

Bureau of Mines Mineral Investigation of the Goodnews Bay Mining District, Alaska

By Steven A. Fechner

DISPLAY ONLY



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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

ft	foot
ft ²	square foot
ft ³	cubic foot
gpm	gallon per minute
hp	horsepower
in	inch
mi	mile
my	million year
oz	troy ounce
ppb	part per billion
ppm	part per million
%	percent
st	short ton
wt	weight
yd ³	cubic yard

BUREAU OF MINES MINERAL INVESTIGATION OF THE
GOODNEWS BAY MINING DISTRICT, ALASKA

By Steven A. Fechner^{1/}

ABSTRACT

The Bureau of Mines conducted site specific mineral investigations and reconnaissance sampling in the Goodnews Bay Mining District in 1986. The results indicate that approximately 70% of the mineral deposits in the district are located in two areas: Slate-Wattamuse Creek and Red Mountain. Placer deposits with high mineral development potential are located on Wattamuse and Cascade Creeks. Gold was found in rocks associated with the intrusive at the head of Wattamuse Creek.

In the Red Mountain area, platinum-group metals (PGM) and gold were found in the Salmon River and its tributaries and along the beach from Platinum to Chagvan Bay. All of the eastern tributaries of the Salmon River that drain Red Mountain and the beach along Kuskokwim Bay from Platinum to the Salmon River have high mineral development potential for small placer mining operations. The Salmon River has a high mineral development potential for a large operation. PGM and gold were found in the weathered dunite on Red Mountain and in the glacial deposits that comprise the bluffs along the beach.

Microprobe platinum-group element analyses of placer PGM grains identified twenty-three platinum-group minerals.

INTRODUCTION

The Bureau of Mines started a mineral evaluation of the Goodnews Bay Mining District in 1985 in order to assess the mineral development potential of the district. This project was undertaken under the Bureau's mining district studies program. This program is designed to determine the mineral development potential of mineral deposits in the district, identify mineral resources and reserves, and evaluate economic feasibility of mining.

Field work was conducted in 1986 and included both site specific mineral investigations and reconnaissance sampling. The district contains placer and lode gold, copper, and one of the two primary platinum producing mines in the United States.

This report summarizes the mineral development potential of identified mineral deposits in the Goodnews Bay Mining District and the data obtained from the 1986 sampling program. A feasibility study has not been conducted for the deposits in the district.

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STUDY AREA

The Goodnews Bay Mining District is located in southwest Alaska (fig. 1). The district boundary was defined by Ransome and Kerns (71)^{2/} and encompasses approximately 1.1 million acres from Cape

^{2/}Underlined numbers in parentheses refer to items in the list of references preceding the appendix.

Newenham on the south to Indian River on the north and Kuskokwim Bay on the west to Ungluayagat Mountain on the east (fig. 2). Access to the district is either by scheduled air service from Bethel and Dillingham to Platinum or Goodnews Bay, or via chartered aircraft to airstrips at Cascade Creek or at the Goodnews Bay mining camp. A gravel road spans the 10 mi between Platinum and the mining camp. Boats can be used to access the coastline.

Figure 3 is a land status map (109). Land status boundaries are not precise and conveyance is incomplete; therefore, specifics should be checked with the Bureau of Land Management. The district consists of both private and federal land. Most of the private land is owned by the Arviq Corporation around the community of Platinum; the Kuitcarak Corporation around the community of Goodnews Bay; and the Calista Corporation around both of the communities. The Bureau of Land Management manages the federal land that surrounds the corporation lands. Over half of the area is in the Togiak National Wildlife Refuge managed by the U.S. Fish and Wildlife Service, which is closed to mineral entry.

PREVIOUS STUDIES

The earliest geological investigation in the Goodnews Bay Mining District was by Martin (59) and Brooks (9-10) who reported on the mineral resources of the Slate-Wattamuse Creek area in 1916-17 and 1920. In 1921 and 1926, the geology and mineral resources of the Slate-Wattamuse Creek area were described by Harrington (39) and Holzheimer (56). In 1931 and 1933, Reed (72-75) described in detail the early placer mining efforts in the district and the ultramafic rocks at Red Mountain. J. C. Roehm (76-80) reported on the mineral

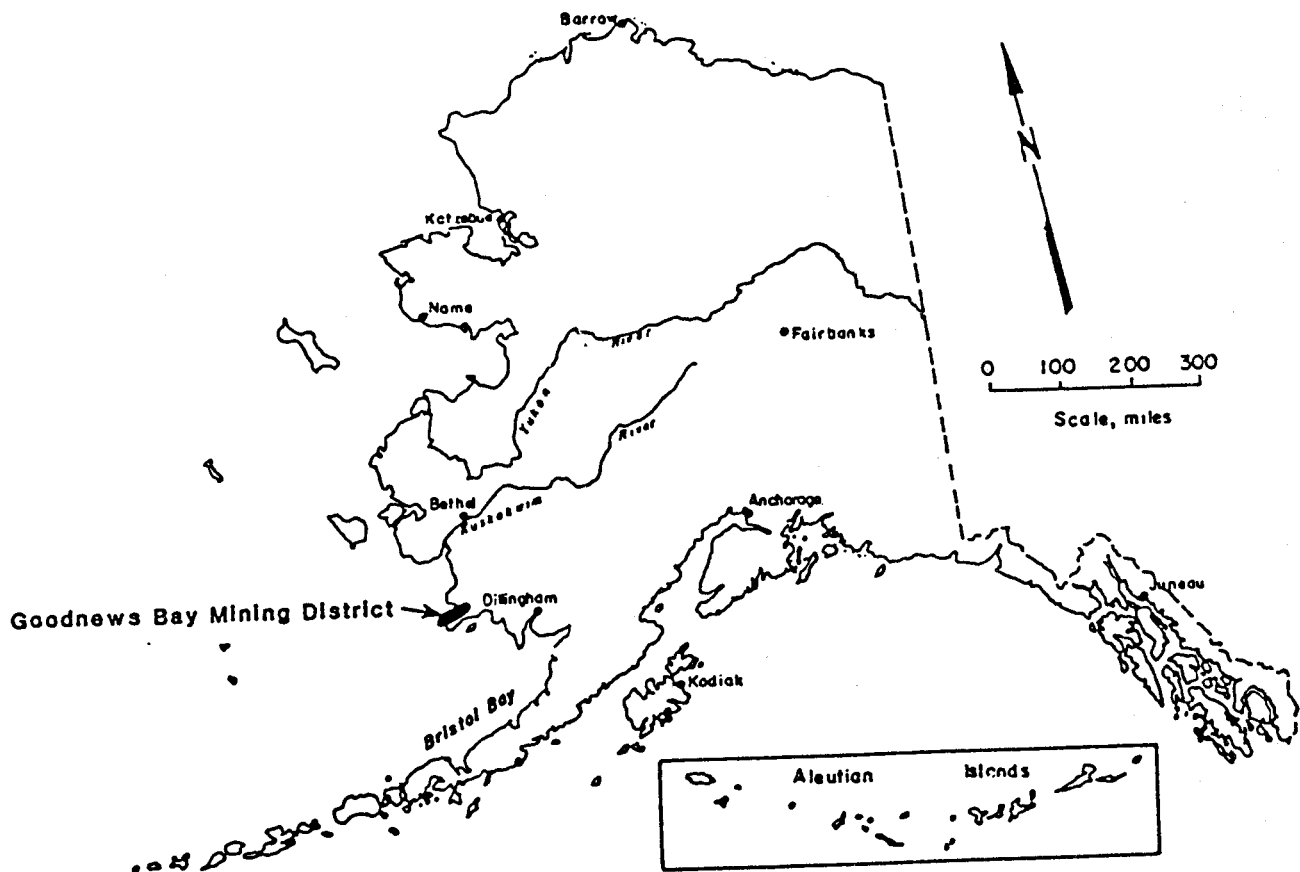


FIGURE 1. — Location map of the Goodnews Bay Mining District, Alaska.

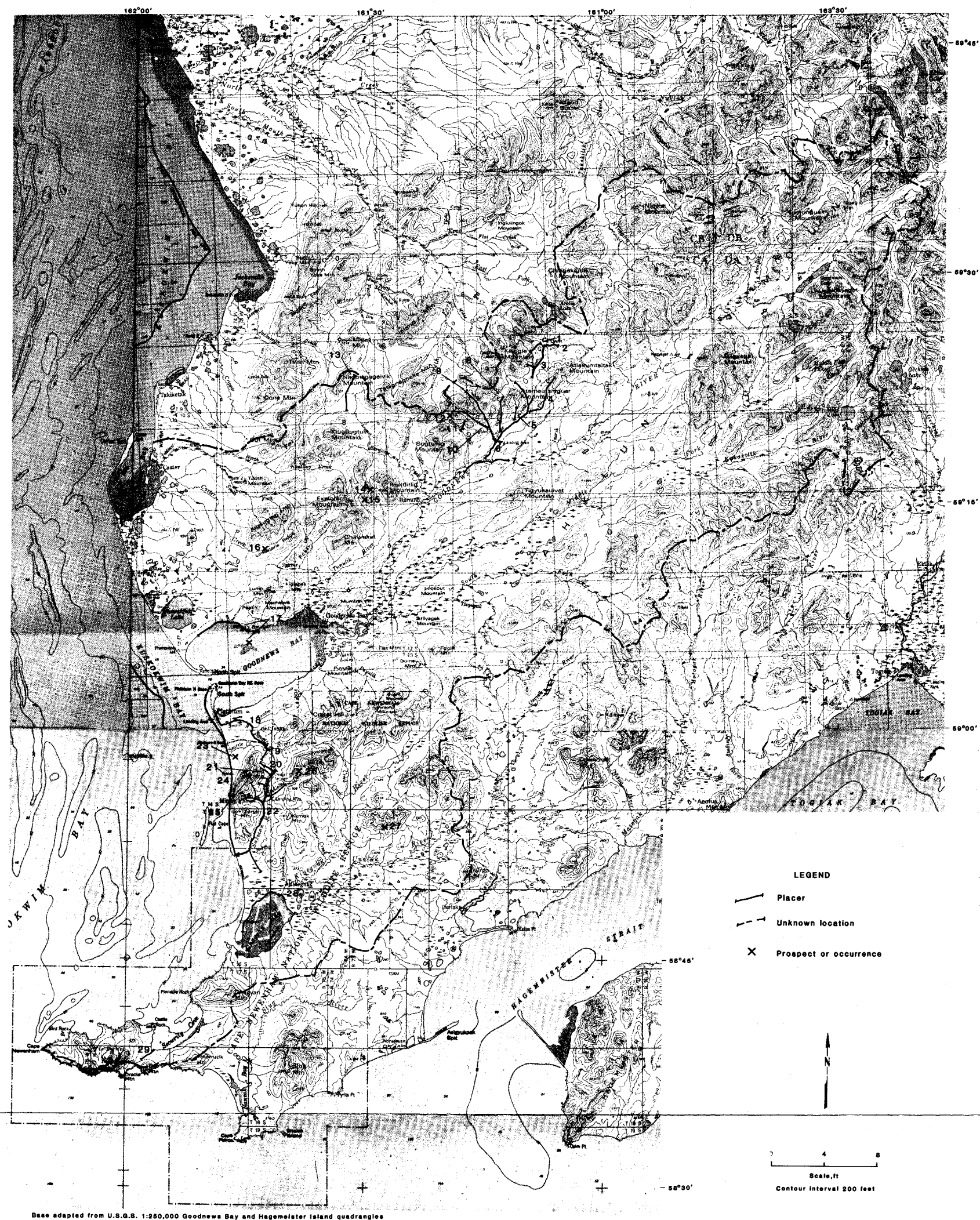


Figure 2. -- Property location map for the Goodnews Bay Mining District, Alaska.

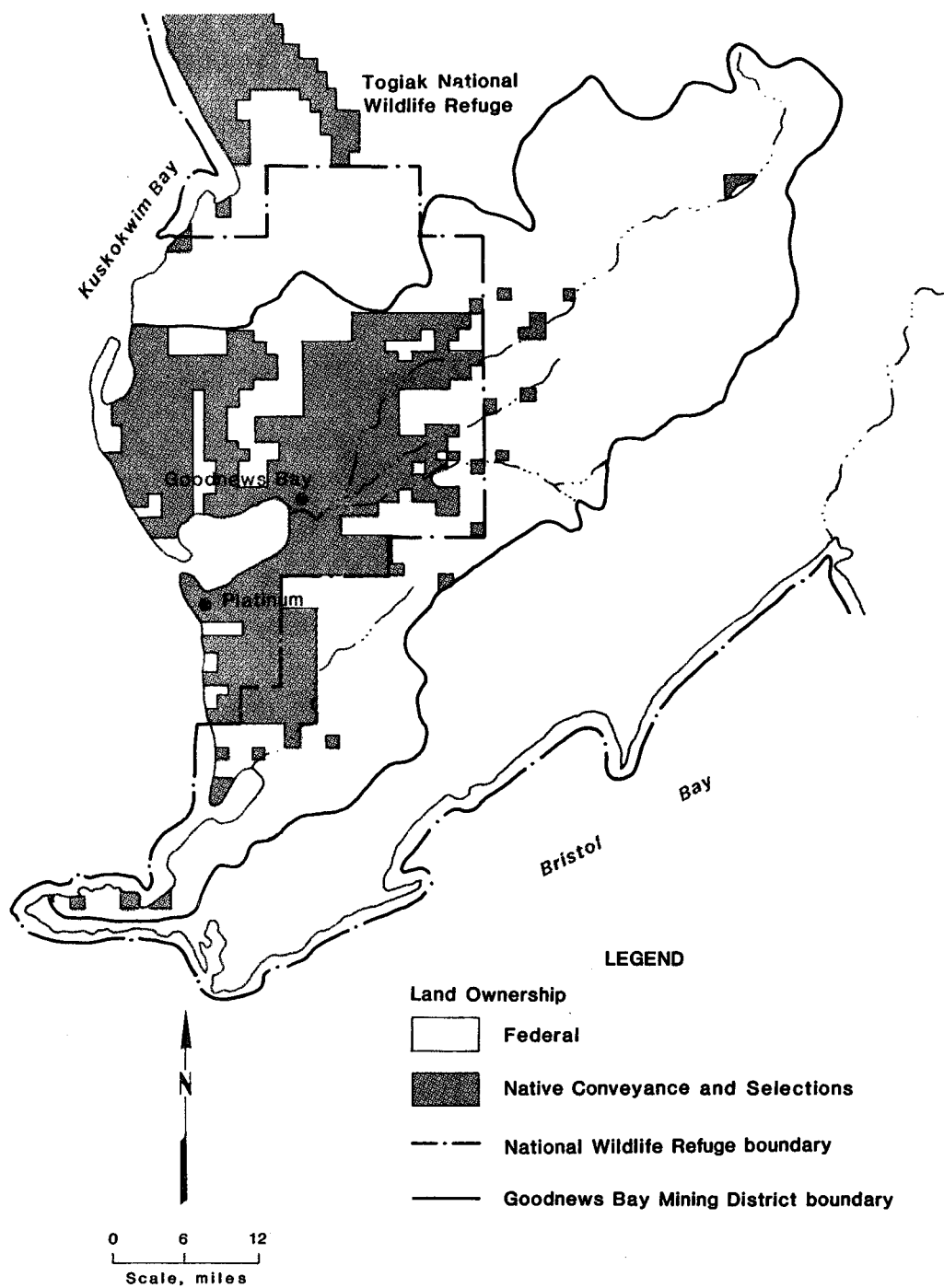


FIGURE 3. Land status map of the Goodnews Bay Mining District.

activity within the district in 1937-39 for the territory of Alaska. P. S. Smith (83-98) reported annually on the mineral activity in the district from 1926 to 1940. J. B. Mertie (60-64) published the most comprehensive descriptions of the platinum deposits in the Red Mountain area in 1937, 1940, 1969, and 1976. Joesting (58) and Fowler (35), for the Territory of Alaska Department of Mines, reported on the mineral activity at the Goodnews Bay Mining camp in 1942 and 1950. Hoare and Coonrad (49, 51-55) of the U.S. Geological Survey (USGS) mapped and described the geology of the central Kuskokwim region. Bird and Clark (5) reported results of electron-microprobe analyses of olivine chromitites from Red Mountain and suggested a similarity between Red Mountain and the Alaska-type zoned complexes. Berryhill (4), of the Bureau, investigated the placer potential of beach sands along much of the Bristol Bay coastline in 1963. In 1967, Porter (70) described the glacial history of the Goodnews Bay area. Results of an Alaska Mineral Resource Assessment Program (AMRAP) study conducted by the USGS were published in 1978 (24-25, 37, 40-48, 102-103). Cobb, Eberlein, and others (16-23, 31-32, 50) have summarized the mineral deposits of the Goodnews Bay and Hagemester Island quadrangles. The Universities of Wisconsin and Texas reported on the offshore sedimentary processes active in the Goodnews and Chagvan Bay area (6, 65, 105, 110-112). Southworth and Foley (100-101) and Carlson (15) reported on the lode PGM potential of the Red Mountain ultramafic complex. Stephen Box (7-8), of the USGS, has recently reported on the tectonic setting of southwestern Alaska.

MINING HISTORY

Mining has occurred at two locations in the Goodnews Bay Mining District: Slate-Wattamuse Creek and Red Mountain areas (figs. 4-6).

In the Slate-Wattamuse Creek area gold was found on Bear Creek in 1916 (9). A year later gold was discovered on Wattamuse Creek. Hand mining occurred on Wattamuse Creek from 1917 until 1937 when the Bristol Bay Mining Co. installed a dredge on the creek. The company subsequently worked Wattamuse Creek and Cascade Creek downstream from the confluence of Wattamuse Creek until 1947.

In the Red Mountain area, platinum was discovered in 1926 at the mouth of Fox Gulch, a tributary of Platinum Creek, by an Eskimo named Walter Smith. Charles Thorsen a local resident and miner in the district went to the site of the discovery, panned some of the metal and sent it to the Bureau's office in Fairbanks, where it was analyzed and identified as platinum. In 1928, Thorsen discovered platinum in the gravels of Clara Creek, and in the same year Edward St. Clair made the first discovery of platinum on Squirrel Creek.

From 1927 to 1934, small scale placer mining operations were conducted on Platinum, Squirrel, and Clara Creeks, and on Fox and Dry Gulches. By 1934, most of the mining claims had been consolidated into two mining companies: the Clara Creek Mining Co. and the Goodnews Bay Mining Co.

The Clara Creek Mining Co. operated in the valleys of Clara Creek and the Salmon River between Clara and Platinum Creeks. Mining operations by the company were terminated in 1940.

The Goodnews Bay Mining Co. began work with a dragline excavator on Squirrel Creek in 1934 and continued mining for 7 years until most of the placers of Platinum Creek, Fox Gulch, and Squirrel Creek were worked out. The company built a dredge in 1937, which was used to mine an average of over 1 million yd³ of gravel per year in the Salmon River valley until 1975 (36). The dredge worked intermittently from 1976 to 1986. Hanson Properties of Spokane, WA, acquired the Salmon River holdings in 1980 and at the time of the Bureau's investigation in 1986, was still the owner.

In 1936 and 1937 considerable exploratory drilling was done in a triangular-shaped area on the northwest side of Red Mountain, bounded by the Smalls River, Red Mountain, and Kuskokwim Bay. A dozen or more holes were drilled by various operators to depths ranging from 30 to 110 ft; bedrock was reached in only a few of these. A hole drilled in the valley of the Smalls River along the north side of the gravel road, about 2.6 mi S52°E of Platinum, reached bedrock at a depth of 192 ft and yielded both platinum and gold (63). No economic quantities of platinum were defined by any of the drilling.

PRODUCTION

Wattamuse and Cascade Creeks were the biggest producers in the Slate-Wattamuse Creek area (table 1). Approximately 6,000 oz of gold were mined by hand placer methods from 1917 to 1935. The Bristol Bay Mining Co. built a dredge on Wattamuse Creek in 1938 and mined 7,000 oz from Wattamuse Creek, and over 9,000 oz from Cascade Creek below Wattamuse Creek by 1947. Nearly 2,500 oz of placer gold were recovered from hand operations on Slate, Olympic, Bear, and Fox Creeks.

