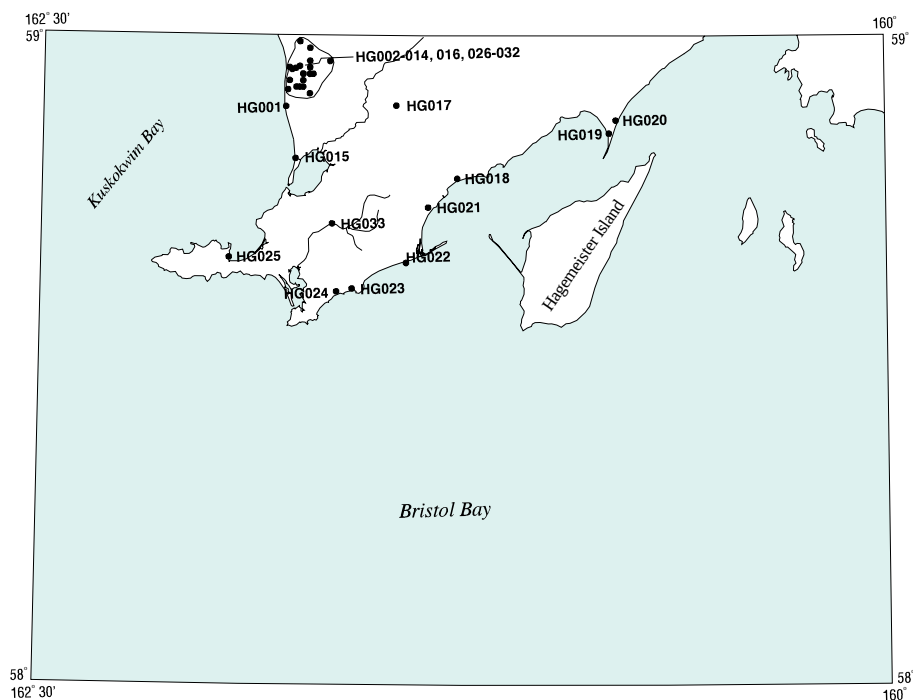


Hagemeister Island quadrangle

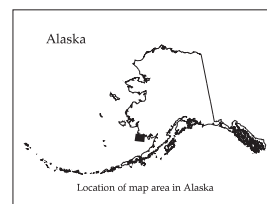
Descriptions of the mineral occurrences shown on the accompanying figure follow. See U.S. Geological Survey (1996) for a description of the information content of each field in the records. The data presented here are maintained as part of a statewide database on mines, prospects and mineral occurrences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



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

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

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Sequim, WA



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

OPEN-FILE REPORT 01-269

Site name(s): Kuskokwim Bay (beach from near Platinum south to Salmon River)

Site type: Occurrence

ARDF no.: HG001

Latitude: 58.89

Quadrangle: HG D-6

Longitude: 161.78

Location description and accuracy:

This location is the modern beach extending from the mouth of the Salmon River north 9 miles to the Hagemeister Island quadrangle boundary. The map site is at Flat Cape, about 2 miles north of the mouth of Salmon River. It is location 4 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:

Main: Cr

Other: Au, Pt

Ore minerals: Chromite, gold, platinum group metal (PGM) alloys

Gangue minerals:

Geologic description:

This location is the modern beach extending from the mouth of the Salmon River north 9 miles to the Hagemeister Island quadrangle boundary. The modern beach is a 75- to 140-m-wide sandy gravel veneer over older unconsolidated deposits. From north to south, the landward margin of the beach is against 4 miles of bluffs to 8 m high of poorly sorted, stratified, pebble and cobble gravel with some thin discontinuous sand lenses; 1.5 miles of talus and bedrock of the Red Mountain ultramafic pluton; and 3.5 miles of bluffs to 16 m high of unconsolidated pebble gravel, clay- and silt-rich deposits with some iron-cemented gravel, and local sand- and peat-bearing sections (Mertie, 1940).

Black sand streaks and lenses are present locally along the beach. These were tested by panning early in the exploration of the area but only traces of platinum were found (Mertie, 1940, p. 36). Systematic sampling and evaluation of the beach sands was later accomplished by Berryhill (1963), Bond (1982), Ulrich (1984), and Fechner (1988). Berryhill (1963) collected auger or shovel samples at 16 locations and Fechner (1988) collected mini-slucice or hydraulic concentrator heavy mineral concentrates at 20 locations. Berryhill (1963) showed that chromite was a major constituent of the heavy mineral concentrates, but that both gold and platinum were commonly present only in trace amounts. One sample collected about 2 miles north of the mouth of Salmon River contained 0.0736

ounce of gold and 0.0573 ounce of platinum per cubic yard. A composite sample of black sands from beaches throughout the Kuskokwim Bay-Chagun Bay area contained 33.8 percent acid-soluble iron, 12.1 percent Cr₂O₃, and less than 0.02 ounce of Au, Pt, and Ag per ton (Berryhill, 1963, p. 13).

Analytical data reported by Fechner (1988) showed that the beach sands commonly contained detectable Pt and Au. The highest values, 0.26 ounce of PGM per cubic yard and 0.1029 ounce of Au per cubic yard, were from the Flat Cape area between the mouth of Salmon River and Red Mountain. Microprobe analyses of the PGM grains showed that they comprise 0.5 to 4.5 percent Rh, 0.2 to 1 percent Ru, 32 to 89.1 percent Pt, 1.6 to 47.8 percent Ir, 0.8 to 15.9 percent Os, and 3.2 to 8.9 percent Fe; the gold fineness ranged from 548 to 863 (Fechner, 1988, p. 24). Fechner (1988) also collected samples of older unconsolidated materials in the bluffs along the beach and showed that small amounts of Pt and Au are present in these deposits both north and south of Red Mountain. Hessin and others (1978 [OF 78-9-J; OF 78-9-K; OF 78-9-L; OF 78-9-P]) and Coonrad and others (1978) showed that samples of bottom sediments collected offshore of the present beach contained anomalous concentrations of Cr, Co, Ni, Hg, Au, and Pt in several places.

Mertie (1940) noted that the lack of higher Pt concentrations in beach sands nearer the Red Mountain ultramafic outcrops could indicate that the lode sources were not uniformly distributed in this pluton and/or that the beach erosion along this part of the pluton is very recent. Fechner (1988) and Ulrich (1984) concluded that the better Pt concentrations in the modern beach sands reflected the presence of higher Pt concentrations in the unconsolidated deposits of the nearby bluffs, particularly in the Flat Cape area. In this area, Fechner (1988) estimated that there are 39,000 cubic yards of material that average 0.0073 ounce of Pt per cubic yard and 0.0033 ounce of Au per cubic yard.

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

Placer PGE-Au; modern beach (Cox and singer, 1986; model 39b)

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

39b

Production Status: No**Site Status:** Inactive**Workings/exploration:**

All work on the modern beach has been spot sampling for heavy mineral concentrates by auger, portable sluice, hydraulic concentrator, hand shovel and panning. This type of work has been repeated several times by early prospectors, and by Mertie (1940), Berryhill, (1963); Bond (1982), Ulrich (1984), and Fechner (1988).

Production notes:**Reserves:**

Fechner (1988) estimated that there are 39,000 cubic yards of material that average 0.0073 ounce of Pt per cubic yard and 0.0033 ounce of Au per cubic yard in the Flat Cape area.

Additional comments:**References:**

Mertie, 1940; Berryhill, 1963; Cobb, 1972 (MF 362); Coonrad and others, 1978; Hessin and others, 1978 (OF 78-9-J); Hessin and others, 1978 (OF 78-9-K); Hessin and others, 1978 (OF 78-9-L); Hessin and others, 1978 (OF 78-9-P); Cobb, 1980 (OF 80-909); Bond, 1982; Ulrich, 1984; Fechner, 1988.

Primary reference: Fechner, 1988

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Red Mountain**Site type:** Occurrence**ARDF no.:** HG002**Latitude:** 58.95**Quadrangle:** HG D-6**Longitude:** 161.77**Location description and accuracy:**

This occurrence is in a small drainage on the lower west flank of Red Mountain. It is 1/4 mile east of the beach and 1 1/4 mile west of the summit of Red Mountain. It is locality 5 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** Cr**Other:** Au, Pt**Ore minerals:** Chromite**Gangue minerals:** Hornblende, olivine**Geologic description:**

Berryhill (1963, sample locality 47) collected a shovel sample of surface materials at this location and determined that the heavy mineral concentrates contained small amounts of chromite (1 to 10 percent) and traces of Pt and Au. Both hornblende and olivine were reported to be present in amounts exceeding 10 percent. This occurrence is in a small drainage on the lower west flank of Red Mountain, a composite ultramafic pluton containing abundant dunite. The surface materials at this site are apparently derived directly from erosion of the Red Mountain pluton.

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39b

Production Status: None

Site Status: Active?

Workings/exploration:

No workings are present.

Production notes:

Reserves:

Additional comments:

References:

Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Red Mountain

Site type: Occurrence

ARDF no.: HG003

Latitude: 58.947

Quadrangle: HG D-6

Longitude: 161.763

Location description and accuracy:

This occurrence is on the west flank of Red Mountain, at an elevation of about 650 feet. It is sample locality 44 of Berryhill (1963) and is approximately located, probably within about 1/4 mile. It is locality 6 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:

Main: Cr

Other: Au, Pt

Ore minerals: Chromite

Gangue minerals: Augite, hornblende, olivine

Geologic description:

Berryhill (1963, sample locality 44) collected a shovel sample of surface materials at this location and determined that the heavy mineral concentrates contained small amounts of chromite (1 to 10 percent) and traces of Pt and Au. Augite, hornblende, and olivine were reported to be present in amounts exceeding 10 percent. This occurrence is on the steeper part of the west flank of Red Mountain, a composite ultramafic pluton containing abundant dunite. The surface materials at this site are expected to be mostly colluvial and to have been derived directly from erosion of the Red Mountain pluton.

Alteration:

Age of mineralization:

Holocene.

Deposit model:

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

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

39b

Production Status: None

Site Status: Active

Workings/exploration:

No workings are present.

