Alaska Resource Data File

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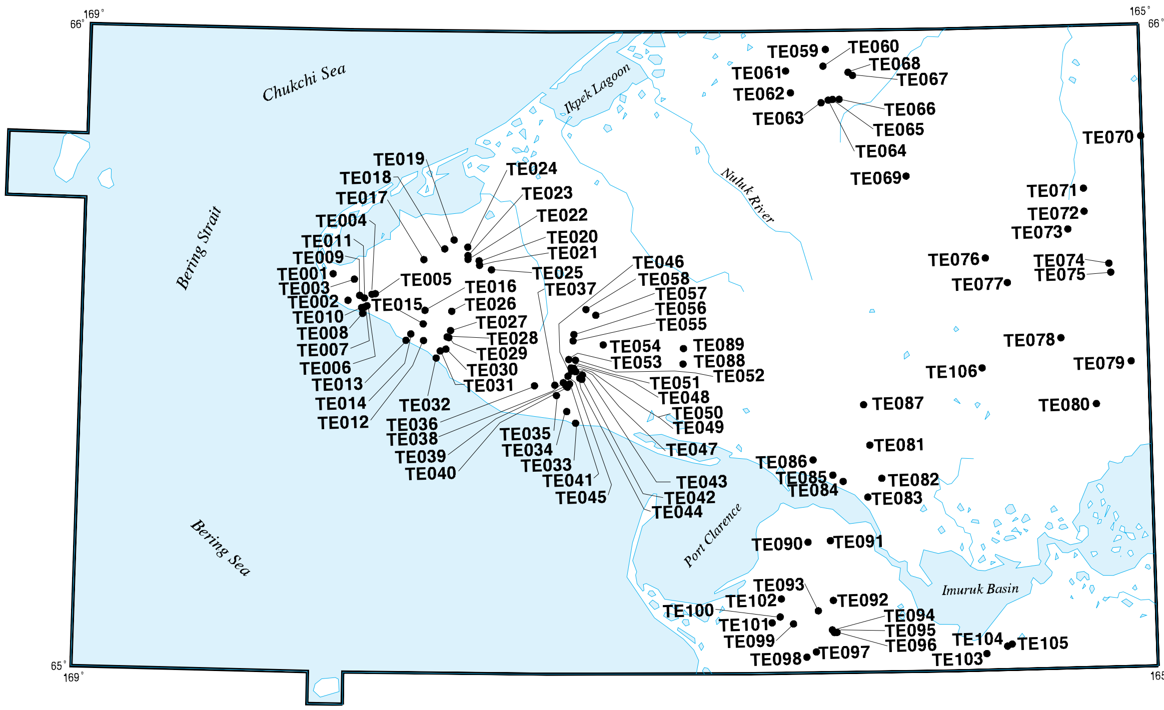
Teller quadrangle

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 Teller 1:250,000-scale quadrangle, western Alaska

This and related reports are accessible through the USGS World Wide Web site http://www-mrs-ak.wr.usgs.gov/ardf. Comments or information regarding corrections or missing data, or requests for digital retrievals should be directed to Donald Grybeck, USGS, 4200 University Dr., Anchorage, AK 99508-4667, e-mail dgrybeck@usgs.gov, telephone (907) 786-7424. This compilation is authored by:

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Location of map area in Alaska

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OPEN-FILE REPORT 98-328

Site name(s): Village Creek

Site Type: Prospect

ARDF no. TE001

Latitude: 65.62 **Quadrangle:** TE C-7

Longitude: 168.06

Location description and accuracy:
Village Creek flows into Bering Sea at the village of Wales, one mile north of Cape Prince of Wales. A placer tin concentration is located about one mile northeast of the stream mouth where the stream gradient decreases as the drainage enters onto the coastal lowland from its headwaters in the uplands of Cape Mountain. This is locality 22 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Village Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Village Creek drains the northwest uplands of the Cape Mountain granite stock (Hudson and Arth, 1983). Eight USBM churn-drill holes (Heide and Sanford, 1948) define one area where average tin grades are 0.1 lb. Sn per cubic yard (Mulligan, 1966, p. 19). This area is located where the stream gradient decreases as the drainage passes from steeper uplands to the coastal lowlands. Beach sands with shells are described in churn-drill holes at an elevation of 43 feet (Mulligan, 1966, p. 18). The tin in this drainage is present in small amounts compared to others peripheral to Cape Mountain known to be associated with significant lode tin deposits (Mulligan, 1966, p. 19-21).

Alteration:

Workings/Exploration:
Eight USBM churn-drill holes (Heide and Sanford, 1948).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1907; Heide and others, 1946; Heide and Sanford, 1948; Mulligan, 1966; Cobb and Sainsbury, 1972; Cobb, 1973; Hudson and Arth, 1983

Primary reference: Heide and Sanford, 1948; Mulligan, 1966

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Dieter; Cape Mountain

Site Type: Prospect

ARDF no. TE002

Latitude: 65.579 **Quadrangle:** TE C-7

Longitude: 168.003

Location description and accuracy:
The prospect adit (now caved) is at 1,700 feet elevation on the north side of the summit to Cape Mountain. Cape Mountain is the upland that makes up Cape Prince of Wales adjacent to Bering Strait on western-most Seward Peninsula. This is locality 1 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Cape Mtn.'. It is also known as the Dieter prospect (Mulligan, 1966, p. 33).

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals: Quartz

Geologic description:
The Cape Mountain (Dieter) prospect is a 418 foot-long adit, now caved, driven S 72 W to intersect an area of quartz veining in the Late Cretaceous (78.8 +/- 2.9 my; Hudson and Arth, 1983, p. 769) Cape Mountain biotite granite. The prospect is near the summit of Cape Mountain which is a roof pendant of marble and interlayered schist (Sainsbury, 1972). Steidtmann and Cathcart (1922, p. 99) reported finding cassiterite-bearing quartz vein material on the adit dump but a later effort by Mulligan (1966, p. 33) was unsuccessful in duplicating this result.
The area of the prospect is in a part of the Cape Mountain biotite granite (Hudson and Arth, 1983) that has characteristics of a precursor phase rather than a mineralizing phase (Hudson and Reed, 1997, figure 3).

Alteration:
Alteration has not been described.

Workings/Exploration:

An adit was driven 418 feet S 72 W from a portal at 1700 feet elevation on the north side of the summit to Cape Mountain. Other surface prospect pits and short shafts were dug in the area.

Age of mineralization:
Late Cretaceous; cassiterite and related mineralization in this area is interpretated to be linked to the evolution of the Cape Mountain granite which has been determined to be 78.8 +/- 2.9 my old by the K/Ar method (Hudson and Arth, 1983, p. 769).

Deposit model:
Cassiterite-quartz vein in granite (Cox and Singer, 1986; model 15b?)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
15b (?)

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:

Collier, 1904; Hess, 1906; Knopf, 1908 (USGS B 358); Harrington, 1919; Steidtmann and Cathcart, 1922; Heide and others, 1946; Mulligan, 1966; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Cobb, 1981 (USGS OFR 81-364A); Cobb, 1981 (USGS OFR 81-364B); Hudson and Arth, 1983; Hudson, 1984

Primary reference: Steidtmann and Cathcart, 1922; Mulligan, 1966

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Boulder Creek

Site Type: Prospect

ARDF no. TE003

Latitude: 65.612 **Quadrangle:** TE C-6

Longitude: 167.98

Location description and accuracy:
Boulder Creek drains northward to Lopp Lagoon from headwaters on the north flank of Cape Mountain, the upland promatory at Cape Prince of Wales. Detrital cassiterite is present from the upper reaches of the main drainage down to an elevation of about 100 feet. This is locality 23 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Boulder Cr.'.

Commodities:
Main: Sn **Other:** W, monazite, xenotime

Ore minerals: Cassiterite, monazite, scheelite, xenotime

Gangue minerals:

Geologic description:
Boulder Creek drains across the north contact of the Late Cretaceous (78.8 +/- 2.9 my; Hudson and Arth, 1983. p. 769) Cape Mountain biotite granite where it intrudes Mississippian marble and limestone (Sainsbury, 1972). Detrital cassiterite is present throughout the steep and boulder-clogged headwater reaches but the placer deposits are best developed at lower elevations (100 to 250 foot surface elevations) where the stream gradient decreases and the drainage enters onto the coastal lowland. The upstream portions of this placer in Boulder Creek valley characteristically have a well defined, narrow (less than 80 feet wide) pay streak with an average tin content of one pound tin per cubic yard (based on 22 churn-drill holes; Mulligan, 1996, p. 19). The lower part of the placer, where the drainage enters onto the coastal lowland, is more dispersed, both laterally and vertically. Here pay can be 30 to 40 feet thick and 1,200 feet or more in width. The tin content of this more dispersed, lower part of the placer is less; 54 churn-drill holes indicate average grades of 0.5 pounds (or less) tin per cubic yard. This lower grade part of the deposit does not extend downstream below about 100 feet surface elevation. Beach deposits with shell fragments were encountered in some churn-drill holes from lower parts of the placer deposit (at about 80-100 feet elevation). Reworking of alluvial deposits by beach processes may be responsible for the more dispersed character of this part of the placer (Mulligan and Thorne, 1959, p. 47-48). Some of the placer concentrates are radioactive. Seven samples had eU contents of 0.003 to 0.021 %. This radioactivity is approximately proportional to the amount of monazite and xenotime that is present. Most of the radioactivity may be due to thorium but traces of uranium were identified in the samples (Mulligan, 1966, p. 62).

Alteration:

Workings/Exploration:
Churn-drill programs by USBM and a private company (Zender Gold Mining Company) were reported by Mulligan and Thorne (1959) and Mulligan (1966). The lower reach of Boulder Creek, from about 100 feet elevation to the stream mouth at Lopp Lagoon and including some adjacent parts of Lopp Lagoon, were explored by Molybdenum Corporation of America in 1938. This churn-drilling program reportedly found little tin (Mulligan, 1966, 21).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Heide and Sanford, 1948; Mulligan and Thorne, 1959; Mulligan, 1966; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference:
Heide and Sanford, 1948; Mulligan and Thorne, 1959; Mulligan, 1966

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Goodwin Gulch

Site Type: Mine

ARDF no. TE004

Latitude: 65.589 **Quadrangle:** TE C-6

Longitude: 167.913

Location description and accuracy:
Goodwin Gulch is an easterly-trending, 1.5 mile-long tributary to upper Goodwin Creek that drains the northeast side of Cape Mountain (Cape Mountain is the upland that forms Cape Prince of Wales adjacent to Bering Strait). This is locality 24 of Cobb and Sainsbury (1972). Cobb (1975) summariized relevant references under the name 'Goodwin Gulch'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Boulder Creek drains across the north contact of the Late Cretaceous (78.8 +/- 2.9 my; Hudson and Arth, 1983. p. 769) Cape Mountain biotite granite where it intrudes Mississippian marble and limestone (Sainsbury, 1972). Detrital cassiterite is present throughout the steep and boulder-clogged headwater reaches but the placer deposits are best developed at lower elevations (100 to 250 foot surface elevations) where the stream gradient decreases and the drainage enters onto the coastal lowland. The upstream portions of this placer in Boulder Creek valley characteristically have a well defined, narrow (less than 80 feet wide) pay streak with an average tin content of one pound tin per cubic yard (based on 22 churn-drill holes; Mulligan, 1996, p. 19). The lower part of the placer, where the drainage enters onto the coastal lowland, is more dispersed, both laterally and vertically. Here pay can be 30 to 40 feet thick and 1,200 feet or more in width. The tin content of this more dispersed, lower part of the placer is less; 54 churn-drill holes indicate average grades of 0.5 pounds (or less) tin per cubic yard. This lower grade part of the deposit does not extend downstream below about 100 feet surface elevation. Beach deposits with shell fragments were encountered in some churn-drill holes from lower parts of the placer deposit (at about 80-100 feet elevation). Reworking of alluvial deposits by beach processes may be reponsible for the more dispersed character of this part of the placer (Mulligan and Thorne, 1959, p. 47-48). Some of the placer concentrates are radioactive. Seven samples had eU contents of 0.003 to 0.021 %. This radioactivity is approximately proportional to the amount of monazite and xenotime that is present. Most of the radioactivity may be due to thorium but traces of uranium were identified in the samples (Mulligan, 1966, p. 62).

Alteration:

Workings/Exploration:
Hand, hydraulic, and power shovel operations have been conducted along the lower 4,500 feet of the active drainage. Premining exploration data have not been recorded. Mulligan (1966) traced detrital cassiterite from areas of previous mining to upstream/upslope lode sources. A proposed churn-drilling program to explore for a deeper channel along the south side of the drainage was not carried out at the time (Mulligan, 1966, p. 67-68).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: Yes **Status:** Inactive

Production notes:
Between 132 and 656 short tons of tin; primarily during the period 1924 to 1940 (Mulligan, 1966, p. 8).

Reserves:
The lower 4,500 feet of the 1.25 mile-long active drainage of Goodwin Gulch has been mined; the volume of material remaining upstream is small.

Additional comments:

References:
Mulligan and Thorne, 1959; Mulligan, 1966; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983.

Primary reference: Mulligan and Thorne, 1959; Mulligan, 1966

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Goodwin Creek; including tributaries Wales Creek and Percy Gulch

Site Type: Prospect

ARDF no. TE005

Latitude: 65.59

Quadrangle: TE C-6

Longitude: 167.9

Location description and accuracy:
Goodwin Creek, with headwaters one mile east of the uplands of Cape Mountain, flows northward from the continental divide to Lopp Lagoon. Its headwater origin (180 feet elevation) is adjacent to the continental divide and only about 0.5 miles from the headwaters of both Cape Creek and Lagoon Creek which flow southward to the Bering Sea. Wales Creek (not identified on existing maps) may be the first tributary downstream from Goodwin Gulch (TE004). The location of Percy Gulch (Cobb, 1975), apparently another tributary to Goodwin Creek, is not known. Goodwin Creek is included in locality 24 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the names 'Goodwin Cr.' and 'Percy Gulch'.

Commodities:
Main: Sn

Other:

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Sanford, 1948) further downstream below the mouth of Wales Creek (not located on existing maps, see location above), identify another 1000 foot-long pay streak which averages one pound tin per cubic yard (Mulligan, 1966, p. 19). Wales Creek is reported to have yielded several hundred pounds of tin-bearing concentrate to hand mining of a small depression at the headwater forks (Mulligan, 1966, p. 21).

Alteration:

Workings/Exploration:
Primarily widely spaced USBM churn-drill holes.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: Yes

Status: Inactive

Production notes:
Very minor; perhaps some near the mouth of Goodwin Gulch and several hundred pounds of tin-bearing concentrate from the headwater forks of Wales Creek.

Reserves:
Not defined; a narrow pay streak has been locally identified.

Additional comments:

References:

Heide and Sanford, 1948; Mulligan and Thorne, 1959; Mulligan, 1966; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Heide and Sanford, 1948; Mulligan, 1966

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Cape Creek; American Tinfields, Inc.

Site Type: Mine

ARDF no. TE006

Latitude: 65.571 **Quadrangle:** TE C-6

Longitude: 167.931

Location description and accuracy:
Cape Creek, the principal drainage on the east side of the Cape Mountain upland, has headwaters in the contact zone of the Late Cretaceous Cape Mountain biotite granite (Hudson and Arth, 1983) with Mississippian marble (Sainsbury, 1972). The creek flows south about 2 miles from its headwaters at the continental divide to its mouth at Tin City on the Bering Sea coast. The upper reaches of the creek include a west fork with headwaters in the uplands of Cape Mountain and an east fork with headwaters against the continental divide. First Chance Creek (TE007) is a short (0.5 mile long) tributary that enters from the west 0.75 mile upstream from the mouth of Cape Creek. This is locality 25 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the names 'Cape Cr.' and 'American Tinfields, Inc.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Cape Creek, the principal drainage on the east side of the Cape Mountain upland, has headwaters in the contact zone of the Late Cretaceous Cape Mountain biotite granite (Hudson and Arth, 1983) with Mississippian marble (Sainsbury, 1972). Private company and USBM churn-drill holes defined upper and lower pay sections along most of Cape Creek including the lower part of the east fork. The upper pay streak was related to the active stream drainage, did not have extensive overburden, and contained a few to several ponds of tin per cubic yard. The lower pay streak, separated from the upper by up to 65 feet of silt and minor sand containing marine shells, was 7 feet or less in thickness, developed on and adjacent to bedrock, and high grade in most places. Grades to over 30 pounds of tin per cubic yard were reported by Mulligan and Thorne (1959, p. 40). Mining during the 1970's and 1980's by Lost River Mining Company verified grades of about 30 pounds of tin per cubic yard over large parts of this pay streak (R. Murray, personal communication in Hudson and Reed, 1997, p. 451). Development of these high grades has been attributed to reworking during the marine transgression that flooded the area and led to the thick silt-rich marine section in Cape Creek (Hudson and Reed, 1997, p. 451-452). Some of the detrital cassiterite is very coarse grained. Washing plant operations in 1982 included a 1.5 inch grizzley and hand picking of the oversize conveyor belt was required to collect coarse aggregates of cassiterite crystals. The largest cassiterite aggregate found in this way weighed 142 pounds (R. Murray, personal communication in Hudson, 1984, p. 8). Some of the cassiterite aggregates are an assemblage of cassiterite, muscovite, quartz, and feldspar (Hudson, 1984, p. 16). The character of this material is consistent with its derivation from lode deposits on slopes above the west headwater of Cape Creek (Mulligan and Thorne, 1959; Mulligan, 1966)

Alteration:

Workings/Exploration:

A churn-drill exploration program defined both upper and lower pay streaks before larger scale mining (Mulligan and Thorne, 1959). Early mining was by hand in the west headwater. Power shovels were used later and the recovered pay was hauled by truck to the beach for washing. The latest mining used a dragline to remove overburden, a dozer to consolidate pay in the pit, and a front-end loader to transport pay to a nearby washing plant. Cassiterite-bearing concentrate was placed in 55 gallon barrels and transferred by crane to barges on the beach for transfer to a coastal freighter anchored nearby.

Age of mineralization:

Quaternary

Deposit model:

Alluvial tin placer (Cox and Singer, 1986; model 39e)

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

39e

Production: Yes **Status:** Inactive

Production notes:

Most of the recorded 1,650 short tons of tin production from the Cape Mountain area (Hudson and Reed, 1997, p. 452) has come from Cape Creek ; over 60% of the total production (1,036 tons) took place between 1979 and 1989 (Bundzten and others, 1990, p. 33). Goodwin Gulch, with between 132 and 650 tons of tin production, has been the only other significant placer source in this area.

Reserves:

Unkown but extensive mining took place in the 1970's and 1980's. Most of the placer deposits, especially the higher grade portions, are probably mined out (Bundzten and others, 1990, p. 33).

Additional comments:

References:

Heide and Sanford, 1948; Mulligan and Thorne, 1959; Mulligan, 1966; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983; Hudson, 1984; Bundzten and others, 1990, Hudson and Reed, 1997

Primary reference: Mulligan and Thorne, 1959; Hudson, 1984; Hudson and Reed, 1997

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): First Chance Creek; American Tinfields, Inc.

Site Type: Mine

ARDF no. TE007

Latitude: 65.569

Quadrangle: TE C-6

Longitude: 167.94

Location description and accuracy:
First Chance Creek is a west tributary to Cape Creek (TE006) located 0.75 miles upstream from the mouth of Cape Creek mouth at Tin City on the Bering Sea coast. This is a small, 0.5 mile long drainage whose headwaters do not extend to the uplands of Cape Mountain to the west. First Chance Creek was included as part of locality 25 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the names 'Cape Cr.' and 'American Tinfields, Inc.'.

Commodities:
Main: Sn

Other:

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Thin overburden (1 - 6 feet) overlies a thin (3 - 5 feet) gravel section on Mississippian limestone bedrock (Sainsbury, 1972). Churn-drill holes and shafts indicated grades between 0.5 and 4 pounds of tin per cubic yard (Mulligan and Thorne, 1959, p. 44) and an average grade of one pound of tin per cubic yard in the lower 1,500 feet of the drainage and traces of tin above (Mulligan, 1966, p. 20). Mulligan and Thorne (1959, p. 21) noted that some of the detrital cassiterite was coarse and attached to gangue minerals (not described) suggesting to them a local lode source rather than transport from Cape Mountain uplands to the west or north. This led to detrital cassiterite mapping in the area of First Chance Creek and discovery of the First Chance Creek Valley lode tin occurrence (TE010) between First Chance Creek and Sarah Creek (Mulligan, 1966, p. 21-22).

Alteration:

Workings/Exploration:
The lower 1,500 feet of the drainage has been mined by various surface, non-float methods.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: Yes

Status: Inactive

Production notes:
Production is a small part of the total 1,650 short tons of tin produced from placers in the Cape Mountain area (Hudson and Reed, 1997, p. 452).

Reserves:
Not defined; the lower 1,500 feet of the drainage has been mined.

Additional comments:

Hudson and Reed (1997) have concluded that a marine transgression affected the Cape Creek area and contributed to higher grades in the pay streak on bedrock that is present there. This transgression would have also affected First Chance Creek although evidence of it in the form of marine deposits has not been noted in the previous work.

References:

Heide and Sanford, 1948; Mulligan and Thorne, 1959; Mulligan, 1966; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983; Hudson, 1984; Hudson and Reed, 1997

Primary reference: Mulligan and Thorne, 1959; Mulligan, 1966

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Cape Creek Beach; American Tinfields, Inc.

Site Type: Prospect

ARDF no. TE008

Latitude: 65.559 **Quadrangle:** TE C-6

Longitude: 167.947

Location description and accuracy:
This prospect is located at the mouth of Cape Creek (TE006) where it drains across the modern and recent beach deposits at Tin City on the Bering Sea coast. This area was included as part of locality 25 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the names 'Cape Cr.' and 'American Tinfields, Inc.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
These deposits have formed from the reworking of alluvial deposits by recent shorelines at the mouth of Cape Creek. Seventy-four churn-drill holes define a fan-shaped area of about 25 acres of cassiterite-bearing, wave-worked beach deposits peripheral to the Cape Creek drainage where it crosses a 1,000 foot -wide coastal zone before entering Bering Sea. This low coastal zone is a former lagoon that is now filled with prograded beach deposits. The tin-bearing deposits are 4 to 26 feet thick and commonly 10 to 15 feet thick. The churn-drill holes extended to bedrock. The beach deposits are frozen except along the modern beach. Tin grades in the beach placer are low; commonly a few hundreths to a few tenths pound of tin per cubic yard (Mulligan and Thorne, 1959, p. 46-47).

Alteration:

Workings/Exploration:
Exploration has included 74 churn-drill holes that delineate the deposit (Mulligan and Thorne, 1959, p. 45-47).

Age of mineralization:
Quaternary

Deposit model:
Beach tinplacer (related to alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined; tin grades are too low to have justified mining in the past.

Additional comments:

References:

Heide and Sanford, 1948; Mulligan and Thorne, 1959; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan and Thorne, 1959

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Bartels Mine; Cape Mountain; Canoe; Percy Lode

Site Type: Mine

ARDF no. TE009

Latitude: 65.587 **Quadrangle:** TE C-6

Longitude: 167.959

Location description and accuracy:
This is an area of lode cassiterite mineralization at an elevation of about 1,000 feet, that straddles the ridge separating the headwaters of Cape Creek (TE006) and Goodwin Gulch (TE004); it is the source area for most of the cassiterite in the Cape Creek (TE006) and Goodwin Gulch (TE004) placers (Mulligan, 1966, p. 22). Several different cassiterite-bearing zones in bedrock are present within an area of about 2,000 feet long in a north-south direction and 800 feet across in an east-west direction; the area includes the Canoe prospect and Percy Lode (Mulligan, 1966, p. 22). This area was not identified separately by Cobb and Sainsbury (1972). Cobb summarized relevant references under the name 'Cape Mtn.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals: Arsenopyrite, clay, feldspar, fluorite, muscovite, pyrite, quartz, tourmaline

Geologic description:
The Bartel Mine area contains the most significant lode cassiterite mineralization known in the Cape Mountain area; it is the source area for the Cape Creek and Goodwin Gulch placers that produced about 1,670 short tons of tin. The only lode production (6 short tons) from the Cape Mountain area is from the Bartel Mine.

The mineralized area straddles the contact of the Late Cretaceous Cape Mountain biotite granite (78.8 +/- 2.9 my; Hudson and Arth, 1983, p. 789) with Mississippian marble (Sainsbury, 1972). The mineralization includes cassiterite disseminated in tourmalinized granite, quartz-cassiterite grains in granite, and cassiterite-bearing lenticular pods in marble. Selvages and pods of toumalinized granite are developed locally along fractures and discontinuous small quartz veins; felsic dikes locally have tourmalinized margins. Cassiterite forms disseminations and clots in some of the tourmalinized rocks but much of this material contains only anomalous amounts of tin. In general, toumalinization is very minor in the area (Collier, 1904, p. 39; Hudson, 1984). Cassiterite-bearing quartz veins in granite are small, discontinous and locally developed. They have been identified in one area about 1,000 feet south of the Lucky Queen adit (Mulligan, 1966, p. 24). Here, USBM dozer trenches exposed clay-altered granite with minor quartz veins that generally contain just a few hundreths per cent tin although one 3-foot wide trench sample contained 1.34 % tin (Mulligan, 1966, p. 30). The most significant lode mineralization in the area is in the northeast contact zone of the Cape Mountain biotite granite with adjacent marble. Here discontinuous veins and pods of quartz, muscovite, and cassiterite are present along granite/marble contacts and more commonly within marble. Only minor mineralization appears to be developed solely within granite. The grade of these deposits can be very high but their individual size is small. The largest individual deposit that has been identified is about 150 feet long and a few to 66 inches wide (Heide and others, 1946). The average width of this deposit is 17 inches and the average grade (as determined from 18 trench samples) is 7.24 % tin (Heide and others, 1946, p. 10). The cassiterite is commonly in coarse aggregates of subhedral to euhedral crystals. This type of mineralization appears to be the principal source of placer cassiterite in nearby Cape Creek and Goodwin Gulch.

Boron, fluorine, and arsenic geochemically characterize the mineralization in this area (Hudson, 1984, p. 12). Two high grade samples (6.3 and 11.8 % tin) collected from USBM trenches contained greater than 1,000 ppm arsenic, variable boron contents (9,380 and 235 ppm respectively), and moderate amounts of fluorine (2,800 and 650 ppm respectively). In fourteen samples from the mineralized area (including the two high grade samples above; Hudson, 1984, p. 14), base metals have low to anomalous concentrations, tungsten ranges up to 610 ppm, and tantalum ranges from 3 to 14 ppm. Hydrothermal alteration or calc-silicate development is conspicuously not widespread or extensively developed in the area. Knopf (1908, p. 37-38) describes local granite pegmatites with thin pyroxene-fluorite-quartz-calcite hornfels along contacts with marble; scheelite and pyrrohotite are present as sparse, scattered grains in this hornfels.

Alteration:

Alteration at Cape Mountain is conspicuous by its absence. Clay development has been noted along fractures and bedding and minor tourmaline replacement of granite is present along some contacts. Tourmaline may also be disseminated in marble adjacent to granite. Minor skarn development includes pyroxene-fluorite +/- quartz, calcite, scheelite, scapolite, and pyrrohotite selvages in marble adjacent to small granite pegmatites. Calcite-muscovite-fluorite-tremolite rocks found on mine dumps may be a replacement selvage in marble but they are not abundant in the area. Discontinuous and small quartz veins also contain muscovite, some tourmaline, and locally abundant iron-oxide. However, many altered fractures or veins consisting of gossanous quartz+/-tourmaline contain only anomalous amounts of tin. The only sulfide mineral that is commonly present is arsenopyrite, both as disseminations in yellow-orange weathering seriate granite and in vein assemblages.

Workings/Exploration:

The adits and drifts of the Bartels Mine extended up to 1,150 feet in combined length (Steidtmann and Cathcart, 1922). Five short diamond-drill holes and several dozer trenches were completed by the USBM (Heide and others, 1946). The USBM also completed detrital cassiterite mapping on slopes periperial to the mine area (Mulligan, 1966).

Age of mineralization:

Late Cretaceous; the mineralization is interpreted to be linked to the evolution of the Cape Mountain biotite granite which has been determined to be 78.8 +/- 2.9 my old by the K/Ar method (Hudson and Arth, 1983, p. 769).

Deposit model:

Cassiterite-bearing veins and pods in marble, at marble/granite contacts, and in granite. Some pegmatite characteristics may be present. Generally related to tin vein model (Cox and Singer, 1986; model 15b)

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

15b

Production: Yes, small **Status:** Inactive

Production notes:

Six short tons of tin are reported to have been produced from the Bartels Mine in 1905 or 1906 (Heide and others, 1946; Mulligan, 1966, p. 8).

Reserves:

Not defined but mining has been minimal.

Additional comments:

Although scattered small grains of scheelite were identified in pyroxene-fluorite hornfels/skarn by Knopf (1908, p. 38), tungsten is generally present in only anomalous amounts. Tungsten was not a significant component of placer concentrates from Cape Creek or Goodwin Gulch.

References:

Collier, 1904; Knopf, 1908 (USGS B 358); Steidtmann and Cathcart, 1922; Heide and others, 1946; Mulligan, 1966; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983; Hudson, 1984

Primary reference: Heide and others, 1946; Mulligan, 1966; Hudson, 1984

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on south side of First Chance Creek valley)

Site Type: Occurrence

ARDF no. TE010

Latitude: 65.568 **Quadrangle:** TE C-6

Longitude: 167.951

Location description and accuracy:
This lode tin occurrence is located at about 200 feet elevation on the low divide between First Chance and Sarah Creeks. First Chance Creek is the small west tributary located 0.75 miles upstream from the mouth of Cape Creek (TE006) at Tin City on the Bering Sea coast. This location was not included separately by Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Felsic dikes to 100 feet wide cross cut Mississippian marble (Sainsbury, 1972) on the low divide between First Chance and Sarah Creeks (Mulligan, 1966, p. 22). Detrital cassiterite mapping suggests that the area containing the dikes is a source of at least some of the placer cassiterite recovered from First Chance Creek (Mulligan, 1966, p. 21). A 175 foot-long dozer trench was opened across one of these dikes. Composite samples from this trench all indicate low but anomalous tin concentrations of 0.01 to 0.06 % (Mulligan, 1966, p. 31). The sample descriptions suggest that the dike is altered, primarily near its contacts where oxidation and clay development is noted. Marine transgressions may have influenced the lower pay streak on nearby Cape Creek (Hudson and Reed, 1997, p. 451-452) and possibly First Chance Creek (TE007). This lode occurrence is at an elevation of 200 feet which is above the highest level of marine deposits that are known in Cape Creek. (TE006). However, this occurrence is located on a marine terrace surface that has a shoreline angle elevation of about 500 feet in this area. The degree to which this higher sea level stand may have influenced the distribution of detrital cassiterite in the First Chance and Cape Creek areas is not known.

Alteration:
Oxidation and clay development have been noted in the felsic dike.

Workings/Exploration:
A 175 foot-long dozer trench crosscuts a 100 foot-wide felsic dike at one location. Detrital cassiterite mapping has been completed in the First Chance Creek drainage (Mulligan, 1966).

Age of mineralization:
Late Cretaceous; tin metallization in the Cape Mountain area is interpreted to be linked to evolution of the Cape Mountain biotite granite that has been determined to be 78.8 +/- 2.9 my by the K/Ar method (Hudson and Arth, 1983, p. 769).

Deposit model:
Lode tin occurrence (generally related to tin vein model of Cox and Singer, 1986; model 15b)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
Not a strong analog to deposit models; possibly tin veins, model 15b

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined, identified grades are low

Additional comments:

References:
Mulligan, 1966; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Mulligan, 1966

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on north side of Cape Creek valley)

Site Type: Occurrence

ARDF no. TE011

Latitude: 65.583 **Quadrangle:** TE C-6

Longitude: 167.941

Location description and accuracy:
This lode tin occurrence is located at 500 feet elevation on the south flank of the ridge between the headwaters of Cape Creek (TE006) and Goodwin Gulch (TE004). Detrital cassiterite mapping in the headwaters of Cape Creek led to discovery of the mineralized outcrops (Mulligan, 1966, p. 22-23). This location is 3,750 feet upstream from the mouth of the west headwater fork of Cape Creek; it was not identified as a separate location by Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals: Unidentified green segregations

Geologic description:
This area is in Mississppian marble (Sainsbury, 1972) peripheral to the Late Cretaceous Cape Mountain biotite granite stock (Hudson and Arth, 1983). A small granite intrusion, identified over about a 20-foot length in a dozer trench, is apparently altered and associated with some mineralized (?) marble. The dozer trench, 145 feet long, is mostly in blocky, gray, limestone (marble) but clay alteration and 'green segregations in clay' are noted in the field descriptions (Mulligan, 1966, p. 32). Samples from the portion of the trench exposing granite and clay contained 0.01 % tin; the green segregations in clay contained 0.69 % tin (Mulligan, 1966, p. 32).

Alteration:
Much clay alteration appears to be developed.

Workings/Exploration:
A 20-foot zone of granite and clay alteration is exposed within a 145- foot dozer trench. Detrital cassiterite mapping has been completed in the east headwater fork of Cape Creek.

Age of mineralization:
Late Cretaceous; tin metallization in the Cape Mountain area is interpreted to be linked to evolution of the Cape Mountain biotite granite that has been determined to be 78.8 +/- 2.9 my by the K/Ar method (Hudson and Arth, 1983, p. 769).

Deposit model:
Lode; cassiterite in altered granite. Analogy to deposit models not clear

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

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1966; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Mulligan, 1966

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied geology

Last report date: 5/10/98

Site name(s): Kigezruk Creek

Site Type: Occurrence

ARDF no. TE012

Latitude: 65.518 **Quadrangle:** TE C-6

Longitude: 167.717

Location description and accuracy:
Kigezruk Creek is a 2.5 mile-long, south-southwest flowing stream whose mouth is on the Bering Sea coast about 7 miles east of Tin City and 2.2 miles west of York. It is located at the major fork in the creek, about 0.6 mile upstream from the mouth. This is locality 34 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Kigezruk Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite (?)