The early small-scale mining operations in the Red Mountain area from 1927 to 1937 yielded about 15,000 oz of platinum-group metals (PGM) (table 2). From 1937-1984, the total production was over 600,000 oz PGM and gold (table 2), with a maximum annual yield of about 30,000 oz of PGM and gold in 1944. Gold comprised less than 3% of the total ounces of precious metals recovered.

TABLE 1. Gold production from Slate-Wattamuse Creek area

Drainage	Years	Ounces of gold produced
Wattamuse Creek (39, 59, 80, 106)...	1917-1947	18,260
Cascade Creek (106)...	1940-1941	9,286
Slate Creek (106)....	1941	1,763
Bear Creek (106).....	1921-1941	559
Olympic Creek (106)...	1923-1929	169
Fox Creek (106).....	1941	4
TOTAL.....		30,041

TABLE 2. PGM production from Red Mountain area

Drainage	Years	Ounces of PGM produced
Clara Creek.....	1928-1937	10,000 1/
Dowry Creek.....	ND	1,800 T/
Salmon River tributaries..	1927-1931	5,000 T/
Salmon River, dredged.....	1937-1984	529,512 Z/
Salmon River, draglined....	ND	100,000 (33)
TOTAL.....		646,312

1/Estimated by author

Z/Total ounces PGM and gold (36)

ND No data

GEOLOGY

Bedrock geology in the Goodnews Bay Mining District consists predominantly of Paleozoic and Mesozoic age metavolcanic and metasedimentary rocks, which have been intruded by Jurassic age gabbros and ultramafic rocks and Cretaceous-Tertiary age felsic igneous rocks. These rocks were previously classified as the Gemuk Group, but recent work by Stephen Box (7-8) has subdivided the group into the Togiak and Goodnews terranes. Bedrock is overlain by unconsolidated Quaternary age deposits. The mineral deposits in the district are spatially and in some cases, genetically related to some of the ultramafic and felsic intrusives.








TOGIAK TERRANE

The Togiak terrane consists of Mesozoic age volcanic and volcanoclastic rocks that Box separated aurally into the Kulukak and Hagemester subterrane (fig. 7, 7). The Kulukak subterrane is exposed to the southeast outside of the Goodnews Bay Mining District. The Hagemester subterrane comprises a northeast-striking belt of rocks with its southwest end at Cape Newenham. The subterrane consists of Upper Triassic through Lower Cretaceous age rocks separated into three units by angular unconformities. The lowest unit is comprised of a mafic igneous suite intercalated with Upper Triassic age chert, which grades upward into lower Jurassic age shallow marine volcanoclastic rocks (7-8). The middle and upper units consist of intermediate composition volcanic and volcanoclastic rocks deposited in rapidly varying subaerial to deep marine environments. The upper unit (Lower Cretaceous) also contains detritus from the adjacent Kulukak subterrane and overlaps the Goodnews terrane.

GOODNEWS TERRANE

Box subdivided the Goodnews terrane into the Cape Peirce, Platinum, and Nukluk subterrane (fig. 7, 7-8). The Cape Peirce subterrane outcrops around Security Cove and Between Chagvan and Goodnews Bays. It consists of Late Triassic or Early Jurassic age foliated volcanic and sedimentary rocks of transitional blueschist-greenschist metamorphic facies (7). The Red Mountain ultramafic complex is in this subterrane.

LEGEND

-  Nukluk subterrane
-  Platinum subterrane
-  Cape Peirce subterrane
-  Hagemeister subterrane
-  Kulukak subterrane
-  Contact
-  Goodnews Bay Mining District boundary

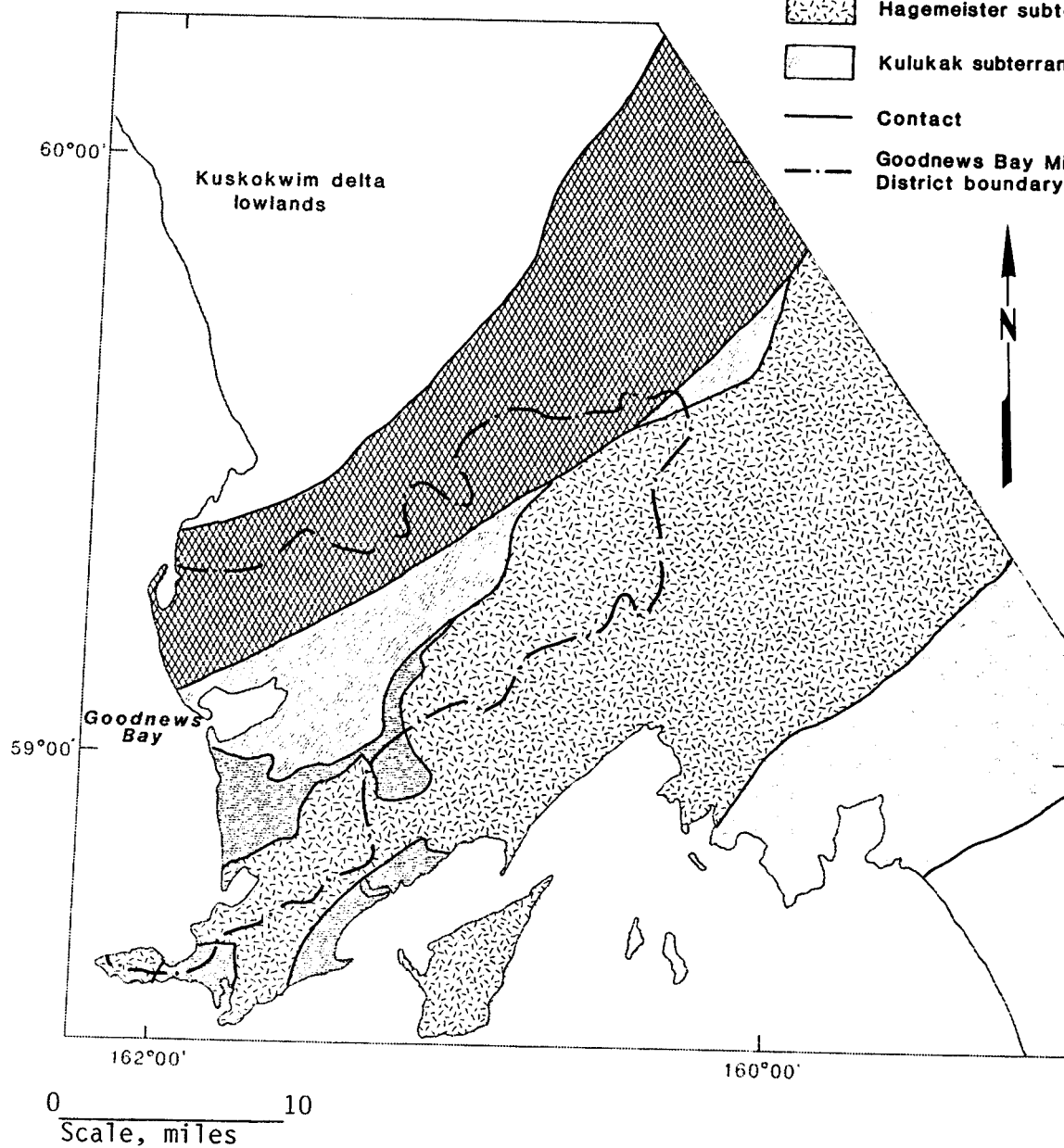


FIGURE 7. Tectonostratigraphic terrane map of the Goodnews Bay Mining District.

The Platinum subterrane is exposed in the Goodnews Bay area and in the upper Goodnews River drainage basin. It consists of nonfoliated Permian age basalts, limestones, and volcanic conglomerate.

The Nukluk subterrane's western edge is mapped from Goodnews Bay to Carter Bay, and is approximately 18 mi wide and trends northeast. The subterrane consists of a matrix-poor melange composed of limestone, radiolarian cherts, volcaniclastic rocks, and polymictic clastic rocks (7). Box (7) mapped a linear fault at the contacts of the Nukluk subterrane and the Platinum and Hagemeister subterrane. Pre-Middle Jurassic amalgamation of the Platinum, Cape Peirce, and Hagemeister subterrane is indicated by a crosscutting belt of early Middle Jurassic age mafic and ultramafic plutons (55).

INTRUSIVES

Intrusive rocks in the Goodnews Bay Mining District consist of Paleozoic and Jurassic age mafic and ultramafic rocks and Cretaceous-Tertiary age felsic rocks.

The mafic intrusives (mainly gabbro) are exposed as discrete bodies, such as at Explorer and Chagvan Mountains, the upper Unaluk River, and Cape Newenham; and as portions of mafic-ultramafic complexes, such as at Tatlignagpeke Mountain. Copper, gold, and arsenic mineralization have been noted or reported in some of the mafic intrusives in the area.

The ultramafic intrusives (dunite) are of Jurassic age and are located at Tatlignagpeke, Red and Suzie Mountains, Chagvan Mountain, and Cape Newenham, and in the Unaluk River drainage. PGM, copper, and chromium mineralization have been noted in some of these intrusives.

Cretaceous-Tertiary age felsic intrusives are exposed in the Explorer Mountain area, Wattamuse Creek, Slate Creek, and Tukaktlik River. Gold, silver, arsenic, antimony, and copper mineralization have been noted in some of these intrusives (104).

UNCONSOLIDATED QUATERNARY DEPOSITS

Unconsolidated Quaternary age deposits in the district consist of marine, glacial and fluvial deposits.

Marine Deposits

The marine deposits in the district consist of unconsolidated beach sands and gravels along Kuskokwim, Goodnews, and Chagvan Bays. The beach (foreshore region) is composed of unconsolidated, poorly sorted, and mostly glacially derived sediments. The sediment is derived from erosion of the bluffs that are prominent along the bays and from transportation by littoral drift. Landforms resulting from littoral drift include the spits at the mouths of Chagvan and Goodnews Bay and the Salmon River. The sediments have been reworked by surf action and ice-push. The beaches average 100 ft wide and range from 1/4 in deep at the base of the bluffs to an unknown depth (possibly 20 ft) in the active low tide level swash zone. The beach widths and depths are greater in the Platinum and Chagvan Bay areas where deposition of material due to littoral drift and barrier-inlet formation is active.

Bedrock consists of glacial clay, whose surface steepens seaward in a stairstep fashion. This study found that black sands which are generally composed of magnetite, ilmenite, chromite, PGM, and gold, are concentrated on the bedrock surface up to 75 ft from the bluffs. In the area between 30 ft from the bluffs and the ocean, the less than 1-in-thick black sand layers are intercalated with relatively unmineralized sand layers over the lower 3 ft depth. Placer PGM and gold were noted or reported in the marine deposits along Kuskokwim Bay from Platinum to Chagvan Bay and along and in Goodnews Bay (4, 21).

Glacial Deposits

Glaciation has had a prominent effect on the morphology of the mining district. The district contains broad U-shaped valleys filled with glacial material. Benches composed of glacial debris were noted along Fox, Olympic, and Wattamuse Creeks and in the Salmon River.

Porter (70) theorized that glaciers originating in the mountains around the Goodnews River spread over the coastal lowlands at least four times as broad piedmont lobes. The oldest drift, deposited during the Kemuk Glaciation, is deeply weathered and completely buried by younger drift. Massive morainal embankments of the Clara Creek Glaciation, the second oldest and most extensive ice advance, have been greatly modified by erosion and mass-wasting. Moraines built during the successively less extensive Chagvan and Unaluk glaciations exhibit less modified constructional topography characterized by low arcuate ridges and numerous kettle lakes. Radiocarbon dates provide a minimum age for the Unaluk Drift of 8,910 years and for the Chagvan Drift of greater than 45,000 years (70). Porter (70) theorized that there was a late Tertiary submergence of the Bering Shelf followed by eustatic changes related to fluctuations of Pleistocene glaciers.

Placer PGM is present in the till and glaciofluvial deposits along the Salmon River and on the west side of Red Mountain. Placer gold is found in the glacial deposits along Kuskokwim Bay and along some of the creeks in the Slate-Wattamuse Creek area.

Fluvial Deposits

Unconsolidated fluvial gravel deposits are found along the streams of the area. Most of the gold produced in the district has come from the alluvial gravels on Cascade Creek. Placer PGM has been produced from alluvial/colluvial and glaciofluvial gravels along the Salmon River and its tributary streams draining Red Mountain.

Gravel deposit widths are up to 600 ft and thicknesses range from 15 to 200 ft in the Salmon River valley (63). In the tributary valleys the depths range from 6 to 20 ft (63).

BUREAU OF MINES INVESTIGATION

The Bureau initiated a mining district study of the Goodnews Bay Mining District in 1985 with field work conducted in 1986. A one year study was sufficient because of the districts' relatively small size, limited number of known mineral deposits, and the availability of data previously collected during the Bureau's on-going critical and

strategic minerals program. A literature search began in 1985, with field investigations in 1986.

LITERATURE SEARCH

A literature search was initiated in 1985. Data compilation on geology, production, and mining history included the review of USGS bulletins and reports, Alaska Territorial Department of Mines reports, ADGGS reports, university theses, company data, claim maps (1), and MAS (108) locations. Twenty-nine mineral properties were identified by the search (fig. 2, appendix A).

FIELD INVESTIGATIONS

Field investigations were conducted in May and June of 1986. Reconnaissance placer sampling was conducted in the drainages of the district. Detailed mapping and sampling of the identified mineral properties and geochemical anomalies were attempted. The Bureau collected 335 samples, which consisted of 234 reconnaissance placer, 87 rock, 7 stream sediment, 5 pan concentrate, and 2 soil samples (appendix B).

The procedure for reconnaissance placer sampling consisted of hand digging a pit and processing 0.1 yd³ of unconsolidated material through a portable mini sluice box or hydraulic concentrator. The sluice box measured 34 in long by 10 in wide and had 0.38-in high transverse riffles resting on expanded metal on indoor-outdoor carpeting. The portable sluice box was used to process material adjacent to stream channels. The hydraulic concentrator consisted of a small grizzly attached to an aluminum mini sluice box similar to the one described above. Two mini sluice boxes were added onto the end of the concentrator's sluice box to enhance fine-grained heavy mineral recovery. Water was pumped to the concentrating unit by a 150-gpm-rated pump coupled with a 5-hp engine. The concentrator was used to process beach and glacial material and mine tailings. Wherever possible, channel samples of unconsolidated material were taken from the surface to bedrock. The 234 reconnaissance placer samples were taken from the following material types: 142 samples from stream material, 74 samples from beach sand, and 18 samples from glacial till.

Detailed reconnaissance placer sampling of beach and glacial sediments at 23 sample sites (177-183, 219-234, fig. 6, appendix B), was conducted from approximately 2 mi north of Red Mountain to 1.5 mi south of the Salmon River. A maximum spacing of one site per 0.5 mi was accomplished, with some spacings at 0.25 mi intervals. Samples of material from the bluff, the base of the bluff, and at 25-, 50-, and 75-ft intervals from the base of the bluff were taken at each site if possible. The actual number of samples taken was dependent on tidal conditions and the width of the beach. For the bluff samples, a representative sample was collected from a channel cut from near the surface to beach level. For the beach samples, a representative sample was collected from a channel cut in the material from the surface to the underlying glacial (bedrock) material, or to a 5 ft depth, whichever was reached first.

The sluice box concentrates were saved. One hundred thirty-seven concentrates were processed in Anchorage to separate the gold and PGM by using gravity separation techniques. The rest of the concentrates did not contain enough visible gold or PGM (less than 0.0001 grams) to warrant physical separation; therefore, they were sent directly to a commercial laboratory for inductively coupled plasma (ICP) and atomic absorption (AA) chemical analyses. The separated gold and PGM particles were measured, counted, described, weighed, and sent to a commercial laboratory for fineness determinations for the gold and electron microprobe analyses for PGM. The size distribution of the grains, recorded in this report as percent, was determined by dividing the number of grains of a certain size by the total number of grains in the sample and multiplying by 100. Fineness determinations are listed in table 3. Results of the microprobe analyses are listed in appendix C.

MINERAL DEVELOPMENT POTENTIAL AND RESOURCE ESTIMATES

Sample results and site specific mineral examinations were used to give each property a mineral development potential rating: "high", "moderate", "low", "unevaluated", and "unknown". These ratings are estimates based on an evaluation of grades and extent of mineralization. A deposit with a high mineral development potential would have both high grades and probable continuity of mineralization. In the case of a placer gold or PGM deposit, grades would exceed 0.01 oz/yd³. A deposit of moderate mineral development potential would have either a high metal content or continuous mineralization identified, but not both. A deposit with a low mineral development potential rating would contain uneconomic grades and/or show little evidence of continuity of mineralization. An unevaluated mineral development potential would be given to a deposit that was not located or visited in the field. An unknown mineral development potential rating has been assigned to properties on which insufficient work was done to properly evaluate.

Resource estimates were made for the properties that had sufficient geologic information to calculate average grade and tonnage or yardage.

RESULTS

Detailed descriptions of the twenty-nine identified mineral properties in the Goodnews Bay Mining District are in appendix A. Twenty-three mineral properties (map nos. 1-4, 6, 8-13, 17, 19-25, 27-29, fig. 2, appendix A) were investigated. Evan's Pup (map no. 5, fig. 2, appendix A) could not be found and the the Bureau was not permitted to investigate the other properties (map nos. 7, 14-15, 18, 26, fig. 2, appendix A). The mineral development potential ratings for the properties are summarized on table 4.

Sample site locations for all of the samples taken by the Bureau are plotted on figures 4-6 and sample results are tabulated in appendix B.

Two areas in the district have had mineral development and contain nearly 70% of the known mineral deposits: the Slate-Wattamuse Creek and Red Mountain areas. They will be discussed in greater detail. Some miscellaneous deposits and the investigation of geochemical anomalies, outside of these two areas, will also be discussed.

TABLE 3. - Fineness values for samples taken in the
Goodnews Bay Mining District

Map no. 1/	Sample no.	Location (map no.)2/	Fineness
50.....	6715.....	Slate Creek (6).....	551
51.....	6716.....	...do.....	794
53.....	6718.....	Caribou Creek (6).....	823
54.....	6696.....	Fox Creek (4).....	817
55.....	6697.....	...do.....	604
56.....	6719.....	Slate Creek (6).....	739
57.....	6720.....	...do.....	829
60.....	6723.....	Olympic Creek (8).....	727
61.....	6736.....	...do.....	809
63.....	6734.....	...do.....	747
65.....	6732.....	...do.....	786
67.....	6725.....	Slate Creek (6).....	718
69.....	6831.....	Wattamuse Creek (10)..	781
70.....	6830.....	...do.....	757
71.....	6757.....	Cascade Creek (9).....	847
72.....	6829.....	Wattamuse Creek (10)..	799
73.....	6783.....	...do.....	780
74.....	6782.....	...do.....	825
75.....	6714.....	...do.....	734
78.....	6713.....	...do.....	745
83.....	6752.....	Cascade Creek (9).....	646
84.....	6751.....	...do.....	784
117.....	6539.....	Barnum Creek trib (13)	816
118.....	6665.....	...do.....	779
121.....	6664.....	...do.....	424
123.....	6558.....	...do.....	745
127.....	6817.....	Beach.....	798
128.....	6816.....	...do.....	859
130.....	6814.....	...do.....	517
131.....	6813.....	...do.....	815
133.....	6810.....	...do.....	821
143.....	6543.....	Poker Creek.....	671
175.....	6789.....	McCann Creek (19).....	918
177.....	6652.....	Beach (25).....	758
178.....	6581.....	Beach till (24).....	775
178.....	6582.....	...do.....	606
179.....	6586.....	Beach (25).....	864
179.....	6587.....	...do.....	642
179.....	6588.....	...do.....	720
179.....	6589.....	...do.....	489
180.....	6622.....	...do.....	733
180.....	6623.....	...do.....	700
182.....	6641.....	...do.....	588
182.....	6642.....	...do.....	548
183.....	6634.....	...do.....	823
184.....	6827.....	Red Mountain (25).....	807
191.....	6738.....	Dowry Creek (21).....	824
195.....	6761.....	...do.....	738
213.....	6575.....	Platinum Creek (22)...	774

See footnotes at end of table.