Production notes:

Reserves:

Additional comments:

References:

Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Red Mountain**Site type:** Occurrence**ARDF no.:** HG004**Latitude:** 58.949**Quadrangle:** HG D-6**Longitude:** 161.752**Location description and accuracy:**

This occurrence is on the west flank of Red Mountain, at an elevation of about 1,250 feet. It is sample locality 45 of Berryhill (1963) and is approximately located, probably within about 1/4 mile. It is locality 6 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** Cr**Other:** Au, Pt**Ore minerals:** Chromite**Gangue minerals:** Augite, hornblende, olivine**Geologic description:**

Berryhill (1963, sample locality 45) collected a shovel sample of surface materials at this location and determined that the heavy mineral concentrates contained greater than 10 percent chromite and traces of Pt and Au. Augite, hornblende, and olivine were also reported to be present in amounts exceeding 10 percent. This occurrence is on the steeper part of the west flank of Red Mountain, a composite ultramafic pluton containing abundant dunite. The surface materials at this site are expected to be colluvial and to have been derived directly from erosion of the Red Mountain pluton.

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39b

Production Status: None

Site Status: Active

Workings/exploration:

No workings are present.

Production notes:

Reserves:

Additional comments:

References:

Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Red Mountain**Site type:** Occurrence**ARDF no.:** HG005**Latitude:** 58.952**Quadrangle:** HG D-6**Longitude:** 161.740**Location description and accuracy:**

This occurrence is on the summit of Red Mountain. The location is probably accurate to within about 1/4 mile. It is locality 8 of Cobb (1972, [MF 362]; 1980 [OF 80-909]).

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

Mertie (1969, p. 84) reported that the heavy mineral concentrate from a sample of residual surface material at this location contained platinum. The residual surface material rests on dunite of the composite Red Mountain ultramafic pluton and upslope to the northwest of a large platinum-in-soil anomaly over this pluton (HG006).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

Placer PGE-Au; residual (Cox and Singer, 1986; model 9b)

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

39b

Production Status: None**Site Status:** Active

Workings/exploration:

No workings are present. The area has been included in soil geochemical surveys, and both gravity and aeromagnetic surveys have been completed over the Red Mountain pluton (Alaska Earth Sciences, 2000).

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

Mertie, 1969; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Mertie, 1969

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Red Mountain**Site type:** Prospect**ARDF no.:** HG006**Latitude:** 58.94**Quadrangle:** HG D-6**Longitude:** 161.73**Location description and accuracy:**

This prospect is on the east side of Red Mountain on the ridge between Boulder and Squirrel Creek drainages. The map site is at the approximate center of a large soil geochemistry anomaly at an elevation of about 1,000 feet. It is accurately located.

Commodities:**Main:** Pt**Other:** Au, Cr**Ore minerals:** Chromite, gold, platinum group metal (PGM) alloys**Gangue minerals:****Geologic description:**

Red Mountain is a large, composite ultramafic pluton of Jurassic age (Hoare and Coonrad, 1978). It is dominantly dunite with a thin border zone assemblage of peridotite, clinopyroxenite, and hornblende-bearing rocks (Southwith, 1986; Southwith and Foley, 1986; Alaska Earth Sciences, 2000). This prospect is in dunite between the crest of Red Mountain and the eastern border zone of the pluton. It is defined by a soil-geochemistry anomaly that is 1,700 meters (5,600 feet) long and 700 meters (2,300 feet) wide. Platinum values in this anomaly range from 60 to 3,300 ppb (Alaska Earth Sciences, 2000). Bird and Clark (1976, Table 4, p. 724) reported Red Mountain sample results of up to 1.4 ppm Pt, 0.020 ppm Pd, 0.0300 ppm Rh, and 0.300 ppm Ir. Fechner (1988, p. 43) reported Red Mountain sample results of up to 1.681 ppm Pt, 0.515 ppm Pd, 0.117 ppm Rh, and 0.823 ppm Ir.

Chromite occurs as disseminations and layers in the dunite. Platinum-bearing alloys have been identified as inclusions in chromite (Bird and Clark, 1976) and as separate grains in heavy mineral concentrate from residual materials over dunite (Fechner, 1988). Three samples of heavy-mineral concentrate contained a trace to 0.0011 ounce of PGM per cubic yard and a trace to 0.0002 ounce of gold per cubic yard. Platinum was recovered from concentrates of residual materials over dunite sampled near the crest of Red Mountain by the Goodnews Bay Mining Company in 1965 (Mertie, 1969, p. 84). The platinum-bearing alloy inclusions in chromite comprise 20 percent platinum, 40 percent

iridium, 25 percent iron and lesser amounts of rhodium, nickel, and chromium (Bird and Clark, 1976, p. 724).

Alteration:

Partial to complete serpentinization of the dunite is common. Mertie (1969, p. 79) reports that 25 percent of the Red Mountain dunite is serpentine.

Age of mineralization:

Jurassic, the age of the Red Mountain ultramafic pluton. Hoare and Coonrad (1978) report K/Ar ages for two samples of amphibole from the southeast border of the Red Mountain pluton: 176.4 +/- 5.3 Ma and 186.9 +/- 5.6 Ma.

Deposit model:

Alaskan PGE (Cox and Singer, 1986; model 9)

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

9

Production Status: None**Site Status:** Active**Workings/exploration:**

A surface soil and rock geochemical survey has been completed over a large part of the Red Mountain dunite. An aeromagnetic survey was flown over the Salmon River (Goodnews) area in 1994, a gravity survey has been completed, and some controlled-source audio magneto-telluric lines have been run over selected parts of the ultramafic complex (Alaska Earth Sciences, 2000). A portable washing plant was used for trial placer prospecting of residual material on the crest of Red Mountain in 1965.

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

The Red Mountain dunite is probably the major source of platinum metals in the placer deposits of the Salmon River drainage.

References:

Mertie, 1969; Mertie, 1976; Bird and Clark, 1976; Hoare and Coonrad, 1978; Southwith, 1986; Southworth and Foley, 1986; Fechner, 1988; Alaska Earth Sciences, 2000.

Primary reference: Alaska Earth Sciences, 2000**Reporter(s):** Travis L. Hudson

Last report date: 03/18/01

Site name(s): Red Mountain**Site type:** Prospect**ARDF no.:** HG007**Latitude:** 58.94**Quadrangle:** HG D-6**Longitude:** 161.73**Location description and accuracy:**

This prospect is on the east side of Red Mountain. It is in the border zone of the Red Mountain pluton and extends from near Fox Gulch north to beyond Clara Creek. The map site is at an elevation of about 500 feet, on the divide between Squirrel Creek and Last Chance Creek.

Commodities:**Main:** Pt**Other:****Ore minerals:** Platinum group metal (PGM) alloys**Gangue minerals:****Geologic description:**

The east border zone of the Jurassic Red Mountain ultramafic pluton was prospected by a series of 12 trenches located from near Fox Gulch north to beyond Clara Creek. The trenching was accompanied by surface mapping and sampling (Alaska Earth Sciences, 2000). The Red Mountain ultramafic pluton is mostly dunite, but the eastern border zone includes bands of peridotite, clinopyroxenite, and hornblende-bearing rocks that are zoned outward from dunite in that order. A 1-meter-wide zone assaying 2.26 grams of PGM per ton was identified in the trench near Fox Gulch (T. Hinderman, oral commun., 2000), but in general the exploration results were apparently not encouraging.

Alteration:

Dunite is locally serpentized.

Age of mineralization:

Jurassic, the age of the Red Mountain ultramafic pluton. Hoare and Coonrad (1978) report K/Ar ages for two samples of amphibole from the southeast border of the Red Mountain pluton: 176.4 +/- 5.3 Ma and 186.9 +/- 5.6 Ma.

Deposit model:

Alaskan PGE (Cox and Singer, 1986; model 9)

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

9

Production Status: None

Site Status: Active

Workings/exploration:

This prospect is an area of trenching and surface mapping and sampling. An aeromagnetic survey was flown over the Salmon River area in 1994, a gravity survey has been completed, and some controlled-source audio magneto-telluric lines have been run over selected parts of the ultramafic complex (Alaska Earth Sciences, 2000).

Production notes:

Reserves:

Additional comments:

References:

Alaska Earth Sciences, 2000.

Primary reference: Alaska Earth Sciences, 2000

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Red Mountain**Site type:** Prospect**ARDF no.:** HG008**Latitude:** 58.93**Quadrangle:** HG D-6**Longitude:** 161.77**Location description and accuracy:**

This prospect represents the deeper, subsurface part of the Red Mountain ultramafic pluton. The surface coordinate location (map site) above this prospect is on the southern end of the pluton above and west of the headwaters of Fox Gulch. It is at an elevation of 1,000 to 1,250 feet and very approximately located.

Commodities:**Main:** Pt**Other:****Ore minerals:** Platinum group metal (PGM) alloys**Gangue minerals:****Geologic description:**

This prospect represents the deeper, subsurface part of the Red Mountain ultramafic pluton. This large Jurassic pluton is mostly dunite, but the eastern border zone includes bands of peridotite, clinopyroxenite, and hornblende-bearing rocks that are zoned outward from dunite in that order. Gravity and aeromagnetic surveys over the Red Mountain pluton show that it is thicker and more deeply seated in its southern part (Alaska Earth Sciences, 2000). This relationship has led to the interpretation that the ultramafic magma was emplaced through a deep feeder conduit in this area. A conceptual diagram of this prospect infers a sulfide-rich, PGM-bearing cumulate zone along the footwall of the feeder conduit (Alaska Earth Sciences, 2000).

Alteration:**Age of mineralization:**

Jurassic, the age of the Red Mountain ultramafic pluton. Hoare and Coonrad (1978) report K/Ar ages for two samples of amphibole from the southeast border of the Red Mountain pluton: 176.4 +/- 5.3 Ma and 186.9 +/- 5.6 Ma.

Deposit model:

Alaskan PGE (Cox and Singer, 1986; model 9)

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

9

Production Status: None

Site Status: Active

Workings/exploration:

An aeromagnetic survey was flown over the Salmon River (Goodnews) area in 1994, a gravity survey has been completed, and some controlled-source audio magneto-telluric lines have been run over selected parts of the ultramafic complex (Alaska Earth Sciences, 2000).

