Salmon River'.

Commodities:**Main:** Au**Other:****Ore minerals:** Gold**Gangue minerals:****Geologic description:**

Mertie (1938, p. 91) reported that coarse gold was found in the upper valley of the King Salmon River in 1907. King Salmon River is a large west tributary to the Nushagak River. It flows east from headwaters along a low divide that separates it from the drainage of Tikchik River. Bedrock in the King Salmon River drainage is mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group locally intruded by Upper Cretaceous or Lower Tertiary granitic and hypabyssal felsic rocks. Clark and others (1970 [OF 438]) reported analytical data for stream sediments and one rock sample in the area of USGS benchmark King. Several of the stream-sediment samples in this area contained anomalous amounts of metals, including Ag, As, B, and Cu. The rock sample, from near the benchmark, contained weakly anomalous amounts of Ag and As. Bedrock in this area includes a small area of felsic intrusive rocks surrounded by hornfels (Clark and others, 1970 [OF 438]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:

Mertie, 1938; Clark and others, 1970 (OF 438); Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Clark and others, 1970 (OF 438)

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Gemuk Mountain**Site type:** Occurrence**ARDF no.:** TA016**Latitude:** 60.60**Quadrangle:** TA**Longitude:** 159.00**Location description and accuracy:**

Gemuk Mountain is a 3,441 foot-high peak near the west boundary of the Taylor Mountains C-8 quadrangle. It is in the west headwaters of the Gemuk River. This occurrence is at an elevation of about 2,850 feet on a ridge a few thousand feet southwest of the summit of Gemuk Mountain. It is locality 6 of Clark and others (1970) and locality 5 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Au, Sb**Other:****Ore minerals:** Gold, pyrite, stibnite**Gangue minerals:** Quartz**Geologic description:**

This occurrence is a mineralized shear zone between granitic rocks and thermally metamorphosed quartzite and shale (Clark and others, 1970). Discontinuous gold-bearing quartz-stibnite masses, 1- to 6-inches wide, occur as pods and lenses in fault gouge and breccia. Polished sections show the vein margins to be quartz and stibnite and the cores to be silicified fragments of biotite diorite in a quartz matrix. Pyrite is common at the margins of the silicified biotite diorite fragments. The mineralized zone trends N 50 W, is nearly vertical, and at least 2 feet wide. Native gold is at the margins of the stibnite-rich pods and lenses. Three vein samples contained gold values of 82, 94, and 100 ppm (Clark and others, 1970).

Alteration:**Age of mineralization:**

Late Cretaceous or Early Tertiary (?). Possibly the age of many granitic plutons in the region.

Deposit model:

Simple Sb deposits (Cox and Singer, 1986; model 27d)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

27d

Production Status: None

Site Status: Undetermined

Workings/exploration:

Surface examination and sampling has occurred, probably including some by private companies since that of Clark and others (1970).

Production notes:

Reserves:

Additional comments:

References:

Clark and others, 1970; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Clark and others, 1970

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Unnamed (near Gemuk Mountain)**Site type:** Occurrence**ARDF no.:** TA017**Latitude:** 60.59**Quadrangle:** TA C-8**Longitude:** 158.98**Location description and accuracy:**

This occurrence is in a headwater drainage of the Gemuk River, 1.1 miles southeast of the summit of Gemuk Mountain. The map site is in the NW1/4 of section 29, T 6 N, R 55 W, of the Seward Meridian. It is sample locality 161 of Clark and others (1970) and locality 10 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Hg**Other:****Ore minerals:** Cinnabar**Gangue minerals:****Geologic description:**

Clark and others (1970) reported panning cinnabar from stream sediments at this locality. This occurrence is along a small headwater tributary of the Gemuk River that heads in an area of gold and stibnite mineralization (TA016).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

Placer Hg

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):**Production Status:** None**Site Status:** Inactive

Workings/exploration:

Production notes:

Reserves:

Additional comments:

References:

Clark and others, 1970; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Clark and others, 1970

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Broken Shovel**Site type:** Prospect**ARDF no.:** TA018**Latitude:** 60.806**Quadrangle:** TA D-8**Longitude:** 158.841**Location description and accuracy:**

The Broken Shovel prospect is in the headwaters of an unnamed, north-flowing drainage, 0.5 mile northeast of upper Cinnabar Creek (TA001) and 3.5 miles southwest of USGS benchmark Prom (2,709 feet elevation). The map site is at an elevation of about 1,250 feet, in the NE1/4 of section 12, T 8 N, R 55 W, of the Seward Meridian. The deposit is exposed on the northwest flank of a small ridge separating headwater tributaries to the north-flowing creek; the westernmost of these tributaries is locally called Broken Shovel Gulch. It is accurately located (see Rutledge, 1950, fig. 6) and included in locality 1 of Cobb (1972 [MF 384]; 1976 [OF 76-606]).