TABLE 3. - Fineness values for samples taken in the
Goodnews Bay Mining District -- Continued

Map no. 1/	Sample no.	Location (map no.)2/	Fineness
218.....	6826.....	Red Mountain (25).....	798
219.....	6698.....	Beach (25).....	789
219.....	6699.....	...do.....	655
219.....	6700.....	...do.....	592
220.....	6726.....	...do.....	723
220.....	6727.....	...do.....	804
220.....	6728.....	...do.....	797
221.....	6729.....	...do.....	792
221.....	6741.....	...do.....	835
221.....	6742.....	...do.....	844
223.....	6743.....	Beach till (25).....	900
223.....	6744.....	Beach (25).....	840
223.....	6745.....	...do.....	736
224.....	6746.....	...do.....	856
224.....	6762.....	...do.....	812
225.....	6799.....	...do.....	857
225.....	6800.....	Beach till (25).....	746
225.....	6809.....	Beach (25).....	848
226.....	6763.....	Beach till (25).....	781
226.....	6764.....	Beach (25).....	846
226.....	6765.....	...do.....	811
227.....	6797.....	Beach till (25).....	801
227.....	6798.....	Beach (25).....	863
227.....	6801.....	...do.....	773
228.....	6767.....	...do.....	777
228.....	6768.....	...do.....	822
229.....	6795.....	...do.....	852
230.....	6707.....	...do.....	784
230.....	6708.....	...do.....	763
230.....	6769.....	...do.....	761
230.....	6770.....	...do.....	792
231.....	6709.....	Beach till.....	688
231.....	6711.....	Beach.....	697
232.....	6771.....	...do.....	710
235.....	6836.....	...do.....	827
236.....	6837.....	...do.....	856
249.....	6803.....	Security Cove (29)....	781
250.....	6670.....	...do.....	834

1/Map no. refers to sample sites plotted on figures 4, 5,
and/or 6.

2/Map no. refers to property location number on figure 2.

TABLE 4. - Mineral development potential ratings for properties in the Goodnews Bay Mining District

Property (map no.) 1/	Mineral Development Potential
JFM and Associates (1).....	Unknown
Canyon Creek (2).....	Unknown
Bear Creek (3).....	Low
Fox Creek (4).....	Low
Evans Pup (5).....	Unevaluated
Slate Creek (6).....	Low
Goodnews River (7).....	Unevaluated
Olympic Creek (8).....	Moderate
Cascade Creek (9).....	High
Wattamuse Creek (10).....	High
Malaria Creek (11).....	Unevaluated
Wattamuse - Granite Creek (12).....	Moderate
Barnum Creek Tributary (13).....	Moderate
Ikuk (14).....	Unevaluated
Tunulik (15).....	Unevaluated
Kigsugtag (16).....	Low
Goodnews Bay (17).....	Unknown
Smalls Creek (18).....	Unevaluated
McCann Creek (19).....	Moderate
Clara Creek (20).....	High
Dowry Creek (21).....	Moderate
Salmon River (22).....	High
Red Mountain (west side) (23).....	Low
Platinum Salmon River Beach (24).....	High
Red Mountain (25).....	Low
Susie Mountain (26).....	Low
Unnamed (27).....	Low
Chagvan Bay (28).....	Unknown
Security Cove (29).....	Moderate

1/Map no. refers to property location number on figure 2.

SLATE-WATTAMUSE CREEK AREA

The Slate-Wattamuse Creek area is shown on figure 5. Bear, Canyon, Cascade, Fox, Malaria, Olympic, Slate, and Wattamuse Creeks, Evan's Pup, and Goodnews River contain placer gold (map nos. 2-11, fig. 2). Most production in the area came from Wattamuse, Cascade and Olympic Creeks (table 1). Most of the drainages are approximately 4 mi long, range from 200 to 2,000 ft wide and contain gravels up to 8 ft thick. They have similar physiographic profiles, with broad U-shaped valleys at the heads and middle portions of the creeks, and canyons in the lower portions. Benches composed of gold-bearing glaciofluvial material are found along Wattamuse, Olympic, and Fox Creeks. Bedrock is composed of Paleozoic to Mesozoic age metavolcanic and metasedimentary rocks, which strike northeast. Felsic intrusives outcrop at the head of most of the drainages. Samples of quartz float (91, 95-96, fig. 5, appendix B) with values up to 2 oz/st Au were taken from the headwaters of Wattamuse and Granite Creeks. Soil samples (85, 87, fig. 5, appendix B) taken from the head of Wattamuse Creek contained up to 6.55 ppm Au. A sample (96, fig. 5, appendix B) of a mafic intrusive rock near the contact of the Wattamuse intrusive contained 3.3 ppm Au.

Bureau placer sampling recovered gold values ranging from trace to 0.7583 oz/yd³. The highest values were found in Wattamuse Creek. High platinum and palladium values were found in the placer concentrates from Bear Creek (44-46, fig. 5, appendix B) but no PGM grains were noted visually. Wattamuse and Cascade Creeks have high mineral development potential (table 4). Gold finenesses were from 551 to 829 (table 3).

Identified Resources

Identified resources in the area were determined for Cascade and Wattamuse Creeks. In Cascade Creek, the dredge mined approximately 800,000 yd³ of material, with an average recovered grade of 0.025 oz/yd³ Au. The average reported grade of the paystreak was 0.04 oz/yd³ Au (73). Therefore, there may be 800,000 yd³ of tailings which contains grades of 0.015 oz/yd³ Au.

In Wattamuse Creek, it was determined that an area at least 100 ft long by 100 ft wide by 6 ft deep is present. This is an identified resource of 60,000 yd³ of material. The average reported mined grade for the Wattamuse gravels was between 0.015 and 0.018 oz/yd³ Au (39). This grade therefore is reasonable for the remaining yardage.

RED MOUNTAIN AREA

The Red Mountain area is shown on figure 6. Placer PGM was found in Fox Gulch in 1926, and since then PGM has been produced from the Salmon River, Fox Gulch, Platinum Creek, Dry Gulch, Squirrel Creek, Clara Creek, McCann Creek, and Dowry Creek. All of the reported PGM production has come from the Salmon River and its tributaries that drain the east side of Red Mountain. PGM was also reported in drill holes from the Smalls River (63); in the glacial deposits on the west

side of Red Mountain; in beach deposits along the beach from Platinum to the Salmon River; and in the weathered bedrock on Red Mountain.

Red Mountain Ultramafic Complex

The geology of the Red Mountain area is dominated by the Jurassic age Goodnews Bay ultramafic complex which comprises Red and Susie Mountains. Southworth and Foley (100-101) of the Bureau examined the bedrock geology of the area in detail from 1982 to 1984. They concluded that the intrusive is an Alaskan-type concentrically zoned ultramafic body, that consists of a dunite core surrounded by werhlite, magnetite clinopyroxenite, hornblende clinopyroxenite, and hornblendite. Southworth and Foley (100-101) also concluded that the Goodnews Bay complex is the bedrock source of placer PGM and some of the gold in the area. The workers noted anomalous PGM contents in chromitite bedrock and in magnetite nuggets in the tailings. PGM was also noted in the rocks on Red Mountain by earlier workers (5, 93, 105). Ulrich (105), identified cooperite and a platinum-iron alloy in the dunite, but no economic concentrations have been noted. During this study the Bureau took three 0.1 yd³ samples of weathered dunite from the top of the Red Mountain (184-185, 218, fig. 6, appendix B). The samples were processed through the hydraulic concentrator and found a trace to 0.0011 oz/yd³ PGM and trace to 0.0002 oz/yd³ Au. The highest PGM and Au values were in the sample (218, fig. 6, appendix B) from the headwaters of Fox Gulch. Gold fineness values in two samples (184, 218) were 807 and 798, respectively (table 3).

Although PGM and gold have been noted in the complex and the complex is a source of the placer PGM and gold found in the creeks of the area, all of the work which has been done on the complex so far indicates that it has a low mineral development potential for lode PGM and gold.

Placer Deposits

PGM has been found in placer deposits within the Red Mountain area. The deposits have been subdivided into four categories for further discussion: (1) Salmon River deposits; (2) Red Mountain stream deposits; (3) marine deposits; and (4) west side of Red Mountain deposits.

Salmon River Deposits

The PGM-bearing placer deposits of the Salmon River occur in two distinct paystreaks; one in the present valley floor and the other in the bench channel on the east side of the valley. The Salmon River was mined by using a dredge with 8 ft³ capacity buckets from between Last Chance and Boulder Creeks downstream to within a mile of the mouth of the Salmon River. The bench gravels on the east side of the creek were mined with a dragline from Clara Creek to Medicine Creek. Mining occurred continuously from 1937 to 1976 and sporadically from 1976 to the present. The average recovery grade for the dredge was 0.012 oz/yd³ PGM.

The valley paystreak is from 300 to 600 ft wide and extends for 6 mi. The paystreak is covered by 30 to 80 ft of overburden. The gravels range up to 2 ft in diameter, with no clay and are from 30 to 75 ft thick. PGM occurs mainly on bedrock, in the overlying 2 ft of gravel and in the uppermost 2 ft of shattered bedrock. The bedrock is unweathered. Mertie (63) reported that the mean sizes by weight of the recovered PGM grains varied by claim, but averaged 16.5% +20 mesh, 13.7% -20/+30 mesh, 31.6% -30/+35 mesh, 16.3% -35/+45 mesh, 20.5% -45/+60 mesh, 1.5% -60 mesh (fig. 8). The mean composition of the recovered PGM grain analyses also varied by claim, but averaged 1.32% Rh, 0.19% Ru, 83.07% Pt, 12.52% Ir, 2.51% Os, and 0.39% Pd (63). Platinum-group minerals including cooperite, osmiridium, laurite, sperrylite, an iridium-palladium sulfide, mertieite, and bowieite have been identified by past workers (26-27, 63).

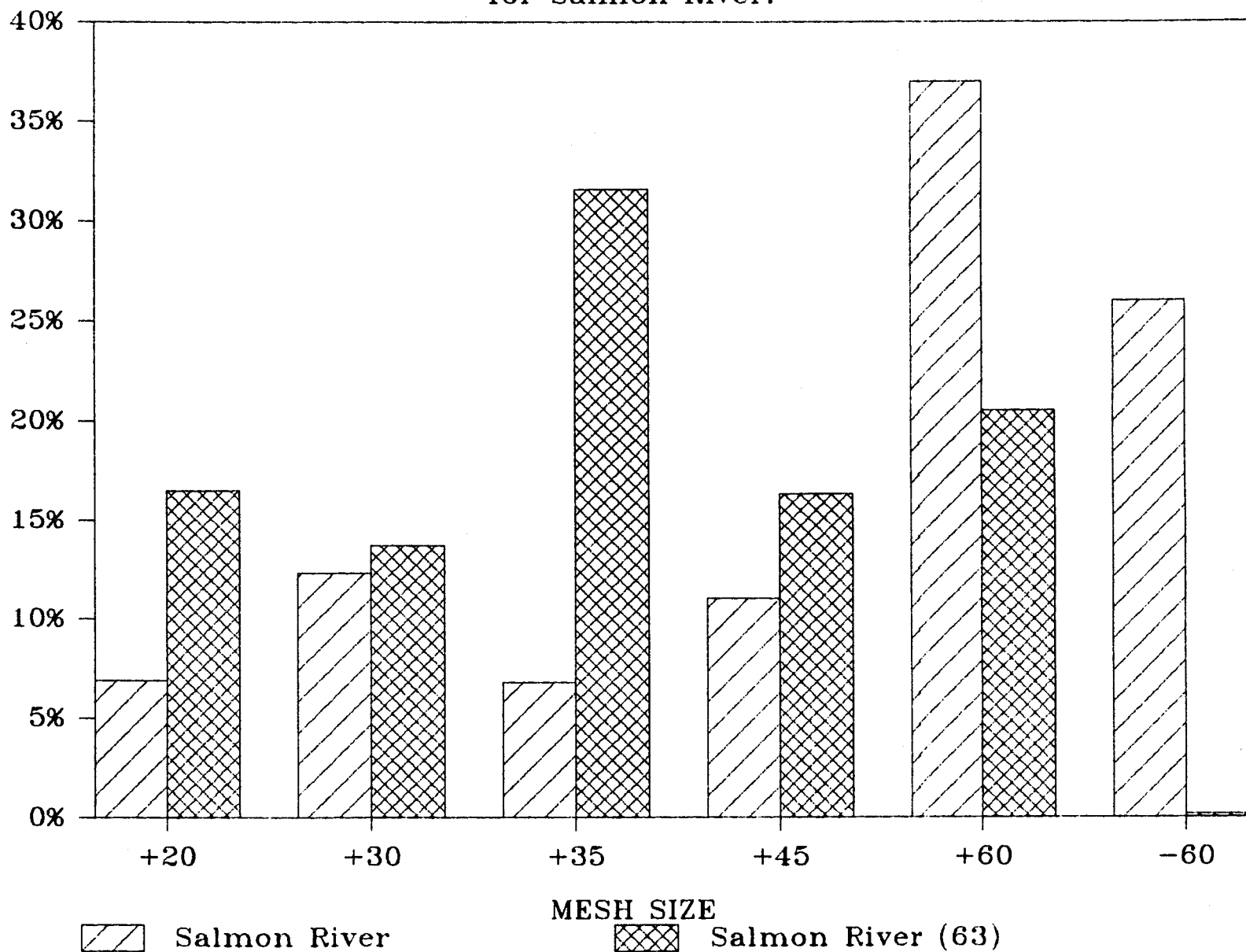
The bench paystreak extends for 10 mi along the east side of the Salmon River valley from Clara Creek to Happy Creek. The paystreak extends south of Happy Creek to Chagvan Bay. The paystreak is from 600 to 1,200 ft wide and from 10 to 200 ft thick. The paystreak consists largely of clay with about 20% gravel, which is irregularly distributed vertically. PGM occurs mainly on the surface of the bedrock and in the overlying 10 ft of clay and gravel. The bedrock is weathered to a depth of 5 ft. The grain sizes by weight of the PGM recovered on the bench paystreak varied by claim, but averaged 14.6% +20 mesh, 13.7% -20/+30 mesh, 20.3% -30/+35 mesh, 33.6% -35/+45 mesh, 16.1% -45/+60 mesh, and 1.5% -60 mesh (63). The mean composition of the recovered PGM also varied by claim but averaged 1.32% Rh, 0.15% Ru, 86% Pt, 10.15% Ir, 1.97% Os, and 0.41% Pd (63).

The Bureau did not extensively sample the Salmon River deposits during this study because the necessary equipment (drills and/or backhoes) was unavailable. The Bureau collected 10 0.1 yd³ placer samples from 9 sample sites (197-205, fig. 6, appendix B) from dredge tailings in the Salmon River near Medicine Creek. The samples contained from 0 to 0.0037 oz/yd³ PGM. PGM grain sizes by volume were 6.9% +20 mesh, 12.3% -20/+30 mesh, 6.8% -30/+35 mesh, 11% -35/+45 mesh, 37% -45/+60 mesh, 26.0% -60 mesh (fig. 8). This study recovered from the dredge tailings PGM grains which were the same mesh sizes as PGM grains reported by Mertie (63) from the dredge. This data suggests that the dredge was losing PGM from each size fraction. Microprobe analyses of the recovered PGM grains contained from 0.6 to 1.1% Rh, 0.4 to 0.7% Ru, 60.3 to 85.5% Pt, 3.8 to 25.6% Ir, 1.2 to 6.3% Os, and 5.9 to 8.9% Fe (appendix C). The recovered grains consist of iron-platinum alloy with 8 to 30% iron, ferroan platinum with minor osmiridium inclusions, osmiridium (iridium with minor osmium), sperrylite, and tetraferroplatinum (appendix C).

Red Mountain Stream Deposits

The PGM-producing streams that drain Red Mountain are from 1 to 2 mi long, have gradients of approximately 600 ft/mi, and are predominantly located on the east side of the mountain. The streams include McCann, Clara, Dowry, Boulder, Last Chance, and Platinum Creeks (fig. 6). Platinum Creek includes Squirrel Creek, and Dry and Fox Gulches. Mertie (63) described the geology and workings of the streams in detail. PGM-bearing alluvial and colluvial material is found in stream and bench deposits in the drainages. The deposits are 200 to

Figure 8. – PGM Size Distribution
for Salmon River.



400 ft wide, 10 to 25 ft thick, and extend from the headwaters to the mouths of the streams. The platinum metals are found in the lower few ft of the gravels, on the surface of the bedrock, and in the upper few ft of bedrock. The PGM grains in the east draining valleys are small, but overall are larger than those found in the Salmon River. Nuggets are uncommon, with the largest nugget weighing 4 oz (63). The streams were mined by hand and dragline excavator from 1926 to 1941. Platinum Creek was worked by the Goodnews Bay Mining Co. in the late 60's and early 70's. Mertie (63) found that the platinum-group element contents of the PGM grains recovered from the Red Mountain streams changed from south to north: the Pt content increases, and the Ir, Os, Ru, and Rh contents decrease. This study found the same relationship as shown on figure 9.

The Bureau sampled McCann, Clara, Dowry, Squirrel, and Platinum Creeks and Fox Gulch during this study. One placer sample (175, fig. 6, appendix B) taken from McCann Creek contained 0.0018 oz/yd³ PGM and 0.0008 oz/yd³ Au. The sizes of the PGM grains by volume were 6.6% +20 mesh, 20% -20/+35 mesh, 40% -35/+60 mesh, and 33.3% -60 mesh (fig. 10). Microprobe analyses of the recovered PGM grains were 2.1% Rh, 0.8% Ru, 81.4% Pt, 1.9% Ir, 0.9% Os, and 8.1% Fe (appendix C). The grains consist of iron-platinum alloy with 8 to 30% Fe, iron-platinum alloy with oriented inclusions of Ru-Ir arsenides, osmium, and sperrylite (appendix C). The fineness value for the recovered gold was 918 (table 3).

Six placer samples taken from five sample sites (186-189, 193, fig. 6, appendix B) were taken from Clara Creek. The samples contained up to 0.034 oz/yd³ PGM, with the highest values being taken from unworked ground at the head of the old mining cut at 500-ft elevation. Microprobe analyses indicated 1.6% Rh, 0.5% Ru, 83% Pt, 3.8% Ir, 1.0% Os, and 8.1% Fe (appendix C). Iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, hollingsworthite, and sperrylite were identified (appendix C).

Four placer samples (190-191, 194-195, fig. 6, appendix B) were taken from Dowry Creek. The samples contained from 0.0007 to 0.0215 oz/yd³ PGM and up to 0.0006 oz/yd³ Au. The sizes of the PGM grains by volume were 1.2% +20 mesh, 10% -20/+30 mesh, 14.3% -30/+35 mesh, 3.2% -35/+45 mesh, 63.3% -45/+60 mesh, and 8% -60 mesh (fig. 10). Microprobe analyses of the recovered PGM grains were from 0.8 to 1.5% Rh, 0.4 to 0.9% Ru, 63.4 to 80.2% Pt, 7.2 to 18% Ir, 1.2 to 6.8% Os, and 6.6 to 7.5% Fe (appendix C). The grains were iron-platinum alloy with 8 to 30% Fe, iron-platinum alloy with minor osmiridium inclusions, osmiridium (iridium with minor osmium), hollingsworthite, osmium, xingzhongite, iridarsenite, irarsite, sperrylite, and tulameenite (appendix C).

Six placer samples taken from five sample sites (209-213, fig. 6, appendix B) of virgin ground and tailings were collected in Platinum Creek. Samples contained from trace to 0.0039 oz/yd³ PGM and up to 0.0006 oz/yd³ Au. Microprobe analyses of the PGM grains recovered in the samples indicated from 0.8 to 1.6% Rh, 0.5 to 1.0% Ru, 45.6 to 77.8% Pt, 8.1 to 37.8% Ir, 3.2 to 13.4% Os, and 4.1 to 8.4% Fe (appendix C). The identified grains were iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, osmiridium (iridium with less ferroan platinum), hollingsworthite, prassoite, kashinite, sulrhodite, ehrlichmanite, iridosmine,

FIGURE 9. – Variation in composition
of PGM from Red Mountain area.

