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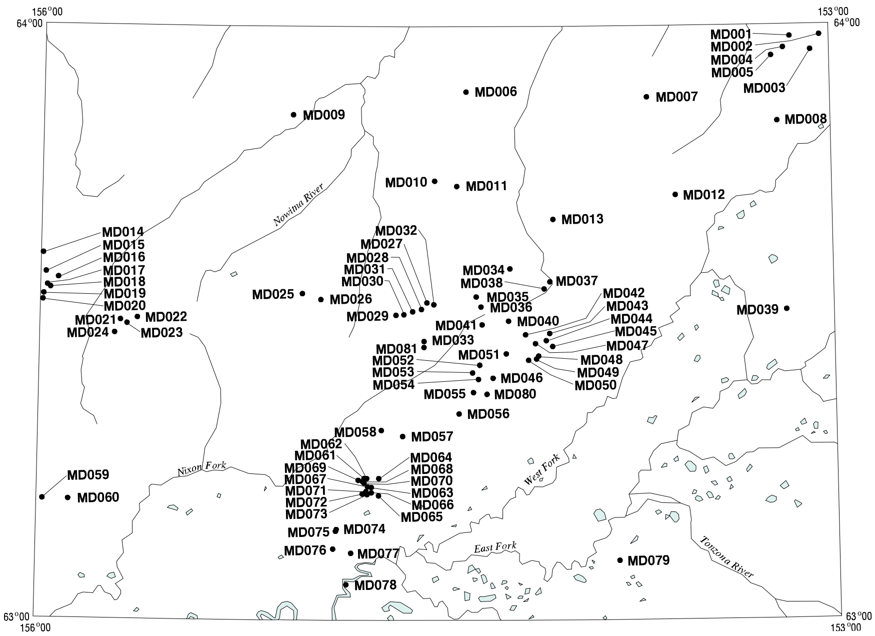
Alaska Resource Data File

Medfra 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 Medfra 1:250,000-scale quadrangle, 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, email 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 99-156

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Fairbanks, Alaska 99701
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Site name(s): Unnamed (in Sischu Creek valley)

Site type: Occurrence

ARDF no.: MD001

Latitude: 63.98 **Quadrangle:** MD D-1

Longitude: 153.15

Location description and accuracy:

Occurence is located in Sischu Creek valley at an approximate elevation of 1,000 feet (304 m) in Section 35, T. 17 S., R. 29 E., of the Kateel River Meridian. Location is imprecise and only known to within a one mile (1.6 km) radius.

Commodities:

Main: Th, U

Other:

Ore minerals:

Gangue minerals:

Geologic description:

Quartz-rhyolite porphyry was found to contain anomalous thorium and uranium. Ore minerals were not identified (Miller and others, 1980; Clautice and others, 1993). Mineralization is inferred to be Early Tertiary, based on isotopic ages from Sischu Volcanic Field (Moll and others, 1980). Miller and others (1980) report up to 16.5 ppm uranium, and 70.4 ppm thorium from grab samples.

Alteration:

Age of mineralization:

Inferred to be Early Tertiary, based on isotopic ages from Sischu Volcanic Field (Moll and others, 1980).

Deposit model:

Volcanogenic Uranium (Cox and Singer, 1986; model no. 25f)

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

25f

Production Status: No

Site Status: Inactive

Workings/exploration:

Miller and others (1980) report up to 16.5 ppm U, and 70.4 ppm Th from grab samples.

Production notes:

Reserves:

None.

Additional comments:

References:

Miller and others, 1980; Clautice and others, 1993.

Primary reference: Miller and others, 1980

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Unnamed

Site type: Occurrence

ARDF no.: MD002

Latitude: 63.982

Quadrangle: MD D-1

Longitude: 153.036

Location description and accuracy:

Occurrence is situated on a broad vegetated ridge at an elevation of 1,850 feet (564 m) in Section 29, T. 17 S., R. 30 E., of the Kateel River Meridian. Location is to within 1,000 feet (304 m).

Commodities:

Main: Th, U

Other: Ce, REE

Ore minerals:

Gangue minerals:

Geologic description:

Miller and others (1980) reported anomalous thorium and uranium from grab samples of porphyritic sanadine-rich rhyolite. Clautice and others (1993) report large sanadine crystals up to 2 cm in diameter, and abundant limonite staining. The occurrence is inferred to be Early Tertiary in age, based on isotopic ages of Sischu Volcanics (Moll and others, 1980).

Miller and others (1980) report values of 24.1 ppm uranium and 117 ppm thorium from grab samples. Clautice and others (1993) report values of 115 ppm thorium, 29 ppm uranium, 230 ppm cerium, and elevated rare-earth-element values.

Alteration:

Limonitic.

Age of mineralization:

Early Tertiary, based on isotopic ages of Sischu Volcanics (Moll and others, 1980).

Deposit model:

Volcanogenic Uranium (Cox and Singer, 1986; model no. 25f)

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

25f

Production Status: No

Site Status: Inactive

Workings/exploration:

Miller and others (1980) report values of 24.1 ppm uranium and 117 ppm thorium from grab samples. Clautice and others (1993) report values of 115 ppm thorium, 29 ppm uranium, 230 ppm cerium, and elevated rare-earth-element values.

Production notes:

Reserves:

None.

Additional comments:

See MD001.

References:

Miller and others, 1980; Clautice and others, 1993.

Primary reference: Clautice and others, 1993

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Unnamed

Site type: Occurrence

ARDF no.: MD003

Latitude: 63.957 **Quadrangle:** MD D-1

Longitude: 153.072

Location description and accuracy:
Occurrence is situated on a broad east-west ridge at an elevation of 1,700 feet (518 m) in Section 6, T. 18 S., R. 30 E., of the Kateel River Meridian. The location is based on descriptions from Clautice and others (1993).

Commodities:

Main: Th, U

Other: REE

Ore minerals:

Gangue minerals:

Geologic description:
Miller and others (1980) reported anomalous thorium and uranium values from the Sischu Volcanics. Clautice and others (1993) report large sanadine crystals in felsic altered volcanic units in this area. The age of the mineral occurrence is inferred to be Early Tertiary, based on isotopic ages of Sischu Volcanics (Moll and others, 1981). Four grab samples collected by Miller and others (1980) contained from 28.0 to 70.3 ppm uranium and from 108 to 127 ppm thorium.

Alteration:

Age of mineralization:
Early Tertiary based isotopic ages from Sischu Volcanics (Moll and others, 1981).

Deposit model:
Volcanogenic Uranium (Cox and Singer, 1986; model no. 25f)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
25f

Production Status: No

Site Status: Inactive

Workings/exploration:

Four grab samples collected by Miller and others (1980) contained from 28.0 to70.3 ppm uranium and from 108 to 127 ppm thorium.

Production notes:

Reserves:

None.

Additional comments:

See MD001 and MD002.

References:

Miller and others, 1980; Clautice and others, 1993.

Primary reference: Miller and others, 1980

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Unnamed

Site type: Occurrence

ARDF no.: MD004

Latitude: 63.961 **Quadrangle:** MD D-1

Longitude: 153.176

Location description and accuracy:

Occurrence is situated on an isolated knob one mile (1.6 km) south of Sischu Creek at an elevation of 2,000 feet (609 m) in Section 3, T. 18 S., R. 29 E., of the Kateel River Meridian. Location is accurate to within 100 feet (30 meters).

Commodities:

Main: Nb, Th, U

Other: Ce, REE, W

Ore minerals:

Gangue minerals:

Geologic description:

Miller and others (1980) reported anomalous thorium and uranium from the Sischu Volcanics. Clautice and others (1993) noted extensive development of smoky quartz and large limonitically stained zones in outcrop. Inferred to be early Tertiary, based on isotopic ages from Sischu Volcanics (Moll and others, 1981).

Miller and others (1980) report values of 25.4 ppm uranium and 68.9 ppm thorium. Clautice and others (1993) reports values from six grab samples ranging from 27.0 to 73.2 ppm thorium 7.3 to 51.5 ppm uranium, 39 to 55 ppm niobium, up to 240 ppm cerium, and elevated tungsten and REE values.

Alteration:

Smoky quartz.

Age of mineralization:

Inferred to be early Tertiary, based on isotopic ages from Sischu Volcanics (Moll and others, 1981).

Deposit model:

Volcanogenic Uranium (Cox and Singer, 1986; model no. 25f)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
25f

Production Status: No

Site Status: Inactive

Workings/exploration:
Miller and others (1980) report values of 25.4 ppm uranium and 68.9 ppm thorium. Clautice reports values from six grab samples ranging from 27.0 to 73.2 ppm thorium, 7.3 to 51.5 ppm uranium, 39 to 55 ppm niobium, up to 240 ppm cerium, and elevated tungsten and REE values.

Production notes:

Reserves:
None.

Additional comments:
See MD001, MD002, and MD003.

References:
Miller and others, 1980; Clautice and others, 1993.

Primary reference: Clautice and others, 1993

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Unnamed

Site type: Occurrence

ARDF no.: MD005

Latitude: 63.948 **Quadrangle:** MD D-1

Longitude: 153.222

Location description and accuracy:

Occurrence is situated on a north-south oriented ridge 2 miles (3.2 km) south of Sischu Creek at an elevation of 1,350 feet (411 m) in Section 9, T. 18 S., R. 29 E., of the Kateel River Meridian. Location is accurate to within 500 feet (152 m).

Commodities:

Main: Th, U

Other: Ce, Rb

Ore minerals:

Gangue minerals:

Geologic description:

Miller and others (1980) report anomalous uranium and thorium levels in slightly porphyritic, fine-grained rhyolite. No ore minerals were identified. Two areas of strongly radioactive rhyolite, each about 4 miles long by 1 to 2 miles wide (6.4 km by 0.8 km) , are separated by 2 miles (3.2 km) of ridgeline. Age is inferred to be early Tertiary, based on isotopic ages of Sischu Volcanics (Moll and others, 1981).

Miller and others (1980) report values of 16.4 ppm uranium and 73.8 ppm thorium from grab samples. Clautice and others (1993) report lower uranium and thorium values than those reported by Moll and others (1981), but up to 900 ppm rubidium, and elevated cerium levels.

Alteration:

Age of mineralization:

Inferred to be early Tertiary, based on isotopic ages of Sischu Volcanics (Moll and others, 1981).

Deposit model:

Volcanogenic Uranium (Cox and Singer, 1986; model no. 25f)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
25f

Production Status: No

Site Status: Inactive

Workings/exploration:
Miller and others (1980) report values of 16.4 ppm uranium and 73.8 ppm thorium from grab samples. Clautice and others (1993) report lower uranium and thorium values than those reported by Miller and others, (1980), but up to 900 ppm rubidium, and elevated cerium levels.

Production notes:

Reserves:
None.

Additional comments:
See MD001-004.

References:
Miller and others, 1980; Moll and others, 1981; Clautice and others, 1993.

Primary reference: Miller and others, 1980

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Our Creek

Site type: Occurrence

ARDF no.: MD006

Latitude: 63.89 **Quadrangle:** MD D-3

Longitude: 154.39

Location description and accuracy:

This placer gold occurrence is located in the valley of Our Creek about 3 miles (5 km) northwest of VABM 'Our Creek', at an elevation of 550 feet (167 m) in Section 28, T. 18 S., R. 23 E., of the Kateel River Meridian. Location is imprecisely known and judged to be within a two mile (3.2 km) radius.

Commodities:

Main: Au

Other: Ag

Ore minerals: Native gold

Gangue minerals:

Geologic description:

The Our Creek placer occurrence was found in the early 20th Century (Brown, 1926). Placer gold was found on bedrock below about 30 feet (9 m) of overburden. No bedrock is exposed in the placer occurrence area.

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: No

Site Status: Inactive

Workings/exploration:
No records of past propspecting or mining activities are available.

Production notes:

Reserves:
None known.

Additional comments:

References:

Brown, 1926.

Primary reference: Brown, 1926

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Browns Fork

Site type: Occurrence

ARDF no.: MD007

Latitude: 63.88 **Quadrangle:** MD D-2

Longitude: 153.7

Location description and accuracy:

This occurrence is situated at the uppermost drainage of Browns Fork at an elevation of 2,000 feet (609 m) in Section 11, T. 19 S., R. 26 E., of the Kateel River Meridian. Location is poorly known and judged to within a two mile (3.2 km) radius.

Commodities:

Main: Cu, Zn

Other:

Ore minerals: Chalcopyrite, sphalerite

Gangue minerals:

Geologic description:

The Browns Fork occurrence(s) is a series of several poorly understood, copper-zinc anomalies in limestone of the Ordovician Novi Mountain formation (Dutro and Patton, 1982). No assay data is available.

Alteration:

Age of mineralization:

Deposit model:

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

Production Status: No

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:
None.

Additional comments:

References:
Dutro and Patton, 1982.

Primary reference: This record

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Dyckman

Site type: Occurrence

ARDF no.: MD008

Latitude: 63.838 **Quadrangle:** MD D-1

Longitude: 153.203

Location description and accuracy:

This occurrence is located near the summit of Dyckman Mountain at an elevation of 1,870 feet (570 m) in Section 16, T. 19 S., R. 29 E., of the Kateel River Meridian. The site is accurately located to within 100 feet (30 m).

Commodities:

Main: As, Mo, Zn

Other: Au

Ore minerals: Arsenopyrite, sphalerite

Gangue minerals: Hematite

Geologic description:

The Dyckman occurrence consists of disseminated arsenopyrite in an intensively altered, rhyolite volcanic (?) breccia. Extensive clay alteration has completely altered all feldspar minerals. The alteration zone was traceable for nearly 500 feet (152 m) along strike. The width of the zone is unknown. The mineral occurrence is inferred to be Cretaceous, based on isotopic age of host rhyolite (Moll and others, 1981). Two grab samples contained 350 ppm zinc and 234 ppm arsenic (Clautice and others, 1993). One sample contained 9 ppb gold (Clautice and others, 1993). DiMarchi and others (1992) report values of 1,630 ppm molybdenum and 574 ppm arsenic from limonitically stained zones in rhyolitic breccia on Dyckman Mountain.

Alteration:

Intensive clay alteration of feldspars; chalcedonic replacements in rhyolitic breccias.

Age of mineralization:

Inferred to be Cretaceous, based on isotopic age of host rhyolite (Moll and others, 1981).

Deposit model:

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

Production Status: No

Site Status: Inactive

Workings/exploration:

Two grab samples contained 350 ppm zinc and 234 ppm arsenic (Clautice and others, 1993). One sample contained 9 ppb gold (Clautice and others, 1993). DiMarchi and others (1992) report values of 1,630 ppm molybdenum and 574 ppm arsenic from limonitically stained zones in rhyolitic breccia on Dyckman Mountain.

Production notes:

Reserves:

None.

Additional comments:

References:

Moll and others, 1981; DiMarchi and others, 1992; Clautice and others, 1993.

Primary reference: Clautice and others, 1993

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Unnamed (east of Sunrise Creek)

Site type: Occurrence

ARDF no.: MD009

Latitude: 63.851 **Quadrangle:** MD D-5

Longitude: 155.049

Location description and accuracy:

Occurrence is situated on a prominent, isolated knob about one half mile (0.8 km) east of Sunrise Creek at an elevation of 1,100 feet (335 m) in Section 12, T. 19 S., R. 19 E., of the Kateel River Meridian.

Commodities:

Main: Hg

Other: Fe

Ore minerals: Cinnabar(?), hematite

Gangue minerals:

Geologic description:

Hematite occurs as dark red and black veinlets and as fine botryoidal masses in cavities in brecciated and hydrothermally altered, porphyritic rhyolite, in part of a unit described as rhyolite domes, tuffs and breccia by Patton and others, 1980). Possible dark, oxidized cinnabar also occurs in the veinlets (Patton and Moll, 1983). Three samples contained 0.95 to 3.70 ppm mercury (Patton and Moll, 1983).

Alteration:

Chalceodonic.

Age of mineralization:

Deposit model:

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

Production Status: No

Site Status: Inactive

Workings/exploration:

Three samples contained 0.95 to 3.70 ppm mercury (Patton and Moll, 1983).

Production notes:

Reserves:

None.

Additional comments:

References:

Patton and others, 1980; King and others, 1980; Patton and Moll, 1983.

Primary reference: King and others, 1980

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Bridge Creek

Site type: Occurrence

ARDF no.: MD010

Latitude: 63.74

Quadrangle: MD C-4

Longitude: 154.51

Location description and accuracy:

This placer gold occurrence is on the eastern-most, second order tributary of Bridge Creek at an elevation of 850 feet (259 m) in Section 23, T. 20 S., R. 22 E., of the Kateel River Meridian. Location is known to within about one-half mile (760 m).

Commodities:

Main: Au

Other: Ag

Ore minerals: Gold

Gangue minerals:

Geologic description:

Placer gold was detected during private and federal AMRAP investigations in a second order tributary of Bridge Creek (Brown, 1926; King and others, 1983). Bedrock is not exposed and gravel thicknesses are unknown.

Anomalous copper, lead, and zinc values were found in samples from Lone Indian Mountain occurrence (MD011) to the east, which drains into Bridge Creek.

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: No

Site Status: Inactive

Workings/exploration:

Anomalous copper, lead, and zinc values were found in samples from Lone Indian Mountain occurrence (MD011) to the east, which drains into Bridge Creek.

Production notes:

Reserves:

None.

Additional comments:

References:

Brown, 1926; King and others, 1983.

Primary reference: King and others, 1983

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Lone Indian Mountain

Site type: Occurrence

ARDF no.: MD011

Latitude: 63.731 **Quadrangle:** MD C-3

Longitude: 154.426

Location description and accuracy:

This occurrence is situated near the summit of Lone Indian Mountain at an elevation of 2,600 feet (792 m) in Section 29, T. 20 S., R. 23 E., of the Kateel River Meridian.

Commodities:

Main: Au

Other: Cu, Pb, Zn

Ore minerals:

Gangue minerals: Quartz

Geologic description:

The Lone Indian Mountain occurrence consists of a ferrigenous quartz-bearing gossan hosted in PreCambrian and Paleozoic schist and marble (DiMarchi and others, 1994). Some quartz-eyed schists in the section are thought to be metavolcanic rocks (Patton and others, 1980). No dimensions of the mineralized zone are given. No ore minerals were recognized. Grab samples of ferricrete gossan collected by DiMarchi and others (1994) contained 803 ppm copper, 148 ppm zinc, and 803 ppm lead. A stream sediment sample collected in Bridge Creek to the west contained 210 ppb gold.

Alteration:

Age of mineralization:

Deposit model:

Polymetallic vein? (Cox and Singer, 1986; model no. 22c)

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

22c

Production Status: No

Site Status: Inactive

Workings/exploration:

Grab samples of ferricrete gossan collected by DiMarchi and others (1994) contained 803 ppm copper, 148 ppm zinc, and 803 ppm lead. A stream sediment sample collected in Bridge Creek to the west contained 210 ppb gold.

Production notes:

Reserves:

None.

Additional comments:

References:

Patton and others, 1980; DiMarchi and others, 1994.

Primary reference: DiMarchi and others, 1994

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Unnamed

Site type: Occurrence

ARDF no.: MD012

Latitude: 63.715 **Quadrangle:** MD C-2

Longitude: 153.595

Location description and accuracy:

Occurrence is situated on a southerly slope of Sischu Mountains at 2,050 feet (625 m) in Section 33, T. 20 S., R. 27 E., of the Kateel River Meridian. Location is known to within 500 feet (152 m).

Commodities:

Main: Zn

Other: Ce, Rb

Ore minerals:

Gangue minerals: Limonite

Geologic description:

This occurrence consists of heavily altered, limonitic rhyolite breccia of Sischu Volcanic Field (Miller and others, 1980; Moll and others, 1981; Clautice and others, 1993). Mineral occurrence is inferred to be Late Cretaceous, based on isotopic age of Sischu Volcanics (Moll and others, 1981). Clautice and others (1993) and Miller and others (1980) report anomalous zinc, rubidium and cerium values from the limonitic breccia zones.

Alteration:

Extensive clay and chalcedonic alteration.

Age of mineralization:

Mineral occurrence is inferred to be Late Cretaceous, based on isotopic age of Sischu Volcanics (Moll and others, 1981).

Deposit model:

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

Production Status: No

Site Status: Inactive

Workings/exploration:

Clautice and others (1993) and Miller and others (1980) report anomalous zinc, rubidium, and cerium values from limonitic breccia zones.

Production notes:

Reserves:

None.

Additional comments:

References:

Miller and others, 1980; Moll and others, 1981; Clautice and others, 1993.

Primary reference: Clautice and others, 1993

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/8/98

Site name(s): Windy Pass

Site type: Prospect

ARDF no.: MD013

Latitude: 63.675 **Quadrangle:** MD C-3

Longitude: 154.061

Location description and accuracy:

The Windy Pass Skarn prospect is situated on a north-facing spur, overlooking a prominent southern tributary of Browns Fork of the Sulukna River at an elevation of 2,280 feet in the southeast corner of Section 17, T. 21 S., R. 25 E., of the Kateel River Meridian. The reporter visited the site in 1992.

Commodities:

Main: Cu, Fe, Mo

Other: Ag, As, Au, Sb, Zn

Ore minerals: Arsenopyrite, chalcopyrite, molybdenite, pyrite

Gangue minerals: Epidote, diopside, garnet, magnetite, phlogophite

Geologic description:

The Windy Pass Cu-Mo-(Au)-Fe skarn prospect is associated with a small, Late Cretaceous, quartz monzonite stock that has intruded Paleozoic limestone probably equivalent to the Novi Mountain Formation (Dutro and Patton, 1982). The main mineralized area is about 200 feet by 3,000 feet (61 m by 914 m) in size. Two types of skarn are identified: (1) zones of sulfides, diopside, plagioclase, and orthoclase in endoskarn; and (2) zones of chalcopyrite, molybdenite, magnetite, phlogophite, garnet, and epidote in exoskarn within the marble front (DiMarchi and others, 1992).

Chalcopyrite is the main ore mineral. Molybdenite is locally abundant. Pyrite locally contains gold values. Copper and molybdenum mainly occur in exoskarn; gold values appear to be in late stage quartz veins. Windy Pass Prospect is inferred to be Late Cretaceous, based on isotopic age dating of the quartz monzonite pluton (Moll and others, 1981).

DiMarchi and others (1992, 1994) reported values as high as 0.27 ounces/ton (8.4 ppm) gold in quartz veins, 0.25 percent copper in exoskarn, and 650 ppm molybdenum in exoskarn. Clautice and others (1993) reported grades as high as 0.61 percent copper, 359 ppm molybdenum, 3,160 ppb gold, 0.23 percent zinc, 0.43 percent arsenic, 236 ppm antimony, and 310 ppm tungsten, mainly exoskarn zones.

Alteration:
Sericite-chlorite in intrusion.

Age of mineralization:
Windy Pass Prospect is inferred to be Late Cretaceous, based on isotopic age of quartz monzonite (Moll and others, 1981).

Deposit model:
Copper skarn deposits (Cox and Singer, 1986; model no. 18b)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b

Production Status: No

Site Status: Inactive

Workings/exploration:
The Windy Pass Cu-Mo-(Au)-Fe skarn prospect was first reported in the literature as a result of AMRAP investigations in the Medfra quadrangle (Patton and ohers, 1980; Patton and Moll, 1983). Work by Central Alaska Gold Company from 1991 to 1994 (DiMarchi and others,1992, 1994) mapped, sampled and conducted ground geophysical surveys of the deposit. No drilling has taken place.
DiMarchi and others (1992, 1994) reported values as high as 0.27 ounces/ton (8.4 ppm) gold (in quartz veins), 0.25 percent copper (in exoskarn), and 650 ppm molybdenum (in exoskarn). Clautice and others (1993) reported grades as high as 0.61 percent copper, 359 ppm molybdenum, 3,160 ppb gold, 0.23 percent zinc, 0.43 percent arsenic, 236 ppm antimony, and 310 ppm tungsten from mainly exoskarn zones.