Production notes:

Reserves:

Additional comments:

References:

Alaska Earth Sciences, 2000.

Primary reference: Alaska Earth Sciences, 2000

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Red Mountain

Site type: Occurrence

ARDF no.: HG009

Latitude: 58.916

Quadrangle: HG D-6

Longitude: 161.775

Location description and accuracy:

The map site of this occurrence is at an elevation of about 650 feet at the head of the Platinum Creek. It is accurate to within about 1/4 mile. This is locality 9 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:

Main: Pt

Other:

Ore minerals: Platinum group metal (PGM) alloys

Gangue minerals:

Geologic description:

Mertie (1969, p. 81) reported that a small amount of platinum was recovered from residual surface materials near this location. The residual surface material rests on dunite of the composite Red Mountain ultramafic pluton.

Alteration:

Age of mineralization:

Holocene.

Deposit model:

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

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

39b

Production Status: None

Site Status: Active?

Workings/exploration:

No workings are present. Surface samples have been collected at this locality and both gravity and aeromagnetic surveys have been completed over the Red Mountain pluton (Alaska Earth Sciences, 2000).

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

Mertie, 1969; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909); Alaska Earth Sciences, 2000.

Primary reference: Mertie, 1969

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Clara Creek**Site type:** Mine**ARDF no.:** HG010**Latitude:** 58.96**Quadrangle:** HG D-6**Longitude:** 161.71**Location description and accuracy:**

Clara Creek is a west tributary to upper Salmon River. It flows eastward from headwaters on the north end of the Red Mountain ultramafic pluton. The road from Platinum to Goodnews Mining Camp crosses Clara Creek very near its confluence with Salmon River. The map site is at the approximate midpoint of placer mine workings along the creek. This is locality 10 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** PGM**Other:** Au, Cr

Ore minerals: Chromite, gold, hollingsworthite, ilmenite, magnetite, platinum group metal (PGM) alloys, sperrylite

Gangue minerals:**Geologic description:**

Clara Creek, a west tributary to upper Salmon River, flows eastward from headwaters on the north end of the Red Mountain ultramafic pluton. It has been placer mined over about 1.4 miles of its 1.5 mile length. Platinum was discovered and placer mining started in 1928. At least some mining took place every year thereafter to 1940 (Fechner, 1988). A dragline was installed in 1935 and larger scale operations exhausted the 200- to 250-foot wide paystreak by 1940 (Mertie, 1969, p. 77).

Gravels in Clara Creek were 10 to 12 feet thick and except for 2 or 3 feet of vegetation-rich material and the upper 2 or 3 feet of gravel, the remainder of the alluvial section was platinum-bearing and mineable (Mertie, 1940). The gravel is subangular, mostly 3 to 4 inches in diameter, and contains cobbles and erratic boulders to 3 or 4 feet across in upper gravel horizons. Higher platinum grades were concentrated on bedrock, in the gravels within a few feet of bedrock, and up to 3 or 4 feet in deeply weathered and fractured bedrock. Mertie (1940) reported that platinum grades were as high as 0.08 ounce per cubic yard but that they were probably generally lower, perhaps averaging 0.02 ounce of platinum per cubic yard. The platinum in Clara Creek is generally fine grained but nuggets up to 2 ounces in size were recovered. Analysis of platinum-bearing concentrate shows

73.29 percent Pt, 5.90 percent Ir, 0.69 percent Os, 0.42 percent Rh, 0.56 percent Pd, 1.01 percent Au, and 18.00 percent impurities (Mertie, 1940, p. 79). The mean of analyses of 6 Pt-rich samples recalculated free of impurities was 88.61 percent Pt, 6.05 percent Ir, 0.97 percent Os, 0.09 percent Ru, 1.01 percent Rh, 0.40 percent Pd, and 2.87 percent Au (Mertie, 1976). Concentrate from one cleanup contained 6.179 ounces gold, 36.098 ounces Ir, 440.421 ounces Pt, 4.221 ounces Os, 0.795 ounce Ru, and 2.569 ounces Rh (Roehm, 1937). A U. S. Bureau of Mines sample from the unmined upper part of the creek contained 0.034 ounce of PGM per cubic yard; microprobe analysis of this sample showed it to contain 1.6 percent Rh, 0.5 percent Ru, 83 percent Pt, 3.8 percent Ir, 1.0 percent Os, and 8.1 percent Fe (Fechner, 1988, p. 71). Fechner (1988) reported four platinum-bearing phases in this sample: iron-platinum alloy with 8 to 30 percent iron, iron-platinum alloy with minor osmiridium inclusions, hollingsworthite, and sperrylite. The unmined part of upper Clara Creek is estimated to be 900 feet long, 75 feet wide, and 2 feet thick; it contains about 5,000 cubic yards of material having a possible grade of 0.034 ounce of PGM per cubic yard (Fechner, 1988, p. 71).

The bedrock of Clara Creek is mostly sheared and deeply weathered chert, quartzite, tuffaceous rocks, and chlorite schist that, in the upper part of the creek are in contact with ultramafic rocks of the Jurassic Red Mountain pluton (Mertie, 1940; Hoare and Coonrad, 1978). The country rocks are included in a regional sedimentary and volcanic assemblage that ranges in age from Paleozoic to Mesozoic (Hoare and Coonrad, 1978).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: Yes; small

Site Status: Active?

Workings/exploration:

Platinum was discovered and small-scale placer mining started in 1928. At least some mining took place every year thereafter to 1940 (Fechner, 1988). A dragline was installed in 1935 and larger scale operations exhausted the 200- to 250-foot wide paystreak by 1940 (Mertie, 1969, p. 77).

Production notes:

Fechner (1988) estimates that a total of 3,590 ounces of PGM were recovered from about 500,000 cubic yards of alluvial material on Clara Creek.

Reserves:

The unmined part of upper Clara Creek is estimated to be 900 feet long, 75 feet wide, and 2 feet thick; it contains about 5,000 cubic yards of material having a possible grade of 0.034 ounce of PGM per cubic yard (Fechner, 1988, p. 71). There are an estimated 500,000 cubic yards of tailings in Clara Creek that contain 0.0080 ounce of PGM per cubic yard (Fechner, 1988, p. 28).

Additional comments:**References:**

Roehm, 1937; Mertie, 1940; Mertie, 1969; Cobb, 1972 (MF 362); Hoare and Coonrad, 1978; Mertie, 1976; Cobb, 1980 (OF 80-909); Fechner, 1988.

Primary reference: Mertie, 1940

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Dowry Creek**Site type:** Mine**ARDF no.:** HG011**Latitude:** 58.95**Quadrangle:** HG D-6**Longitude:** 161.71**Location description and accuracy:**

Dowry Creek is a west tributary to upper Salmon River. It flows eastward from headwaters on the northeast flank of the Red Mountain ultramafic pluton. The road from Platinum to Goodnews Mining Camp crosses Dowry Creek very near its confluence with Salmon River. The map site is the approximate center of placer mine workings along the creek. This is locality 11 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** PGM**Other:** Au

Ore minerals: Gold, chromite, hollingsworthite, ilmenite, irarsite, iridarsenite, magnetite, osmiridium, osmium, platinum-iron alloys, sperrylite, tulameenite, xingzhongite

Gangue minerals:**Geologic description:**

Dowry Creek, a west tributary to upper Salmon River, flows eastward from headwaters on the northeast flank of the Red Mountain ultramafic pluton. It has been placer mined over about 0.6 miles of its one-mile length, from its confluence with the Salmon River upstream to an elevation of 450 feet. Platinum on Dowry Creek was probably discovered in 1928, the year it was discovered on nearby Clara Creek (HG010). At least some mining occurred in 1935 and a dragline, first installed on Clara Creek in 1935, was probably moved to Dowry Creek and worked the paysteak out by 1941. Bedrock in Dowry Creek is mostly dunite of the Red Mountain ultramafic pluton.

Dowry Creek contained about 5 feet of gravel and about 90,000 cubic yards were placer mined. The mean of 5 analyses of Pt-rich samples from Dowry Creek, recomputed free of impurities, is 87.56% Pt, 7.34% Ir, 1.47% Os, 0.12% Ru, 1.25% Rh, 0.46% Pd, and 1.80% Au (Mertie, 1976). Serpentinized dunite at the head of the creek is overlain by a 120-foot-wide and 2-foot-thick unmined deposit of cobbles, boulders, and clay that contains 0.0215 ounce of PGM and 0.0006 ounce of Au per cubic yard (Fechner, 1988, p. 73). Gold particle fineness measurements were 738 and 828. A sample of 3 feet of bank material at an elevation of 600 feet contained 0.0035 ounce of PGM per cubic yard, and

two samples of placer mine tailings contained 0.0007 and 0.0015 ounce of PGM per cubic yard (Fechner, 1988, p. 73). Microprobe analyses of platinum-rich grains showed 0.8 to 1.5 percent Rh, 0.4 to 0.9 percent Ru, 63.4 to 80.2 percent Pt, 7.2 to 18 percent Ir, 1.2 to 6.8 percent Os, and 6.6 to 7.5 percent Fe. The grains consisted of iron-platinum alloy containing 8 to 30 percent Fe; iron-platinum alloy with minor osmiridium inclusions; and osmiridium, hollingsworthite, osmium, xingzhongite, iridarsenite, irarsite, sperrylite, and tulameenite.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: Yes; small

Site Status: Active?

Workings/exploration:

Platinum on Dowry Creek was probably discovered in 1928, the year it was discovered on nearby Clara Creek (HG010). At least some mining occurred in 1935 and a dragline, first installed on Clara Creek in 1935, was probably moved to Dowry Creek and worked the paysteak out by 1941. It has been placer mined over about 0.6 mile of its one-mile length, from its confluence with the Salmon River upstream to an elevation of 450 feet.

Production notes:**Reserves:**

An unmined alluvial deposit in the upper part of the creek is estimated to contain 7,000 cubic yards of material containing 0.0125 ounce of PGM per cubic yard (Fechner, 1988, p. 74).

Additional comments:**References:**

Cobb, 1972 (MF 362); Mertie, 1976; Cobb, 1980 (OF 80-909); Fechner, 1988.