Commodities:**Main:** Hg, Sb**Other:****Ore minerals:** Cinnabar, stibnite**Gangue minerals:** Quartz**Geologic description:**

The Broken Shovel prospect is 0.5 mile northeast of the Cinnabar Creek lode mercury mine (TA001). It consists of a zone of discontinuous quartz-stibnite veins along the faulted contact of a vertical mafic dike in Triassic sedimentary rocks (Sainsbury and MacKevett, 1965). The dike, exposed in a few shallow dozer trenches, is 1- to 3-feet-thick and trends N 5-20 E for a distance of at least 320 feet (Sainsbury and MacKevett, p. 40). The quartz veins are narrow, discontinuous, and only locally contain small stibnite lenses and minor cinnabar. Cinnabar was reportedly panned in the gulch drainage downslope from the Broken Shovel prospect. Cady and others (1955) report that sills of silica-carbonate rock (inferred to be altered mafic intrusive rocks) are also present in the gulch.

Alteration:

Quartz veining and silica-carbonate alteration of mafic rocks.

Age of mineralization:

Late Cretaceous or Tertiary (?). May be similar in age to other mercury deposits in southwest Alaska. Several of these postdate deposition and deformation of mid-Cretaceous clastic sedimentary rocks and emplacement of Upper Cretaceous or Tertiary intrusive rocks.

Deposit model:

Simple Sb deposits (Cox and Singer, 1986; model 27d)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

27d

Production Status: None**Site Status:** Probably inactive**Workings/exploration:**

A few shallow dozer trenches have explored the prospect.

Production notes:**Reserves:****Additional comments:****References:**

Rutledge, 1950; Cady and others, 1955; Sainsbury and MacKevett, 1965; Cobb, 1972 (MF 384); Cobb, 1976 (OF 76-606).

Primary reference: Sainsbury and Mackevett, 1965**Reporter(s):** Travis L. Hudson**Last report date:** 12/30/00

Site name(s): Unnamed (south of Taylor Mountains)

Site type: Occurrence

ARDF no.: TA019

Latitude: 60.86

Quadrangle: TA D-4

Longitude: 157.38

Location description and accuracy:

This occurrence is reported to be about 1 mile south of the upper Taylor Creek airstrip (T.K. Bundtzen, personal commun., 1992). For this record, the map site is at an elevation of 1,400 feet in the NE1/4 of section 23, T 9 N, R 46 W, of the Seward Meridian. It is very approximately located, perhaps within a mile.

Commodities:

Main: Au

Other: Ag, Hg

Ore minerals: Arsenopyrite, cinnabar, gold, pyrite

Gangue minerals: Quartz, tourmaline

Geologic description:

T. K. Bundtzen (personal commun., 1992) reports that disseminated arsenopyrite, cinnabar, pyrite, and minor gold are in hypabyssal rhyolite about 1 mile south of the Taylor Creek airstrip. Sparse sulfides are also in quartz-tourmaline veinlets that cut the rhyolite. Cady and others (1955, p. 71, plate 1) noted east-west-trending rhyolite dikes or sills on the ridges just west of lower Forks Creek, about about 2.5 miles east-northeast of this occurrence. The felsic hypabyssal rocks intrude mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group.

Alteration:

Quartz-tourmaline veining is present.

Age of mineralization:

Late Cretaceous or Early Tertiary, the age of felsic plutons in southwest Alaska that intrude the mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group.

Deposit model:

Sulfide-bearing veins in or near felsic hypabyssal intrusive rocks

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Some surface examination and sampling has occurred but the nature of any additional work is not known.

Production notes:

Reserves:

Additional comments:

References:

Cady and others, 1955.

Primary reference: Cady and others, 1955

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Little Taylor Mountains**Site type:** Occurrence**ARDF no.:** TA020**Latitude:** 60.85**Quadrangle:** TA B-6**Longitude:** 157.19**Location description and accuracy:**

This occurrence is on the crest of the Little Taylor Mountains, 3.1 miles southeast of the confluence of Fork and Taylor Creeks. The map site is at an elevation of about 2,100 feet, in the SW1/4 of section 24, T 9 N, R 45 W, of the Seward Meridian. This occurrence was included under the name 'Little Taylor Mts.' by Cobb (1976 [OF 76-606]).

Commodities:**Main:** Au (?), Cu**Other:****Ore minerals:** Gold, pyrite**Gangue minerals:** Quartz, sericite**Geologic description:**

Several felsic dikes or sills cut mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group in the higher parts of the Little Taylor Mountains (Cady and others, 1955, p. 71, plates 1 and 6). At a locality a little northwest of the summit of the Little Taylor Mountains, the felsic sheets trend northwest, and dip southwest, parallel to the enclosing sedimentary rocks. The felsic intrusions and the enclosing sedimentary rocks are strongly silicified and pyritized. 'Traces of copper' were also noted by Cady and others (1955, p. 122) in the Little Taylor Mountains. For this record, it is assumed that at least a little gold is present in the altered rocks.