Production notes:

Reserves:
None reported.

Additional comments:
See Nixon Fork Mine (MD062). The Windy Pass prospect is on land selected or owned by Doyon Ltd. For additional information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska 99701.

References:
Patton and others, 1980; Dutro and Patton, 1982; Patton and Moll, 1983; DiMarchi and others, 1992; DiMarchi and others, 1994; Clautice and others, 1993.

Primary reference: DiMarchi and others, 1992

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/5/98

Site name(s): Colorado Creek

Site type: Mine

ARDF no.: MD014

Latitude: 63.613 **Quadrangle:** MD C-6

Longitude: 155.997

Location description and accuracy:

This placer mine is situated in Colorado Creek basin above the junction of Creston Creek; the center of the placer is at an elevation of 550 feet (167 m) in Section 5, T. 22 S., R. 15 E., of the Kateel River Meridian. The site is accurately located; the reporter worked at the site in 1996.

Commodities:

Main: Ag, Au

Other: Hg, Pd, Sb, U

Ore minerals: Coulsonite, gold, palladium (trace), powellite, samarskite, xanthoconite

Gangue minerals: Garnet, ilmenite, magnetite

Geologic description:

The Colorado Creek gold-polymetallic placer deposit in the Medfra quadrangle is a portion of a 6.5 mile (10.4 km) long auriferous placer paystreak originating in the Cripple Creek Mountains. The payzone in the Medfra C-6 quadrangle comprises about 2.0 miles (3.2 km) or 30 percent of the total commercially exploited deposit. The auriferous gravels in the lower end average about 16 feet (5 m) thick and have an average width of 800 feet (243 m). The east limit of the paystreak gradually turns into an elevated ancestral bench overlain by up to 40 feet (12 m) of mixed eolian and colluvial deposits of Illinoin and Wisconsin age. The overburden contains well preserved Pleistocene megafauna which has been excavated by University of Alaska-Fairbanks Museum personnel (Thorson and Guthrie, 1982).

The gravels in Colorado Creek paystreak contain abnormally high concentrations of boulders up to 3 feet (0.9 m) in diameter derived from the Cripple Creek Mountains. This, coupled with knowledge that the Cripple Creek Mountains were glaciated in Quaternary time, suggests a glaciofluvial outwash origin for the placer deposits (Bundtzen and others, 1997).

Gold in Colorado Creek averages 873 fine with 121 silver. Anomalous mercury (up to 2.02 percent) was detected in some placer gold. An unusual group of rare heavy minerals were identified from mine concentrates, including traces of palladium, the niobium-uranium-yttrium mineral samarskite, the vanadium mineral coulsonite, and the silver sulfosalt xanthoconite (Bundtzen and others, 1987). In addition, an abnormally high concentration of garnet-magnetite-tactie cobbles have been recovered in cleanups, presumably derived from mineralization at the Neirod-East prospect (MD007).

Alteration:

Age of mineralization:

Middle Pleistocene, based on isotopic dates from overburden and geological inference (Bundtzen and others, 1997; Thorson and Guthrie, 1982).

Deposit model:

Placer Au-PGE deposits (Cox and Singer, 1986; model no. 39a)

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

39a

Production Status: Yes; medium

Site Status: Active

Workings/exploration:

Almost all past production has been from surface workings. Prior to 1915, some shafts were driven near the junction of Colorado Creek with Creston Creek. Beginning in 1930, hydraulic mine operations predominated, and from the late 1930s to the present, dragline-bulldozer have predominated. Hydraulic boom-dam methods proved to be very successful in previous years.

From 1946 to 1948, the Goodnews Bay Mining Company conducted an extensive churn drilling program on Colorado Creek in anticipation of proving up a reserve that could be mined by a bucket line dredge. The company terminated the project and judged it was not suitable for a dredge. (John Fullerton, 1998). In recent years, the payzone has averaged about 0.015 ounces gold per cubic yard of pay (Ron Rosander, written communication, 1997).

Production notes:

The first reported gold production from Colorado Creek occurred in 1913, when O. A. Olsen mined from a shaft near Creston Creek on a small scale (Bundtzen and others, 1997). After World War I, production was intermittent until 1928, when Sid Paulsen initiated a hydraulic mining venture. Dragline-bulldozer equipment was introduced in 1937. Mining continued on a small scale during World War II. From 1949 to 1958, Fullerton Brothers Mining Inc. and Strandberg and Sons Mining Inc. conducted large scale dragline-bulldozer operations in two locations on the creek. The Fullertons worked on the lower end mainly in the Medfra quadrangle. Mine activities ceased by 1960s. Beginning in 1974, Rosander Mining Company acquired most of the claims in the Colorado Creek basin and initiated medium scale dragline-bulldozer operations, which continues to the present day.

Based on researching past mining records, Bundtzen and others (1997) estimate that approximately 110,000 ounces (3,421 kg) of gold and 12,500 ounces (388 kg) of silver were produced in Colorado Creek from 1913 to 1997. About 30 percent of this total came from the portion of the deposit within the Medfra C-6 quadrangle.

Reserves:

Additional comments:

See Neirod-East (MD020), Montana Saddle (MD018), and Montana Creek (MD015) prospects.

References:

Mertie, 1936; Patton and others, 1980; Thorson and Guthrie, 1982; Bundtzen and others, 1997.

Primary reference: Bundtzen and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/4/98

Site name(s): Montana Creek

Site type: Prospect

ARDF no.: MD015

Latitude: 63.583 **Quadrangle:** MD C-6

Longitude: 155.98

Location description and accuracy:

The Montana placer prospect is located on about 2 miles (3.2 km) of Montana Creek, a tributary of Colorado Creek, from an elevation of 1,400 feet (427 m) to about 1,000 feet (304 m), in Section 21, T. 22 S., R. 15 E., of the Kateel River Meridian. The reporter visited the site in 1996.

Commodities:

Main: Ag, Au

Other: Sn, Ti, Zr

Ore minerals: Placer gold

Gangue minerals: Cassiterite, ilmenite, zircon

Geologic description:

The Montana placer prospect consists of a left-limit bench on Montana Creek over a distance of about 2 miles (3.2 km). Overburden ranges from 20 to 40 feet (6 m to 12 m) thick, and auriferous gravels average about 10 feet (3 m) thick. Reconnaissance drilling suggests that most values are on bedrock. The auriferous gravels are overlain by Quaternary eolian and colluvial deposits (Thorson and Guthrie, 1982). The Montana Creek Placer deposit is inferred to be Pleistocene, based on isotopically dated Quaternary units in Colorado Creek (Thorson and Guthrie, 1982).

Alteration:

Age of mineralization:

The Montana Creek Placer deposit is inferred to be Pleistocene, based on isotopically dated Quaternary units in Colorado Creek (Thorson and Guthrie, 1982).

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: Undetermined.

Site Status: Active

Workings/exploration:

The prospect was first mentioned by Mertie (1936). According to Steve Neirod and Ron Rosander (oral commun., 1982), a reconnaissance churn drilling program in the 1950s conducted by Strandberg and Sons Mines Inc. encountered a low grade gold-bearing paystreak of unknown extent.

Production notes:

No production records have been found. In 1996 and 1997, a small exploration camp was being assembled at Colorado Creek for a placer drilling program on Montana Creek.

Reserves:

None.

Additional comments:

See Colorado Creek (MD014).

References:

Mertie, 1936; Patton and others, 1980; Thorson and Guthrie, 1982; Bundtzen and others, 1997.

Primary reference: Bundtzen and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Wyoming Lode

Site type: Prospect

ARDF no.: MD016

Latitude: 63.574 **Quadrangle:** MD C-6

Longitude: 155.933

Location description and accuracy:

The Wyoming prospect is situated on a steep, north-facing spur overlooking the East Fork of Montana Creek and the Main Fork of Wyoming Creek at an elevation of 2,400 feet (731 m) in Section 22, T. 22 S., R. 15 E., of the Kateel River Meridian. The reporter investigated the prospect in 1996.

Commodities:

Main: Au, Sb

Other: As, Hg(?)

Ore minerals: Arsenopyrite, cinnabar(?), gold, stibnite

Gangue minerals: Quartz

Geologic description:

The Wyoming Lode consists of three distinct quartz-sulfide-sulfosalt veins that strike North 65 degrees east and dip steeply to vertical. The vein swarm can be traced for about 450 feet (137 m) along the strike and have a collective width of about 200 feet (61 m). The southern-most and highest vein consists of disseminated stibnite and arsenopyrite in a quartz vein that ranges from 1 foot to 3 feet (0.3 to 0.9 m) thick. The northern-most veins, which range from 2 to 5 feet (0.6 to 1.5 m) thick, contain massive to disseminated pods of very coarse-grained, interlocking stibnite blades and euhedral quartz crystals to 9 inches (23 cm) long and uncommon arsenopyrite. Distinctly reddish kermesite, an oxidation product of stibnite, frequently covers the stibnite blades. The textural habitat of the Wyoming and Moose Jaw lode (MD019) 2 miles (3.2 km) to the southwest are quite similar, which suggests both lodes might be related (Bundtzen and others, 1997). Mertie (1936) described the Wyoming lode as a cinnabar-stibnite deposit. However, Bundtzen and others (1997) searched for but could not identify cinnabar in the vein system.

All mineralized veins at the Wyoming Lode cut hornfels adjacent to the Cripple Creek Mountains pluton, about 0.5 miles (0.8 km) from the sediment-intrusive contact. The Wyoming Lode is inferred to be Late Cretaceous based on the 71.2 Ma isotopic age of the adjacent pluton (Bundtzen and others, 1997).

Five chip-channel samples taken across three of the mineralized veins by Bundtzen and others (1997) contained up to 652 ppb gold, 2,830 ppm arsenic, and 45.7 percent antimony, but no detectable mercury.

Alteration:

Stibnite oxidized to kermesite.

Age of mineralization:

The Wyoming Lode is inferred to be Late Cretaceous based on the 71.2 Ma isotopic age of the adjacent pluton (Bundtzen and others, 1997).

Deposit model:

Simple stibnite deposits (Cox and Singer, 1986; model no. 27d)

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

27d

Production Status: No

Site Status: Inactive

Workings/exploration:

Surface pits and trenches have been excavated to explore the deposit. Five chip-channel samples collected by Bundtzen and others (1997) contain up to 652 ppb gold, 2,830 ppm arsenic, and 45.7 percent antimony. None of the samples contained detectable mercury.

Production notes:

Very coarse stibnite blades have possible mineral speciman quality potential.

Reserves:

None.

Additional comments:

See Moose Jaw Lode (MD019).

References:

Mertie, 1936; Patton and others, 1980; Bundtzen and others, 1997.

Primary reference: Bundtzen and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/4/98

Site name(s): Colorado Gossan

Site type: Occurrence

ARDF no.: MD017

Latitude: 63.561 **Quadrangle:** MD C-6

Longitude: 155.974

Location description and accuracy:

The Colorado Gossan occurrence is located on a south-facing slope overlooking the broad saddle that contains the Montana Saddle prospect (MD018). The occurrence is at an elevation of 1,870 feet (570 m) in Section 28, T. 22 S., R. 15 E., of the Kateel River Meridian. The occurrence is precisely located as the reporter visited the site in 1996.

Commodities:

Main: Au

Other: As, Hg, Sb

Ore minerals: Arsenopyrite

Gangue minerals: Ferricrete, tourmaline

Geologic description:

The Colorado Gossan is a rectangular shaped, 1,500 feet by 950 feet (457 m by 290 m) zone of iron rich ferricrete-tourmaline flooding in hornfels adjacent to the Cripple Creek Mountains pluton. Most of the zone is rubble crop with only a few outcrops observed. Disseminated arsenopyrite grains were seen in selected hand specimens but most samples are extensively oxidized. The gossan area is approximately 2,500 feet (762 m) away from the contact between the hornfels and plutonic phases of the Cripple Creek Mountains stock. The Colorado Gossan prospect is inferred to be Late Cretaceous based on 71.0 Ma age of adjacent plutonic rocks (Moll and others, 1981).

Three large, continuous, chip-channel samples taken across 700 feet (213 m) of the long axis of the zone averaged 1,815 ppm arsenic, 80 ppb gold, 3,540 ppb mercury, and 154 ppm antimony (Bundtzen and others, 1997).

Alteration:

Extensive oxidation of original sulfide mineralization.

Age of mineralization:

The Colorado Gossan prospect is inferred to be Late Cretaceous based on 71.0 Ma age of adjacent plutonic rocks (Moll and others, 1981).

Deposit model:
Polymetallic replacement deposit (Cox and Singer, 1986; model no. 19a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
19a

Production Status: No

Site Status: Inactive

Workings/exploration:
No previous surface working were detected in 1996. Three large, continuous, chip-channel samples taken across 700 feet (213 m) of the long axis of the zone averaged 1,815 ppm arsenic, 80 ppb gold, 3,540 ppb mercury, and 154 ppm antimony (Bundtzen and others, 1997).

Production notes:

Reserves:
None.

Additional comments:
Similar morphological features at Won-North prospect (MD021) and Win prospect (MD060).

References:
Mertie, 1936; Patton and others, 1980; Bundtzen and others, 1997.

Primary reference: Bundtzen and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Montana Saddle

Site type: Prospect

ARDF no.: MD018

Latitude: 63.557

Quadrangle: MD C-6

Longitude: 155.962

Location description and accuracy:

The Montana Saddle prospect is located in a broad saddle separating the Montana Creek and Colorado Creek drainage basins in the northern part of the Cripple Creek Mountains at an elevation of 1,900 feet (579 m) in Section 27, T. 22 S., R. 15 E., of the Kateel River Meridian. Location is precisely known; the reporter visited the prospect in 1996.

Commodities:

Main: Au

Other: As, Hg, Sb

Ore minerals: Arsenopyrite, trace chalcopyrite

Gangue minerals: Feldspar, quartz

Geologic description:

The Montana Saddle prospect consists of an en echelon series of cox-comb quartz-arsenopyrite-chalcopyrite and quartz-feldspar veinlets ranging from 1 to 5 inches (2.5 to 13 cm) thick in a hornblende granite phase of the Cripple Creek Mountains stock. The vein spacing, which varies from 6 inches to 3 feet (15 cm to 0.9 m), trends in a consistent north 60 degrees east for a traceable strike distance of at least 450 feet (137 m) and for a width of at least 275 feet (84 m), before disappearing under tundra in all directions.

The Montana Saddle prospect is aligned along a north 40 degrees east trending fault mapped by Bundtzen and others (1997), which apparently controls the distribution of other metallic prospects--including the Wyoming (MD016), Neirod-East (MD020), and Moose Jaw (MD019) lodes. The coarse grained, hypidiomorphic, hornblende granite contains about 10 percent olive green hornblende, and contrasts with the biotite pyroxene monzonite phase, which is more typical of the Cripple Creek Mountains stock. Age of mineralization is inferred to be Late Cretaceous based on a 71.0 Ma age for the adjacent Cripple Creek Mountains pluton (Bundtzen and others, 1997).

Five chip-channel samples that aggregate about 45 feet (14 m) of vein width yielded an average assay of 465 ppb gold, 968 ppm arsenic, and 1,995 ppb mercury (Bundtzen and others,1997). One sample contained 590 ppm antimony; however, the remaining samples contained only trace amounts of antimony.

Alteration:

Ankerite alteration near quartz-sulide vein swarms.

Age of mineralization:

A Late Cretaceous age is inferred based on a 71.0 Ma age for the adjacent Cripple Creek Mountains pluton (Bundtzen and others, 1997).

Deposit model:

Porphyry Cu-Au (Cox and Singer, 1986; model no. 20c)

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

20c

Production Status: No

Site Status: Active

Workings/exploration:

The prospect area has been cut by four trenches of two distinct ages. One trench system is nearly completely overgrown with vegetation, whereas good rock exposures are still preserved in the two younger excavations. Five chip-channel samples of that aggregate about 45 feet (14 m) of vein width yielded an average assay of 465 ppb gold, 968 ppm arsenic, and 1,995 ppb mercury (Bundtzen and others,1997). One sample contained 590 ppm antimony; however, the remaining samples contained only trace amounts. Placer Dome U.S., Inc. and Novagold Inc. sampled and trenched the prospect in 1997 and 1998 respectively.

Production notes:

Reserves:

None.

Additional comments:

See Wyoming Lode (MD016), Neirod East (MD020), and Moose Jaw (MD019) prospects.

References:

Patton and others, 1980; Bundtzen and others, 1997.

Primary reference: Bundtzen and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Moose Jaw

Site type: Prospect

ARDF no.: MD019

Latitude: 63.546 **Quadrangle:** MD C-6

Longitude: 155.994

Location description and accuracy:

The Moose Jaw prospect is located in the apex of a north-facing, steep spur of the Cripple Creek Mountains at an elevation of 2,050 feet (625 m) in Section 32, T. 22 S., R. 15 E., of the Kateel River Meridian. Location is precisely known; reporter visited the site in 1996.

Commodities:

Main: Au, Sb

Other: As, Hg

Ore minerals: Stibnite

Gangue minerals: Quartz

Geologic description:

The Moose Jaw deposit is a quartz-stibnite vein deposit that cuts the hornfels aurole of the Cripple Creek Mountains Pluton near the head of Colorado Creek drainage. The deposit is conspicuously marked by a slight break or notch in a steep scree slope of hornfels outcrops and rubble. The quartz-stibnite vein trends north 55 degrees east for a distance of at least 700 feet (213 m); talus buries the vein on both ends. Where exposed, the vein varies from 1.5 to 4.0 feet (0.45 to 1.20 m) in width.

Very coarse stibnite blades up to 12 inches (30 cm) long form clusters and rosettes throughout the vein structure. Massive, finer grained stibnite makes up about 20 percent of the Moose Jaw vein, whereas disseminated stibnite zones characterize about 30 percent of the vein. About 50 percent of the vein consists of mixtures of massive to coarse, bladed stibnite and euhedral quartz crystals, disseminated quartz, and stockwork style zones in hornfels. Age of mineralization is inferred to be Late Cretaceous based on 71.0 Ma age of adjacent pluton (Bundtzen and others, 1997). Pits have been dug along about 400 feet (122 m) of strike of the vein; however, the first published descriptions are from Bundtzen and other (1997). Four chip-channel samples along about 600 feet (182 m) of the Moose Jaw prospect contained 31 to 1,675 ppb gold, 0.20 to 44.90 percent antimony, 40 to 50 ppm mercury, and 580 to 14,600 ppm arsenic.

Alteration:
Stibnite locally altered to stibiconite.

Age of mineralization:
Late Cretaceous (inferred) based on 71.0 Ma age of adjacent pluton (Bundtzen and others, 1997).

Deposit model:
Simple stibnite deposit (Cox and Singer, 1986; model no. 27d)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
27d

Production Status: No

Site Status: Inactive

Workings/exploration:
In previous years, pits were dug along about 400 feet (122 m) of strike of the vein; however, the first published descriptions are from Bundtzen and other (1997). Four chip-channel samples along about 600 feet (182 m) of the Moose Jaw prospect contained 31-to-1,675 ppb gold, 0.20-to-44.90 percent antimony, 40 to 50 ppm mercury, and 580 to 14,600 ppm arsenic.

Production notes:
Large and impressive stibnite crystals and blades that are very abundant throughout vein structure might have mineral specimen potential.

Reserves:
None.

Additional comments:
See Wyoming Lode (MD016) in Medfra C-6 quadrangle.

References:
Patton and others, 1980; Bundtzen and others, 1997.

Primary reference: Bundtzen and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Neirod - East

Site type: Prospect

ARDF no.: MD020

Latitude: 63.536

Quadrangle: MD C-6

Longitude: 155.995

Location description and accuracy:

The Neirod-East prospect lies along a steep westerly slope of the Cripple Creek Mountains at an elevation of 2,350 feet (716 m) in Section 33, T. 22 S., R. 16 E., of the Kateel River Meridian. The reporter investigated the site in 1996.

Commodities:

Main: Au

Other: As, Cu, Hg, Pb, Sb, Zn

Ore minerals: Arsenopyrite, boulangerite, jamesonite, pyrite, zinkenite

Gangue minerals: Ferricrete breccia, quartz, tourmaline

Geologic description:

An extensive altered zone in border phase plutonic rocks and hornfels extends in a north-south direction for a distance of about 1,968 feet (600 m). The mineralization consists of : (1) ferricrete breccia in the border phase of the Cripple Creek Mountains pluton; (2) stockwork veins in hornfels; and (3) quartz stockwork in fine grained monzonite. The Neirod-East prospect falls within a north 40 degrees east alignment of several metallic lodes--including the Moose Jaw (MD019), Montana Saddle (MD018), and Wyoming Lode (MD016) prospects. Age of mineralization is inferred to be Late Cretaceous based on 71.0 Ma age of adjacent pluton (Bundtzen and others, 1997).

Microprobe analyses of mineralization from the Neirod-East prospect indicates the presence of boulangerite, jamesonite, and zinkenite in addition to the megascopic arsenopyrite observed in hand specimens. Gold is intimately intergrown with jamesonite - an uncommon association (Bart Cannon, written communication, 1998). Five chip channel samples collected along about 1,640 feet (500 m) strike of the zone contained up to 760 ppb gold, 1.00 percent arsenic, 5,360 ppb mercury, and 178 ppm copper (Bundtzen and others, 1997).

Alteration:

Extensive sericitization of plutonic rocks; late tourmaline metasomatism.

Age of mineralization:
Late Cretaceous (inferred) based on 71.0 Ma age of adjacent pluton (Bundtzen and others, 1997).

Deposit model:
Porphyry Cu-Au (Cox and Singer, 1986; model no. 20c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
20c

Production Status: No

Site Status: Active

Workings/exploration:
Five chip channel samples collected along about 1,640 feet (500 m) strike of the zone contained up to 760 ppb gold, 1.00 percent arsenic, 5,360 ppb mercury, and 178 ppm copper (Bundtzen and others, 1997).

Production notes:

Reserves:
None.

Additional comments:
See Montana Saddle prospect (MD018).

References:
Patton and others, 1980; Bundtzen and others, 1997.

Primary reference: Bundtzen and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Won - North; Stockwork Zone; Standoff Ridge

Site type: Prospect

ARDF no.: MD021

Latitude: 63.504

Quadrangle: MD C-6

Longitude: 155.696

Location description and accuracy:

The Won - North prospect is situated on a north-facing slope near the summit of a north-south trending ridgeline at an elevation of 2,300 feet (701 m) in Section 12, T. 23 S., R. 16 E., of the Kateel River Meridian. Mineralization in the Standoff Ridge Zone of the Won - North prospect is about 2.1 miles (3.4 km) North of the Won - South prospect (MD024). Location is accurate; the reporter visited the site in 1984.

Commodities:

Main: Ag, Sn

Other: As, Cu, Pb, Sb, Zn

Ore minerals: Arsenopyrite, cassiterite, chalcopyrite, sphalerite, tetrahedrite

Gangue minerals: Axinite, quartz, tourmaline

Geologic description:

The Won - North prospect is the northern-most group of silver-tin prospects that have been referred to by Burleigh (1992; BMOF 85-92) as the 'Won' deposit. Mineralization occurs as moderately dipping breccia vein structures in thermally altered rocks of the Upper Cretaceous Kuskokwim Group. The Stockwork zone consists of stockwork quartz veining and crosscutting tourmaline breccias that can be traced on the surface for about 1,000 feet (300 m) by 250 feet (76 m). Small 0.5 to 2 inch (1.2 to 5.0 cm) thick quartz veinlets occur often, with a density of 30 per foot (0.3 m). The Standoff Ridge Zone is a series of four or more north 25 degrees west -trending vein structures that can be traced for about 1,500 feet (457 m).

Arsenopyrite and cassiterite are the dominant ore minerals found in the various zones. Age of mineralization is inferred to be Late Cretaceous-Early Tertiary, based on ages of nearby plutonic rocks (Bundtzen and Miller, 1997). Anaconda Mineral Company drilled the property in 1984 and encountered up to 0.14 percent tin and 4.6 ounces/ton silver over narrow, sheeted veins up to six feet (1.8 m) wide.