Gangue minerals:

Geologic description:
Bedrock in the drainage is a slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age that is locally intruded by altered mafic bodies (Sainsbury, 1972). A trace and 0.01 pounds of tin per cubic yard were found in heavy mineral concentrates from two USBM churn-drill holes (Mulligan, 1959, p. 21). Heavy minerals that were identified included pyrite, magnetite, ilmenite, and tourmaline; cassiterite was not identified. Overburden is not present and the stream gravels over bedrock are only 3 to 4.5 feet thick. Gold has been reported from this creek but its presence was not confirmed by USBM churn-drilling.

Alteration:

Workings/Exploration:
Two USBM churn drill holes have been completed here.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on Baituk Creek)

Site Type: Occurrence

ARDF no. TE013

Latitude: 65.518

Quadrangle: TE C-6

Longitude: 167.783

Location description and accuracy:
Baituk Creek is a south-southwest flowing stream about 6 miles long, that enters the Bering Sea about 5.5 miles east of Tin City and 3.7 miles west of York. This location is at the mouth of the creek. It is locality 33 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Baituk Cr.'.

Commodities:
Main: Sn, Au

Other:

Ore minerals: Cassiterite, gold

Gangue minerals:

Geologic description:
Bedrock in the drainage is a slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age locally intruded by altered mafic bodies (Sainsbury, 1972). The one USBM churn-drill hole completed at this location encountered 15 feet of gravel above bedrock. Heavy mineral concentrates from this drill hole contained a trace of tin and gold. The heavy minerals included garnet, limonite psuedomorphs after pyrite, pyrite, ilmentite, magnetite, augite, tourmaline, hornblende, zircon, epidote, sphene, hypersthene, staurolite, cassiterite, and gold.

Alteration:

Workings/Exploration:
One USBM churn-drill hole has been completed here.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None

Status: Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on Baituk Creek)

Site Type: Occurrence

ARDF no. TE014

Latitude: 65.528

Quadrangle: TE C-6

Longitude: 167.765

Location description and accuracy:
Baituk Creek is a south-southwest flowing stream about 6 miles long, that enters the Bering Sea about 5.5 miles east of Tin City and 3.7 miles west of York. This location is one mile upstream from the mouth of the creek. It is locality 32 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Baituk Cr.'.

Commodities:
Main: Sn, Au

Other:

Ore minerals: Cassiterite, gold

Gangue minerals:

Geologic description:
Bedrock in this drainage is a slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age locally intruded by altered mafic bodies (Sainsbury, 1972). The two USBM churn-drill holes completed at this location encountered 5 and 8.5 feet of gravel above bedrock. Heavy mineral concentrates from these drill holes contained a trace of tin and one contained detectable gold. The heavy minerals included pyrite, limonite psuedomorphs after pyrite, augite, magnetite, ilmenite, apatite, hornblende, and cassiterite.

Alteration:

Workings/Exploration:
Two USBM churn-drill holes have been completed here.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None

Status: Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on Baituk Creek)

Site Type: Occurrence

ARDF no. TE015

Latitude: 65.544 **Quadrangle:** TE C-6

Longitude: 167.719

Location description and accuracy:
Baituk Creek is a south-southwest flowing stream about 6 miles long, that enters the Bering Sea about 5.5 miles east of Tin City and 3.7 miles west of York. This location is 2.75 miles upstream from the mouth of the creek and in proximity to the mouths of its tributaries, Eureka and Boulder Creeks. It is locality 31 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Baituk Cr.'.

Commodities:
Main: Sn, Au **Other:**

Ore minerals: Cassiterite, gold

Gangue minerals:

Geologic description:
Bedrock in the drainage is a slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age locally intruded by altered mafic bodies (Sainsbury, 1972). The two USBM churn-drill holes completed at this location encountered 5.5 feet of gravel over bedrock. Heavy mineral concentrates from these drill holes contained a trace of tin in one and 0.02 pounds of tin per cubic yard in the other; one contained detectable gold. The heavy minerals included pyrite, limonite psuedomorphs after pyrite, augite, magnetite, ilmenite, apatite, zircon, tourmaline, cassiterite and gold. Two prospect pits, neither of which reached bedrock, did not contain detectable tin, eU, or gold.

Alteration:

Workings/Exploration:
Two USBM churn-drill holes were completed on Baituk Creek and two prospect pits were dug, one each at the mouth of Boulder and Eureka Creeks.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on Baituk Creek)

Site Type: Occurrence

ARDF no. TE016

Latitude: 65.565

Quadrangle: TE C-6

Longitude: 167.713

Location description and accuracy:
Baituk Creek is a south-southwest flowing stream about 6 miles long, that enters the Bering Sea about 5.5 miles east of Tin City and 3.7 miles west of York. This location is 4.25 miles upstream from the mouth of the creek. It is locality 30 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Baituk Cr.'.

Commodities:
Main: Sn, Au

Other:

Ore minerals: Cassiterite, gold

Gangue minerals:

Geologic description:
Bedrock in the drainage is a slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age locally intruded by altered mafic bodies (Sainsbury, 1972). The three USBM churn-drill hole completed at this location encountered 4 to 5 feet of gravel over bedrock. Heavy mineral concentrates from these drill holes contained a trace of tin and one contained a trace of gold. The heavy minerals included pyrite, limonite psuedomorphs after pyrite, augite, cassiterite and gold. A sample from a prospect pit on Justice Creek contained 0.003 % eU and a trace of gold. Two other prospect pits in the area failed to reach bedrock and samples from them did not contain uranium or gold values.

Alteration:

Workings/Exploration:
Three USBM churn-drill holes on Baituk Creek and three prospect pits, one each in the headwater drainage of Baituk Creek and the headwater tributaries, Fremont and Justice Creeks, were completed in this area.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None

Status: Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Lynx Creek

Site Type: Occurrence

ARDF no. TE017

Latitude: 65.644 **Quadrangle:** TE C-6

Longitude: 167.719

Location description and accuracy:
Lynx Creek is a stream about two miles west of Potato Mountain (TE024) that flows northwestward from headwaters on the continental divide to its mouth on Lopp Lagoon. Lynx Creek headwaters have four major tributaries and none directly drain uplands of Potato Mountain. This occurrence was not identified separately by Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite (?)

Gangue minerals:

Geologic description:
Bedrock in the drainage is a slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age locally intruded by altered mafic bodies (Sainsbury, 1972). Mulligan (1966, p. 19 and 33) reports 0.03 pound tin per cubic yard from one sample site (of unknown type) at about 140 feet elevation on this drainage. This extends the area of low level detrital tin occurrences westward two or more miles from drainages with headwaters in the uplands of Potato Mountain. The elevation of this sample site is close to that of a Pleistocene strandline (150 to 200 feet) that has been inferred from geomorphic features 2 miles to the northeast where Potato Creek flows onto the lowlands adjacent to Lopp Lagoon (Hudson and Reed, 1997, p. 454).

Alteration:

Workings/Exploration:
One sample site of unknown type is reported by Mulligan (1966, p. 19 and 33).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:

Mulligan, 1966; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Reed, 1997

Primary reference: Mulligan, 1966

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Potato Creek

Site Type: Prospect

ARDF no. TE018

Latitude: 65.661 **Quadrangle:** TE C-6

Longitude: 167.641

Location description and accuracy:
Potato Creek extends northward 6 miles from headwaters on the south side of Potato Mountain (TE024) to its mouth on Lopp Lagoon. Although elevations on maps in older USBM reports do not appear to closely match modern topographic maps, the placer tin concentration is reasonably well located by the location of USBM churn-drill holes relative to topographic features along the drainage. Placer tin has been identified between about 150 feet and 250 feet elevation along the drainage. This is locality 26 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Potato Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals: Hematite, magnetite, pyrite

Geologic description:
Bedrock in the headwaters of Potato Creek is thermally metamorposed thin-bedded metapelite, metasandstone, and minor impure metacarbonate rocks of unknown but probable Paleozoic age. These rocks makeup the relatively resistant upland of Potato Mountain that is interpreted to be underlain at depth by biotite granite (Hudson and Reed, 1997, p. 454). The creek has 0 to 24 feet of overburden on top of 2 to 10 feet of gravel over bedrock. Tin concentrations of 0.05 to 0.54 pounds per cubic yard were identified in churn-drill holes from an elevation of 250 feet downstream to an elevation of about 150 feet.. Tin was not found at higher elevations along the creek. The downstream limits of this placer concentration were not defined by the USBM churn-drilling. The 150 to 200 foot elevation area along this drainage is the approximate location of a Pleistocene strandline that is inferred from the general geomorphic character of the area (Hudson and Reed, 1997, p. 454).

Alteration:

Workings/Exploration:
The USBM completed 30 churn-drill holes along 8 lines spread out over about 1.5 miles of the creek (Heide and Rutledge, 1949).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Heide and Rutledge, 1949; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Reed, 1997

Primary reference: Heide and Rutledge, 1949

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Oakland Creek (formerly known as Diomede Creek)

Site Type: Prospect

ARDF no. TE019

Latitude: 65.675 **Quadrangle:** TE C-6

Longitude: 167.606

Location description and accuracy:
Oakland Creek (formerly known as Diomede Creek) drains 4.5 miles northwest 4.5 from headwaters on Potato Mountain (TE024) to its mouth on Lopp Lagoon. The location of placer tin concentrations along this drainage are approximately located; the elevations shown on maps in USBM reports do not seem to match those on modern topographic maps. This is locality 27 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Diomede Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Bedrock in the headwaters of Oakland Creek is thermally metamorposed thin-bedded metapelite, metasandstone, and minor impure metacarbonate rocks of unknown but probable Paleozoic age. These rocks makeup the relatively resistant upland of Potato Mountain that is interpreted to be underlain at depth by biotite granite (Hudson and Reed, 1997, p. 454). Three to ten feet of overburden are present on gravels that locally reach 37 feet of thickness. The USBM churn-drill results are for pay sections on bedrock that are generally 1 to 6 feet thick but in two holes the gravel and pay thickness were both much greater (27 and 35 feet of pay in gravel sections 34 and 37 feet thick respectively). Tin concentrations between 0.04 and 0.24 pounds of tin per cubic yard were returned from 12 of 17 USBM churn-drill holes (Heide and Rutledge, 1949, p. 20). The tin concentrations are higher in lower parts of the sampled drainage (elevations estimated to be between 150 to 200 feet). This is close to where a Pleistocene strandline has been inferred from the geomorphic character of the area (Hudson and Reed, 1997, p. 454).

Alteration:

Workings/Exploration:
The USBM completed 17 churn-drill holes to bedrock along 4 lines spread out over 5,600 feet of the drainage length (Heide and Rutledge, 1949).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Heide and Rutledge, 1949; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Reed, 1997

Primary reference: Heide and Rutledge, 1949

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Buck Creek; including Left Fork; West Fork; Peluk Creek; and upper Buck Creek

Site Type: Mine

ARDF no. TE020

Latitude: 65.643 **Quadrangle:** TE C-6

Longitude: 167.511

Location description and accuracy:
Buck Creek is the principal drainage on the east side of Potato Mountain (TE024) and the principal source of placer cassiterite production in this area. From headwaters against Potato Mountain, the stream drains 4 miles eastward to its mouth on Grouse Creek. Important tributaries to Buck Creek include Sutter Creek (TE021), Iron Creek (TE022) in the headwaters of Sutter Creek, Left Fork, West Fork, Peluk Creek, and upper Buck Creek. This is locality 29 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Buck Cr.' and 'Peluk Cr.'.

Commodities:
Main: Sn **Other:** Au (Sutter Creek to West Fork areas)

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Bedrock in the headwaters of Buck Creek is thermally metamorposed thin-bedded metapelite, metasandstone, and minor impure metacarbonate rocks of unknown but probable Paleozoic age. These rocks makeup the relatively resistant upland of Potato Mountain that is interpreted to be underlain at depth by biotite granite (Hudson and Reed, 1997, p. 454). Significant lode tin deposits are present in the headwaters of Buck Creek and its tributaries (Mulligan, 1965).

Placer cassiterite occurs throughout the active drainage of Buck Creek, from its headwaters against Potato Mountain to its mouth about 4 miles eastward on Grouse Creek. The alluvial gravels have been mined by two small bucket-line dredges along the present stream channel from the mouth at Grouse Creek westward for 15,000 feet. Hand mining took place for 1,500 feet further upstream. As noted by Mulligan (1965, p. 14-15), Buck Creek seems to contain a small amount of gravel for the size of its valley. The thickness of the gravel section is commonly only 4 to 6 feet and widths are about 200 feet. The gravels are well-sorted, contain few boulders over 1 foot in diameter, and little clay (Heide and Rutledge, 1949, p. 5). Overburden varies from 0 to 14 feet thick in USBM churn-drill holes. The grade of the productive gravel has been estimated to have averaged 2.9 pounds of tin per cubic yard (Heide and Rutledge, 1949, p. 21). Grades as high as 9.5 pounds of tin per cubic yard were identified locally by USBM churn-drilling (Heide and Rutledge, 1949, p. 11). Here as elsewhere on western Seward Peninsula, the gravels are fozen except along active steam courses.

Alteration:

Workings/Exploration:
The lower 15,000 feet of Buck Creek was mined by two small bucket-line dredges. Another 1,500 feet of the creek above the dredged area was mined by hand methods.

Post-mining churn-drilling by the USBM included 86 holes along the main drainage of Buck Creek and additional holes on tributaries.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: Yes **Status:** Inactive

Production notes:
Most of the 1,124 short tons of tin produced from the Potato Mountain area (Heide and Rutledge, 1949, p. 4) came from the placers of Buck Creek.

Reserves:
Post-mining churn drilling by the USBM identified small areas containing up to 5 pounds of tin per cubic yard (Heide and Rutledge, 1949).

Additional comments:

References:
Heide and Rutledge, 1949; Mulligan, 1965; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Reed, 1997

Primary reference: Heide and Rutledge, 1949

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Sutter Creek

Site Type: Mine

ARDF no. TE021

Latitude: 65.636 **Quadrangle:** TE C-6

Longitude: 167.509

Location description and accuracy:
Sutter Creek is the major east tributary to Buck Creek (TE020), the principal placer tin producer in the Potato Mountain (TE024) area. Iron Creek (TE022), with headwaters on Potato Mountain, is a headwater drainage of Sutter Creek. The mouth of Sutter Creek, almost on the eastern boundary of the Teller C-6 quadrangle, is at about 225 feet elevation on Buck Creek . This creek was included with locality 29 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Sutter Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Bedrock in the northern headwaters of Sutter Creek is thermally metamorposed thin-bedded metapelite, metasandstone, and minor impure metacarbonate rocks of unknown but probable Paleozoic age. These rocks makeup the relatively resistant upland of Potato Mountain that is interpreted to be underlain at depth by biotite granite (Hudson and Reed, 1997, p. 454). Significant lode tin deposits are present in the headwaters of Iron Creek, the northern headwater fork of Sutter Creek (Mulligan, 1965). The thin (1 to 10 feet thick) alluvial gravels of the active Sutter Creek drainage contain 0 to 1 pound of tin per cubic yard. Detrital cassiterite is present upstream from the previous workings to the fork with Iron Creek. The higher grades are present in the lower part of the drainage just upstream from areas of previous mining. Some of this tin is derived from the headwaters of Iron Creek but the higher grades in the lower part of the creek (including the area of previous mining) may be related to proximity to Buck Creek.

Alteration:

Workings/Exploration:
The lower 1,000 feet of Sutter Creek has been mined, probably by a combination of hand methods and dredging. Fifty USBM churn-drill holes on 12 lines were completed between the creek mouth and the fork with Iron Creek.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: Yes **Status:** Inactive

Production notes:
A small amount of the 1,124 short tons of tin that have been produced from placers in the Potato Mountain area came from lower Sutter Creek.

Reserves:
Not defined; only a few small areas of higher tin grades were identified by USBM churn-drilling.

Additional comments:

References:
Heide and Rutledge, 1949; Mulligan, 1965; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Reed, 1997

Primary reference: Heide and Rutledge, 1949

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Iron Creek

Site Type: Mine

ARDF no. TE022

Latitude: 65.645 **Quadrangle:** TE C-6

Longitude: 167.553

Location description and accuracy:
Iron Creek is the 1.3 mile-long north headwater tributary to Sutter Creek (TE021) that drains the east side of Potato Mountain (TE024) and the south side of the South Hill prospect (TE023). Its headwaters are against the highest part of Potato Mountain and separted by a small divide from the west fork of Buck Creek (TE020). This is locality 28 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Iron Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Bedrock in the headwaters of Iron Creek is thermally metamorposed thin- bedded metapelite, metasandstone, and minor impure metacarbonate rocks of unknown but probable Paleozoic age. These rocks makeup the relatively resistant upland of Potato Mountain that is interpreted to be underlain at depth by biotite granite (Hudson and Reed, 1997, p. 454). Its headwaters are adjacent to the most significant lode cassiterite mineralization in the area (Mulligan, 1965). This short headwater drainage has thin alluvial gravels, generally 4 to 5 feet thick, and a narrow pay streak that contained up to a few ponds of tin per cubic yard. Hand mining and sluicing took place along 1,500 feet of the creek channel starting about one half mile upstream from the confluence with Sutter Creek.

Alteration:

Workings/Exploration:
About 1,500 feet of the headwater reach has been hand mined; the pay streak was 4 to 5 feet thick and 15 to 20 feet wide. The USBM completed 22 churn-drill holes along 7 lines spread out over 3,200 feet of the drainage (Heide and Rutledge, 1949) and detrital cassiterite mapping in the headwaters to help define lode occurrences (Mulligan, 1965).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: Yes **Status:** Inactive

Production notes:
A small amount of the 1,124 short tons of tin that were produced from alluvial placers in the Potato Mountain area came from Iron Creek (Mulligan, 1965, p. 17).

Reserves:
One small area (200 x 600 feet in area and 5 feet thick), averages about 0.6 pounds of tin per cubic yard (Heide and rutledge, 1949, p. 15; Mulligan, 1965, p. 24).

Additional comments:

References:
Heide and Rutledge, 1949; Mulligan, 1965 (USBM RI 6587); Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Reed, 1997

Primary reference: Heide and Rutledge, 1949; Mulligan, 1965 (USBM RI 6587)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): South Hill (near Potato Mountain)

Site Type: Prospects

ARDF no. TE023

Latitude: 65.651 **Quadrangle:** TE C-6

Longitude: 167.553

Location description and accuracy:

This is the most significant area of exposed lode cassiterite mineralization in the Potato Mountain area. It is a 1,200 by 1,500 area centered on a small rounded hill (South Hill, 900 feet elevation) between the headwaters of Iron Creek (TE022) and the West and Left forks of Buck Creek (TE020). It is the principal source of placer cassiterite in these adjacent drainages. Locality 2 of Cobb and Sainsbury (1972) is plotted in the approximate location of the Daisy and Eureka prospects (see Potato Mountain, TE024); they did not separately identify the South Hill lode prospect on their map. Cobb (1975) summarized relevant references under the name 'Potato Mtn.'.

Commodities:

Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals: Arsenopyrtie, clay, pyrite, quartz, tourmaline

Geologic description:

Potato Mountain is an isolated upland of hornfels. The protolith for the hornfels is a sedimentary sequence of laminated to thinly bedded mudstone, siltstone, sandstone and some impure limestone that dips moderately (30 to 40 degrees) and is of unknown but probable Paleozoic age. These rocks have a slaty cleavage but are everywhere thermally recrystallized in the uplands of the Potato Mountain area. Although only one granite dike is known at the surface, the presence of a granite stock at depth is suggested by the large area of hornfels and by gravity data. A gravity profile and model across the Potato Mountain upland (McDermott, 1982; Hudson and Reed, 1997, figure 5B) indicate that a buried granite stock has an irregular, perhaps block-faulted upper surface at a depth of about 1,300 feet. Significant block faulting is also suggested by discontinuities in magnetic data for the area (McDermott, 1983). The cassiterite mineralization at Potato Mountain is inferred to be similar in age to other tin sytems of western Seward Peninsula. These tin systems are interpreted to be linked to the evolution of associated granite intrusions that are 70 to 80 my old (Hudson and Arth, 1983, p. 769).

Cassiterite occurs in quartz-toumaline +/- pyrite and arsenopyrite veinlets and replacements and as dessiminations in clay-altered zones (Mulligan, 1965; Hudson, 1983). The veinlets, up to a few inches in width, irregularly crosscut weakly to moderately tourmalinized hornfels, particularly near clay-altered zones. Small-scale replacement of mica-rich hornfels layers by very fine-grained dark tourmaline is common. Clay-rich, high-grade (to several per cent tin) zones extend to 300 feet along strike and are up to 20 feet wide. These high grade zones commonly have quartz and cassiterite within clay-rich alteration. All clay-rich surface samples (Mulligan, 1965) may have been affected by residual concentration of cassiterite during weathering. The density and orientation of the veinlets and clay-altered zones is not well defined but they seem to have steep to vertical dips. The Potato Mountain lode tin system that is presently exposed is geochemically characterized by a simple suite of elements; tin, boron, and arsenic are commonly anomalous in rock samples from throughout the area. Data for 36 grab and composite samples from the surface (Hudson, 1983, p. 10) show that tin ranges up to 6.3 %, arsenic in 18 samples is greater than 1,000 ppm, and boron contents are commonly several thousand to greater than 20,000 ppm. Fluorine has a range of 190 to 3,200 ppm and base metals, silver, and tantalum are not significant in the samples.

In 1990, Kennecott drilled two vertical diamond-drill holes on this prospect (Meyers, 1990). They were located at 925 feet elevation on the crest of South Hill. One (PMD-1A) reached a total depth of 57 feet before being lost due to equipment problems. The second (PMD-1B) was a twin located 2.5 feet to the west of the first hole; it reached a total depth of 1,353 feet before encountering a clay-altered zone that could not be penetrated with the equipment available. The following data are taken from Meyers (1990). PMD-1A encountered one zone of steeply dipping quartz-tourmaline-cassiterite veins in the interval 8 to 16.5 feet with a true thickness of 2 feet. This zone contained 3.16% tin, 0.73 % arsenic, and 4.6 ppm silver. PMD-1B encountered three intervals with 0.1% tin or more; (1) the interval between 10 and 28 feet (true thickness of 4 feet) contained 1.44% tin, 0.63% arsenic, 0.84% boron, 2,426 ppm fluorine, and 4.6 ppm silver; (2) the interval between 302 and 304 feet (true thickness of 1 foot) contained 0.125% tin, greater than 1% arsenic, greater than 1% boron, 1,322 ppm fluorine, and 3.9 ppm silver, and (3) the interval between 746 and 748 feet (true thickness of 1 foot) contained 0.2% tin, 0.08% arsenic, 0.21% boron, 1,140 ppm fluorine, and 0.2 ppm silver. The general character of the rocks changed with depth in PMD-1B. To a depth of 920 feet, the rocks were dominately hornfels with local quartz veins; from 920 to 1,277 feet, hornfels was more intensely developed and biotite-tourmaline bands and 'granitized' and skarn-like textures were present; and from 1,277 to 1,344 feet garnet and/or intense tourmaline with chlorite alteration was developed. From 1,344 to the bottom of the hole at 1,353 feet, a greenish sulfide-rich clay with 'skarn' clasts was encountered. These lithologic changes were reflected in the downhole geochemical profiles. Tin stayed at anomalous levels (between 50 and 200 ppm) though most of the hole but arsenic (increasing from 100 ppm or less to a few hundred ppm or more), fluorine (increasing from 800 ppm to 1,000 ppm levels to greater than 8,000 ppm), and silver (increasing from background levels of less than 0.1 ppm to background levels of 0.5 ppm) were clearly at higher concentrations in the part of the hole below 750 feet.

Alteration:

Tourmaline +/- pyrite and arsenopyrite replacement of layering in the hornfels is common. Hydrothermal clay alteration is superimposed on mineralized and altered rocks throughout the system, even to depths of 1353 feet in diamond-drill hole PMD-1B.

Workings/Exploration:

The USBM completed extensive detrital cassiterite mapping in the area and followed it up with many surface dozer trenches and related sampling (Mulligan, 1965). The USBM work also included the drilling of 5 short diamond-drill holes totalling 723 feet. Surface sampling and geophysical surveys for Anaconda Minerals Company were reported on by Hudson (1983) and McDermott (1982; 1983). Some of the later work was included by Hudson and Reed (1997). Two vertical diamond-drill holes (one to 57 feet and one to 1,353 feet) were completed in 1990 by Kennecott Exploration Inc. (Meyers, 1990).

Age of mineralization:

Late Cretaceous; the cassiterite mineralization at Potato Mountain is inferred to be similar in age to other tin sytems of western Seward Peninsula. These tin systems are interpreted to be linked to the evolution of associated granite intrusions that are 70 to 80 my old (Hudson and Arth, 1983, p. 769).

Deposit model:

Quartz-cassiterite veins in hornfels. Related to both the tin vein (15b) and tin greisen (15c) models of Cox and Singer (1986)

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

15b, 15c

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:

Steidtmann and Cathcart, 1922; Mulligan, 1965 (USBM RI 6587); Cobb and Sainsbury, 1972; Cobb, 1975; McDermott, 1982; Hudson and Arth,1983; Hudson, 1983; McDermott, 1983; Meyers, 1990; Hudson and Reed, 1997

Primary reference:

Mulligan, 1965 (USBM RI 6587); Hudson, 1983; Meyers, 1990; Hudson and Reed, 1997

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Potato Mountain;Quartz Porphry dike; Red Fox; Eureka; Daisy; Iron Creek valley; Big and Little Potato Mountain divide; and Iron Creek-Oakland Creek divide

Site Type: Prospects

ARDF no. TE024

Latitude: 65.664 **Quadrangle:** TE C-6

Longitude: 167.554

Location description and accuracy:
The Quartz Porphyry dike has some significance compared to the other minor prospects of the Potato Mountain area (Red Fox, upper Buck Creek valley, Eureka, Daisy, Iron Creek valley, Big and Little Potato Mountain divide, and Iron Creek-Oakland Creek divide, Mulligan, 1965, p. 69-70) because of recent diamond-drilling here (Meyers, 1990). It is located on the ridgecrest separating the headwaters of Peluk Creek (a north tributary to West Fork of Buck Creek) and the west tributary to Red Fox Creek. The elevation of the prospect area is approximately 1,050 feet. This locality was not identified separately by Cobb and Sainsbury (1972) but historical references for the general area (Potato Mountain) are sumarized by Cobb (1975) under the name 'Potato Mtn.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite (?)

Gangue minerals: Quartz, sulfide minerals, tourmaline

Geologic description:
The Quartz Porphyry dike area is part of the thermally metamorphosed upland of Potato Mountain. The protolith for the hornfels is a sedimentary sequence of laminated to thinly bedded mudstone, siltstone, sandstone and some impure limestone that is of unknown but probable Paleozoic age. These rocks have a slaty cleavage but are everywhere thermally recrystallized. The most prominent felsic dike of the general area is exposed here (Mulligan, 1965, figure 23). It is a light-gray porphyritic granite with medium- to coarse-grained quartz and feldspar phenocrysts in a very fine-grained groundmass. The groundmass and the feldspar phenocrysts are locally replaced by quartz, tourmaline, and sericite (Hudson, 1983).

The presence of a granite stock at depth is suggested by the large area of hornfels and by gravity data. A gravity profile and model across the Potato Mountain upland (McDermott, 1982; Hudson and Reed, 1997, figure 5B) indicate that a buried granite stock has an irregular, perhaps block-faulted upper surface at a depth of about 1,300 feet. Significant block faulting is also suggested by discontinuities in magnetic data for the area (McDermott, 1983).

Although old prospect pits are present in this area, Mulligan (1965, p. 69-70) could not confirm the presence of significant tin. Kennecott (Meyers, 1990) identified this area as an intensely altered zone spatially associated with the northeast-trending quartz porphyry dike. Diamond-drill hole PMD-2 was drilled vertically 998 feet here to test the altered zone. According to Meyers (1990), this hole (collar elevation of 1,100 feet) encountered hornfels from 0 to 180 feet; weakly argillized feldspar porphyry from 180 to 186 feet; hornfels from 186 to 268 feet; moderately argillized feldspar porphyry (268 to 274 feet), hornfels with possible skarn and probable intense tourmalinization from 274 to 974 feet; and greenish sulfide-rich clay with clasts of green-brown garnet or tourmalinized rock from 974 to 998 feet. The hole could not be continued through the clay-rich material and was terminated at 998 feet.

Tin values were weakly to moderately anomalous; 30 to 300 ppm with a high of 400 ppm throughout PMD-2. Boron was only locally high uphole but below 750 feet was generally in the 1000 to 2000 ppm range. Arsenic was generally in the 20 to 50 ppm range with local spikes to greater than 1 per cent; arsenic levels seemed to increase below 750 feet. Fluorine did increase downhole, from a 700 to 900 ppm range to 1,500 to 2,500 ppm below 500 feet. Silver variation was similar to fluorine; 0.1 to 0.2 ppm above 500 feet and 0.5 to 0.6 ppm below.

Other minor prospects in the Potato Mountain upland (including Red Fox, upper Buck Creek valley, Eureka, Daisy, Iron Creek valley, Big and Little Potato Mountain divide, and Iron Creek-Oakland Creek divide, Mulligan, 1965) are minor mineral occurrences, such as local quartz veining, and commonly the location of old prospecting pits. Subsequent work (Mulligan, 1965) did not identify them as significant.

Alteration:
Local argillic alteration and probably local weak to moderate tourmaline replacement.

Workings/Exploration:
Local surface pits and one 998 foot vertical diamond-drill hole

Age of mineralization:
Late Cretaceous; the tin metallization at Potato Mountain is inferred to be similar in age to other tin sytems of western Seward Peninsula. These tin systems are interpreted to be linked to the evolution of associated granite intrusions that are 70 to 80 my old (Hudson and Arth, 1983, p. 769).

Deposit model:
Altered hornfels with weak tin metallization and related hydrothermal alteration. Potential tin vein (model 15b) or tin greisen (model 15c) of Cox and Singer (1986) at depth.

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

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1965 (USBM RI 6587); Cobb and Sainsbury, 1972; Cobb, 1975; McDermott, 1982; Hudson and Arth,1983; Hudson, 1983; McDermott, 1983; Meyers, 1990

Primary reference: Mulligan, 1965 (USBM RI 6587); Meyers, 1990

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Grouse Creek

Site Type: Mine

ARDF no. TE025

Latitude: 65.629 **Quadrangle:** TE C-5

Longitude: 167.464

Location description and accuracy:
Grouse Creek is the major west tributary to the Mint River which drains northward about 20 miles to Lopp Lagoon from headwaters in the York Mountains. The 5,000 foot-long segment from the mouth of Buck Creek (TE020) downstream to the mouth of East Fork has produced placer cassiterite. This part of Grouse Creek was included with locality 29 of Cobb and Sainsbury (1972). The historical references for this locality were summarized under the name 'Grouse Cr.' by Cobb (1975).

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals: Hematite, magnetite, pyrite

Geologic description:
Bedrock in the headwaters of Buck Creek (TE020), the major east tributary and the apparent source of placer cassiterite on Grouse Creek, is thermally metamorposed thin-bedded metapelite, metasandstone, and minor impure metacarbonate rocks of unknown but probable Paleozoic age. These rocks makeup the relatively resistant upland of Potato Mountain that is interpreted to be underlain at depth by biotite granite (Hudson and Reed, 1997, p. 454). Significant lode tin deposits are present in the headwaters of Buck Creek and its tributaries (Mulligan, 1965). Alluvial gravels of the active Grouse Creek drainage have been mined by a small bucket-line dredge over about 5,000 feet of the stream channel from the mouth of Buck Creek downstream to the mouth of East Fork. USBM churn-drilling showed Grouse Creek gravels to be thin (2 to 9 feet) and some local unmined portions to have as much as 6.7 pounds of tin per cubic yard (Heide and Rutledge, 1949, p. 9). Most of the remaining unmined gravels contain a few hundreths to a few tenths pound tin per cubic yard. The downstream limit of pay seems to be at an elevation of 150 to 200 feet and Mulligan (1965, p. 14-15) has considered the possibility that a high sea level stand may have influenced tin distribution in this area. All the gravels are frozen except for those in proximity to the active stream

Alteration:

Workings/Exploration:
Alluvial gravels of the active Grouse Creek drainage have been mined by a small bucket-line dredge over about 5,000 feet of the stream channel from the mouth of Buck Creek downstream to the mouth of East Fork. The USBM completed 22 churn-drill holes along 8 lines spread out over 6,000 feet of the drainage, from the mouth of Buck Creek downstream to below the mouth of East Fork.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: Yes **Status:** Inactive

Production notes:
A portion of the 1,124 short tons of tin produced from the placers of the Potato Mountain area came from Grouse Creek.

Reserves:
Only local unmined areas containing tin grades greater than 1 pound per cubic yard were identified by USBM churn-drilling.

Additional comments:

References:
Heide and Rutledge, 1949; Mulligan, 1965 (USBM RI 6587); Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Heide and Rutledge, 1949

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Ishut Creek

Site Type: Occurrence

ARDF no. TE026

Latitude: 65.564 **Quadrangle:** TE C-6

Longitude: 167.612

Location description and accuracy:
Ishut Creek is a major, south-flowing headwater tributary to the Anikovik River; their confluence is about 4 miles upstream from the mouth of the Anikovik River at York on the Bering Sea. This locality, where 2 USBM churn-drill holes contained trace amounts of scheelite, is about 2.5 miles further upstream on Ishut Creek than locality 41 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Ishut Cr.'.

Commodities:
Main: W **Other:**

Ore minerals: Scheelite

Gangue minerals:

Geologic description:
Bedrock in the drainage is a slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age locally intruded by altered mafic bodies (Sainsbury, 1972). Heavy mineral concentrate from two USBM churn-drill holes contained pyrite, limonite psuedomorphs after pyrite, magnetite, apatite, tourmaline, zircon, and traces of scheelite (Mulligan, 1959, p. 19). Three churn-drill holes on lower Ishut Creek (about 0.3 miles upstream from the mouth) contained heavy mineral concentrates with pyrite, limonite psuedomorphs after pyrite, augite, ankerite and zircon. A trace of tin was detected but tin-bearing minerals were not identified (Mulligan, 1959, p. 18-19).