Alteration:

Silicification, pyritization, and sericitization.

Age of mineralization:

Late Cretaceous or Early Tertiary, the age of felsic plutons in southwest Alaska that intrude the mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group.

Deposit model:

Gold (?)-bearing altered felsic intrusive rocks

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

Production Status: None

Site Status: Undetermined

Workings/exploration:

Some surface examination and sampling has probably occurred, but the nature of any additional work is not known.

Production notes:

Reserves:

Additional comments:

References:

Cady and others, 1955; Cobb, 1976 (OF 76-606).

Primary reference: Cady and others, 1955

Reporter(s): Travis L. Hudson

Last report date: 12/30/00

Site name(s): Unnamed (southern Shotgun Hills area)

Site type: Prospect

ARDF no.: TA021

Latitude: 60.37

Quadrangle: TA B-6

Longitude: 158.15

Location description and accuracy:

This prospect is centered on an upland (elevation of 2,516 feet) that is 2.8 miles north of USGS benchmark King. This is in the headwaters of unnamed north tributaries to the King Salmon River, in the southern Shotgun Hills area. The map site is in the NW1/4 of sec. 9, T 3 N, R 51 W, of the Seward Meridian.

Commodities:

Main: Ag, Au

Other: As, B, Bi, Cu, Pb, Sb, Sn, Hg

Ore minerals: Arsenopyrite, malachite

Gangue minerals: Limonite, quartz, scorodite

Geologic description:

Clark and others (1970 [OF 438]) report analytical results for several rock samples collected along about 5,000 feet of the crest of this upland. Several of these samples have weakly to strongly anomalous concentrations of Ag (to 7 ppm), As, B, Bi, Cu, Pb, Sb, Sn, Au (to 0.1 ppm), and Hg. Bedrock is mostly hornfels in mid-Cretaceous clastic sedimentary rocks of the Kuskokwim Group. Clark and others (1970 [OF 438]) generally describe this hornfels as strongly limonite stained and cut by numerous small quartz veins rarely exceeding 1/8 inch in width. Some of the quartz veins carry minor amounts of arsenopyrite and arsenopyrite is also locally disseminated in hornfels. Some scorodite and malachite are also locally present.

Alteration:

Silicification, oxidation, and probably tourmaline replacement, inasmuch as many rock samples contain over 2,000 ppm B.

Age of mineralization:

Late Cretaceous. Hornfels is developed in mid-Cretaceous clastic sedimentary rocks and is probably similar in age to hornfels at the Shotgun prospect (TA007), 3 miles to the north-northeast. Intrusive rocks in the area of the Shotgun prospect are about 68 to 70 Ma

in age.

Deposit model:

Polymetallic veins? (Cox and Singer, 1986; model 22c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c?

Production Status: None

Site Status: Active?

Workings/exploration:

Reconnaissance surface observation and sampling has taken place on this prospect.

Production notes:**Reserves:****Additional comments:****References:**

Clark and others, 1970 (OF 438).

Primary reference: Clark and others, 1970 (OF 438)

Reporter(s): Travis L. Hudson

Last report date: 3/16/01

Site name(s): Unnamed (south of King Salmon River)

Site type: Prospect

ARDF no.: TA022

Latitude: 60.26

Quadrangle: TA B-6

Longitude: 158.09

Location description and accuracy:

This prospect is at an elevation of about 2,700 feet on a ridgecrest in the headwaters of unnamed south tributaries to the upper King Salmon River. For this record, the map site is near the west end of the north boundary of section 23, T 2 N, R 51 W, of the Seward Meridian.

Commodities:

Main: Ag, Au

Other: As, B, Hg

Ore minerals: Arsenopyrite, malachite

Gangue minerals: Limonite, quartz, scorodite

Geologic description:

Clark and others (1970 [OF 437]) report analytical data for several rock samples collected over about 6,000 feet of this ridgecrest. The samples contain weakly to strongly anomalous concentrations of Ag (to 3 ppm), Au (to 0.7 ppm), As, B, Cu, Mo, and Hg. These samples were collected in a large area of hornfels. Clark and others (1970 [OF 438]) generally describe hornfels with anomalous metal contents as strongly limonite stained and cut by numerous small quartz veins rarely exceeding 1/8 inch in width. Some of the quartz veins carry minor amounts of arsenopyrite, and arsenopyrite is also locally disseminated in hornfels. Some scorodite and malachite are also locally present.

Alteration:

Silicification and oxidation.