Primary reference: Fechner, 1988

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Salmon River**Site type:** Mine**ARDF no.:** HG012**Latitude:** 58.91**Quadrangle:** HG D-6**Longitude:** 161.71**Location description and accuracy:**

This placer mine is located in the present valley of Salmon River. Salmon River is the main drainage on the east side of Red Mountain. Its mouth is on Kuskokwim Bay approximately 10 miles south of the community of Platinum. Dredge mining took place from the mouth of Boulder Creek (HG026), a west tributary, south about five miles to within 1 1/4 mile of the mouth of the river. The dredge tailings are a few hundred feet wide and confined to the active drainage. The map site is at the approximate midpoint of the dredge tailings. This mine is included in locality 12 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** Au, PGM**Other:** Cr, diamond, Hg

Ore minerals: Chromite, cinnabar, diamond, gold, ilmenite, iron-platinum alloy with 8 to 30 percent Fe, iron-platinum alloy with minor osmiridium inclusions, magnetite, mercury, osmiridium, sperrylite, tetraferroplatinum

Gangue minerals:**Geologic description:**

This placer mine is located in the present valley of Salmon River. Dredge mining took place from the mouth of Boulder Creek (HG026), a west tributary, south about five miles to within 1 1/4 mile of the mouth of the river. The dredge tailings are commonly few hundred feet wide and confined to the active drainage. The paystreak was 300 to 450 feet wide, except near the mouth of Platinum Creek (HG014) where it was up to 600 feet wide (Mertie, 1969, p. 82). Overburden gravel, sand, and silt deposits vary from 30 to 80 feet thick and do not change systematically in thickness. The gravels are mostly well-rounded pebbles and cobbles up to 2 feet across interbedded with sand and silt; clay is not present. The pay is on an uneven, non-weathered bedrock surface that is locally incised up to 20 feet; in the overlying 2 feet of gravels; and in 2 feet of fractured bedrock. The tenor of the worked paystreak was 0.002 to 0.026 ounce of PGM per cubic yard (Fechner, 1988). PGM grains become smaller southward through the Salmon River valley paystreak, from

0.2 to less than 0.002 inch in diameter. Four samples of tailings from this mine contained up to 0.0037 ounce of PGM per cubic yard (Fechner, 1988, p. 190, 193). PGM grains from Salmon River valley and bench tailings contain 0.6 to 1.1 percent Rh, 0.4 to 0.7 percent Ru, 60.3 to 85.5 percent Pt, 3.8 to 25.6 percent Ir, 1.2 to 6.3 percent Os and 5.9 to 8.9 percent Fe (Fechner, 1988, p. 81). The PGM-bearing phases identified in these samples included iron-platinum alloy containing 8 to 30 percent Fe; iron-platinum alloy with minor osmiridium inclusions; and osmiridium, sperrylite, and tetraferroplatinum (Fechner, 1988, p. 81). Small amounts of cinnabar and traces of native mercury have been identified in dredge concentrates (Mertie, 1976, p. 38). Two small diamonds were identified in the nondissolved residue from 8 PGM granules (Mertie, 1976, p. 17). The Salmon River valley placer is continuous with the placer in Platinum Creek (HG014) and with the placers in some of its other west tributaries. The paystreak apparently ends or becomes uneconomic at the south end of the mine workings. The workings are all below surface elevations of 150 feet and their proximity to the coastline and low elevation suggests that Quaternary sea level changes could have influenced placer development.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: Yes; medium

Site Status: Active

Workings/exploration:

The Salmon River valley paystreak was worked by dredge starting in 1937, and several parallel cuts totaling approximately 15 to 20 miles of workings up to 60 feet deep have been made. Considerable exploration drilling was completed to delineate the paystreak.

Production notes:

A large part of the 650,000 ounces of PGM and 15,600 ounces of Au produced from the Salmon River area was recovered from this placer.

Reserves:

Inasmuch as the recovery efficiency of the dredge operations was about 60 percent, the mine tailings are a low-grade resource. Fechner (1988, p. 27) estimates that over 40 million cubic yards of tailings are present that could contain 0.0013 to 0.017 ounce of PGM per cubic yard.

Additional comments:**References:**

Mertie, 1969; Cobb, 1972 (MF 362); Mertie, 1976; Cobb, 1980 (OF 80-909); Fechner, 1988.

Primary reference: Mertie, 1976

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Squirrel Creek

Site type: Mine

ARDF no.: HG013

Latitude: 58.93

Quadrangle: HG D-6

Longitude: 161.73

Location description and accuracy:

Squirrel Creek is a northern tributary to Platinum Creek on the west side of Salmon River valley. The headwaters of Squirrel Creek are on the southeast flank of Red Mountain. It is included in locality 12 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:

Main: PGM

Other: Au

Ore minerals: Gold, chromite, ilmenite, iron-platinum alloy, magnetite, osmiridium

Gangue minerals:

Geologic description:

The headwaters of Squirrel Creek are on the southeast flank of Red Mountain. About the upper 1/3 of the drainage is in dunite of the Jurassic Red Mountain ultramafic pluton. Bedrock in the lower 2/3 of the creek is sheared argillite, graywacke, and mafic to intermediate, fine-grained igneous rocks that are difficult to identify because of their extensively decomposed character where exposed in mining cuts (Mertie, 1940). These country rocks to the Red Mountain pluton are included in a regional sedimentary and volcanic assemblage that ranges in age from Paleozoic to Mesozoic (Hoare and Coonrad, 1978).

Gravels in Squirrel Creek are commonly 13 feet thick but are locally up to 20 feet thick. In the lower part of the creek the gravels are subrounded to subangular but in the upper creek the cobbles and boulders are more angular; all the alluvial material is locally derived. The gravels are covered by 2 to 3 feet of vegetation-rich materials. The gravels have been mined from the confluence of Squirrel and Platinum Creeks upstream to an elevation of 350 feet, a distance of about 3/4 mile. In the 150- to 500-foot-wide paystreak, platinum is concentrated on bedrock, in the overlying 2 to 3 feet of gravel, and in fractures in bedrock. PGM grades were locally up to 0.1 ounce per cubic yard, but averaged about 0.03 ounce per cubic yard. The recovered platinum-bearing grains are generally coarser than on other nearby creeks and nuggets up to 1.5 ounces have been found (Mertie, 1940). The mean precious metal content of 22 samples (recomputed free of impurities) is 77.21% Pt, 15.68% Ir, 3.92% Os, 0.72% Ru, 1.58% Rh, 0.34% Pd, and 0.55%

Au (Mertie, 1976).

Three samples of Squirrel Creek tailings contained 0.0006 to 0.0033 ounce of PGM per cubic yard. Platinum-bearing grains from these samples contained 0.5 to 1.9 percent Rh, 0.3 to 0.9 percent Ru, 47 to 88.4 percent Pt, 0.7 to 37.4 percent Ir, 0.5 to 9.2 percent Os, and 4.1 to 9.0 percent Fe (Fechner, 1988). Platinum-bearing phases that were identified in these grains included iron-platinum alloy containing 8 to 30 percent Fe; iron-platinum alloy with minor osmiridium inclusions; osmiridium; and osmiridium with subordinate iron-platinum alloy. There are an estimated 50,000 cubic yards of tailings on Squirrel Creek with an average grade of 0.002 ounce of PGM per cubic yard. In the area of the Goodnews Bay Mining Company camp, there are an estimated 37,000 cubic yards of unmined alluvium grading 0.0135 ounce of PGM per cubic yard (Fechner, 1988, p. 81).

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

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

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

39b

Production Status: Yes; small

Site Status: Active?

Workings/exploration:

Platinum was discovered on Squirrel Creek in 1928 and small-scale mining took place intermittently until WWII. Much of the mining was by dragline, which worked the paystreak in four parallel cuts.

Production notes:

About 50,000 yards of alluvial material has been worked on this creek. If this material contained an average of 0.03 ounce of PGM per cubic yard and mining recovered 60 percent, then about 900 ounces of PGM have been produced from Squirrel Creek.

Reserves:

There are an estimated 50,000 cubic yards of tailings on Squirrel Creek with an average grade of 0.002 ounce of PGM per cubic yard. In the area of the Goodnews Bay Mining Company camp, there are an estimated 37,000 cubic yards of unmined alluvium grading 0.0135 ounce PGM per cubic yard (Fechner, 1988, p. 81).

Additional comments:

References:

Mertie, 1940; Cobb, 1972 (MF 362); Mertie, 1976; Hoare and Coonrad, 1978; Cobb, 1980 (OF 80-909); Fechner, 1988.

Primary reference: Mertie, 1940

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Platinum Creek**Site type:** Mine**ARDF no.:** HG014**Latitude:** 58.92**Quadrangle:** HG D-6**Longitude:** 161.73**Location description and accuracy:**

Platinum Creek is a west tributary to Salmon River. The confluence of Platinum Creek and Salmon River is about 4.5 miles upstream of the mouth of Salmon River on Kuskokwim Bay. The map site is at the mouth of Squirrel Creek, at the approximate midpoint of placer mine workings along Platinum Creek. This mine is included in locality 12 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** PGM**Other:** Au, Cr

Ore minerals: Chromite, ehrlichmanite, gold, hollingsworthite, ilmenite, iridarsenite, iridosmine, iridium, iron-platinum alloy with 8 to 30 percent Fe, iron-platinum alloy with minor osmiridium inclusions, kashinite, magnetite, osmiridium, osmiridium with lesser iron-platinum alloy, osmium, prassoite, sulrhodite, sperrylite, tulameenite

Gangue minerals:**Geologic description:**

Platinum Creek flows northeast along the southeast border of the Red Mountain ultramafic pluton; three of its west tributaries, Fox Gulch (HG028), Dry Gulch (HG027), and Squirrel Creek (HG013), have headwaters within the Red Mountain pluton. Bedrock in Platinum Creek is sheared argillite, graywacke, and mafic to intermediate, fine-grained igneous rocks that are difficult to identify because of their extensively decomposed character where exposed in mining cuts (Mertie, 1940). These country rocks to the Red Mountain pluton are included in a regional sedimentary and volcanic assemblage that ranges in age from Paleozoic to Mesozoic (Hoare and Coonrad, 1978).