Alteration:

Workings/Exploration:
A total of five churn-drill holes were completed by the USBM on Ishut Creek in 1957 (Mulligan, 1959). Two of these were at the location of this occurrence and three were about 2.5 miles downstream (about 0.3 miles upstream from the mouth of Ishut Creek on Anikovik River).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:

Mulligan, 1959 (USBM RI 5520); Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Buckner Creek (tributary to Anikovik River); Buhner Creek

Site Type: Occurrence

ARDF no. TE027

Latitude: 65.534

Quadrangle: TE C-6

Longitude: 167.616

Location description and accuracy:
Ishut Creek is a major, south-flowing headwater tributary to the Anikovik River; their confluence is about 4 miles upstream from the mouth of the Anikovik River at York on the Bering Sea. This locality, where 2 USBM churn-drill holes contained trace amounts of scheelite, is about 2.5 miles further upstream on Ishut Creek than locality 41 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Ishut Cr.'.

Commodities:
Main: Sn, Au (?)

Other:

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Bedrock of the Anikovik River drainage includes two major assemblages (Sainsbury, 1972). Throughout most of the drainage, bedrock is a slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age locally intruded by altered mafic bodies. Ordovician limestone of the York Mountains makes up bedrock in the headwaters of the eastern tributaries. The USBM reported results from three churn-drill holes in this part of Anikovik River (Mulligan, 1959, p. 18-19); there was no overburden and only 3 to 4 feet of gravel over bedrock in these holes. The two upstream a short distance from the mouth of Buckner Creek had a trace of tin detected in the heavy mineral concentrates but only pyrite, limonite psuedomorphs after pyrite, augite, zircon, and garnet were identified minerals. The one churn-drill hole from the mouth of Buckner Creek contained heavy mineral concentrate with pyrite, limonite psuedomorphs after pyrite, hematite, augite, zircon, and cassiterite. Gold was not identified in any of these churn-drill holes.

Alteration:

Workings/Exploration:
Some early hand mining was attempted on Buckner Creek. The USBM completed 3 churn-drill holes in this area (Mulligan, 1959, p. 8).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: Yes; small

Status: Inactive

Production notes:

Reserves:

Additional comments:

References:

Mulligan, 1959 (USBM RI 5520); Cobb and Sainsbury; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Jarvis Creek (tributary to Anikovik River)

Site Type: Occurrence

ARDF no. TE028

Latitude: 65.524 **Quadrangle:** TE C-6

Longitude: 167.629

Location description and accuracy:
This locality is on Jarvis Creek just upstream of its confluence with the Anikovik River. Jarvis Creek is a 1-mile long west tributary to the Anikovik River that enters 3 miles upstream from the mouth of Anikovik River at York on the Bering Sea. This location is 0.6 miles downstream from the mouth of Buckner Creek (TE027), another west tributary to Anikovik River. It is approximately locality 38 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Anikovik R.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite (?)

Gangue minerals:

Geologic description:
Bedrock in the Jarvis Creek drainage is slaty metapelitic and metasandstone sequence (of unknown but probable Paleozoic age locally intruded by altered mafic bodies. Brooks (1901) reported cassiterite from the Anikovik River at approximately this locality (Cobb and Sainsbury, 1972; Cobb 1975) and two USBM churn-drill holes (no overburden and only 4 feet of gravel over bedrock) were completed here in 1957 (Mulligan, 1959). The churn-drill holes were located on each side of lower Jarvis Creek just upstream of its mouth on Anikovik River. Traces of tin were reported from the heavy mineral concentrate but the minerals identified from this locality were pyrite, limonite psuedomorphs after pyrite, augite, ankerite, zircon, and garnet (Mulligan, 1959, p. 18-19).

Alteration:

Workings/Exploration:
Two USBM churn-drill holes were completed at this locality (Mulligan, 1959).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments

References:
Brooks, 1901; Mulligan, 1959 (USBM RI 5520); Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Banner Creek (tributary to Anikovik River)

Site Type: Occurrence

ARDF no. TE029

Latitude: 65.523 **Quadrangle:** TE C-6

Longitude: 167.622

Location description and accuracy:
Banner Creek is an east tributary to the Anikovik River; their confluence is about 2.3 miles upstream from the mouth of the Anikovik River at York on the Bering Sea. The USBM completed three churn-drill holes on a line across this creek about 0.75 miles upstream from the mouth on Anikovik River. The churn-drill holes are just upstream of an unnamed south tributary to Banner Creek. This is locality 39 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Banner Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Banner Creek flows west from headwaters in Ordovician limestones of the York Mountains (Sainsbury, 1972) but most of its drainage is across a thin bedded metapelitic and metasandstone sequence of unknown but probable Paleozoic age. The USBM completed three churn-drill holes on a line across Banner Creek about 0.75 miles upstream from the mouth on Anikovik River; this location is just upstream of an unnamed south tributary to Banner Creek (Mulligan, 1959). The churn-drill holes encountered five feet of gravel on bedrock. Heavy mineral concentrates contained a trace of tin and included pyrite, limonite psuedomorphs after pyrite, ilmenite, tourmaline, zircon, augite, hematite, hypersthene, and cassiterite. Although first reports from this creek indicated the presence of some gold (Cobb, 1975), the USBM drilling did not encounter it. Mulligan (1959, p. 17) noted the presence of a felsic dike (with some sulfide minerals) in bedrock near the churn-drill locations.

Alteration:

Workings/Exploration:
Three USBM churn-drill holes have been completed here (Mulligan, 1959).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Brooks, 1901; Mulligan, 1959 (USBM RI 5520); Cobb and Sainsbury, 1972
Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Anikovik River

Site Type: Occurrence

ARDF no. TE030

Latitude: 65.505 **Quadrangle:** TE C-6

Longitude: 167.633

Location description and accuracy:
Anikovik River is a southwest-flowing stream, about 7 miles long, whose mouth is at York on the Bering Sea about 9 miles east of Tin City. This locality is on the main drainage of the river, about 1.5 miles upstream from the mouth at York. This is locality 37 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Anikovik R.'.

Commodities:
Main: Sn, Au, chromite **Other:**

Ore minerals: Cassiterite,chromite, gold

Gangue minerals:

Geologic description:
Anikovik River's eastern tributaries have headwaters in Ordovician limestone of the York Mountains (Sainsbury, 1972) whereas the main drainage and western tributaries are in areas underlain by a thin-bedded, slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age locally intruded by altered mafic bodies. The USBM completed three churn-drill holes in a line across Anikovik River at this locality (Mulligan, 1959). Heavy mineral concentrates from the five feet of gravel encountered here contained chromite (in one hole; 0.23 pounds of chromite per cubic yard containing 48 % Cr_2O_3), pyrite, limonite pseudomorphs after pyrite, olivine, augite, apatite, cassiterite, and gold. The gravels contain only a trace of tin.

Alteration:

Workings/Exploration:
Thre USBM churn-drill holes were completed here (Mulligan, 1959).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959 (USBM RI 5520); Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Deer Creek

Site Type: Occurrence

ARDF no. TE031

Latitude: 65.502 **Quadrangle:** TE C-6

Longitude: 167.654

Location description and accuracy:
Deer Creek is the second east tributary to the Anikovik River upstream 0.9 miles from the mouth of Anikovik River at York on the Bering Sea. York is about 9 miles east of Tin City. This is locality 36 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Deer Cr., trib. Anikovik R.'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the Deer Creek drainage is a sequence of thin-bedded, slaty metapelite and metasandstone of unknown but probable Paleozoic age that is locally intruded by altered mafic bodies. Brooks (1901, p. 134-135) reports the presence of placer gold and one gold nugget was also recovered from a limonitic nodule in carbonaceous slate.

Alteration:

Workings/Exploration:
Probably some attempts at small scale hand mining.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au-PGE placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes, small **Status:** Inactive

Production notes:
Yes, but probably very minor

Reserves:

Additional comments:

References:
Brooks, 1901; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Brooks, 1901

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Anikovik River Beach

Site Type: Mine

ARDF no. TE032

Latitude: 65.491

Quadrangle: TE B-6

Longitude: 167.669

Location description and accuracy:
This locality is at the mouth of the Anikovik River at York on the Bering Sea coast. York is about 9 miles east of Tin City. This is locality 35 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Anikovik R.'.

Commodities:
Main: Au, Sn

Other:

Ore minerals: Cassiterite, gold

Gangue minerals:

Geologic description:
Anikovik River's eastern tributaries have headwaters in Ordovician limestone of the York Mountains (Sinsbury, 1972) whereas the main drainage and western tributaries are in areas underlain by a thin-bedded, slaty metapelitic and metasandstone sequence of unknown but probable Paleozoic age locally intruded by altered mafic bodies . This locality is in the lower part of the river within 0.25 miles of the Bering Sea. The geomorphic character of this area suggests that at least some alluvial deposits of the Anikovik River have been reworked by shoreline processes but available descriptions are insufficient to evaluate this possibility. The two USBM churn-drill holes here (Mulligan, 1959), encountered only 3 and 4 feet of gravel and appear to have been in alluvial materials. A trace of tin was found in the heavy mineral concentrates from these churn-drill holes but the identified minerals only included pyrite, limonite pseudomorphs after pyrite, augite, ilmenite, magnetite, ankerite, and zircon (Mulligan, 1959, p. 19). Mulligan (1959, p. 5) reports that a small dredge worked in this area for 123 days during the 1914 and 1915 seasons. This dredge processed 156,000 cubic yards of gravel and recovered 1,217 ounces of gold and 1,600 pounds of concentrate containing 31% tin.

Alteration:

Workings/Exploration:
Mulligan (1959, p. 5) reports that a small dredge worked in this area for 123 days during the 1914 and 1915 seasons. This dredge processed 156,000 cubic yards of gravel and recovered 1,217 onces of crude gold and 1,600 pounds of concentrate containing 31% tin. Two USBM churn-drill holes were later completed in this area (Mulligan, 1959).

Age of mineralization:
Quaternary

Deposit model:
Alluvial and beach(?) Au-Sn placer (Cox and Singer, 1986; models 39a and 39c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a, 39c

Production: Yes

Status: Inactive

Production notes:

Reserves:

Additional comments:

References:

Mulligan, 1959 (USBM RI 5520); Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Lost River Beach

Site Type: Occurrence

ARDF no. TE033

Latitude: 65.391 **Quadrangle:** TE B-5

Longitude: 167.146

Location description and accuracy:
This locality is at the mouth of Lost River on the Bering Sea coast about 21 miles west of Brevig Mission. It is locality 44 of Cobb and Sainsbury (1972). It was not included by Cobb (1975).

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite (?)

Gangue minerals:

Geologic description:
Lost River is the main south-flowing drainage in the York Mountains. Bedrock in this drainage and its tributaries are various Ordovician limestone facies locally intruded by felsic and mafic dikes and granite stocks (Sainsbury, 1969). Although the lower part of this river is in an area where marine terraces are prominantly developed, this locality appears to be in alluvial gravels of the active drainage where it crosses the lowland adjacent to the present shoreline. One USBM churn-drill hole here encountered 5.5 feet of gravel over limestone bedrock that contained 0.09 pounds of tin per cubic yard (Mulligan, 1959, p. 13); information on the mineralogy of this material was not given.

Alteration:

Workings/Exploration:
One USBM churn-drill hole was completed here (Mulligan, 1959).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959 (USBM RI 5520); Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on Rapid River)

Site Type: Prospect

ARDF no. TE034

Latitude: 65.409 **Quadrangle:** TE B-5

Longitude: 167.179

Location description and accuracy:
This is the localtion of two USBM churn-drill holes on the lower part of Rapid River. Rapid River is the major west tributary of Lost River. Its mouth is located one mile upstream from the mouth of Lost River on the Bering Sea. The two churn-drill holes are 0.4 and 0.75 miles upstream from the mouth of Rapid River. This is locality 45 of Cobb and Sainsbury (1972). Cobb (1975) summarized this reference under the name 'Rapid R.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite (?)

Gangue minerals:

Geologic description:
Bedrock in the 7-mile long southeast flowing Rapid River and its tributary drainages includes various Ordovician limestone facies and local mafic and felsic dikes (Sainsbury, 1969). The two USBM churn-drill holes in the lower part of the river encountered relatively thick gravels for the area; 23 feet of gravel over limestone bedrock in one and more than 30.5 feet of gravel in the other (bedrock was not encountered). Heavy mineral concentrates from both churn-drill holes indicate a trace of tin in the gravels (Mulligan, 1959, p. 13). The mineralogy of the concentrates was not determined. Mulligan (1959, 12-13) notes that the gravel thickness decreases to only a few feet a short distance upstream from the drill holes.

Alteration:

Workings/Exploration:
Two USBM churn-drill holes have been completed here (Mulligan, 1959).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959 (USBM RI 5520); Sainsbury, 1969; Cobb and Sainsbury, 1972

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Alaska Chief

Site Type: Prospect

ARDF no. TE035

Latitude: 65.434 **Quadrangle:** TE B-5

Longitude: 167.218

Location description and accuracy:
This prospect is located near the bottom of a small gulch on the north side of Rapid River about 4.7 miles upstream from the mouth on Lost River. This is locality 5 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Alaska Chief '.

Commodities:
Main: Pb **Other:**

Ore minerals: Galena

Gangue minerals:

Geologic description:
Gossan with galena remnants in Ordovician limestone; unoxidized character and controls on mineralization are not known.

Alteration:
Oxdized; iron oxides/hydroxides present.

Workings/Exploration:
A 35-foot shaft and two exploratory adits were completed early in the century (Knopf, 1908, p. 58-59). One 143-foot long adit intersected 7 feet of low grade galena mineralization 50 feet below the bottom of the shaft. The second adit was 600 feet long and appears to have been driven along a fault zone in limestone without success.

Age of mineralization:
Assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Sulfide vein or replacement in limestone. Model not clear; possibly a polymetallic replacement (Cox and Singer, 1986, model 19a)

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

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Knopf, 1908 (USGS B 358); Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Knopf, 1908 (USGS B 358)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Rapid River

Site Type: Prospect

ARDF no. TE036

Latitude: 65.449 **Quadrangle:** TE B-5

Longitude: 167.3

Location description and accuracy:
Rapid River is the major west tributary of Lost River. Its mouth is located one mile upstream from the mouth of Lost River on the Bering Sea. This prospect is located in the valley of Rapid River, about 5.5 miles upstream from its confluence with Lost River. The area of mineralization extends across Rapid River valley but it is best developed on a small knoll on the north side of the drainage at 471 feet elevation. This is locality 3 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Rapid R.'.

Commodities:
Main: Be, fluorite **Other:** Ag(?), Cu, Pb, Sn, Zn

Ore minerals: Bertrandite, cassiterite, chrysoberyl, euclase, fluorite, galena, possibly phenakite, sphalerite

Gangue minerals: Diaspore, hematite, silica, tourmaline, white mica

Geologic description:
Banded fluorite-chrysoberyl veinlets, veins, pipes, and irregular replacements are present in Lower Ordovician limestone and dolomite in the footwall of the Rapid River fault. Sainsbury (1969; 1972) maps the Rapid River fault as a 12-mile long east-west trending thrust fault in the southern part of the York Mountains although stratigraphic relations across the fault suggest normal displacement. The fluorite-chyrsoberyl mineralization is locally present over an area 4,400 feet long (east-west) and about 1,000 feet wide. Lamprophyre dikes are also common in this area and some dike borders localize fluorite-chyrsoberyl replacements. Individual veins are generally 1 to 3 inches wide and spaced 6 to 18 inches apart but some irregular replacements are up to 25 feet across. Structures with a general east-west orientation, such as joints, small faults, and dike borders are a dominant control on mineralization.

The mineralization includes minor euclase, bertrandite, and phenakite (?). Gangue minerals are diaspore, white mica, tourmaline, and hematite; fine-grained silica is locally present along the mineralized zones. BeO contents of 12 samples range from 0.15 to 1.05%; fluorite content of two samples is 57% (Sainsbury, 1963, p. 11). Diamond-drilling by Newmont Mining Company in 1963 encountered mineralization in the footwall of the Rapid River fault a few hundred feet below the surface. This drilling encountered sulfide mineralization in the cores of some veins. The sulfide minerals include galena and sphalerite; minor cassiterite is associated with the sulfides (Sainsbury, 1969, p. 77). Newmont attempted to find this early drill data in 1998 but was unsuccessful. However, the old project files did contain a report on metallugical testing of samples obtained by the 1963 drilling (Porter, 1964). One sample, a composite from drill holes 9 through 14, weighed 100 pounds and containted 12.0% CaF2 , 0.086% BeO, and 56.4% CaCO3. A second sample, a composite from drill holes 2, 8, 21, 22, and a 10-foot channel in a surface trench, weighed 50 pounds and contained 27.4% CaF2, 0.22% BeO, and 34.5% CaCO3. Bench-scale sink-float tests showed that this material could be upgraded to about 50% CaF2 and 0.35% BeO. The metallugical test results indicated that the beryllium was associated with silicate minerals and did not directly follow fluorite through the procedures.

Alteration:
Some lamprophere dikes have tactite borders but these may not be related to mineralization. The origin of dolomite and dolomite breccia is also not clear here. Mass balance calculations show significant SiO_2, Al_2O_3, alkali, and fluorine enrichment with mineralization (Sainsbury, 1968, p. 1567).

Workings/Exploration:
A few dozer trenches and several diamond drill holes have been completed on the prospect.

Age of mineralization:
Assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Fluorite- and beryllium-bearing veins and replacements in Ordovician limestone (Sainsbury, 1968)

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

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Sainsbury, 1963; Sainsbury, 1968; Sainsbury, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Sainsbury, 1963; Sainsbury, 1968; Sainsbury, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Curve Creek

Site Type: Prospect

ARDF no. TE037

Latitude: 65.45 **Quadrangle:** TE B-5

Longitude: 167.224

Location description and accuracy:
Curve Creek is the second tributary entering Lost River from the west, 3 miles upstream from the mouth of Lost River on Bering Sea. It is a southeast-flowing stream draining Ordovician limestones of the York Mountains. The Curve Creek prospect is located on the south side of a small west tributary between elevations of 500 and 1,000 feet. This is locality 4 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Curve Cr.'.

Commodities:
Main: Fluorite **Other:** Be

Ore minerals: Fluorite

Gangue minerals: Diaspore, pyrite, silica, stibnite (?)

Geologic description:
Fluorite and some beryllium (up to 0.15% BeO) mineralization is localized along mafic dikes and fractured Lower Orodvician limestone in the footwall of the Rapid River fault. Sainsbury (1969; 1972) maps the Rapid River fault as a 12-mile long east-west trending thrust fault in the southern part of the York Mountains although stratigraphic relations across the fault suggest normal displacement. Mineralization here is apparently present over about 4,000 feet of east-west strike.

Alteration:
Mass balance calculations show significant SiO2, Al2O3, alkali, and fluorine enrichment with mineralization (Sainsbury, 1968, p. 1567).

Workings/Exploration:
Surface observations and sampling reported by Sainsbury (1969, p. 77-78).

Age of mineralization:
The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Fluorite- and beryllium-bearing veins and replacements in Ordovician limestone (Sainsbury, 1968)

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

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Sainsbury, 1968; Sainsbury, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Sainsbury, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Bessie-Maple

Site Type: Prospect

ARDF no. TE038

Latitude: 65.454

Quadrangle: TE B-5

Longitude: 167.192

Location description and accuracy:

The Bessie-Maple prospect is located along the Rapid River fault where it crosses a north-south ridge that separates Lost River valley from the Curve Creek drainage. This is on the west side of Lost River valley (elevation 500 to 570 feet) just across and upstream from the mouth of Tin Creek. The Bessie-Maple prospect merges to the east with the Lost River Valley prospect (TE041). This is locality 6 of Cobb and Sainsbury (1972). Cobb (1975) summarized rlevant references under the name 'Bessie & Maple'.

Commodities:

Main: Ag, Cu, Pb, Sn, W., Zn

Other: Au, Be, fluorite

Ore minerals: Cassiterite (?), chalcopyrite, galena, sphalerite, stannite, wolframite

Gangue minerals: Arsenopyrite, pyrite, stibnite, topaz, tourmaline

Geologic description:

Polymetallic, sulfide-bearing veins, veinlets, replacements, and fracture fillings in Ordovician limestone are locally present over about 1,200 feet of the east-west trending Rapid River fault zone. Sainsbury (1969, 1972) maps the Rapid River fault as a 12-mile long, east-west trending thrust fault in the southern part of the York Mountains although stratigraphic relations across the fault suggest normal displacement. Fluorite and beryllium-bearing mineralization has apparently developed peripheral to the sulfide veins. Lamprophyre dikes and a small plug are present in the mineralized area. Sulfide vein mineralogy is complex. Knopf (1908, p. 57-58) described a 1-foot wide zone of stringer veinlets containing wolframite, stannite, and galena with topaz and fluorite. Steidtmann and Cathcart (1922) described fractured and kaolinized dike rocks, some with disseminated tourmaline and fluorite, cemented with thin seams of galena, pyrite, and chalcopyrite and in places with 3-inch wide vertical stibnite-bearing veins. Sainsbury (1965; 1969, p. 64) described a 1-foot wide diamond drill intercept of semi-massive sulfides containing stannite, pyrite, arsenopyrite, and galena. Grades reported for sulfide-rich samples include trace to 0.03 opt gold, 4.2 to 25.6 opt silver, 0.5 to 9.1 % Pb, 0.48 to 1.53% Cu, about 3% Zn, 0.3 to 1.6% Sn, up to 3.2% WO_3 and 3% Sb (Berg and Cobb, 1967, p. 132). Fluorite, chrysoberyl, white mica, and tourmaline are present in replacements of limestone and dolomite peripheral to the sulfide-bearing veins. One sample from the Bessie-Maple adit dump contained 0.39% BeO and 59% fluorite (Sainsbury, 1963, p. 8). Samples from three short USBM diamond drill holes had up to 0.79% BeO and 75% fluorite (Mulligan, 1965). Five inclined diamond drill holes completed by Lost River Mining Corporation through the near vertical fluorite mineralization had average intersections of 60 feet grading 34% fluorite (WGM, 1972, p. 54). Three of these five holes also intersected sulfide mineralization. These intersections were: (1) 10 feet of 0.18% Sn, 0.11% Pb, 4.9% Zn, 0.15% Cu, and 1.34 opt Ag; (2) 4.5 feet of 0.22 % lead, 1.89 % Zn, and 1 opt Ag; and (3) 2 feet of 0.27% Pb and 2.17% Zn (WGM, 1972, p. 72). Another diamond drill hole drilled vertically at a location north of the main Bessie-Maple prospect encountered 46 feet of 21.2 % fluorite, 0.23% Pb, 0.38 % Cu, and 1.3 opt Ag in the uppermost part of the hole (WGM, 1972, p. 72-73).

Alteration:

The limestone is commonly dolomitized but the relation of this alteration to sulfide and fluorite mineralization is not clear. Lamprophere dikes are kaolinized and locally contain disseminated tourmaline and fluorite. Fluorite veining and replacement is in effect a type of alteration here that can be thought of as distal alteration to more intense, tin metallization at depth. Mass balance calculations show significant SiO2, Al22O3, alkali, and fluorine enrichment with this type of alteration (Sainsbury, 1968, p. 1567).

Workings/Exploration:

Older workings are a 150-foot adit and various suface pits and trenches. The USBM completed three short diamond drill holes totalling 399 feet on the eastern part of the mineralized area near where it merges with the Lost River valley prospect. Lost River Mining Corporation drilled 8 diamond drill holes totalling 1,905 feet in the prospect area (WGM, 1972, p. 63).

Age of mineralization:

The mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:

Fluorite-, beryllium-, and sulfide-bearing veins, veinlets, and replacements in limestone (Sainsbury, 1968)

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

Production: None **Status:** Active

Production notes:

Reserves:

Not defined

Additional comments:

References:

Knopf, 1908 (USGS B 358); Steidtmann, and Cathcart, 1922; Sainsbury, 1963; Mulligan, 1965 (USBM AOF 7-65); Sainsbury, 1968; Sainsbury, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1972; WGM, 1972; Cobb, 1975; Hudson and Arth

Primary reference:

Knopf, 1908 (USGS B 358); Steidtmann, and Cathcart, 1922; Sainsbury, 1963; Mulligan, 1965 (USBM AOF 7-65); Sainsbury, 1969; WGM, 1972

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on Lost River)

Site Type: Occurrence

ARDF no. TE039

Latitude: 65.449 **Quadrangle:** TE B-5

Longitude: 167.182

Location description and accuracy:
Lost River is the main south-flowing drainage in the York Mountains of western Seward Peninsula. Its mouth on the Bering Sea is 21 miles west of Brevig Mission. This locality is four miles upstream from the mouth and just below the confluence with Tin Creek , a significant east tributary to Lost River. The occurrence is in alluvial gravels of the active Lost River drainage just west of the outcropping Idaho lode prospect (TE040). It is locality 42 of Cobb and Sainsbury (1972). It was not included separately by Cobb (1975).

Commodities:
Main: Sn **Other:** Ag, Pb

Ore minerals: Cassiterite (?), galena

Gangue minerals:

Geologic description:
Bedrock in this drainage and its tributaries are various Ordovician limestone facies locally intruded by felsic and mafic dikes and granite stocks (Sainsbury, 1969). The USBM completed two churn-drill holes in the active drainage of Lost River here (Mulligan, 1959, p.12-15). This locality is just west of the outcropping Idaho lode prospect and downstream of the fluorite-beryllium-sulfide mineralization along the Rapid River fault at the Bessie-Maple (TE038) and Lost River valley lode (TE041) prospects. The two churn-drill holes showed the 5 to 6 feet of gravel on bedrock here to contain 0.29 and 0.35 pounds of tin per cubic yard. The gravels at this locality are 9 and 10 feet thick Bedrock described from the bottom of one of these holes is dolomite with chlorite, fluorite, and a trace of pyrite. The gravel in the holes also contained a trace of silver and one contained 0.04 pounds of lead per cubic yard. Galena was identified in the lead-bearing material but otherwise the mineralogy of the heavy mineral concentrates was not reported. Traces of lead and zinc were found in the bedrock but the the related minerals could not be identified (Mulligan, 1959, p. 15).

Alteration:

Workings/Exploration:
Two USBM churn-drill holes have been completed here (Mulligan, 1959).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:
None

Reserves:
Not defined; low grades are indicated

Additional comments:

References:
Mulligan, 1959 (USBM RI 5520); Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Idaho

Site Type: Prospect

ARDF no. TE040

Latitude: 65.447 **Quadrangle:** TE B-5

Longitude: 167.177

Location description and accuracy:

The Idaho prospect is located on the east bank of Lost River just below the mouth of Tin Creek. This is about 4 miles upstream of the mouth of Lost River on the Bering Sea and 1.9 miles downstream from the Lost River Mine (TE048-TE051). This is locality 7 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Idaho'.

Commodities:

Main: Ag, Cu, Pb, Sn, Zn **Other:** Fluorite, W

Ore minerals: Cassiterite (?), chalcopyrite, galena, sphalerite, stannite (?)

Gangue minerals: Calcite, idocrase, fluorite, magnetite, pyrite, pyrrhotite

Geologic description:

The Idaho prospect is on a low bench (about 200 feet elevation) on the east bank of Lost River. Here Ordovician limestone in the hanging wall of the Rapid River fault is locally exposed along cut banks of Lost River and its east tributary Tin Creek. Extensive fluorite veining in the limestone merges northward across Tin Creek to that exposed in the Lost River Valley prospect. The original Idaho prospect was a small area of chalcopyrite-pyrrhotite-fluorite mineralization exposed on the east bank of Lost River (Knopf, 1908). Sainsbury noted the presence of tin, sulfide minerals, and fluorite (1969, plate 1) and of beryllium rock and sulfides in this general area (1969, plate 5). Three types of mineralization are present here (Hudson, 1990): (1) fluorite and beryllium-bearing veins and replacements in dolomite; (2) magnetite-fluorite-idocrase (?) replacement veins (laminar skarn or wrigglite) along fractures in the carbonate rocks; and (3) sulfide-rich veins (and replacements?).

Dolomite outcrops along the south side of lower Tin Creek contain irregularly sheeted fluorite veins. Individual veins are up to 3 inches wide and zones up to 1 foot wide can have up to 20 thin veinlets. Channel and grab samples of this mineralization contain up to 19% fluorine and 0.023 to .063 % beryllium. The presence of 0.023% beryllium in 4-foot wide zones containing sparse fluorite veins suggests that some of the mineralization is disseminated.

Laminar magnetite-fluorite-idocrase (?) replacement veins (wrigglite) are common in outcrop along the east bank of Lost River. These veins, which vary from hairline seams to 3 feet wide, contain elevated tin, tungsten, beryllium, fluorine, base-metal, and silver. Five samples (Hudson 1983; 1990) contained 0.14 to 0.36% tin, 0.06 to 0.26% tungsten, 0.012 to 0.029% beryllium, 13 to 15% fluorine, and 0.3 to 4.7 ppm silver. Zinc, determined in only one of these samples, was 1.05%.

Highly oxidized sulfide-rich mineralization is present in a vein exposed in a dozer trench on the east bank of Lost River. The trench exposes a 4-foot wide oxidized zone that strikes northeast and dips south. Sulfide remnants in this zone are massive pyrrhotite-chalcopyrite-sphalerite rock with minor constituents such as fluorite. Four sulfide-rich samples contained up to 0.19% tungsten, 0.64 to 3.72% copper, 0.14 to 14.3% zinc, 5 to 35 ppm silver, and weakly anomalous tin and lead

(Hudson, 1983; 1990).

Airborne and ground magnetometer surveys show that a large, 600+ gamma positive magnetic anomaly is centered on the Idaho prospect area. This feature combined with the widespread surface mineralization and alteration, the results of a soil geochemistry survey, and structural setting (interpreted to be in a downdropped hanging wall block of the Rapid River fault) suggests the presence of significant skarn and/or replacement mineralization at depth (Hudson, 1983; 1990). A vertical diamond drill hole was drilled in 1995 to test this interpretation. This drill hole was collared slightly east of the sulfide vein exposed in the dozer trench. It reached a total depth of 983 feet (Drechsler, 1995). It encountered sulfide-bearing veins, veinlets, and disseminations in the upper 100 feet including one interval between 40.5 and 45 feet that contained up to 50% massive pyrrhotite and chalcopyrite. Steep dipping magnetite-calcsilicate veins and veinlets, less than 1 inch wide and commonly less than 0.25 inch wide, are common below 100 feet. These appear to increase in intensity below 500 feet including two intervals (640 to 678 feet and 938 to the bottom of the hole) that are stockworks. Fluorite-bearing veins are scattered through the hole but appear to be more abundant at depth. Two thin (0.25 and 0.75 inch wide) felsic dikes are present between 910 and 930 feet. The sulfide-rich interval between 40.5 and 45 feet assayed 1.74% copper, 2.2% zinc, 16 ppm silver, 3.79% CaF_2, 250 ppm tin, and 55 ppm tungsten. Other selected intervals in the hole were anomalous in base metals, tin, and tungsten but significant grades were not intercepted. Two five-foot samples representing the interval between 432 and 442 feet contained 340 and 650 ppm tin and 540 and 320 tungsten; a sample representing the 715 to 720 foot interval contained 11% fluorite, 160 ppm tin, and 375 ppm tungsten; and two five-foot samples representing the interval between 818 and 828 feet contained 10 and 11% fluorite, 520 and 640 ppm tin, and 480 and 510 ppm tungsten.

Alteration:

All of the veining in the area can be considered a type of alteration in the outer fringes of a significant hydrothermal system. This includes fluorite, laminar magnetite-fluorite-idocrase, and the sulfide-rich veins. Dolomitization is also locally devloped but it is not known how this is related to mineralization.

Workings/Exploration:

One dozer trench, a surface soil geochemical survey, outcrop geologic mapping and sampling, an airborne magnetic survey, a ground magnetic survey, and one vertical 983-foot diamond drill hole have been completed on the prospect.

Age of mineralization:

The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:

Skarn, vein, and replacement in limestone. Tin skarn (model 14b) and/or replacement tin (model 14c) model of Cox and Singer (1986) may be applicable

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

14b, 14c

Production: None

Status: Active

Production notes:

Reserves:

Not defined

Additional comments:

References:

Knopf, 1908 (USGS B 358); Sainsbury, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983; Hudson, 1983; Hudson, 1990; Drechsler, 1995

Primary reference: Hudson, 1983; Hudson, 1990; Drechsler, 1995

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Lost River; Grothe-Pearson; Tozer

Site Type: Prospect

ARDF no. TE041

Latitude: 65.452 **Quadrangle:** TE B-5

Longitude: 167.169

Location description and accuracy:

This prospect is a 0.75 mile, east-west trending zone along the Rapid River fault where it crosses Lost River valley. This is approximately 4.5 miles upstream from the mouth of Lost River on the Bering Sea (21 miles west of Brevig Mission). The prospect is best exposed on a low bench on the east side of the river at elevations of 200 to 250 feet just north of the mouth of Tin Creek. This prospect was not separately identified by Cobb and Sainsbury (1972) or Cobb (1975). It is also known as the Grothe-Pearson prospect (Sainsbury, 1969, plate 5); it merges to the west with the Bessie-Maple prospect (TE038) and to the south with the Idaho prospect (TE040). The Tozer prospect (Sainsbury, 1969, plate 5) is included here as part of the Lost River valley prospect.

Commodities:

Main: Ag, Be, Cu, fluorite, Pb, Sn, Zn **Other:**

Ore minerals: Cassiterite (?), chrysoberyl, fluorite, galena (?), sphalerite (?), stannite

Gangue minerals: Arsenopyrite, diaspore, pyrite, tourmaline, white mica

Geologic description:

Sainsbury (1969; 1972) maps the Rapid River fault as a 12-mile long east-west trending thrust fault in the southern part of the York Mountains although stratigraphic relations across the fault suggest normal displacement. Sainsbury (1969) indicates that the Rapid River fault is continuous for another 1.5 miles east of this prospect but earlier mapping (Sainsbury, 1964) suggests the possiblity that the Rapid River fault is offset by the north-south trending Lost River normal fault in the area of this prospect. Bedrock in the prospect area is Ordovician limestone locally cut by thin felsic dikes. Mineralization is probably at least locally present over about 5,000 feet of strike of the Rapid River fault including the Lost River valley and Bessie-Maple prospect (TE038) to the west. Soil samples across this prospect on the east side of Lost River are highly anomalous in base metals, tin, and beryllium (Sainsbury, 1969, plate 5).