Age of mineralization:

Late Cretaceous. Hornfels is developed in mid-Cretaceous clastic sedimentary rocks and is probably similar in age to hornfels at the Shotgun prospect (TA007). Intrusive rocks in the area of the Shotgun prospect are about 68 to 70 Ma in age.

Deposit model:

Polymetallic veins? (Cox and Singer, 1986; model 22c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):

22c?

Production Status: None

Site Status: Probably inactive

Workings/exploration:

Reconnaissance surface observation and sampling has taken place on this prospect.

Production notes:

Reserves:

Additional comments:

References:

Clark and others, 1970 (OF 437).

Primary reference: Clark and others, 1970 (OF 437)

Reporter(s): Travis L. Hudson

Last report date: 3/16/01

References

- Burleigh, R. E., 1991, Evaluation of the tin-tungsten greisen mineralization and associated granite at Sleitat Mountain, southwestern Alaska: U. S. Bureau of Mines Open File report 35-91, 38 p.
- Cady, W. M., Wallace, R. E., Hoare, J. M., and Webber, E. J., 1955, The central Kuskokwim region, Alaska: U. S. Geological Survey Professional Paper 269, 132 p.
- Clark, A. L., Condon, W. H., Hoare, J. M., and Sorg, D. H., 1970, Analyses of rock and stream sediment samples from the Taylor Mountains C-8 quadrangle, Alaska: U. S. Geological Survey Open-File Report 437, 94 p.
- Clark, A. L., Condon, W. H., Hoare, J. M., and Sorg, D. H., 1970, Analyses of rock and stream sediment samples from the Taylor Mountains C-8 quadrangle, Alaska: U. S. Geological Survey Open-File Report 438, 89 p.
- Clark, A. L., Condon, W. H., Hoare, J. M., and Sorg, D. H., 1970, Analyses of rock and stream sediment samples from the Taylor Mountains C-8 quadrangle, Alaska: U. S. Geological Survey Open-File Report 439, 110 p.
- Clark, A. L., Condon, W. H., and Hoare, J. M., and Sorg, D. H., 1971, Analyses of stream-sediment samples from the Taylor Mountains D-8 quadrangle, Alaska: U. S. Geological Survey Open-File Report 458, 60 p.
- Cobb, E. H., 1972, Metallic mineral resources map of the Taylor Mountains quadrangle: U. S. Geological Survey Miscellaneous Field Studies Map MF-384, scale 1:250,000.
- Cobb, E. H., 1976, Summary of references to mineral occurrences (other than mineral fuels and construction materials) in the Dillingham, Sleetmute, and Taylor Mountain quadrangles, Alaska: U. S. Geological Survey Open-File Report 76-606, 92 p.
- Decker, J. E., and 11 others, 1994, Geology of southwestern Alaska, *in* Plafker, George, and Berg, H. C., eds., *The Geology of Alaska: Boulder, Colorado, Geological Society of America, The Geology of North America, v. G-1, p. 285-310.*
- Farnstrom, H., 1991, Sleitat: A new tin-silver prospect in southwestern Alaska: *Alaska Miner*, v. 19, p. 12-14.
- Hawley, C. C., Martinez, E. E., and Marinenko, John, 1969, Geochemical data on the South ore zone, White Mountain mine, and on the gold content of other mercury ores, southwestern Alaska, *in* Some shorter mineral resources investigations in Alaska: U. S. Geological Survey Circular 615, p. 16-20.
- Hudson, T. L., and Reed, B. L., 1997, Tin deposits in Alaska: *Economic Geology Monograph* 9, p. 450-465.
- Martin, G. C., and Katz, F. J., 1912, A geologic reconnaissance of the Iliamna region, Alaska: U. S. Geological Survey Bulletin 485, 138 p.
- Menzie, W. D., and Reed, B. L., 1986, Grade and tonnage model of Sn greisen deposits: U. S. Geological Survey Bulletin 1693, p. 71-72.
- Mertie, J. B., Jr., 1938, The Nushagak district, Alaska: U. S. Geological Survey Bulletin 903, 91 p.
- NovaGold Resources Inc., 2000, Shotgun Project: <http://www.nrigold.com/shotgun.htm>
- Rombach, C. S., 2000, Genesis and mineralization of the Shotgun deposit, southwestern Alaska, *in* The Tintina gold belt: Concepts, exploration, and discoveries: *British Columbia and Yukon Chamber of Mines, Special Volume No. 2, p. 181-196.*

- Rutledge, F. A., 1950, Investigation of mercury deposits, Cinnabar Creek area, Georgetown and Akiak districts, Kuskokwim region, southwestern Alaska: U. S. Bureau of Mines Report of Investigations 4719, 9 p.
- Sainsbury, C. L. and MacKevett, E. M., Jr., 1965, Quicksilver deposits of southwestern Alaska: U. S. Geological Survey Bulletin 1187, 89 p.