Platinum was discovered on Fox Gulch in 1927 and placer mining began on Platinum Creek in 1928. It has been placer mined, mostly by dragline operations, over about 1 mile of its length below Fox Gulch. Gravels in Platinum Creek were about 12 feet thick below 2 to 3 feet of vegetation-rich material. The locally derived gravel is mostly rounded to subangular but just downstream from Fox Gulch it is coarser: 8 to 12 inch, subangular, boulders are common, and some are as much as 3 feet across (Mertie, 1940). The

paystreak was commonly 100 to 125 feet wide, but it was wider near the mouths of Fox Gulch and Squirrel Creek and it widened to about 400 feet near the mouth of Platinum Creek. At the mouth of Squirrel Creek there were two paystreaks, one continuing downstream from Squirrel Creek and one continuing downstream from upper Platinum Creek (Mertie, 1976, p. 25). Platinum was concentrated in the lower few feet of gravel, on bedrock, and in fractures in bedrock. One cleanup on Platinum Creek just below the mouth of Fox Gulch yielded 0.02 ounce of PGM per cubic yard. Most of the platinum is fine, the largest nugget recovered by 1937 weighed 1/4 ounce. Some of the platinum is intergrown with chromite. In addition to chromite, the heavy mineral concentrates contain much ilmenite and magnetite. The U. S. Bureau of Mines collected six samples from the present drainage upstream from Dry Gulch that contained a trace to 0.0093 ounce of PGM per cubic yard. A sample from the unmined area above the confluence with Fox Gulch contained 0.0028 ounce of PGM and 0.0006 ounce of Au per cubic yard (Fechner, 1988, p. 80). An estimated 50,000 cubic yards of tailings are present above the mouth of Squirrel Creek; two samples from them contained 0.0028 and 0.0006 ounce of PGM per cubic yard. The mean of 26 analyses of PGMs (recalculated to exclude impurities) from Fox Gulch and Platinum Creek above Squirrel Creek was 63.71% Pt, 28.01% Ir, 5.39% Os, 0.47% Ru, 1.82% Rh, 0.23% Pd, and 0.37% Au. The mean of 38 analyses from lower Platinum Creek valley was 77.03% Pt, 16.76% Ir, 3.62% Os, 0.27% Ru, 1.44% Rh, 0.34% Pd, and 0.84% Au (Mertie, 1976). Microprobe analyses of the PGM-bearing grains in U. S. Bureau of Mines samples showed them to contain 0.8 to 1.6 percent Rh, 0.5 to 1.0 percent Ru, 45.6 to 77.8 percent Pt, 8.1 to 37.8 percent Ir, 3.2 to 13.4 percent Os, and 4.1 to 8.4 percent Fe (Fechner, 1988, p. 80). PGM-bearing phases that were identified in these samples included iron-platinum alloy containing 8 to 30 percent Fe; iron-platinum alloy with minor osmiridium inclusions; osmiridium; osmiridium with subordinate iron-platinum alloy; and hollingsworthite, prassoite, kashinite, sulrhodite, ehrlichmanite, iridosmine, osmium, iridarsenite, iridium, sperrylite, and tulameenite. The gold fineness measured in one sample was 714 (Fechner, 1988, p. 80).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: Yes; small

Site Status: Active?

Workings/exploration:

Platinum was discovered on Fox Gulch in 1927 and placer mining began on Platinum

Creek in 1928. It has been placer mined, mostly by dragline operations, over at least 1.1 miles of its length below Fox Gulch.

Production notes:

If 0.02 ounce of PGM per cubic yard was recovered from 50,000 yards of pay, Platinum Creek above the mouth of Squirrel Creek produced 1,000 ounces of PGM.

Reserves:

There are about 50,000 cubic yards of tailings with an estimated average grade of about 0.0026 ounce of PGM per cubic yard on Platinum Creek above the mouth of Squirrel Creek (Fechner, 1988, p. 81).

Additional comments:**References:**

Mertie, 1940; Cobb, 1972 (MF 362); Mertie, 1976; Hoare and Coonrad, 1978; Cobb, 1980 (OF 80-909); Fechner, 1988.

Primary reference: Fechner, 1988

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Chagvan Bay

Site type: Occurrence

ARDF no.: HG015

Latitude: 58.81

Quadrangle: HG D-6

Longitude: 161.75

Location description and accuracy:

The Chagvan Bay occurrence is 4.5 miles of the modern beach, extending from 1.5 miles south of the mouth of Salmon River to the sand spit at the mouth of Chagvan Bay. The map site is at the approximate midpoint of the 4.5-mile-long of beach. This is locality 13 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:

Main: Cr

Other: Au, Pt

Ore minerals: Chromite

Gangue minerals:

Geologic description:

Berryhill (1963) collected 5 auger samples along this segment of the Kuskokwim Bay beach. Heavy mineral concentrates from these samples contained greater than 10 percent chromite and trace amounts of gold and platinum.

Alteration:

Age of mineralization:

Holocene.

Deposit model:

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

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

39b

Production Status: None

Site Status: Inactive

Workings/exploration:

No workings are present; there was surface sampling in the 1950's and probably at other times (Berryhill, 1963).

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

Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Suzie Mountain**Site type:** Prospect**ARDF no.:** HG016**Latitude:** 58.96**Quadrangle:** HG D-5**Longitude:** 161.65**Location description and accuracy:**

This prospect is on the west ridge of Suzie Mountain and along the west side of Suzie Creek. The map site is on the ridge crest at an elevation of about 900 feet and about 3.5 miles northeast of Goodnews Mining Camp. It is in the NE1/4 of section 20, T 14 S, R 74 W, of the Seward Meridian. The prospect is accurately located. Cobb's locality number 2 (1972 [MF 362]; 1980 [OF 80-909]) appears to be at this location.

Commodities:**Main:** Pt**Other:** Cu**Ore minerals:****Gangue minerals:****Geologic description:**

This prospect is on the west ridge of the Suzie Mountain ultramafic complex, a composite dunite, peridotite, and clinopyroxenite pluton that is inferred to be Jurassic in age (Hoare and Coonrad, 1978; Alaska Earth Sciences, 2000). A geochemical survey in the area of this prospect has defined a 700-meter-long and up to 100-meter-wide soil anomaly that averages 130 ppb Pt; the maximum Pt value in the anomaly is 345 ppb Pt (Alaska Earth Sciences, 2000). The anomaly extends northwest from Suzie Creek across the ridge crest at this locality.

On June 1, 1972, Allen L. Clark (U. S. G. S.) told E. H. Cobb (1972 [MF 362]; 1980 [OF 80-909]) that copper minerals had been found at this locality. In the Salmon River area, traces of chalcopyrite, pyrite, or pyrrohotite are common in surface outcrops of hornblende-bearing rocks in marginal parts of the ultramafic complexes (Alaska Earth Sciences, 2000).

Alteration:**Age of mineralization:**

Jurassic, the inferred age of the ultramafic plutons in the area (Hoare and Coonrad,

1978).

Deposit model:

Alaskan PGE (Cox and Singer, 1986; model 9)

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

9

Production Status: None

Site Status: Active

Workings/exploration:

There has been surface soil and rock sampling at this location (Alaska Earth Sciences, 2000). An aeromagnetic survey was flown over the Salmon River area in 1994, a gravity survey has been completed, and some controlled-source audio magneto-telluric lines have been run over selected parts of the ultramafic complexes (Alaska Earth Sciences, 2000).

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

Cobb, 1972 (MF 362); Hoare and Coonrad, 1978; Cobb, 1980 (OF 80-909); Alaska Earth Sciences, 2000.

Primary reference: Alaska Earth Sciences, 2000

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Unnamed (north tributary to Unaluk River)

Site type: Occurrence

ARDF no.: HG017

Latitude: 58.892

Quadrangle: HG D-5

Longitude: 161.452

Location description and accuracy:

This occurrence is on the south side of an east-west oriented mountain between the Kinignak River and the headwaters of the Unaluk River. It is at an elevation of about 750 feet on the north side of a saddle, in the E1/2 of section 9, T 15 S, R 73 W, of the Seward Meridian. It is probably located to within about 1/3 mile. It is locality 2 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:

Main: Au

Other: Pt

Ore minerals: Gold

Gangue minerals:

Geologic description:

On June 1, 1972, Allen L. Clark (U. S. G. S.) told E. H. Cobb that lode gold had been found at this location (Cobb, 1980, p.33 [OF 80-909]). Cobb (1972 [MF 362]) showed this location to be on the the south side of an east-west oriented mountain between the Kinignak River and the headwaters of the Unaluk River. It is at an elevation of about 750 feet on the north side of a saddle marking the approximate south contact of a mafic pluton and sedimentary rocks (Hoare and Coonrad, 1979). The mafic plutons in the general area are gabbroic rocks that locally contain olivine and show compositional layering. They have yielded Jurassic K/Ar ages that range from 159 to 187 Ma (Hoare and Coonrad, 1978). The country rocks intruded by the pluton are Paleozoic to Mesozoic sedimentary rocks that include limestone near the contact just to the west of this locality. Fechner (1988) mapped and sampled the general area. A pan-concentrate sample from a saddle within the pluton contained 240 ppb Au and 125 ppb Pt; a chert sample from the contact zone at this location contained 70 ppb Au; and three small flakes of gold were recovered from a 0.1-cubic-yard sample of alluvium from a creek draining the east side of the pluton.

Alteration:

Age of mineralization:

If the mineralization is epigenetic, then it is probably Early Jurassic or younger. It can be as old as the nearby pluton, which is correlated with nearby mafic plutons that have been K/Ar dated as Jurassic in age (Hoare and Coonrad, 1978).

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

Production Status: None

Site Status: Inactive

Workings/exploration:

No workings have been reported at this occurrence.

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

Cobb, 1972 (MF 362); Hoare and Coonrad, 1978; Cobb, 1980 (OF 80-909); Fechner, 1988.