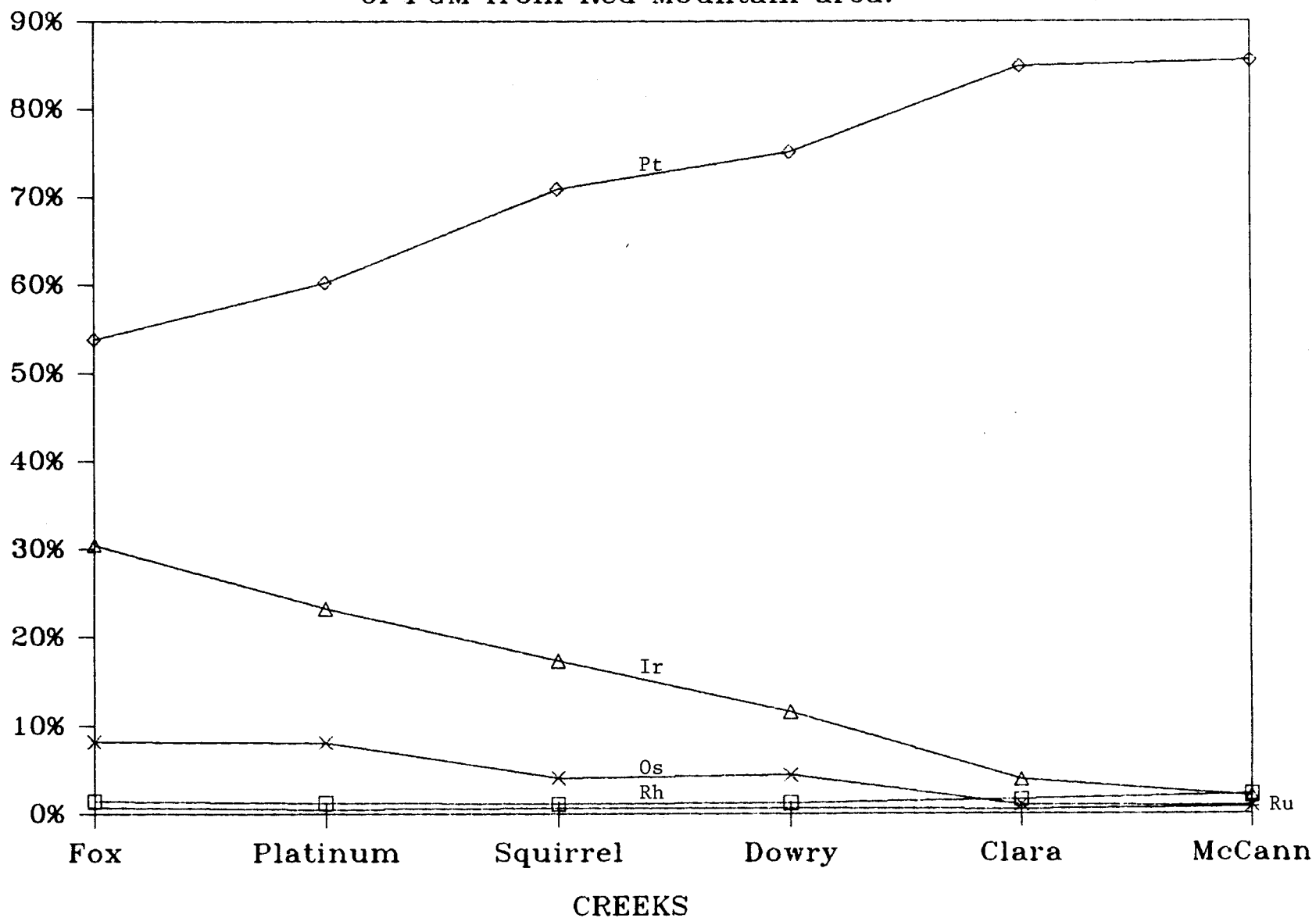
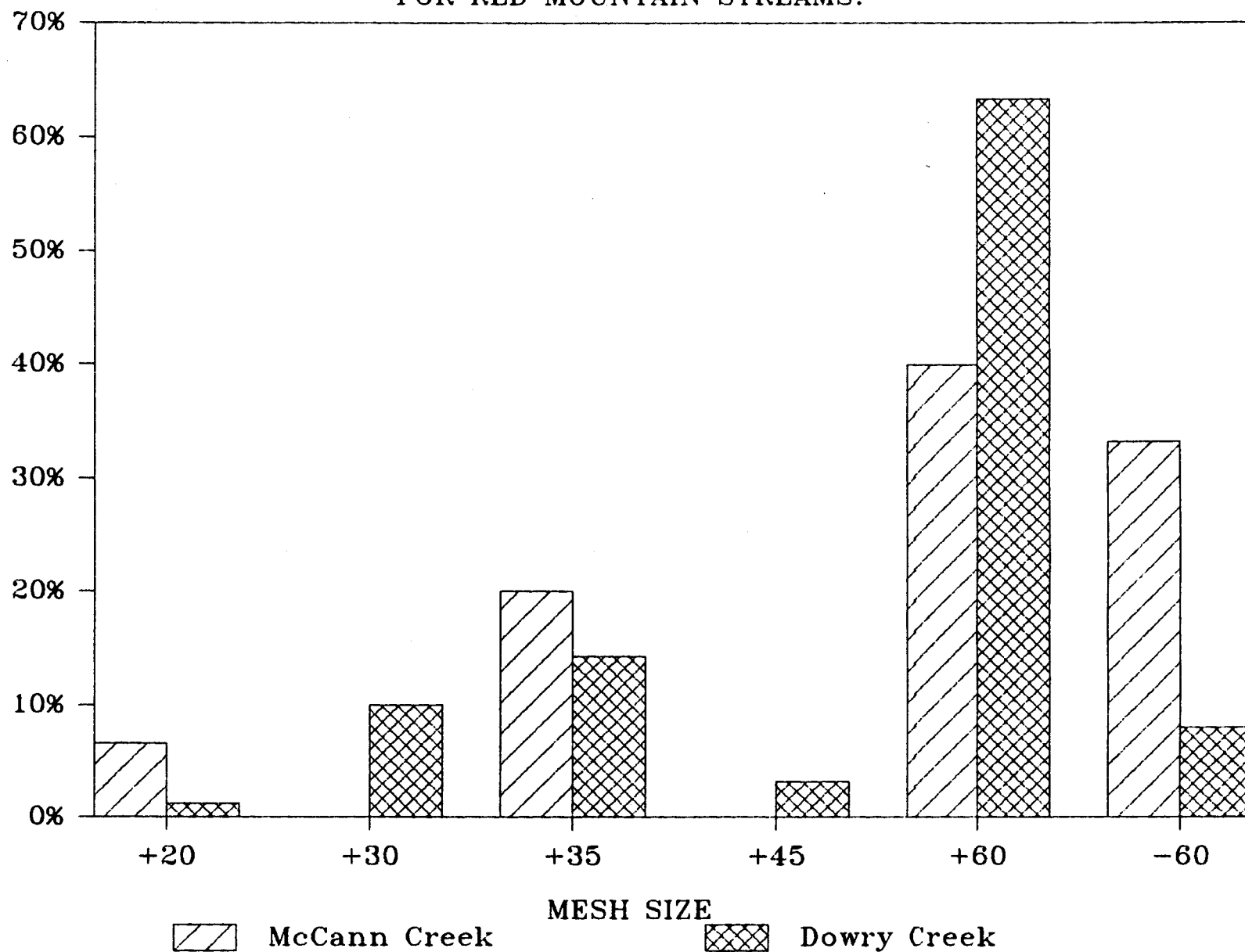


FIGURE 10. — PGM SIZE DISTRIBUTION
FOR RED MOUNTAIN STREAMS.



osmium, iridarsenite, iridium, sperrylite, and tulameenite (appendix C).

Four placer samples (214-217, fig. 6, appendix B) were taken from Fox Gulch. The samples contained from 0.0009 to 0.0378 oz/yd³ PGM. Microprobe analyses of the PGM grains indicated from 1.3 to 1.9% Rh, 0.7 to 1.0% Ru, 37.7 to 48.6% Pt, 26.7 to 41.3% Ir, 9.8 to 13.4% Os, and 3.8 to 4.8% Fe (appendix C). The recovered grains consisted of iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, iridium with minor osmium, hollingsworthite, iridarsenite, irarsite, iridium, sperrylite, and platarsite (appendix C).

Three placer samples (206-208, fig. 6, appendix B) were taken from tailings in Squirrel Creek. The samples contained from 0 to 0.0037 oz/yd³ PGM. Microprobe analyses of PGM grains indicated from 0.5 to 1.9% Rh, 0.3 to 0.9% Ru, 47.0 to 88.4% PGM, 0.7 to 37.4% Ir, 0.5 to 9.2% Os, and 4.1 to 9.0% Fe (appendix C). The grains consisted of iron-platinum alloy with 8 to 30% Fe, iron-platinum alloy with minor osmiridium inclusions, osmiridium with lesser iron-platinum alloy, and osmium (appendix C).

Beach Deposits

PGM has been previously reported (4, 6, 63, 105), and was found in this study, on the beaches along Kuskokwim Bay from the community of Platinum to Chagvan Bay. PGM and gold are enriched in black sand accumulations on the beaches; however the accumulations are spotty and discontinuous. Sixty-one placer samples of beach sands were taken from twenty-eight sample sites (176-183, 219-238, figs. 4 and 6, appendix B) between Platinum and Chagvan Bay during this study. The samples ranged in value from 0 to 0.26 oz/yd³ PGM and 0 to 0.1029 oz/yd³ Au. The highest values were obtained from samples collected in the Flat Cape area and the lowest values from samples collected north of Red Mountain and south of the Salmon River. The grain size distribution for gold by volume was 1% +20 mesh, 4.5% -20/+30 mesh, 11% -30/+35 mesh, 26.5% -35/+45 mesh, 20% -45/+60 mesh, and 37% -60 mesh (fig. 11). The grain size distribution by volume for PGM was 0.3% +20 mesh, 2.6% -20/+30 mesh, 6.7% -30/+35 mesh, 10.6% -35/+45 mesh, 4% -45/+60 mesh, and 75.8% -60 mesh (fig. 12). Microprobe analyses of the PGM grains indicate they contain from 0.5 to 4.5% Rh, 0.2 to 1.0% Ru, 32 to 89.1% Pt, 1.6 to 47.8% Ir, 0.8 to 15.9% Os, and 3.2 to 8.9% Fe (appendix C). The grains consisted of iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, osmiridium (iridium with minor osmium), iron-platinum alloy with oriented inclusions of Ru-Ir arsenides, osmiridium with lesser iron-platinum alloy, rhodium, hollingsworthite, iridosmine, osmium, iridarsenite, irarsite, iridium, sperrylite, platarsite, tulameenite, and tetraferroplatinum (appendix C). Fineness values of the gold grains ranged from 548 to 863 (table 3).

Figure 11. - Au Size Distribution
for Beach.

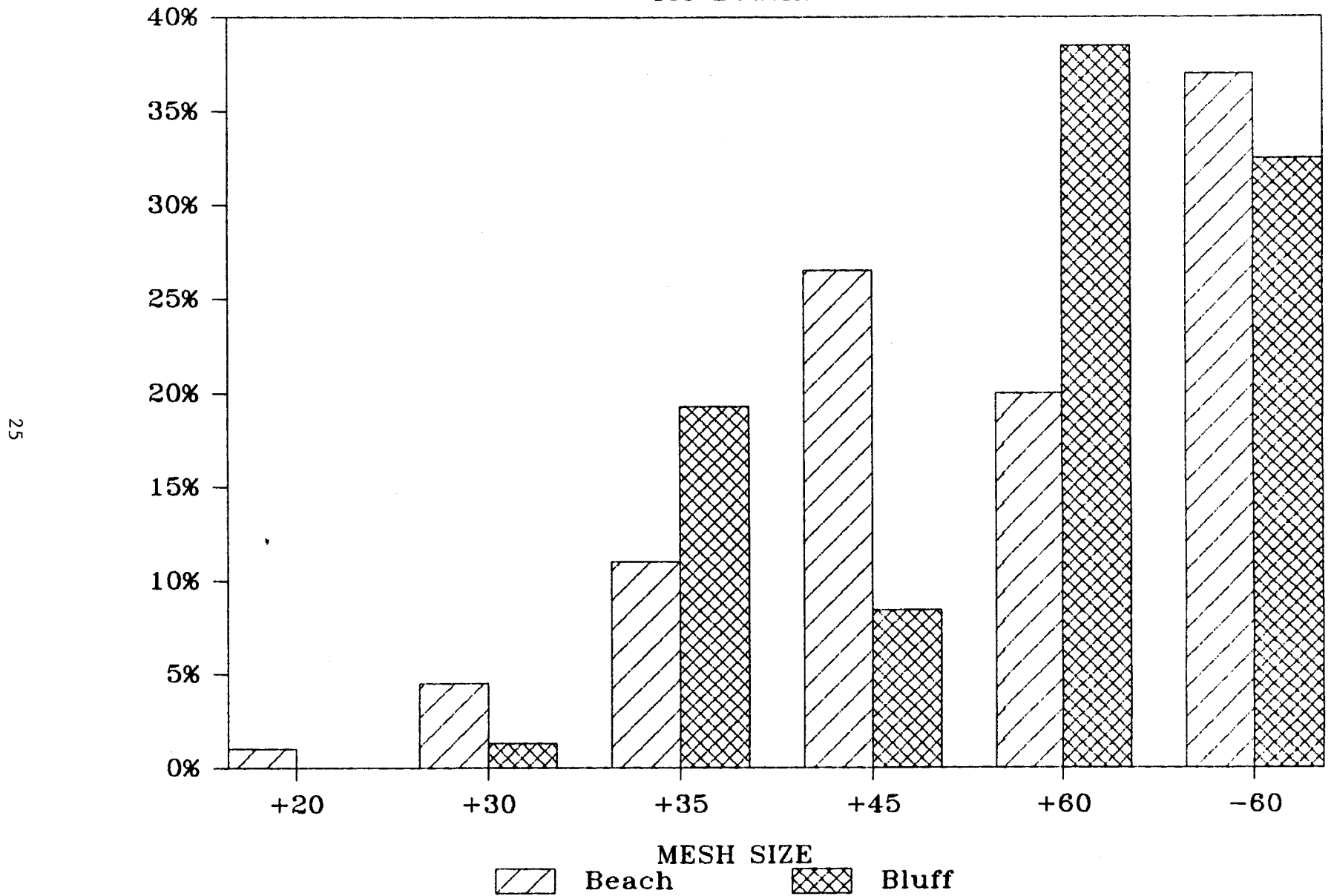
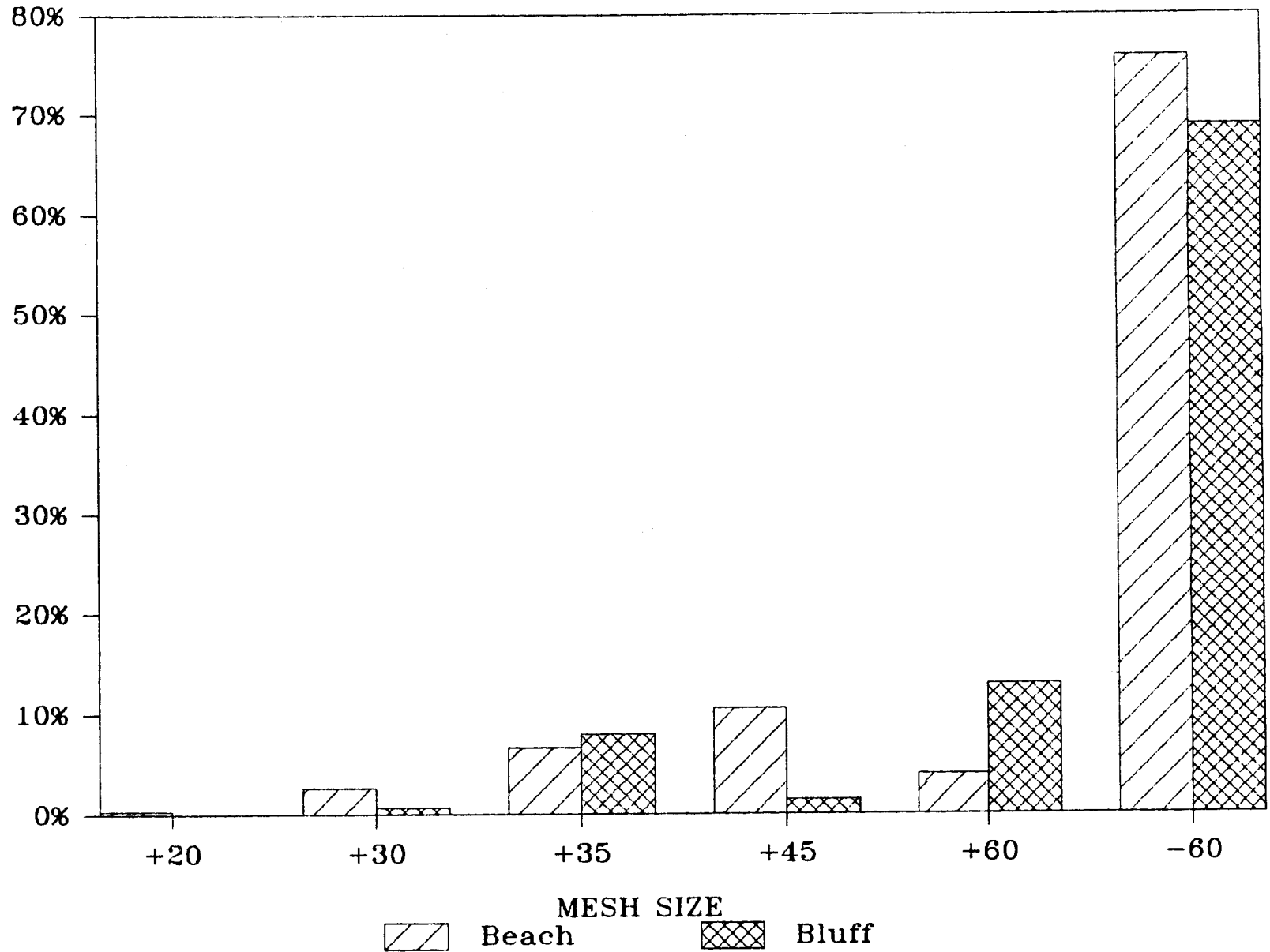


Figure 12. – PGM Size Distribution
for Beach.



West Side of Red Mountain Deposits

The placer deposits on the west side of Red Mountain are composed predominantly of glacial material from three glacial episodes. The glacial material is exposed in the bluffs along the beach. The bluffs north of Red Mountain are composed of more poorly sorted material than those south of Red Mountain, where glacio-fluvial gravel is more prominent. Holes drilled in 1937 and 1938 in the material on the northwest side of Red Mountain indicated that the material was up to 110 ft thick and contained uneconomic amounts of PGM and gold (78).

Sixteen placer samples (178, 180, 181-183, 220, 222-231, fig. 6, appendix B) were taken of the glacial material that composes the bluffs along the beach. The samples contained from 0 to 0.0013 oz/yd³ PGM and 0 to 0.0005 oz/yd³ Au. The best samples (225-226) were taken from the bluffs in the Flat Cape area where more glaciofluvial material is exposed. The size distribution by volume for gold was 1.3% +30 mesh, 19.3% -30/+35 mesh, 8.4% -35/+45 mesh, 38.5% -45/+60 mesh, and 32.5% -60 mesh (fig. 11). The grain size distribution by volume for PGM was 0.7% +30 mesh, 8% -30/+35 mesh, 1.5% -35/+45 mesh, 13% -45/+60 mesh, and 68.8% -60 mesh (fig. 12). Microprobe analyses of the PGM grains found 0.7 to 1.7% Rh, 0.4 to 1.0% Ru, 7.2 to 86.2% Pt, 3 to 69.4% Ir, 0.6 to 20.2% Os, and 0.2 to 8.3% Fe (appendix C). The grains consisted of iron-platinum alloy with 8 to 30% Fe, iron-platinum alloy with minor osmiridium inclusions, osmiridium (iridium with minor osmium), iron-platinum alloy with oriented inclusions of Ru-Ir arsenides, and hollingsworthite (appendix C). Fineness values for the gold ranged from 688 to 900 (table 3). The mesh sizes of the gold and PGM grains in the bluffs correlate well with those found on the beach. Sampling during Ulrich's (105) and this study indicate that the bluffs are the source for much of the PGM and gold found on the beach.