Alteration:

Axinite and sericite.

Age of mineralization:

Late Cretaceous-early Tertiary, inferred based on ages of nearby plutonic rocks (Bundtzen and Miller, 1997).

Deposit model:

Tin-polymetallic (Cox and singer, 1986; model no. 20b)

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

20b

Production Status: No

Site Status: Active

Workings/exploration:

The U.S. Geological Survey AMRAP program of the Medfra quadrangle (King and others, 1980, 1983; Patton and others, 1980) reported anomalous values of arsenic, bismuth, tin, silver, tungsten, and lead in stream sediment and pan concentrate samples from streams draining the project area. Duval Corporation and Anaconda Minerals Company followed up on these anomalies and found the Won-North prospect. In 1984, Anaconda Minerals company drilled the Standoff Ridge zone, and encountered up to 0.14 percent tin and 4.6 ounces/ton silver over narrow, sheeted veins up to 6 feet (1.8 m) wide. Online Exploration Services Inc., Anchorage, Alaska, has continued exploration at the Won-North prospect in recent years.

Production notes:

Reserves:

No reserves were calculated from the drill program.

Additional comments:

See Won - South (MD024) and Gemini (MD023) prospects.

References:

Patton and others, 1980; Burleigh, 1992 (BMOFR 85-92); Bundtzen and Miller, 1997.

Primary reference: Burleigh, 1992 (BMOFR 85-92)

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Unnamed

Site type: Occurrence

ARDF no.: MD022

Latitude: 63.508

Quadrangle: MD C-6

Longitude: 155.632

Location description and accuracy:

Occurrence is situated on a northeast-facing spur of an isolated range of hills at an elevation of 2,000 feet (609 m) in Section 8, T. 23 S., R. 17 E., of the Kateel River Meridian. Location is estimated to be within about 500 feet (152 m).

Commodities:

Main: Ag, Pb

Other: Sb, Zn

Ore minerals: Galena

Gangue minerals: Quartz

Geologic description:

Quartz -galena vein cuts sheared argillite and hornfels (Patton and Moll, 1983). Surface samples contain values of 100 ppm Ag, more than 2 percent Pb, 700 ppm Sb, and 300 ppm Zn (Patton and Moll, 1983).

Alteration:

Age of mineralization:

Deposit model:

Polymetallic Vein (Cox and Singer, 1986; model no. 22c)

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

22c

Production Status: No

Site Status: Inactive

Workings/exploration:

The occurrence was first reported by U.S. Geological Survey personnel during an AMRAP investigation of the Medfra quadrangle (Patton and others, 1980). Surface samples contain 100 ppm Ag, more than 2 percent Pb, 700 ppm Sb, and 300 ppm Zn (Patton and Moll, 1983).

Production notes:

Reserves:
None.

Additional comments:
See Won - North (MD021), Win (MD060), Gemini (MD023) and Won - South (MD024) prospects.

References:
Patton and others, 1980; King and others, 1980; Patton and Moll, 1983.

Primary reference: Patton and Moll, 1983

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Gemini; South Vein

Site type: Prospect

ARDF no.: MD023

Latitude: 63.498 **Quadrangle:** MD B-6

Longitude: 155.671

Location description and accuracy:

The Gemini (South Vein) prospect, which is considered a part of the larger 'Won' mineralized system, is situated near the top of a north-south trending ridgeline at an elevation of 2,500 feet (762 m) in Section 18, T. 23 S., R. 17 E., of the Kateel River Meridian. The Gemini prospect is approximately 1.5 miles (2.4 km) northeast of the Won-South prospect. (MD024).

Commodities:

Main: Ag, Sn

Other: As, Cu, Fe, Pb, Sb, W, Zn

Ore minerals: Arsenopyrite, cassiterite, chalcopyrite, sphalerite

Gangue minerals: Axinite, quartz, tourmaline

Geologic description:

The Gemini prospect consists of three, closely spaced, North 65 degree West-trending breccia veins that cut thermally altered Upper Cretaceous, Kuskokwim Group flysch. The vein deposits consist of crackle breccias and limonitic brecciated hornfels that contain massive to disseminated cassiterite, arsenopyrite, chalcopyrite, and sphalerite. Cassiterite-bearing veins can be traced east of the ridge summit, but not to the west.

The Gemini Vein has a minimum strike length of 900 feet (275 m), whereas the South Vein could be traced for about 4,300 feet (1,310 m). The Gemini prospect is inferred to be Late Cretaceous-Early Tertiary age, based on radiometric ages of related pluronic rocks in Kuskokwim Mineral Belt (Bundtzen and Miller, 1997). A 1984 Anaconda Minerals Company drill program encountered up to 8.15 percent tin and 3.91 ounces/ton silver over widths of 1.5 feet (0.45 m) in the Gemini vein.

Alteration:

Axinite-sericite-tourmaline replacements.

Age of mineralization:

Late Cretaceous-Early Tertiary age, based on radiometric ages of related plutonic rocks in Kuskokwim Mineral Belt (Bundtzen and Miller, 1997).

Deposit model:
Tin-polymetallic deposits (Cox and Singer, 1986; model no. 20b)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
20b

Production Status: No

Site Status: Active

Workings/exploration:
A data release from the U.S. Geological Survey AMRAP survey of the Medfra quadrangle (King and others, 1980; Patton and others, 1980) indicated that anomalous tin, tungsten, bismuth, lead, silver, and arsenic were detected in stream sediment and pan concentrate samples draining the Gemini prospect area. Duval Corporation and Anaconda Minerals Company followed up on this work and discovered the Gemini and related vein systems. In 1984, Anaconda Minerals Company completed three shallow diamond drill holes into the Gemini and South Veins. The Anaconda Minerals Company drill program encountered up to 8.15 percent tin and 3.91 ounces/ton silver over widths of 1.5 feet (0.45 m). Online Exploration Services Inc. (Anchorage, Alaska) explored the property in 1997.

Production notes:

Reserves:
Based on Anaconda Minerals Company exploration data and their own surface sampling, Burleigh (1992 BMOFR 85-92) and Bundtzen and Miller (1997) estimate that 1,153,333 tons (1,046,300 tonnes) of ore contains 0.216 percent tin. The average tenor for other metals (silver, arsenic, lead, tungsten, antimony, and zinc) was not calculated.

Additional comments:
See Won - South (MD024), Win (MD060), Won - North (MD021) and Cloud (MD059) prospects.

References:
King and others, 1980; Patton and others, 1980; Burleigh, 1992 (BMOFR 85-92); Bundtzen and Miller, 1997.

Primary reference: Burleigh, 1992 (BMOFR 85-92)

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Won - South; Prospect Pit; Dog Day; Gash; Tin Ridge

Site type: Prospect

ARDF no.: MD024

Latitude: 63.482

Quadrangle: MD B-6

Longitude: 155.717

Location description and accuracy:

The Won-South Prospect is located in an inclined saddle on a south facing slope of a small but locally prominent 2,920 foot high mountain range in Section 23, T. 23 S., R. 16 E., of the Kateel River Meridian. The property is at an elevation of 2,350 feet (717 m). The reporter briefly visited the site in 1984.

Commodities:

Main: Ag, Sn

Other: As, Cu, Pb, Sb, W, Zn

Ore minerals: Arsenopyrite, cassiterite, chalcopyrite, sphalerite, tetrahedrite

Gangue minerals: Axinite, quartz, tourmaline

Geologic description:

The Won - South prospect is one of several argentiferous and stanniferous prospects in a small but prominent mountain upland 10 miles (15 km) east of the Cripple Creek Mountains. The Won-South prospect consists of four or more, northwest trending, breccia-vein structures that cut tourmaline-axinite and quartz-altered hornfels (Burleigh, 1992; Bundtzen and Miller, 1997). The veins strike North 45 degrees West, and dip steeply both in northeast and southwest directions. The largest tin-silver bearing vein at the Won-South prospect is the Dog Day and Gash veins, which could be traced for strike lengths of up to 3,500 feet (1,067 m).

Tin and silver values occur in brecciated hornfels with cassiterite matrix, cassiterite-sulfide druse on fracture surfaces, in open space crackle breccias, and as disseminated cassiterite in quartz veins (Burleigh, 1992, BMOFR 85-92). Host lithologies are thermally altered (hornfels) of shallow marine-to-nonmarine facies of the Upper Cretaceous Kuskokwim Group. The thermal effects are caused by an underlying plutonic body that is manifested in the prospect area by fine grained, northwest trending intermediate dikes. Although some tin was found in the dikes, all significant mineralization thus far found is in the hornfels. Age of mineralization is inferred to be Late Cretaceous-early Tertiary based on age range of plutons in Kuskokwim Mineral belt (Bundtzen and Miller, 1997). In 1984, Anaconda Minerals Company completed two diamond drill holes into the Dog

Day and Gash veins and encountered up to 6.90 percent tin and 3.3 ounces/ton silver and highly anomalous antimony, lead, arsenic, copper, and tungsten over unknown widths.

Alteration:

Sericite-quartz in intermediate dikes.

Age of mineralization:

Late Cretaceous-early Tertiary (inferred) based on age range of plutons in Kuskokwim Mineral belt (Bundtzen and Miller, 1997).

Deposit model:

Tin Polymetallic (Cox and Singer, 1986; model no. 20b)

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

20b

Production Status: No

Site Status: Active

Workings/exploration:

A data release of the U.S. Geological Survey AMRAP study of the Medfra quadangle (King and others, 1980, 1983b; Patton and others, 1980) reported anomalous tin, tungsten, bismuth, lead, silver, and arsenic in stream sediment and pan concentrate samples from creeks draining the project area. In 1983 Duval Corporation and Anaconda Minerals Inc. followed up on these anomalies and discovered the Won-South lode system. In 1984, Anaconda Minerals completed at least two diamond drill holes into the Dog Day and Gash Veins. Drilling encountered up to 6.9 percent tin and 3.3 ounces/ton silver, and anomalous antimony, lead, arsenic, copper, and tungsten over an undisclosed width. On-line Exploration Services, Anchorage, Alaska, continued exploration activities in 1997.

Production notes:

Reserves:

Utilizing Anaconda Minerals exploration data and their own surface sampling, Burleigh (1992, BMOFR 85-92) and Bundtzen and Miller (1997) indicate that the Dog Day-Gash Vein system contains 981,875 tons (890,757 tonnes) of ore grading 1.03 percent tin. The average grade for silver, copper, tungsten and other commodities was not calculated.

Additional comments:

See Won - North (MD021), Gemini, (MD023), and Win (MD060) prospects.

References:

Patton and others, 1980; King and others, 1980; King and others, 1983; Burleigh, 1992 (BMOFR 85-92); Bundtzen and Miller, 1997.

Primary reference: Burleigh, 1992 (BMOFR 85-92)

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Sunshine

Site type: Prospect

ARDF no.: MD025

Latitude: 63.55 **Quadrangle:** MD C-5

Longitude: 155.01

Location description and accuracy:

The Sunshine placer gold occurrence is situated in Sunshine Creek, 2.5 miles (4 km) north of the crest of the Sunshine Mountains at an elevation of 1,500 feet (457 m) in Section 33, T. 22 S., R. 20 E., of the Kateel River Meridian. Location is accurate to within one mile (1.6 km).

Commodities:

Main: Au

Other: Ag

Ore minerals: Placer gold

Gangue minerals:

Geologic description:

The Sunshine placer gold occurrence consists of fine-grained placer gold in boulder-rich stream gravels in Sunshine Creek (Brown, 1926; King and others, 1983). No other detailed information is available.

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: No

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

None.

Additional comments:

References:

Brown, 1926; King and others, 1983.

Primary reference: Brown, 1926

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Clearwater Creek

Site type: Occurrence

ARDF no.: MD026

Latitude: 63.54 **Quadrangle:** MD C-4

Longitude: 154.94

Location description and accuracy:
This placer occurrence is located in a tributary of Clearwater Creek along the northern slopes of the Sunshine Mountains at an elevation of about 1,500 feet (457 m) in Section 36, T. 22 S., R. 20 E., of the Kateel River Meridian. Location is imprecisely known to within two miles (3.2 km).

Commodities:

Main: Au

Other: Ag

Ore minerals: Placer gold

Gangue minerals:

Geologic description:
Placer gold was noted in Clearwater Creek during the early 20th Century (Brown, 1926; Andrews, 1978). Anomalous gold in stream sediments was noted during AMRAP investigation (King and others, 1983). The placer gold occurrence is found in a second order stream near its intersection with a third order trunk of Clearwater Creek.

Alteration:

Age of mineralization:

Deposit model:
Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

Production Status: No

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:

None.

Additional comments:

References:

Brown, 1926; Andrews, 1978; King and others, 1983.

Primary reference: Andrews, 1978

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Tarn

Site type: Prospect

ARDF no.: MD027

Latitude: 63.535 **Quadrangle:** MD C-4

Longitude: 154.539

Location description and accuracy:

The Tarn prospect is situated on a steep cirque headwall in the north-central Mystery Mountains at an elevation of 3,200 feet (975 m) in Section 1, T. 23 S., R. 22 E., of the Kateel River Meridian. Location is accurate to within about 500 feet (152 m).

Commodities:

Main: Au, Cu

Other: As, Sb

Ore minerals: Arsenopyrite, chalcopyrite

Gangue minerals: Quartz, tourmaline

Geologic description:

The Tarn prospect is within the eastern part of a northeast trending belt of porphyry-like copper-gold prospects that strike for 7 miles (11 km) in the central Mystery Mountains. The Tarn prospect consists of hydrothermal breccias in monzonitic dikes and small stocks that contain chalcopyrite, pyrite, tourmaline, and minor to trace arsenopyrite. Malichite occurs in hairline fractures in intrusive rocks; alteration and mineralization is not well developed in country-rock hornfels. The Tarn prospect is inferred to be Late Cretaceous, based on isotopic ages of plutonic rocks in Mystery Mountains (Moll and others, 1981). No assay data was found for this summary.

Alteration:

Biotite in hornfels; ankerite in intrusions.

Age of mineralization:

The Tarn prospect is inferred to be Late Cretaceous, based on isotopic ages of plutonic rocks in Mystery Mountains (Moll and others, 1981).

Deposit model:

Porphyry Cu-Au (Cox and Singer, 1986; model no. 20c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
20c

Production Status: No

Site Status: Inactive

Workings/exploration:

Regional exploration work conducted by WGM Inc. in the late 1970s discovered the Tarn and related prospects in the Mystery Mountains (Andrews, 1978). From 1988 to 1990, American Copper and Nickel Company conducted regional exploration, which included a detailed airborne geophysical survey. ASA Inc. continued detailed exploration work from 1991 to 1997 (DiMarchi and others, 1997). No drilling has taken place on the property, and no assay data was found for this summary.

Production notes:

Reserves:

None.

Additional comments:

See Copenhagen Hill (MD030), Frozen Creek (MD032), Pork Chop (MD031), and Mystery Mountains West (MD029) prospects.

References:

Andrews, 1978; Moll and others, 1981; DiMarchi and others, 1997.

Primary reference: DiMarchi and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Mystery Mountains East

Site type: Prospect

ARDF no.: MD028

Latitude: 63.524 **Quadrangle:** MD C-4

Longitude: 154.56

Location description and accuracy:

The Mystery Mountains East prospect is situated on a steep southerly flank of a southwest facing valley about 2 miles (3.2 km) north of Cottonwood Creek at an elevation of 3,400 feet (1,036 m) in Section 2, T. 23 S., R. 22 E., of the Kateel River Meridian. Location is accurate to within 500 feet (152 m).

Commodities:

Main: Cu

Other: Ag, As, Sb

Ore minerals: Arsenopyrite, chalcopyrite, pyrite, trace stibnite

Gangue minerals: Quartz, tourmaline

Geologic description:

The Mystery Mountains East prospect is one of a number of porphyry-like copper-gold prospects that occur along a seven mile (11 km) long, northeast trending belt through the central Mystery Mountains. Mineralization consists of tourmaline quartz veins, breccia veins, and fractures associated with small monzonite and quartz porphyry bodies hosted in biotite hornfels (DiMarchi and others, 1997). Sulfides include arsenopyrite, chalcopyrite, pyrite, and traces of stibnite, within a 600 feet by 600 feet (183 m by 183 m) area. The Mystery Mountain East prospect is inferred to be Late Cretaceous, based on isotopic ages from Mystery Mountains plutonic rocks (Moll and others, 1981). Surface grab samples from the Mystery Mountains East prospect ran as high as 830 ppm arsenic, 203 ppm copper, 2.0 ppm silver, but contained no gold (DiMarchi and others, 1997).

Alteration:

Biotite, tourmaline, and quartz.

Age of mineralization:

The Mystery Mountain East prospect is inferred to be Late Cretaceous, based on isotopic ages from Mystery Mountains plutonic rocks (Moll and others, 1981).

Deposit model:
Porphyry Cu-Au (Cox and Singer, 1986; model no. 20c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
20c

Production Status: No

Site Status: Inactive

Workings/exploration:
WGM Inc. located a number of porphyry-like prospects in the Mystery Mountains during the late 1970s (Andrews, 1978). From 1988 to 1990, ACNC conducted detailed exploration work, which included an airborne geophysical survey. ASA Inc. continued work from 1991 to 1997. Surface grab samples from the Mystery Mountains East prospect ran as high as 830 ppm arsenic, 203 ppm copper, 2.0 ppm silver, but contained no gold (DiMarchi and others, 1997).

Production notes:

Reserves:
None.

Additional comments:
See Copenhagen Hill (MD030), Frozen Creek (MD032), Tarn (MD027), and Pork Chop (MD031) prospects.

References:
Andrews, 1978; Moll and others, 1981; DiMarchi and others, 1997.

Primary reference: DiMarchi and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Mystery Mountains West

Site type: Occurrence

ARDF no.: MD029

Latitude: 63.514 **Quadrangle:** MD C-4

Longitude: 154.656

Location description and accuracy:

The Mystery Mountains West occurrence is situated on a southwesterly spur in the western-most part of the Mystery Mountains about 0.6 miles (0.9 km) northwest of Cottonwood Creek, at an elevation of 1,650 feet (503 m) in Section 8, T. 23 S., R. 22 E., of the Kateel River Meridian. Location is accurate to within 500 feet (152 m).

Commodities:

Main: Pb, Zn

Other: Ag

Ore minerals: Galena, sphalerite

Gangue minerals: Quartz

Geologic description:

The Mystery Mountains West occurrence consists of galena, sphalerite, and quartz in hornfels, and locally in quartz-tourmaline breccias in hornfels. Altered dikes cut the hornfels on the property. The Mystery Mountains West occurrence represents an outermost metallic lead-zinc zonation observed in the Mystery Mountains mineralized area, which is thought to be a large-scale copper porphyry system. Prospects more central to the core, which include the Copenhagen Hill, Mystery Mountains-East, Frozen Creek, and Tarn prospects (MD030, MD028, MD032, MD027) are representative of a copper-gold bearing core. The Ursus prospect (MD033), like the Mystery Mountains West mineralization, represents a southern, outer lead-zinc zone (DiMarchi and others, 1997). The Mystery Mountains West occurrence is inferred to be Late Cretaceous, based on isotopic ages of plutonic rocks in Mystery Mountains (Moll and others, 1981). No assay data was found for this summary.

Alteration:

Sericite in dike rocks.

Age of mineralization:

The Mystery Mountains West occurrence is inferred to be Late Cretaceous, based on isotopic ages of plutonic rocks in Mystery Mountains (Moll and others, 1981).

Deposit model:
Polymetallic vein deposits (Cox and Singer, 1986; model no. 22c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: No

Site Status: Inactive

Workings/exploration:
Mystery Mountains West is one of a number of prospects related to a large porphyry copper-gold target explored in the Mystery Mountains by WGM Inc., ACNC, and ASA Inc. from 1975 to 1997 (DiMarchi and others, 1997). No assay data was found for this summary.

Production notes:

Reserves:
None.

Additional comments:
See Ursus prospect (MD033).

References:
Moll and others, 1981; DiMarchi and others, 1997.

Primary reference: DiMarchi and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Copenhagen Hill

Site type: Prospect

ARDF no.: MD030

Latitude: 63.515 **Quadrangle:** MD C-4

Longitude: 154.626

Location description and accuracy:

The Copenhagen Hill prospect is situated near the summit of an isolated hill about 1 mile (1.6 km) north of Cottonwood Creek at an elevation of 2,450 feet (746 m) in Section 9, T. 23 S., R. 22 E., of the Kateel River Meridian. Location is known to within about 500 feet (152 m).

Commodities:

Main: Cu

Other: Ag, Au

Ore minerals: Chalcopyrite, pyrite

Gangue minerals: Quartz, tourmaline

Geologic description:

The Copenhagen Hill prospect is the western-most copper-gold showing in a seven mile (11 km)-long, northeast trending belt of porphyry-like prospects through the central Mystery Mountains (DiMarchi and others, 1997). The hornfels is intruded by several porphyry dikes. Unlike other prospects in the Mystery Mountains, sulfides such as chalcopyrite, pyrite, and pyrrhotite are found in abundance in the hornfels. Quartz-tourmaline breccias are common within a 450 feet by 300 feet (137 m by 91 m) mineralized area. The Copenhagen Hill prospect is believed to be Late Cretaceous, based on inferred isotopic age of Mystery Mountains plutonic rocks (Moll and others, 1981). No assay data was found for this summary.

Alteration:

Tourmaline.

Age of mineralization:

The Copenhagen Hill prospect is believed to be Late Cretaceous, based on inferred isotopic age of Mystery Mountains plutonic rocks (Moll and others, 1981).

Deposit model:

Porphyry Cu-Au (Cox and Singer, 1986; model no. 20c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
20c

Production Status: No

Site Status: Inactive

Workings/exploration:
Regional exploration conducted by WGM Inc. in 1978 found the Copenhagen prospect (Andrews, 1978). During 1988 to 1990, ACNC conducted exploration including an airborne geophysical survey. During 1991 to 1997, ASA Inc. continued detailed exploration work at the Copenhagen prospect and throughout the Mystery Mountains. The Copenhagen Hill prospect is believed by DiMarchi and others (1997) to represent the westernmost copper-gold anomalous area in a district-wide, porphyry-style metallic zonation (DiMarchi and others, 1997). No assay data was found for this summary.

Production notes:

Reserves:
None.

Additional comments:
See Pork Chop (MD031), Mystery Mountains East (MD028), Frozen Creek (MD032), and Tarn (MD027) prospects.

References:
Andrews, 1978; Moll and others, 1981; DiMarchi and others, 1997.

Primary reference: DiMarchi and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Pork Chop

Site type: Prospect

ARDF no.: MD031

Latitude: 63.52 **Quadrangle:** MD C-4

Longitude: 154.593

Location description and accuracy:

The Pork Chop prospect is situated near the summit of a southerly spur of the Mystery Mountains about one mile (1.6 km) north of Cottonwood Creek at an elevation of 2,500 feet (762 m) in Section 10, T. 23 S., R. 22 E., of the Kateel River Meridian. Location is accurate to within about 300 feet (91 m).

Commodities:

Main: Au, As, Cu, Zn

Other: Ag, Cd, Sb

Ore minerals: Chalcopyrite, malachite, native gold, pyrite

Gangue minerals: Quartz, tourmaline

Geologic description:

The Pork Chop prospect is one of six mineralized zones that occur in a prominent 7 mile (11 km) long, northeast trending belt that crosses the central part of the Mystery Mountains (DiMarchi and others, 1997). This belt is marked by a central core of copper-gold soil anomalies, and a peripheral zone of lead-zinc soil anomalies (DiMarchi and others, 1997).