Primary reference: Fechner, 1988

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Hagemeister Strait (west of Estus Point)

Site type: Occurrence

ARDF no.: HG018

Latitude: 58.78

Quadrangle: HG D-4

Longitude: 161.27

Location description and accuracy:

This occurrence is on the modern beach at the mouth of the Osviak River on the north side of Hagemeister Strait. It is 3.25 miles west of Estus Point, and coincides with locality 15 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:

Main: Cr

Other:

Ore minerals: Chromite

Gangue minerals:

Geologic description:

A heavy-mineral concentrate from a beach sample contained a trace (less than 1 percent) of chromite (Berryhill, 1963, sample no. 63).

Alteration:

Age of mineralization:

Holocene.

Deposit model:

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

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

39b

Production Status: None

Site Status: Inactive

Workings/exploration:

No workings are present.

Production notes:

Reserves:

Additional comments:

References:

Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Hagemeister Strait (north of Tongue Point)**Site type:** Occurrence**ARDF no.:** HG019**Latitude:** 58.85**Quadrangle:** HG D-3**Longitude:** 160.82**Location description and accuracy:**

This occurrence is on the modern beach along the north shore of Hagemeister Strait. It is 2.5 miles north-northeast of Tongue Point and 4.75 miles east-southeast of the mouth of Matogak River. It is locality 19 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

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

Berryhill (1963) collected beach samples along the north side of Hagemeister Strait and reported flour gold in heavy-mineral concentrate from this locality.

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39a

Production Status: None**Site Status:** Inactive**Workings/exploration:**

No workings are present at this locality, although Berryhill (1963) observed several old hand-dug surface trenches at Tongue Point.

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

Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Togiak Bay**Site type:** Occurrence**ARDF no.:** HG020**Latitude:** 58.87**Quadrangle:** HG D-3**Longitude:** 160.80**Location description and accuracy:**

This occurrence is on the modern beach along the west shore of Togiak Bay, 4 miles north of Tongue Point. It is locality 20 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

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

Maddren (1915, p. 358) reported that one man was recovering gold with a rocker on the Togiak Bay beach during 1914. Berryhill (1963, sample 86) collected beach samples along the west side of Togiak Bay and reported flour gold in heavy-mineral concentrate from this locality. The beach is a thin veneer of sand below a 40-foot-high bluff of glaciofluvial gravels that are considered to be the source of the gold.

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39a

Production Status: None**Site Status:** Inactive

Workings/exploration:

There are no workings at this locality, although Berryhill (1963) noted several old hand-dug trenches at Tongue Point.

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

Maddren, 1915; Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Hagemeister Strait (north of Asigyukpak Spit)

Site type: Occurrence

ARDF no.: HG021

Latitude: 58.73

Quadrangle: HG C-5

Longitude: 161.34

Location description and accuracy:

This occurrence is on the modern beach along the north shore of Hagemeister Strait. It is 5.3 miles north along the beach from the base of Asigyukpak Spit and 1/4 mile west along the beach from the east boundary of the Hagemeister Island C-5 quadrangle. It is locality 14 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:

Main: Cr

Other:

Ore minerals: Chromite

Gangue minerals:

Geologic description:

Berryhill (1963) collected beach samples along the north side of Hagemeister Strait and reported a trace (less than 1 percent) of chromite in heavy-mineral concentrate from this locality.

Alteration:

Age of mineralization:

Holocene.

Deposit model:

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

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

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

No workings are present.

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

Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Hagemeister Strait (Asigyukpak Spit area)**Site type:** Occurrence**ARDF no.:** HG022**Latitude:** 58.65**Quadrangle:** HG C-5**Longitude:** 161.42**Location description and accuracy:**

This occurrence is the 10 miles of modern beach along the north shore of Hagemeister Strait, from the tip of Asigyukpak Spit (in the Hagemeister Island C-4 quadrangle) west to within about 2 miles of Pyrite Point. The map site is on the beach about 1/8 mile south-east of VABM Fifteen; it is approximately sample location 54 of Berryhill (1963). This occurrence is locality 18 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

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

Berryhill (1963) collected 7 samples of beach deposits along this segment of the Hagemeister Strait shoreline; five of these samples contained trace amounts of flour gold in heavy-mineral concentrates. In 1937, gold in workable amounts was reported in some of the beach deposits northwest of Hagemeister Island and in the valley of the Slug River (Smith, 1939, p. 63 [B 910-A]).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

No workings are present.

Production notes:

Reserves:

Additional comments:

References:

Smith, 1939 (B 910-A); Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Hagemeister Strait (west of Pyrite Point)**Site type:** Occurrence**ARDF no.:** HG023**Latitude:** 58.61**Quadrangle:** HG C-5**Longitude:** 161.58**Location description and accuracy:**

This occurrence is on the modern beach on the north shore of Hagemeister Strait, 3/4 mile west-northwest of Pyrite Point. It is sample locality 50 of Berryhill (1963) and locality 17 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

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

Berryhill (1963, sample 50) collected an auger sample of beach sand from this locality that contained a trace amount of flour gold in the heavy-mineral concentrate. In 1937, gold in workable amounts was reported in some of the beach deposits northwest of Hagemeister Island and in the valley of the Slug River (Smith, 1939, p. 63 [B 910-A]).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39a

Production Status: None**Site Status:** Inactive

Workings/exploration:

No workings are present.

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

Smith, 1939 (B 910-A); Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Hagemeister Strait (west of Pyrite Point)**Site type:** Occurrence**ARDF no.:** HG024**Latitude:** 58.60**Quadrangle:** HG C-5**Longitude:** 161.61**Location description and accuracy:**

This occurrence is on the modern beach on the north shore of Hagemeister Strait, 2 miles west of Pyrite Point. It is sample locality 49 of Berryhill (1963) and locality 16 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

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

Berryhill (1963, sample 49) collected an auger sample of beach sand from this locality that contained a trace amount of flour gold in the heavy-mineral concentrate. In 1937, gold in workable amounts was reported in some of the beach deposits northwest of Hagemeister Island and in the valley of the Slug River (Smith, 1939, p. 63 [B 910-A]).

Alteration:**Age of mineralization:**

Holocene.

Deposit model:

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

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

39a

Production Status: None**Site Status:** Inactive

Workings/exploration:

No workings are present.

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

Smith, 1939 (B 910-A); Berryhill, 1963; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909).

Primary reference: Berryhill, 1963

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Security Cove**Site type:** Occurrence**ARDF no.:** HG025**Latitude:** 58.657**Quadrangle:** HG C-6**Longitude:** 161.944**Location description and accuracy:**

Security Cove is on the north side of the peninsula between Kuskokwim Bay and Hagemeister Strait. This occurrence is on the west side of Security Cove, approximately 8 miles east of Cape Newenham and 2 miles north of the summit of Gap Mountain. The location is probably accurate within 0.25 mile. It is locality 3 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** Au**Other:** Pb, Pt**Ore minerals:** Gold, platinum group metal (PGM) alloys, pyrite**Gangue minerals:****Geologic description:**

On 6/1/72, Allen L. Clark (U. S. G. S.) reported to E. H. Cobb that lode gold had been found in this area (Cobb (1972 [MF 362]; 1980 [OF 80-909])). The area is underlain by low-grade metasedimentary and metavolcanic rocks, including schistose calcareous siltstone and limestone, and greenish tuffaceous rocks (Hoare and Coonrad, 1978). These rocks are part of a regional assemblage (Goodnews terrane of Kilburn and others, 1993, and Decker and others, 1994) of sedimentary and volcanic rocks that ranges in age from Devonian to Jurassic. On the peninsula that includes Security Cove, the metasedimentary and metavolcanic rocks are intruded by small, Jurassic (?) ultramafic plutons (Hoare and Coonrad, 1978). Large parts of this peninsula, including areas around Security Cove, are covered by Quaternary gravel deposits.

Fechner (1988) reported stream-sediment, beach-, and rock-sample data for the Security Cove area. The stream sediments contained up to 0.0033 ounce of gold per cubic yard and beach samples contained trace amounts of gold. One third of the gold in the stream sediments was + 20 mesh in size and rough and iron-stained. Three PGM grains were found in one sample. The bedrock outcrops along the west side of Security Cove are metavolcanic and argillaceous rocks cut by 4- to 15-foot-wide shear zones that strike N 45-55 E and dip 60 to 75 degrees south. The shear zones contain abundant pods of pyrite;

one bedrock sample (no. 253, Fechner, 1988) contained 3,460 ppm lead, but gold was below detection limits (5 ppb).

Alteration:

Oxidation and iron-staining is locally present.

Age of mineralization:

The placer occurrences that have been sampled are Holocene. The bedrock mineralization in shear zones that cut the low-grade metasedimentary rocks is probably post-Jurassic, the age of the younger sedimentary rocks in the regional Goodnews terrane (Decker and others, 1994).

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model 39a). Unclassified lodes in shear zones.

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

39a

Production Status: None

Site Status: Inactive

Workings/exploration:

Fechner (1988) reported that minor prospecting pits were locally present in the area.

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

Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909); Fechner, 1988; Kilburn and others, 1992; Decker and others, 1994.

Primary reference: Fechner, 1988

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Boulder Creek**Site type:** Mine**ARDF no.:** HG026**Latitude:** 58.94**Quadrangle:** HG D-6**Longitude:** 161.71**Location description and accuracy:**

Boulder Creek is a west tributary to Salmon River with headwaters on the east side of Red Mountain. The Platinum to Goodnews Bay Mining Camp road crosses Boulder Creek very near its confluence with Salmon River. The map site is about 1/4 mile upstream of the road crossing. This is location 8 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** PGM**Other:** Au**Ore minerals:** Gold, platinum-group metal (PGM) alloys**Gangue minerals:****Geologic description:**

Boulder Creek is one of several creeks that have headwaters on the east side of the Red Mountain ultramafic pluton. It is about 1 mile long and heads against the summit of Red Mountain. Some placer mining of PGMs has taken place on Boulder Creek, probably along its lower part near Salmon River, but little information about this placer has been made public (Mertie, 1976; Cobb, 1980 [OF 80-909]). A Defense Minerals Exploration Administration contract funded drilling of 50 exploration holes in alluvium along the east side of Red Mountain between Last Chance and Dowry Creeks in 1953. The depths of these drill holes ranged from 5 to 51 feet and the PGM content ranged from 0 to 0.0085 ounce of PGM per cubic yard. The highest values in these holes were on Boulder Creek, where the average PGM content of 8 drill holes was 0.0024 ounce per cubic yard (Fechner, 1988, p. 80). Mertie (1976) reports that PGM recovered from Boulder Creek contained (recomputed free of impurities): 77.99 percent Pt, 16.28 percent Ir, 3.41 percent Os, 0.25 percent Ru, 1.31 percent Rh, 0.21 percent Pd, and 0.55 percent Au.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: Yes; small

Site Status: Active?