Identified Resources and Mineral Development Potential

A summary of identified resources for placer deposits in the Red Mountain area are listed in table 5. The unmined measured and indicated resources in the Salmon River have overall low average grades (0.0021 oz/yd³ PGM, 33). These resources are in the lower sections of the bench deposit, which is up to 200 feet thick. Existing tailings are the largest available resource. Over 40 million yd³ of material was mined by the dredge. The material ranged from 0.002 to 0.026 oz/yd³ PGM. If it is assumed that the average recovery of the dredging operation was from 60% (28), there could be 40 million yd³ of tailings that range from 0.0013 to 0.017 oz/yd³ PGM. The average grade of the tailings would vary from claim to claim, and some of the claims with the highest original production grades have already been remined. The tailing samples taken during this study have low average grades (0 to 0.0037 oz/yd³ PGM); however, samples were small and were taken from the sides of the tailings piles, which probably are not representative of the tenor of the whole tailings pile. Drilling or bulk sampling by trenching is needed to adequately assess the grade of the tailings.

TABLE 5. - Identified resources in the Red Mountain area

Drainage	Classification	Cubic Yards	Average grade oz/yd ³ PGM	Average grade oz/yd ³ Au
Salmon River bench.	Measured (33)...	37,882,300	0.0023	ND
Do.....	Indicated (33)...	24,530,000	0.0017	ND
Salmon River dragline.	Measured (33)...	496,000	0.0084	ND
Do.....	Indicated (33)...	500,000	0.0070	ND
Salmon River tailings.	Inferred.....	40,000,000	0.0013 to 0.017	ND
McCann Cr....	...do.....	500,000	0.0030	ND
Clara Cr....	...do.....	5,000	0.0340	ND
Clara Cr tailings....	...do.....	500,000	0.0080	ND
Dowry Creek..	...do.....	7,000	0.0125	ND
Platinum Cr. tailings.	...do.....	50,000	0.0026	ND
Fox Gl.....	Measured (36)...	20,000	0.0200	ND
Fox Gl tailings.	Inferred (36)...	160,000	0.0120	ND
Squirrel Cr..	Measured (36)...	37,000	0.0135	ND
Squirrel Cr. tailings.	Inferred.....	50,000	0.0020	ND
Beach N of Red Mtn.	...do.....	27,000	0.0008	0.0001
Beach S of Red Mtn.	...do.....	39,000	0.0073	0.0033

ND - No data

The Salmon River has a high mineral development potential; however, much more sampling is needed as well as a high volume low cost mining operation, with an efficient recovery system, to economically work the Salmon River placer deposits.

The identified resources of the streams that drain Red Mountain are smaller than those of the Salmon River, but their average grades are higher (table 5). Clara Creek has high, Dowry Creek has moderate, and the Platinum Creek drainages have high mineral development potentials (table 4). A small or medium sized operation (less than 500 to 2,000 yd³/day) could feasibly mine these deposits, but the operator would have to control more than one creek to assure multi-year operations.

PGM and gold values are extremely variable in the beach deposits from Platinum to the Salmon River. The highest values occur along the beach south of Red Mountain, where there are 39,000 yd³ of inferred resources that average 0.0073 oz/yd³ PGM and 0.0033 oz/yd³ Au (table 5). More sampling is needed to increase resources. The beach has a high mineral development potential for a small operator who would concentrate on mining the high grade areas of the beach. Because of the high costs of transporting equipment and supplies to the area, an operator who controlled all of the PGM-bearing deposits in the area would have the best chance of economically mining the beach as part of the overall mining plan for the area.

Page, et. al. (69) reported identified resources of 1.3 million oz of platinum in lodges, 5.0 million oz of platinum in bays, and 0.5 million oz platinum in beaches around Goodnews Bay. Sampling during this study does not support these findings.

Building material (i.e. sand and gravel) is in short supply in southwest Alaska. The tailings in the creek on the east side of Red Mountain would be an excellent source of building material for the region.

MISCELLANEOUS DEPOSITS

The remaining 30% of the known mineral deposits in the Goodnews Bay Mining District are located in the western and southern portions of the district. These deposits are described in more detail in appendix A. Most of the deposits have low or unknown mineral development potentials; however, Barnum Creek Tributary and Security Cove have moderate mineral development potential because of their anomalous placer gold values and potential for the presence of significant resources.

Barnum Creek Tributary is a south flowing tributary of Barnum Creek near the divide between Barnum Creek and Faro Creek/Arolik River (map no. 13, fig. 2). The tributary is a slow moving stream with numerous beaver ponds and it cuts through glacial material. Four placer samples (117-118, 121-122, fig. 4, appendix B), taken from surface gravels, contained from 0.0002 to 0.0010 oz/yd³ Au. Gold fineness ranged from 424 to 816 (table 3). Anomalous gold values from the surface gravels indicate further sampling is warranted. Drilling would be necessary to adequately evaluate the gravels.

Streams that drain into the southwest side of Security Cove are historically known to contain gold (78). The streams cut through

glacial material. The Bureau sampled three stream beds and the beach along Security Cove in the vicinity of the known gold occurrences (map no. 29, fig. 2). Four placer samples from the streams (249, 251-252, 254, fig. 4, appendix B) contained from trace to 0.0033 oz/yd³ Au. The gold particles were rough, nuggety, and iron-stained. The sizes of the gold particles by volume were 33.4% +20 mesh, 20% -20/+35 mesh, and 26.6% -35 mesh. Finenesses for two samples were 781 and 834 (table 3). Three PGM grains were found in sample 249. Microprobe analyses of the PGM indicated a composition of 0.5% Rh, 0.2% Ru, 84% Pt, 3.2% Ir, 1.4% Os, and 7.7% Fe (appendix C). The grains were iron-platinum alloy with 8 to 30% Fe, iron-platinum alloys with minor osmiridium inclusions, and osmiridium (iridium with minor osmium) (appendix C). Only traces of gold were found in beach samples. The amount, character, and size of the recovered gold, and the lack of placer gold in the beach material and other streams in the area suggest a local source. The source may be the iron-stained Paleozoic rocks, which outcrop along the west side of the cove. The rocks appear to be sheared metavolcanics and argillaceous sediments. Shear zones strike N45° to 55°E, dip 60° to 75° NW, are from 4 to 15 ft wide, and contain abundant pyrite in pods, stringers, and disseminations. No gold was detected in the rock samples, but one sample (253, fig. 4, appendix B) from a pod contained 0.34% Pb.

The Ikuk and Tunulik deposits (map nos. 14 and 15, fig. 2, respectively), were not investigated during this study because the local village corporation would not grant the Bureau permission to sample on their land. Both deposits are characterized by the presence of sulfides located along fracture zones in intrusive complexes (104). Sulfide minerals reportedly contain chalcopyrite, arsenopyrite, pyrrhotite, and pyrite (104). Samples from the deposits reportedly ranged up to 2.4% Cu, 25.2 ppm Ag, 0.16 oz/st Au, and 0.99% As (104).

GEOCHEMICAL ANOMALIES

Geochemical anomalies have been identified in the Goodnews Bay Mining District by the USGS during the AMRAP studies and during studies by a geological consulting firm, under contract with Calista Corporation (24-25, 40-48, 103-104). The drainages having the highest geochemical anomalies, which did not contain identified mineral properties, and those not on local village corporation land were investigated and many of the streams were resampled during this study using placer sampling techniques.

The Bureau investigations did not locate any economically mineralized material in the drainages with geochemical anomalies. The anomalous chemical analyses from the Bureau's sampling and the USGS samples were low in comparison to anomalies from economically mineralized areas in the state. The Bureau therefore concluded from the investigations that it is unlikely that economically mineralized material exists in the drainages that contain these geochemical anomalies.

SUMMARY

The Bureau conducted site specific mineral investigations and sampling in the Goodnews Bay Mining District in 1986. The results indicate that approximately 70% of the mineral deposits in the district are located in two areas: Slate-Wattamuse Creek and Red Mountain. In the Slate-Wattamuse Creek area, Wattamuse and Cascade Creeks have high mineral development potential and sufficient resources to support a small to medium-size placer mining operation. Gold was found in the rocks associated with the intrusive that outcrops at the head of Wattamuse Creek. This area has a moderate mineral development potential for possible lode gold resources.

In the Red Mountain area, PGM and gold were found in the Salmon River and its tributaries that drain Red Mountain and along the beach from Platinum to Chagvan Bay. Bureau sampling and reports indicate that resources are sufficient to support small mining operations in the streams that drain Red Mountain and on selected sections of the beach between Red Mountain and the mouth of the Salmon River. The Salmon River has a high mineral development potential for a large operation. A large operation is needed because of the gravel depth and moderate grade of the remaining resources. Placer operators in this area would also have to be able to process and recover PGM from the large percentage of clay that is present in the deposits. Detailed drilling and/or trenching of the deposits is needed prior to a mining decision.

PGM and gold were found in the weathered dunite on Red Mountain proving that it is a source of the PGM and some of the gold found in the placer deposits. PGM and gold were also recovered from the glacial bluffs along the beach indicating the bluffs are a source of much of the PGM and gold found along the beach. Although these two deposits are sources for the PGM and gold in the streams and on the beach, the present data indicates that the average PGM and gold grades are too low to constitute mineable deposits using present technology. These deposits, however, have only been surficially sampled. Drilling is needed to properly define the extent and tenor of these mineral deposits.

Microprobe analyses identified trends which correlated well with the findings of Mertie (63) for placer PGM in the area. Twenty-three platinum group minerals were identified; whereas, only seven had been reported previously.

The tailings in the mined stream of the Red Mountain area would be excellent sources of building material (i.e. sand and gravel) for southwest Alaska.

Placer deposits with moderate mineral development potentials were found at Barnum Creek Tributary and Security Cove. Further exploration using drills is needed to properly evaluate these deposits. Sulfide minerals in fractured intrusives have been previously identified at the Ikuk and Upper Tunulik River prospects.

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APPENDIX A. -- Mineral Property Summaries
for the Goodnews Bay Mining District, Alaska

Explanation

- Map Location No. - Location number of the property shown on figure 2.
- Kardex No. - Location number of property in the Minfile Reference System (1).
- Mineral Survey No.- Refers to the number assigned to a survey performed on an individual or group of mining claims. Mineral Surveys are available at U. S. Bureau of Land Management State Offices.
- MAS No. - Number assigned to Bureau Mineral Availability System mineral property files (108).

NAME: JFM & Associates

Map Location No. 1

Kardex No. 37

Mineral Survey No.

MAS No. 9001

LOCATION:

Deposit Type: Placer & Lode.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B6.NE 1/4 Sec 12 T 9S R71W Meridian: Seward.

Geographic: Tributary to Bear or Canyon Creeks.

Elevation: 900 ft.

Access: Float airplane to Canyon Lake or helicopter.

HISTORY:

Production: None reported.

1981 - Staked by John Malone (1).

1984 - Assessment work done (1).

WORKINGS AND FACILITIES: Suction dredging reported (108).

GEOLOGIC SETTING: Paleozoic-Mesozoic sedimentary and volcanic rocks.

BUREAU INVESTIGATION: The Bureau investigated the area in 1986. No mineralized rocks were noted. A sample of chert breccia (43, fig. 5, appendix B) and a stream sediment sample (42, fig. 5, appendix B) were taken. No anomalous metal values were found in the samples.

RESOURCE ESTIMATE: No indications of economic minerals were found; therefore, a resource could not be calculated.

MINERAL DEVELOPMENT POTENTIAL: This property has an unknown mineral development potential because more work is needed.

RECOMMENDATIONS: More mapping and sampling is needed.

REFERENCES: 1, 108.

NAME: Canyon Creek

Map Location No. 2

Kardex No.

Mineral Survey No.

MAS No. 20

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B6. S 1/2 Sec 5 T 9S R70W Meridian: Seward.

Geographic: Tributary to the Goodnews River.

Elevation: 600 ft.

Access: Float airplane to Canyon Lake or helicopter.

HISTORY: Unknown.

Production: None reported.

WORKINGS AND FACILITIES: Unknown.

GEOLOGIC SETTING: Bedrock is mainly sedimentary and volcanic rocks of Paleozoic-Mesozoic age. Canyon Creek, in general, occupies a broad glacial valley. A steep canyon section is present 4.5 mi downstream of Canyon Lake and is approximately 1.5 mi long.

BUREAU INVESTIGATION: The Bureau did not specifically sample Canyon Creek near Bear Creek. Bedrock was sampled (40, fig. 4, appendix B) downstream from Bear Creek. No gold was noted in the sample. A 0.1 yd³ placer sample (39, fig. 4, appendix B) was taken from Canyon Creek and contained 2 very fine pieces of gold.

RESOURCE ESTIMATE: A resource could not be calculated due to insufficient data.

MINERAL DEVELOPMENT POTENTIAL: Canyon Creek has an unknown mineral development potential because of insufficient sampling. The samples that were taken from Canyon and Bear Creeks, however, indicate that it is unlikely the creek contains significant values of placer gold.

RECOMMENDATIONS: More sampling is required to evaluate the property.

REFERENCES: 21, 31, 50, 52, 108.

NAME: Bear Creek

Map Location No. 3

Kardex No. 3

Mineral Survey No.

MAS No. 9

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B6. T 9S R70 & 71W Meridian: Seward.

Geographic: Tributary to Canyon Creek.

Elevation: 700 ft.

Access: Float airplane to Canyon Lake or helicopter.

HISTORY:

Production: Au(oz) Ag(oz)

1916 - Gold was found on the creek (<u>9</u>).		
1917 - Few men working, but not much found. Wilkins, Smith and Danielson mined (<u>73</u>).		
1919 - Three of four men prospecting and two men working on claim No. 2 above Discovery (<u>39</u>).		
1920 - Mining occurred.		
1921 - Ryan and Hanson mined 600 yd ³ gravel (<u>106</u>).....	70	
1922 - 1500 yd ³ of gravel mined (<u>106</u>).....	120	
1923 - 1000 yd ³ of gravel mined (<u>106</u>).....	120	
1924 - James Ryan mined (<u>106</u>).....	60	
1925 - Mining occurred (<u>106</u>).....	11	
1926 - Minor production. Holzheimer visited the creek (<u>56</u>).		
1927 - Minor production.		
1928 - Minor production.		
1929 - Peter Roeser mined 600 ft ² of bedrock (<u>106</u>).....	3	
1930 - Peter Roeser mined 1500 ft ² of bedrock (<u>106</u>).....	10	
1931 - Peter Roeser was mining and prospecting on No. 1 above Discovery (<u>73</u>).		
1932 - Peter Roeser mined 259 yd ³ of gravel and cleaned 1400 ft ² of bedrock (<u>106</u>).....	16	
1934 - Small outputs reported by Walter Culver on No. 1 and 2 Above claims (<u>106</u>).....	0.93	
1939 - Two men sank test pits (<u>80</u>).		
1941 - J.F. Brink mined (<u>106</u>).....	<u>148.35</u>	<u>12.79</u>
Total.....	559.28	12.79

WORKINGS AND FACILITIES: Tailings are present for approximately a 1 mi extent 1 mi above the mouth of Bear Creek. Approximately 12,000 yd³ were mined.

GEOLOGIC SETTING: This creek is a tributary to Canyon Creek. The upper three miles of the creek have been prospected. The width of the valley where the work has been done is about 200 ft from rim to rim. The depth to bedrock is from 5 to 7 ft. The gravel is a coarse

subangular wash, with no large boulders. There is little to no overburden. The paystreak lies on the right side of the valley. The gold is reddish in color and fineness is 837 (73). In the middle of Discovery Claim, which is located at the confluence of the main western tributary to Bear Creek (Danielson Creek), a small pit about 100 ft² ran 0.002 oz/ft² Au (73). A pit 800 ft upstream from the upper line of Discovery claim ran 0.007 oz/ft² Au (73). On claim No. 1 above Discovery the pit ran 0.006 oz/ft² Au (73). On the right limit rim the ground was reported to run 0.011 oz/ft² Au (73).

BUREAU INVESTIGATION: The Bureau sampled (41, 44-46, fig. 5, appendix B) the drainage in 1986. A piece of float (44, fig. 5, appendix B) containing pyrite and arsenopyrite in a limonite stained intrusive (diorite?) contained 0.75 ppm Au. A sample (41, fig. 5, appendix B) of a volcanic rock (basalt?) from mine tailings (possibly a piece of bedrock) contained 20 ppb Pd.

Four 0.1 yd³ placer samples (41, 44-46, fig. 5, appendix B) were taken from the drainage. No gold was recovered in the samples. Platinum and palladium were found in analyses of the concentrates. Sample 45 from Danielson Creek contained greater than 10 ppm Pt and anomalous As and Cu values (appendix B).

Measurements of the mine pits indicated that approximately 12,000 yd³ were mined in Bear Creek.

RESOURCE ESTIMATE: Insufficient quantities of economic placer minerals were found to calculate resources.

MINERAL DEVELOPMENT POTENTIAL: No recoverable Au or Pt was found in samples taken in the Bear Creek drainage. The drainage has a low mineral development potential for placer deposits. Some rock samples did contain anomalous Au and Pd values. Placer concentrates also contained anomalous Pt, As, and Cu values. This drainage has an unknown lode mineral development potential for Au, Pt, As, and Cu.

RECOMMENDATIONS: More exploration for lode mineralization is needed.

REFERENCES: 1, 9, 10, 17, 19, 21-23, 31, 39, 50, 52, 56, 73, 78, 80, 84-89, 92, 106, 108.

NAME: Fox Creek (Gulch)

Map Location No. 4
Kardex No. 19
Mineral Survey No. _____
MAS No. 7

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B6. T09S R70 & 71W Meridian Seward.

Geographic: Tributary to Slate Creek.

Elevation: 400 ft.

Access: Overland from Goodnews Bay or plane to Slate Creek.

HISTORY:

Production: Au(oz) Ag(oz)

1935 - Culver and Saylor found gold on a bench (78).

1936 - Small production reported (94). Shonbeck and Beaton of Anchorage leased the property and drilled with an airplane drill. Poor results were obtained and bedrock was not reached in the creek bed (78).

1937 - W.W. Johnson leased the claims and hydrauliced a bench. Only a few ounces were recovered. Eight men were employed (78).

1941 - R.D. Huff mined (106)..... 3.98 0.97

WORKINGS AND FACILITIES: Small hydraulicking and drilling conducted. A mining cut is present on the east side of the creek approximately 2.5 miles upstream of its confluence with Slate Creek. Approximately 20,000 yd³ of gravel were mined from the cut. A hillman airplane 4-in drill was found on a bench on the east side of the creek approximately 2 mi upstream of the confluence with Slate Creek.

GEOLOGIC SETTING: The creek is nearly 5 mi long. Two miles up Fox Creek from its junction with Slate Creek on the left limit, coarse placer gold was found in 1935 by Culver and Taylor on a small bench a few ft above the present creek bed (78). The pay was found to be confined to an area 100 by 200 ft and averaged 0.08 oz/yd³ (77). Gravels ranged from 5 to 7 ft thick. Bedrock consists of folded argillites. The gold is very smooth and bright and found mainly on bedrock. Fineness is 885 (78). The creek contains beaver ponds within a mile of its mouth. The creek flows in a canyon the last mile of its course.

BUREAU INVESTIGATION: The Bureau took five 0.1 yd³ placer samples (47-49, 54-55, fig. 5, appendix B) in 1986. Sample values ranged from trace to 0.0003 oz/yd³ Au. Gold fineness values were 604 and 817.