At Pork Chop, porphyry-like mineralization consist of disseminated chalcopyrite and pyrite in intensive altered tourmaline-quartz veins, vein breccias, and shears, all within several small quartz porphyry bodies that intrude Cretaceous Kuskokwim Group flysch. The Cretaceous flysch is thermally altered to biotite hornfels. Malachite is frequently observed in hairline fractures of intrusions. The strongest tourmaline alteration appears to be near the intersection of northeast trending and northwest trending faults. Most of the hydrothermal alteration is restricted to the quartz porphyry and does not invade the country rock (DiMarchi and others, 1997). The Pork Chop prospect is believed to be Late Cretaceous, based on isotopic age of Mystery Mountains plutonic rocks (Moll and others, 1981).

Surface samples analyzed by ASA Inc. run as high as 5,000 ppm copper and 1,000 ppb gold. Clautice and others (1993) report values as high as 141 ppm copper, 788 ppb gold, 1,870 ppm arsenic, 14.0 ppm uranium, 2.00 percent zinc, and 441 ppm cadmium from grab samples at the Pork Chop prospect.

Alteration:

Sericite+quartz+tourmaline+malachite.

Age of mineralization:

The Pork Chop prospect is believed to be Late Cretaceous, based on isotopic age of Mystery Mountains plutonic rocks (Moll and others, 1981).

Deposit model:

Porphyry Cu-Au (Cox and Singer, 1986; model no. 22c)

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

22c

Production Status: No

Site Status: Active

Workings/exploration:

Regional exploration work conducted by WGM Inc. during 1975-to-1978 discovered the Pork Chop, Copenhagen Hill (MD030), and Ursus (MD033) prospects in the Mystery Mountains (Andrews, 1978). Hecla Mining Company explored and sampled the Pork Chop prospect in 1982 (Bell, 1983). From 1988 to 1990, American Copper and Nickel Inc. conducted exploration of the Pork Chop and related prospects in the Mystery Mountains, and flew a detailed airborne geophysical survey of the area. From 1991 to 1997, ASA Inc. continued to explore the Pork Chop and related deposits (DiMarchi and others, 1997). No drilling has taken place at the Pork Chop prospect. Surface samples analyzed by ASA Inc. run as high as 5,000 ppm copper and 1,000 ppb gold. Clautice and others (1993) report values as high as 141 ppm copper, 788 ppb gold, 1,870 ppm arsenic, 14.0 ppm uranium, 2.0 percent zinc, and 441 ppm cadmium from grab samples at the Pork Chop prospect.

Production notes:

Reserves:

None.

Additional comments:

See Copenhagen Hill (MD030), Mystery Mt. East (MD028), Ursus (MD033), Tarn (MD027), and Frozen Creek (MD032) prospects. The Pork Chop prospect is on land selcted or owned by Doyon Ltd. For additional information, contact Doyon Ltd at 210 1st Ave, Fairbanks, Alaska, 99701.

References:

Andrews, 1978; Bell, 1983; Moll and others, 1981; Clautice and others, 1993; DiMarchi and others, 1997.

Primary reference: DiMarchi and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Frozen Creek

Site type: Prospect

ARDF no.: MD032

Latitude: 63.532 **Quadrangle:** MD C-4

Longitude: 154.513

Location description and accuracy:

The Frozen Creek prospect is situated on a south rim of an east-facing cirque valley on the east side of the Mystery Mountains at an elevation of 2,500 feet (762 m) in Section 6, T. 23 S., R. 22 E., of the Kateel River Meridian. Prospect is known to within 250 feet (76 m).

Commodities:

Main: Au, Cu

Other: Ag

Ore minerals: Chalcopyrite, pyrite, pyrrhotite

Gangue minerals: Magnetite, tourmaline

Geologic description:

The Frozen Creek prospect consists of a large zone of boron metasomatism in the eastern edge of the Mystery Mountains Pluton. It is the eastern-most porphyry-like prospect in a seven mile (11 km) long northeast-trending zone of similar prospects that cut across the central Mystery Mountains. The Frozen Creek prospect is inferred to be Late Cretaceous based on isotopic age of Mystery Mountains intrusive complex (Moll and others, 1981).

A strong copper-gold soil anomaly was detected at Frozen Creek (DiMarchi and others, 1997), which is part of the core of Cu-Au anomalies that are surrounded by a lead-zinc mineral zonation. Disseminated chalcopyrite and pyrrhotite are found throughout a tourmaline-enriched monzonitic plutonic rocks; little mineralization is noted in host biotite hornfels. Malachite is locally abundant in hairline fractures in small intrusive bodies. The mineralized zone at Frozen Creek is at least 1,500 feet (457 m) in diameter. Two grab samples of mineralization collected by Clautice and others (1993) averaged 585 ppm copper and 2.1 ppm silver.

Alteration:

Sericite and secondary biotite in pluton.

Age of mineralization:

The Frozen Creek prospect is inferred to be Late Cretaceous based on isotopic age of Mystery Mountains intrusive complex (Moll and others, 1981).

Deposit model:

Porphyry Cu-Au (Cox and Singer, 1986; model no. 20c)

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

20c

Production Status: No

Site Status: Active

Workings/exploration:

The Frozen Creek prospect was found during regional exploration conducted by WGM Inc. in 1977 (Andrews, 1978). ACNC worked on the prospect from 1988 to 1990, and ASA Inc. continued work through 1997 (DiMarchi and others, 1997). During 1989-1991, American Copper and Nickel Inc. explored the area as a porphyry copper-gold target. ASA Inc. continued exploration work with the same target in mind during 1995 and 1996. Two grab samples reported by Clautice and others (1993) averaged 585 ppm copper and 2.1 ppm silver.

Production notes:

Reserves:

None.

Additional comments:

See Tarn (MD027), Pork Chop (MD031), Mystery Mt. East (MD028), and Copenhagen Hill (MD030) prospects. The Frozen Creek Prospect is on land selected or owned by Doyon Ltd. For additional information contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:

Andrews, 1978; Moll and others, 1981; Clautice and others, 1993; DiMarchi and others, 1997.

Primary reference: DiMarchi and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Ursus

Site type: Occurrence

ARDF no.: MD033

Latitude: 63.47

Quadrangle: MD B-4

Longitude: 154.55

Location description and accuracy:

The Ursus prospect is located in the southern part of the Mystery Mountains on a prominent north-south ridgeline, at an elevation of 2,000 feet (609 m) in Section 23, T. 23 S., R. 22 E., of the Kateel River Meridian. Location is accurate to within about 3,000 feet (914 m).

Commodities:

Main: Ag, Pb

Other: As, Cu

Ore minerals: Galena, pyrite

Gangue minerals: Quartz, tourmaline

Geologic description:

The Ursus prospect occurs in both tourmaline bearing, pyrite, feldspar porphyry and brown brecciated hornfels. Vein breccias are common in the hornfels. The diffuse mineral zone is marked by strong limonite gossan development and conspicuous ankeritic alteration in the quartz porphyry intrusion. The Ursus prospect is inferred to be Late Cretaceous, based on isotopic ages of plutonic rocks in Mystery Mountains (Patton and others, 1980; Moll and others, 1981) .

Ursus is thought to represent an outer mineral zonation away from the central Mystery Mountains and is characterized by anomalous lead, silver and zinc in soils. An inner copper-gold zonation in the central Mystery Mountains is manifested by the Frozen Creek (MD032), Copenhagen (MD030) and Pork Chop (MD0031) copper-gold prospects.

Limonitically stained grab samples of quartz-tourmaline veins yielded up to 2.30 percent lead, 1,000 ppm copper, and 4.70 ounces/ton silver (DiMarchi and others, 1997).

Alteration:

Ankerite in quartz porphyry.

Age of mineralization:

The Ursus prospect is inferred to be Late Cretaceous, based on isotopic ages of plutonic rocks in Mystery Mountains (Moll and others, 1981).

Deposit model:
Polymetallic vein (Cox and Singer, 1986; model no. 22c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: No

Site Status: Inactive

Workings/exploration:
Ursus is one of a number of prospects explored by the mineral industry from 1975 to 1997 as a large porphyry copper-gold system centered on the Mystery Mountains (Andrews, 1978; Bell, 1983; DiMarchi and others, 1997). Limonitically stained grab samples of quartz-tourmaline veins yielded up to 2.30 percent lead, 4.7 ounces/ton (161 grams/tonne) silver, and 1,000 ppm copper (DiMarchi and others, 1997).

Production notes:

Reserves:
None.

Additional comments:
See Mystery Mountains West (MD029) prospect. The Ursus Prospect is on land selected or owned by Doyon Ltd. For additional information contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Andrews, 1978; Patton and others, 1980; Moll and others, 1981; Bell, 1983; DiMarchi and others, 1997.

Primary reference: DiMarchi and others, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Shepard

Site type: Occurrence

ARDF no.: MD034

Latitude: 63.592 **Quadrangle:** MD C-3

Longitude: 154.225

Location description and accuracy:

The Shepard occurrence is situated on a north-facing spur of a sharp 3,160 foot high peak that overlooks Shepard Creek. The occurrence is at an elevation of 3,080 feet (939 m) in Section 9, T. 22 S., R. 24 E., of the Kateel River Meridian. The site is accurate to within 500 feet (152 m).

Commodities:

Main: Au, Cu, Zn

Other: Co

Ore minerals: Arsenopyrite, chalcopyrite

Gangue minerals: Quartz

Geologic description:

The Shepard occurrence consists of quartz veins in and near a northwest trending quartz monzonite dike swarm (DiMarchi and others, 1992). The quartz veins contain disseminated arsenopyrite, chalcopyrite, and carry gold values; they are found in zones of silicic and phyllic alteration in the quartz monzonite dikes.

Surface samples collected by DiMarchi and others (1992) contain up to 500 ppb gold. Nine samples averaged 100 ppb gold. Copper, cobalt, and arsenic values are not given.

Alteration:

Silicic and phyllic in intrusion.

Age of mineralization:

Deposit model:

Polymetallic veins (Cox and Singer, 1986; model no. 22c)

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

22c

Production Status: No

Site Status: Inactive

Workings/exploration:

Surface samples taken by DiMarchi and others (1992) contain up to 500 ppb gold. Nine samples averaged 100 ppb gold. Copper, cobalt, and arsenic values are not given.

Production notes:

Reserves:

None.

Additional comments:

The Shepard occurrence is on lands selected or owned by Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:

DiMarchi and others, 1992.

Primary reference: DiMarchi and others, 1992

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/5/98

Site name(s): Von Frank - North

Site type: Occurrence

ARDF no.: MD035

Latitude: 63.545 **Quadrangle:** MD C-3

Longitude: 154.353

Location description and accuracy:

The Von Frank - North occurrence is situated on a southwest spur of Von Frank Mountain at an elevation of approximately 2,800 feet (853 m) in Section 36, T. 22 S., R. 23 E., of the Kateel River Meridian. The prospect was located on a 1:63,360 scale map by Clautice and others (1993), and is accurate to within 250 feet (76 m).

Commodities:

Main: As, Sb

Other: Au, Co

Ore minerals: Arsenopyrite, pyrite

Gangue minerals: Quartz

Geologic description:

Thin stockwork-type arsenopyrite-pyrite veins developed in granodiorite at the west side of Von Frank Mountain intrusion. No dimensions or aerial extent are given (Clautice and others, 1993; DiMarchi and others, 1994) The age of mineralization is Late Cretaceous, based on inferred age of 70.0 Ma Von Frank Mountain pluton (Patton and others, 1980; Moll and others, 1981). In 1992, Clautice and others (1993) collected grab samples of intrusive-hosted mineralization, which contained up to 78 ppb gold, 192 ppm antimony, and 100 ppm cobalt.

Alteration:

Sericite-quartz-ankerite in intrusion.

Age of mineralization:

The age of mineralization is Late Cretaceous, based on inferred age of 70.0 Ma Von Frank Mountain pluton (Moll and others, 1981).

Deposit model:

Polymetallic vein (Cox and Singer, 1986; model no. 22c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: No

Site Status: Inactive

Workings/exploration:
In 1991, Central Alaska Gold Company began a sampling program and encountered auriferous mineralization in a border phase of the Von Frank Mountain intrusion (DiMarchi and others, 1994). In 1992, Clautice and others (1993) collected grab samples of intrusive-hosted mineralization, which contained up to 78 ppb gold, 192 ppm antimony, and 100 ppm cobalt.

Production notes:

Reserves:
None.

Additional comments:
See Von Frank - South prospect (MD036). The Von Frank - North occurrence is on lands selected or owned by Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave, Fairbanks, Alaska 99701.

References:
Patton and others, 1980; Moll and others, 1981; Clautice and others, 1993; DiMarchi and others, 1994.

Primary reference: Clautice and others, 1993

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Von Frank - South

Site type: Prospect

ARDF no.: MD036

Latitude: 63.528 **Quadrangle:** MD C-3

Longitude: 154.335

Location description and accuracy:

The Von Frank - South prospect is situated on a southerly spur of Von Frank mountain at an elevation of approximately 2,550 feet (777 m) in Section 1, T. 23 S., R. 23 E., of the Kateel River Meridian. The reporter visited the site in 1990.

Commodities:

Main: Au, Cu

Other: As, Mo

Ore minerals: Arsenopyrite, bournonite, chalcopyrite, molybdenite, pyrite, sphalerite, stibnite

Gangue minerals: Quartz, carbonate

Geologic description:

The Von Frank - South prospect is a chalcopyrite-pyrite-(moybdenite) quartz stockwork in a 69 Ma diorite stock, a cupola of the larger Von Frank Mountain monzonitic pluton (Patton and others, 1980; Moll and others, 1981; DiMarchi and others, 1994; Bundtzen and Miller, 1997). Much of the stockwork occurs in joint-fractures with regular N 55 E, 80 SE, and N 45 W, 75 SW orientations. Mineralized veinlets ranged from 1 inch to 6 inches (2.5 cm to 15 cm) thick and total about 15 per every 4 feet (1.2 m). About 90 percent of the stockwork is in plutonic rocks; the remaining 10 percent occurs in hornfels. Sulfides in stockwork from drill core include chalcopyrite, sphalerite, bournonite, stibnite, and pyrite. Bundtzen and Miller (1997) compare the Von Frank - South prospect with other Cu-Au Porphyry prospects in the Kuskokwim Mineral Belt of Southwest Alaska.

Drill intercepts include 429 feet (131 m) of 0.13 ounces/ton (0.45 g/tonne) gold, and 135 feet (41 m) of 0.035 ounces/ton (1.2 grams/tonne) gold (Bundtzen and others, 1994). Up to 0.35 percent copper was also present in drill core. The best mineralization from surface samples yielded 0.559 ounces (19.1 grams/tonne) gold. Gold and copper have a correlation coefficient of 0.92 (DiMarchi and others, 1994).

Alteration:

Quartz+sericite+ankerite in diorite intrusion.

Age of mineralization:
Late Cretaceous (69.0 Ma), based on biotite age in host diorite (Bundtzen and others, 1994).

Deposit model:
Porphyry Cu-Au (Cox and Singer, 1986; model no. 20c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
20c

Production Status: No

Site Status: Inactive

Workings/exploration:
ASA Inc. discovered the Von Frank-South prospect in 1992. In 1993, ASA Inc., an Alaskan-based exploration firm, completed 2,000 feet (610 m) of reconnaissance diamond drilling, geologic mapping, and geochemical sampling. Drill intercepts include 429 feet (131 m) with an average grade of 0.013 ounces/ton (0.45 grams/tonne) gold, and 135 feet (41 m) of 0.035 ounces/ton (1.2 grams/ton) gold (Bundtzen and others, 1994). Up to 0.35 percent copper was also detected in drill core, but analytical results from mineralized sample widths were not available. The highest grade surface sample yielded 0.559 ounces/ton (19.1 grams/tonne) gold. Gold and copper have a correlation coefficient of 0.92, with much lower values of gold and other metals (DiMarchi and others, 1994).

Production notes:

Reserves:
None.

Additional comments:
See Von Frank - North (MD035), Montana Saddle (MD0180), and Neirod - East (MD020) prospects. The Von Frank - South prospect is on land selected or owned by Doyon Ltd. For additional information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Bundtzen and others, 1994; DiMarchi and others, 1994; Bundtzen and Miller, 1997.

Primary reference: DiMarchi and others, 1994

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Cache Creek - North

Site type: Occurrence

ARDF no.: MD037

Latitude: 63.57 **Quadrangle:** MD C-4

Longitude: 154.074

Location description and accuracy:

The Cache Creek North occurrence is a soil-rubble anomaly located at an elevation of 1,500 feet (457 m) in a stream basin of the South Fork of White Mountain Creek in Section 20, T. 22 S., R. 25 E., of the Kateel River Meridian. Location is known to within 250 feet (76 m).

Commodities:

Main: Zn

Other: Pb

Ore minerals: Sphalerite

Gangue minerals: Carbonate solution breccia

Geologic description:

Mineralization only occurs as rubble-crop of the Silurian Paradise Fork Formation of Dutro and Patton (1982), which is also unit 'Sic' of Andrews and Rishel (1982). Cache Creek North is northern end of North 55 degrees East striking unit of micritic limestone and white dolomite.The host rock is inferred to be Silurian based on fossil control (Dutro and Patton, 1982). A 3,000 foot (915 m)-long soil anomaly contains up to 1.05 percent zinc and 450 ppm lead (Andrews and Rishel, 1982).

Alteration:

White dolomite replacement.

Age of mineralization:

The host rock is inferred to be Silurian based on fossil control (Dutro and Patton, 1982). The age of the mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
A 3,000 foot (915 m)-long soil anomaly contains up to 1.05 percent zinc and 450 ppm lead (Andrews and Rishel, 1982).

Production notes:

Reserves:
None.

Additional comments:
See Reef Ridge deposit (MD055), and Cache Creek South (MD038) Prospect. The Cache Creek - North occurrence is on lands selected or owned by Doyon Ltd. For further infomation, contact Doyon Ltd at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Andrews and Rishel, 1982; Dutro and Patton, 1982.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Cache Creek - South

Site type: Occurrence

ARDF no.: MD038

Latitude: 63.558 **Quadrangle:** MD C-3

Longitude: 154.096

Location description and accuracy:

The Cache Creek South occurrence is located at approximately 2,400 feet (732 m) in elevation at the head of Cache Creek, a tributary to the South Fork of White Mountain Creek in Section 30, T. 22 S., R. 25 E., of the Kateel River Meridian. Location is known to within 100 feet (30 m).

Commodities:

Main: Zn

Other:

Ore minerals: Sphalerite

Gangue minerals: Dolomite

Geologic description:

Intense zinc-bearing solution breccia zone hosted in Paradise Fork Formation of Dutro and Patton (1982), which is also unit 'Sic' of Andrews and Rishel (1982). The zone appears to be about 10 feet (3 m) thick, and can be traced for about 200 feet (61 m) along a strike direction of N 55 E. Mineralization difficult to recognize due to the elusive color (pale tan) of sphalerite. Host rock is inferred to be Silurian based on age of the 'Sic' unit (Patton and others 1980; Blodgett, 1982). Four surface grab samples ranged from 0.64 percent to 6.40 percent zinc and averaged 2.20 percent zinc, with no appreciable lead (Andrews and Rishel, 1982).

Alteration:

Recrystallized dolomite.

Age of mineralization:

The host rock is probably Silurian based on age of 'Sic' unit (Blodgett, 1982). The age of the mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley

Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Cache-Creek-South was discovered in the late 1970s during regional exploration conducted by WGM Inc. on lands selected by Doyon Ltd. Four surface grab samples contained 0.64 percent to 6.40 percent zinc and averaged 2.20 percent zinc, with no appreciable lead (Andrews and Rishel, 1982).

Production notes:

Reserves:
None.

Additional comments:
See Reef Ridge (MD055) and Cache Creek North (MD037) Mississippi Valley Type showings. The Cache Creek - South occurrence is on lands selected or owned by Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Andrews and Rishel, 1982; Blodgett, 1982; Dutro and Patton, 1982.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Telida Mountain

Site type: Occurrence

ARDF no.: MD039

Latitude: 63.52 **Quadrangle:** MD C-1

Longitude: 153.18

Location description and accuracy:

The Telida Mountain occurrence is situated on a steep, south facing spur of a northwest-trending ridgeline of the Telida Mountains at an elevation of 1,750 feet (533 m) in Section 1, T. 23 S., R. 29 E., of the Kateel River Meridian. The location is imprecise and only known to within about one mile (1.6 km).

Commodities:

Main: Sn

Other: Ag, Be, Cd, Pb, W

Ore minerals: Cassiterite

Gangue minerals: Quartz

Geologic description:

Float that contained disseminated cassiterite was detected in granitic rocks of the Telida Mountains Pluton during reconnaissance exploration work by ASA Inc. The exploration was following up several anomalous areas recommended by the U.S. Geological Survey (Patton and Moll, 1983). The U.S. Geological Survy found anomalous tin, tungsten, beryllium, cadmium, and silver in stream sediment and pan concentrate samples in the area (King and others, 1983).

Alteration:

Age of mineralization:

Deposit model:

Tin-Polymetallic Veins (?) (Cox and Singer, 1986; model no. 20b)

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

20b(?)

Production Status: No

Site Status: Inactive

Workings/exploration:

The U.S. Geological Survey found anomalous tin, tungsten, berylium cadmium, and silver in both stream sediment and pan concentrate samples of the general occurrence area Grades of the mineralized float are not available.

Production notes:

Reserves:

None.

Additional comments:

See Win (MD060), Won - North (MD021), Won - South (MD024), and Gemini (MD023) prospects. The Telida Mountain occurrence is on lands conveyed to Doyon Ltd. For further information, contact Doyon Ltd at 210 1st Ave., Fairbanks, Alaska, 99701.

References:

King and others, 1983; Patton and Moll, 1983; DiMarchi and others, 1992.

Primary reference: Patton and Moll, 1983

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Whirlwind

Site type: Prospect

ARDF no.: MD040

Latitude: 63.504 **Quadrangle:** MD C-3

Longitude: 154.231

Location description and accuracy:

The Whirlwind prospect is situated at the southwest end of Whirlwind Ridge at an elevation of 2,700 feet (823 m) in Section 9, T. 23 S., R. 24 E., of the Kateel River Meridian. Location is accurate to within about 1,000 feet (304 m).

Commodities:

Main: Ag, Pb

Other: As, Cu

Ore minerals: Arsenopyrite, galena

Gangue minerals: Carbonate, quartz

Geologic description:

The Whirlwind prospect consists of veinlets and replacement zones near the contact of a composite pluton with Cretaceous flysch. The composite pluton, which is composed of pyroxenite, gabbro, and monzonite, is elongated parallel to the northeast trending ridgeline (Patton and others, 1980). Galena and arsenopyrite occur in replacement zones at the contact and as grains in mafic phases of the pluton. The pluton is marked by an elongated aeromagnetic high (Patton and others, 1982). The Whirlwind prospect is inferred to be Late Cretaceous, based on isotopic ages of the host pluton (Moll and others, 1981). Grab samples collected by DiMarchi and others (1992) contain as much as 276 ppm copper, 1.4 ppm silver, 396 ppm lead, and 6,192 ppm arsenic.

Alteration:

Age of mineralization:

The Whirlwind prospect is inferred to be Late Cretaceous, based on isotopic ages of the host pluton (Moll and others, 1981).

Deposit model:

Polymetallic veins (Cox and singer, 1986; model no. 22c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: No

Site Status: Inactive

Workings/exploration:
The Whirlwind Prospect was discovered in 1991 by ASA Inc. during regional exploration on lands selected by Doyon Ltd. Grab samples collected by DiMarchi and others (1992) contain as much as 276 ppm copper, 1.4 ppm silver, 396 ppm lead, and 6,192 ppm arsenic.

Production notes:

Reserves:
None.

Additional comments:
The Whirlwind prospect is on lands selected or owned by Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Patton and others, 1982; DiMarchi and others, 1992.

Primary reference: DiMarchi and others, 1992

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Unnamed

Site type: Occurrence

ARDF no.: MD041

Latitude: 63.498 **Quadrangle:** MD B-3

Longitude: 154.331

Location description and accuracy:

This occurrence is situated near the point of a bluff on Von Frank Creek at an elevation of 1,550 feet (472 m) in Section 13, T. 23 S., R. 23 E., of the Kateel River Meridian. Location is accurate to within about 1,000 feet (304 m).