Mineralization exposed in dozer trenches is of several types; (1) fluorite and chyrsoberyl veins with diaspore, tourmaline , and white mica, (2) fluorite veins with or without fine-grained silica, (3) sulfide-bearing veins with stannite and related gossanous zones, and (4) quartz-muscovite- tourmaline-pyrite veinlets with up to 1.1% tin. Samples of the fluorite-beryllium mineralization contain 0.4 to almost 2% BeO and 50 to 59% fluorite (Sainsbury, 1963, p. 8). The complex, polymetallic character of the sulfide mineralization is well developed here as it is in the Bessie-Maple prospect to the west. Gossanous samples from trenches contain up to several percent lead, almost 1% copper, 4% zinc, 0.9% tin, 8 opt silver, and greater than 1,000 ppm arsenic (Hudson, 1983).

Alteration:

The veining and related replacement in this area can be thought of as distal alteration to more intense, tin metallization at depth. Mass balance calculations show significant SiO_2, Al_2O_3, alkali, and fluorine enrichment with this type of alteration (Sainsbury, 1968, p. 1567).

Workings/Exploration:
Several surface dozer trenches and reconnaissance geochemical surveys have been completed on the bench east of Lost River.

Age of mineralization:
The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Fluorite-, beryllium-, and sulfide-bearing veins and replacements in limestone (Sainsbury, 1968)

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

Production: None **Status:** Active

Production notes:
None

Reserves:
Not defined

Additional comments:

References:
Sainsbury, 1963; Sainsbury, 1964; Sainsbury, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983; Hudson, 1983

Primary reference: Sainsbury, 1969; Hudson, 1983

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on Tin Creek, tributary to Lost River)

Site Type: Prospect

ARDF no. TE042

Latitude: 65.459 **Quadrangle:** TE B-5

Longitude: 167.123

Location description and accuracy:
Tin Creek is an east tributary to Lost River whose confluence is located 4.5 miles upstream from the mouth of Lost River on the Bering Sea. Fluorite and beryllium-bearing veins and tactite are mostly developed on the south flank of a hill cored by fine-grained granite (Sainsbury, 1969), that the headwaters of Tin Creek flow around. This rounded hill, between Tin Creek and its small north tributary, reaches elevations of just over 1,150 feet. Mineralization is locally present from creek level (400 feet) upslope (northward) to the contact of the Tin Creek stock at an elevation of about 850 feet. This locality was not identified separately by Cobb and Sainsbury (1972) but relevant information was summarized by Cobb (1975) under the name 'Tin Cr., trib. Lost R.'.

Commodities:
Main: Be, Sn, fluorite **Other:**

Ore minerals: Cassiterite, chrysoberyl, fluorite, helvite, sulfide minerals

Gangue minerals: Idocrase, magnetite, white mica

Geologic description:
The headwaters of Tin Creek are in an area where a small stock of biotite granite, the Tin Creek stock (Sainsbury, 1969; Hudson and Arth, 1983) intrudes Orovician limestone and dolomite. The Tin Creek stock covers a 1,000 by 2,000 foot area on the crest of the rounded hill between Tin Creek and its northern tributary. The south contact of the stock is irregular and includes granite offshoots, dikes, and apophyses in the bordering carbonate rocks. Two types of mineralization are present in the carbonate country rocks on the south flank of the Tin Creek stock: (1) laminar magnetite-fluorite- idocrase skarn (wrigglite) with helvite, and (2) fluorite-diaspore-white mica veins and replacements that contain chrysoberyl. The laminar skarn forms replacement veins along fractures in limestone and larger irregular bodies adjacent to granite intrusions. The fluorite-diaspore-white mica-chrysoberyl veins, from less than an inch up to a few feet wide, are scattered through limestone and localized along borders to granite dikes. They contain cassiterite, stannite, and other sulfide minerals in places. Oxidation of the sulfide-bearing veins has produced gossanous materials at the surface. The helvite-bearing skarn is reported to carry up to 0.45% BeO (Sainsbury, 1969, p. 80). Three samples of beryllium-bearing veins contained 0.13 to 1.11% BeO (Sainsbury, 1963, p. 13). Samples of skarn from this area contained 1,020 to 4,500 ppm tin and more than 20,000 ppm fluorine; one of these samples contained 175 ppb gold (Hudson, 1983).

Alteration:
Calc-silicate, magnetite, and fluorite replacement of limestone

Workings/Exploration:
A few surface pits and trenches are present in the area.

Age of mineralization:
The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Veins and tactite in limestone intruded by granite. Tin skarn model (14b) of cox and Singer (1986).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
14b

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Sainsbury, 1963; Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983; Hudson, 1983

Primary reference: Sainsbury, 1963; Sainsbury, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Greisen (on Tin Creek)

Site Type: Prospect

ARDF no. TE043

Latitude: 65.466 **Quadrangle:** TE B-5

Longitude: 167.121

Location description and accuracy:
Tin Creek is an east tributary to Lost River whose confluence is located 4.5 miles upstream from the mouth of Lost River on the Bering Sea. The Gresien prospect is in the eastern part of the Tin Creek granite stock, a rounded hill in the headwaters of Tin Creek (Sainsbury, 1969). This rounded hill, between Tin Creek and its small north tributary, reaches elevations of just over 1,150 feet. This locality 10 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Tin Cr., trib. Lost R.'.

Commodities:
Main: Sn **Other:** Ag, Cu, Pb, Zn,

Ore minerals: Cassiterite

Gangue minerals: Fluorite, quartz, topaz, tourmaline, white mica

Geologic description:
The headwaters of Tin Creek are in an area where a small stock of biotite granite, the Tin Creek stock (Sainsbury, 1969; Hudson and Arth, 1983) intrudes Orovician limestone and dolomite. The Tin Creek stock covers a 1,000 by 2,000 foot area on the crest of the rounded hill between Tin Creek and its northern tributary. The south contact of the stock is irregular and includes granite offshoots, dikes, and apophyses in the bordering carbonate rocks. An eastern part of the Tin Creek granite stock is cut by parallel greisen sheets with peripheral alteration selvages. Seven samples of this greisen (Hudson, 1983) contained 525 to 3,020 ppm tin, 1,040 ppm to 1.7% lead, 8,400 to greater than 20,000 ppm fluorine, 550 to greater than 1,000 ppm arsenic, and 5 to 24 ppm silver. Copper (to 280 ppm) and zinc (to 3,630 ppm) are elevated in some of these samples and gold (5 ppb) was detected in four. The style of mineralization here is interpreted to be similar to that at depth in the Lost River Mine endogreisen prospect (TE050).

Alteration:
Typical greisen alteration with feldspar destruction and extensive replacement by quartz, topaz, and white mica in the host granite. Some quartz veining may be present in the cores of greisen zones. Tourmaline and fluorite are also present in altered rocks. Alteration selvages are less completely greisenized granite.

Workings/Exploration:
Little exploration has taken place here but some surface trenches or pits may be present.

Age of mineralization:
The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Tin greisen (Cox and Singer, 1986, model 15c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
15c

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983; Hudson, 1983

Primary reference: Sainsbury, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Yankee Girl

Site Type: Prospect

ARDF no. TE044

Latitude: 65.461

Quadrangle: TE B-5

Longitude: 167.131

Location description and accuracy:

The Yankee Girl prospect is located on the north side of Tin Creek valley at an elevation of 900 feet. It is 700 feet west of the contact of the Tin Creek stock (see Sainsbury, 1969, plate 6). Tin Creek is an east tributary to Lost River whose confluence is located 4.5 miles upstream from the mouth of Lost River on the Bering Sea. This is locality 9 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Yankee Girl'.

Commodities:

Main: Pb, Sn

Other:

Ore minerals: Cassiterite, cerussite, galena

Gangue minerals: Arsenopyrite, iron oxide gossan, fluorite, pyrite

Geologic description:

This prospect is a gossanous fracture zone in Ordovician limestone peripheral to the Tin Creek granite stock (Knopf, 1908, p. 269; Sainsbury, 1969, plate 6). The gossan contains galena remnants, cerussite, arsenopyrite and some disseminated cassiterite (Seidtmann and Cathcart, 1922, p. 80). Anderson (1947) reported a sample assay that ran 0.02 opt gold, 0.6 opt silver, 3.1% lead, and 0.47% tin.

Alteration:

Oxidation and related iron oxide/hydroxide development; secondary lead minerals

Workings/Exploration:

A short exploratory adit was originally opened on the prospect but it had already caved by 1918.

Age of mineralization:

The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:

Vein or replacement in limestone. Not clear; possibly polymetallic replacement model (19a) or replacement tin model (14c) of Cox and Singer (1986) may apply but close analogs are not obvious.

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

Production: None

Status: Inactive

Production notes:

Reserves:

Not defined

Additional comments:

References:
Knopf, 1908 (USGS B 358); Steidtmann, and Cathcart, 1922; Anderson, 1947; Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Knopf, 1908 (USGS B 358); Steidtmann, and Cathcart, 1922

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on Lost River)

Site Type: Occurrence

ARDF no. TE045

Latitude: 65.464

Quadrangle: TE B-5

Longitude: 167.175

Location description and accuracy:
Lost River is the major south-flowing drainage in the York Mountains of western Seward Peninsula. This locality is on the main drainage, just below the mouth of Cassiterite Creek, 5 miles upstream from the mouth of Lost River on the Bering Sea. This is locality 43 of Cobb and Sainsbury (1972). It was not included separately by Cobb (1975).

Commodities:
Main: Sn

Other:

Ore minerals: Cassiterite (?

Gangue minerals:

Geologic description:
Bedrock in this drainage and its tributaries are various Ordovician limestone facies locally intruded by felsic and mafic dikes and granite stocks (Sainsbury, 1969). The USBM completed three churn-drill holes in a line across Lost River at his locality. These holes encountered 5 to 9 feet of gravel over limestone bedrock. Gravel from lower parts of these holes contained 0.04 and 0.05 pounds of tin per cubic yard (Mulligan, 1959, p. 13). The heavy minerals in these gravels were not identified.

Alteration:

Workings/Exploration:
Three USBM churn-drill holes are the only reported work on this part of Lost River.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None

Status: Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Mulligan, 1959 (USBM RI 5520); Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Cassiterite Creek (Lost River)

Site Type: Mine

ARDF no. TE046

Latitude: 65.472 **Quadrangle:** TE B-5

Longitude: 167.161

Location description and accuracy:
Cassiterite Creek is an eastern tributary to Lost River; their confluence is 5 miles upstream from the mouth of Lost River on the Bering Sea. The Lost River Mine (TE048-TE051), the principal lode source of tin in the Lost river area, is located 1 mile upstream from the mouth of Cassiterite Creek. About 2,000 feet of Cassiterite Creek (elevation about 275 feet), at and below Lost River Mine, has been placer mined for tin. This is locality 46 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Lost River'.

Commodities:
Main: Sn, W **Other:**

Ore minerals: Cassiterite, wolframite

Gangue minerals:

Geologic description:
Bedrock in this drainage and its tributaries are various Ordovician limestone facies locally intruded by felsic and mafic dikes and granite stocks (Sainsbury, 1969). The principal lode sources of tin in the Lost River area (Lost River Mine; TE048, TE049, TE050, and TE051) are located at the head of this placer. A pre-erosion projection of the Lost River Mine exogreisen deposit (the Cassiterite dike, Hudson and Reed, 1997, p. 458), suggests that several thousand tons of tin could have been eroded into Cassiterite Creek and the Lost River drainage. Mulligan (1959, p. 13) states that production data indicate the grade of the mined material in the 2,000 foot-segment of Cassiterite Creek below the Lost River Mine was 3 to 4 pounds of tin per cubic yard. Heide (1946, p. 5) noted that about 20 tons of tin concentrate were produced between 1904 and 1911; production up to 1964 is reported to be 93.4 short tons of tin (Sainsbury, 1964, p. 4; previously reported as production between 1948 and 1951 by Lorain and others, 1958). Placer mining has included working of residual materials over lode deposits and some that took place in the 1960's using dozer and sluice box processed mine waste rock. The elevation of this placer deposit, about 275 feet, is below that of a prominent marine terrace developed on the south side of the York Mountains and well expressed at the mouth of Lost River. Therefore, some reworking of the placer materials by marine processes may have occurred in Cassiterite Creek although evidence of this has not been identified.

Alteration:

Workings/Exploration:
Hand mining and dozer/sluice operations have taken place on 2,000 feet of Cassiterite Creek below Lost River Mine. Residual placers on lode deposits at the Lost River Mine have also been worked. The status of exploration of this deposit is not known; a significant amount of tin , potentially eroded from the Lost River Mine exogreisen (Cassiterite dike) lode deposit, seems unaccounted for in the Cassiterite Creek placer.

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: Yes **Status:** Inactive

Production notes:
Sainsbury (1964, p. 4) reports that 93.4 short tons have tin have been produced from the Cassiterite Creek placer.

Reserves:
Not defined

Additional comments:

References:
Heide, 1946; Lorain and others, 1959; Mulligan, 1959 (USBM RI 5520); Sainsbury, 1964; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Reed, 1997

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Camp Creek (tributary to Lost River)

Site Type: Prospect

ARDF no. TE047

Latitude: 65.471 **Quadrangle:** TE B-5

Longitude: 167.146

Location description and accuracy:
Camp Creek is an east tributary to Cassiterite Creek about 0.75 miles upstream from Cassiterite Creek's mouth on Lost River and 2,000 feet south of the Lost River Mine (TE048-TE051). The prospect is on the south side of Camp Creek at elevations of 300 to 500 feet. This locality was not identified separately by Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Lost River'.

Commodities:
Main: Be, fluorite **Other:**

Ore minerals: Chrysoberyl, fluorite

Gangue minerals: Diaspore, muscovite, tourmaline

Geologic description:
Fluorite- and beryllium-bearing veins and veinlets are common in Ordovician limestone along a 2,400 foot-long east-west trending zone on the south side of Camp Creek (Sainsbury, 1969, plate 3). The principal controls on the veins and veinlets are nearly vertical sheeted fractures, closely spaced joints, brecciated zones, and borders to igneous dikes.

Mineralization includes fluorite, diaspore, tourmaline, muscovite, chrysoberyl, hematite, and todorokite. Stibnite in fluorite and diaspore has been identified on the ridgeline east of Camp Creek. USBM diamond drilling encountered stannite- and pyrite-bearing sulfide zones within the fluorite and beryllium-bearing mineralization. Nineteen surface samples contained 0.31 to 6.00% BeO; the fluorite content, determined for 8 of these samples, ranged from 54.6 to 62.4% (Sainsbury, 1963, p. 7).

Diamond drilling by the USBM and Lost River Mining Corporation enabled a resource calculation of 2,116,000 tons of 30.6% fluorite in an open-pit configuration and 1,695,000 tons of 30.0 % fluorite that would require underground mining (WGM, 1972, p. 63). These calculations used a cut-off grade of 15% fluorite and an overall weighted average of at least 23% fluorite. The general dimensions of the mineralized zone determined by this drilling are 3,000 feet long, up to 130 feet thick, and 300 feet downdip (apparently shallow to moderate south dip); mineralization is open along strike and dip (WGM, 1973, p. 53). The Lost River Mining Corporation work did not identify other valuable constituents in the mineralized material.

Alteration:
Fluorite and beryllium-bearing mineralization is thought to be a type of distal alteration to tin metallizing sytems in this area. Mass balance calculations show significant SiO2, Al2O3, alkali, and fluorine enrichment with mineralization (Sainsbury, 1968, p. 1567). The limestone is commonly dolomitized but the relation of this alteration to sulfide and fluorite mineralization is not clear.

Workings/Exploration:
Surface dozer trenches, 13 USBM diamond drill holes totalling 2,158 feet, and 23 Lost River Mining Corporation diamond drill holes totalling 8,146 feet have been completed on the prospect.

Age of mineralization:
The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Fluorite-, beryllium-, and sulfide-bearing veins and replacements in limestone (Sainsbury, 1968)

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

Production: None **Status:** Active?

Production notes:

Reserves:

Additional comments:

References:
Sainsbury, 1963; Sainsbury, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1972; WGM, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Sainsbury, 1968; Sainsbury, 1969; WGM, 1972

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Lost River-Cassiterite dike exogreisen

Site Type: Mine

ARDF no. TE048

Latitude: 65.476 **Quadrangle:** TE B-5

Longitude: 167.153

Location description and accuracy:
Lost River Mine is located on Cassiterite Creek, one mile upstream of its confluence with Lost River. This confluence is 5 miles upstream from the mouth of Lost River on the Bering Sea. The Lost River Mine area includes the Cassiterite dike exogreisen deposit (TE048), the Lost River Mine skarn deposit (TE049), the Lost River Mine endogreisen deposit (TE050), and the Ida Bell dike exogreisen deposit (TE051). The Cassiterite dike exogreisen deposit crosses Cassiterite Creek about 0.9 miles upstream from its mouth (elevation approximately 300 feet). The principal surface workings in the Lost River Mine area are on the Cassiterite dike east of Cassiterite Creek between elevations of 300 and 600 feet. This is locality 8 of Cobb and Sainsbury (1972). References for this locality were summarized under the name 'Lost River' by Cobb (1975).

Commodities:
Main: Sn, W **Other:**

Ore minerals: Cassiterite, chalcopyrite, galena, sphalerite, stannite, wolframite

Gangue minerals: Arsenpyrite, fluorite, kaolinite, pyrite quartz, white mica, topaz, tourmaline

Geologic description:
The pre-mineral Cassiterite dike crosscuts Ordovician limestone and dolomite above a buried and mineralized granite cupola. The dike strikes northwest, dips moderately south, and extends at depth into parts of the Lost River skarn deposit. It ranges in thickness between 3 and 21 feet but in areas of previous stoping, widths of 5 to 10 feet are common (Sainsbury, 1964, plate 10). It is extensively altered over 2,200 feet of strike in the mine area. The dike was probably emplaced along a fault and some post mineralization displacement on this structure has occurred (Sainsbury, 1964, p. 10). Originally a leucocratic and porphyritic felsic rock, the dike is extensively replaced by quartz-topaz-fluorite greisen with disseminated cassiterite and sulfide minerals such as stannite, arsenopyrite, pyrite, galena, chalcopyrite, and sphalerite. Sulfide-rich veinlets containing cassiterite crosscut the greisen in many places. Wolframite is present in greater amounts in deeper parts of the mineralized dike where its mode of occurrence is similar to that of cassiterite, including its presence in crosscutting sulfide-bearing veins.

Overprinting clay (kaolinite) alteration is common throughout the deposit. This alteration can completely obliterate preexisting textures and mineralogy, leaving only cassiterite grains in a clay matrix. Sainsbury (1964, p. 36) emphasizes that the clay alteration was superimposed on previously mineralized rock and that it did not affect tin distribution.

Mining operations in the 1950's produced 309 tons of tin from 51,000 tons of ore averaging 1.13% tin (Lorain and others, 1958). Tungsten was not recovered during these operations. Some parts of the deposit were of higher grade; distinct ore shoots with greater than 2% tin were present (Hudson and Reed, 1997, p. 458). The higher grade tungsten zones contained 0.8% WO3. Sainsbury (1964, p. 50) has calculated reserves for two types of ore; 200,500 tons grading 1.3% tin and 0.125% WO3 and

105,000 tons grading 0.76% tin and 0.6% WO3. Sainsbury (1964, p. 51) suggests that the known and inferred ore with greater than 1% combined tin and WO3 could be about 430,000 tons. The deposit is open to the southeast and potential exists to the west on the other side of Cassiterite Creek.

Alteration:
Greisen has extensively replaced the felsic Cassiterite dike over 2,200 feet of strike and several hundred feet of dip. Later kaolinite replacement has overprinted much of the greisen.

Workings/Exploration:
In addition to many surface trenches, significant underground workings exist at the Lost River Mine. Most of these are on the Cassiterite dike but some deeper exploratory drifts encountered the buried Lost River granite cupola. The underground workings include adits, drifts, declines, raises, and shafts that total several thousand feet in length (Sainsbury, 1964, plate 10). These workings are developed on five levels with over 500 feet of vertical extent and with individual drifts being up to 1,100 feet long. Many diamond drill holes have been completed from both the surface and underground.

Age of mineralization:
The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983). Fine-grained, leucocratic granite collected from a Lost River Mine dump has been dated at 80.2 +/- 2.9 my (Hudson and Arth, 1983, p.769).

Deposit model:
Exogriesen. This deposit has characteristics of both tin vein model (15b) and tin greisen model (15c) of Cox and Singer (1986).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
15b, 15c

Production: Yes **Status:** Active

Production notes:
Lode production from the Lost River Mine is all from the Cassiterite dike exogreisen. Production includes 5.6 tons of concentrate containing 3.5 tons of tin and 0.6 tons of tungsten in 1913 and 309 tons of tin in concentrate produced between 1952 and 1955 (Lorain and others, 1958, p. 7).

Reserves:
Sainsbury (1964, p. 50) has calculated reserves for two types of ore; 200,500 tons grading 1.3% tin and 0.125% WO3 and 105,000 tons grading 0.76% tin and 0.6% WO3. Sainsbury (1964, p. 51) suggests that the known and inferred ore with greater than 1% combined tin and WO3 could be about 430,000 tons. The deposit is open to the southeast and potential exists to the west on the other side of Cassiterite Creek.

Additional comments:

References:
Lorain and others, 1958; Sainsbury, 1964; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983; Hudson and Reed, 1997

Primary reference: Sainsbury, 1964

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Lost River-skarn

Site Type: Mine

ARDF no. TE049

Latitude: 65.474 **Quadrangle:** TE B-5

Longitude: 167.156

Location description and accuracy:

The Lost River Mine area includes the Cassiterite dike exogreisen deposit (TE048), the Lost River Mine skarn deposit (TE049), the Lost River Mine endogreisen deposit (TE050), and the Ida Bell dike exogreisen deposit (TE051). The Lost River skarn deposit is located 0.9 to 1 mile up Cassiterite Creek from its confluence with Lost River. This confluence is 5 miles upstream from the mouth of Lost River on the Bering Sea coast. The deposit is developed adjacent to and 800 feet south of the surface trace of the Cassiterite dike (Dobson, 1982, figure 3). It extends across Cassiterite Creek at an elevation of about 275 feet but most of the deposit (both at the surface and in the subsurface) is east of the creek. This deposit was included as part of locality 8 by Cobb and Sainsbury (1972). References were summarized under the name 'Lost River' by Cobb (1975).

Commodities:
Main: Fluorite, Sn, W **Other:** Ag, Cu, Pb

Ore minerals: Cassiterite, chalcopyrite, fluorite, scheelite, sphalerite, wolframite

Gangue minerals: Biotite, garnet, hornblende, idocrase, pyrite, pyrrhotite, white mica

Geologic description:

The Lost River skarn is a roughly equidimensional, 10 million cubic yard volume of intense calc-silicate veining and replacement in Ordovician limestone above the apex of a fine-grained, equigranular, and leucocratic granite cupola. The buried granite cupola is known from drill core (Dobson, 1982, figure 6) and underground workings of the Lost River mine (Sainsbury, 1964, plate 10). The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983). Fine-grained, leucocratic granite collected from a Lost River Mine dump has been dated at 80.2 +/- 2.9 my (Hudson and Arth, 1983, p.769).

As described by Dobson (1982), the skarn grades outward from a core of intense calc-silicate veining and replacement to a peripheral zone of fluorite-mica veining. A core of early anhydrous skarn, dominated by garnet and idocrase, was subsequently overprinted and enlarged by a hydrous skarn with abundant fluorite, biotite, and hornblende. Less intense veining, mostly fluorite-mica veins but also hydrous skarn veins, extends outward several hundred feet from the center of skarn development. Late-forming hydrothermal breccias overprint the center of the skarn.

Tin was introduced with the early anhydrous skarn development where it was primarily incorporated in silicate phases such as andraditic garnet, although some cassiterite and base metal sulfide minerals did accompany later idocrase and garnet veining at this stage. Cassiterite became common as part of the hydrous skarn, which also included fluorite, scheelite, and sulfide minerals such as sphalerite, chalcopyrite, pyrrhotite, and pyrite in addition to the hydrous silicates (biotite and hornblende). Cassiterite and wolframite also accompanied the late fluorite-mica veining. Dobson (1982) points out that destruction of early calc-silicate minerals by hydrous skarn as well as later hydrothermal mica- and clay-matrix breccias appears to have remobilized and redeposited tin as cassiterite, thereby upgrading the recoverable tin content of the skarn as a whole.

Extensive diamond drilling of this skarn by Lost River Mining Corporation led to a resource calculation of 23, 527,000 tons grading 16.43% fluorite, 0.26% tin, and 0.04% WO3 that could be mined by open pit methods (WGM, 1972, p. 63). However, the spatial and mineralogic complexity of the deposit documented by Dobson (1982) suggests caution in using this early estimate of tonnage and grade.

Dobson (1982) developed a temporal and spatial framework for understanding relations between skarn evolution and development of veining and greisen in the subjacent granite cupola and the superjacent Cassiterite dike exogreisen deposit. In general, it appears that the overall polymetallic and aluminous character, the abundance of fluorine, and the significant potassium enrichment of the skarn reflect evolution of the highly evolved felsic magma in the subjacent granite pluton.

Alteration:

There are several stages and styles of alteration in the Lost River skarn deposit; (1) early anhydrous skarn with abundant garnet and idocrase, (2) hydrous skarn with biotite and hornblende, (3) fluorite-mica veining, (4) mica-matrix breccias, and (5) clay-matrix breccias.

Workings/Exploration:

Some of the underground workings of the Lost River mine encounter parts of the Lost River skarn and it is reasonably well exposed at the surface in outcrops and dozer trenches. However, it is primarily known from extensive diamond drilling (WGM, 1972, p. 63) which includes that of the USBM (22 holes totalling 8,693 feet), USDMEA (several underground holes totalling 1,984 feet), US Steel Corporation (15 holes totalling 5,201 feet) and Lost River Mining Corporation (68 holes totalling 36,949 feet).

Age of mineralization:

The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983). Fine-grained, leucocratic granite collected from a Lost River Mine dump has been dated at 80.2 +/- 2.9 my (Hudson and Arth, 1983, p.769).

Deposit model:

Tin-bearing skarn (Cox and Singer, 1986; model 14b)

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

14b

Production: None **Status:** Active

Production notes:

Production from the Lost River Mine has been from the Cassiterite dike exogreisen deposit (TE048).

Reserves:

Extensive diamond drilling of this skarn by Lost River Mining Corporation led to a resou

rce calculation of 23, 527,000 tons grading 16.43% fluorite, 0.26% tin, and 0.04% WO3 that could be mined by open pit methods and 1,275,000 tons of 11.66% fluorite, 0.15% tin, and 0.01% WO3 that would need to be mined by underground methods (WGM, 1972, p. 63). However, the spatial and mineralogic complexity of the deposit documented by Dobson (1982) suggests caution in using this early estimate of tonnage and grade.

Additional comments:

References:
Lorain and others, 1958; Sainsbury, 1964; Cobb and Sainsbury, 1972; Cobb, 1975; Dobson, 1982; Hudson and Arth, 1983; Hudson and Reed, 1997

Primary reference: Dobson, 1982

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Lost River-endogreisen

Site Type: Mine

ARDF no. TE050

Latitude: 65.474 **Quadrangle:** TE B-5

Longitude: 167.156

Location description and accuracy:

The Lost River Mine area includes the Cassiterite dike exogreisen deposit (TE048), the Lost River Mine skarn deposit (TE049), the Lost River Mine endogreisen deposit (TE050), and the Ida Bell dike exogreisen deposit (TE051). The Lost River endogreisen deposit is located in a subsurface granite cupola below the Lost River skarn deposit. The skarn is exposed along and east of Cassiterite Creek at elevations of 275 to 400 feet about 0.9 miles upstream from the creek's confluence with Lost River. The upper part of the endogreisen is within 100 to 200 feet of the surface whereas deeper parts extend to depths of 750 feet or more. This deposit was included as part of locality 8 by Cobb and Sainsbury (1972). References were summarized under the name 'Lost River' by Cobb (1975).

Commodities:

Main: Sn **Other:** Ag, Cu, Pb, Zn, W

Ore minerals: Cassiterite, chalcopyrite, galena, sphalerite, wolframite

Gangue minerals: Arsenopyrite, fluorite, pyrite, quartz, topaz, tourmaline, white mica

Geologic description:

The Lost River endogreisen deposit is developed at the roof of a highly differentiated, fine-grained granite cupola and in sheeted zones at depth within the cupola. The Lost River skarn deposit is developed in Ordovician limestone country rocks adjacent to and above the endogreisen deposit. Late hydrothermal breccia, with mica- and clay-rich matrices, have been superimposed on both endogreisen and skarn (Dobson, 1982, figure 4). The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983). Fine-grained, leucocratic granite collected from a Lost River Mine dump has been dated at 80.2 +/- 2.9 my (Hudson and Arth, 1983, p.769).

As described by Dobson (1982), the roof greisen is mica-rich, commonly 30 to 60% muscovite and probably zinnwaldite. The mica-rich greisen merges upward with hydrothermal breccias having a mica-rich matrix. Downward the mica-rich roof greisen gives way to quartz-rich greisen that characteristically contains tourmaline and sulfide minerals including pyrite, arsenopyrite, galena, sphalerite, and chalcopyrite. There are gradations from unaltered to completely greisenized granite but in places only thin, quartz-arsenopyrite, quartz-tourmaline, and greisen veins are present in granite. The roof greisen as mapped by Dobson (1982, figures 4 and 5), has dimensions of about 120 x 400 x 1,000 feet. Sainsbury's (1964, plate 9) compilation of grade data for this part of the deposit indicates that the general grade is a few tenths of a percent tin and a few hundreths of a percent WO3.

The deeper sheeted greisen was defined by Dobson (1982, figure 4) but it is primarily known from intercepts in two diamond drill holes completed by Teasgulf Inc. in 1979. Hole TG 2 (collared at 275 feet elevation, azimuth of N 19 E, inclined at 67.5 degrees, and a total depth of 1,012 feet) encountered: (1) 0.19% tin, 0.74% copper, 0.95% lead, 4.32% zinc, 2.73 opt silver, and 0.01% WO3 from 633 to 638 feet; (2) 1.21% tin, 0.05% copper, 0.06% lead, 0.03% zinc, 0.18 opt silver, and 0.06% WO3 from 638 to 647 feet; (3) 0.84% tin, less than 0.03% copper, 0.18% lead, 0.43% zinc, 0.27 opt silver, and 0.01% WO3 from 800.1 to 814.5 feet; and (4) 1.33% tin, less than 0.03% copper, less than 0.04% lead and zinc, 0.04 opt silver, and 0.05% WO3 from 814.5 to 823.6 feet. Hole TG 3 (collared at 321 feet elevation, azimuth of N 19 E, inclined at 64.5 degrees, and a total depth of 1,037 feet) encountered: (1) 0.28% tin, 0.08% copper, 0.78% lead, 0.80% zinc, and 1.75 opt silver (tungsten was not determined) from 778.5 to 789.8 feet; and (2) 0.88% tin, 0.08% copper, 0.20% lead, 2.13% zinc, and greater than 3.4 opt silver (tungsten was not determined) from 796.3 to 801.4 feet. Other zones of weaker tin metallization and weaker to stronger base metal and silver metallization are present in these holes. The metallization is in highly silicified zones with sulfide minerals, tourmaline, and fluorite in granite.

Alteration:

There is a well-developed quartz-tourmaline-fluorite greisen at depth, a mica-rich greisen in the roof zone, and both mica- and clay-matix hydrothermal breccias above the roof zone. The greisen types appear to merge with one another and the breccias are late, overprinting assemblages.

Workings/Exploration:

This prospect has been explored by 750 feet of underground workings of the Lost River mine (32 and 195 crosscuts, Calcite drift, and 190 raise; Sainsbury, 1964, plate 9). The upper roof greisen has been encountered by many USBM and Lost River Mining Corporation drill holes and the deeper sheeted greisen zones hve been encountered by two Texasgulf Inc diamond drill holes.

Age of mineralization:

The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983). Fine-grained, leucocratic granite collected from a Lost River Mine dump has been dated at 80.2 +/- 2.9 my (Hudson and Arth, 1983, p.769).

Deposit model:

Endogreisen including roof and sheeted greisen. Tin greisen model (15c) of Cox and Singer, 1986).

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

15c

Production: None **Status:** Active

Production notes:

Production from the Lost River Mine has been from the Cassiterite dike exogreisen deposit (TE048).

Reserves:

Resource estimates have not been separately determined for the endogreisen deposits; grades are commonly a few tenths percent tin and a few hundreths percent WO3 although some greisen sheets at depth have higher tin grades, base metals, and silver in places.

Additional comments:

References:

Lorain and others, 1958; Sainsbury, 1964; Cobb and Sainsbury, 1972; Cobb, 1975; Texasgulf, Inc., 1979; Dobson, 1982; Hudson and Arth, 1983; Hudson and Reed, 1997

Primary reference: Texasgulf, Inc., 1979; Dobson, 1982

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Lost River-Ida Bell dike exogreisen

Site Type: Mine

ARDF no. TE051

Latitude: 65.477 **Quadrangle:** TE B-5

Longitude: 167.163

Location description and accuracy:
The Lost River Mine area includes the Cassiterite dike exogreisen deposit (TE048), the Lost River Mine skarn deposit (TE049), the Lost River Mine endogreisen deposit (TE050), and the Ida Bell dike exogreisen deposit (TE051). The Ida Bell exogreisen deposit is located on the on the west side of Cassiterite Creek, one mile upstream of its confluence with Lost River (Sainsbury, 1969, plate 1). It is at an elevation of 400 to 500 feet. The Ida Bell is a felsic dike that trends northwest for about 2 miles from Lost River across Cassiterite Creek. It intersects the northwest-trending Cassiterite dike in the prospect area. This location was not identified separately by Cobb and Sainsbury (1972) although several relevant references were summarized by Cobb (1975) under the name 'Lost River'.

Commodities:
Main: Sn, W **Other:**

Ore minerals: Cassiterite, wolframite

Gangue minerals: Fluorite, quartz, sulfide minerals, topaz, tourmaline, white mica

Geologic description:
The Ida Bell prospect is developed within a 2-mile long, northwest-trending felsic dike in Ordovician limestone that is up to 55 feet wide but averages 28.5 feet in width where exposed in dozer trenches. At the surface, this dike intersects the Cassiterite dike at about 500 feet elevation on the low north-south trending divide between Cassiterite Creek and Lost River. The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983). Fine-grained, leucocratic granite collected from a Lost River Mine dump has been dated at 80.2 +/- 2.9 my (Hudson and Arth, 1983, p.769).