RESOURCE ESTIMATE: No indications of economic placer minerals were found; therefore, a resource could not be calculated.

MINERAL DEVELOPMENT POTENTIAL: Sampling indicated low gold values in Fox Creek. This creek has a low mineral development potential.

RECOMMENDATIONS: None.

REFERENCES: 1, 22, 31, 50, 73, 77-78, 80, 94, 106, 108.

NAME: Evans Pup

Map Location No. 5

Kardex No.

Mineral Survey No.

MAS No.

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel

Quadrangle: Goodnews Bay B6?

Meridian: Seward.

Geographic: An unknown tributary of Slate Creek.

Elevation: Unknown.

Access: Airplane to Slate Creek or boat up the Goodnews River.

HISTORY:

Production: Minor.

1937 - Roehm reported that a native named
Evan was taking out a few oz in a
creek between Olympic and Fox Creeks
(78).

WORKINGS AND FACILITIES: Unknown

GEOLOGIC SETTING: Alluvial-colluvial gravels are present in a small
creek.

BUREAU INVESTIGATION: The property was looked for, but was not
located.

RESOURCE ESTIMATE: A resource could not be estimated because the
property was not evaluated.

MINERAL DEVELOPMENT POTENTIAL: This property has an unevaluated
mineral development potential.

RECOMMENDATIONS: None.

REFERENCES: 77-78.

NAME: Slate Creek

Map Location No. 6

Kardex No. 8, 10

Mineral Survey No. _____

MAS No. 4

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B6. T9 & 10S R71W Meridian: Seward.

Geographic: Tributary to the Goodnews River.

Elevation: 150 ft.

Access: Overland route via a trail from Goodnews Bay village and by plane to the airstrip on Cascade Creek.

HISTORY:

Production: Au(oz) Ag(oz)

- 1931 - Negotiations for a drilling contract made. Upper section 0.5 mi upstream from Fox Creek was worked by Ivan Oldtrader, with minor production. John O'Malley mined about 1000 ft² of bedrock (73).
- 1933 - Work done.
- 1934 - Drilling done by New York Alaska above the mouth of Cascade Creek with poor results. Drilling was discontinued (78).
- 1936 - Prospecting conducted at the head of Slate Creek (92).
- 1937 - Exploration continued.
- 1939 - Mining by hydraulicing and hand methods done (96).
- 1941 - Bristol Bay Mining Co. mined(?) (106).....1763.3 401.15
- 1954 - Two claims staked.
- 1985 - Ron Wittom mined at mouth of Caribou Creek.

WORKINGS AND FACILITIES: Hand mining conducted in the past on Discovery Claim is about 0.25 mi above the mouth of Fox Creek. Placer operation owned by Ron Wittom of Bethel is located at the mouth of Caribou Creek.

GEOLOGIC SETTING: Slate Creek is the main creek in the area and is a tributary to the Goodnews River. Cascade, Olympic, Caribou, and Fox Creeks are tributaries to Slate Creek. Slate Creek above the junction with Fox Creek has a narrow V-shaped canyon-like valley down to within 1/2 mi of the mouth of Fox Creek where it widens to about 300 ft from rim to rim. The grade of the valley is about 2%. The gravels are very coarse and contain large granitic boulders up to 5 ft in diameter. The depth to bedrock is from 6 to 8 ft. The gold is coarse and shotty with no large nuggets (73).

Slate Creek below the Fox Creek junction occupies a shallow fairly wide valley intrenched into the Goodnews River lowland. Rock bluffs 10 ft high outcrop on both limits of the flood plain near the mouth. Just below the mouth of Cascade Creek the valley is about 1/4 mi wide from rim to rim. Reed (73) reported that between the mouths of Olympic and Cascade Creeks, George Wickert sank a few holes to bedrock in unknown locations. Reed (73) also reported that the depth to bedrock is from 7 to 8 ft, and that good prospects were found. It was also stated that several men have run trenches into the rims of the valley all along lower Slate and found encouraging prospects (73).

BUREAU INVESTIGATION: The Bureau sampled the Slate Creek drainage in 1986 (50-53, 56-59, 67. fig. 5, appendix B). Seven 0.1 yd³ placer samples contained from trace to 0.0014 oz/yd³ Au. A 0.1 yd³ sample from Caribou Creek (53, fig. 3, appendix B), a tributary of Slate Creek, contained 0.0015 oz/yd³ Au, with the concentrate having 85 ppm W. Over 90% of the gold was less than 35 mesh in size. Gold fineness ranged from 551 to 829 (table 3). Bedrock was not reached in any of the samples.

RESOURCE ESTIMATE: No indications of economic placer minerals were found in the creek; therefore, a resource was not calculated.

MINERAL DEVELOPMENT POTENTIAL: The Bureau's samples of the creek contained low gold values; therefore, the creek should have a low mineral development potential above its confluence with Caribou Creek. The Creek may have a higher potential at the confluences of Cascade, Olympic, and Fox Creeks.

RECOMMENDATIONS: Detailed sampling to bedrock and/or drilling would be required to evaluate the drainage below the confluences of Cascade, Olympic, and Fox Creeks.

REFERENCES: 1, 19-22, 31, 50, 60, 73-74, 77-78, 89, 91, 94-96, 106, 108.

NAME: Goodnews River

Map Location No. 7

Kardex No. 26

Mineral Survey No.

MAS No.

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B6 & 7. T10S R71W Meridian: Seward.

Geographic: Main fork of the Goodnews River around the confluence of
Slate Creek.

Elevation: 150 ft.

Access: Overland access via a trail from Goodnews Bay village or
boat from Goodnews Bay.

HISTORY:

Production: None reported

1900 - Claims staked on river (1).

WORKINGS AND FACILITIES: Unknown.

GEOLOGIC SETTING: Quaternary alluvial gravels are present.

BUREAU INVESTIGATION: The Bureau could not sample the river because
the surrounding land is owned by the Kuitcarak Corporation, which
would not grant the Bureau permission to sample on their land.

RESOURCE ESTIMATE: A resource could not be calculated because of
insufficient data.

MINERAL DEVELOPMENT POTENTIAL: The river has an unevaluated mineral
development potential. Placer gold should be present at the
confluence of the Goodnews River and Slate Creek.

RECOMMENDATIONS: Drilling would be required to evaluate the potential
for a placer gold resource.

REFERENCES: 1, 22, 50.

NAME: Olympic Creek

Map Location No. 8
Kardex No. 18
Mineral Survey No. _____
MAS No. 5

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B-6. Sec 3 T10S R71W Meridian: Seward.

Geographic: Tributary to Slate Creek.

Elevation: 300 ft.

Access: Overland route via a trail from Goodnews Bay.

HISTORY:

Production: Au(oz)

1920 - Claims staked (1).

1923 - George Wiechert mined 800 yd³ of
gravel and 4,000 ft² of bedrock (106)..... 28

1925 - Peter Roeser mined (106)..... 6

1926 - Shoveling in operation by Peter Roeser

1927 - Minor work by Peter Roeser (106).....100

1928 - Peter Roeser mined (106)..... 20

1929 - Little sluicing done- Peter Roeser
cleaned 3,000 ft² of bedrock (106)..... 15

1930 - Minor work.

1931 - Small amount of gold produced. Peter Roeser
prospected (73).

Total....169

WORKINGS AND FACILITIES: Most of the work on Olympic Creek has been done on Discovery Claim, where a cabin is situated. The upper end of the main pit on Olympic Creek is about 1500 ft below the main tributary to Olympic Creek. About 10,000 ft² of bedrock were cleared. About 500 ft below the main pit, a small pit comprising about 4000 ft² was worked. A small ditch 0.25 mi long is on the right limit of the creek.

GEOLOGIC SETTING: This creek is a small north tributary to Slate Creek. The creek is wide at its mouth, narrowing to a canyon above the upper forks. The depth to bedrock on Discovery Claim averages about 6 ft. Bedrock is basalt. The gravel is coarse and subangular and contains many granitic boulders up to 2 ft in diameter.

The average value of the ground worked is 0.04 oz/yd³ Au (73). The gold is distributed in a spotty manner. The gold is whitish in color and has a fineness of 820 (73).

BUREAU INVESTIGATION: The Bureau sampled the drainage in 1986. Seven 0.1 yd³ placer samples (60-66, fig. 5, appendix B) were taken. The samples contained from trace to 0.0045 oz/yd³ Au. Sample 65 taken from an alluvial fan, contained 0.0045 oz/yd³ Au. The alluvial fan was approximately 600 ft long, 100 ft wide, with an unknown depth. Hydraulic mining cuts were noted on the west side of the creek approximately 1 mi above its confluence with Slate Creek. The cuts were in glaciofluvial bench deposits approximately 20 ft thick. It was estimated that approximately 100,000 yd³ were mined from these cuts. A 0.1 yd³ placer sample (62, fig. 5, appendix B) from the bench contained trace amounts of gold.

A 3 ft channel sample (61, fig. 5, appendix B) of a gravel bank along the creek contained 0.0041 oz/yd³ Au. The concentrate contained 600 ppb Pt.

Over 95% of the gold particle sizes were less than 35 mesh. Fineness values of the gold ranged from 727 to 809 (table 3).

RESOURCE ESTIMATE: Not enough information is available to calculate a resource.

MINERAL DEVELOPMENT POTENTIAL: Bureau sampling indicated moderate gold values. Bedrock was not reached in any sample; therefore it is theorized that the average value of the gravels should be higher than indicated by the sampling. Sampling using a drill and/or trenching is needed to develop a resource. The property has a moderate mineral development potential.

RECOMMENDATIONS: The alluvial fan that contained gold should be sampled in greater detail. The bench deposits should be drilled. The alluvial gravels in the creek should be sampled to bedrock.

REFERENCES: 1, 21-22, 31, 50, 52, 73, 84-89, 106, 108.

NAME: Cascade Creek

Map Location No. 9

Kardex No. 17,26

Mineral Survey No. _____

MAS No. 6

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B6 & B7. T9 & 10S R71W Meridian: Seward.

Geographic: Tributary to Slate Creek.

Elevation: 200 ft.

Access: Overland access via trail from Goodnews Bay village and
by plane to the airstrip on Cascade Creek.

HISTORY:

Production: Au(oz)

Ag(oz)

1931 - Reed visited property (73).

1937 - Roehm visited property (78).

1939 - Bristol Bay Mining Co. dredge
mined Wattamuse and Cascade
Creeks (80).

1940 - Dredge continued to operate-mining

417,000 yd³ (106)..... 5218.62 1202

1941 - Dredge continued mining (106)..... 4067.69 1098.07

Total..... 9,286.31 2,300.07

WORKINGS AND FACILITIES: Holes drilled upstream of the mouth of
Wattamuse Creek with very poor results. Cascade Creek was dredged
from the mouth of Wattamuse Creek downstream for approximately 1 mi.

GEOLOGIC SETTING: The section of the creek below Wattamuse Creek is
400 to 500 ft wide. Above the mouth of Wattamuse the valley is 200 ft
wide. The gravel is coarse but finer than that on Wattamuse. No
granite wash or boulders are present. The depth of the gravels above
the mouth of Wattamuse is approximately 6 ft. Below the mouth the
gravels are 8 to 10 ft deep. The bedrock is basalt. The main
paystreak is just below the mouth of Wattamuse Creek, with values
averaging 0.04 oz/yd³ Au (73).

BUREAU INVESTIGATION: The Bureau sampled Cascade Creek in 1986. The
Bureau took seven 0.1 yd³ placer samples (68, 71, 76-77, 81, 83-84,
fig. 5, appendix B) and one rock sample (82, fig. 5, appendix B).
Gold values ranged from trace to 0.0017 oz/yd³ Au. Mesh sizes of
the gold particles were 3% +30, 68% -30/+60, and 29% -60. Gold
fineness values ranged from 646 to 847 (table 3).

The Bristol Bay Mining Co. dredge worked Cascade Creek from the mouth
of Wattamuse Creek downstream for approximately 1.0 mi. It was
calculated that approximately 800,000 yd³ were mined.

RESOURCE ESTIMATE: The dredge recovered an average of 0.025 oz/yd³ Au. It was reported that the average grade of the paystreak was 0.04 oz/yd³ Au (73); therefore, the 800,000 yd³ of tailings may contain grades as much as 0.015 oz/yd³ Au; This figure, however, would have to be substantiated by more sampling and drilling.

MINERAL DEVELOPMENT POTENTIAL: The creek has a high mineral development potential because of the high grades that were present during mining and the possibility that economic grades are still present in the tailings and unmined portions of the creek.

RECOMMENDATIONS: The area downstream of the confluence of Cascade and Wattamuse Creeks requires further sampling and drilling.

REFERENCES: 1, 50, 73, 77-78, 89, 106, 108.

NAME: Wattamuse Creek

Map Location No. 10

Kardex No. 1, 2,

4, 5,

6, 7,

9, 31

Mineral Survey No. 2272

MAS No. 3

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B6 & B7. T9 & 10S R71W Meridian: Seward.

Geographic: Tributary to Cascade Creek.

Elevation: 200 to 750 ft.

Access: Overland access via a trail from Goodnews Bay village or by plane to an airstrip on Cascade Creek.

HISTORY:

Production: Au (oz)

Ag (oz)

1915 - First claims staked.

1916 - Assessment work filed.

1917 - Placer gold discovered. Thorsen, Wilkins, and Jean bought claims (59).....1,000?

1918 - Work done (39).....1,000?

1919 - Work done on three claims by two plants. Discovery Mining Co employed 10-12 men. Thorsen-Everson-Wilkins produced from 13,983 yd³ (106)..... 910.14 148.66
Ryan & Wickert produced from No. 3 Above Discovery (39, 106)..... 57.87 9.45

1920 - One mine operated

1921 - Jean, Everson, Thorsen produced (106)..... 559

Another operator produced from 100 yd³ (106)..... 14

1922 - Unidentified operator mined 7000 yd³ (106)..... 510

1923 - Jean, Thorsen, Everson, Wilkins mined 2000 yd³ (106)..... 364

1924 - Jean, J.L. mined 666 yd³ and 18,000 ft² bedrock (106)..... 674

1925 - Jean, J.L. mined (106)..... 385.25

1926 - Minor work

1927 - Smith, Schmidt, and Jean mined (106)..... 111

1928 - Mining and development work suspended due to high water

1929 - No work done

1930 - One man working-(Possibly J.L. Jean) (106)..... 48.07? 7?

1931 - Minor work done by Edward "Slim" Smith

1932 - Mining occurred, 1000 ft² of bedrock cleaned (106)..... 230

1933 - Gold found on benches, 3 to 4 men worked the ground

1934 - Smith and Jean mined on No. 1 below, with 3,000 ft² bedrock worked (106)..... 38.5 11

1935 - Smith and Jean mined (106)..... 53.46

1937 - Drilling and exploration conducted (78)

History (continued).	Production.	<u>Au (oz)</u>	<u>Ag (oz)</u>
1938 - Bristol Bay Mining Co. built dredge, but it didn't begin work until September and ceased operating on October 8th (96).			
1939 - Roehm visited property. Union Construction Co. 2.5-ft dredge began operating on June 2. Operated for one month, employing 25 men. The dredge worked the lower part of Discovery claim at the mouth of Wattamuse Creek (80).....	7000?		
1946 - Bristol Bay Mining Co. mined on No. 2 Above claim with a dragline. 65,212 yd ³ mined (106).....	2713		657
1947 - Bristol Bay Mining Co. mined on Nos. 5-8 claims with a dragline (106) 105,195 yd ³ of gravel mined.....	2592		621
1953 - Claims staked.			
1956 - Claims staked.			
1968 - Claims staked.			
	Total.....	18,260.29?	1,054.11?

WORKINGS AND FACILITIES: Hand operations occurred until 1938, when a dredge was installed on the property. Draglines were also used. Joe Jean drilled the gravels in upper Wattamuse Creek at 500 ft elevation with subeconomic results (Betty Huffman, personal communication) Cabins are present.

GEOLOGIC SETTING: The creek is 3 mi long. The valley at the mouth is 300 ft wide and narrows to a canyon less than 200 ft wide 1,000 ft above the mouth. The canyon is present to within a mi of the head of the creek. The creek cuts slate argillites, sandstones, and basalt at nearly right angles. The formations strike N45°E. The gravels are between 5 and 7 ft deep. In 1919 the paystreaks ran 0.02 to 0.15 oz/ft² Au of bedrock (39). The gold fineness was approximately 800 (39). The grades of the mined gravels were from 0.015 to 0.18 oz/yd³ Au (39). Gravels contain rocks from the bedrock plus granite pebbles. The creek has been glaciated.

BUREAU INVESTIGATION: In 1986, the Bureau took seven 0.1 yd³ placer samples (69-70, 72-75, 78, fig. 5, appendix B). The samples were taken from the creek bed and gravel benches along the creek. The samples from the benches (72-75, fig. 5, appendix B) contained from 0.0053 to 0.0108 oz/yd³ Au. The samples from the creek (69-70, 78, appendix B) contained from 0.0013 to 0.7583 oz/yd³ Au. The richest samples were collected from Discovery Claim. Gold finenesses were from 734 to 825 (table 3).

RESOURCE ESTIMATE: Inferred Resource: 60,000 yd³ which contain from 0.015 and 0.018 oz/yd³ Au.

The resource was calculated by using an area 100 ft long by 100 ft wide by 6 ft thick. The grade was taken from average values reported from the original paystreak (39). Higher values were found during the Bureau sampling and the tailings could be reworked; therefore, the inferred resources are probably conservative.

MINERAL DEVELOPMENT POTENTIAL: The Bureau sampling indicates that the creek has a high mineral development potential for a small mining operation.

RECOMMENDATIONS: The high values found in the samples during the Bureau investigation, the presence of gold in the bench gravels along the creek, and the presence of unmined areas along the creek indicate that small scale placer mining is warranted.

REFERENCES: 1, 10, 17, 19-22, 31, 39, 50, 56, 59, 73-74, 77-78, 80, 83-93, 95-98, 106, 108.

NAME: Malaria Creek

Map Location No. 11

Kardex No. 24

Mineral Survey No.

MAS No. 8

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B7. SE 1/4 Sec 6 T10S R71W Meridian: Seward.

Geographic: Tributary to Granite Creek.

Elevation: 1000 ft.

Access: Overland by trail from Goodnews Bay to Granite Creek, then
by foot up the creek.

HISTORY:

Production: None.

1900 - Claims staked.

1936 - Prospecting conducted (94).

WORKINGS AND FACILITIES: None noted.

GEOLOGIC SETTING: The creek is a northern tributary of Granite Creek. Bedrock consists of a Tertiary granodiorite-diorite intrusive, which is a possible source of the gold in Wattamuse Creek.

BUREAU INVESTIGATION: The Bureau took a 0.1 yd³ placer sample (99, fig. 5, appendix B) from Granite Creek near its junction with Malaria Creek in 1986. A trace amount of gold was recovered. The concentrate contained anomalous molybdenum and tellurium values.

RESOURCE ESTIMATE: No indications of economic placer minerals were found; therefore, a resource could not be calculated.

MINERAL DEVELOPMENT POTENTIAL: The prospect has an unevaluated mineral development potential because of insufficient sampling.

RECOMMENDATIONS: Drilling would be needed to properly evaluate this prospect.

REFERENCES: 1, 22, 31, 50, 94, 106, 108.

NAME: Wattamuse-Granite Creek

Map Location No. 12

Kardex No.

Mineral Survey No.

MAS No.

LOCATION:

Deposit Type: Lode.

Mining District: Goodnews Bay. Commodities: Au, Ag, Sb, As.

Recording District: Bethel.

Quadrangle: Goodnews Bay B7. T9 & 10S R72W Meridian: Seward.

Geographic: Headwaters of Wattamuse and Granite Creeks.

Elevation: 1800 ft.

Access: Airplane to Cascade Creek airstrip or by boat up the Goodnews River, then by foot.

HISTORY:

Production: None.

1974- Mapped and sampled by a consulting firm for Calista Corp (104).

WORKINGS AND FACILITIES: None.