Commodities:

Main: Ba

Other:

Ore minerals: Barite

Gangue minerals:

Geologic description:

Patton and Moll (1983) noted barite concretions in shale of the Whirlwind Creek Formation of Dutro and Patton (1982). Age of mineralization is believed to be Latest Silurian to lower Devonian, based on the age of the host Whirlwind Creek Formation (Dutro and Patton, 1982). Patton and Moll (1983) reported up to 50 ppm copper, 1,000 ppm zinc, and greater than 5,000 ppm barium from the shale samples.

Alteration:

Age of mineralization:

Age of the syngenetic barite mineralization is believed to be Latest Silurian to lower Devonian, based on the age of the host Whirlwind Creek Formation (Dutro and Patton, 1982).

Deposit model:

Bedded barite deposit (Cox and Singer, 1986; model no. 31b)

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

31b

Production Status: No

Site Status: Inactive

Workings/exploration:

This bedded barite occurrence was found by the U.S. Geological Survey during an AMRAP investigation of the McGrath quadrangle (Patton and others, 1980). Patton and Moll (1983) reported up to 50 ppm copper, 1,000 ppm zinc, and greater than 5,000 ppm barium from the shale samples.

Production notes:

Reserves:

None.

Additional comments:

The Unamed (MD041) sedimentary barite occurrence is on lands selected or owned by Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:

Patton and others, 1980; King and others, 1980; Patton and Moll, 1983.

Primary reference: Patton and Moll, 1983

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Lynn-Marie

Site type: Prospect

ARDF no.: MD042

Latitude: 63.481

Quadrangle: MD B-3

Longitude: 154.167

Location description and accuracy:

The Lynn-Marie prospect is located at 2,500 feet (762 m) in elevation near the crest of a prominent knob overlooking the headward reaches of the North Fork of Soda Creek in Section 23, T. 23 S., R. 24 E., of the Kateel River Meridian. Location is accurate to within about 250 feet (76 m).

Commodities:

Main: Zn

Other: Pb

Ore minerals: Smithsonite, sphalerite

Gangue minerals: Dolomite, secondary carbonate

Geologic description:

Mineralization in the Lynn-Marie prospect occurs in a solution-breccia gossan zone 50 feet (15 m) wide and 250 feet (76 m) long in the Silurian Paradise Fork Formation of Dutro and Patton (1982); this is unit 'Sic' of Andrews and Rishel (1982). The host rock is a fine grained micritic limestone and limey siltstone that has been extensively replaced by a white dolomite. The Lynn-Marie prospect is on the north limb of the Big Gate anticline immediately below micritic limestone of the Whirlwind Creek Formation (Dutro and Patton, 1982). Grab samples from surface exploration of the gossan contained up to 46.8 percent zinc, with no appraciable lead; however, galena was identified in hand specimens in the gossan.

Alteration:

Vuggy dolomite replacement.

Age of mineralization:

Age of host unit is believed to be Silurian (inferred) from fossils (Blodgett, 1982). The age of mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Lyn-Marie prospect was found in the late 1970s during a regional base metal exploration program conducted by WGM Inc. and Patino Ltd. on lands selected by Doyon Ltd. Grab samples from surface exploration of gossan contained up to 46.8 percent zinc, with no appreciable lead; however, galena was identified in hand specimens. About 10 to 50 percent of the mineralized zone was intense gossan.

Production notes:

Reserves:
None.

Additional comments:
See Reef Ridge (MD055) and Soda Creek (MD056) Mississippi Valley Type deposits. The Lynn-Marie prospect is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Andrews and Rishel, 1982; Blodgett, 1982; Dutro and Patton, 1982.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Starship

Site type: Prospect

ARDF no.: MD043

Latitude: 63.483 **Quadrangle:** MD B-3

Longitude: 154.076

Location description and accuracy:

The Starship prospect is located about one mile (1.5 km) northeast of the Bear Pass prospect on a northwest facing ridgeline at an elevation of 2,150 feet (655 m) in Section 20, T. 23 S., R. 25 E., of the Kateel River Meridian. Location is known to within about 125 feet (38 m).

Commodities:

Main: Zn

Other: Cd

Ore minerals: Smithsonite

Gangue minerals: Secondary carbonate

Geologic description:

The Starship prospect consists of a smithsonite-bearing solution breccia in dolomite and limestone of the Paradise Fork Formation of Dutro and Patton (1982); this is unit 'Sic' of Andrews and Rishel (1982). Zone of mineralization measures about 15 feet by 100 feet (4.5 m by 30 m) and is mainly in rubble crop. Age of host unit is Silurian (inferred), based on fossil control. (Patton and others, 1980; Dutro and Patton, 1982; Schmidt, 1997). The age of the mineralization is unknown. Grab samples from surface explorations of high grade mineralization contain up to 23.25 percent zinc and 0.14 percent cadmium. Mineralized rubble crop distribution indicates a relatively small and discordant mineral body.

Alteration:

Secondary dolomite.

Age of mineralization:

Age of host unit is Silurian (inferred), based on fossil control. (Dutro and Patton, 1982). The age of mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Starship prospect was found by WGM Inc. and Patino Ltd. in the late 1970s during base metal exploration on lands selected by Doyon Ltd (Andrews and Rishel, 1982). Grab samples from surface explorations of high grade mineralization contain up to 23.25 percent zinc and 0.14 percent cadmium. Mineralized rubble crop distribution indicates a relatively small and discordant mineral body.

Production notes:

Reserves:
None.

Additional comments:
See Spring Ridge (MD047), Bear Pass (MD044), Beaver (MD048), and Big Gate (MD050) Mississippi Valley Type occurrences in Medfra quadrangle. The Starship prospect is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Andrews and Rishel, 1982; Dutro and Patton, 1982; Schmidt, 1997.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Bear Pass

Site type: Prospect

ARDF no.: MD044

Latitude: 63.471 **Quadrangle:** MD B-3

Longitude: 154.089

Location description and accuracy:

The Bear Pass prospect is at approximately 2,300 feet (700 m) in elevation along a north-trending ridgeline in Section 29, T. 23 S., R. 25 E., of the Kateel River Meridian. Location is known to within 100 feet (30 m).

Commodities:

Main: Zn

Other: As, Cd, Mo

Ore minerals: Iron Oxides

Gangue minerals: Secondary carbonates

Geologic description:

Two zones of zinc-bearing, iron oxide gossan occur in areas of 150 feet by 60 feet (46 m by 18 m) and 150 feet by 40 feet (46 m by 12 m) on a prominant ridge top. Mineralization is hosted in a well-developed solution breccia of the Whirlwind Creek Formation of Dutro and Patton (1982); this is in unit 'Dda' of Andrews and Rishel (1982). Host rock is Lower Devonian based on fossil control in 'Dda' unit; age of mineralization is unknown. In both mineralized areas, gossan comprises about 5 percent of available float. A grab sample from an outcrop of solution-breccia mineralization contains 4.38 percent zinc and 100 ppm cadmium (Andrews and Rishel, 1982). Clautice and others (1993) reports grab sample assays of 2.00 percent zinc, 276 ppm arsenic, and 32 ppm molybdenum.

Alteration:

Age of mineralization:

Host rock is Lower Devonian based on fossil control in 'Dda' unit. The age of mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Bear Pass prospect was found by WGM Inc. and Patino Ltd. during the late 1970s while conducting base metal exploration on lands selected by Doyon Ltd. In both mineralized areas, gossan comprises about 5 percent of available float. A grab sample from an outcrop of solution breccia mineralization contains 4.38 percent zinc and 100 ppm cadmium. Clautice and others (1993) reports grab sample assays of 2.00 percent zinc, 276 ppm arsenic, and 32 ppm molybdenum.

Production notes:

Reserves:
None.

Additional comments:
See Starship (MD043), Spring Ridge (MD047), Beaver (MD048), and Bermuda (MD045) Mississippi Valley Type showings in Medfra quadrangle. The Bear Pass prospect is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Andrews and Rishel, 1982; Dutro and Patton, 1982; Clautice and others, 1993; Schmidt, 1997.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Bermuda

Site type: Prospect

ARDF no.: MD045

Latitude: 63.461 **Quadrangle:** MD B-3

Longitude: 154.065

Location description and accuracy:

The Bermuda prospect is located on a southwest spur at 2,000 feet (610 m) in elevation near the head of Beaver Creek, in the extreme southwest corner of Section 28, T. 23 S., R. 25 E., of the Kateel River Meridian. Location is known to within 100 feet (30 m).

Commodities:

Main: Zn

Other: Pb

Ore minerals: Smithsonite

Gangue minerals: Dolomite, secondary carbonates

Geologic description:

At the Bermuda prospect, iron-rich smithsonite gossan is hosted in recrystallized dolomite, which is considered to be the same northeast striking, mineralized dolomite layer as at the Big Gate (MD050) and Beaver (MD048) zinc occurrences. Host unit is probably equivalent to the Paradise Fork Formation of Dutro and Patton (1982); unit OSbd of Andrews and Rishel (1982). Host rock is inferred to be mid-Paleozoic based on fossil collections (Dutro and Patton, 1982). The age of mineralization is unknown. Composite grab samples in main spur area contained an average of 0.67 percent zinc and 0.035 percent lead. Further to the northeast, float found in stream cut along strike contained 17.00 percent zinc and 0.23 percent lead (Andrews and Rishel, 1982).

Alteration:

Secondary dolomite.

Age of mineralization:

Host rock is inferred to be Paleozoic based on fossil collections (Dutro and Patton, 1982). The age of the mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley

Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Bermuda prospect was found by WGM Inc. and Patino Ltd. in the late 1970s during exploration for base metals on lands selected by Doyon Ltd (Andrews and Rishel, 1982) Composite grab samples in main spur area contained an average of 0.67 percent zinc and 0.035 percent lead. Further to the northeast, float found in stream cut along strike contained 17.00 percent zinc and 0.23 percent lead (Andrews and Rishel, 1982).

Production notes:

Reserves:
None.

Additional comments:
See also Beaver (MD048), Hillside (MD049) and Big Gate (MD050) Mississippi Valley Type occurrences in Medfra B-3 quadrangle. The Bermuda prospect is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Andrews and Rishel, 1982; Dutro and Patton, 1982; Schmidt, 1997.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Midway

Site type: Prospect

ARDF no.: MD046

Latitude: 63.408 **Quadrangle:** MD B-3

Longitude: 154.29

Location description and accuracy:

The Midway prospect is located along a south-facing slope of an east-west ridgeline at an elevation of 1,400 feet (427 m) about 1.75 miles (2.8 km) northeast of the Reef Ridge deposit, in Section 18, T. 24 S., R. 24 E., of the Kateel River Meridian. Location is accurate to 100 feet (30 m).

Commodities:

Main: Zn

Other: Pb

Ore minerals: Smithsonite

Gangue minerals: Dolomite

Geologic description:

The Midway smithsonite prospect is located along a break in slope in limestone and dolomite of the Telsitna Formation of Dutro and Patton (1982). The Midway occurrence is mainly manifested in anomalous lead and zinc in springs and seeps that occur along a break in slope. Smithsonite was identified in solution breccias exposed in rubble. Most of the prospect area is covered by vegetation. A soil grid established a 500 feet by 800 feet (152m by 244 m) anomalous zone which averages 250 ppm zinc and 100 ppm lead. Nearby stream sediment sampling yielded up to 176 ppm lead and 500 ppm zinc (Andrews and Rishel, 1982).

Alteration:

Age of mineralization:

Deposit model:

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

Production Status: No

Site Status: Inactive

Workings/exploration:

The Midway prospect was found by WGM Inc. and Patino Ltd. during exploration for base metals in the late 1970s on lands selected by Doyon Ltd. A soil grid established a 500 feet by 800 feet (152m by 244 m) anomalous zone which averages 250 ppm zinc and 100 ppm lead. Nearby stream sediment sampling yielded up to 176 ppm lead and 500 ppm zinc (Andrews and Rishel, 1982).

Production notes:

Reserves:

None.

Additional comments:

The Midway prospect is on land selected or coveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:

Andrews and Rishel, 1982; Dutro and Patton, 1982; Schmidt, 1997.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/1/98

Site name(s): Spring Ridge

Site type: Prospects

ARDF no.: MD047

Latitude: 63.466 **Quadrangle:** MD B-3

Longitude: 154.13

Location description and accuracy:

The Spring Ridge prospects consists of two areas of mineralization about 1,000 feet apart on northwest spurs at 1,900 feet in elevation (580 m) in Section 25, T. 23 S., R. 23 E., of the Kateel River Meridian. Location is accurate within 1,000 feet (304 m).

Commodities:

Main: Zn

Other: Pb

Ore minerals: Smithsonite

Gangue minerals: Dolomite

Geologic description:

At the Spring Ridge prospects, smithsonite-bearing gossans occur on two adjacent ridge spurs about 1,000 feet (300 m) apart, and about 30 feet by 50 feet (9 m by 15 m) in size, in the lower part of the Whirlwind Creek Formation of Dutro and Patton (1982); this is unit 'Dda' of Andrews and Rishel (1982). Mineralization in both areas occur in well developed solution breccias in dolomite. Host rock is inferred to be Latest Silurian based on fossils; however, the age of the mineralization is unknown. A grab sample from surface exploration along the eastern spur yielded 2.72 percent zinc and 0.14 percent lead. Two grab samples from the western spur contained 9.07 percent zinc and 12.00 percent zinc respectively; no lead was detected in either sample (Andrews and Rishel, 1982).

Alteration:

Secondary dolomite in fractures.

Age of mineralization:

Host rock is inferred to be Latest Silurian based on fossils (Dutro and Patton, 1982); however, the age of the mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley

Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Spring Ridge prospects were found by WGM Inc. and Patino Ltd. during base metal exploration conducted in the 1970s on lands selected by Doyon Ltd. (Andrews and Rishel, 1982). A grab sample from surface exploration along the eastern spur yielded 2.72 percent zinc and 0.14 percent lead. Two grab samples from the western spur contained 9.07 percent zinc and 12.00 percent zinc respectively; no lead was detected in either sample.

Production notes:

Reserves:
None.

Additional comments:
See Starship (MD043), Bermuda (MD045), and Bear Pass (MD044) Mississippi Valley Type occurrences in Medfra quadrangle. The Spring Ridge prospects are on land selected or conveyed to Doyon Ltd. For further infoemation, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Andrews and Rishel, 1982; Dutro and Patton, 1982; Schmidt, 1997.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Beaver

Site type: Prospect

ARDF no.: MD048

Latitude: 63.445

Quadrangle: MD B-3

Longitude: 154.118

Location description and accuracy:

The Beaver prospect is located on a south-facing slope at 1,950 feet (595 m) in elevation, upslope from the West Fork of Beaver Creek in Section 6, T. 24 S., R. 25 E., of the Kateel River Meridian. Location is known within 100 feet (30 m).

Commodities:

Main: Zn

Other: Pb

Ore minerals: Cerussite, galena, smithsonite

Gangue minerals: Dolomite, ferrigenous gossan, secondary carbonate

Geologic description:

At the Beaver prospect, mineralized rubble covers a 400 feet by 100 feet (122 m by 30 m) area in a sheet of gray dolomite of the Paradise Fork Formation of Dutro and Patton (1982). Smithsonite-rich, cerrusite-galena zones occur in well developed solution breccias, especially in recrystallized white, vuggy dolomite. Host unit trends N 45 E and dips 45 degrees South. Beaver is considered the best of a series of Mississippi Valley Type deposits exposed on the north limb of the Beaver Creek syncline. Other related deposits include Big Gate (MD050), Hillside (MD049), and Bermuda (MD045) showings. Host rock is Ordovician-Silurian, based on fossils in host unit (Blodgett, 1982); however, the age of the mineralization is unknown.

Grab samples from cerussite-rich gossan contain up to 32.7 percent zinc and 34.5 percent lead. A continuous trench sample that was composed of about 80 percent gossan contained 19.25 percent zinc and 0.90 percent lead over a 40 feet (12 m) interval (Schmidt, 1997).

Alteration:

White vuggy dolomite; galena to oxidized cerrusite.

Age of mineralization:

Host rock is Ordovician-Silurian, based on fossils in host unit (Blodgett, 1982); however, the age of the mineralization is unknown.

Deposit model:
Southeast Missouri Pb-Zn (Cox and singer, 1986; model no. 32a) or Mississippi Valley Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Beaver prospect was discovered by WGM Inc. and Patino Ltd. during exploration for base metals on lands in the 'Reef Ridge district.' Sporadic surface investigations were continued by Pasminco Ltd. until about 1989. Grab samples from cerussite-rich gossan contain up to 32.7 percent zinc and 34.5 percent lead. A continuous trench sample that was composed of about 80 percent gossan contained 19.25 percent zinc and 0.90 percent lead over a 40 feet (12 m) channel interval (Schmidt, 1997).

Production notes:

Reserves:
None.

Additional comments:
See Bermuda (MD045), Hillside (MD049), and Big Gate (MD050) Mississippi Valley Type occurrences in Medfra B-3 quadrangle.

References:
Blodgett, 1982; Dutro and Patton, 1982; Anderson and Macqueen, 1988; Schmidt, 1997.

Primary reference: Schmidt, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Hillside

Site type: Occurrence

ARDF no.: MD049

Latitude: 63.44

Quadrangle: MD B-3

Longitude: 154.126

Location description and accuracy:

The Hillside lead occurrence is on a south-facing slope at 1,800 feet (549 m) in elevation near the West Fork of Beaver Creek; it is about 2,500 feet (760 m) southwest of the Beaver prospect in Section 6, T. 24 S., R. 25 E., of the Kateel River Meridian. Location is known within about 250 feet (76 m).

Commodities:

Main: Pb, Zn

Other: Fe

Ore minerals: Galena, iron-rich gossan

Gangue minerals: Dolomite

Geologic description:

At the Hillside occurrence, iron-rich gossan occurs in a 100 feet by 50 feet (30 m by 15 m) area that is hosted in solution breccias of the Beaver Creek Dolomite (Schmidt, 1997). Mineralization is believed to occur in roughly the same 'stratigraphic' horizon as the Beaver (MD048), Big Gate (MD050), and Bermuda (MD045) Mississippi Valley Type occurrences, which occur along the south limb of Beaver Creek Syncline. Host units are inferred to be Lower Paleozoic from fossils in dolomite (Blodgett, 1982).

Grab samples from surface exploration contain from 0.22 to 2.40 percent lead and up to 2,200 ppm zinc in a 100 feet by 50 feet (30 m by 15 m) area (Schmidt, 1997).

Alteration:

Age of mineralization:

Host units are inferred to be Lower Paleozoic from fossils in dolomite. (Blodgett, 1982); however, the age of the mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Hillside occurrence was discovered by WGM Inc. and Patino Ltd. during exploration for base metals in the 'Reef Ridge district' (Schmidt, 1997). Grab samples from surface exploration contain from 0.22 to 2.40 percent lead with up to 2,200 ppm zinc in a 100 feet by 50 feet (30 m by 15 m) area (Schmidt, 1997).

Production notes:

Reserves:
None.

Additional comments:
See Beaver (MD048), Big Gate (MD050), and Bermuda (MD045) Mississippi Valley Type showings.

References:
Patton and Others, 1980; Blodgett, 1982; Dutro and Patton, 1982; Anderson and Macqueen, 1988; Schmidt, 1997.

Primary reference: Schmidt, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Big Gate

Site type: Occurrence

ARDF no.: MD050

Latitude: 63.438

Quadrangle: MD B-3

Longitude: 154.156

Location description and accuracy:

The Big Gate zinc occurrence is located at an elevation of approximately 1,700 feet (518 m), east of the North Fork of Soda Creek in Section 1, T. 24 S., R. 24 E., of the Kateel River Meridian. Location is known to within 250 feet (76 m).

Commodities:

Main: Zn

Other: Pb

Ore minerals:

Gangue minerals: Mineralized gossan

Geologic description:

The Big Gate iron-rich gossan occurs in the Beaver Dolomite of Andrews and Rishel (1982), the same unit hosting mineralization at the Hillside (MD0049), Beaver (MD048), and Bermuda (MD045) Mississippi Valley Type showings. The gossan occurs in an irregular zone with an approximate surface diameter of 200 feet (61 m). Host units are inferred to be Silurian from fossils (Dutro and Patton, 1982). The age of the mineralization is unknown. Grab samples contained up to 0.1 percent lead and 2.0 percent zinc (Andrews and Rishel, 1982).

Alteration:

Secondary dolomite.

Age of mineralization:

Host units are inferred to be Silurian from fossils (Dutro and Patton, 1982). The age of the mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley Type.

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Big Gate gossan was discovered by WGM Inc. and Patino Ltd. during exploration for base metals in the late 1970s on lands selected by Doyon Ltd. (Andrews and Rishel, 1982). Surface grab samples contained up to 0.1 percent lead and 2.0 percent zinc.

Production notes:

Reserves:
None.

Additional comments:
See Hillside (MD049), Beaver (MD048), and Bermuda (MD045) Mississippi Valley Type occurrences. The Big Gate occurrence is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Andrews and Rishel, 1982; Blodgett, 1982; Dutro and Patton, 1982.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Katy-O

Site type: Occurrence

ARDF no.: MD051

Latitude: 63.449 **Quadrangle:** MD B-3

Longitude: 154.24

Location description and accuracy:

This occurrence is located at an elevation of 2,000 feet (610 m) in an unnamed creek basin in Section 33, R. 23 S., R. 24 E., of the Kateel River Meridian. Location is known to within 300 feet (91 m).

Commodities:

Main: Zn

Other:

Ore minerals: Zinc-bearing gossan

Gangue minerals: Dolomite

Geologic description:

The Katy-O occurrence is a poorly exposed gossan in a small area of unit 'Dlr' of Andrews and Rishel (1982); it is probably equivalent to the lower Whirlwind Creek Formation of Dutro and Patton (1982). Host unit is inferred to be Lower Devonian, based on fossils. The age of the mineralization is unknown. Gossan in float contains 1 percent zinc (Andrews and Rishel, 1982).

Alteration:

Age of mineralization:

Host unit is inferred to be Lower Devonian, based on fossils. The age of the mineralization is unknown.

Deposit model:

Southeast Missouri Pb-Zn (Cox and Singer, 1986; model no. 32a) or Mississippi Valley Type

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

32a

Production Status: No

Site Status: Inactive

Workings/exploration:

The Katy-O occurrence was discovered by WGM Inc. and Patino Ltd. during exploration for base metals in the late 1970s on lands selected by Doyon Ltd. (Andrews and Rishel, 1982). Gossan in float contains 1 percent zinc.

Production notes:

Reserves:

None.

Additional comments:

See Lynn-Marie (MD042) Mississippi Valley Type occurrence. The Katy-O occurrence is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:

Andrews and Rishel, 1982; Dutro and Patton, 1982; Schmidt, 1997.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Canyon Creek

Site type: Occurrence

ARDF no.: MD052

Latitude: 63.43

Quadrangle: MD B-3

Longitude: 154.34

Location description and accuracy:

The Canyon Creek placer occurrence is situated in Canyon Creek at an elevation of 1,250 feet (381 m) in Section 1, T. 24 S., R. 23 E., of the Kateel River Meridian. Location is imprecise and judged to be within a one mile (1.6 km) radius.

Commodities:

Main: Au

Other: Ag

Ore minerals: Placer gold

Gangue minerals:

Geologic description:

Brown (1926) mentions that placer gold was found in Canyon Creek around 1920. No details as to the thickness of overburden, pay gravels or grade are known. Age of mineralization is unknown.

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: No

Site Status: Active

Workings/exploration:

Production notes:

Reserves:
None.

Additional comments:

References:
Brown, 1926.

Primary reference: Brown, 1926

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Atoll

Site type: Prospect

ARDF no.: MD053

Latitude: 63.417

Quadrangle: MD B-3

Longitude: 154.367

Location description and accuracy:

The Atoll prospect is situated at about 2,000 feet in elevation on the northwest slope of a ridge approximately 2.5 miles (4 km) northwest of Reef Ridge, in Section 11, T. 24 S., R. 23 E., of the Kateel River Meridian. Location is precisely known to within 100 feet (30 m).