Local greisen development and related veining has been overprinted by late kaolinization in most exposed areas. Greisen contains quartz, topaz, sericite, fluorite, and arsenopyrite. A USBM diamond drill hole that intersects the Ida Bell dike 483 feet below the surface intersection with the Cassiterite dike shows it to be 40 feet wide and to average 0.33% tin including a seven foot section of 1.13% tin (Sainsbury, 1964, p. 52).

The available drill holes and trenches outline a 900 x 400 x 28.5 foot volume containing about 840,000 tons that averages 0.26% tin and less than 0.1% WO3. One part of this block, near the intersection with the Cassiterite dike, contains 60,000 tons of 1.06% tin (Sainsbury, 1964, p. 52). The more local greisen development in the Ida Bell dike, at least at the surface, contrasts with the more extensive greisen alteration of the Cassiterite dike to the east of Cassiterite Creek in the Lost River mine. However, this prospect has not been extensively explored.

Alteration:
Significant alteration is restricted to the Ida Bell dike and includes greisen (quartz, topaz, sericite, fluorite, tourmaline, and arsenopyrite replacement of granite) and later overprinting kaolinization.

Workings/Exploration:
Several surface dozer trenches and four USBM diamond drill holes have been completed on the Ida Bell prospect. A short adit and winze were also developed (Heide, 1946, figure 2).

Age of mineralization:
The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983). Fine-grained, leucocratic granite collected from a Lost River Mine dump has been dated at 80.2 +/- 2.9 my (Hudson and Arth, 1983, p.769).

Deposit model:
Exogreisen. This deposit has characteristics of both the tin vein model (15b) and tin greisen model (15c) of Cox and Singer (1986).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
15b, 15c

Production: None **Status:** Active?

Production notes:
Production from the Lost River Mine has been from the Cassiterite dike exogreisen deposit (TE048).

Reserves:
The available drill holes and trenches outline a 900 x 400 x 28.5 foot volume containing about 840,000 tons that averages 0.26% tin and less than 0.1% WO3. One part of this block, near the intersection with the Cassiterite dike, contains 60,000 tons of 1.06% tin (Sainsbury, 1964, p. 52).

Additional comments:

References:
Heide, 1946; Sainsbury, 1964; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Heide, 1946; Sainsbury, 1964

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Dalcoath Dike

Site Type: Prospect

ARDF no. TE052

Latitude: 65.489 **Quadrangle:** TE B-5

Longitude: 167.147

Location description and accuracy:
The Dalcoath dike prospect is about 1 mile north of the Lost River Mine (TE048-TE051). It is on the south side of the ridge separating Crystal Creek and the headwaters of Cassiterite Creek, both east tributaries to Lost River in the York Mountains. The surface trace of the dike, which trends N 50 E and dips about 65 degrees north, has been mapped by Sainsbury (1969, plate 1) at elevations of 600 to over 1,000 feet. This location was not identified separately by Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals: Arsenopyrite, chlorite, danburite, pyrite, tourmaline, white mica

Geologic description:
The 2- to 3-foot wide, Dalcoath dike has been mapped for over a mile of length and is highly altered for about 2,000 feet of this length. It intrudes Ordovician limestone and is one of the set of lamprophyre dikes locally present throughout the Lost River area. Faulting has deformed limestone, dike rock, and altered rocks; fault gouge is well developed in some places. The dike may have originally been emplaced along a fault but some movement has post-dated emplacement, alteration, and mineralization. Six-inch wide limestone selvages adjacent to both sides of the dike are recrystallized and contain minor topaz and scattered tremolite. Some tremolite mats are developed along bedding. Cassiterite, intergrown with danburite, is locally abundant in this altered limestone (Knopf, 1908, p. 51). Alteration of the dike includes disseminated replacement by quartz, white mica, tourmaline, arsenopyrite, and pyrrhotite. Arsenopyrite-rich replacement is well developed along the hanging wall contact and small cassiterite grains are disseminated in the highly altered rocks (Knopf, 1908, p. 51). Samples of quartz-tourmaline rock contain up to 1.9% tin but only 3 ppm tungsten (Hudson, 1983).

Layered tactite is well developed on the lower slopes south of the Dalcoath dike. This tactite is also present on the lower part of the west side of the ridge cut by the Dalcoath dike in the area of the Hidden dike prospect (TE053). A positive magnetic anomaly detected by an airborne survey (McDermott, 1983) is developed in the Dalcoath dike area (Hudson, 1983).

Alteration:
The strongly altered lamprophyre dike has abundant white mica, arsenopyrite, quartz, tourmaline, danburite in places, chlorite, pyrite, and some topaz.

Workings/Exploration:
Prospect pits scattered along the dike, a 100-foot long adit, and a 25-foot deep shaft were completed by 1918 (Steidtmann and Cathcart, 1922, p. 76-77). There has been only occasional surface observation and sampling since.

Age of mineralization:
The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Alteration and mineralization along lamprophyre dike in Ordovician limestone. Deposit analog is not clear; possibly tin vein model (15b), or at depth, tin skarn, replacement, or greisen models(14b, 14c, and 15c) after Cox and Singer (1986).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
14b, 14c, 15b, 15c

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Knopf, 1908 (USGS B 358); Steidtmann, and Cathcart, 1922; Sainsbury, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; McDermott, 1983; Hudson, 1983; Hudson and Arth, 1983

Primary reference: Knopf, 1908 (USGS B 358); Hudson, 1983

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Hidden Dike

Site Type: Prospect

ARDF no. TE053

Latitude: 65.49 **Quadrangle:** TE B-5

Longitude: 167.172

Location description and accuracy:
The Hidden dike prospect is located on the northwest flank of the ridge between Crystal Creek and the upper part of Cassiterite Creek. Both creeks are east tributaries to Lost River in the York Mountains. The prospect is at about 750 foot elevation and only 0.5 mile upstream from the confluence of Crystal Creek and Lost River. This locality was not identified separately by Cobb and Sainsbury (1972) or Cobb (1975) but the surface trace of the Hidden dike was mapped by Sainsbury (1969, plate 1).

Commodities:
Main: Sn **Other:** Pb, Ag

Ore minerals: Cassiterite (?), galena

Gangue minerals: Pyrrhotite, quartz, tourmaline

Geologic description:
The Hidden dike is a felsic quartz porphyry that is bordered by layered tactite developed in Ordovician limestone. The contact with tactite is irregular, brecciated, and locally strongly altered. Tourmaline, galena, and pyrrhotite are present in the more strongly altered rocks. Two samples of tourmalized quartz porphyry contained 1.4 and 3.2% tin, 2.9 and 4.45% lead, and 1.1 and 2.9 opt silver. The layered tactite was only weakly anomalous in tin (to 110 ppm) and other elements (Hudson, 1983).

This prospect, the Dalcoath dike prospect 0.75 mile to the east (TE052), the extensive tactite development at lower elevations of the ridge where the Hidden and Dalcoath dikes are located, and an apparently related magnetic anomaly (McDermott, 1983) suggests the possibility of a tin mineralizing system at depth in this general area (Hudson, 1983). The surface dikes are not believed to be directly responsible for the nearby tactite development.

Alteration:
Calc-silicate tactite is well developed in carbonate rocks bordering the Hidden dike. The dike itself is variably replaced by tourmaline but large parts are unaltered. The border of the dike appears to have localized irregular solution breccias.

Workings/Exploration:
Only limited surface observations and sampling have been completed here.

Age of mineralization:
The age of the mineralization is assumed to be related to the development of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Altered quartz porphyry dike in tactite. Deposit analog is not clear; possibly tin vein model (15b), or at depth, tin skarn, replacement, or greisen models(14b, 14c, and 15c) after Cox and Singer (1986).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
14b, 14c, 15b, 15c

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Sainsbury, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1972; Cobb, 1975; McDermott, 1983; Hudson, 1983; Hudson and Arth, 1983

Primary reference: Hudson, 1983

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Third Of July

Site Type: Prospect

ARDF no. TE054

Latitude: 65.513 **Quadrangle:** TE C-5

Longitude: 167.043

Location description and accuracy:

The Third of July prospect is located at an elevation of 1,250 feet on the south side of an Ordovician limestone ridge that separates the headwaters of Anderson Creek and an unnamed 13-mile long stream that flows south to Brevig Lagoon. Anderson Creek, with headwaters on the southeast slopes of Brooks Mountain, flows east to the Don River. The prospect is on the south side of a prominent saddle (1,350 feet elevation) developed at the head of north and south draining gulches. The pass between Anderson Creek headwaters and the unnamed stream to the south, at 640 feet elevation, is 0.75 miles west of the prospect. This locality was not identified by Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals: Mica, quartz, sulfide minerals (?), topaz, tourmaline

Geologic description:

This prospect is a 500 x 500 foot area of prophyritic granite intrusion in Ordovician limestone. Sainsbury (1969, plate 1) mapped the location of the granite and noted the presence of beryllium-bearing minerals here.

Anaconda Minerals Company completed detailed mapping, sampling, and gravity and magnetic surveys in the prospect area during parts of the summers of 1982 and 1983 (Hudson and Wyman, 1983). This work indicates that the exposed granite is a small part of a larger granite body at depth. The exposed intrusion is porphyritic biotite granite with quartz and feldspar phenocrysts in an aplitic groundmass. Thin, 1 to 2.5 inch wide aplite dikes, some with disseminated purple fluorite, cut the porphyritic granite. The age of the mineralization is assumed to be similar to that of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Ordovician limestone intruded by the granite has been thermally recrystallized over large areas. Thin quartz-fluorite, calcite-fluorite, or fluorite veins and veinlet stockworks are widespread and common within 300 feet of the granite contact. Minor skarn, developed locally along the limestone-granite contact, includes light green quartz, fluorite, epidote, calcite bands with purple fluorite veins and some sulfide minerals. Sulfide minerals include pyrite and pyrrhotite in altered limestone and granite. Endoskarn is locally developed where remnant quartz phenocrysts are present within light to dark green epidote-fluorite-sericite assemblages. Intense silicification of limestone is also locally present in the contact zone. The porphyritic granite is altered to greisen along structural zones and fractures. These altered rocks typically contain vuggy clots of tourmaline crystals in a light colored, aphanitic matrix (quartz and mica?). Vuggy quartz-tourmaline veins up to one-foot wide cut granite and greisen. The exposed granite is similar to precursor granites (Hudson and Reed, 1997, figure 3) and not the fine-grained, equigranular, and leucocratic granite more directly associated with tin metallization elsewhere on Seward Peninsula (Hudson and Arth, 1983). A mineralizing granite phase could be present in the subsurface of this area.

Most cassiterite mineralization is associated with altered rocks within granite. Gossan fragments have up to 0.2% tin but only weakly anomalous lead and zinc (100 to 500 ppm). Arsenic, tungsten, and base metals are generally present at low levels; elevated tin, fluorine, and boron characterize the metasomatism here. Greisen samples contain up to 0.4% tin, 5,800 ppm fluorine, and greater than 20,000 ppm boron.

Alteration:
Thermal recrystallization of limestone, minor skarn in limestone, minor endoskarn in granite, fluorite-bearing veins and veinlets in both limestone and granite, and local greisenization of granite are all present in the prospect area.

Workings/Exploration:
Surface mapping and sampling and a few shallow hand-dug surface pits have been completed here. An airborne magnetic survey and a gravity survey have been completed over the prospect (McDermott in Hudson and Wyman, 1983, p. 68-71).

Age of mineralization:
The age of the mineralization is assumed to be similar to that of tin systems in the Lost River area and therefore Late Cretaceous, the age of the tin-mineralizing granites there (Hudson and Arth, 1983).

Deposit model:
Tin greisen in granite. (Cox and Singer, 1986; model 15c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
15c

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Wyman, 1983; Hudson and Arth, 1983; Hudson and Reed, 1997

Primary reference: Hudson and Wyman, 1983

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Foggy Day; Read; Paigite; Cameron

Site Type: Prospects

ARDF no. TE055

Latitude: 65.519 **Quadrangle:** TE C-5

Longitude: 167.156

Location description and accuracy:
Several mineral occurrences are located on west-facing slopes peripheral to the Brooks Mountain granite stock in the headwaters of a southeast tributary to the Mint River. Mint River flows northward from its headwaters along the continental divide in the York Mountains. This prospect area is downslope to the west of the continental divide at an approximate elevation of 1,750 feet. Prospects included in this area are Foggy Day, Cameron, Read, and Paigite (West and White, 1952, plate 1). This area was shown as locality 11 of Cobb and Sainsbury (1972) and Cobb (1975) summarized relevant references under the name 'Brooks Mtn.'.

Commodities:
Main: None **Other:** Ag, Pb, U

Ore minerals: Galena and zuenerite, but complex mineralogy characterizes this area

Gangue minerals: Complex mineralogy characterizes assemblages

Geologic description:
Brooks Mountain granite stock is a 1 by 2 mile composite intrusion just south and east of Brooks Mountain (elevation 2,898 feet), the highest part of the York Mountains. The country rocks to the Late Cretaceous (77.0 +/- 3.0 my; Hudson and Arth, 1983, p. 769) Brooks Mountain granite are Ordovician limestone and locally fine-grained, carbonaceous metaclastic rock of unknown but probable Paleozoic age. Tactite is common in marble nearby to the granite contact on the northwest and southwest sides of the stock (Sainsbury, 1969, plate 1). Hornfels is developed in the nearby metaclastic rocks. The granite is dominately seriate and prophyritic types (Hudson and Arth, 1983, p. 770) that are not known to be directly linked with significant tin metallization in the western Seward Peninsula tin belt; they are instead precusor-type granites (Hudson and Reed, 1997, figure 3).

The mineralization in this area is associated with contact metamorphic rocks developed in Ordovician limestone peripheral to the southwest contact of the Brooks Mountain granite stock. Complex mineralogy characterizes the occurrences here. Tactite forms seams and irregular masses in crystalline marble; idocrase, garnet, diopside, augite, hedenbergite, phlogopite, and fluorite are present in the tactite. Sulfide minerals, dominately galena, include pyrrhotite, stannite, sphalerite, pyrite, arsenopyrite, chalcopyrite, chalcocite, and bornite. Other minerals include scapolite, chrondrodite, siderophyllite, tourmaline, scheelite, ludwigite, magnetite, hematite, limonite, cerussite, azurite, malachite, paigite, and hulsite. Zuenerite is locally present in association with hematite in oxidized granite adjacent to marble.

This is primarily an area of interesting mineral occurrences although selected samples of galena-rich material assayed 34% lead and 11 opt silver (Knopf, 1908, p. 42-43) and zuenerite-rich material contained up to 2.14% eU (West and White, 1952, p. 4).

Alteration:
Primarily calc-silicate tactite development but with significant associated boron metasomatism.

Workings/Exploration:
Several surface pits and some dozer trenches have been completed here.

Age of mineralization:
The age of the mineralization is assumed to be similar to the age of the Brooks Mountain granite (77.0 +/- 3.0 my; Hudson and Arth, 1983, p. 769).

Deposit model:
This is an approximate 1,500 by 3,000 foot area of variable contact metamorphism of Ordovician limestone near the contract of the Brooks Mountain granite stock. Possibly tin skarn (Cox and Singer, 1986, model 14b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
14b

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Knopf, 1908 (USGS B 358); West and White, 1952; Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975; Patton and Robinson, 1975; Hudson and Arth, 1983; Hudson and Reed, 1997

Primary reference: Knopf, 1908 (USGS B 358); West and White, 1952

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on western side of Brooks Mountain)

Site Type: Prospect

ARDF no. TE056

Latitude: 65.529

Quadrangle: TE C-5

Longitude: 167.153

Location description and accuracy:

This area is along the west contact zone of the Brooks Mountain granite stock, about 0.8 mile north of the prospects on the southwest side of the stock (TE055). The prospect area is at an elevation of about 2,500 feet along and immediately west of the continental divide. This locality was not shown separately by Cobb and Sainsbury (1972) but some relevant references were summarized by Cobb (1975) under the name 'Brooks Mtn.'.

Commodities:

Main: None

Other: Pb, U

Ore minerals: Galena

Gangue minerals: Calcite, idocrase, tourmaline

Geologic description:

Brooks Mountain granite stock is a 1 by 2 mile composite intrusion just south and east of Brooks Mountain (elevation 2,898 feet), the highest part of the York Mountains. The country rocks to the Late Cretaceous (77.0 +/- 3.0 my; Hudson and Arth, 1983, p. 769) Brooks Mountain granite are Ordovician limestone and locally fine-grained, carbonaceous metaclastic rock of unknown but probable Paleozoic age. Tactite is common in marble nearby to the granite contact on the northwest and southwest sides of the stock (Sainsbury, 1969, plate 1). Hornfels is developed in the nearby metaclastic rocks. The granite is dominately seriate and prophyritic types (Hudson and Arth, 1983, p. 770) that are not known to be directly linked with significant tin metallization in the western Seward Peninsula tin belt; they are instead precusor-type granites (Hudson and Reed, 1997, figure 3).

Tactite here contains much idocrase and some tourmaline. It forms irregular masses and green-colored seams along fractures in marble. Small cubes of galena are present in open vugs in the tactite. About 700 feet to the southeast, the Brooks Mountain granite contains 1 to 4 inch wide quartz-tourmaline veins along joints. Uranium (to 1% eU) is present in zuenerite associated with hematite coatings on vein and fracture surfaces (West and White, 1952).

Alteration:

Tactite in carbonate rocks, quartz-tourmaline veining in granite, and secondary oxide development.

Workings/Exploration:

Some surface pits have been dug here.

Age of mineralization:

The age of the mineralization is assumed to be similar to the age of the Brooks Mountain granite (77.0 +/- 3.0 my; Hudson and Arth, 1983, p. 769).

Deposit model:
This is an area of variable contact metamorphism of Ordovician limestone by the Brooks Mountain granite stock. Possibly tin skarn (Cox and Singer, 1986; model 14b)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
14b

Production: None

Status: Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
West and White, 1952; Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975; Patton and Robinson, 1975; Hudson and Arth, 1983; Hudson and Reed, 1997

Primary reference: West and White, 1952

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): York Creek (East)

Site Type: Occurrence

ARDF no. TE057

Latitude: 65.559 **Quadrangle:** TE C-5

Longitude: 167.071

Location description and accuracy:
York Creek is a north-flowing tributary to the Pinguk River. It heads on the continental divide and the north flank of Brooks Mountain, the highest part (2,898 feet elevation) of the York Mountains. Some of the headwater areas are in the contact zone of the Brooks Mountain granite stock. This location is on the east headwater fork of York Creek at an elevation of 500 feet. It is locality 48 of Cobb and Sainsbury (1972) and Cobb (1975) summarized relevant references under the name 'York Cr.'.

Commodities:
Main: Sn, W **Other:**

Ore minerals: Cassiterite, scheelite

Gangue minerals:

Geologic description:
USBM churn-drill holes were completed at this locality and three others were completed about 1 mile downstream at an elevation of 400 feet (Mulligan, 1959, p. 6). Ten to 11 feet of gravel overlying shale and limy shale bedrock contain a trace of tin per cubic yard. Minerals in the heavy mineral concentrate included pyrite, limonite pseudomorphs after pyrite, garnet, tourmaline, apatite, barite, augite, traces of cassiterite, and scheelite (Mulligan, 1959, p. 16). The three churn-drill holes 1 mile downstream (400 feet elevation) encountered only 2 to 3 feet of gravel and contained a trace of tin; identified minerals there were pyrite, limonite pseudomorphs after pyrite, barite, tourmaline, garnet, and zircon (Mulligan, 1959, p. 16).

Alteration:

Workings/Exploration:
Three USBM churn-drill holes were completed at this locality and three more 1 mile downstream (400 feet elevation).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959 (USBM RI 5520); Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): York Creek (West)

Site Type: Occurrence

ARDF no. TE058

Latitude: 65.568 **Quadrangle:** TE C-5

Longitude: 167.108

Location description and accuracy:
York Creek is a north-flowing tributary to the Pinguk River. It heads on the continental divide and the north flank of Brooks Mountain, the highest part (2,898 feet elevation) of the York Mountains. Some of the headwater areas are in the contact zone of the Brooks Mountain granite stock. This location is on the west headwater fork of York Creek at an elevation of 510 feet. It is locality 47 of Cobb and Sainsbury (1972) and Cobb (1975) summarized relevant references under the name 'York Cr.'.

Commodities:
Main: Sn, W **Other:**

Ore minerals: Powellite, scheelite

Gangue minerals:

Geologic description:
The headwater area of York Creek, on the north flank of the Brooks Mountain area, includes the contact zone of the Brooks Mountain granite stock and a small granite plug in Ordovician limestone (Sainsbury, 1969, plate 1). Fine-grained, carbonaceous metapelitic rocks of uncertain but probable Paleozoic age are also present in this area and thermally metamophosed near granite intrusions. Three USBM churn-drill holes were completed at this locality (Mulligan, 1959, p. 6). The 7.5 to 12 feet of gravel overlying shale and limy shale bedrock contain a trace of tin per cubic yard. Minerals identified in the heavy mineral concentrate included pyrite, limonite pseudomorphs after pyrite, garnet, barite, tourmaline, scheelite, and powellite (Mulligan, 1959, p. 16).

Alteration:

Workings/Exploration:
Three USBM churn-drill holes have been completed here (Mulligan, 1959, p. 6, 15, and 16).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:

Mulligan, 1959 (USBM RI 5520); Sainsbury, 1969; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Mulligan, 1959 (USBM RI 5520)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Tin Creek (in Ear Mountain area)

Site Type: Occurrence

ARDF no. TE059

Latitude: 65.971 **Quadrangle:** TE D-3

Longitude: 166.196

Location description and accuracy:
Tin Creek, within the Bering Land Bridge National Preserve, drains the lower elevations of the north flank of Ear Mountain. Ear Mountain is an isolated upland reaching a maximum elevation of 2,329 feet in the north-central Teller D-3 quadrangle. This locality is at 525 feet elevation in the headwaters of Tin Creek, 0.9 miles northwest of the Ear Mountain landing strip. This is locality 53 of Cobb and Sainsbury (1972) and Cobb (1975) summarized relevant references under the name 'Tin Cr., trib. Shishmaref Inlet'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
The Ear Mountain upland is cored by a Late Cretaceous (76.7 +/- 2.8 my) composite biotite granite stock (Sainsbury, 1972; Hudson and Arth, 1983). Country rocks to this stock are an impure and schistose carbonate sequence of unknown but probable Paleozoic age. Tin Creek does not have headwaters that cross the contact zone of the Ear Mountain granite stock directly although tundra-mantled slopes above the headwater area continue upward for 1.5 miles south to an area of significant lode tin metallization (Ear Mountain prospect, TE060)). A USBM churn-drill hole at this locality encountered 3 feet of overburden and three feet of gravel. The gravel contained a trace of tin per cubic yard and identified minerals included calcite, quartz, diopside, actinolite, tourmaline, orthoclase, albite, limonite (pseudomorph after pyrite), and cassiterite (Mulligan, 1959, p, 30).

Alteration:

Workings/Exploration:
One USBM churn-drill hole was completed here (Mulligan, 1959).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Mulligan, 1959 (USBM RI 5493)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Ear Mountain; North Hill; Winfield shaft

Site Type: Prospect

ARDF no. TE060

Latitude: 65.945 **Quadrangle:** TE D-3

Longitude: 166.206

Location description and accuracy:
Ear Mountain is an isolated upland cored by a granite stock (Sainsbury, 1972) that reaches a maximum elevation of 2,329 feet in the north-central Teller D-3 quadrangle. The Ear Mountain prospect is located in the north contact zone of the Ear Mountain granite stock. This contact is locally irregular but trends approximately east -west across North Hill, a flat-topped hill (elevation of 1,642 feet) on the northeast flank of the Ear Mountain upland. The Ear Mountain prospect is centered on the old Winfield shaft (Mulligan, 1959). This is locality 14 of Cobb and Sainsbury (1972) and Cobb (1975) summarized relevant references under the name 'Ear(s) Mtn.'.

Commodities:
Main: Ag, Cu, Sn, Zn **Other:** Au

Ore minerals: Cassiterite, chalcopyrite, sphalerite

Gangue minerals: Arsenopyrite, axinite, calc-silicates, fluorite, pyrrhotite, pyrite, quartz, sericite, tourmaline, zinnwaldite

Geologic description:
Ear Mountain is cored by a 2 x 2 mile, Late Cretaceous (76.7 +/- 2.8 my; Hudson and Arth, 1983, p. 769), composite biotite granite stock. Country rocks to this stock are an impure and schistose carbonate sequence, with some metapelitic rocks, of unknown but probable Paleozoic age.

The Ear Mountain stock is mostly porphyritic biotite granite with an aplitic groundmass. Medium- to coarse-grained seriate biotite granite is present along the southern margin and medium-grained equigranular alaskite forms small intrusive bodies in the vicinity of the northern contact. Dikes and sills of alaskite and fine-grained granite prophyry are present in the country rocks. A few mafic dikes are also locally present in granite and country rocks. The country rocks, mostly impure and schistose carbonate rocks but also including some fine-grained, dark metapelitic rocks, are variably converted to tactite and hornfels around the granite stock (Knopf, 1908, p. 28-29). Skarn is well-developed in parts of the Ear Mountain prospect for about 7,000 feet of strike along the north contact of the Ear Mountain granite (Mulligan, 1959). Skarn minerals include idocrase, garnet, wollastonite, diopside, spinel, salite, and forsterite. A later hydrous skarn stage has been reported by Bond (1982) that includes idocrase, quartz, tourmaline, fluorite, calcite, magnetite, pyrrhotite, pyrite, stannite, chalcopyrite, and sericite or muscovite. Much of the hydrous alteration is vein-controlled and overprinting assemblages (pyrrhotite and chalcopyrite-pyrite veins in magnetite) are present.

Greisen-like alteration is present within equigranular granite north of the main pluton contact, distinct linear zones cutting coarse porphyritic granite inward from the main pluton contact, and an irregular zone in granite at the north contact of the pluton. Most of the greisen-like alteration is quartz-tourmaline replacement that is widespread in the Ear Mountain area as veins that are developed along joints or fractures in granite. Selvages adjacent to mineralized fractures and joints, in places a few feet wide, are characterized by tourmaline replacement of feldspar. In porphyritic granite with coarse feldspar phenocrysts, tourmaline aggregates that pseudomorph the feldspar crystals are common. Fluorite-white mica-quartz-tourmaline alteration with some disseminated cassiterite is present at the surface east of the Winfield shaft (trench 3E of Mulligan, 1959) and high-grade samples from the Winfield shaft dump (see below) are rusty, arsenopyrite-fluorite-quartz-tourmaline rocks. The protolith of the high-grade rocks from the Winfield shaft dump is not known but mapping and sampling by Mulligan (1959) in the underground workings of the Winfield shaft suggests that they may have been metasedimentary.

There is a strong stratigraphic control to mineralization in the Winfield shaft workings (Mulligan, 1959). Specific "altered limestone" beds peripheral to an unaltered alaskite sill were mapped and sampled separately by Mulligan (1959, p. 16). Mineralized layers within 7.5 feet stratigraphic thickness (above and below, 15 feet total stratigraphic thickness) of an 0.8 foot thick alaskite sill average 1.09% tin. Layers that overlie the tin-rich beds above the alaskite sill, aggregating almost 12 feet of additional stratigraphic thickness, contain lower tin values (0.1 to 0.2%) but significant copper (0.72-3.0%), zinc (0.8 to 1.9%) and silver (0.36 to 3.41 opt). Mulligan (1959, p. 43-44) also reports a trace or slightly more gold in some samples from the Winfield shaft; one sample contained a highly anomalous 2.58 opt gold. Sample results reported by Hudson (1983), including several from the Winfield shaft dump, contain gold in the less than 5 ppb to 105 ppb range. The mineralogic character of mineralized beds in the Winfield shaft workings have not been specifically described but composite samples of altered limestone adjacent to the alaskite sill contain "quartz, less fluorite, some feldspar and tourmaline, relatively small amounts of clinopyroxene, amphibole, siderite, arsenopyrite, chlorite, limonite, epidote, sericite, pyrite, biotite, pageite, pyrrhotite, and cassiterite. Very small amounts of rutile, garnet, magnetite, pyrolusite, and gold are also observed" (Mulligan, 1959, p. 49). Other mineralized limestone samples from the Winfield shaft contain "feldspar with amphibole, fluorite, quartz, clinopyroxene, tourmaline, and relatively small amounts of pyrite, pyrrhotite, siderite, limonite, scapolite, arsenopyrite, chorite, pageite, and sericite. Also very small amounts of cassiterite, pyrolusite, rutile, and chalcopyrite" (Mulligan, 1959, p. 49).

Samples from the Winfield shaft dump contain "quartz, fluorite, axinite, zinnwaldite, chalcopyrite, arsenopyrite, sphalerite and relatively small amounts of pyrrhotite, tourmaline, hematite, limonite, cerussite, talc, and pyrite. Also very small amounts of malachite, galena, hypersthene, calcite, cassiterite, and scheelite" (Mulligan, 1959, p. 49).

Geochemical data for rock samples from the Ear Mountain prospect area are included in Hudson (1983). Nine samples of arsenopyrite-quartz-tourmaline-fluorite rocks from the Winfield shaft dump contain 1.10 to 5.0% tin. One tactite, one hornfels, and three quartz-tourmaline rocks contain 0.19 to .88% tin. All other rocks had 1,000 ppm tin or less. Tungsten was highly anomalous in two quartz-tournmaline rocks (400 and 1,800 ppm), tantalum is not present in amounts greater than 40 ppm, and fluorine and boron are commonly present in highly anomalous amounts (greater than 20,000 ppm and 10,000 ppm respectively). Arsenic exceeds 1,000 ppm in many samples with higher tin contents and base metals were at low to strongly anomalous concentrations (5 to 4,600 ppm copper, 4 to 1,010 ppm lead, and 3 to 385 ppm zinc). None of these samples appear to have represented base metal-rich mineralization like that encountered by Mulligan (1959) in the Winfield shaft workings.

Anaconda Minerals Company completed an airborne magnetometer survey (0.25 mile flight spacing) over the Ear Mountain area in 1979 (Hudson, 1983). These data indicate local magnetic highs in the contact zone surrounding the Ear Mountain granite stock, and a magnetic low over the granite itself. A broader magnetic gradient to the north of the granite supports the interpretation of a shallow dipping granite contact in this area (Knopf, 1908, p. 30) but direct links between known mineralization and the magnetic character of the area are not obvious.

Alteration:
Alteration includes: skarn and hornfels development in country rocks; quartz-tourmaline-fluorite-white mica veining and replacement of granite; and sulfide-bearing replacement of country rocks with or without quartz, fluorite, and boron-bearing silicates.

Workings/Exploration:
Fourteen dozer trenches, a 29 foot shaft (Winfield shaft), a 35 foot winze, and about 100 feet of irregular drifts have been completed in the prospect area (Mulligan, 1959). There has been no diamond drilling to date.

Age of mineralization:
The mineralization is assumed to be related to evolution of the Ear Mountain granite stock and therefore Late Cretaceous in age (76.7 +/- 2.9 my, Hudson and Arth, 1983, p. 769).

Deposit model:
Greisen, skarn, and sulfide-rich replacement in carbonate rocks. Tin greisen (15c), tin skarn (14b), and possibly replacement tin (14c) models after Cox and Singer (1986).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
14b, 14c, 15c

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined but significant thickness and grade are present in the altered carbonate rocks of the Winfield shaft.

Additional comments:

References:
Knopf, 1908 (USGS B 358); Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Bond, 1982; Hudson and Arth, 1983; Hudson, 1983 including several from the Winfield shaft dump

Primary reference:
Mulligan, 1959 (USBM RI 5493); Hudson, 1983

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/1998

Site name(s): Tuttle Creek

Site Type: Prospect

ARDF no. TE061

Latitude: 65.938 **Quadrangle:** TE D-3

Longitude: 166.349

Location description and accuracy:
Tuttle Creek is a west-flowing drainage with headwaters on the north flank of Ear Mountain, an isolated upland reaching 2,329 feet elevation in the north-central Teller D-3 quadrangle. The headwaters of Tuttle Creek are in the area straddling the contact between the Ear Mountain granite stock and metacarbonate rocks (Sainsbury, 1972). North Hill, a flat-topped hill reaching 1,642 feet elevation on the north flank of the Ear Mountain upland, is the location of the principal lode prospect (TE060) in the area. This is locality 49, 50, and 52 of Cobb and Sainsbury (1972). Cobb (1975) summarized references to this locality under the name 'Tuttle Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Tuttle Creek and its headwaters drain a mineralized area straddling the contact between the Late Cretaceous Ear Mountain granite stock (76.7 +/- 2.9 my; Hudson and Arth, 1983, p. 769) and an impure metacarbonate sequence, with some metapelitic rocks, of unknown but probable Paleozoic age. Both overburden and gravel vary from a few feet to 15 feet in thickness. The tin content of the gravels varies from a trace to 1.28 pounds per cubic yard. The average tin content of the main drainage, as determined by 45 churn-drill holes, is 0.2 pounds per cubic yard (Mulligan, 1959, p. 23). The mining section along this part of the drainage averaged 7 feet in thickness. Tin in heavy mineral concentrates is present as cassiterite; other heavy minerals that were identified include monazite, zircon, axinite, scheelite, magnetite, and danburite (Killeen and Ordway, 1955). Some heavy mineral concentrate contained 0.23% eU; only traces of gold are reported.

Alteration:

Workings/Exploration:
Seventy three churn-drill holes (on 14 lines located along 2.5 miles of the drainage) and 9 other churn-drill holes in headwaters have been completed (Mulligan, 1959, p. 20 and 23).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Killeen and Ordway, 1955; Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Mulligan, 1959 (USBM RI 5493)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Quartz Creek (Ear Mountain area)

Site Type: Occurrence

ARDF no. TE062

Latitude: 65.904

Quadrangle: TE D-3

Longitude: 166.331

Location description and accuracy:
Quartz Creek is an east tributrary to Tuttle Creek that drains the southwest flank of Ear Mountain. It crosses the contact zone, and has headwaters in, the Ear Mountain granite stock (Sainsbury, 1972). Ear Mountain is an isolated upland reaching 2,329 feet elevation in the north-central Teller D-3 quadrangle. Three USBM churn-drill holes were completed at about 370 feet elevation and two were completed at about 680 feet elevation on this creek (Mulligan, 1959, p. 20). Coordinates for this occurrence are for the location at the lower elevation. This is locality 51 of Cobb and Sainsbury (1972). Cobb (1975) summarized references to this location under the name 'Quartz Cr.'.