Workings/exploration:

Some small-scale placer workings are inferred to be present on Boulder Creek, probably along its lower part near Salmon River. A Defense Minerals Exploration Administration contract funded drilling of 50 exploration holes in alluvium along the east side of Red Mountain between Last Chance and Dowry Creeks in 1953. The depths of these drill holes ranged from 5 to 51 feet and the PGM content ranged from 0 to 0.0085 ounce of PGM per cubic yard. The highest values in these holes were on Boulder Creek, where the average PGM content of 8 drill holes was 0.0024 ounce per cubic yard (Fechner, 1988, p. 80).

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

Mertie, 1976; Cobb, 1977 (OF 77-168B); Cobb, 1980 (OF 80-909); Fechner, 1988.

Primary reference: Mertie, 1976

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Dry Gulch**Site type:** Mine**ARDF no.:** HG027**Latitude:** 58.92**Quadrangle:** HG D-6**Longitude:** 161.74**Location description and accuracy:**

Dry Gulch is a small north tributary to Platinum Creek (HG014). Dry Gulch is between Fox Gulch and Squirrel Creek and its confluence with Platinum Creek is about 1 mile upstream of the mouth of Platinum Creek. The map site is at the approximate midpoint of placer tailings in the drainage. It is included in locality 12 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** PGM**Other:** Au**Ore minerals:** Chromite, gold, ilmenite, magnetite, platinum-group metal (PGM) alloys**Gangue minerals:****Geologic description:**

The headwaters of Dry Gulch are in the southeast border zone of the Red Mountain ultramafic pluton, where clinopyroxenite and hornblende-bearing rocks are dominant (Alaska Earth Sciences, 2000). Dry Gulch is only about 1/2 mile long, and placer tailings are present along about 1/4 mile of its lower length. Small-scale mining took place as early as 1927 or 1928, and continued intermittently until 1934, when the Goodnews Bay Mining Company started larger-scale dragline operations in the area (Mertie, 1940; 1976). The placer deposit probably has general characteristics like those on nearby Platinum Creek (HG014) and Fox Gulch (HG028). Locally derived gravels were coarse and bouldery, up to 12 feet thick but thinning upstream; PGMs were concentrated on or near bedrock. Bedrock along the mined part of Dry Gulch is part of an assemblage that includes sheared argillite, graywacke, and mafic to intermediate, fine-grained igneous rocks that are difficult to identify because of their decomposed character where exposed in mining cuts (Mertie, 1940). These rocks are included in a regional sedimentary and volcanic assemblage that ranges in age from Paleozoic to Mesozoic (Hoare and Coonrad, 1978). Platinum in Dry Gulch was probably discovered at about the same time that mining started on Platinum Creek (1928, Mertie, 1940). Dry Gulch was probably worked out by 1941.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: Yes; small

Site Status: Active?

Workings/exploration:

Placer tailings are present along about 1/4 mile of lower Dry Gulch. Small-scale mining took place as early as 1927 or 1928 and continued intermittently until 1934, when the Goodnews Bay Mining Company started larger-scale dragline operations in the area (Mertie, 1940). Dry Gulch was probably worked out by 1941.

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

Mertie, 1940; Cobb, 1972 (MF 362); Mertie, 1976; Hoare and Coonrad, 1978; Cobb, 1980 (OF 80-909); Alaska Earth Sciences, 2000.

Primary reference: Mertie, 1940

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Fox Gulch**Site type:** Mine**ARDF no.:** HG028**Latitude:** 58.92**Quadrangle:** HG D-6**Longitude:** 161.75**Location description and accuracy:**

Fox Gulch is a west headwater tributary to Platinum Creek (HG014). Its confluence with Platinum Creek is about 1 mile upstream of the mouth of Platinum Creek on Salmon River. The map site is at the approximate midpoint of the placer workings. It is included in locality 12 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** PGM**Other:** Au, Cr**Ore minerals:** Chromite, gold, ilmenite, magnetite, platinum-group metal (PGM) alloys**Gangue minerals:****Geologic description:**

Fox Gulch is where platinum was first discovered in the Salmon River area (1926). It has been placer mined for about 0.4 mile upstream from its junction with Platinum Creek. The headwaters of Fox Gulch are in dunite of the Red Mountain ultramafic pluton, and it also flows across border zone clinopyroxenite and hornblende-bearing rocks. In the area of mining, however, the bedrock is part of an assemblage that includes sheared argillite, graywacke, and mafic to intermediate, fine-grained igneous rocks that are difficult to identify because of their decomposed character where exposed in mining cuts (Mertie, 1940). These strata are included in a regional sedimentary and volcanic assemblage that ranges in age from Paleozoic to Mesozoic (Hoare and Coonrad, 1978).

Gravels in lower Fox Gulch are up to 12 feet thick, but they thin upstream. The gravels are coarse, subangular, and locally derived and contain boulders averaging 8 to 12 inches in diameter. The average width of the paystreak was 75 feet and it extended at least 2,600 feet upstream from the mouth of Fox Gulch. Platinum was concentrated in the lower few feet of gravel, on bedrock, and in fractures in bedrock. Chromite is common in the heavy-mineral concentrates and some chromite grains are intergrown with PGM. The U. S. Bureau of Mines collected 4 samples from the present drainage. These samples contained 0.0009 to 0.0378 ounce of PGM per cubic yard (Fechner, 1988, p. 80). The highest grade sample was from unmined material in the upper part of the gulch. One

sample of tailings in Fox Gulch contained 0.0121 ounce of PGM per cubic yard (Fechner, 1988). Microprobe analyses of PGM grains from these samples showed 1.3 to 1.9 percent Rh, 0.7 to 1.0 percent Ru, 37.7 to 48.6 percent Pt, 26.7 to 41.3 percent Ir, 9.8 to 13.4 percent Os, and 4.1 to 8.4 percent Fe. PGM-bearing phases that were identified in these samples included iron-platinum alloy containing 8 to 30 percent Fe; iron-platinum alloy with minor osmiridium inclusions; and hollingsworthite, irarsite, iridarsenite, iridium, sperrylite, and platarsite (Fechner, 1988, p. 80). The mean of 26 analyses of PGMs (recalculated to exclude impurities) recovered during mining from Fox Gulch and Platinum Creek above Squirrel Creek was 63.71% Pt, 28.01% Ir, 5.39% Os, 0.47% Ru, 1.82% Rh, 0.23% Pd, and 0.37% Au. Six samples from Fox Gulch, recalculated free of impurities, averaged 50.56 percent Pt, 39.14 percent Ir, 7.74 percent Os, 0.71 percent Ru, 1.62 percent Rh, 0.14 percent Pd, and 0.09 percent Au (Mertie, 1976). Fechner (1988) estimates that there are 160,000 cubic yards of tailings on Fox Gulch that contain 0.012 ounce of PGM per cubic yard and 20,000 cubic yards of unmined material that contain 0.02 ounce of PGM per cubic yard.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: Yes; small**Site Status:** Active?**Workings/exploration:**

Placer tailings are present along about 1/2 mile of lower Fox Gulch. Small-scale mining took place as early as 1927 and continued intermittently until 1934, when the Goodnews Bay Mining Company started larger-scale dragline operations in the area (Mertie, 1940). The deposit was worked out by WWII. Mining was continuous from Fox Gulch downstream into Platinum Creek.

Production notes:

If 0.02 ounce of PGM per cubic yard were recovered from 160,000 yards of pay, Fox Gulch produced 3,200 ounces of PGM.

Reserves:

Fechner (1988) estimates that there are 160,000 cubic yards of tailings on Fox Gulch that contain 0.012 ounce of PGM per cubic yard and 20,000 cubic yards of unmined material that contain 0.02 ounce of PGM per cubic yard.

Additional comments:**References:**

Mertie, 1940; Cobb, 1972 (MF 362); Mertie, 1976; Hoare and Coonrad, 1978; Cobb, 1980 (OF 80-909); Alaska Earth Sciences, 2000.

Primary reference: Mertie, 1976

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Last Chance Creek**Site type:** Prospect**ARDF no.:** HG029**Latitude:** 58.94**Quadrangle:** HG D-6**Longitude:** 161.71**Location description and accuracy:**

Last Chance Creek is a 0.6-mile-long west tributary to Salmon River. It is between Boulder (HG026) and Squirrel Creek (HG013). It is included in locality 8 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** PGM**Other:****Ore minerals:** Platinum-group metal (PGM) alloys**Gangue minerals:****Geologic description:**

Platinum-bearing alluvium is reported to be present in this creek, but apparently not in mineable grades or volumes (Mertie, 1976). A Defense Minerals Exploration Administration contract funded drilling of 50 exploration holes in alluvium along the east side of Red Mountain between Last Chance and Dowry Creeks in 1953. The depths of these drill holes ranged from 5 to 51 feet and the PGM content ranged from 0 to 0.0085 ounce of PGM per cubic yard (Fechner, 1988). Last Chance Creek flows across Paleozoic or Mesozoic sedimentary and igneous rocks that are intruded by the Jurassic Red Mountain ultramafic pluton (Hoare and Coonrad, 1978). The border zone of this pluton is within a few hundred feet of the upstream limit of the creek.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: None**Site Status:** Active?**Workings/exploration:**

A Defense Minerals Exploration Administration contract funded drilling of 50 exploration holes in alluvium along the east side of Red Mountain between Last Chance and Dowry Creeks in 1953. The depths of these drill holes ranged from 5 to 51 feet and the PGM content ranged from 0 to 0.0085 ounce of PGM per cubic yard (Fechner, 1988, p. 80).