Commodities:

Main: Zn

Other: Pb

Ore minerals: Smithsonite

Gangue minerals: Dolomite, ferricrete minerals

Geologic description:

At the Atoll prospect, smithsonite-bearing, iron-oxide gossan covers an area of 300 feet by 50 feet (91 m by 15 m) in tectonized dolomite and micritic limestone; unit probably equivalent to the Paradise Fork Formation of Dutro and Patton (1982). Mineralized rubble constitutes about one percent of float on the hillslope. Host unit is Late-Ordovician based on fossils (Dutro and Patton, 1982). Age of mineralization is not known.

A large composite, chip-channel sample of 50 samples taken across the mineralized zone averaged 1.0 percent zinc and 395 ppm lead. A high-graded sample of 10 pieces of mineralized float contained 7.95 percent zinc but no lead. A strong zinc soil anomaly (1,900 to 4,000 ppm) covers a 1,000 feet by 4,000 feet (300 m by 122 m) area below the Atoll prospect (Andrews and Rishel, 1982).

Alteration:

Secondary dolomite.

Age of mineralization:

Host unit is Late-Ordovician based on fossils (Dutro and Patton, 1982). Age of mineralization is not known.

Deposit model:
Southeast Missouri Pb-Zn, (Cox and Singer, 1986; model no. 32a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Atoll prospect was discovered by WGM Inc. and Patino Ltd. during exploration for base metals in the late 1970s on lands selected by Doyon Ltd. (Andrews and Rishel, 1982). A large composite, chip-channel sample of 50 samples taken across the mineralized zone averaged 1.0 percent zinc and 395 ppm lead. A high-graded sample of 10 pieces of mineralized float yielded 7.95 percent zinc but no lead. A strong zinc soil anomaly (1,900 to 4,000 ppm) covers a 1,000 feet by 4,00 feet (300 m by 122 m) area below the Atoll prospect.

Production notes:

Reserves:
None.

Additional comments:
See Reef Ridge (MD055), Midway (MD046), Beaver Creek (MD048) ,and other Mississippi Valley Type prospects in Medfra quadrangle. The Atoll prospect is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Andrews and Rishel, 1982; Dutro and Patton, 1982; Schmidt, 1997.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Saddle

Site type: Prospect

ARDF no.: MD054

Latitude: 63.406

Quadrangle: MD B-3

Longitude: 154.345

Location description and accuracy:

The Saddle prospect occurs in the divide between Nixon Fork and Soda Creek drainages and about 1.3 miles (2 km) north of Reef Ridge deposit in Section 13, T. 22 S., R. 22 E., of the Kateel River Meridian. Location is precisely known to within 100 feet (30 meters).

Commodities:

Main: Zn

Other: Pb

Ore minerals: Smithsonite

Gangue minerals: Dolomite, ferricrete, secondary calcite

Geologic description:

The Saddle prospect is underlain by a continuous sequence of laminated to thinly bedded, light to dark gray dolomite of the Lower to Middle Silurian Paradise Fork Formation (Dutro and Patton, 1982). Host units strike N 80 to 85 West and dip 55 degrees South. The bedded sequence hosting the smithsonite mineralization is underlain on the north and south by dolomitic shale beds of the Middle to Upper Telsitna Formation (Dutro and Patton, 1982). Mineralization occurs in a 10 foot (3m) wide by 20 feet (6 m) long Amphipora-bearing horizon of bedded dolomite containing smithsonite, secondary dolomite, ferricrete, and secondary calcite in solution breccia. Host rock age is Silurian, based on Amphipora sp. found in ore zone of Paradise Fork Formation (Blodgett, 1982). The age of the mineralization is unknown.

Soil sampling from surface exploration indicates a weak to moderate zinc anomaly extending in an east-west direction for about 1,200 feet (366 m). Three grab samples in the smithsonite-bearing solution breccia zone averaged 15.79 percent zinc with no appreciable lead (Schmidt, 1997).

Alteration:

Smithsonite and sulfide species altered to ferricrete by groundwater.

Age of mineralization:
Host rock age is Silurian, based on Amphipora found in ore zone of Paradise Fork Formation (Blodgett, 1982). The age of the mineralization is unknown.

Deposit model:
Appalachian zinc (Cox and Singer ,1986; model no. 32b) or Mississippi Valley Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32b

Production Status: No

Site Status: Inactive

Workings/exploration:
The Saddle prospect was discovered by WGM Inc. and Patino Ltd. during exploration for base metasls in the late 1970s. Intermittant exploration work was continued by Pasminco Ltd. until about 1989 (Schmidt, 1997). Soil sampling from surface exploration indicates a weak to moderate zinc anomaly extending in an east-west direction for about 1,200 feet (366 m). Three grab samples in the smithsonite-bearing solution breccia zone average 15.79 percent zinc and no appreciable lead (Schmidt, 1997).

Production notes:

Reserves:
None.

Additional comments:
See Soda Creek (MD056), Reef Ridge (MD055), Midway (MD046) and Bear Pass (MD044) prospects in Medfra Quadrangle.

References:
Patton and others, 1980; Blodgett, 1982; Dutro and Patton, 1982; Anderson and Macqueen, 1988; Schmidt, 1997.

Primary reference: Schmidt, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/1/98

Site name(s): Reef Ridge

Site type: Prospect

ARDF no.: MD055

Latitude: 63.384 **Quadrangle:** MD B-3

Longitude: 154.364

Location description and accuracy:

The Reef Ridge prospect is located on a south-facing spur ridge north of the West Fork of Soda Creek, in the Medfra B-3 quadrangle in Section 26, T. 24 S., R. 23 E., of the Kateel River Meridian, at an elevation of 1840 feet (561 m). Location is precisely known; reporter visited property in 1993 and 1997.

Commodities:

Main: Zn

Other: Ag, Cd, Pb

Ore minerals: Cerussite, galena, hydrozincite, pyrite, smithsonite, sphalerite

Gangue minerals: Iron ferricrete, pyrite, white dolomite

Geologic description:

Mineralization at the Reef Ridge deposit covers a surface area of about 700 feet (213 m) by 1,200 feet (366 m), and is hosted in the lower portion of the Whirlwind Creek Formation of Latest Silurian to Middle Devonian age (Dutro and Patton, 1982). As subdivided in the prospect area, the Whirlwind Creek Formation that hosts the metallic mineralization at Reef Ridge consists of vuggy dolomite, interbedded laminated Amphipora rich, algal limestone and lime mudstone, a distinctive carbonate conglomerate with black chert pebbles, and a fossiliferous carbonate reef complex. Clautice and others (1993) reported Pb-Pb analyses which are permissive for classification of the Reef Ridge prospect as a classic Mississippi Valley Type deposit.

Two major zones have been identified. The eastern zone trends on surface N 20 E and is approximately 450 feet (137 m) long and 60 feet (18 m) wide. Mineralization consisting of secondary smithsonite, with minor flecks of galena and pyrite that have been introduced into tectonic breccias with a distinctive white dolomite gangue. The breccias are introduced along the high angle 'Prospect Fault' (Andrews and Rishel, 1982; Mosher, 1990). The west zone trends N 20 W and is approximately 700 feet (213 m) long and up to 160 feet (49 m) wide. At depth, the west zone deflects to a strike approximately parallel to the east zone decribed above. Mineralization in the west zone is characterized by hydrozincite hosted in strong solution breccias and accompanied by black hydrocarbon residues. Most of the zinc mineralization in the west zone is controlled by a high angle fracture; however, tectonic breccias are not as well developed in the west zone as they are in the east zone. Host lithology is inferred to be Devonian based on fossils at prospect. Age of mineralization is not known.

From 1976 to 1982, WGM Inc., operator for Patino Ltd., completed about 2,000 feet (610 m) of diamond drilling and 1,700 feet (518 m) of trenching on the Reef Ridge property. One drill hole (#8) in the east zone intersected 38 feet (11.5 m) of 7.44 percent zinc, and 19 feet (5.8 m) grading 6.41 percent zinc. One drill hole (#1) in the west zone intersected 56 feet (17 m) grading 10.46 percent zinc. Schmidt (1997) indicates that one hole (not identified) intersected 154 feet (47 m) grading 20 percent zinc at Reef Ridge. Silver and lead values are not given although up to 1,000 ppm cadmium and 1,000 ppm lead were encountered in assay results. No silver values are given. Clautice and others (1993) report assay values of 2.00 percent zinc, and 2,000 ppm cadmium.

Alteration:

Groundwater has caused all primary metallic minerals to be nearly completely oxidized to secondary minerals; i.e. pyrite has altered to ferricrete; galena has altered to cerussite, and other secondary minerals.

Age of mineralization:

Host lithology is inferred to be Devonian based on fossils at prospect. Age of mineralization is not known.

Deposit model:

Southeast Missouri lead-zinc (Cox and Singer, 1986; model no. 32a; Fisher and Juilliand, 1886)

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

32a

Production Status: No

Site Status: Inactive

Workings/exploration:

The Reef Ridge deposit was discovered by WGM Inc. and Patino Ltd. during exploration for base metals in the 1970s on lands selected by Doyon Ltd. (Andrews and Rishel, 1982). From 1976 to 1982, the exploration operator, WGM Inc., completed about 2,000 feet (610 m) of diamond drilling and 1,700 feet (518 m) of trenching on the Reef Ridge property. One drill hole (#8) in the east zone intersected 38 feet (11.5 m) of 7.44 percent zinc, and 19 feet (5.8 m) grading 6.41 percent zinc. One drill hole (#1) in the west zone intersected 56 feet (17 m) grading 10.46 percent zinc. Schmidt (1997) indicates that one hole (not identified) intersected 154 feet (47 m) grading 20 percent zinc at Reef Ridge. Silver and lead values are not given although up to 1,000 ppm cadmium and 1,000 ppm lead were encountered in assay results. No silver values are given. Clautice and others (1993) report assay values of 2.00 percent zinc, and 2,000 ppm cadmium.

Production notes:

Reserves:

Based on the 1976-1982 subsurface and surface exploration work, an inferred reserve of 1,980,000 tons (1,800,000 tonnes) grading 6.5 percent zinc has been identified at the Reef Ridge deposit (Andrews and Rishel, 1982; Fair and Bright, 1989; Schmidt, 1997).

Additional comments:

See also Soda Creek (MD056), Asmyrahha (MD080), Saddle (MD054), Atoll (MD053), Midway (MD046), Big Gate (MD050), Beaver (MD048), Hillside (MD049), and Bear Pass (MD044) Mississippi Valley Type prospects and occurrences in Medfra quadrangle. The Reef Ridge deposit is on land selected or conveyed to Doyon Ltd. For further information contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:

Patton and others, 1980; Andrews and Rishel, 1982; Dutro and Patton, 1982; Fisher and Juilland, 1986; Fair and Bright, 1989; Mosher, 1990; Clautice and others, 1993; Schmidt, 1997.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 5/6/98

Site name(s): Soda Creek

Site type: Prospects

ARDF no.: MD056

Latitude: 63.348 **Quadrangle:** MD B-3

Longitude: 154.418

Location description and accuracy:

The Soda Creek prospects are located on a north facing slope near the top of an east-west trending ridgeline south of Soda Creek in the Medfra B-3 quadrangle in Section 2, T. 25 S., R. 23 E., of the Kateel River Meridian, at an elevation of 2,250 feet (686 m). Location is precisely known; reporter visited the property in 1993.

Commodities:

Main: Zn

Other: Pb

Ore minerals: Smithsonite

Gangue minerals: Dolomite, iron ferricrete

Geologic description:

Two small carbonate hosted zinc/lead deposits approximately 1,500 feet (457 m) apart are structurally controlled along fractures and solution breccia zones in an interbedded carbonate unit that is probably equivalent to the Paradise Creek Formation of Dutro and Patton (1982). The South Soda Creek prospect consists of a linear zone up to 3 feet (0.9 m) wide and up to 30 feet (9.1 m) long in strongly mineralized rubble that is largely composed of solution breccias of several types (Schmidt, 1997). The North Soda Creek deposit consists of smithsonite-bearing gossan in a 2,000 square foot area on a steep, north-facing dip slope. The smithsonite appears to be introduced along a 10 foot (3 m) thick brecciated zone in massive micrite limestone. Mineralization does not extend laterally for more than 200 feet (61 m). Solution breccias occur at both prospecting sites. Rocks hosting the mineralization are inferred to be Late Silurian in age, based on fossils at the site; however, the specific age of the mineralization is unknown.

From 1976 to1982, surface sampling and limited trenching was completed on the property. One grab sample at the South Soda Creek prospect contained 26.6 percent zinc and 0.11 percent lead. Other grab samples contained from 370 ppm to 18.10 percent zinc, 2 to 35 ppm cadmium, and 7 to 250 ppm lead. At the North Soda Creek showing, a channel sample along a 37 foot (11.2 m) long trench yielded 0.50 percent zinc, but no lead or cadmium (Schmidt, 1997).

Alteration:
White dolomite; secondary carbonate solution breccias.

Age of mineralization:
Host is inferred to be Late Silurian in age, based on fossils at site; however, the age of the mineralization is unknown.

Deposit model:
Southeast Missouri Lead-Zinc (Cox and Singer, 1986; model no. 32a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Soda Creek prospects were discovered by WGM Inc. and Patino Ltd. during exploration for base metals in the late 1970s (Schmidt, 1997). From 1976 to1982, surface sampling and limited trenching was completed on the property. Intermittant exploration work was continued by Pasminco Ltd. until about 1989 (Schmidt, 1997). One grab sample at the South Soda Creek prospect contained 26.6 percent zinc and 0.11 percent lead. Other grab samples contained from 370 ppm to 18.10 percent zinc, 2-to-35 ppm cadmium, and 7-to-250 ppm lead. At the North Soda Creek showing, a channel sample along a 37 foot (11.2 m) long trench yielded 0.50 percent zinc, but no lead or cadmium (Schmidt, 1997).

Production notes:

Reserves:
None.

Additional comments:
See also Reef Ridge (MD055), Asmyrahha (MD080), Atoll (MD053), Big Gate (MD050), Hillside (MD049), and Bear Pass (MD044) prospects in Medfra quadrangle.

References:
Patton and others, 1980; Dutro and Patton, 1982; Fisher and Juilland, 1986; Anderson and Macqueen, 1988; Schmidt, 1997.

Primary reference: Schmidt, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 5/8/98

Site name(s): Boulder Creek

Site type: Occurrence

ARDF no.: MD057

Latitude: 63.31 **Quadrangle:** MD B-4

Longitude: 154.63

Location description and accuracy:

The Boulder Creek placer occurrence is located in Boulder Creek valley at an elevation of 1,000 feet (304 m) in Section 11, T. 25 S., R. 22 E., of the Kateel River Meridian. Location is imprecisely known and judged to be within a two mile (3.2 km) radius.

Commodities:

Main: Au

Other: Ag

Ore minerals: Placer gold

Gangue minerals:

Geologic description:

Placer gold was found in the valley of Boulder Creek, a third order tributary of the Nixon Fork, in 1920 (Brown, 1926). No bedrock is exposed and no gravel thicknesses are known. Age of mineralization is unknown.

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: No

Site Status: Inactive

Workings/exploration:

Production notes:

Reserves:
None.

Additional comments:

References:
Brown, 1926; King and others, 1983.

Primary reference: Brown, 1926

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Jones Creek

Site type: Occurrence

ARDF no.: MD058

Latitude: 63.32 **Quadrangle:** MD B-4

Longitude: 154.71

Location description and accuracy:

The Jones Creek placer occurrence is situated in Jones Creek valley at an elevation of about 850 feet (259 m) in Section 17, T. 25 S., R. 22 E., of the Kateel River Meridian. Location is imprecisely known and judged to be within a two mile (3.2 km) radius.

Commodities:

Main: Au

Other: Ag

Ore minerals: Placer gold

Gangue minerals:

Geologic description:

Placer gold was discovered in Jones Creek about 1920 (Brown, 1926; King and others,1983). No bedrock is exposed. No estimates of gravel thickness are available. Age of mineralization is unknown.

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: No

Site Status: Inactive

Workings/exploration:

Discovery occurred about 1920. There are no records of any production.

Production notes:

Reserves:
None.

Additional comments:

References:
Brown, 1926; King and others, 1983.

Primary reference: Brown, 1926

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/6/98

Site name(s): Cloud

Site type: Occurrence

ARDF no.: MD059

Latitude: 63.201 **Quadrangle:** MD A-6

Longitude: 155.977

Location description and accuracy:

The Cloud occurrence is located on a northeast facing spur of Cloudy Mountain at an elevation af approximately 2,400 feet (731 m) in Section 27, T. 26 S., R. 15 E., of the Kateel River Meridian. The prospect is located to within 1,000 feet (300 m).

Commodities:

Main: Ag, Sn

Other: As, Bi, Pb, Sb, Zn

Ore minerals: Arsenopyrite, cassiterite, Pb-Sb-Zn-Ag sulfosalts

Gangue minerals: Quartz, tourmaline

Geologic description:

The geologic description is sketchy and based on a brief industry report (Anaconda Minerals Company, written communication, 1984). The Cloud prospect is not as well documented as the Win (MD060), Won-North (MD021), Won-South (MD024), and Gemini (MD023) tin-silver prospects in the Medfra quadrangle. The Cloud prospect consists of quartz-tourmaline (cassiterite-arsenopyrite-complex Pb-Sb-Zn-Ag sulfosalt) veins in hornfels about 2,000 feet (600 m) from the contact with a small monzonite stock. Vein orientations and dimensions were not given. The hornfels is thermally altered Kuskokwim Group of Upper Cretaceous age (Patton and others, 1980). Age is judged to be Late Cretaceous-early Tertiary, based on dated, genetically related intrusives nearby (Bundtzen and Miller, 1997). No specific assay data is available for this summary.

Alteration:

Age of mineralization:

Age is judged to be Late Cretaceous-early Tertiary, based on dated, genetically related intrusives nearby (Bundtzen and Miller, 1997).

Deposit model:

Tin polymetallic vein (Cox and singer, 1986; model no. 20b)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
20b

Production Status: No

Site Status: Inactive

Workings/exploration:
The prospect area was discovered in 1983 by Duval Corporation while following up stream sediment anomaly data released by the U.S. Geological Survey (King and others, 1980; 1983; Patton and others, 1980). No specific assay data is available.

Production notes:

Reserves:
None.

Additional comments:
See Won - North (MD021), Won - South (MD024), Win (MD060), and Gemini (MD023) prospects.

References:
King and others, 1980; King and others, 1983; Patton and others, 1980; Bundtzen and Miller, 1997.

Primary reference: King and others, 1983

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Win

Site type: Prospect

ARDF no.: MD060

Latitude: 63.201 **Quadrangle:** MD A-6

Longitude: 155.881

Location description and accuracy:

This prospect is located on a southeast trending spur extending from VABM Side, at an elevation of 1,500 feet (457 m) in Section 31, T. 26 S., R. 16 E., of the Kateel River Meridian. The reporter visited the site in 1984.

Commodities:

Main: Ag, Nb, Sn

Other: As, Bi, Cu, Fe, Pb, Sb, Sc, Te, Zn

Ore minerals: Arsenopyrite, bismuthinite, bismuth-lead sulfosalts, cassiterite, chalcopyrite, silver-tellurium sulfosalts, sphalerite

Gangue minerals: Anatase, quartz, tourmaline

Geologic description:

Mineralization at the Win prospect consists of polymetallic-sulfide and quartz-cassiterite mineralized vein and breccia vein systems within a quartz -tourmaline (dravite)-altered hornfels aureole that appears to be related to a small felsic stock and related dikes. Host rocks for the veins and vein breccias are lithic sandstone and siltstone of the Upper Cretaceous Kuskokwim Group (Bundtzen and Miller, 1997); age of mineralization is inferred to be Late Cretaceous based on 70.0 Ma age of nearby Cloudy Mt. intrusion (Moll and others, 1981).The intrusions are cal-alkalic, high Ca, low K, biotite rich, magnetite-bearing, oxidized garnet bearing dacite and granite porphyry (Burleigh, 1992). Mineralization in the hornfels covers a diffuse 1.25 square mile (3.2 square km) area, mainly south of the intrusive center. Mineralized veins and breccia zones exhibit a pronounced N 65 to 75 W trend -- coincident with several regional faults in the immediate area (Patton and others, 1980). Virtually all significant mineralization ocurs in hornfels and not in intrusives.

An extensive sampling program yielded many high grade samples of polymetallic mineralization (Burleigh, 1992, BMOFR 92-92). One 7.75 foot (2.4 m) channel sample across a breccia vein contained 18.82 ounces/ton silver and 6.97 peercent tin. Additional sampling showed values as high as 94.63 ounces/ton silver, 46.38 percent tin, 926 ppm bismuth, 0.36 percent copper, 1,699 ppm niobium, 5.00 percent antimony, 0.77 percent zinc, and 390 ppm selenium. Niobium values have a high correlation coefficient with tin at the Win prospect.

Alteration:

Tourmaline-quartz-sericite in felsic intrusive rocks; quartz-tourmaline-sphene in hornfels.

Age of mineralization:

Late Cretaceous (inferred) based on 70.0 Ma age of nearby Cloudy Mt. intrusion (Moll and others, 1981). Specific age of the deposit is unknown.

Deposit model:

Tin polymetallic vein (Cox and singer, 1986; model no. 20b)

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

20b

Production Status: No

Site Status: Inactive

Workings/exploration:

Duval Corporation trenched several veins at the Win prospect in the 1970s and early 1980s. Anaconda Minerals followed up with additional trenching and sampling in 1983. Online Exploration Services conducted surface sampling and an airborne geophysical survey of the Win prospect in 1997. An extensive sampling program conducted by the U.S. Bureau of Mines (Burleigh, 1992; BMOFR 92-92) yielded many high grade samples of polymetallic mineralization. One 7.75 foot (2.4 m) channel sample across a breccia vein contained 18.82 ounce/ton silver, and 6.97 percent tin. Additional sampling showed values as high as 94.63 ounce/ton silver, 46.38 percent tin, 926 ppm bismuth, 0.36 percent copper, 1,699 ppm niobium, 5.00 percent antimony, 0.77 percent zinc, and 390 ppm selenium. Niobium positively correlates with high tin values at the Win prospect. Anomalous gold has also been detected (Jim Adler, personal communication, 1998).

Production notes:

Reserves:

Despite widespread high grade mineralization, reserves have not been calculated, and there has been no drilling recorded as of 1997.

Additional comments:

See Won - South (MD024), Won - North (MD021), Cloud (MD059), and Gemini (MD023) prospects.

References:

Patton and others, 1980; Moll and others, 1981; Burleigh, 1992 (BMOFR 92-92); Bundtzen and Miller, 1997.

Primary reference: Burleigh, 1992 (BMOFR 92-92)

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Nixon Fork - Crystal; Garnet Extension

Site type: Mines

ARDF no.: MD061

Latitude: 63.239

Quadrangle: MD A-4

Longitude: 154.774

Location description and accuracy:

The Nixon Fork - Crystal and Garnet Extension mines are about 2,000 feet west of the Nixon Fork Mine (MD062), in Section 13, T. 26 S., R. 21 E., of the Kateel River Meridian. The reporter visited the site in 1995 and 1996.

Commodities:

Main: Ag, Au

Other: Bi, Cu, W

Ore minerals: Auriferous pyrite, arsenopyrite, chalcopyrite, native bismuth, scheelite

Gangue minerals: Epidote, magnetite

Geologic description:

The Nixon Fork - Crystal and Garnet Extension mines consist of locally gold-rich, contact metamorphic deposits in Paleozoic limestone, generally within a few feet of quartz monzonite contact. Although most ores are locally enriched by oxidation, the Crystal and Garnet Extension were distinguished from other ore bodies in the Nixon Fork Mine area by preservation of primary gold-bearing sulfide oe bodies. The deposits consist of chalcopyrite, pyrite, and bornite in a gangue of calcite, siderite, and zeolites. Hence the Crystal and Garnet extension deposits are considered unoxidized extensions of the Nixon Fork lode system (MD062). Age is probably Late Cretaceous, based on isotopic age (71.0 Ma) of associated monzonite (Moll and others, 1981). Assay data is summarized with the Nixon Fork mine (MD062).