Commodities:
Main: Sn

Other:

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Quartz Creek crosses the contact zone, and has headwaters in, the Ear Mountain granite stock (Sainsbury, 1972). This is a Late Cretaceous (76.7 +/- 2.9 my; Hudson and Arth, 1983, p. 769) composite biotite granite that intrudes an impure and schistose carbonate sequence, with some metapelitic rocks, of unknown but probable Paleozoic age. Three USBM churn-drill holes were completed at about 370 feet elevation and two were completed at about 680 feet elevation on this creek (Mulligan, 1959, p. 20). Coordinates for this occurrence are for the location at the lower elevation. These churn-drill holes encountered 3 to 6.5 feet of gravel. The lower part of the gravel and adjacent bedrock contained a trace of tin per cubic yard in two of the holes at 370 feet elevation. Minerals identified in samples here include quartz, calcite, oligoclase, orthoclase, garnet, diopside, and traces of pyrite, limonite, idocrase, tourmaline, epidote, chlorite, biotite, actinolite, and muscovite. Tin-bearing minerals were not identified (Mulligan, 1959, p. 30) although heavy mineral concentrates from this creek contained monazite, zircon, cassiterite, zenotime, apatite, and scapolite (Killeen and Ordway, 1955, p. 81-82).

Alteration:

Workings/Exploration:
A total of 5 churn-drill holes were completed on this creek (Mulligan, 1959, p. 20).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None

Status: Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Killeen and Ordway, 1955; Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Mulligan, 1959 (USBM RI 5493)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Deer Creek (Ear Mountain area)

Site Type: Occurrence

ARDF no. TE063

Latitude: 65.888 **Quadrangle:** TE D-3

Longitude: 166.215

Location description and accuracy:
Deer Creek is a short, 2-mile long north tributary to Crosby Creek with headwaters on the south flank of Ear Mountain. Ear Mountain is an isolated upland reaching 2,329 feet elevation in the north-central Teller D-3 quadrangle. It is cored by a Late Cretaceous granite stock (Sainsbury, 1972). Quartz Creek has headwaters in the contact zone of the granite but it does not extend northward into the stock itself. This is locality 56 of Cobb and Sainsbury (1972). Cobb (1975) summarized references for this locality under the name 'Deer Cr., trib. Crosby Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Deer Creek has headwaters in the contact zone of the Ear Mountain granite stock (Sainsbury, 1972). This is a Late Cretaceous (76.7 +/- 2.9 my; Hudson and Arth, 1983, p. 769) composite biotite granite that intrudes an impure and schistose carbonate sequence, with some metapelitic rocks, of unknown but probable Paleozoic age. The USBM completed one churn-drill hole at about 350 feet elevation on this creek (Mulligan, 1959, p. 20). The lower part of the 6 feet of gravel and the adjacent bedrock here contained 0.02 pounds of tin per cubic yard. Minerals identified in the churn-drill sample include quartz, orthoclase, oligoclase, pyrite, limonite pseudomorphs after pyrite, and small amounts of grossularite garnet, tourmaline, idocrase, chondrodite, epidote, and actinolite. Cassiterite was identified (Mulligan, 1959, p. 29).

Alteration:

Workings/Exploration:
One USBM churn-drill hole has been completed on the creek (Mulligan, 1959, p. 20).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Mulligan, 1959 (USBM RI 5493)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Step Creek; Step Gulch

Site Type: Occurrence

ARDF no. TE064

Latitude: 65.892 **Quadrangle:** TE D-3

Longitude: 166.188

Location description and accuracy:
Step Creek is a north tributary to Crosby Creek with headwaters that extend across the south contact zone into the Ear Mountain granite stock. Ear Mountain is an isolated upland reaching 2,329 feet elevation in the north-central Teller D-3 quadrangle. It is cored by a Late Cretaceous granite stock (Sainsbury, 1972). This location includes localities 54 and 57 of Cobb and Sainsbury (1972). Cobb (1975) summarized references to these localities under the name 'Step Gulch'. Step Gulch is the headwater part of Step Creek.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Step Creek crosses the contact zone of the Ear Mountain biotite granite stock. This is a Late Cretaceous (76.7 +/- 2.9 my; Hudson and Arth, 1983, p. 769) composite biotite granite that intrudes an impure and schistose carbonate sequence, with some metapelitic rocks, of unknown but probable Paleozoic age. The country rocks are variably converted to tactite and hornfels around the granite stock (Knopf, 1908, p. 28-29).

One USBM churn-drill hole at about 400 feet elevation in the lower part of the creek indicated 0.05 pounds of tin per cubic yard in a 10-foot thick gravel section and 2 feet of underlying bedrock. A sample from this hole contained quartz, orthoclase, albite, oligoclase, and tourmaline with smaller amounts of grossularite garnet, idocrase, diopside, ankerite, pyrite, zoisite, epidote, chlorite and limonite pseudomorphs after pyrite. Cassiterite was also identified in very small amounts (Mulligan, 1959, p. 29). Pan concentrate material from the headwater gulch over granite bedrock contained cassiterite, monazite, zircon, and 0.142% eU (Killeen and Ordway, 1955).

Alteration:

Workings/Exploration:
One USBM churn-drill hole on the lower part of the creek (approximately 400 feet elevation) was completed (Mulligan, 1959, p. 20).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:
Reserves:

Additional comments:

References:

Knopf, 1908 (USGS B 358); Killeen and Ordway, 1955; Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Killeen and Ordway, 1955; Mulligan, 1959 (USBM RI 5493)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Pinnacle Creek

Site Type: Occurrence

ARDF no. TE065

Latitude: 65.893

Quadrangle: TE D-3

Longitude: 166.171

Location description and accuracy:
Pinnacle Creek is a north tributary to Crosby Creek with headwaters that extend across the south contact zone into the Ear Mountain granite stock. Ear Mountain is an isolated upland reaching 2,329 feet elevation in the north-central Teller D-3 quadrangle. It is cored by a Late Cretaceous granite stock (Sainsbury, 1972). This is locality 55 and 58 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Pinnacle Cr.'.

Commodities:
Main: Sn

Other:

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Pinnacle Creek crosses the contact zone of the Ear Mountain biotite granite stock. This is a Late Cretaceous (76.7 +/- 2.9 my; Hudson and Arth, 1983, p. 769) composite biotite granite that intrudes an impure and schistose carbonate sequence, with some metapelitic rocks, of unknown but probable Paleozoic age. The country rocks are variably converted to tactite and hornfels around the granite stock (Knopf, 1908, p. 28-29).

A USBM churn-drill in the lower part of the creek at an elevation of approximately 360 feet, returned 0.02 pounds of tin per cubic yard. A sample from this hole contained quartz, calcite, orthoclase, plagioclase, grossularite garnet, idocrase, pyrite, traces of blue tourmaline, brown tourmaline, and epidote. Cassiterite was also identified (Mulligan, 1959, p. 29). Pan concentrate material from the headwaters over granite bedrock contained cassiterite, monazite, zircon and 0.18% eU (Killeen and Ordway, 1955).

Alteration:

Workings/Exploration:
One USBM churn-drill hole was completed on the lower part of the creek at approximately 360 feet elevation (Mulligan, 1959, p. 20).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None

Status: Inactive

Production notes:

Reserves:

Additional comments:

References:

Knopf, 1908 (USGS B 358); Killeen and Ordway, 1955; Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Killeen and Ordway, 1955; Mulligan, 1959 (USBM RI 5493)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Saddle Creek; Crosby Creek

Site Type: Occurrence

ARDF no. TE066

Latitude: 65.893 **Quadrangle:** TE D-3

Longitude: 166.146

Location description and accuracy:
Saddle Creek is the headwater segment of Crosby Creek which drains the south flank of Ear Mountain. Ear Mountain is an isolated upland reaching 2,329 feet elevation in the north-central Teller D-3 quadrangle. It is cored by a Late Cretaceous granite stock (Sainsbury, 1972). This is locality 59 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Crosby Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Saddle Creek has headwaters in the southeast contact zone of the Ear Mountain biotite granite stock. This is a Late Cretaceous (76.7 +/- 2.9 my; Hudson and Arth, 1983, p. 769) composite biotite granite that intrudes an impure and schistose carbonate sequence, with some metapelitic rocks, of unknown but probable Paleozoic age. The country rocks are variably converted to tactite and hornfels around the granite stock (Knopf, 1908, p. 28-29). One of two USBM churn-drill holes on the lower part of the creek (about 340 feet elevation) contained 0.01 pounds of tin per cubic yard. Samples from these holes contain quartz, calcite, grossularite garnet, albite, limonite pseudomorphs after pyrite, traces of blue tourmaline, brown tourmaline, epidote, and idocrase. Cassiterite was also identified (Mulligan, 1959, p. 29).

Alteration:

Workings/Exploration:
Two USBM churn-drill holes were completed on the lower part of the creek at approximately 340 feet elevation (Mulligan, 1959, p. 20).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Knopf, 1908 (USGS B 358); Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Mulligan, 1959 (USBM RI 5493)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Kreuger Creek

Site Type: Prospect

ARDF no. TE067

Latitude: 65.93 **Quadrangle:** TE D-3

Longitude: 166.094

Location description and accuracy:
Kreuger Creek is a south-flowing tributary to the Arctic River that drains the east side of Ear Mountain. Ear Mountain is an isolated upland reaching 2,329 feet elevation in the north-central Teller D-3 quadrangle. Kreuger Creek has west tributaries, including Eldorado Creek (TE068), that extend across the contact zone and into east and north parts of the Ear Mountain granite stock. Eldorado Creek actually heads in an area of significant lode tin and related metallization at North Hill (Ear Mountain prospect, TE060). This is locality 64 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Kreuger Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
The segment of Kreuger Creek referred to here is the 0.5 miles at and below the confluence with Eldorado Creek. Eldorado Creek has headwaters that cross the northeast contact zone of the Ear Mountain granite stock (Sainsbury, 1972). This stock is a Late Cretaceous (76.7 +/- 2.9 my; Hudson and Arth, 1983, p. 769) composite biotite granite that intrudes an impure and schistose carbonate sequence, with some metapelitic rocks, of unknown but probable Paleozoic age. The country rocks are variably converted to tactite and hornfels around the granite stock (Knopf, 1908, p. 28-29). Churn-drill holes on this part of Kreuger Creek contain a trace to 0.71 pounds of tin per cubic yard from a pay horizon that varies from 5 to 16 feet thick. Total gravel thickness varies from 6 to 22.5 feet thick. Heavy mineral identifications are not available but the mineralogy here is probably similar to that from the headwaters of Eldorado Creek (TE068).

Alteration:

Workings/Exploration:
The USBM reports results for 11 churn-drill holes on three lines spaced along 2,600 feet of the drainage (Mulligan, 1959, p. 26).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Knopf, 1908 (USGS B 358); Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Mulligan, 1959 (USBM RI 5493)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Eldorado Creek

Site Type: Prospect

ARDF no. TE068

Latitude: 65.935 **Quadrangle:** TE D-3

Longitude: 166.111

Location description and accuracy:
Eldorado is a west tributary to upper Kreuger Creek (TE067) with headwaters in the northeast contact zone of the Ear Mountain granite stock (Sainsbury, 1972) including a part of North Hill where significant lode tin and related metallization has been identified (Ear Mountain prospect, TE060). Ear Mountain is an isolated upland reaching 2,329 feet elevation in the north-central Teller D-3 quadrangle. This is locality 60, 61, 62, and 63 of Cobb and Sainsbury (1972). Cobb summarized relevant references under the name 'Eldorado Cr.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite

Gangue minerals:

Geologic description:
Eldorado Creek has headwaters that cross the northeast contact zone of the Ear Mountain granite stock (Sainsbury, 1972). This stock is a Late Cretaceous (76.7 +/- 2.9 my; Hudson and Arth, 1983, p. 769) composite biotite granite that intrudes an impure and schistose carbonate sequence, with some metapelitic rocks, of unknown but probable Paleozoic age. The country rocks are variably converted to tactite and hornfels around the granite stock (Knopf, 1908, p. 28-29). Churn drill holes from Eldorado Creek, including three in its headwater tributaries at about 600 and 750 feet elevation (Mulligan, 1959, p. 20), contain a trace to 0.8 pounds of tin per cubic yard. The total gravel thickness in these holes varied from 1 to 14 feet and the pay thickness was 2 to 11.5 feet. Minerals identified in the headwater tributary holes include quartz, calcite, grossularite garnet, albite, orthoclase, zircon, epidote, hornblende, limonite, crossite, tourmaline, dioside, chlorite, chondrodite, idocrase, magnetite, and cassiterite (in all three tributaries; Mulligan, 1959, p. 29).

Alteration:

Workings/Exploration:
A total of 20 churn-drill holes were completed along three lines located along 2,600 feet of the lower part of the creek and three other churn-drill holes were completed in headwater tributaries (Mulligan, 1959).

Age of mineralization:
Quaternary

Deposit model:
Alluvial tin placer (Cox and Singer, 1986; model 39e)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39e

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Knopf, 1908 (USGS B 358); Mulligan, 1959 (USBM RI 5493); Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Arth, 1983

Primary reference: Mulligan, 1959 (USBM RI 5493)

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Kelly Creek

Site Type: Prospect

ARDF no. TE069

Latitude: 65.772 **Quadrangle:** TE D-2

Longitude: 165.896

Location description and accuracy:
Kelly Creek, unofficially named in 1982 (the year actress Grace Kelly died), is a north tributary to the American River. The American River, a major drainage in the east-central Teller quadrangle, is itself a north tributary to the Agiapuk River whose mouth is on the intertidal Imuruk Basin. Kelly Creek is the largest tributary entering from the north in the area where the direction of flow of the American River changes from north to south. Kelley Creek splits into north and west headwater drainages about 7 miles upstream from its mouth. The Kelly Creek prospect is located in the headwaters of the west headwater drainage, 1.1 miles southeast of the continental divide at elevations of 800 to 950 feet. This prospect was discovered in 1982 and therefore not included as a locality by Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Au **Other:**

Ore minerals: Au

Gangue minerals: Arsenopyrite (?), clay, carbonate, pyrite, quartz

Geologic description:
The Kelly Creek prospect is in metapelitic rocks - mica-quartz shist and graphitic quartz schist - intercalated in a metasedimentary sequence that includes schistose, micaceous, parly dolomitic marble, mica-calcite schist, and minor micaceous quartzite. The metasedimentary sequence is interpreted to represent a limestone-shale assemblage with related facies variations. It is now highly deformed and perhaps isoclinally folded. Schistosity now dips moderately in various directions in the prospect area; steep-dipping marble-schist contacts and other strong linear features may indicate the location of normal faults. A mafic to intermediate (?) metavolcanic and metasedimentary assemblage consisting of various greenschist and amphibolite lithologies intercalated regionally with some calcareous quartzite and marble is present in the headwaters of Fox Creek, 3 miles north of the Kelly Creek prospect. The relation of the metavolcanic assemblage to the pelitic schist/marble assemblage that hosts the Kelly Creek prospect is not known. All of the metavolcanic and metasedimentary rocks in the Kelly Creek and Fox Creek area are of unknown but probable Paleozoic age although Sainsbury (1972) mapped them as Precambrian.

The Kelly Creek prospect is primarily within tundra-mantled metapelitic rocks in saddles and slopes between rubble uplands of schistose marble; bedrock outcrops are only locally present within the marble uplands. The metapelitic rocks have lineated quartz segregations along their foliation and disseminated euhedral pyrite crystals are common.

Soil geochemical surveys following up gold and arsenic anomalies in stream sediments from the west headwater drainage of Kelly Creek led to discovery of the prospect (Hudson and Wyman, 1983; Hudson, 1984). The soil geochemical surveys defined an irregular but large area (3,000 x 4,000 feet) containing anomalous gold to 1.4 ppm, arsenic to greater than 1,000 ppm, antimony to 62 ppm, mercury to 5,000 ppb, and silver to 0.9 ppm. The gold, arsenic, and antimony values define strong, coherent, multielement anomalies. Mercury is commonly elevated along with these elements but its distribution and concentration is more erratic; it is more widely dispersed at anomalous levels than the other three elements.

Rock samples from frost boils and surface pits 3 to 4 feet deep show that the stronger anomalies are associated with silicified breccia and quartz-stockwork veined, sooty, black carbonaceous quartz schist. Quartz stockwork veins are thin, less than 0.5 inches wide, and locally broken and recemented by a fine-grained, dark siliceous matrix. Two small diameter diamond drill holes encountered mineralization at shallow depths (Marrs and Ivey, 1984). These holes were oriented N 45 E, they were inclined 45 and 60 degrees, and they reached 140 and 154 feet total depth. One encountered 77 feet of 0.032 opt gold and the other 44 feet of 0.035 opt gold. The higher gold concentrations seem to be in a zone that dips shallowly west although all the rocks in these two holes had highly anomalous metal contents; gold is commonly present in the several hundred ppb range.

Clay is locally present in fractures and as part of the matrix in breccia. Dolomite and calcite are reported to be in veins with quartz in some drill core (Marrs and Ivey, 1984). Pyrite is disseminated in pelitic schist and is present in all mineralized rocks and a part is probably sedimentary in origin. Quartz segregations along the foliation in pelitic shist are recrystallized, sugary textured, and vuggy in mineralized rocks. Arsenopyrite has not been conclusively identified but it is probably present. The controls on mineralization have not been defined, the distribution of grade has not been determined, and large areas of anomalous soil geochemistry have not been evaluated by the previous work.

Alteration:

Brecciation, silicification, and quartz stockwork veining is common in pelitic schist. Quartz veins may contain some carbonate minerals. Clay and limonite are present in some mineralized rocks.

Workings/Exploration:

Exploration includes: regional stream sediment geochemistry; a soil geochemical survey on a grid covering a 3,000 x 6,000 foot area; several shallow surface pits; and four small-diameter diamond drill holes (Cook Inlet Region, Inc., 1985).

Age of mineralization:

Unknown; probably mid-to Late Cretaceous; mineralization postdates regional deformation.

Deposit model:

Disseminated and stockwork quartz and gold mineralization in metapelitic rocks. Possibly carbonate-hosted Au-Ag (26a) and/or low sulfide Au-quartz vein (36a) models after Cox and Singer (1986)

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

26a, 36a

Production: None **Status:** Active

Production notes:

Reserves:

Not defined

Additional comments:

References:

Hudson and Wyman, 1983; Hudson, 1984; Marrs and Ivey, 1984

Primary reference: Hudson, 1984; Marrs and Ivey, 1984

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Bryan Creek; Dick Creek

Site Type: Mine

ARDF no. TE070

Latitude: 65.826 **Quadrangle:** TE D-1

Longitude: 165.003

Location description and accuracy:
Bryan Creek is a northeast flowing drainage with some headwater tributaries on the northeast flank of the Kougarok Mountain upland. This location is at the confluence of Bryan Creek and its southeast tributary, Dick Creek. This confluence is at an elevation of about 275 feet on the eastern border of the Teller D-1 quadrangle. This is locality 65 of Cobb and Sainsbury (1972) and relevant references were summarized by Cobb (1975) under the name 'Bryan Cr.' and 'Dick Cr.'.

Commodities:
Main: Au **Other:** Sn, W

Ore minerals: Cassiterite, gold, scheelite

Gangue minerals:

Geologic description:
Dick Creek is a north-flowing tibutary to Bryan Creek that has been placer mined for its gold content. Bryan Creek, the only placer mine in the Serpentine district, is almost all in the Bendeleben quadrangle. Only a small part of this mine, at the confluence of Dick Creek and Bryan Creek, may be in the Teller quadrandle. A dredge may have worked on the creek early on but most of the mining has been by dozer and sluice methods. Cassiterite and scheelite are reported from concentrates.

Alteration:

Workings/Exploration:
Open cut dozer operations dominated the work here.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes **Status:** Probably inactive

Production notes:
Not known

Reserves:
Not defined; most of lower Dick Creek has been mined.

Additional comments:

References:
Collier and others, 1908; Anderson, 1947

Primary reference: Collier and others, 1908; Anderson, 1947

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Ward

Site Type: Mine

ARDF no. TE071

Latitude: 65.747 **Quadrangle:** TE C-1

Longitude: 165.226

Location description and accuracy:

The Ward mine, which consists of 8 patented claims, is at an elevation of 1,160 feet on the northwest-trending ridgecrest , between the drainages of Bismark Creek and the headwater reach of the Serpentine River (Sainsbury and others,1969). This is in the north-central Teller C-1 quadrangle just south of the boundary with the Teller D-1 quadrangle. Cobb and Sainsbury (1972) show the Ward mine as locality 15 and an unnamed locality (16) to be located on the ridgecrest between Bismark Creek and the headwater reach of the Serpentine River. Their locality 16 is actually closer to the Ward mine than locality 15. A lode occurrence at locality 15 of Cobb and Sainsbury (1972) could not be verified. Cobb (1975) summarized relevant references to the Ward mine under the name 'Ward (Copper Co.)'.

Commodities:
Main: Cu **Other:**

Ore minerals: Azurite, possibly bornite, minor chalcopyrite, malachite,

Gangue minerals: Quartz

Geologic description:

The lode deposit at the Ward mine is a type of mineral occurrence that is repeated at many locations along a north-trending marble belt that extends southward from this location to the Iron Creek and Casadepaga River areas of southern Seward Peninsula. It has been described as a zone of silicification in marble above a thrust contact with underlying metapelitic schist (Sainsbury and others, 1969; Sainsbury, 1975, p. 90-94). The silica-rich rocks have been metamorphosed and commonly have a laminar fabric. Copper-bearing minerals, mostly malachite but also including azurite and in places chalcopyrite and possibly bornite, are disseminated in the silica-rich rocks. The minor sulfides tend to be along faint laminae and joints (Sainsbury and others, 1969, p. 22). Malachite and azurite also occur in small veins and veinlets in the silica-rich rocks. Sainsbury and others (1969; p. 37) report a spectrographic analysis of copper-bearing rocks from the Ward deposit. This sample contained 1,500 ppm copper, 100 ppm tin, and 300 ppm zinc. Mercury, gold, and arsenic were also reported to be anomalous.

The summary characterization of this type of Seward Peninsula mineral deposit by Sainsbury (1974, p. 90-94) contains inconsistencies with some descriptions of these deposits. Their origin is uncertain and other possibilities should be considered. One possiblity is that the silica-rich rocks are quartzites and that there is a stratigraphic control to the Ward deposit and similar occurrences elsewhere on Seward Peininsula. Quarzite at the base of the regional carbonate assemblage is recognized elsewhere in the Kougarok Mountain area (Puchner, 1986, p. 1777).

Alteration:

The development of silica-rich rocks at the base of marble overlying metapelitic rocks, by whatever process, characterizes the deposit.

Workings/Exploration:

The deposit has been explored by surface pits, trenches, shallow shafts, and short adits.

Age of mineralization:
Unknown; if stratigraphic controls are important then it is probably Paleozoic in age. Otherwise the Ward deposit could be Jurassic or Early Cretaceous (age of regional deformation).

Deposit model:
Copper-bearing mineralization in silica-rich zones at base of marble overlying metapelitic schist.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Production: Yes, small

Status: Inactive

Production notes:
Forty tons of high-graded material containing 30 to 40% copper were produced between 1906 and 1916.

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1975; Cobb, 1975; Puchner, 1986

Primary reference: Sainsbury and others, 1969; Sainsbury, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Kougarok

Site Type: Prospect

ARDF no. TE072

Latitude: 65.711 **Quadrangle:** TE C-1

Longitude: 165.226

Location description and accuracy:
The Kougarok prospect is a 1.5 square mile area centered 2 miles north of the summit of Kougarok Mountain (2,870 feet elevation), the highest area in the Teller quadrangle outside the York Mountains. The prospect area is on the west flank of the north-south trending ridgecrest from near the Kougarok Mountain summit downslope to elevations of about 1,000 feet in the southeast headwaters of Star Creek. Star Creek is a north-flowing headwater tributary to the south fork of the Serpentine River. The prospect was discovered in 1979 (Puchner, 1986) during followup investigations of anomalous tin contents in pan concentrates from Star Creek (Marsh and others, 1972). It was not known to Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Sn **Other:** Ta

Ore minerals: Cassiterite, columbite-tantalite

Gangue minerals: Arsenopyrite, fluorite, quartz, topaz, tourmaline, white mica

Geologic description:
A Late Cretaceous composite granite complex intrudes metapelitic schist in the Kougarok prospect area. The metapelitic schist is a highly deformed mica-quartz schist characterized by isoclinally folded quartz boudins and segregations that may be Precambrian in age (Gardner and Hudson, 1984). It is thermally metamorphosed to biotite-bearing hornfels within several hundred feet of the granite contact. Boron-rich metasomatism has altered metapelitic schist and hornfels to tourmaline-axinite-sulfide rocks throughout the main prospect area.

Most of the granite complex is only present in the subsurface although a few granite dikes and a highly altered plug are exposed at the surface. Diamond drilling shows the subsurface granite to have porphyritic and eguigranular phases (Puchner, 1986). Equigranular leucocratic phases were intruded later than the porphyritic phases and are associated with extensive alteration of the country rocks, exogreisen development in peripheral dikes and plug, and with roof greisen development in the subsurface pluton. Local and regional gravity surveys (Puchner, 1986; Barnes and Hudson, 1977) show the Kougarok granites to be part of a much larger batholithic complex at depth. Puchner (1986) reports Rb/Sr and K/Ar data that indicate the granite and associated mineralized rocks are Late Cretaceous in age (72 +/- 2 and 70.2 +/- 2.2 my respectively). These ages are consistent with that of other tin granite complexes of western Seward Peninula (Hudson and Arth, 1983).

A greisen-altered granite dike (Chuck's dike, Puchner, 1984; Apel, 1984) and the Main plug are the principal exogreisen deposits. The equigranular zinnwaldite granite dike, offset locally by normal faults, is almost 3,000 feet long in the prospect area (Puchner, 1986, figure 3). This dike, with a steep east dip, varies in thickness from one to 15 feet although it is commonly 6 to 8 feet thick. It is a variably altered over most of its length but complete greisenization is present at five places at the surface (Puchner, 1986, p. 1787). The longest exposed greisen segment is 500 feet long in strike and greisen development continues downdip in the subsurface about

500 feet where it merges with a roof greisen in the subsurface pluton (Puchner, 1986, p. 1786). Tin grades in the Chuck's dike greisen are commonly 1%. Two surface trenches and 9 diamond drill holes in this part of the dike have defined a resource of 240,000 tons of 1.3% tin (0.1% tin cutoff grade; Puchner, 1984). This resource includes a higher grade portion of 110,000 tons averaging 2.3% tin. The Main plug area, exposed upslope to the east of Chuck's dike at an elevation of about 2,100 feet, is a nearly vertical composite intrusive center that is extensively altered and contains two greisen pipes. These pipes, each about 100 feet across at the surface, appear to merge at depth and extend to deep levels in the intrusive center (Puchner, 1986, p. 1786). The Main plug is a complex body but surface trenches and diamond drilling suggest a combined resource of 1.4 million tons averaging 0.45% tin (no cutoff); tantalum and niobium are each present in this deposit in the 0.1 to 0.03% range (Puchner, 1984). A high grade resource within this deposit (0.5% tin cutoff) is estimated to contain 100,000 tons averaging 2.1% tin.

The zinnwaldite granite that forms Chuck's dike at the surface becomes a subhorizontal granite intrusion at depth whose irregular upper part is the location of a roof greisen (Puchner, 1986, p. 1786). Alteration through this intrusion increases upward to a quartz-tourmaline-topaz greisen where tin grades can exceed 1%. Limited diamond drilling suggests a resource of 1.3 million tons or more averaging 0.36% tin (0.1% cutoff) including a part that is 140,000 tons averaging 1.0% tin (0.5% cutoff; Puchner, 1984). One of the diamond drill intercepts in the roof greisen was 53 feet of 0.23% tin (0.1% cutoff) including 13 feet of 0.93% tin (0.5 % cutoff). In general, tin grade increases to as much as 3.4% upwards through the altered zinnwaldite intrusion to the roof greisen. Silver to 17 ppm, lead to 1,340 ppm, and tantalum from 20 ppm near the base to as high as 845 ppm also increase upwards to the roof greisen. Fluorine is at 1 to 2% levels in the zinnwaldite granite and arsenic is erratically high (greater than 1,000 ppm) in the upper part of this intrusion (Puchner, 1986, p. 1791).

Kougarok is a boron-rich tin system characterized by abundant tourmaline and axinite replacement in the host schist and tourmaline disseminations in altered granite. Its elevated tantalum and niobium, present in discrete tantalite/columbite grains, is also notable.

Alteration:

Hydrothermal alteration is extensive in the Kougarok prospect area. The country rock metapelitic schist and hornfels is extensively veined and replaced by tourmaline, axinite, and sulfide minerals (dominately pyrrhotite but including arsenopyrite and chalcopyrite) over a roughly circular area with a diameter of 3,700 feet at the surface and to a depth of almost 800 feet in the area above the zinnwaldite granite and between Chuck's dike and the Main plug (Puchner, 1986). Tin is commonly anomalous in these rocks and in places exceeds 0.1%. Sericite and tourmaline development is ubiquitous in granite intrusions of the prospect area. Puchner (1986) recognizes increasing degrees of alteration from weak sericite-tourmaline replacement to assemblages with increasing zinnwaldite contents to quartz-tourmaline-topaz greisen. Zinnwaldite-rich alteration zones peripheral to roof greisen are common.

Workings/Exploration:

Surface dozer trenching has been completed on a part of Chuck's dike and in the Main plug area. Twenty nine larger diameter diamond drill holes and 32 smaller diamond drill (Winkie) holes have been completed (Puchner, 1984). Most of these have been in the north Chuck's dike and Main plug area.

Age of mineralization:

Late Cretaceous; the radiometric ages referenced by Puchner (1986) include an Rb/Sr age of 72 +/- 2 my for porphyritic biotite granite and a K/Ar age of 70.2 +/- 2.6 my for zinnwaldite granite from the Main plug.

Deposit model:
Tin greisen including exogreisen and endogreisen (roof) deposits (Cox and Singer, 1986, model 15c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
15c

Production: None **Status:** Active

Production notes:

Reserves:
Preliminay resource estimates have been made for a part of the exogreisen deposit in Chuck's dike, the exogreisen deposit in the Main plug, and the roof greisen in buried zinnwaldite granite (Puchner, 1984). The resource estimate for exogreisen in Chuck's dike is 240,000 tons averaging 1.3% tin (including a part that is 110,00 tons averaging 2.3% tin). The Main plug exogreisen resource estimate is 1.4 million tons averaging 0.45% tin and 0.1 to 0.3% of both tantalum and niobium; this includes a part that has 100,000 tons of 2.1% tin. The roof greisen estimate is 1.3 million tons of 0.36% tin including a part that is 140,000 tons of 1.0% tin. Puchner (1984) emphasizes that these estimates are preliminary and that more exploration is needed to constrain them.

Additional comments:

References:
Cobb and Sainsbury, 1972; Cobb, 1975; Marsh and others, 1972; Barnes and Hudson, 1977; Hudson and Arth, 1983; Gardner and Hudson, 1984; Puchner,1984; Puchner, 1986

Primary reference: Puchner,1984; Puchner, 1986

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Tin Cup

Site Type: Prospect

ARDF no. TE073

Latitude: 65.684 **Quadrangle:** TE C-1

Longitude: 165.289

Location description and accuracy:

The Tin Cup prospect is located on a marble ridgecrest 0.5 miles southwest of the continental divide at an elevation of 1,480 feet between the headwaters of a northwest tributary to Eldorado Creek and Star Creek. This is 1.9 miles west of Kougarok Mountain summit and 2.5 miles southwest of the Main plug at the Kougarok prospect (TE072) in the north-central Teller C-1 quadrangle. The prospect was first identified in 1978 and it is not included in the compilation of Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:

Main: Sn **Other:**

Ore minerals: Cassiterite (?)

Gangue minerals:

Geologic description:

The Tin Cup prospect is in marble that stratigraphically overlies the highly deformed metapelitic schist of the Kougarok Mountain area. The base of the marble is in many places schistose carbonate rocks and quartzite; the contact with underlying metapelitic rocks is probably a deformed unconformity. The marble may be as young as Devonian (Puchner, 1986, p. 1777) but the underlying metapelitic schist could be as old as Precambrian (Gardner and Hudson, 1984). Several felsic dikes intrude the marble at the Tin Cup prospect (Puchner, 1986, p. 1778). These dikes are visible from the air and were the focus of initial exploration that followed up the pan concentrate tin anomalies reported by Marsh and others (1972). Claims staked here by Texasgulf, Inc. in 1978 later became part of the Kougarok project of the Anaconda Minerals Company.

The felsic dikes and associated mineralization such as skarn veinlets are assumed to be similar in age to intrusion and related mineralization at the nearby Kougarok prospect. The radiometric ages referenced by Puchner (1986) for the Kougarok prospect include an Rb/Sr age of 72 +/- 2 my for porphyritic biotite granite and a K/Ar age of 70.2 +/- 2.6 my for zinnwaldite granite from the Main plug.

The felsic dikes have various orientations and several intersect in the Tin Cup area. They are weakly altered and have anomalous tin contents. Gravity surveys indicate that the main granite pluton at depth is about 10,000 feet or more below the surface here (Puchner, 1986, p. 1778). Anaconda drilled one diamond drill hole in the Tin Cup prospect area. This veritical hole reached a depth of 1,437 feet, did not encounter significant mineralization, and bottomed in marble. However, below 656 feet depth, ten felsic dikes varying from less than a foot to 34 feet in intercept thickness, were encountered. Numerous skarn veinlets, with up to 400 ppm tin, were also encountered below 656 feet in this hole (Puchner, 1984). Magnetic anomalies are also reported to be present here (Puchner, 1984).

Alteration:

Alteration of the felsic dikes is probably weak clay and sericite development.

Workings/Exploration:
Surface mapping and sampling and one vertical diamond drill hole to a total depth of 1,437 feet have been completed here.

Age of mineralization:
Late Cretaceous; the felsic dikes and associated mineralization such as skarn veinlets are assumed to be similar in age to intrusion and related mineralization at the nearby Kougarok prospect. The radiometric ages referenced by Puchner (1986) for the Kougarok prospect include an Rb/Sr age of 72 +/- 2 my for porphyritic biotite granite and a K/Ar age of 70.2 +/- 2.6 my for zinnwaldite granite from the Main plug.