GEOLOGIC SETTING: The consulting firm (104) described the prospect as a granodiorite to diorite intrusive in contact with hornfelsed metasedimentary rocks, quartzites, and gabbros. The intrusive is cut by 1-in to 1-ft wide quartz veins, which contain arsenopyrite, pyrite, and chalcopyrite. Stibnite has been found in quartz float.

Samples from the consulting firm contained up to 9.5 ppm Au, 14.9 ppm Ag, 17% As, 22% Sb, and 1500 ppm Hg (104).

BUREAU INVESTIGATION: The Bureau mapped and sampled the area in 1986. Weather conditions prevented a detailed examination of the area. Nineteen samples (80, 85-97, fig. 5, appendix B) were taken from the headwaters of Wattamuse Creek. The highest gold value (2.18 oz/st) was found in a composite grab sample (91, fig. 5, appendix B) of quartz from the divide between Granite and Wattamuse Creek. The sample contained arsenopyrite. The sample also contained 6.6 ppm Ag, 2850 ppm As, 400 ppm Bi, 40 ppm Sb, and 184 ppm W. Other quartz grab samples (95, 96, fig. 5, appendix B) contained 1,000 to 10,000 ppm As, 1.25 to 5.3 ppm Au, up to 10 ppb Pd, and 30 and 190 ppm Sb.

A mafic igneous unit occurs near the contact of the intrusive with the hornfels unit. A sample (96, fig. 5, appendix B) from the outcrop contained arsenopyrite, pyrrhotite, and chalcopyrite. It had values of 17.4 ppm Ag, 3.3 ppm Au, 0.13% As, 30 ppm Bi, and 0.19% Cu. Gold was panned from a small creek that drains the saddle between the Wattamuse and Granite Creek drainages. A stream sediment sample (92, fig. 5, appendix B) from this creek contained 1.3 ppm Au and 0.23% As.

A soil sample (87, fig. 5, appendix B) taken from a saddle at the headwaters of Wattamuse Creek contained 15.4 ppm Ag, 0.5% As, 6.55 ppm Au, 65 ppm Bi, 550 ppm Cu, 784 ppm Pb, 10 ppb Pd, 70 ppm Sb, 30 ppm W, and 860 ppm Zn.

There is a positive correlation between anomalous bismuth values and anomalous gold values.

RESOURCE ESTIMATE: A resource can not be calculated at this time due to insufficient data.

MINERAL DEVELOPMENT POTENTIAL: The high gold values found in some of the samples from the area suggest that the area has a high potential for discovery of a lode gold deposit. However, the lack of an identified resource indicates that the property has a moderate mineral development potential.

RECOMMENDATIONS: High gold values were found in quartz float from the headwaters of Wattamuse Creek. High gold values were also found associated with a mafic intrusive(?) unit at the contact of the intrusive. Therefore, this property needs more detailed mapping, sampling, and possibly drilling of the contact.

REFERENCES: 104.

NAME: Barnum Creek Tributary

Map Location No. 13

Kardex No.

Mineral Survey No.

MAS No.

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B7. Secs 27, 34 T 9S R73W Meridian: Seward.

Geographic: North tributary to Barnum Creek near Nagotligageivik Mountain.

Elevation: 300 ft.

Access: 1.5 mi east of trail from Goodnews Bay to Arolik River.

HISTORY:

Production: Minor.

1938 - Roehm (79) reported that Christen and H. Oya discovered gold at the head of Barnum Creek. \$11 of coarse gold was panned.

WORKINGS AND FACILITIES: None.

GEOLOGIC SETTING: Glacial drift in a broad valley. Beaver ponds are located along the creek. The gravels along the tributary are well-sorted silt, sand, gravel and boulders.

BUREAU INVESTIGATION: The Bureau sampled (117-122, fig. 4, appendix B) the drainage in 1986. Four placer samples (117-118, 121-122, fig. 4, appendix B) contained from 0.0002 to 0.0010 oz/yd³ Au. Gold fineness values ranged from 424 to 816 (table 3). The concentrate from sample 122 contained Pt and Pd values.

Nagotligageivik Mountain was mapped and samples were taken (119-120, fig. 4, appendix B) in order to try and determine the source of the placer gold. Chert was the only rock type found on the mountain. No gold was noted in the samples.

The gold in the drainage is probably of glacial origin.

RESOURCE ESTIMATE: A resource could not be calculated due to insufficient data.

MINERAL DEVELOPMENT POTENTIAL: The creek has a moderate mineral development potential because of the anomalous placer samples taken from the gravels.

RECOMMENDATIONS: Further sampling and drilling are recommended.

REFERENCES: 79.

NAME: Ikuk Prospect

Map Location No. 14

Kardex No. _____

Mineral Survey No. _____

MAS No. _____

LOCATION:

Deposit Type: Lode.

Mining District: Goodnews Bay. Commodities: Cu, Au, As.

Recording District: Bethel.

Quadrangle: Goodnews Bay B7. Sec 36 T10S R73W Meridian: Seward.

Geographic: On a ridge between the Tunilik River and Camp Creek.

Elevation: 1600 ft.

Access: Helicopter.

HISTORY:

Production: None.

1974 - Mapped and sampled by a consulting firm
for the Calista, Corp (104).

WORKINGS AND FACILITIES: None.

GEOLOGIC SETTING: The consulting firm (104) described the prospect as in an area which is steep and hard to work. The geology consists of an intrusive complex which contains peridotite, diorite, granodiorite, and quartz monzonite. Mineralization is in a fractured fine to medium grained diorite intruded by at least 2 gabbroic dikes. The fractured zone is 800 ft wide and strikes N-S. Sulfide minerals consist of chalcopyrite, arsenopyrite, pyrrhotite, and pyrite. The chalcopyrite occurs as blebs, stringers, and disseminations in a silicified, chloritized, and biotite-altered diorite zone 100 ft wide. Gold values are associated with the silicified intrusive.

Samples from the prospect ranged up to 2.4% Cu, 25.2 ppm Ag, 0.16 oz/st Au, and 0.99% As (104).

BUREAU INVESTIGATION: The Bureau was unable to assess the property because the land is privately owned by the Kuitcarak Corporation, which would not grant the Bureau permission to sample the property.

RESOURCE ESTIMATE: A resource estimate could not be made due to insufficient data.

MINERAL DEVELOPMENT POTENTIAL: The occurrence has an unevaluated mineral development potential because the Bureau was unable to gain access to the property.

RECOMMENDATIONS: Further work is needed on this property because of the small amount of time that has been spent evaluating the property. The creeks that drain the property should also be placer sampled because of the occurrence of gold in the rocks.

REFERENCES: 104.

NAME: Tunulik

Map Location No. 15

Kardex No.

Mineral Survey No.

MAS No.

LOCATION:

Deposit Type: Lode.

Mining District: Goodnews Bay. Commodities: Cu, Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay B7. Sec 1 T11S R73W Meridian: Seward.

Geographic: Small creek on the northeast side of the Tunulik River.

Elevation: 750 ft.

Access: Helicopter.

HISTORY:

Production: None.

1974- Mapped, and sampled by a consulting firm
for Calista Corp (104).

WORKINGS AND FACILITIES: None.

GEOLOGIC SETTING: The consulting firm (104) stated that the rocks consist of diorite and gabbro, with pods of 1-2% chalcopryrite. A vuggy quartz-orthoclase vein 2 in wide contained 3 ppm Au and 3,000 ppm As. The small creek draining the area contained 4.1 ppm Au in a stream sediment sample and flakes of gold were panned from the creek.

BUREAU INVESTIGATION: The Bureau was unable to investigate this occurrence because it was located on private land owned by Kuitcarak Corporation, which would not allow the Bureau to sample the property.

RESOURCE ESTIMATE: A resource could not be calculated due to lack of data.

MINERAL DEVELOPMENT POTENTIAL: The property has an unevaluated mineral development potential because the Bureau was unable to evaluate the ground.

RECOMMENDATIONS: More work is recommended, especially placer sampling of the Tunulik River downstream of the property for possible placer gold.

REFERENCES: 104.

NAME: Kigsugtag

Map Location No. 16

Kardex No. 9

Mineral Survey No. _____

MAS No. _____

LOCATION:

Deposit Type: Lode.

Mining District: Goodnews Bay. Commodities: Unknown.

Recording District: Bethel.

Quadrangle: Goodnews Bay A8. Secs 22, 24, 26, 27 T11S R74W

Meridian: Seward.

Geographic: Along Carter Creek on Kigsugtag Mountain.

Elevation: 300 ft.

Access: An all-terrain vehicle trail is present from Goodnews Bay.

HISTORY:

Production: None.

1971 - 9 lode claims staked by Abbott Findlay (1).

WORKINGS AND FACILITIES: None noted.

GEOLOGIC SETTING: The north side of Carter Creek consists of undivided volcanic and sedimentary rocks of Mesozoic and Paleozoic ages. The south side of Carter Creek is the upper portion of a thrust plate consisting of N50-65°E striking NW dipping interbedded Devonian micritic limestones, slates and quartzites, which have been intruded by three Jurassic gabbroic intrusions and one diabasic(?) intrusion.

BUREAU INVESTIGATION: The Bureau mapped and sampled the drainage in 1986. No outcrops were noted in the valley. On the south side of the valley (Limestone Ridge), no alteration was found at the contacts of the intrusives with the sedimentary rocks. Six rock samples were taken (136-137, 139-141, 144, fig. 4, appendix B). The most mineralized rock sample (141), a piece of massive vuggy limonite, found as float, contained 200 ppm As, 100 ppm Ga, 20 ppm Tl, and 475 ppm Zn (appendix B).

RESOURCE ESTIMATE: A resource was not calculated because no economic minerals were found.

MINERAL DEVELOPMENT POTENTIAL: The property has a low mineral development potential because the Bureau's examination indicates that it is unlikely that economic mineralization exists in the drainage.

RECOMMENDATIONS: None.

REFERENCES: 1.

NAME: Goodnews Bay

Map Location No. 17

Kardex No. 33

Mineral Survey No. _____

MAS No. 1, 2

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au, Fe, Cr, PGM.

Recording District: Bethel.

Quadrangle: Goodnews Bay A8 and Hagemeister Island D-6.

T12S R74, 75W Meridian: Seward.

Geographic: North shore and in Goodnews Bay.

Elevation: Sea level.

Access: Boat.

HISTORY:

Production: None.

1963 - U.S. Bureau of Mines drilled and sampled
the beach (4).

1969 - 239 claims staked.

1971-1972 - Inlet Oil drilled the claims (50).

WORKINGS AND FACILITIES: Drilling conducted by Inlet Oil in the
mid-1970's.

GEOLOGIC SETTING: The bay consists of glaciofluvial outwash. Cobb
(50) stated that in 1969 the unconsolidated deposits of Goodnews Bay
were core sampled. Chemical analyses revealed detectable amounts of
platinum in many of the samples (50). Platinum was concentrated in
the clay layers rather than the sand layers (50). Most samples also
contained both native mercury and cinnabar and a single tiny diamond
was said to have been found (50). The best values were found along
the north side of the bay, south of Beluga Peak. In 1970, a more
elaborate sampling program was undertaken and an airborne magnetometer
survey was made. The results of the sampling are unknown, but were
rumored to be unfavorable.

BUREAU INVESTIGATION: Berryhill (4) found chromite, magnetite and
traces of gold. The highest iron content was 6.1 lb per yd³. In
1986, the Bureau took one 0.1 yd³ placer sample (134, fig. 4,
appendix B) from the beach. Trace amounts of platinum and gold were
noted.

RESOURCE ESTIMATE: Not enough information is available to make a
resource estimate.

MINERAL DEVELOPMENT POTENTIAL: It was not possible for the Bureau to
sample the bay during this study; therefore, it has an unknown mineral
development potential.

RECOMMENDATIONS: Drilling in Goodnews Bay is required to properly evaluate this property.

REFERENCES: 1, 4, 16-17, 19-21, 23, 50, 108, 110-111.

NAME: Smalls River

Map Location No. 18

Kardex No. 29

Mineral Survey No. _____

MAS No. _____

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: PGM, Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay A8.

T13S R75W Meridian: Seward.

Geographic: Tributary to Goodnews Bay.

Elevation: Sea level to 100 ft.

Access: Overland access via road or off-road vehicle from
Platinum.

HISTORY:

Production: None.

1937 - Hole drilled (63).

1969 - Goodnews Bay Mining Co. staked 78 claims.

WORKINGS AND FACILITIES: None.

GEOLOGIC SETTING: Holocene-Pleistocene glacial outwash. The river drains the north side of the Red Mountain ultramafic complex. PGM and gold were reported in a drill hole along the north side of the gravel road, about 2.6 mi S52°E of Platinum, from the saddle between the Smalls and Salmon Rivers (63).

BUREAU INVESTIGATION: The Bureau could not sample the river because the land is privately owned by Arviq Corporation, which would not grant the Bureau permission to sample.

RESOURCE ESTIMATE: A resource could not be calculated due to insufficient information.

MINERAL DEVELOPMENT POTENTIAL: The Smalls River has an unevaluated mineral development potential.

RECOMMENDATIONS: Drilling in the past and the presence of gold in the glacial deposits in the area indicate that gold and PGM exist in the area and could be reconcentrated by the Smalls River. Therefore, detailed sampling and drilling is recommended.

REFERENCES: 1, 30, 50, 62-63.

NAME: McCann Creek

Map Location No. 19

Kardex No. 9

Mineral Survey No.

MAS No. 9

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: PGM, Au.

Recording District: Bethel.

Quadrangle: Hagemeister Is. D6. Sec 12 T14S R75W Meridian: Seward.

Geographic: North side of Red Mountain, approximately 3 mi south of
Platinum.

Elevation: 150 ft.

Access: By road from Platinum.

HISTORY:

Production: None reported.

1931 - 8 claims staked by Edward McCann.

1953 - Claims drilled under a Defense Minerals

Exploration Administration (DMEA) grant (57).

WORKINGS AND FACILITIES: 2 pits (150 ft long x 75 ft wide x 6 ft
deep), approximately 5,000 yd³ have been moved.

GEOLOGIC SETTING: This creek is a small tributary of Smalls River and
heads against Clara Creek. The northwest side of the creek is
composed of the Red Mountain dunite, while the southeast side of the
creek is composed of metamorphosed sedimentary and volcanic rocks

A contractor for the DMEA drilled 20 churn holes in McCann Creek in
1953 (57). The holes were on the Discovery and No. 1 Above claims.
On No. 1 Above the depths of the holes ranged from 23 to 48 ft. The
depths of the holes on the Discovery claim ranged from 27 to 88 ft.
Overburden depths ranged from 0 to 5 ft. PGM values ranged from
0.00011 to 0.01399 oz/yd³ (57). The highest value was found in a 39
ft deep drill hole on No. 1 Above claim.

BUREAU INVESTIGATION: The Bureau sampled the creek in 1986. A 0.1
yd³ placer sample (175, fig. 6, appendix B) was taken from gravel
between two mining pits. The sample contained 0.0018 oz/yd³ PGM and
0.0008 oz/yd³ Au. The sizes by volume of the recovered PGM grains
were 6.6% +20 mesh, 20% -20/+45 mesh, 40% -45/+60 mesh, and 33.3% -60
mesh (fig. 10). Microprobe analyses of the recovered PGM grains from
sample 175 contained 2.1% Rh, 0.8% Ru, 81.4% Pt, 1.9% Ir, 0.9% Os, and
8.1% Fe (appendix C). These values are comparable with PGM found on
Clara Creek. The grains consisted of iron-platinum alloy with 8 to
30% Fe, iron-platinum alloy with oriented inclusions of Ru-Ir
arsenides, osmium, and sperrylite (appendix C). The fineness value
for the recovered gold was 918 (table 3).

RESOURCE ESTIMATE: Inferred: 500,000 yd³ averaging 0.003 oz/yd³.

The resource was estimated using the drill hole data (57) and mean area method.

MINERAL DEVELOPMENT POTENTIAL: The creek has a moderate mineral development potential because of the moderate average PGM values, but isolated high PGM values and large resources..

RECOMMENDATIONS: More drilling is required to properly evaluate the property.

REFERENCES: 1, 16, 20, 23, 31, 57, 62-63, 72, 75, 108.

NAME: Clara Creek

Map Location No. 20

Kardex No. 1,3,6

7,10

Mineral Survey No. _____

MAS No. 3

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: PGM, Au, Cr.

Recording District: Bethel.

Quadrangle: Hagemester Is. D6. Sec 13 T14S R75W Meridian: Seward.

Geographic: Tributary to Salmon River.

Elevation: 250 to 500 ft.

Access: Overland via road from Platinum

HISTORY:

Production: PGM (oz)

1928 - Charles Thorsen discovered platinum
and started mining (72)..... 71
1929 - Some platinum produced (72)..... 224
1930 - Minor work (38)..... 385
1931 - Reed visited the property. Six men
(Charles Thorsen, Andrew Olson,
Martin Garthe, O.J. Sampson, John
Haralsen, and August Wicklund) mining (72)..... 410
1932 - Mining continued.
1933 - Mining continued.
1934 - Mining continued.
1935 - Dragline installed on property.
1936 - Large scale mining started; 320,000 ft²
of bedrock mined (78)..... 1900
1937 - Dragline operation continued; recovered by
July (77)..... 600
1938 - Mining continued.
1939 - 27 men employed at the dragline operation
where 612,000 bedrock ft were mined (80).
1940 - Mining continued.
1941 - Mining terminated.

Total... 3,590

10,000 oz production are estimated from amount of tailings present in the creek and average mined grades.

WORKINGS AND FACILITIES: Clara Creek Mining Co. operated a dragline, sluicibox operation on the property from 1936 to 1940 or 1941. The creek was mined from the Platinum road to approximately 500 ft elevation. Approximately 500,000 yd³ have been moved. One cabin is still on the creek.

GEOLOGIC SETTING: Clara Creek, about 2 mi long, is a tributary of the Salmon River. The watershed area of the creek is about 1.5 square mi. Seven placer claims have been staked on Clara Creek. The overburden on Clara Creek is 10-12 ft deep; the upper 2 to 3 ft consists of tundra, peat, and dark-colored mossy material mixed with

sand. The underlying gravel is subangular and of small size, averaging about 3-4 in. in diameter. The gravel consists of rocks of locally derived bedrock fragments and other material derived from glaciofluvial deposits on the divide between the Salmon and Smalls Rivers. Bedrock consists of metamorphosed rocks of several types that includes sheared chert, quartzites derived from chert and graywacke, tuffaceous rocks, and chloritic siliceous schist. The bedrock floor rises steeply to the south and gradually to the north.

Two cuts, one on the north and one on the south side of the creek were used to mine the 200 to 250 ft wide Clara Creek pay streak. The pay streak was found to extend from the contact between the ultrabasic rocks and the metamorphosed sedimentary rocks downstream almost to the Salmon River. Early mining recovered as much as 0.08 oz/yd³ Pt, but the overall tenor as determined by dragline mining was closer to 0.02 oz/yd³ Pt (61).

The PGM grains on Clara Creek are fine-grained, although nuggets as large as 2 oz have been recovered (61). Most of the metals were found in the gravels close to bedrock. Roehm (78) reported that one cleanup contained 6.179 oz of Au, 36.098 oz of Ir, 440.421 oz of Pt, 4.221 oz of Os, 0.795 oz of Ru, and 2.569 oz of Rh.

BUREAU INVESTIGATION: The Bureau sampled Clara Creek in 1986. Six 0.1 yd³ placer samples from five sample sites (186-189, 193, fig. 6, appendix B) were taken. The samples contained from trace to 0.034 oz/yd³ PGM. The highest value was taken from the upstream end of the highest mining cut on the south side of the creek, where a +10 mesh nugget was recovered (sample 187). At this location a 2-ft thick section of clay and boulders is present on dunite bedrock. The sides of the creek were also sampled, with only minor PGM and Au recovered. Microprobe analyses of sample 187 contained 1.6% Rh, 0.5% Ru, 83% Pt, 3.8% Ir, 1.0% Os, and 8.1% Fe (appendix C). Iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, hollingsworthite, and sperrylite were identified.

RESOURCE ESTIMATE: Inferred: 5,000 yd³ of 0.034 oz/yd³ PGM.