Alteration:

Extensive oxidation of primary sulfides.

Age of mineralization:

Age is probably Late Cretaceous, based on isotopic age (71.0 Ma) of associated monzonite (Moll and others, 1981).

Deposit model:

Copper-gold skarn (Cox and Singer, 1986; model no. 18b)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
18b

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:
The Nixon Fork Crystal and Garnet mines were discovered at the same time as the main Nixon Fork Deposit (MD062) in 1917 or 1918. The small but rich gold-skarn deposits were developed mainly by inclined shafts with branching levels.

Production notes:
Production included with Nixon Fork Mine (MD062).

Reserves:

Additional comments:
See Nixon Fork Mine (MD062).

References:
Martin, 1922; Mertie, 1936; Herreid, 1966; Freeman, 1996.

Primary reference: Mertie, 1936

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Nixon Fork; Mespelt; Crystal; Garnet; High Grade; Mespelt Inclined Shaft; Recreation; Keen; Twin Shafts; Mespelt Main Shaft; Garnet Trench; Parsons And Strand; Southern Cross

Site type: Mine

ARDF no.: MD062

Latitude: 63.239 **Quadrangle:** MD A-4

Longitude: 154.764

Location description and accuracy:

The Nixon Fork Mine is located at an elevation of approximately 1,400 feet (426 m) in Section 13, T. 26 S., R. 21 E., of the Kateel River Meridian. Location is precisely known as it is actively being mined. Reporter visited the site in 1996 and 1997.

Commodities:

Main: Ag, Au, Cu

Other: Bi, Th, U, W

Ore minerals: Auriferous chalcopyrite, auriferous pyrite, azurite, bismuth, bornite, chalcocite, chrysocolla, electrum, malachite, scheelite, unidentified U/Th minerals

Gangue minerals: Calcite, chlorite, epidote, garnet, limonite, quartz, sericite, siderite, zeolite

Geologic description:

The Nixon Fork gold mine is a series of small, rich contact metamorphic deposits in limestone within 100-150 m of a composite monzonite stock. The monzonite phase has yielded a 40K-40Ar biotite age of 68.0 Ma (Moll and others, 1981; Bundtzen and Miller, 1997). Younger (?) quartz porphyry bodies cut the monzonite along structures and form a distinctive border pahase of the monzonite pluton.

The mineable ore bodies are copper-gold skarns that occur in irregular, structurally controlled zones in carbonate host rock with maximum dimensions of 66 feet (20 meters) along strike, 230 feet (70 meters) along rake, and are up to 16 feet (5 meters) wide (Freeman, 1996). Gangue minerals in the skarn zones include abundant garnet, diopside, epidote, and apatite. The ore bodies are lenticular, and are without well defined walls; some are probably hydrothermal replacement bodies that postdate skarn formation. Most metallic values and skarn occur as exoskarn 10 to 30 feet into the marble front; minor metallic bearing endoskarns occur within sattelite bodies of monzonite; however, most of this mineralization is not ore grade. Ore consists of auriferous chalcopyrite and pyrite with subordinate bornite and a little chalcocite that has been partly to thoroughly oxidized to a mixture of free gold and secondary copper minerals. The exception to this extensive 'supergene' oxidation process is the Crystal and Garnet Lodes (MD061), which consist mainly of unoxidized chalcopyrite, pyrite and bornite in a calcite, siderite and zeolite gangue. Gold fineness from the various Nixon Fork ore bodies range from 715 to 794 with silver being the major impurity.

The Nixon Fork mine is renowned for it's high grade gold ores. Mertie (1936) and Herreid (1966) report assay values from both surface and underground workings of up to 24.34 ounces/ton gold, 17.26 ounces/ton silver, 11.69 percent copper, and 1.40 percent bismuth. From 1920 to 1997, the mine has produced (from all operators) 119,956 ounces (3,730 kg) of gold, 19,566 (608 kg) ounces of silver, 1,235,443 pounds (560,396 kg) of copper, from about 99,765 tons (90,506 tonnes) of ore. The silver and copper production figures are incomplete and considered conservative.

Alteration:

Oxidation of sulfides probably resulted in some supergene enrichment of gold values

Age of mineralization:

Age is probably Late Cretaceous, based on isotopic age of monzonite (Moll and others, 1981).

Deposit model:

Copper-gold skarn (Cox and Singer, 1986; model no. 18b)

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

18b

Production Status: Yes; medium

Site Status: Active

Workings/exploration:

Exploration and development took place intermittently from 1920 to 1961. After a hiatus of about 25 years, activities resumed in 1984 when Battle Mountain Mining Company leased claims from Ted Almasy and Margaret Mespelt, the owners. In 1989, Central Alaska Gold Company took over the leases and by 1994, had defined 91,200 tons (85,348 tonnes) of ore in several high grade bodies grading 1.42 ounces/ton (48.2 grams/tonne) gold and about 2.00 percent copper. Nevada Consolidated Goldfields resumed production in October, 1995 after a production hiatus of 34 years. (Bundtzen and others, 1996).

The Nixon Fork mine has been mined from at least 8 shafts with extensive branching levels and from a few pits and trenches; deepest mining was at 460-ft (140 m) level of garnet shaft in 1961 (Herreid, 1966). Some references report workings as deep as 600 ft below surface. Most shafts are about 100 ft (30 m) deep, with 2-3 levels; this includes two inclined shafts driven in early 1930's. Currently (1998) the mine is being worked through a spiral decline. The ore bodies currently being exploited are steeply inclined, structurally controlled chimneys.

Maximum assays of 24.34 ounces/ton gold, 17.26 ounces/ton silver, 11.69 percent copper, and 1.4 percent bismuth have been reported in the literature (Mertie, 1936).

Production notes:

Lode deposits were soon discovered in the area after the 1917 discovery of placer gold in the Hidden Creek basin. In 1920, T.P.Aitken produced the first ore--about 370 tons (335 tonnes). In 1921, the Treadwell-Yukon Mining Company, based in Juneau, Alaska, optioned the property from Aitken and mined for four years and milled 6,922 tons (6,280 tonnes) of ore. In 1925, the property reverted to owner E.M. Whalen, who produced ore on a fairly continuous basis until 1942. The property produced intermittently for six seasons from 1946 to 1961. Total production from 1920 to 1961 is estimated to be 36,016 ounces (933 kg) gold, and 1,836 ounces (57 kg) silver from 20,200 tons (18,325 tonnes) of ore. Prior to World War II, copper production (as a byproduct) was not accurately recorded; smelter returns that report a byproduct of copper are available for five operating years.

In October, 1995, Nevada Consolidated Goldfields resumed production of the Nixon Fork Mine and through the end of 1997, produced 83,940 ounces 2,610 kg) gold, 17,730 ounces (551 kg) silver, and 1,194,000 pounds (541,598 kg) copper from 79,565 tons (72,180 tonnes) of ore. From 1920 to the end of 1997, the Nixon Fork Mine has been in production for 30 seasons, and produced 119,956 ounces (3,730 kg) gold, 19,566 ounces (608 kg) silver, and 1,235,443 pounds (560,396 kg) of copper from 99,765 tons (90,506 tonnes) of ore (production data from all previous operations was complied by the reporter). Silver and copper production figures are incomplete; hence totals for these latter metals are considered conservative. Mineral production data for the Nixon Fork Mineis not yet available for 1998.

Reserves:

As of late 1997, exploration has replaced most of the ore mined from 1995 to 1997. In December, 1997, reserves stood at about 85,000 tons (77,112 tonnes) grading approximately 1.2 ounces/ton (41.1 grams/tonne) gold and undisclosed copper and silver (Swainbank and others, 1997).

Additional comments:

See Nixon Fork Crystal (MD061) and Whalen Glory Hole (MD071) mines.

References:

Mertie, 1936; Williams, 1961; Herreid, 1966; King and others, 1980; Patton and others, 1980; Bundtzen and others, 1994; Bundtzen and others, 1996; Freeman, 1996; Bundtzen and Miller, 1997; Newberry and others, 1997; Swainbank and others, 1997.

Primary reference: Herreid, 1966

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Encio Gulch (formerly Riddle Gulch)

Site type: Mine

ARDF no.: MD063

Latitude: 63.224

Quadrangle: MD A-4

Longitude: 154.747

Location description and accuracy:

The Encio Gulch placer mine is at extreme left limit head of Hidden Creek drainage basin immediately opposite the head of Ruby Creek, which dissects the Nixon Fork lode mining area (MD062) to the northwest.

Commodities:

Main: Au

Other: Ag, Bi, W

Ore minerals: Native bismuth, placer gold, scheelite

Gangue minerals: Hematite, ilmenite, magnetite, sphene, thorianite, zircon

Geologic description:

Encio Gulch is the upper extension of the placer deposit in Hidden Creek (see Hidden Creek placer; MD066). The gulch occupies a first order incision that exhibits a stream gradient of nearly 500 feet/mile (95 m/km). Much of the previous production activities occurred near the confluence of Encio Gulch and Hidden Creek, where the hydraulic gradient became about 250 feet/mile. The paystreak varied from 25-to-55 feet (8-17 m) wide, and averaged about 35 feet (11 m) in width. About 10 feet (3 m) of overburden laid on top of a 4-foot (1.2 m) thick paystreak. Bedrock under the paystreak consists of altered monzonite of the Nixon Fork pluton, which has a K-Ar age of 68 Ma (Bundtzen and Miller, 1997). Monzonite boulders up to 6 feet (2 m) in diameter were commonly encountered during past mining activities. Two records of gold fineness from Encio Gulch yielded values of 857 and 886, which differs from the higher gold fineness average of 928 found in Hidden Creek below Encio Gulch (Mertie, 1936).

Alteration:

Auriferous gravels partially cemented by ferricrete, probably due to ground water oxidation.

Age of mineralization:

Quaternary

Deposit model:
Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:
Exploration and production began in Encio Gulch in 1922 by E.M Whalen. Exploration and production resumed in 1926 and continued on a small scale until 1932. Small scale production was finished during development of a small cut in 1937. A hydraulic mining method that deployed a boom dam arrangement was the principle mining method prior to 1932.

Production notes:
In 1922, 57 ounces of gold and 6 ounces of byproduct silver were recovered from 570 cubic yards of pay gravels in Riddle (now Encio) Gulch. In 1937, about 6 ounces of placer gold was recovered from an undisclosed amount of pay gravels in Encio Gulch. Production from 1926 to 1932 was probably lumped with the production total on Hidden Creek (MD066). Reed and Miller (1971) imply that small scale production activities took place in Encio Gulch during 1968.

Reserves:

Additional comments:
Note: Not the same creek as the one currently named Riddle Gulch on USGS topographic maps. See also Hidden Creek (MD066), Holmes Gulch (MD072) and Birch Gulch (MD073).

References:
Brown, 1926; Mertie, 1936; Herreid, 1966; Reed and Miller, 1971; Cobb, 1974; Cobb, 1978; Patton and others, 1980; Fisher and Juilland, 1986.

Primary reference: Brown, 1926

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 5/4/98

Site name(s): Pupinski

Site type: Prospect

ARDF no.: MD064

Latitude: 63.239 **Quadrangle:** MD A-4

Longitude: 154.719

Location description and accuracy:

The Pupinski prospect is located near the saddle north of Encio Gulch at an elevation of 1,500 feet (457 m) in Section 18, T. 26 S., R. 22 E., of the Kateel River Meridian. The reporter visited the site in 1989 and 1996.

Commodities:

Main: Ag, Sn

Other: Cu, W

Ore minerals: Cassiterite, chalcopyrite, galena

Gangue minerals: Magnetite, tourmaline

Geologic description:

The Pupinski prospect is along the southeastern margin of the Nixon Fork monzonite stock (Bundtzen and Miller, 1997). It consists of a magnetite-sulfide skarn that differs from the Nixon Fork Mine showings (MD062) in that gold is absent and copper, silver, tin and minor tungsten values are elevated. Cassiterite is locally abundant in late stage veins, and in association with tourmaline. The Pupinski deposit has only been briefly explored. Age of mineralization is probably Upper Cretaceous based on isotopic age (68.0 Ma) of Nixon Fork pluton (Moll and others, 1981; Bundtzen and Miller, 1997). Grab samples collected at the site contain up to 262 ppm silver, 3.00 percent copper, 0.35 percent tin, and 120 ppm tungsten (Bundtzen and Miller, 1997; Ted Almasy, personal communication, 1998).

Alteration:

Sericite and tourmaline.

Age of mineralization:

Age of mineralization is probably Upper Cretaceous, based on isotopic age of Nixon Fork pluton (Moll and others, 1981).

Deposit model:

Polymetallic tin (Cox and Singer, 1986; model no. 20b)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
20b

Production Status: No

Site Status: Inactive

Workings/exploration:
The Pupinski deposit has only been briefly explored, mainly by Central Alaska Gold Company in the early 1990s (Ted Almasy, personal communication, 1998). Grab samples collected at the site contain up to 262 ppm silver, 3.00 percent copper, 0.35 percent tin, and 120 ppm tungsten (Bundtzen and Miller, 1997; Ted Almasy, personal communication, 1998).

Production notes:

Reserves:
None.

Additional comments:
See Win Deposit (MD060). The Pupinski prospect is on land conveyed to Doyon Ltd. For further information, contact Doyon Ltd at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Bundtzen and Miller, 1997.

Primary reference: Bundtzen and Miller, 1997

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Matthews and Blackburn

Site type: Prospect

ARDF no.: MD065

Latitude: 63.21 **Quadrangle:** MD A-4

Longitude: 154.72

Location description and accuracy:
The Mathews and Blackburn prospect is located at an elevation of 1,200 feet (366 m), one mile (1.6 km) east of Hidden Creek in Section 29, T. 26 S., R. 22 E., of the Kateel River Meridian. Location is imprecise and based on description by Martin (1922) and Brown (1926).

Commodities:

Main: Au(?), Cu

Other:

Ore minerals: Malachite, free gold (?)

Gangue minerals: Carbonate

Geologic description:
In 1920, a lode prospect was staked over a pyroxenite dike in limestone, which was uncovered in upper Hidden Creek (see MD066). According to Brown (1926), gold and copper carbonates are present. The Matthews and Blackburn vein lies within the pyroxenite dike, which is composed predominately of augite. The dike intrudes the Ordovician Telsitna Limestone formation (Dutro and Patton, 1982).

Alteration:

Age of mineralization:

Deposit model:

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

Production Status: No

Site Status: Inactive

Workings/exploration:
Surface prospecting was conducted prior to 1925 (Martin, 1922; Brown, 1926).

Production notes:

Reserves:
None.

Additional comments:
See Hidden Creek placer (MD066). The Matthews and Blackburn prospect is on land conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Martin, 1922; Brown, 1926; Dutro and Patton, 1982.

Primary reference: Martin, 1922

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Hidden Creek: Grable and Blackburn Mine

Site type: Mine

ARDF no.: MD066

Latitude: 63.215 **Quadrangle:** MD A-4
A-4
AK

Longitude: 154.747

Location description and accuracy:

The well known Hidden Creek placer gold deposit is located on Hidden Creek, a stream that flows south-southwest from Encio Gulch area near Nixon Fork lode mine to the Nixon Fork of the Kuskokwim River. The Hidden Creek placer gold deposit extends from the mouth of Encio (Riddle) Gulch downstream to the confluence of Birch Gulch and Hidden Creek, a distance of approximately 1.5 mile (2.4 km).

Commodities:

Main: Ag, Au

Other: Bi, Sn, Th, W

Ore minerals: Bismuth, cassiterite, gold, scheelite, thorianite

Gangue minerals: Hematite, ilmenite, magnetite, zircon

Geologic description:

The productive portion of Hidden Creek lies along a third order stream with an average gradient of 120 feet/mile. Bedrock in most of the area that was placer mined is part of the Nixon Fork monzonite pluton which has yielded a K-Ar age of 68.0 Ma (Bundtzen and Miller, 1997). Most of the stream gravels consisted of monzonite float. Limestone underlies Hidden Creek Valley about 2 miles downstream from the head of the drainage. A copper-bearing pyroxenite dike that intrudes the limestone was found in one placer mine cut, which was thought to be a local source for placer gold. (Cobb, 1978; Herreid, 1966).

Unconsolidated overburden above monzonite bedrock was 10-12 feet (3.0-3.7 m) thick, and auriferous gravels averaged about 4 feet (1.2 m) thick. The paystreak width varied from 75 to 125 feet (23 to 38 m) wide and averaged about 60 feet (18 m) in width. Below Birch Gulch, the Quaternary fill quickly thickens to as much as 200 feet (60 m); this abrupt thickening of Quaternary valley fill is probably related to the change of underlying bedrock from monzonite to limestone; chemical weathering, karsting, and cavern formation in the limestone was noted by Brown (1926).

Fourteen gold fineness determinations from placer gold mined in Hidden Creek ranged from 912 to 962 and averaged 928 (Mertie, 1936; Smith, 1941; Glover, 1942). Silver was the major impurity in the placer gold, which exhibits some of the highest fineness values of any Alaskan placer gold. In addition, substantial quantities of native bismuth occurs, frequently intergrown with native gold, magnetite, ilmenite, and brown scheelite. Minor to trace amounts of barite, cassiterite, zircon, and thorianite were found in heavy mineral concentrates during mine production, however, no other minerals other than placer gold were commercially recovered. Other placer streams such as Holmes, Riddle, and Birch Gulches, which presumably have similar if not identical lode sources for the placer gold, yield significantly different fineness values, which has mystified previous workers (i.e., Smith, 1941). Such data suggests significantly different lode sources for the placer gold in these areas.

Alteration:

Auriferous gravels partially cemented with ferricrete, due to ground water oxidation.

Age of mineralization:

Quaternary

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

From 1922 to 1932, placer deposits were developed with hydraulic mine methods. A scraper was used to move large monzonite boulders in the mine cuts; these boulders frequently ranged from 2 to 6 feet (0.6-2 m) in diameter. In 1922 , 274 ounces of placer gold were recovered from 4,000 cubic yards of pay; i.e., this mine cut contained a recovered grade of 0.06 oz/cubic yard (2.78 g/ cubic meter) gold. A dragline was first used in 1935 and was used until mine shutdown in 1938. After World War II, Birch Creek and its tributaries continued to produce on a small scale until about 1960.

Production notes:

Hidden Creek contributed about 50 percent of the placer gold production from the Nixon Fork area. Placer gold was first discovered on Hidden Creek in 1917 (Herreid, 1966). In 1922, F.A. Matthews and Louis Blackburn initiated placer gold production, which continued every season until 1932. Production resumed in 1935 and continued until 1938. Total production from 1922 to 1938 is estimated to be 4,435 ounces (138 kg) of gold and 230 ounces (7 kg) of silver. Production on Hidden Creek from 1938 to 1960 has not been accurately determined, but is not thought to be significant (Ted Almasy and

Margaret Mespelt, personal communication, 1998).

Reserves:

Additional comments:

See also Encio (Riddle) Gulch (MD063) Birch Gulch (MD073), and Holmes Gulch (MD072). The Hidden Creek: Grable and Blackburn Mine is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:

Brown, 1926; Smith, 1926; Smith, 1930 (B 810); Smith, 1930 (B 813); Smith, 1931; Mertie, 1936; Smith, 1941; Glover, 1942; Herreid, 1966; Cobb, 1974; Cobb, 1978.

Primary reference: Brown, 1926

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 5/4/98

Site name(s): Whalen; Whalen and Griffin

Site type: Mine

ARDF no.: MD067

Latitude: 63.225 **Quadrangle:** MD A-4

Longitude: 154.761

Location description and accuracy:

The Whalen Mine is at an elevation of 1,500 feet (457 m) in Section 24, T. 26 S., R. 22 E., of the Kateel River Meridian. Location of Whalen shaft is accurate and based on map by Herreid (1966).

Commodities:

Main: Ag, Au, Cu

Other: Bi, Th, U, W

Ore minerals: Bismuth, chalcopyrite, gold, pyrite, radioactive minerals, scheelite

Gangue minerals: Carbonate, limonite, malachite

Geologic description:

The Whalen mine is part of the Nixon Fork mine complex and descriptions closely follow those of the Nixon Fork mine (MD062). Highly oxidized ore consists of limonite, malachite, Cu-oxides, free gold with minor unoxidized pyrite and chalcopyrite; also minor amounts of scheelite, native bismuth and radioactive minerals are present. Oxidation is pervasive; deposit is in limestone inlier associated with a roof pendant, surrounded by quartz monzonite. Copper content was estimated at between 1 and 2 percent (Brown, 1926). Gold fineness was 812 gold and 171 silver (Smith, 1931). Age is Late Cretaceous, based on isotopic age of monzonite (Moll and others, 1981).

Alteration:

Oxidation.

Age of mineralization:

Late Cretaceous, based on isotopic age of monzonite (Moll and others, 1981).

Deposit model:

Copper-gold skarn (Cox and Singer, 1986; model no. 18b)

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

18b

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

The Whalen mine extended to a depth of 200 ft (61 m) through an inclined shaft and several drifts. The upper part of the workings caved in 1924, and formed a distinctive 200 foot by 100 foot (61 m by 30 m) glory hole (labeled 'glory hole' on USGS topographic maps). The ore that was mined was estimated to contain up to 3.38 ounces/ton (115 grams/tonne) gold.

Production notes:

Production was lumped with Nixon Fork figures (MD062), and has not produced ore during current activities from1995 to 1998.

Reserves:

Additional comments:

See also: Nixon Fork Mine (MD062).

References:

Martin, 1922; Brown, 1926; Smith, 1931; Smith, 1930; Smith, 1941; Mertie, 1936; Herreid, 1966.

Primary reference: Herreid, 1966

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Upper Ruby Creek

Site type: Mine

ARDF no.: MD068

Latitude: 63.233 **Quadrangle:** MD A-4

Longitude: 154.778

Location description and accuracy:
The Upper Ruby Creek mine is located at an elevation of 1,000 feet (300 m) in Section 13, T. 26 S., R. 22 E., of the Kateel River Meridian. Location is within 300 feet (91 m).

Commodities:

Main: Ag, Au

Other: Bi, Th, W

Ore minerals: Bismuth, gold, radioactive mineral (brookite?), scheelite

Gangue minerals: Ilmenite, magnetite

Geologic description:
The Upper Ruby Creek placer mine is a continuation of the Ruby Creek-Strand deposit (MD069); the only difference is a higher stream gradient of 250 feet/mile. White and Stevens (1953) studied the abundant radioactive concentrates from Upper Ruby Creek placer deposit. Age of mineralization is unknown, but probably Quaternary, based on local geomorphology.

Alteration:

Age of mineralization:

Deposit model:
Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

Production Status: Yes

Site Status: Inactive

Workings/exploration:

Upper Ruby Creek was mined mostly prior to 1925 (Brown, 1926).

Production notes:

Production data is scant and was lumped with Ruby Creek-Strand and Crystal Gulch deposits, which collectively produced 1,511 ounces (47 kg) of gold from 1920 to 1942.

Reserves:

Additional comments:

See Ruby Creek-Strand (MD068) and Crystal Gulch (MD070) deposits. The Upper Ruby Creek mine is on lands selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:

Brown, 1926; Smith, 1926; Mertie, 1936; White and Stevens, 1953; Cobb, 1974; Cobb, 1978.

Primary reference: Mertie, 1936

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Ruby Creek; Strand

Site type: Mine

ARDF no.: MD069

Latitude: 63.236

Quadrangle: MD A-4

Longitude: 154.796

Location description and accuracy:
The Ruby Creek (Strand) placer gold deposit is the lower portion of the Ruby Creek placer (see Ruby Creek; MD068). It is located below the confluence of Crystal Gulch at an elevation of 750 feet in Section 14, T. 26 S., R. 21 E., of the Kateel River Meridian. Location is known to within 250 feet (76 m).