Deposit model:
Uncertain; prospect is an area of weakly altered felsic dikes in marble above a buried tin granite complex. Mineralization at depth could include various types of tin greisen, skarn or replacement deposits (models 15c, 14b, and 14c of Cox and Singer, 1986)

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

Production: None **Status:** Probably inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Cobb and Sainsbury, 1972; Cobb, 1975; Marsh and others, 1972; Barnes and Hudson, 1977; Hudson and Arth, 1983; Gardner and Hudson, 1984; Puchner,1984; Puchner, 1986

Primary reference: Puchner,1984; Puchner, 1986

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (near Henry Creek)

Site Type: Occurrence

ARDF no. TE074

Latitude: 65.629 **Quadrangle:** TE C-1

Longitude: 165.138

Location description and accuracy:
This locality is on a ridgecrest at 2,500 feet elevation between the headwater forks of Henry Creek, a west tributary to the Kougarok River. It is 4.5 miles southeast of the summit of Kougarok Mountain in the east-central Teller C-1 quadrangle. This is locality 17 of Cobb and Sainsbury (1972) who called it the Worcester prospect. However, the lack of observed mineralization here (Sainsbury, and others, 1969, p. 22) suggests that the Worcester prospect (TE075) is another locality one mile to the south (locality 18 of Cobb and Sainsbury, 1972). Cobb (1975) summarized references to this locality under the name 'Unnamed occurrence'.

Commodities:
Main: Cu **Other:**

Ore minerals: None known

Gangue minerals:

Geologic description:
This is a large area of silica-rich rock within a marble assemblage. Mineralization was not observed in these rocks (Sainsbury and others, 1969, p. 22) although it was recorded as a separate locality by Cobb and Sainsbury (1972). The silica-rich rocks are 'contorted' and may be quartzite.

Alteration:

Workings/Exploration:
None

Age of mineralization:
Paleozoic (?); the silica-rich rocks are apparently metamorphosed and would therefore predate mid-Mesozoic deformation and metamorphism in the region. The associated marbles are probably Paleozoic in age.

Deposit model:
Silica-rich zone, possibly quartzite, within a marble assemblage. This occurrence is not a strong analog to defined deposit models

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

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:
Also see Ward mine (TE071)

References:
Sainsbury and others, 1969; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Worcester

Site Type: Prospect

ARDF no. TE075

Latitude: 65.615 **Quadrangle:** TE C-1

Longitude: 165.132

Location description and accuracy:
This locality is at 2,500 to 2,600 feet on a ridgecrest between headwater tributaries of Henry Creek, a west tributary to the Kougarok River. It is in the east-central Teller C-1 quadrangle, 1 mile south of the Henry Creek occurrence (TE074) and 5.4 miles southeast of the summit of Kougarok Mountain. This is locality 18 of Cobb and Sainsbury (1972) although they referred to it as an unnamed occurrence and called their locality 17 the Worcester prospect. The description by Sainsbury and others (1969, p. 22) suggests that this locality is actually the Worcester prospect. Cobb (1975) summarized references to this prospect under the name 'Worcester'.

Commodities:
Main: Cu **Other:**

Ore minerals: Secondary copper minerals (probably azurite and malachite) and some copper-bearing sulfides

Gangue minerals: Quartz

Geologic description:
Silica-rich rocks are present at the base of a marble assemblage overlying schist. Small amounts of copper-bearing sulfide minerals are present in vertical joints and secondary copper staining is present. The occurrence has been explored by two short adits. Because of the presence of observed mineralization and early exploration workings here, this location rather than the locality 1 mile to the north (Cobb and Sainsbury, 1972) is considered the Worcester prospect of Mertie (1918). Sainsbury and others (1969, p. 37) report spectrographic analyses for four samples from this locality. A selected high-grade sample contained 7.1% copper and 7,000 ppm zinc. Traces of gold and mercury were also reported in these analyses.

This occurrence is similar in setting and character to the Ward mine (TE071) north of Kougarok Mountain. The summary characterization of this type of Seward Peninsula mineral deposit by Sainsbury (1975, p. 90-94) contains inconsistencies with some descriptions of these deposits. Their origin is uncertain and other possibilities should be considered. One possiblity is that the silica-rich rocks are quartzites and that there is a stratigraphic control to the Ward deposit and similar occurrences elsewhere on Seward Peininsula. Quarzite at the base of the regional carbonate assemblage is recognized elsewhere in the Kougarok Mountain area (Puchner, 1986, p. 1777).

Alteration:
The development of silica-rich rocks at the base of marble overlying metapelitic rocks, by whatever process, characterizes the deposit.

Workings/Exploration:
Two short adits and surface pits are present.

Age of mineralization:
Paleozoic (?); the silica-rich rocks are apparently metamorphosed and would therefore predate mid-Mesozoic deformation and metamorphism in the region. The

associated marbles are probably Paleozoic in age. However, the relation of copper metallization to the genesis of the silica-rich rocks is not clear.

Deposit model:
Silica-rich rock with minor copper-bearing mineralization at the base of a marble assemblage overlying schist

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

Production: No **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Mertie, 1918; Sainsbury and others, 1969; Cobb and Sainsbury, 1972; Sainsbury, 1975; Cobb, 1975; Puchner, 1986

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Goldrun Creek

Site Type: Mine

ARDF no. TE076

Latitude: 65.642 **Quadrangle:** TE C-2

Longitude: 165.603

Location description and accuracy:
Goldrun Creek is an east tributary to the American River whose mouth is 2.75 miles north of the mouth of Budd Creek. This is in the east-central Teller C-2 quadrangle, 11 miles west of the summit of Kougarok Mountain (Teller C-1 quadrangle). This is locality 74 of Cobb and Sainsbury (1972). It was not included in the reference compilation of Cobb (1975).

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Very little is recorded about this placer mining operation. Dozer and sluice operations have taken place on the lower part of the creek, between elevations of 265 and 320 feet and within 1 mile of the confluence with the American River. Bedrock in the area is a metapelitic assemblage of unknown but probable Paleozoic age.

Alteration:

Workings/Exploration:
Dozer and sluice operations have taken place along about a half mile of the creek between elevations of 265 and 320 feet.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes, small **Status:** Probably inactive

Production notes:
Not recorded

Reserves:
Not defined

Additional comments:

References:
Alaska Division of Mines and Minerals, 1964

Primary reference: Alaska Division of Mines and Minerals, 1964

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Windy Creek

Site Type: Mine

ARDF no. TE077

Latitude: 65.603

Quadrangle: TE C-2

Longitude: 165.522

Location description and accuracy:
This Windy Creek is a tributary to Budd Creek in the eastern Teller C-2 and western Teller C-1 quadrangles. Budd Creek is an east tributary to the American River with headwaters along the continental divide just west of Kougarok Mountain. This is locality 75 of Cobb and Sainsbury (1972). Cobb (1975) summarized references to this locality under the name 'Windy Cr., trib. American R.'.

Commodities:
Main: Au

Other: Hg, Sn (?)

Ore minerals: Cinnabar, gold

Gangue minerals:

Geologic description:
The lower mile of Windy Creek, including the area of its mouth on Budd Creek, has been placer mined for gold. A small dredge operated here early in the century. Cinnabar is reported to be in heavy mineral concentrates from the placer operations but the reported presence of cassiterite has not been confirmed. The area of operations is 11 miles southwest, and across the continental divide from, the Kougarok tin prospect. Bedrock in the Windy Creek drainage is a metapelitic/metacarbonate assemblage of unknown but probable Paleozoic age.

Another small area of historical placer operations appears to be present on upper Windy Creek in the Teller C-1 quadrangle. This location, about 0.4 miles of the creek starting 1 mile upstream from its confluence with Trilby Creek (a south tributary to Windy Creek), appears to have been the site of dozer and sluice operations at some unknown time.

Alteration:

Workings/Exploration:
Dredge mining took place on the lower mile of the creek and including the area of confluence with Budd Creek. Another local area of apparent dozer and sluice operations is 3.3 miles upstream from the confluence with Budd Creek (1 mile upstream of the mouth of Trilby Creek, a south tributary to Windy Creek).

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes

Status: Probably inactive

Production notes:
Not recorded

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (near Magnolia Creek)

Site Type: Prospect

ARDF no. TE078

Latitude: 65.515 **Quadrangle:** TE C-1

Longitude: 165.326

Location description and accuracy:
Magnolia Creek is a north tributary to Igloo Creek in the northern Teller B-1 and southern Teller C-1 quadrangles. The Magnolia Creek prospect is located on the east side of upper Magnolia Creek on the west-facing, headwater slopes of a small east tributary. The prospect is between elevations of 750 and 1100 feet on the west side of the north-south ridge between upper Magnolia Creek and Yale Creek to the east. This prospect was identified in 1982. It was not included in the compilations of Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals: Quartz (?)

Geologic description:
The Magnolia Creek prospect is an area of anomalous gold values in stream sediments and soils. Magnolia Creek marks the approximate boundary between a highly deformed metapelitic schist to the east and a metapelitic/metacarbonate assemblage to the west. Stream silts in the small east tributary to Magnolia Creek contained highly anomalous gold (295 and 1,830 ppb; Hudson and Wyman, 1983). Follow-up soil sampling on the tundra-mantled slopes in the headwaters of this tributary defined a large area of anomalous gold (5 to 125 ppb), some arsenic (to 62 ppm), and some mercury (to 600 ppb). The area of anomalous soils is about 1.4 miles long in a north-south direction and about 0.5 miles wide in an east -west direction; the upslope limits of the anomalous area have not been determined (Hudson and Wyman, 1983). The nature of the mineralization in the metapelitic schist responsible for the anomalous soils and steam silts has not been determined.

Alteration:
Not known

Workings/Exploration:
Reconnaissance stream silt and soil sampling is all that has been done here.

Age of mineralization:
Not known

Deposit model:
Disseminated or vein gold in metapelitic schist. Possibly low-sulfide Au-quartz veins (Cox and Singer, 1986, model 36a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production: None **Status:** Inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Cobb and Sainsbury, 1972; Cobb, 1975; Hudson and Wyman, 1983

Primary reference: Hudson and Wyman, 1983

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (near Coco Creek)

Site Type: Occurrence

ARDF no. TE079

Latitude: 65.476 **Quadrangle:** TE B-1

Longitude: 165.065

Location description and accuracy:
This is located on the ridgeline along the northwest side of upper Coco Creek in the northeast Teller B-1 quadrangle. It is along a marble layer in schist at an elevation of 1,350 feet. This is locality 19 of Cobb and Sainsbury (1972). Cobb (1975) summarized the one reference for this occurrence under the name 'Unnamed occurrence'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold (?)

Gangue minerals:

Geologic description:
Marble intercalated in schist is locally red-stained and replaced by sideritic carbonate with small quartz veinlets. Two samples from this locality contained anomalous gold (Sainsbury and others, 1969, p. 17-18, 36).

Alteration:
Quartz veining, sideritic carbonate replacement, and possibly silicification.

Workings/Exploration:
None

Age of mineralization:
Not known.

Deposit model:
Indeterminate.

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

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Sainsbury and others, 1969; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (near Hunter Creek)

Site Type: Occurrence

ARDF no. TE080

Latitude: 65.411 **Quadrangle:** TE B-1

Longitude: 165.2

Location description and accuracy:
This occurrence is on the rideline between upper Hunter Creek and and tributary to Johnston Creek in the central Teller B-1 quadrangle. It is at an elevation of 900 feet adjacent to a saddle between the two drainages. This is locality 20 of Cobb and Sainsbury (1972). Cobb (1975) summarized the one reference to this occurrence under the name 'Unnamed occurrence'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold (?)

Gangue minerals:

Geologic description:
This occurrence is in an area of intercalated metapelitic and metacarbonate rocks that may contain some quartzites. A sample of 'altered limestone with quartz veinlets' is reported to have anomalous gold (Sainsbury and others, 1969, p. 18, 36).

Alteration:
Silicification of carbonate rocks (?)

Workings/Exploration:
None

Age of mineralization:
Not known

Deposit model:
Indeterminate.

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

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Sainsbury and others, 1969; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Allene Creek

Site Type: Mine

ARDF no. TE081

Latitude: 65.354 **Quadrangle:** TE B-3

Longitude: 166.049

Location description and accuracy:
Allene Creek, in the eastern Teller B-3 and western Teller B-2 quadrangles, is a north-flowing tributary to North Creek, a south tributary to the Agiapuk River. Placer-mining operations took place along this drainage at surface elevations of about 200 feet and at 260 to 350 feet. Upstream operations were 12 miles east of Brevig Mission. This location includes localities 71, 72, and 73 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Allene Cr.'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the Allene Creek drainage is a chlorite and mica schist assemblage that is locally intruded by small greenstone bodies (Sainsbury, 1972); the age of this assemblage is uncertain but it is probably Paleozoic. Dredge and later dozer/sluice mining took place on the main drainage at about 200 feet surface elevation (Cobb and Sainsbury, 1972) and for 1.5 miles between surface elevations of 260 to 350 feet (Sainsbury and others, 1969). Early mining apparently encountered fine, bright gold on a false clay bedrock but little is recorded about the character of this placer deposit.

Alteration:

Workings/Exploration:
Dredge and later dozer/sluice mining took place on the main drainage at about 200 feet surface elevation (Cobb and Sainsbury, 1972) and for 1.5 miles between surface elevations of 260 to 350 feet (Sainsbury and others, 1969).

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes **Status:** Probably inactive

Production notes:
Not known

Reserves:
Not defined; main drainage extensively worked for 1.5 miles

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Offield Creek

Site Type: Mine

ARDF no. TE082

Latitude: 65.302 **Quadrangle:** TE B-3

Longitude: 166.006

Location description and accuracy:
Offield Creek is a south-flowing stream whose mouth is on the northeast shore of Grantley Harbor, 9.25 miles east of Teller. The creek is in the southeast corner of the Teller B-3 quadrangle and adjacent parts of the Teller B-2 quadrangle. Placer operations were apparently on upstream parts of the drainage at surface elevations of about 400 feet (Cobb and Sainsbury, 1972). This is locality 70 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Offield Cr.'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the Offield Creek drainage is a schistose chlorite and mica schist assemblage that is locally intruded by small greenstone bodies (Sainsbury, 1972); the age of this assemblage is uncertain but it is probably Paleozoic. Although Cobb (1975) states that this creek has been extensively placer mined, primarily in the 1930s, Sainsbury and others (1969) did not show the location of placer workings. The character of the placer deposit has not been described.

Alteration:

Workings/Exploration:
Cobb (1975) states that this creek has been extensively placer mined.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes **Status:** Probably inactive

Production notes:
Not known, primarily in the 1930's

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): McKinley Creek

Site Type: Mine

ARDF no. TE083

Latitude: 65.273 **Quadrangle:** TE B-3

Longitude: 166.059

Location description and accuracy:
McKinley Creek is a 2.5-mile long, south-flowing stream whose mouth is on the northeast shore of Grantley Harbor, 8.5 miles east of Teller. Placer operations have taken place over about 0.4 miles of the main drainage between elevations of 150 and 200 feet, just above the headwater fork (Sainsbury and others, 1969). This is locality 69 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'McKinley Cr.'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the McKinley Creek drainage is a chlorite and mica schist assemblage that is locally intruded by small greenstone bodies (Sainsbury, 1972); the age of this assemblage is uncertain but it is probably Paleozoic. Sainsbury and others (1969) show the location of placer workings (about 0.4 miles of the main drainage between elevations of 150 and 200 feet, just above the headwater fork) but otherwise this deposit has not been described.

Alteration:

Workings/Exploration:
Placer operations have taken place over about 0.4 miles of the main drainage between elevations of 150 and 200 feet, just above the headwater fork (Sainsbury and others, 1969). These are assumed to have been dozer and sluice operations.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes **Status:** Probably inactive

Production notes:
Not known

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Dewey Creek

Site Type: Occurrence

ARDF no. TE084

Latitude: 65.298 **Quadrangle:** TE B-3

Longitude: 166.15

Location description and accuracy:
Dewey Creek is a 2.5-mile long, southwest-flowing stream whose mouth is on the north shore of Grantley Harbor, 6 miles northeast of Teller. This is locality 68 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Dewey Cr.'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the Dewey Creek drainage is a chlorite and mica schist assemblage that is locally intruded by small greenstone bodies (Sainsbury, 1972); the age of this assemblage is uncertain but it is probably Paleozoic. Placer gold is reported to be present in this drainage but there are no known mining operations.

Alteration:

Workings/Exploration:
None known

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Undetermined **Status:** Probably inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Moonlight Creek; Igloo Creek

Site Type: Mine

ARDF no. TE085

Latitude: 65.308

Quadrangle: TE B-3

Longitude: 166.188

Location description and accuracy:
Moonlight Creek is a southwest-flowing stream whose mouth is on the north shore of Grantley Harbor, 5 miles northeast of Teller. This is locality 67 of Cobb and Sainsbury (1972). This creek was formerly known as Igloo Creek and Cobb (1975) summarized relevant references under the name 'Igloo Cr., trib. Grantley Harbor'.

Commodities:
Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the Moonlight Creek drainage is a chlorite and mica schist assemblage that is locally intruded by small greenstone bodies (Sainsbury, 1972); the age of this assemblage is uncertain but it is probably Paleozoic. Some small scale placer mining apparently took place early in the century but other information has not been recorded about this deposit.

Alteration:

Workings/Exploration:
Not known

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes

Status: Probably inactive

Production notes:
Not known

Reserves:
Not defined

Additional comments:

References:
Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Sunset Creek

Site Type: Mine

ARDF no. TE086

Latitude: 65.332 **Quadrangle:** TE B-3

Longitude: 166.261

Location description and accuracy:
Sunset Creek is a southwest-flowing stream whose mouth is on the north shore of Grantley Harbor, 4 miles northeast of Teller and 6.25 miles southeast of Brevig Mission. Placer mining operations took place 1.4 to 2.1 miles upstream from the mouth at surface elevations of about 40 to 110 feet (Sainsbury and others, 1969). This is locality 66 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Sunset Cr.'.

Commodities:
Main: Au, W **Other:**

Ore minerals: Gold, scheelite

Gangue minerals:

Geologic description:
Bedrock in the Sunset Creek drainage is a chlorite and mica schist assemblage that is locally intruded by small greenstone bodies (Sainsbury, 1972); the age of this assemblage is uncertain but it is probably Paleozoic. Quaternary basalt flows are present at higher elevations in some headwater areas. Small quartz veins are common in the schist bedrock. The placer gold deposit , at least locally high grade, is in a few to several feet of fine gravel on schist and greenstone bedrock that also contains gold in the upper three feet. Scheelite was abundant enough to have been saved during some operations. Mining took place at several different times between 1901 and 1946 and employed several different methods, including dredging and hydraulicking (Cobb, 1975).

The deposit is at elevations where Quaternary marine transgressions may have modified the alluvial placer (Sainsbury and others, 1969).

Alteration:

Workings/Exploration:
Placer mining operations took place 1.4 to 2.1 miles upstream from the mouth at surface elevations of about 40 to 110 feet (Sainsbury and others, 1969). This included mining by several different methods including dredging and hydraulicking.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes **Status:** Probably inactive

Production notes:
Not known

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed Creek

Site Type: Mine

ARDF no. TE087

Latitude: 65.417

Quadrangle: TE B-3

Longitude: 166.07

Location description and accuracy:
This is a north-flowing, south tributary to the Agiapuk River in the northeast Teller B-3 quadrangle. Sainsbury and others (1969) mapped the presence of placer mining operations between surface elevations of 240 to 250 feet on an east tributary whose confluence with the main drainage is 2.5 miles upstream from the Agiapuk River. This locality was not included in the compilation of Cobb and Sainsbury (1972). Cobb (1975) summarized Sainsbury and others (1969) under the name 'Unnamed creek'.

Commodities:
Main: Au (?)

Other:

Ore minerals: Gold (?)

Gangue minerals:

Geologic description:
Bedrock in this drainage is a chlorite and mica schist assemblage that is locally intruded by small greenstone bodies (Sainsbury, 1972); the age of this assemblage is uncertain but it is probably Paleozoic. All that is known about this locality is that some placer mining operations took place along the lower 0.5 miles of the east tributary (Sainsbury and others, 1969).

Alteration:

Workings/Exploration:
Sainsbury and others (1969) mapped the presence of placer mining operations between surface elevations 240 to 250 feet (the lower 0.5 miles) on the east tributary. The confluence of this tributary with the main drainage of the unnamed creek is 2.5 miles upstream from the Agiapuk River.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes

Status: Probably inactive

Production notes:
Not known

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Black Mountain

Site Type: Prospect

ARDF no. TE088

Latitude: 65.483 **Quadrangle:** TE B-4

Longitude: 166.744

Location description and accuracy:
The Black Mountain area is a four square mile upland between Tozer Creek and the California River, in the northern Teller B-4 quadrangle and adjacent parts of the Teller C-4 quadrangle. Large parts of this area are thermally metamorphosed and tactite is widespread. However, the prospect area described here is at about 1700 feet elevation on the southwest ridgecrest between headwaters to Constance Creek and an unnamed east tributary to Tozer Creek. This is locality 13 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Black Mtn.'.

Commodities:
Main: Sn **Other:**

Ore minerals: Cassiterite, galena, sphalerite

Gangue minerals: Diopside, epidote, fluorite, garnet, idocrase, plagioclase, quartz, tourmaline, wollastonite

Geologic description:
The upland including Black Mountain is an area of hornfels, calc-silicate hornfels, and tactite intruded by a locally exposed biotite granite. The metasedimentary rocks, fine-grained metapelitic and metacarbonate rocks, are of unknown but probable Paleozoic age. The Late Cretaceous (79.1 +/- 2.9 my, Hudson and Arth, 1983, p. 769) biotiote granite, medium-grained and equigranular, is exposed in a small area on the southern flanks of the upland and is interpreted to be part of an early precurser granite phase rather than an mineralyzing granite phase (Hudson and Arth, 1983, p. 784; Hudson and Reed, 1997, figure 3). The wide distribution of thermally metamorposed rocks and the results of gravity and aeromagnetic surveys (McDermott, 1983a) indicate that most of the Black Mountain area is underlain by granite at depth. The area is transected by many normal faults and related fractures.

Sainsbury and Hamilton (1967, p. B23) noted the presence of quartz-topaz greisen with cassiterite, pyrite, pyrrhotite, sphalerite, and galena in the northeast part of the exposed granite body but most of the mineralization and alteration in the area is associated with calc-silicate rocks. Calc-silicate rocks contain garnet, idocrase, tourmaline, wollastonite, and epidote. Cross-cutting veins and alteration along normal faults and fractures include quartz, tourmaline, fluorite, and sulfide minerals (pyrite, sphalerite, arsenopyrite, and probably others). Cassiterite and wolframite have not been conclusively identified in the calc-silicate rocks. Only reconnaissance geochemistry for a few rock samples is available (Sainsbury and Hamilton, 1967, p. B24; Hudson, 1984, p. 20). Tin is weakly anomalous in most tactite samples but one garnet-epidote-idocrase rock contained 1,800 ppm tin. Weak base metal, silver, and gold (60 and 100 ppb) and strong arsenic (400 ppm), fluorine (over 20,000 ppm), and boron (2,230 ppm) anomalies are present in some rocks.

Alteration:
Calc-silicate hornfels and tactite development is common; late quartz-fluorite +/- tourmaline veining and alteration is present along faults and fractures

Workings/Exploration:
Some reconnaissance rock geochemistry and traverse geology, regional gravity and aeromagnetic surveys, and some onsite magnetic character and susceptability determinations have been completed (Hudson, 1984; McDermott, 1983a; 1983b; Reed and others, 1989).

Age of mineralization:
Late Cretaceous; the Black Mountain biotite granite, interpreted to be linked to alteration and mineralization in this area, has been determined to be 79.1 +/- 2.9 my old by the K/Ar method (Hudson and Arth, 1983, p. 769).

Deposit model:
Tin skarn (Cox and Singer, 1986; model 14b).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
14b

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
U. S. Geological Survey, 1964; Sainsbury and Hamilton, 1967; U. S. Geological Survey, 1967; Sainsbury, 1969; Hudson and Arth, 1983; McDermott, 1983 (1982 geophysical report); McDermott, 1983; Hudson, 1984; Reed and others, 1989

Primary reference: Sainsbury and Hamilton, 1967; McDermott, 1983 (1982 geophysical report); Hudson, 1984

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Willow Branch of Tozer Creek

Site Type: Prospect

ARDF no. TE089

Latitude: 65.507

Quadrangle: TE C-4

Longitude: 166.742

Location description and accuracy:

This prospect is on the south side of the Willow Branch of Tozer Creek in the south-central Teller C-4 quadrangle. Willow Branch is a south tributary to Tozer Creek, a major east tributary to the Don River. Mineralization is along a fault that is about 500 feet south and parallel to Willow Branch at elevations between 440 and 600 feet. This is locality 12 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Black Mtn.'.

Commodities:

Main: Zn

Other: Sn

Ore minerals: Cassiterite (?), sphalerite

Gangue minerals: Arsenopyrite, fluorite, garnet, pyrite, quartz

Geologic description:

The Willow Branch of Tozer Creek is in the northwest part of the upland that includes Black Mountain. This upland is an area of hornfels, calc-silicate hornfels, and tactite intruded by a locally exposed biotite granite. The metasedimentary rocks, fine-grained metapelitic and metacarbonate rocks, are of unknown but probable Paleozoic age. The Late Cretaceous (79.1 +/- 2.9 my, Hudson and Arth, 1983, p. 769) biotite granite, medium-grained and equigranular, is exposed in a small area on the southern flanks of the upland and is interpreted to be part of an early precurser granite phase rather than an mineralyzing granite phase (Hudson and Arth, 1983, p. 784; Hudson and Reed, 1997, figure 3). The wide distribution of thermally metamorphosed rocks and the results of gravity and aeromagnetic surveys (McDermott, 1983) indicate that most of the Black Mountain area is underlain by granite at depth. The area is transected by many normal faults and related fractures.

Sainsbury and Hamilton (1967) mapped a northwest-trending fault along the south side of Willow Branch that is noticeably mineralized over a distance of about 2,500 feet. This fault juxtaposes metapelitic rocks to the north against calc-silicate rocks to the south. Along the fault, calc-silicate rocks are variably replaced by garnet and sulfide-rich assemblages over widths of a few to 12 feet. The sulfide minerals include sphalerite, pyrite, arsenopyrite, and a sooty, black unidentified material. Fluorite and fine-grained silica are noted as gangue minerals in this assemblage (Sainsbury and Hamilton, 1969, p. B23). One sample of the sulfide-rich material has been analyzed (Sainsbury and Hamilton, 1967, p. B24). This sample contained 3% zinc, 700 ppm tin, 300 ppm copper, and 300 ppm lead.

Alteration:

Garnet and sulfide-rich tactite replaces calc-silicate rock (hornfels); possibly some later quartz-fluorite veining.

Workings/Exploration:

Surface reconnaissance mapping and an analysis of one random chip sample is all the information available for this prospect.

Age of mineralization:
Late Cretaceous; the Black Mountain biotite granite, interpreted to be linked to alteration and mineralization in this area, has been determined to be 79.1 +/- 2.9 my old by the K/Ar method (Hudson and Arth, 1983, p. 769).

Deposit model:
Fault-controlled replacement and veining. Possibly tin skarn (14b) or tin vein (15b) model after Cox and Singer (1986).

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

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:

References:
Sainsbury and Hamilton, 1967; Hudson and Arth, 1983; McDermott, 1983 (1982 geophysical report); McDermott, 1983

Primary reference: Sainsbury and Hamilton, 1967

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Coyote Creek

Site Type: Mine

ARDF no. TE090

Latitude: 65.204

Quadrangle: TE A-3

Longitude: 166.283

Location description and accuracy:
Coyote Creek is a north-flowing stream whose mouth is on the south shore of Grantley Harbor, 1.75 miles southeast of Teller. Mining operations as mapped by Sainsbury and others (1969) took place along 0.6 miles of the main drainage between elevations of 245 and 320 feet. This is locality 85 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Coyote Cr.'.

Commodities:
Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the Coyote Creek drainage is a metapelitic sequence with local metamorphosed mafic intrusive bodies (Sainsbury, 1972). In places, the retrograded greenschist facies mafic bodies preserve remnant blueschist facies minerals. The age of this assemblage is unknown but it is probably Paleozoic. Placer mining operations have taken place along 0.6 miles of the main drainage between elevations of 245 and 320 feet (Sainsbury and others, 1969). These non-float operations took place primarily between 1920 and 1940 (Cobb, 1975). The character of the placer deposit has not been described.

Alteration:

Workings/Exploration:
Various kinds of open-cut, non-float operations have taken place along 0.6 miles of the main drainage between elevations of 245 and 320 feet .

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes

Status: Probably inactive

Production notes:
Not known

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969; Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Dese Creek

Site Type: Mine

ARDF no. TE091

Latitude: 65.206

Quadrangle: TE A-3

Longitude: 166.2

Location description and accuracy:
Dese Creek is a north-flowing stream whose mouth is on the southeast shore of Grantley Harbor, 7 miles southeast of Teller. As mapped by Sainsbury and others (1969), placer mining operations took place along 1.5 miles of the main drainage at surface elevations of 45 to 180 feet. This is locality 86 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Dese Cr.'.

Commodities:
Main: Au

Other: Hg

Ore minerals: Cinnabar, gold

Gangue minerals:

Geologic description:
Bedrock in the Dese Creek drainage is a metapelitic sequence with local metamorphosed mafic intrusive bodies (Sainsbury, 1972). In places, the retrograded greenschist facies mafic bodies preserve remnant blueschist facies minerals. The age of this assemblage is unknown but it is probably Paleozoic. Sainsbury and others (1969) mapped placer workings along 1.5 miles of the main drainage at surface elevations of 45 to 180 feet. Mining took place primarily between 1927 and 1946 and included several years of dredge operations (Cobb, 1975). Heavy mineral concentrates from placer operations contained cinnabar. Sainsbury and others (1969) report anomalous mercury levels in stream sediments above the area of placer operations. The character of the placer deposit has not been described. The area is low enough that Quaternary marine transgressions could have affected the placer deposit.

Alteration:

Workings/Exploration:
Placer mining operations, mostly dredging, have taken place along 1.5 miles of the main drainage between surface elevations of 45 and about 180 feet.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes

Status: Probably inactive

Production notes:
Not known

Reserves:
Not defined

Additional comments:

References:

Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969; Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Bluestone River

Site Type: Mine

ARDF no. TE092

Latitude: 65.113 **Quadrangle:** TE A-3

Longitude: 166.192

Location description and accuracy:
Bluestone River is a north-flowing stream whose mouth is on the south shore of Tuksuk Channel, 11 miles southeast of Teller. Sainsbury and others (1969) mapped placer mining operations along 1.25 miles of the main drainage at surface elevations between 95 and 145 feet. Cobb and Sainsbury (1972) show another area of operations 0.5 miles north of those mapped by Sainsbury and others (1969). These are localities 83 and 84 of Cobb and Sainsbury (1972). Other locations of placer mining further upstream on Bluestone River are parts of tributary mining locations (Gold Run, TE094 and Skookum Creeks, TE093; Sainsbury and others, 1969). Cobb (1975) summarized relevant references under the name 'Bluestone R.'.

Commodities:
Main: Au **Other:** Hg, platinum-group metals

Ore minerals: Cinnabar, gold, platinum-group metals

Gangue minerals:

Geologic description:
Bedrock in the Bluestone River drainage is mostly a metapelitic sequence with local metamorphosed mafic intrusive bodies (Sainsbury, 1972). South and east tributaries to the Bluestone River, such as Gold Run Creek, have bedrock assemblages that include chlorite schist, some amphibolite, and metamorphosed mafic intrusive bodies. In places, the retrograded greenschist facies mafic bodies preserve remnant blueschist facies minerals. The ages of these assemblages are not known but they are probably Paleozoic. Sainsbury and others (1969) mapped placer mining operations along 1.25 miles of the main drainage at surface elevations between 95 and 145 feet. Cobb and Sainsbury (1972) show another area of operations 0.5 miles north (downstream) of those mapped by Sainsbury and others (1969). Other locations of placer mining further upstream on Bluestone River are parts of tributary mining locations (Gold Run and Skookum Creeks; Sainsbury and others, 1969). The placer deposits below elevations of 145 feet are low enough to have potentially been affected by shoreline marine trangressions at times of Quaternary high sea level stands.

Gold occurs on benches as well as the main drainage. Most of the gold is fine but some nuggets were present (Collier and others, 1908). Smith (1909) reports that one nugget worth $72 (1908) was recovered. The upper one foot of bedrock contributed to pay. Sainsbury (1972, p. 3) reports that cinnabar and some platinum-group metals are present in auriferous gravels of the Bluestone River.

Alteration:

Workings/Exploration:
Sainsbury and others (1969) mapped placer mining operations along 1.25 miles of the main drainage at surface elevations between 95 and 145 feet. Cobb and Sainsbury (1972) show another area of operations 0.5 miles north (downstream) of those mapped by Sainsbury and others (1969). Other locations of placer mining

further upstream on Bluestone River are parts of tributary mining locations (Gold Run and Skookum Creeks; Sainsbury and others, 1969).

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes **Status:** Probably inactive

Production notes:
Not known

Reserves:
Not defined

Additional comments:

References:
Collier and others, 1908; Smith, 1909; Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Collier and others, 1908; Sainsbury and others, 1969; Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Skookum Creek

Site Type: Mine

ARDF no. TE093

Latitude: 65.097 **Quadrangle:** TE A-3

Longitude: 166.248

Location description and accuracy:
Skookum Creek is a south tributary to the Right Fork Bluestone River, in the central Teller A-3 quadrangle. The confluence of this short, 1.75 long, north-flowing stream with the North Fork Bluestone River is at about 245 feet surface elevation. Cobb and Sainsbury (1972) did not show this as a separate locality but Sainsbury and others (1969) mapped the location of placer mining operations to be on the lower 0.4 miles of the main drainage (between surface elevations of about 245 and 375 feet) and continuing downstream along the main drainage of the North Fork Bluestone River for another 0.4 miles (between surface elevations of about 240 and 245 feet). Cobb (1975) summarized references possibly relevant to Skookum Creek under the name 'Bluestone R., Right Fork'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the lower part of Skookum Creek is a metapelitic schist assemblage (Sainsbury, 1972). This assemblage may be in high-angle fault contact with chlorite schist and related rocks that make up bedrock in the upper part of the drainage. Both of these assemblages have local metamorphosed mafic intrusive bodies and both are of unknown but probable Paleozoic age. Sainsbury and others (1969) mapped the location of placer mining operations to be on the lower 0.4 miles of the main drainage (between surface elevations of about 245 and 375 feet) and continuing downstream along the main drainage of the North Fork Bluestone River for another 0.4 miles (between surface elevations of about 240 and 245 feet). Gold is reported to be present on benches as well as on the main drainage of Right Fork Bluestone River (Cobb, 1975). The placer deposits here have not been described. Sainsbury and others (1969) report anomalous mercury contents in stream sediments of North Fork Bluestone River upstream of the confluence with Skookum Creek.