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

Mertie, 1976; Cobb, 1977 (OF 77-168B); Cobb, 1980 (OF 80-909); Fechner, 1988.

Primary reference: Mertie, 1976**Reporter(s):** Travis L. Hudson**Last report date:** 03/18/01

Site name(s): McCann Creek

Site type: Occurrence

ARDF no.: HG030

Latitude: 58.98

Quadrangle: HG D-6

Longitude: 161.71

Location description and accuracy:

McCann Creek is a small stream that flows north from the northern end of Red Mountain to Smalls River. The Platinum to Goodnews Bay Mining Camp road crosses McCann Creek at its confluence with Smalls River, which is 2 miles northeast of the summit of Red Mountain. The map site is at an elevation of about 200 feet on McCann Creek. This occurrence is included in locality 8 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:

Main: PGM

Other:

Ore minerals: Chromite, ilmenite, magnetite, platinum-group metal (PGM) alloys

Gangue minerals:

Geologic description:

Platinum-group metals have been identified in this creek but no workable paystreak has been found. PGM-rich material contains 95.5 percent Pt, 2.8 percent Ir, 1.2 percent Rh, and 0.5 percent Pd (Mertie, 1976). The creek flows across Paleozoic or Mesozoic sedimentary and igneous rocks that are intruded by the Jurassic Red Mountain ultramafic pluton (Hoare and Coonrad, 1978). Dunite of this pluton is within a few hundred feet of the upstream limit of the creek.

Alteration:

Age of mineralization:

Quaternary.

Deposit model:

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

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

39b

Production Status: None**Site Status:** Active?**Workings/exploration:**

Some exploration drill holes have probably been drilled along this creek; no mining has been reported.

Production notes:**Reserves:**

Fechner (1988, p. 28) estimates that there are 500,000 cubic yards of material grading 0.0030 ounce of PGM per cubic yard in McCann Creek.

Additional comments:**References:**

Mertie, 1976; Cobb, 1977 (OF 77-168B); Cobb, 1980 (OF 80-909).

Primary reference: Mertie, 1976**Reporter(s):** Travis L. Hudson**Last report date:** 03/18/01

Site name(s): Smalls River**Site type:** Prospect**ARDF no.:** HG031**Latitude:** 58.99**Quadrangle:** HG D-6**Longitude:** 161.74**Location description and accuracy:**

Smalls River is the main drainage on the north side of Red Mountain. This prospect is about 1.5 miles from Kuskokwim Bay along the Platinum to Goodnews Bay Mining Camp road. The location is an exploration drill hole that was drilled along the north side of the road. The map site is in the SW 1/4 of section 2, T 14 S, R 75 W, of the Seward Meridian. The location is very approximate, probably to within 1.2 mile. This prospect is locality 5 of Cobb (1972 [MF 362]; 1980 [OF 80-909]).

Commodities:**Main:** Pt**Other:****Ore minerals:** Platinum-group metal (PGM) alloys**Gangue minerals:****Geologic description:**

Mertie (1969, p. 81; 1976, p. 5) reports that a 192-foot-deep exploration drill hole at this location intersected platinum- and gold-bearing material but it was apparently only a local concentration. Smalls River is the main drainage on the north side of the Red Mountain ultramafic pluton.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: None

Site Status: Inactive

Workings/exploration:

An exploration hole was drilled 192 feet to bedrock at this location.

Production notes:

Reserves:

Additional comments:

References:

Mertie, 1969; Mertie, 1976; Cobb, 1977 (OF 77-168B); Cobb, 1980 (OF 80-909).

Primary reference: Mertie, 1969

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Salmon River Bench**Site type:** Mine**ARDF no.:** HG032**Latitude:** 58.94**Quadrangle:** HG D-6**Longitude:** 161.70**Location description and accuracy:**

This record describes the Salmon River Bench mine, and the subsurface extension of the deposit as defined by drilling.

The Salmon River Bench mine is along the east side of Salmon River valley. Dredge mining has taken place from opposite the mouth of Dowry Creek at a surface elevation of about 275 feet, south 2 miles to opposite the mouth of Platinum Creek at a surface elevation about 175 feet. The area of dredge tailings is commonly 600 to 700 feet wide. The map site is at the approximate midpoint of the placer tailings. This mine is included in locality 12 of Cobb (1972 [MF 362]; 1980 [OF 80-909]). The subsurface extension of this deposit has been traced southward by drilling for a distance of about 10 miles, to within 3/4 mile of the coast of Kuskokwim Bay.

Commodities:**Main:** Au, PGM**Other:** Cr, diamond, Hg

Ore minerals: Chromite, cinnabar, diamond, gold, iron-platinum alloy with 8 to 30 percent Fe, iron-platinum alloy with minor osmiridium inclusions, mercury, osmiridium, sperrylite, tetraferroplatinum

Gangue minerals:**Geologic description:**

Dredge mining of the Salmon River Bench has taken place from opposite the mouth of Dowry Creek on the north (surface elevation of about 275 feet), south 2 miles to opposite the mouth of Platinum Creek (surface elevation about 175 feet). The area of dredge tailings is commonly 600 to 700 feet wide. The paystreak is on weathered bedrock, in the overlying 10 feet of clay and gravel, and in fractured bedrock. It has been traced by drilling for a distance of about 10 miles, to within 3/4 mile of the coast; it is 600 feet to as much as 1,000 feet wide in places. The bedrock bench does not contain local incisions and has a general dip to the south. As a result, overburden thickness changes from as little as 15 feet at the north end of the paystreak to more than 200 feet within a mile of the mouth of Salmon River. The unconsolidated deposits on this bench are clay and about 20

percent gravel, which forms lenses and streaks as much as 70 feet thick. The gravels contain commonly faceted, subangular to rounded pebbles and cobbles coated with clay; the clay makes recovery of PGM grains difficult (Mertie, 1969, p. 82). Non-siliceous pebbles and cobbles are decomposed. Unlike other unconsolidated deposits in placer mines of the Salmon River area, some layers in the bench overburden are frozen. South of Happy Creek, the upper part of the overburden locally is thick, clean, and little-weathered gravel (Mertie, 1976, p. 32). Five samples of the bench tailings contained PGM contents from below detection to 0.0024 ounce per cubic yard (Fechner, 1988, p. 191-192). PGM grains from Salmon River valley and bench tailings contain 0.6 to 1.1 percent Rh, 0.4 to 0.7 percent Ru, 60.3 to 85.5 percent Pt, 3.8 to 25.6 percent Ir, 1.2 to 6.3 percent Os, and 5.9 to 8.9 percent Fe (Fechner, 1988, p. 81). The PGM-bearing phases identified in these samples included iron-platinum alloy containing 8 to 30 percent Fe; iron-platinum alloy with minor osmiridium inclusions; and osmiridium, sperrylite, and tetraferroplatinum (Fechner, 1988, p. 81). Small amounts of cinnabar and traces of native mercury have been identified in dredge concentrates (Mertie, 1976, p. 38). Two small diamonds were identified in the nondissolved residue from 8 PGM granules (Mertie, 1976, p. 17). This placer is spatially removed from the Red Mountain ultramafic pluton on the west side of Salmon River valley, from which many younger alluvial placers have been derived (eg. HG010, HG011, HG013, HG014, and HG027). Some higher and older bench remnants exist along the east side of Salmon River valley and reworking of these deposits has contributed to the Salmon River bench placer. In general, it appears that the Salmon River bench placer has a long and complicated history. Its proximity to the coastline and low elevation (in places actually below present sealevel), suggests that Quaternary sea level changes could have influenced its development.

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39b

Production Status: Yes; medium

Site Status: Active

Workings/exploration:

Dredge mining, started on Salmon River in 1937, has taken place from opposite the mouth of Dowry Creek to the north (surface elevation of about 275 feet) south 2 miles to opposite the mouth of Platinum Creek (surface elevation about 175 feet). The area of dredge tailings is commonly 600 to 700 feet wide. Drilling has delineated the extensions of the bench placer deposit southward to within 3/4 mile of the mouth of Salmon River on

Kuskokwim Bay. It becomes deeper and apparently uneconomic to the south.

Production notes:

A significant part of the estimated 650,000 ounces of PGM and 15,600 ounces of gold produced from the Salmon River area placers (Cobb, 1980 [OF 80-909]) was recovered from the Salmon River bench placer.

Reserves:

Fechner (1988, p. 81) lists measured and indicated reserve estimates from private company files that total over 63 million cubic yards with grades ranging from 0.0017 to 0.0084 ounce of PGM per cubic yard.

Additional comments:**References:**

Mertie, 1969; Cobb, 1972 (MF 362); Cobb, 1980 (OF 80-909); Fechner, 1988.

Primary reference: Mertie, 1969

Reporter(s): Travis L. Hudson

Last report date: 03/18/01

Site name(s): Slug River**Site type:** Prospect**ARDF no.:** HG033**Latitude:** 58.71**Quadrangle:** HG C-5**Longitude:** 161.64**Location description and accuracy:**

This prospect, or area of prospects, is very approximately located, probably with an accuracy of several miles. Slug River is on Cape Newenham Peninsula and flows southwest to Nanvak Bay. Somewhere along its approximately 16-mile length, some placer gold was recovered in 1937 (Smith, 1939 [B 910-A; B 917-A]). For this record, the map site is in the upper river valley where several headwater tributaries come together. It is in the NE1/4 of section 15, T 17 S, R 75 W, of the Seward Meridan. Cobb (1980 [OF 80-909]) included this location under the name, 'Slug R.'.

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

Somewhere in Slug River valley, a few hundred dollars worth (a few tens of ounces) of placer gold were recovered in 1937 (Smith, 1939 [B 910-A; B 917-A]).

Alteration:**Age of mineralization:**

Quaternary.

Deposit model:

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

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

39a

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Hand mining probably took place in a few places along Slug River gravel bars.

Production notes:

A few hundred dollars worth (a few tens of ounces at the most) of gold were reported to have been recovered (Smith, 1939 [B 910-A; B 917-A]).

Reserves:

Additional comments:

References:

Smith, 1939 (B 910-A); Smith, 1939 (B 917-A); Cobb, 1980 (OF 80-909).

Primary reference: Smith, 1939 (B 910-A)

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