Commodities:

Main: Ag, Au

Other: Bi, Sn, U, W

Ore minerals: Bismuth, cassiterite, gold, scheelite, uranothorianite

Gangue minerals: Azurite, fluorite, ilmenite, magnetite, sphene

Geologic description:
No data on size or grade of the Ruby Creek (Strand) deposit has been found in published sources. Ilmenite and magnetite were abundant in concentrates. The Strand part of the Ruby Creek placer is a mature, third order stream with an average gradient of about 150 feet/ mile. The upper end above Crystal Gulch is a second order stream with a higher gradient. In 1929, fineness was estimated to be 807 gold and 107 silver (Mertie, 1936). Age is Quaternary, based on inference with similar deposits in area (Bundtzen and others, 1997).

Alteration:

Age of mineralization:
Quaternary, based on inference with similar deposits in area (Bundtzen and others, 1997).

Deposit model:
Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Both underground drifting and open cut methods were used prior to 1933 (Mertie, 1936).

Production notes:

Ruby Creek was the first to be mined in the Nixon Fork area (1917). From 1917 to 1942, Ruby Creek produced at least 1,522 ounces (47 kg) gold and unknown amounts of silver. Production continued intermittently until about 1961, but the latter year's production levels were believed to be modest.

Reserves:

Additional comments:

See also Hidden Creek (MD066), Upper Ruby Creek (MD068), Birch Gulch (MD073), and Holmes Gulch (MD072).

References:

Martin, 1922; Brown, 1926; Mertie, 1936; Glover, 1942; Herreid, 1966; Cobb, 1974; Cobb, 1978.

Primary reference: Mertie, 1936

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Crystal Gulch

Site type: Mine

ARDF no.: MD070

Latitude: 63.234

Quadrangle: MD A-4

Longitude: 154.78

Location description and accuracy:

The Crystal Gulch placer deposit is in a steep, southerly-facing, first order gulch located at 900 feet (274 m) in Section 13, T. 26 S., R. 21 E., of the Kateel River Meridian. Location is accurate to within 100 feet (30 m).

Commodities:

Main: Ag, Au

Other: Bi, Sn, U

Ore minerals: Bismuth, brookite, cassiterite, gold

Gangue minerals: Very abundant magnetite

Geologic description:

The rich Crystal Gulch placer deposit occurs in a steep first order tributary of Ruby Creek. Stream gradient averages about 500 feet per mile (650 m/km). Most of the values occurred at the intersection of the gulch with Ruby Creek. The Crystal Gulch deposit was exhausted by 1924. The uranium mineral brookite was identified by Mertie (1936). Concentrates averaged 5 percent cassiterite during the life of the operation. (Ted Almasy, personal communication, 1998). Age of mineralization is unknown, but judged to be Quaternary, based on comparative geomorphological features in southwest Alaska (Bundtzen and Miller, 1997).

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

The placer deposit was mined exclusively by surface-hydraulic methods (Brown, 1926; Mertie, 1936).

Production notes:

Production estimates are lumped with other properties on Ruby Creek, which produced a total of 1,511 ounces (47 kg) of gold prior to 1942.

Reserves:

Additional comments:

See also Ruby-Strand (MD069), Birch Gulch (MD073), Holmes Gulch (MD0 72), Encio Gulch (MD063) and Upper Ruby Creek (MD068).

References:

Brown, 1926; Mertie, 1936; Cobb, 1974; Cobb, 1978; Bundtzen and Miller, 1997.

Primary reference: Mertie, 1936

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Whalen Shaft

Site type: Mine

ARDF no.: MD071

Latitude: 63.217 **Quadrangle:** MD A-4

Longitude: 154.767

Location description and accuracy:

The Whalen Shaft is located in Section 24, T. 26 S., R. 21 E., of the Kateel River Meridian, about 500 feet (152 m) from the Whalen Glory Hole near the old airstrip. Reporter visited the site in 1997.

Commodities:

Main: Ag, Au, Cu

Other: Bi, W

Ore minerals: Allanite, gold, malachite, silver, scheelite

Gangue minerals: Kyanite, pyroxene, tremolite, zircon

Geologic description:

The Whalen Shaft is mainly a tactite with gold-polymetallic mineral values. Ore from tactite contained the following: 25 percent biotite; 10 percent pyroxene; 10 percent tremolite; 10 percent carbonate; and 10 percent malachite (Herreid, 1966). The tactitie zone averaged: 1.24 ounces/ton gold, 2.9 ounces/ton silver, 1.11 percent copper, and 0.05 percent bismuth (Herreid, 1966). Age of mineralization is unknown, but probably related to the 68.0 Ma Nixon Fork monzonite pluton (Bundtzen and Miller, 1997).

Alteration:

Age of mineralization:

Deposit model:

Copper-Gold skarn (Cox and Singer, 1986; model no. 18b)

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

18b

Production Status: Yes

Site Status: Inactive

Workings/exploration:

The Whalen Shaft was driven to an unknown depth, but not below the water table, which was at about 400 feet.

Production notes:

Specific production figures are not known; the gold-copper production was lumped with the Nixon Fork Mine (MD062).

Reserves:

Additional comments:

See Nixon Fork Mine (MD062).

References:

Martin, 1922; Brown, 1926; Mertie, 1936; White and Stevens, 1953; Herreid, 1966; Cobb, 1974; Cobb, 1978; Bundtzen and Miller, 1997.

Primary reference: Herreid, 1966

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Holmes Gulch

Site type: Mine

ARDF no.: MD072

Latitude: 63.213

Quadrangle: MD A-4

Longitude: 154.781

Location description and accuracy:

The Holmes Gulch placer mine is located at an elevation of 750 feet (228 m) in Section 25, T. 26 S., R. 21 E., of the Kateel River Meridian. Location is known to within 250 feet (76 m).

Commodities:

Main: Ag, Au

Other: Bi

Ore minerals: Bismuth, gold

Gangue minerals: Magnetite

Geologic description:

The Holmes Gulch placer deposit is in a steep first order stream that can be traced for about one mile (1.6 km). Gravels in Holmes Gulch were 11 ft (3.3 m) deep, and can be traced upstream 4000 ft (1,219 m) toward the Whalen shaft (MD071). Most of the mining took place at the intersection of Holmes Gulch and Hidden Creek. Boulders up to 4 ft in diameter encountered during mining. Age of mineralization is unknown, but is probably Quaternary, based on correlative geomorphological features with other dated placer deposits nearby (Bundtzen and Miller, 1997).

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Small-scale, surface-hydraulic sluicing predominated. There is no evidence that heavy machinery was employed in Holmes Gulch (Mertie, 1936). Most mining took place at the intersection of Holmes Gulch and Hidden Creek.

Production notes:

The first recorded production from Holmes Gulch took place in 1919; mining continued intermittently until 1938. The production total for Holmes Gulch was 1,065 ounces (33 kg) gold and an unknown amount of silver.

Reserves:

Additional comments:

See Hidden Creek (MD066).

References:

Martin, 1922; Brown, 1926; Mertie, 1936; Cobb, 1974; Cobb, 1978; Bundtzen and Miller, 1997.

Primary reference: Mertie, 1936

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Birch Gulch (Creek); Groshong's Mine

Site type: Mine

ARDF no.: MD073

Latitude: 63.212 **Quadrangle:** MD A-4

Longitude: 154.763

Location description and accuracy:

The Birch Gulch placer mine is located in a first order gulch about 0.5 miles (0.8 km) long that runs south-southwest into Hidden Creek (MD066), about 2.0 miles (3.2 km) downstream from Encio Gulch (MD063).

Commodities:

Main: Ag, Au

Other: Bi

Ore minerals: Bismuth, gold

Gangue minerals: Ilmenite, magnetite, zircon

Geologic description:

Placer gold in Birch Gulch occurs on bedrock and in lower 3 ft (0.9 m) of alluvial section up to 24 ft (7.3m) thick. Placer mining during 1933 uncovered 3 ft (0.9 m) of angular wash beneath 8 ft (2.4 m) of muck. Paystreak averages 50 ft (15.2 m) wide. Most past mine activities took place near the confluence of Birch Gulch and Hidden Creek in a poorly developed alluvial fan deposit. Mertie (1936) reports a single fineness value of 961.75 Au and 33.00 Ag from a Birch Gulch placer gold sample. Age of mineralization is judged to be Quaternary, based on comparative geomorphology with other dated placer deposit nearby (Bundtzen and Miller, 1997).

Alteration:

Age of mineralization:

Quaternary

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Past mine activity utilized hydraulic mine methods, namely a boom dam to remove overburden and a small giant to sluice pay gravels. No mechanized mining was known to take place in Birch Gulch.

Production notes:

The Birch Gulch placer discovery occurred in 1917. Small scale production commenced in 1922, and took place in 1922-23; 1925-1927; and 1932. From 1922 to 1932, a total of 864.2 ounces (26.8 kg) gold and 50.9 ounces (1.6 kg) silver were produced from Birch Gulch. In 1926, 139.7 ounces (4.3 kg) gold were recovered from 3,300 cubic yards (2,523 cubic meters) of pay, or an average grade of 0.042 oz/cubic yard Au. No further mine activities are known.

Reserves:

Additional comments:

See also Hidden Creek (MDO66), Encio Gulch (MDO63), and Holmes Gulch (MD072) placers.

References:

Brown, 1926; Mertie, 1936; Smith, 1941; Herreid, 1966; Cobb, 1974; Bundtzen and Miller, 1997.

Primary reference: Mertie, 1936

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 5/6/98

Site name(s): Stone; Stone Lode

Site type: Prospect

ARDF no.: MD074

Latitude: 63.153

Quadrangle: MD A-4

Longitude: 154.877

Location description and accuracy:

The Stone Lode prospect is located at an elevation of 1,250 feet (381 m) in Section 16, T. 27 S., R. 21 E., of the Kateel River Meridian. The reporter visited the site in 1989 and 1996.

Commodities:

Main: Ag, Au

Other: Bi

Ore minerals: Bismuth, chalcopyrite, gold

Gangue minerals: Garnet, magnetite

Geologic description:

The Stone Lode prospect is a poorly known, but promising gold prospect in skarn near a limestone/monzonite contact; it is geologically very similar to Nixon Fork Mine (MD062). Mineralization consists of garnet-rich and wallastonite-idocrase-epidote skarn that replaces an Ordovician limestone near the margin of a small monzonite body that is currently undated.

Alteration:

Tactite.

Age of mineralization:

Deposit model:

Copper-gold skarn (Cox and Singer, 1986; model no. 18b)

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

18b

Production Status: Undetermined.

Site Status: Active

Workings/exploration:
Only surface workings have been completed at the Stone Lode prospect. No assay data are available.

Production notes:
Some modest production activities in the form of test shipments of high grade ore by the owner may have taken place (Ted Almasy, personal communication, 1998).

Reserves:

Additional comments:
See Nixon Fork Mine (MD062). The Stone prospect is on in part on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Berg and Cobb, 1967; Patton and Moll, 1983.

Primary reference: Berg and Cobb, 1967

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Eagle Creek Gulch

Site type: Occurrence

ARDF no.: MD075

Latitude: 63.15 **Quadrangle:** MD A-4

Longitude: 154.88

Location description and accuracy:
The Eagle Creek Gulch occurrence is iocated just below the Stone Lode (MD074), in Section 17, T. 27 S., R. 21 E., of the Kateel River Meridian. Location is known to within 2,500 feet (762m).

Commodities:

Main: Ag, Au

Other: Th, U, W

Ore minerals: Gold, radioactive minerals, scheelite

Gangue minerals: Magnetite

Geologic description:
The Eagle Creek Gulch placer occurrence is a poorly understood concentration of placer gold at the head of Eagle Creek, below the Stone gold skarn deposit (MD074). May be, in part, a residual placer deposit. Age of mineralization is unknown.

Alteration:

Age of mineralization:

Deposit model:
Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:

Some placer mining has taken place in the 1920s and 1930s but no production records were found.

Production notes:

Production tests were completed in the 1920s and 1930s; unkown production.

Reserves:

Additional comments:

The Eagle Creek Gulch prospect is on lands conveyed to Doyon Ltd. For additional information, contact Doyon Ltd. at 210 1st Ave., Fairbanks,
Alaska, 99701.

References:

White and Stevens, 1953; Cobb, 1972; Cobb, 1974.

Primary reference: White and Stevens, 1953

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Eagle Creek

Site type: Mine

ARDF no.: MD076

Latitude: 63.12 **Quadrangle:** MD A-4

Longitude: 154.89

Location description and accuracy:

The Eagle Creek placer mine is located at an elevation of 500 feet (151 m) in Eagle Creek Basin in Section 29, T. 27 S., R. 21 E., of the Kateel River Meridian. Accuracy is judged to be within a one mile (1.6 km) radius based on location by White and Stevens (1953).

Commodities:

Main: Ag, Au

Other: Th, U, W

Ore minerals: Gold, scheelite, uranothorianite

Gangue minerals: Allanite, fluorite, garnet, hematite, ilmenite, magnetite, sphene, zircon

Geologic description:

Geologic descriptions of Eagle Creek placer mine (deposit) are based on descriptions of White and Stevens (1953), and personal communications with Ted Almasy of McGrath (1998). Concentrates were composed of nearly 85 percent ilmenite. Eagle Creek is a second order stream that flows southwesterly towards Crooked Creek. The paystreak mined was approximately 100 feet (30) wide and covered by 16 feet (5m) of overburden. (Ted Almasy, personal communication, 1998.) Age of mineralization is unknown. The average grade of the deposit is unknown.

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:
Surface workings only.

Production notes:
Jack Nixon first mined the Eagle Creek placer gold deposit in 1918 (Ted Almasy, personal communication, 1998). Prior to World War II mining activities were intermittent and on a small scale. A production estimate is not available.

Reserves:

Additional comments:
See Eagle Creek Gulch (MD075). The Eagle Creek mine is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
White and Stevens, 1953; Berg and Cobb, 1967; Cobb, 1974.

Primary reference: White and Stevens, 1953

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Crooked Creek; Clow and Strands

Site type: Mine

ARDF no.: MD077

Latitude: 63.113 **Quadrangle:** MD A-4

Longitude: 154.823

Location description and accuracy:

The location of the Crooked Creek placer mine (deposit) is based on claim locations by Clow and Strands; it is at about 550 feet (168 m) elevation in Section 34, T. 27 S., R. 21 E., of the Kateel River Meridian.

Commodities:

Main: Ag, Au

Other:

Ore minerals: Placer gold

Gangue minerals:

Geologic description:

There is little data available for the Crooked Creek placer gold deposit. The creek heads into monzonite at top of ridge which is the presumed lode source for placer gold. (Ted Almasy, personal communication, 1998). There is no information available concerning average grade, dimensions, or heavy mineral content.

Alteration:

Age of mineralization:

Deposit model:

Placer Au-PGE (Cox and Singer, 1986; model no. 39c)

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

39c

Production Status: Yes; small

Site Status: Inactive

Workings/exploration:
Surface workings only.

Production notes:
No details are available. Production took place in 1950s (Ted Almasy, personal communication, 1998).

Reserves:
None.

Additional comments:
See Eagle Gulch (MD075) and Eagle Creek (MD076). The Crooked Creek mine is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Brown, 1926; Alaska Kardex File 65-14.

Primary reference: Brown, 1926

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Unnamed

Site type: Occurrence

ARDF no.: MD078

Latitude: 63.06 **Quadrangle:** MD A-4

Longitude: 154.84

Location description and accuracy:

The unamed manganese occurrence is situated along the banks of the Kuskokwim River at an elevation of 380 feet in Section 15, T. 28 S., R. 21 E., of the Kateel River Meridian. Patton and Moll (1983) located the occurrence within a 2,500 feet (762 m) radius. Th reporter visited the site in 1988.

Commodities:

Main: Mn

Other: Fe

Ore minerals: Manganese carbonate(?), pyrolusite

Gangue minerals:

Geologic description:

Both iron and manganese oxides are strongly developed in deformed shale and sandstone for about 500 feet along the banks of the Kukokwim River. The age of the shale is unknown and could be either Paleozoic (Nixon Fork subterrane) or Late Cretaceous (Kuskokwim Group). The apparent beding in the shale is N 55 E with steep southeasterly dips. A strong shear zone plunges N 25 E at 20 degrees. The main ore minerals present are pyrolusite and goetthite, both of which occur as coatings and impregnations on fracture surfaces in the shear zone. A distinct N 10 E lineament, which controls the trend of the hills north of the river, runs through the manganiferous area. Although Patton and Moll (1983) suggest this is a sedimentary manganese deposit, field evidence suggests that it may also be an accumulation of iron and manganese oxides within a shear zone. Surface samples have yielded up to 23.00 percent manganses (Berg and Cobb, 1967).

Alteration:

Extensive development of iron and manganese oxides.

Age of mineralization:

Deposit model:

Sedimentary Manganese(?) or unknown (Cox and Singer, 1986; model no. 34b(?))

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
34b(?)

Production Status: No

Site Status: Inactive

Workings/exploration:
Surface samples contained up to 23 percent manganese. (Berg and Cobb, 1967).

Production notes:

Reserves:
None.

Additional comments:
In Nixon Fork subterrane of Farewell Composite Terrane (Bundtzen and others, 1997), or Cretaceous Kuskokwim Group.

References:
Berg and Cobb, 1967; Patton and Moll, 1983; Bundtzen and Miller, 1997.

Primary reference: Berg and Cobb, 1967

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

Site name(s): Babybasket

Site type: Occurrence

ARDF no.: MD079

Latitude: 63.1 **Quadrangle:** MD A-2

Longitude: 153.82

Location description and accuracy:

The Babybasket occurrence is situated just south of the highest point in the Babybasket Hills (1,455 ft summit) at an elevation of 1,250 feet (381 m) in Section 36, T. 27 S., R. 26 E., of the Kateel River Meridian. Location is imprecise and judged to within a two mile (3.2 km) radius.

Commodities:

Main: Cu, Zn

Other: Ag, Pb

Ore minerals: Chalcopyrite, pyrite, sphalerite

Gangue minerals: Calcite, quartz

Geologic description:

The Babybasket prospect consists of several zones of disseminated chalcopyrite, pyrite and rare sphalerite in calc-silicate skarn and carbonate replacement zones. The mineralized zones are adjacent to gabbro-diorite dikes and sills that intrude Cambro-Ordovician silty limestone and shale of the Lyman Hills Formation, the lower-most part of the Dillinger subterrane as defined by Bundtzen and others (1997). No size or orientations of mineralized zones are known.

The occurrences were detected as a result of anomalous values found in stream sediment and pan concentrate samples collected by the U.S. Geological Survey (King and others, 1980; 1983). Age is probably either Paleozoic or Triassic, based on isotopic age data collected from equivalent gabbro-diorite sills in the McGrath quadrangle (Bundtzen and others, 1997).

Alteration:

Age of mineralization:

The Babybasket occurrence is probably either Paleozoic or Triassic, based on isotopic age data collected from equivalent gabbro-diorite sills in the McGrath quadrangle (Bundtzen and others, 1997).

Deposit model:
Polymetallic Replacement Deposit (?)(Cox and Singer, 1986; model no. 19a)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
19a (?)

Production Status: No

Site Status: Inactive

Workings/exploration:
The Babybasket occurrence was found as the result of sampling by the U.S. Geological Survey (King and others, 1980; 1983).

Production notes:

Reserves:
None.

Additional comments:
Similar deposits are described in the McGrath and Lime Hills quadrangles (Bundtzen and others, 1994; 1997).

References:
King and others, 1980; King and others, 1983; Bundtzen and others, 1994; Bundtzen and others, 1997.

Primary reference: King and others, 1980

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/3/98

Site name(s): Asmyrahha

Site type: Prospect

ARDF no.: MD080

Latitude: 63.381 **Quadrangle:** MD B-3

Longitude: 154.313

Location description and accuracy:

The Asmyrahha zinc prospect is 1.5 miles (2.4 km) east of Reef Ridge deposit (MD055) at an elevation of approximately 1,500 feet (457 m) in Section 30, T. 24 S., R. 24 E., of the Kateel River Meridian. Location is known to within 125 feet (38 m).

Commodities:

Main: Zn

Other:

Ore minerals: Smithsonite

Gangue minerals: Dolomite

Geologic description:

Smithsonite-bearing rubble is exposed for 150 feet (45 m) of strike length in an old burn area. Host rock for the mineralization is a banded to micritic limestone that is probably equivalent to the Paradise Fork Formation of Dutro and Patton (1982); this is the 'Sic' unit of Andrews and Rishel (1982). The age of the mineralization is unknown. Smithsonite bearing carbonate units strike N 50 E and dip approximately 55 degrees South. Smithsonite mineralization is parallel to the strike of the limestone, but dips 15 degrees South along a low angle structure. Grab samples of the gossan contain up to 8.4 percent zinc with no appreciable lead. A trench cut at right angles to the strike of the ridgeline averaged 0.5 percent zinc and no lead across 10 feet (3 m).

Alteration:

Ferricrete oxidation at surface.

Age of mineralization:

Host rocks are Silurian; age of mineralization is unknown.

Deposit model:

Southeast Missouri lead-zinc (Cox and Singer, 1986; model no. 32a) or Mississippi Valley Type

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
32a

Production Status: No

Site Status: Inactive

Workings/exploration:
The Asmyrahha prospect was discovered by WGM Inc. and Patino Ltd. during exploration for base metals in the late 1970s on lands selected by Doyon Ltd. (Andrews and Rishel, 1982). Grab samples of the gossan contain up to 8.4 percent zinc with no appreciable lead. A trench that was cut at right angles to the strike of the ridgeline averaged 0.5 percent zinc and no lead over 10 feet (3 m).

Production notes:

Reserves:
None.

Additional comments:
See Soda Creek (MD056), Midway (MD046), and Saddle (MD054) and other Mississippi Valley Type zinc-lead showings in the Medfra quadrangle. The Asmyrahha prospect is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
Patton and others, 1980; Andrews and Rishel, 1982; Dutro and Patton, 1982; Schmidt, 1997.

Primary reference: Andrews and Rishel, 1982

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/2/98

Site name(s): Unnamed

Site type: Occurrence

ARDF no.: MD081

Latitude: 63.46 **Quadrangle:** MD B-4

Longitude: 154.55

Location description and accuracy:
This occurrence is located on southern flanks of Mystery Mountains at approximately 1,500 feet (457 m) elevation in Section 35, T. 23 S., R. 22 E., of the Kateel River Meridian. Location is imprecise and judged to be within a two mile (3.2 km) radius.

Commodities:

Main: Ag, As, Pb

Other: Cu, Sb, Sn, Zn

Ore minerals:

Gangue minerals: Tourmaline

Geologic description:
Occurrence consists of tourmaline-bearing altered dacite porphyry with iron oxide spots after pyrite. Anomalous silver, lead, and arsenic values occur in grab samples; elevated levels of antimony, copper, zinc, and tin also occur. Limited assay data is provided in King and others (1980) and Patton and Moll (1983).

Alteration:
Tourmaline.

Age of mineralization:

Deposit model:
Polymetallic Vein (Cox and Singer, 1986; model no. 22c)

Deposit model number (After Cox and Singer, 1986 or Bliss, 1992):
22c

Production Status: No

Site Status: Inactive

Workings/exploration:
Not indicated; see Patton and Moll (1983) and King and others (1980) for analytical data.

Production notes:

Reserves:
None.

Additional comments:
The unamed (MD081) occurrence is on land selected or conveyed to Doyon Ltd. For further information, contact Doyon Ltd. at 210 1st Ave., Fairbanks, Alaska, 99701.

References:
King and others, 1980; Patton and Moll, 1983.

Primary reference: Patton and Moll, 1983

Reporter(s): Bundtzen, T.K. (Pacific Rim Geological Consulting)

Last report date: 6/7/98

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