Alteration:

Workings/Exploration:
Sainsbury and others (1969) mapped the location of placer mining operations to be on the lower 0.4 miles of the main drainage (between surface elevations of about 245 and 375 feet) and continuing downstream along the main drainage of the North Fork Bluestone River for another 0.4 miles (between surface elevations of about 240 and 245 feet). These were all probably non-float operations.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes **Status:** Probably inactive

Production notes:
Not known

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Gold Run

Site Type: Mine

ARDF no. TE094

Latitude: 65.067 **Quadrangle:** TE A-3

Longitude: 166.197

Location description and accuracy:

Gold Run is a major south tributary to the Bluestone River and the location of the most extensive placer mining operations in the Teller A-3 quadrangle. Gold Run Creek and North Fork Bluestone River come together to form the north-flowing Bluestone River at a surface elevation of 190 feet. Sainsbury and others (1969) mapped the location of placer mining operations to include the first half mile of the Bluestone River below the mouth of Gold Run and over 4 miles of the main drainage of Gold Run upstream from its mouth. These operations were at surface elevations between about 190 and 345 feet. This is locality 81 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Gold Run'.

Commodities:
Main: Au **Other:** Hg, platinum-group metals, W

Ore minerals: Cinnabar, gold, platinum-group metals, scheelite

Gangue minerals:

Geologic description:

Bedrock in this drainage and its headwater tributaries is dominately a chlorite-bearing schist and amphibolite assemblage (Sainsbury, 1972). The lower 1.25 miles of the stream drains across a metapelitic schist assemblage. Both of these assemblages have local metamorphosed mafic intrusive bodies and both are of unknown but probable Paleozoic age. Sainsbury and others (1969) mapped the location of placer mining operations to include the first half mile of the Bluestone River below the mouth of Gold Run and over 4 miles of the main drainage of Gold Run upstream from its mouth. These operations, which involved extensive dredging, were at surface elevations between about 190 and 345 feet. Mining took place at various times between 1900 and 1946 but much of the dredging was between 1935 and 1940 (Cobb, 1975).

Gold is present on benches, old channels, and the present drainage. Some pay, particularly near the mouth of Alder Creek, was very rich containing $50 (1908) per cubic yard (Collier and others, 1908). The pay was in the lower gravels on bedrock and included some bedrock. A yellow clay was present at the base of the pay in some places. The gravels are at least in part coarse and locally include large greenstone boulders. Granitic boulders, exotic to the area, are present in some gravels. Some of the gold is coarse with a nugget as large as 22.25 ounces having been recovered (Smith, 1938). Anderson (1947) reported that scheelite was present in heavy mineral concentrates and Sainsbury and others (1969) reported that cinnabar and platinum-group metals were also present.

Alteration:

Workings/Exploration:

Sainsbury and others (1969) mapped the location of placer mining operations to include the first half mile of the Bluestone River below the mouth of Gold Run and over 4 miles of the main drainage of Gold Run upstream from its mouth. These operations, which involved extensive dredging, were at surface elevations between about 190 and 345 feet along the main drainage. Various open-cut and hydraulicking methods have also been used. A prospect shaft at the pass between Gold Run and McAdam Creek encountered bedrock at 115 feet and some coarse gold.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes **Status:** Probably inactive

Production notes:
Yes, considerable from 1900 to at least 1946

Reserves:
Not defined; a prospect shaft at the pass between Gold Run and McAdam Creek encountered bedrock at 115 feet and some coarse gold. This is an area mapped as being mantled by moraine by Sainsbury (1972).

Additional comments:

References:
Collier and others, 1908; Smith 1938; Anderson, 1947; Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Collier and others, 1908; Sainsbury and others, 1969; Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (on Alder Creek)

Site Type: Prospect

ARDF no. TE095

Latitude: 65.063 **Quadrangle:** TE A-3

Longitude: 166.19

Location description and accuracy:
Alder Creek is an east tributary to Gold Run who's mouth is 1.9 miles upstream of the confluence of Gold Run and Bluestone River. This lode prospect is located on the south side of the creek, at approximately 320 feet surface elevation, 1,000 feet southeast of the confluence with Gold Run. This prospect is just southeast of the facilities of Sullivan's Camp and it is shown as a prospect occurrence on the USGS 1:63,360 topographic map of the Teller A-3 quadrangle. It is locality 21 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Alder Cr.'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals: Pyrite, quartz, talcose altered material

Geologic description:
This is a lode prospect initially exposed on lower Alder Creek by placer operations and subsequently explored to a depth of 60 feet from exposures on the south side of the creek. The prospect is an altered fault (?) zone, in one place 16 feet wide, along a contact between schistose carbonate rocks in the hanging wall and metapelitic rocks in the footwall (Collier and others, 1908, p. 279-280). The altered zone is a talcose material with quartz stringers and blebs, pyrite, and fine gold. A sample assayed 0.06 opt gold and a trace of silver (Collier and others, 1908).

Alteration:
Clay and sericite (?) may be source of talcose material noted by Collier and others (1908).

Workings/Exploration:
Some surface workings and shallow exporation to depth of 60 feet has been noted.

Age of mineralization:
Not known; apparently post-dates regional deformation and metamorphism which is Late Jurassic/Early Cretaceous in age.

Deposit model:
Altered fault (?) contact with quartz stringers, pyrite, and fine gold. Possibly low sulfide Au-quartz vein model (Cox and Singer, 1986, model 36a).

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
36a

Production: None **Status:** Probably inactive

Production notes:

Reserves:
Not defined

Additional comments:

References:
Collier and others, 1908; Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Collier and others, 1908

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Alder Creek

Site Type: Mine

ARDF no. TE096

Latitude: 65.063

Quadrangle: TE A-3

Longitude: 166.18

Location description and accuracy:

Alder Creek is an east tributary to Gold Run who's mouth is 1.9 miles upstream of the confluence of Gold Run and Bluestone River. The old mining facilities of Sullivan's Camp are at the mouth of Alder Creek, 0.25 miles east of the Nome-Teller road. Gold mining reportedly took place along the lower main drainage for about a mile upstream from the mouth on Gold Run. Alder Creek was included as a part of locality 81 by Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Alder Cr.'.

Commodities:

Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:

Bedrock in the Alder Creek drainage is a chlorite schist assemblage with local metamorphosed mafic intrusive bodies (Sainsbury, 1972). The age of this assemblage is not known but it is probably Paleozoic. Gold was discovered in 1900 and about 1mile of the lower creek was reported to have been mined by 1908 (Collier and others, 1908). The gravel is reported to be 4 feet thick over broken limestone bedrock 0.5 miles upstream of the mouth (Collier and others, 1908, p. 279-280). The muck here was also 4 feet thick. The coarse gold is well -rounded and accompanied by pyrite cubes in heavy mineral concentrates.

Alteration:

Workings/Exploration:

Placer mining operations are reported to have taken place over about the lower 1 mile of the main drainage. This would be at surface elevations of 260 to 310 feet.

Age of mineralization:

Quaternary

Deposit model:

Alluvial Au placer (Cox and Singer, 1986; model 39a)

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

39a

Production: Yes

Status: Probably inactive

Production notes:

Not known

Reserves:

Not defined

Additional comments:

References:
Collier and others, 1908; Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Collier and others, 1908

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Quartz Creek; Sunset Creek; Slate Creek

Site Type: Mine

ARDF no. TE097

Latitude: 65.033 **Quadrangle:** TE A-3

Longitude: 166.257

Location description and accuracy:
This Quartz Creek is a short, 1 mile long south tributary to upper Gold Run in the south-central Teller A-3 quadrangle; the confluence is at about 480 feet surface elevation. Sainsbury and others (1969) mapped the location of placer operations to be the lower 0.25 miles of Quartz Creek and contiguous 0.25 miles of Gold Run downstream from the mouth of Quartz Creek. This is locality 80 of Cobb and Sainsbury (1972) who note only one prior reference to this location (Collier and others, 1908, p. 277). It was not identified as a separate locality by Cobb (1975).

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the drainage of Quartz Creek (and most of upper Gold Run) is a chlorite schist assemblage with local metamorphosed mafic intrusive bodies (Sainsbury, 1972). The age of this assemblage is not known but it is probably Paleozoic. Sainsbury and others (1969) mapped the location of placer operations to be the lower 0.25 miles of Quartz Creek and contiguous 0.25 miles of Gold Run downstream from the confluence with Quartz Creek. These were probably open-cut and/or hydraulic operations. The character of this placer deposit has not been described.

Alteration:

Workings/Exploration:
Sainsbury and others (1969) mapped the location of placer operations to be the lower 0.25 miles of Quartz Creek and contiguous 0.25 miles of Gold Run downstream from the confluence with Quartz Creek. These were probably open-cut and/or hydraulic operations.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes, small **Status:** Probably inactive

Production notes:
Not reported

Reserves:
Not defined

Additional comments:

References:
Collier and others, 1908; Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Upper Quartz Creek

Site Type: Mine

ARDF no. TE098

Latitude: 65.025

Quadrangle: TE A-3

Longitude: 166.292

Location description and accuracy:
Upper Quartz Creek as shown on the south-central Teller A-3 topographic map is a separate south tributary to Gold Run who's mouth is 0.9 miles upstream from the mouth of Quartz Creek. The 1:250,000 scale Teller quadrangle topographic map shows this drainage to be Sunset Creek and its tributary Slate Creek. The nomenclature shown on the Teller A-3 topographic map is used here. Sainsbury and others (1969) show the location of placer mining operations to be along 0.4 miles of the main drainage at surface elevations of 595 to 640 feet. This is just below the headwater fork, 1 mile upstream from the confluence with Gold Run. This was not identified as a separate locality by Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Au

Other:

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in this drainage is a chlorite schist assemblage with local metamorphosed mafic intrusive bodies (Sainsbury, 1972). The age of this assemblage is not known but it is probably Paleozoic. Sainsbury and others (1969) show the location of placer mining operations to be along 0.4 miles of the main drainage at surface elevations of 595 to 640 feet. This is just below the headwater fork, 1 mile upstream from the confluence with Gold Run. The character of this placer deposit has not been described.

Alteration:

Workings/Exploration:
Placer mining, probably open-cut and/or hydraulic operations, took place along 0.4 miles of the main drainage at surface elevations of 595 to 640 feet. This is just below the headwater fork, 1 mile upstream from the confluence with Gold Run.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes, small

Status: Probably inactive

Production notes:
Not reported

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Windy Creek

Site Type: Mine

ARDF no. TE099

Latitude: 65.077 **Quadrangle:** TE A-3

Longitude: 166.34

Location description and accuracy:
This Windy Creek is a south tributary to the Right Fork Bluestone River. The mouth of Windy Creek is 2.4 miles upstream from the mouth of Skookum Creek and 1.25 miles downstream of the Ring Creek-Eagle Creek fork at the headwaters of Right Fork Bluestone River. The confluence of Windy Creek with North Fork Bluestone River is at about 360 feet elevation. This is locality 79 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Windy Cr., trib. Bluestone R.'. Sainsbury and others (1969) did not show the location of mining operations along this creek and the location can only be considered approximate.

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
A regional boundary between metapelitic rocks to the northwest and chlorite schist and related rocks to the southeast parallels Windy Creek about 0.2 to 0.4 miles to the southeast of the main drainage (Sainsbury, 1972). The metapelitic assemblage makes up most of the bedrock in the Windy Creek drainage. Both regional assemblages locally contain metamorphosed mafic intrusive bodies. The age of these assemblages is not known but they are probably Paleozoic. The location of operations and the nature of the placer deposit here have not been described. Mining is reported for the years 1924 and 1926 to 1931 (Cobb, 1975).

Alteration:

Workings/Exploration:
Mining is reported for the years 1924 and 1926 to 1931 (Cobb, 1975).

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes, small **Status:** Probably inactive

Production notes:
Not reported

Reserves:
Not defined

Additional comments:

References:

Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Bering Creek

Site Type: Mine

ARDF no. TE100

Latitude: 65.088 **Quadrangle:** TE A-3

Longitude: 166.389

Location description and accuracy:
Bering Creek is a south tributary to Eagle Creek (TE101) in the west-central Teller A-3 quadrangle. This 1.5 mile long, north-flowing stream's confluence with Eagle Creek is at about 490 feet surface elevation. The location of placer mining operations was not mapped by Sainsbury and others (1969) but Cobb and Sainsbury (1972) show two locations on this creek, locality 79 which is on the main drainage at a surface elevation of about 550 feet (0.75 miles upstream of the mouth) and locality 78 which is at the mouth. The upstream location is considered approximate. Cobb (1975) summarized relevant references under the names 'Bering Cr.' and 'Eagle Cr.'.

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the Bering Creek drainage is a metapelitic sequence that is locally cut by metamorphosed mafic intrusive bodies (Sainsbury, 1972). The age of this sequence is uncertain but it is probably Paleozoic. Coarse, bright, unworn placer gold was handmined from this creek in the early part of the century (1902 to 1908; Cobb, 1975) and hydraulic operations took place at the mouth of the creek in 1946 (White and others, 1953). The character of the placer deposit has not been described.

Alteration:

Workings/Exploration:
Small scale hand mining probably predominated and was locally pursued along this short drainage early in the century (1902 to 1908). Some hydraulic operations took place at the mouth on Eagle Creek in 1946.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes, small **Status:** Probably inactive

Production notes:
Not reported

Reserves:
Not defined

Additional comments:

References:
White and others,1953; Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Cobb, 1975

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Eagle Creek

Site Type: Mine

ARDF no. TE101

Latitude: 65.079

Quadrangle: TE A-3

Longitude: 166.419

Location description and accuracy:
Eagle Creek is the north-flowing headwater tributary of Right Fork Bluestone River. Sainsbury and others (1969) mapped placer mining operations along 0.9 miles of the main drainage between surface elevations of 550 and about 635 feet (both downstream and upstream of the mouth of Walker Creek, a south tributary to Eagle Creek). These operations start about 2.25 miles upstream of the confluence with Right Fork Bluestone River and 1 mile upstream of the mouth of Bering Creek. This is locality 76 of Cobb and Sainsbury (1972). Cobb (1975) summarized relevant references under the name 'Eagle Cr.'.

Commodities:
Main: Au

Other: Hg

Ore minerals: Cinnabar, gold

Gangue minerals:

Geologic description:
Bedrock in the Bering Creek drainage is a metapelitic sequence that is locally cut by metamorphosed mafic intrusive bodies (Sainsbury, 1972). The age of this sequence is uncertain but it is probably Paleozoic.

At least some placer mining on this part of Eagle Creek is recent compared to that in other areas of the Teller A-3 quadrangle. Sainsbury and others (1969) indicate that mining was taking place in 1968 or 1969. These operations took place along 0.9 miles of the main drainage between surface elevations of 550 and about 635 feet (both downstream and upstream of the mouth of Walker Creek, a south tributary to Eagle Creek). They start about 2.25 miles upstream of the confluence with Right Fork Bluestone River and 1 mile upstream of the mouth of Bering Creek. They were probably dozer and sluice opeations. Cinnabar pebbles are reported to be present in heavy mineral concentrates but otherwise the character of the placer deposit has not been described.

Alteration:

Workings/Exploration:
Placer mining operations, some as recent as 1968 or 1969, took place along 0.9 miles of the main drainage between surface elevations of 550 and about 635 feet (both downstream and upstream of the mouth of Walker Creek, a south tributary to Eagle Creek). They start about 2.25 miles upstream of the confluence with Right Fork Bluestone River and 1 mile upstream of the mouth of Bering Creek. They were probably dozer and sluice opeations.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes, small

Status: Probably inactive

Production notes:
Not reported

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Ring Creek

Site Type: Mine

ARDF no. TE102

Latitude: 65.116 **Quadrangle:** TE A-3

Longitude: 166.384

Location description and accuracy:
Ring Creek is the south -flowing headwater tributary of Right Fork Bluestone River in the west-central Teller A-3 quadrangle. Sainsbury and others (1969) mapped the location of placer mining operations along the principal west tributary to Ring Creek from the confluence at 440 feet surface elevation, upstream 0.6 miles to a surface elevation of 500 feet. This locality was not included by Cobb and Sainsbury (1972) or Cobb (1975).

Commodities:
Main: Au **Other:**

Ore minerals: Gold

Gangue minerals:

Geologic description:
Bedrock in the Bering Creek drainage is a metapelitic sequence that is locally cut by metamorphosed mafic intrusive bodies (Sainsbury, 1972). The age of this sequence is uncertain but it is probably Paleozoic. Sainsbury and others (1969) mapped the location of placer mining operations along the principal west tributary to Ring Creek from the confluence at 440 feet surface elevation, upstream 0.6 miles to a surface elevation of 500 feet. The date of these operations is not known and the character of the placer deposit has not been described.

Alteration:

Workings/Exploration:
Sainsbury and others (1969) mapped the location of placer mining operations along the principal west tributary to Ring Creek from the confluence at 440 feet surface elevation, upstream 0.6 miles to a surface elevation of 500 feet. The date of these operations and the mining method employed are not known; they were probably dozer and sluice operations.

Age of mineralization:
Quaternary

Deposit model:
Alluvial Au placer (Cox and Singer, 1986; model 39a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
39a

Production: Yes, small **Status:** Probably inactive

Production notes:
Not reported

Reserves:
Not defined

Additional comments:

References:
Sainsbury and others, 1969; Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975

Primary reference: Sainsbury and others, 1969

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Christophosen Creek

Site Type: Mine

ARDF no. TE103

Latitude: 65.026

Quadrangle: TE A-2

Longitude: 165.629

Location description and accuracy:
Christophosen Creek is a stream on the north flank of the Kigluaik Mountains whose mouth is on Windy Cove of Imuruk Basin. This creek is not identified by name on USGS topographic maps; its name comes from a location map made by Coats (1944). The graphite deposit at this locality is 1.75 miles southeast of the mouth of the creek and 8.5 miles due east of the White River. It is at the abrupt break in slope on the north side of the mountain front, just upslope of the surface trace of the active Kigluaik normal fault. The graphite -bearing rocks are in the footwall of this fault. This location was not shown by Cobb and Sainsbury (1972) but Cobb (1975) summarized relevant references under the name 'Christophosen Cr.'

Commodities:
Main: Graphite

Other:

Ore minerals: Graphite

Gangue minerals: Amphibole, biotite, garnet, muscovite, plagioclase, pyrrhotite, quartz, sphene, sillimanite, zircon

Geologic description:
Flake graphite occurs as disseminations and high-grade tabular lenses within amphibolite facies metasedimentary rocks (Coats, 1944). The metamorphic rocks are primarily biotite-quartz schist with some sillimanite and garnet (Sainsbury, 1972). Small granitic plugs, dikes, and sills locally intrude the metamorphic rocks. The graphite-bearing schists are sharply bound to the north by the recently active Kigluaik fault, the principal fault along which late Cenozoic uplift of the Kigluaik Mountains has taken place (Hudson and Plafker, 1978). The graphite-bearing schists strike approximately parallel to the mountain front and dip north between 25 and 65 degrees. They form a zone along the mountain front that is 200 to 400 feet thick and possibly 20,000 feet long (Hudson, 1981; also see Ruby Creek and Graphite Creek localities to the east). To the south, the graphite-bearing schists are in conformable contact with other amphibolite facies metasedimentary rocks. The latter appear to be feldspathic and contain much less graphite. The graphite-bearing schists make up two general sequences; (1) a heterogeneous sequence of garnet-sillimanite-biotite-quartz schist with disseminated graphite and graphite-rich lenses, and (2) a more evenly layered biotite-quartz schist with disseminated graphite. The latter contains disseminated pyrrhotite and commonly weathers orange.

Claims were first staked on this deposit in 1900 but most of the work here appears to have taken place between 1912 and 1917 (Cobb, 1975). Coats (1944) describes 25-foot thick schist units with 10% disseminated graphite. Lenses in these schists, a few inches to 18 inches thick, can contain 50 to 90% coarse graphite by volume. The length of the lenses appears to be 10 to 15 times their widths. The graphite flakes are commonly 0.004 to 0.04 inches in diameter although some are greater than 0.1 inch across. Two samples (Coats, 1944) contained 24.9% and 56.6% graphite of which 76% and 82% was coarser than 30 meshes per inch. Samples of schist with disseminated graphite from this locality appeared to have a few to 15% graphite in thin section but laboratory analyses indicated only 4 to 6% (Wolgemuth, 1982).

Alteration:
Some shearing and deformation of graphite-rich lenses has accompanied faulting and oxidation of disseminated pyrrhotite has led to orange-staining of graphite-bearing rocks but other types of alteration are not identified.

Workings/Exploration:
Small surface pits are the principal wokings here. Exploration activity in the general area took place as recently as 1994 (Swainbank and others, 1995).

Age of mineralization:
The metamorphism that has developed coarse graphite in these rocks is Late Jurassic to Early Cretaceous in age.

Deposit model:
Flake graphite in disseminations and tabular lenses within amphibolite facies metasedimentary rocks

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

Production: Yes, small **Status:** Inactive

Production notes:
130 tons of hand-sorted high-grade material were shipped in 1916 (Mertie, 1918) and other small shipments of similar material may have occurred.

Reserves:
A stock pile of hand-sorted material here is estimated to contain 50 tons and the few miles of strike between the area of the Christophosen Creek deposit and the Graphite Creek deposit to the east has been estimated to contain 65,000 tons averaging about 60% graphite (Coats, 1944). This zone has also been estimated to contain, overall, more than 10 million tons of 10% or more graphite (Weiss, 1973).

Additional comments:

References:
Mertie, 1918; Harrington, 1919; Coats, 1944; Sainsbury, 1972; Cobb and Sainsbury, 1972; Weiss, 1973; Cobb, 1975; Hudson and Plafker, 1978; Hudson, 1981; Wolgemuth, 1982; Swainbank and others, 1995

Primary reference: Harrington, 1919; Coats, 1944

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Ruby Creek

Site Type: Prospect

ARDF no. TE104

Latitude: 65.037 **Quadrangle:** TE A-2

Longitude: 165.552

Location description and accuracy:
Ruby Creek is a small east headwater tributary to Glacier Canyon Creek that flows northward across the Kigluaik Mountain front 0.4 miles northeast of Glacier Canyon Creek. This creek is not identified by name on USGS topographic maps; its name comes from a location map made by Coats (1944). This location is 11.8 miles due east of White River and 2.4 miles northeast of the Christophosen mine (TE 103) at elevations of 550 to 650 feet. It is at the abrupt break in slope on the north side of the mountain front, just upslope of the surface trace of the active Kigluaik normal fault. The graphite -bearing rocks are in the footwall of this fault. This location was not shown by Cobb and Sainsbury (1972) but Cobb (1975) summarized relevant references under the name 'Ruby Cr.'.

Commodities:
Main: Graphite **Other:**

Ore minerals: Graphite

Gangue minerals: Amphibole, biotite, garnet, muscovite, plagioclase, pyrrhotite, quartz, sphene, sillimanite, zircon

Geologic description:
Flake graphite occurs as disseminations and high-grade tabular lenses within amphibolite facies metasedimentary rocks (Coats, 1944). The metamorphic rocks are primarily biotite-quartz schist with some sillimanite and garnet (Sainsbury, 1972). Small granitic plugs, dikes, and sills locally intrude the metamorphic rocks. The graphite-bearing schists are sharply bound to the north by the recently active Kigluaik fault, the principal fault along which late Cenozoic uplift of the Kigluaik Mountains has taken place (Hudson and Plafker, 1978). The graphite-bearing schists strike approximately parallel to the mountain front and dip north between 25 and 65 degrees. They form a zone along the mountain front that is 200 to 400 feet thick and possibly 20,000 feet long (Hudson, 1981; also see Christophosen Creek locality to the west and Graphite Creek locality to the east). To the south, the graphite-bearing schists are in conformable contact with other amphibolite facies metasedimentary rocks. The latter appear to be feldspathic and contain much less graphite. The graphite-bearing schists make up two general sequences; (1) a heterogeneous sequence of garnet-sillimanite-biotite-quartz schist with disseminated graphite and graphite-rich lenses, and (2) a more evenly layered biotite-quartz schist with disseminated graphite. The latter contains disseminated pyrrhotite and commonly weathers orange.

To the west of Ruby Creek, a 50-foot trench along strike exposes lenses up to 1 foot wide that are estimated to contain 70% graphite by volume. This zone of high-grade lenses has been traced along strike for 500 feet and is exposed over a vertical extent of 175 feet. The width of the graphite-rich zone was not recorded. A sample from this exposure contained 60% graphite of which 65% was coarser than 30 mesh to the inch (Coats, 1944). Other graphite-rich zones are present along Ruby Creek including a faulted section 4 feet wide with 1 to 6 inch wide graphite stringers and a 12 foot wide section with several 4 to 12 inch thick graphite-rich lenses. Individual lenses are not more than 20 feet long and seem to be about 12 times their width in length. The lenses overlap one another and come and go through the graphite-rich section (Coats, 1944). A sample of schist (plagioclase-biotite-quartz schist) with disseminated graphite from this locality was thought to have 5 to 10% graphite in thin section but laboratory analysis indicated a graphite content of 3% (Wolgemuth, 1982).

Alteration:
Some shearing and deformation of graphite-rich lenses has accompanied faulting and oxidation of disseminated pyrrhotite has led to orange-staining of graphite-bearing rocks but other types of alteration are not identified.

Workings/Exploration:
A 50 -foot long surface trench and a 20 foot-long drift were noted by Coats (1944) and other small surface workings (pits) are probably present. Exploration activity in the general area took place as recently as 1994 (Swainbank and others, 1995).

Age of mineralization:
The metamorphism that has developed coarse graphite in these rocks is Late Jurassic to Early Cretaceous in age.

Deposit model:
Flake graphite in disseminations and tabular lenses within amphibolite facies metasedimentary rocks

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

Production: Yes, small **Status:** Inactive

Production notes:
Some of the graphite shipments reported for the Alaska Graphite Company may have come from this locality. These shipments include 35 tons (1907) and 100 tons (1916 or 1917) of hand-sorted, high-grade material (Mertie, 1918; Harrington, 1919; Coats, 1944).

Reserves:
The few miles of strike between the area of the Christophosen Creek deposit and the Graphite Creek deposit to the east has been estimated to contain 65,000 tons averaging about 60% graphite (Coats, 1944). This zone has also been estimated to contain, overall, more than 10 million tons of 10% or more graphite (Weiss, 1973).

Additional comments:

References:
Mertie, 1918; Harrington, 1919; Coats, 1944; Sainsbury, 1972; Cobb and Sainsbury, 1972; Weiss, 1973; Cobb, 1975; Hudson and Plafker, 1978; Hudson, 1981; Wolgemuth, 1982; Swainbank and others, 1995

Primary reference: Coats, 1944

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Graphite Creek

Site Type: Mine

ARDF no. TE105

Latitude: 65.04 **Quadrangle:** TE A-2

Longitude: 165.535

Location description and accuracy:
Graphite Creek flows northward across the Kigluaik Mountain front 0.9 miles northeast of Glacier Canyon Creek and 0.5 miles northeast of Ruby Creek. This creek is not identified by name on USGS topographic maps; its name comes from a location map made by Coats (1944). Its mouth is on the east shore of Windy Cove on Imuruk Basin, 0.75 miles northeast of the mouth of Glacier Canyon Creek. The graphite deposits are at about 750 feet elevation at the abrupt break in slope on the north side of the mountain front, just upslope of the surface trace of the active Kigluaik normal fault. The graphite -bearing rocks are in the footwall of this fault. This location was not shown by Cobb and Sainsbury (1972) but Cobb (1975) summarized relevant references under the name 'Graphite Cr.'.

Commodities:
Main: Graphite **Other:**

Ore minerals: Graphite

Gangue minerals: Amphibole, biotite, garnet, muscovite, plagioclase, pyrrhotite, quartz, sphene, sillimanite, zircon

Geologic description:
Flake graphite occurs as disseminations and high-grade tabular lenses within amphibolite facies metasedimentary rocks (Coats, 1944). The metamorphic rocks are primarily biotite-quartz schist with some sillimanite and garnet (Sainsbury, 1972). Small granitic plugs, dikes, and sills locally intrude the metamorphic rocks. The graphite-bearing schists are sharply bound to the north by the recently active Kigluaik fault, the principal fault along which late Cenozoic uplift of the Kigluaik Mountains has taken place (Hudson and Plafker, 1978). The graphite-bearing schists strike approximately parallel to the mountain front and dip north between 25 and 65 degrees. They form a zone along the mountain front that is 200 to 400 feet thick and possibly 20,000 feet long (Hudson, 1981; also see Christophosen Creek locality to the west and Graphite Creek locality to the east). To the south, the graphite-bearing schists are in conformable contact with other amphibolite facies metasedimentary rocks. The latter appear to be feldspathic and contain much less graphite. The graphite-bearing schists make up two general sequences; (1) a heterogeneous sequence of garnet-sillimanite-biotite-quartz schist with disseminated graphite and graphite-rich lenses, and (2) a more evenly layered biotite-quartz schist with disseminated graphite. The latter contains disseminated pyrrhotite and commonly weathers orange.

West of Graphite Creek a 30 foot-long pit exposes a garnet-bearing schist with disseminated graphite and graphite-rich lenses. A 13-foot section here contained 3 feet of garnet -bearing schist with graphite and a 3.5 foot thick high-grade graphite lense with quartz stringers. A sample of the garnet-bearing schist contained 12% graphite of which 80% was coarser than 30 mesh per inch and a sample of the graphite-rich material contained 59% graphite of which 83% was coarser than 30 mesh per inch (Coats, 1944). A 25-foot thick zone containing disseminated graphite and a 3-foot wide high-grade lense is exposed on the east side of Graphite Creek. Twenty foot of this section is estimated to contain 10% disseminated graphite. This zone has been traced eastward on the surface for a distance of 480 feet and where it is well exposed, a 3- to 4-foot wide high-grade lense is present (Coats, 1944).

Alteration:

Some shearing and deformation of graphite-rich lenses has accompanied faulting and oxidation of disseminated pyrrhotite has led to orange-staining of graphite-bearing rocks but other types of alteration are not identified.

Workings/Exploration:

Surface pits, including one 30-feet long from which 50 tons of high-grade material were recovered, are present. Exploration activity in the general area took place as recently as 1994 (Swainbank and others, 1995).

Age of mineralization:

The metamorphism that has developed coarse graphite in these rocks is Late Jurassic to Early Cretaceous in age.

Deposit model:

Flake graphite in disseminations and tabular lenses within amphibolite facies metasedimentary rocks

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

Production: Yes, small **Status:** Inactive

Production notes:

Most of the graphite shipments reported for the Alaska Graphite Company may have come from this locality. These shipments include 35 tons (1907) and 100 tons (1916 or 1917) of hand-sorted, high-grade material (Mertie, 1918; Harrington, 1919; Coats, 1944). Coats (1944) reports that about 50 tons were recovered in 1916 from the 30-foot long pit on the west side of Graphite Creek.

Reserves:

The few miles of strike between the area of the Christophosen Creek deposit and the Graphite Creek deposit to the east has been estimated to contain 65,000 tons averaging about 60% graphite (Coats, 1944). This zone has also been estimated to contain, overall, more than 10 million tons of 10% or more graphite (Weiss, 1973)

Additional comments:

References:

Mertie, 1918; Harrington, 1919; Coats, 1944; Sainsbury, 1972; Cobb and Sainsbury, 1972; Weiss, 1973; Cobb, 1975; Hudson and Plafker, 1978; Hudson, 1981; Swainbank and others, 1995

Primary reference: Coats, 1944

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

Site name(s): Unnamed (near Igloo Creek)

Site Type: Occurrence

ARDF no. TE106

Latitude: 65.471 **Quadrangle:** TE B-2

Longitude: 165.624

Location description and accuracy:
This occurrence is on the ridge crest between lower Igloo Creek (east tributary to the American River) and another (unnamed) east tributary to the the American River. The mouth of the unnamed east tributary is 4.25 miles north of the mouth of Igloo Creek. This occurrence is at a surface elevation of approximately 1,150 feet, 4.4 to 4.5 miles due east of the American River. The location is mapped by Sainsbury (1972) but it was not included by Cobb and Sainsbury (1972). Cobb (1975) refers to this location as 'Unnamed occurrence'.

Commodities:
Main: Sn **Other:**

Ore minerals: Not determined

Gangue minerals: Not determined

Geologic description:
Sainsbury (1972) notes the occurrence of tactite rubble and outcrop on this ridge. The mapped bedrock assemblage in this area is chlorite-epidote-amphibole schist with some intercalated metacarbonate rocks and local metamorphosed mafic intrusive bodies (Sainsbury, 1972). Partial results of a spectrographic analysis reported by Sainsbury (1972, p. 3) indicate that tactite here can contain greater than 1,000 ppm tin, 1,000 ppm beryllium, and greater than 1,000 ppm bismuth. No other data are available.

Alteration:
Calc-silicate minerals replacing metacarbonate rocks

Workings/Exploration:
No prospecting activities are known to have taken place at this location.

Age of mineralization:
May be Late Cretaceous, the age of other tin-bearing mineralized systems of western Seward Peninsula.

Deposit model:
Tin-bearing skarn (Cox and Singer, 1986; model 14b)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
14b

Production: None **Status:** Inactive

Production notes:

Reserves:

Additional comments:
A 1982 reconnaissance traverse on this ridge did not relocate this occurrence (Hudson, 1983).

References:
Sainsbury, 1972; Cobb and Sainsbury, 1972; Cobb, 1975; Hudson, 1983

Primary reference: Sainsbury, 1972

Reporter: Travis L. Hudson (Applied Geology)

Reporter affiliation: Applied Geology

Last report date: 5/10/98

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