The inferred resource is calculated from the exposure of unmined ground at the head of the creek, which has the following dimensions: 900 ft long by 75 ft wide by 2 ft thick.

Roehm (78) reported that recovery was approximately 70% with the dragline operation; therefore, there are possibly 500,000 yd³ of tailings which average 0.008 oz/yd³ PGM assuming an original average recovery grade of 0.02 oz/yd³ PGM.

MINERAL DEVELOPMENT POTENTIAL: The unmined area at the head of Clara Creek has a high mineral development potential for a small operation because of the high grade found in the Bureau samples. The tailings may also contain a mineable quantity of PGM and/or be a good building material source for southwest Alaska.

RECOMMENDATIONS: Detailed sampling of the tailings and more extensive sampling of the virgin ground is needed.

REFERENCES: 1, 11, 16-20, 23, 31, 61-63, 72, 77-78, 80, 86-98, 108.

NAME: Dowry Creek

Map Location No. 21

Kardex No. 1c

Mineral Survey No. _____

MAS No. _____

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: PGM, Au.

Recording District: Bethel.

Quadrangle: Hagemeister Is. D6. Sec 24 T14S R75W Meridian: Seward.

Geographic: East side of Red Mountain.

Elevation: 250 to 500 ft.

Access: By road from Platinum.

HISTORY:

Production: Estimated - 1800 oz PGM.

1931 - Reed reported two claims held by
Fred Wolters and Neil Corrigan (72).

1935 - Mining occurred (93).

1984 - Material on creek is used for
building material in Bethel.

WORKINGS AND FACILITIES: The creek has been mined from the road to 450 ft elevation, a distance of approximately 0.6 mi. Approximately 90,000 yd³ were mined.

GEOLOGIC SETTING: Dowry Creek is approximately 1 mi long. It is a western tributary to the Salmon River. Bedrock consists of metamorphosed volcanic and sedimentary rocks. The creek is 200 ft wide at its mouth but it narrows rapidly. Gravels were originally 5 ft thick.

BUREAU INVESTIGATION: The Bureau mapped and sampled the creek in 1986. At the head of the creek a 120-ft wide by 2-ft deep area has been stripped for mining. Two ft of boulders, cobbles, and clay overlie a serpentinized dunite bedrock. Sample 191 was taken from this area and contained 0.0215 oz/yd³ PGM and 0.0006 oz/yd³ Au (fig. 6, appendix B). Sample 190 was taken from 3 ft of bank material at 600-ft elevation (fig. 6, appendix B). The material consisted of boulders, cobbles, and clay and contained 0.0035 oz/yd³ PGM. Tailings were sampled (194-195, fig. 6, appendix B) and contained from 0.0007 and 0.0015 oz/yd³ PGM. The sizes of the PGM particles by volume in the samples were 1.2% +20 mesh, 10% -20/+30 mesh, 14.3% -30/+35 mesh, 3.2% -35/+45 mesh, 63.3% -45/+60 mesh, and 8% -60 mesh (fig. 10). The sizes of the gold particles by volume were 6.3% +30 mesh, 31.3% -30/+35 mesh, 18.7% -35/+45 mesh, and 43.7% -45/+60 mesh. Microprobe analyses of the recovered PGM grains contained from 0.8 to 1.5% Rh, 0.4 to 0.9% Ru, 63.4 to 80.2% Pt, 7.2 to 18% Ir, 1.2 to 6.8% Os, and 6.6 to 7.5% Fe (appendix C). The grains consisted of iron-platinum alloy with 8 to 30% Fe, iron-platinum alloy with minor osmiridium inclusions, osmiridium (iridium with minor osmium), hollingsworthite, osmium, xingzhongite, iridarsenite, irarsite, sperrylite, and tulameenite (appendix C). Gold particle finenesses for samples 191 and 195 were 824 and 738, respectively (table 3).

RESOURCE ESTIMATE: Inferred: 7000 yd³ of 0.0125 oz/yd³ PGM.

The resource was calculated using a 600 ft length, a 120 ft width, and 2.5 ft depth. The average grade was the average value of samples 190 and 191.

MINERAL DEVELOPMENT POTENTIAL: Dowry Creek has a moderate mineral development potential for a small placer mining operation because of its small amount of available resource and high grades. The tailings are a readily available source of building material for southwest Alaska.

RECOMMENDATIONS: More sampling and possibly drilling is needed to increase reserves.

REFERENCES: 1, 16, 18-20, 31, 62-63, 72, 75, 93, 98.

NAME: Salmon River, Quartz Creek,
Snow Gulch, Platinum Creek, Fox
Gulch, Squirrel Creek, Medicine
Creek, Dry Gulch, Boulder Creek,
Last Chance Creek

Map Location No. 22
Kardex No. 2,4,8

19
Mineral Survey No. _____
MAS No. 4

LOCATION: Deposit Type: Placer.
Mining District: Goodnews Bay. Commodities: PGM, Au, Cr.
Recording District: Bethel.
Quadrangle: Hagemeister Is. D6. T14 & 15S R74 & 75W Meridian: Seward.
Geographic: Tributary to Kuskokwim Bay, located approximately 12 mi
south of the town of Platinum.
Elevation: 10 to 250 ft.
Access: Overland via road from Platinum.

HISTORY:	Production: PGM(oz)	Au(oz)
1926 - PGM found on Fox Gulch by Walter Smith. Charles Thorsen sent some of the PGM to the Bureau of Mines office at College, Alaska, where chemical analysis indicated high grade platinum.		
1927 - Mining on Platinum and Dry Creeks (72).....		17.5
1928 - Two camps on Squirrel and one camp on Platinum Creek (72).....		73
1929 - Work done on Squirrel, Platinum and Fox Creeks (72).....		197
1930 - Work done on Squirrel, Dry, and Platinum Creeks and Fox Gulch (72).....		391
1931 - Mining on Squirrel, Dry Creeks, and Fox Gulch (72).....		370
1933 - Platinum produced from Squirrel, Fox, and Platinum Creeks. Andrew Olson and associates acquired extensive tracts of claims on the developed streams and 38 claims on the Salmon River (91).		
1934 - 60 claims controlled by the company, with 15 to 20 men employed. Drag-line scraper plant mining using open-cut and sluicing methods. Platinum mined on Squirrel, Fox, and Platinum Creeks (92).		
1935 - First mention of Goodnews Bay Mining Co. Squirrel, Fox, and Dowry Creeks mined. A basic dike rock from Squirrel Creek was analyzed by Paul Hopkins of the USGS and platinum metals were positively identified (93)		
1936 - Mining on Squirrel, Fox, and Platinum Creeks. Extensive test drilling was in progress. A large loan was granted from the Reconstruction Finance Corporation to build a dredge. Four holes drilled on lower Salmon River (78).		

History	Production.	PGM(oz)	Au(oz)
1937 - Dredge brought in and put into operation. Dredging conducted for 6 weeks before it was ended on December 20th. 351,078 yd ³ of gravel mined (106).....			4085.55 6284.35 Pt + Os 1088.3 Iridium
1938 - 45 men employed on dredging operation in Salmon River and dragline operations on Platinum and Fox Creeks. Roehm (79) reported that over 30 lbs of platinum were taken out from the left limit of Platinum Creek near its mouth in six days. Dredge mined from Discovery claim to 1 above Discovery claim to Discovery claim. Over 1 million yd ³ moved (36).....		29902.17	121.01
1939 - Dredge and dragline mining continued Dredge mined from Discovery claim to 3 Below Discovery claim (36).....		17899.65	64.06
1940 - Strandberg & sons mining on Dry Gulch Dredge mined from 3 Below Discovery claim to 5 Below Discovery (36).....		26730.39	53.67
1941 - Dredge mined 5 Below Discovery claim to 7 Below Discovery claim (total metals, 36)...		20066.4	
1942 - Dredge mined 7 Below Discovery claim to 8 Below to 7 Below to 6 Below Discovery claim (total metals (36).....		14696.77	
1943 - Dredge mined from 6 Below to 5 Below to 4 Below Discovery claim (36, 106).....		15781	107 (7.36 oz Ag)
1944 - Mining on 4 Below Discovery to Sarah 4 Below Discovery claim to Margaret 3 Below Discovery claim (total metals, 36).....		30654.6	
1945 - Mining on Margaret 3 Below Discovery claim to Pankin 2 Below Discovery claim to 1 Below Discovery claim to Discovery claim (total metals, 36).....		22577.34	
1946 - Mining on 1 above Discovery claim to Ethel 1 Above Discovery claim to Ethel 2 Above Discovery Claim (36, 106).....		18549.54	410
1947 - Mining from 2 Above Discovery claim to 3 Above Discovery claim to 4 Above Discovery claim (36, 106).....		9126.6	757 (4 oz Ag)
1948 - Mining from 5 Above Discovery claim to 4 Above Discovery claim to 3 Above Discovery claim to 2 Above Discovery claim to Ethel bench (36, 106).....		8405.66	356
1949 - Mining on Med Frac. Palladium B. claim Palladium B and Osmium B plus Med. Frac. Ethel B claim (total metals 36).....		5218.9 total - 10895.57	

History	Production	PGM(oz)	Au(oz)
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1950 - Fowler (35) conducted a mining safety check. The power unit was removed from the dredge to a shore unit. The power capacity of the dredge was doubled. Mining on Osmium, Ruthenium, and Rhodium bench claims (total metals, 36).....		17309.45	
1951 - Mining continued (total metals, 36).....		20119.8	
1952 - Mining continued (total metals, 36).....		20284.8	
1953 - Mining continued (total metals, 36).....		15697.9	
East side of Red Mountain was drilled under a DMEA contract (57).			
1954 - Mining continued (total metals, 36).....		17569.5	
1955 - Mining continued (total metals, 36).....		14939.8	
1956 - Mining continued (total metals, 36).....		16811.4	
1957 - Mining continued (total metals, 36).....		13850.5	
1958 - Mining continued (total metals, 36).....		10253	
1959 - Mining continued (total metals, 36).....		10636.4	
1960 - Mining continued (total metals, 36).....		13318	
1961 - Mining continued (total metals, 36).....		16111.4	
1962 - Mining continued (total metals, 36).....		12471.3	
1963 - 39 claims staked from the Salmon River to Chagvan Bay (total metals, 36).....		12024.9	
1964 - 60 claims staked from Salmon River to Chagvan Bay (total metals, 36).....		12981.6	
1965 - Mining continued (total metals, 36).....		9973.3	
1966 - Mining continued (total metals, 36).....		8855.9	
1967 - Mining continued (total metals, 36).....		7237.7	
1968 - Mining continued (total metals, 36).....		7580.2	
1969 - Mining continued (total metals, 36).....		10484.7	
1970 - Mining continued (total metals, 36).....		6701.2	
1971 - Mining continued (total metals, 36).....		4495	
1972 - Mining continued (total metals, 36).....		4202.3	
1973 - Mining continued (total metals, 36).....		4707	
1974 - Mining continued (total metals, 36).....		2584.3	
1975 - Mining continued (total metals, 36).....		3086.4	
1976 - Mining continued (total metals, 36).....		3212	
1977 - Mining continued (total metals, 36).....		6892	
1978 - No mining.			
1979 - Geological investigations of claims.			
1980 - Claims sold to Hanson Properties- camp refurbished.			
1981 - Mined 200,066 yd ³ with the dredge (12).....		900	
1982 - Dredge sank in spring. Refloated by summer with minor production.			
1983 - Exploration with a backhoe (12).....		3000?	
1984 - Magnetometer survey and exploration using a drill, backhoe, and dragline.			
1985 - No activity.			

Total.....530660

An additional 100,000 oz were recovered from dragline operations on benches and creeks draining the east side of Red Mountain (33).

Production information from the Goodnews Bay Mining Co. files was provided to the Bureau by R. A. Hanson. Figures A-1 and 2 are graphs which depict the amount and type of material mined and average recovered PGM grade and by the Goodnews Bay Mining Co. from 1938 to 1975. The company mined approximately 40 million yd³ of unmined material and 4 million yd³ of tailings (fig. A-1). The average grade was 0.026 oz/yd³ PGM in 1938 and it fell to as low as 0.002 oz/yd³ PGM in 1974 (fig. A-2).

WORKINGS AND FACILITIES: A pontoon-hulled dredge weighing 1400 tons, electrically operated, drawing 1,000 horsepower is present in Salmon River. The dredge is 130 ft long by 60 ft wide by 9 ft draft. It has 94 eight ft³ buckets. It operated at the rate of 31 buckets per minute. From 1938 to 1975, the dredge mined over 1 million yd³ per season. Miscellaneous mining equipment, complete shops and bunkhouses.

Platinum Creek has been mined from the confluence of Fox Gulch to its mouth. An elevated sluicebox is located on the creek.

Fox Gulch has been mined from the confluence with Platinum Creek to 400-ft elevation.

Squirrel Creek has been mined upstream of the camp to 350-ft elevation.

Salmon River has been mined from Dowry Creek downstream to within 1 mi of its mouth. The bench on the east side of the river was mined by dragline from Medicine Creek to Dowry Creek. The dredge worked from between Boulder and Last Chance Creeks to within a mile of the ocean on both the bench and main creek.

GEOLOGIC SETTING: Mertie (63) described the PGM deposits at Goodnews Bay and the following discussion is taken predominantly from his report. Platinum Creek, with a length of 2 mi, has two tributaries from the north: Fox Gulch and Squirrel Creek. These streams had paystreaks which extended from their headwaters to their mouths; and Platinum Creek was mined from the mouth of Fox Gulch to its confluence with Salmon River. The paystreak on Platinum Creek included stream and bench placer deposits. At the mouth of Fox Gulch, the width of this paystreak was 200 ft, and at the confluence with Salmon River it had a width of at least 400 ft. The depth to bedrock, less the surficial cover of moss, increased from 12 ft at its confluence with Fox Gulch to 25 ft at its mouth. The total length of the paystreaks of Platinum Creek, Fox Gulch, and Squirrel Creek, was about 3.5 mi. PGM occurred in the lower few feet of the gravels, and on the surface of bedrock, and for a few feet within the cracks and crevices of fractured bedrock. These metals consist of fine grains, however, they are larger than those recovered from the paystreaks of Salmon River. Nuggets are uncommon, though more prevalent in Fox Gulch than elsewhere. The largest nugget recovered weighed 4 oz.

The PGM deposits in the valley of the Salmon River occur in two distinct paystreaks, one in the present valley floor and the other in what has been designated as the bench channel, along the eastern side of the valley.

The valley paystreak extends from claim 7 above Discovery claim, near the mouth of Boulder Creek, downstream to the lower end of claim 15 below Discovery, a distance of about 6 mi. This deposit ranges in width from 300 to 450 ft, except at the mouth of Platinum Creek, where it was as wide as 600 ft. The valley paystreak is covered by 30 to 80 ft of overburden. Gravels constitute a large percentage of the alluvium. The gravels range up to 2 ft in diameter, with no clay and are from 30 to 75 ft thick. Bedrock is unaltered by weathering and shows deep gutters with a depth as great as 20 ft. PGM occur mainly on bedrock, in the overlying 2 ft of gravels, and in the uppermost 2 ft of shattered bedrock. The sizes of the PGM grains, diminishing downstream, range from 0.2 in to less than 0.002 in diameter.

The paystreak terminates, or becomes noncommercial at the lower end of claim 15 below Discovery. On the east bank of the Salmon River, just above the mouth of Happy Creek, there is an ancient deposit of fairly well sorted outwash gravels of glacial origin. Four 75 to 110 ft holes, drilled on the south side of Salmon River below Happy Creek, contained no PGM or gold values (78).

The bench paystreak, as defined by drilling, extends from the Association claim east of claim 9 above Discovery downstream to within 0.75 mi from Chagvan Bay, a distance of about 10 mi. On the Olson bench claim, this deposit had a width of 600 ft, but at some sites farther upstream was as wide as 1,200 ft. At the northern limit of the bench paystreak, the depth to bedrock is 10 ft; east of the Discovery claim, the depth is 45 ft; at the lower end of the Olson bench claim the depth is 125 ft; and 0.87 mi from Chagvan Bay the depth is 200 ft. Bedrock on the bench is level.

The bench paystreak consists largely of clay from top to bottom, with an average content of about 20 pct gravel, which is irregularly distributed vertically. The gravels occur mainly as inlaid seams and lenses in the clay, though in places drilling has penetrated beds of gravel ranging in thickness from 25 to 70 ft. The paystreak is definitely of glacial origin. The bedrock, if nonsiliceous, is deeply weathered to as much as 5 ft. PGM occur mainly on the surface of the bedrock and in the overlying 10 ft of clay and gravel. The bench paystreak has been locally enriched in PGM at the sites of tributary gulches from the east that drained an older paystreak higher on the valley wall. The sites of these ancient gulches, do not correspond exactly with the position of the gulches shown on the topographic map. These high-level deposits have been prospected, but have been found to be narrow, intermittent, and too low grade to be mined at a profit.

Fifty holes were drilled on the east side of Red Mountain between Dowry and Last Chance Creeks in 1953 under a Defense Minerals Exploration Administration contract (57). Depths of the drill holes ranged from 5 to 51 ft. PGM values ranged from 0 to 0.0085 oz/yd³. The highest values were found in drill holes along Boulder Creek. The average value of eight drill holes was 0.0024 oz/yd³ PGM.

BUREAU INVESTIGATION: The Bureau sampled Platinum Creek, Fox Gulch, Squirrel Creek, and the tailings of the Salmon River in 1986.

Platinum Creek was sampled from 200 feet elevation, approximately 0.25 mi upstream of Fox Gulch to Dry Gulch. Six 0.1 yd³ placer samples taken from five sample sites (209-213, fig. 6, appendix B) contained from trace to 0.0093 oz/yd³ PGM. Of the PGM particles recovered, 3% were +30 mesh and 97% were -30 mesh in size. No PGM was reported by past investigators above the confluence with Fox Gulch; however, sample 213 (fig. 6, appendix B) taken 0.25 mi above the confluence contained 0.0028 oz/yd³ PGM and 0.0006 oz/yd³ Au. The tailings in Platinum creek were mapped and sampled. It was calculated that 50,000 yd³ of overburden were stripped and 50,000 yd³ of gravel were mined in Platinum Creek above the confluence with Squirrel Creek. Two samples of tailings (209-210, fig. 6, appendix B) contained 0.0012 and 0.0039 oz/yd³ PGM. Microprobe analyses of the PGM grains in the samples contained from 0.8 to 1.6% Rh, 0.5 to 1.0% Ru, 45.6 to 77.8% Pt, 8.1 to 37.8% Ir, 3.2 to 13.4% Os, and 4.1 to 8.4% Fe (appendix C). The identified grains were iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, osmiridium (iridium with less iron-platinum alloy), osmiridium (with lesser iron-platinum alloy), hollingsworthite, prassoite, kashinite, sulrhodite, ehrlichmanite, iridosmine, osmium, iridarsenite, iridium, sperrylite, and tulameenite (appendix C). One fineness value for the recovered gold was 714 (table 3).

Four 0.1 yd³ placer samples (214-217, fig. 6, appendix B) were taken from Fox Gulch. The samples contained from 0.0009 to 0.0378 oz/yd³ PGM. The highest value was from the virgin ground at the head of the creek. A sample of tailings (214, fig. 6, appendix B) contained 0.0121 oz/yd³ PGM. The sizes by volume of the PGM grains recovered were 1.25% +20 mesh, 6.5% -30/+30 mesh, 6.25% -30/+35 mesh, and 86% -35 mesh. It was calculated that approximately 160,000 yd³ of material was moved. Microprobe analyses of the PGM grains contained from 1.3 to 1.9% Rh, 0.7 to 1.0% Ru, 37.7 to 48.6% Pt, 26.7 to 41.3% Ir, 9.8 to 13.4% Os, and 3.8 to 4.8% Fe (appendix C). The recovered grains consisted of iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, iridium with minor osmium, hollingsworthite, iridarsenite, irarsite, iridium, sperrylite, and platarsite (appendix C).

Three 0.1 yd³ placer samples (206-208, fig. 6, appendix B) of tailings were taken from Squirrel Creek. The samples contained from 0.0006 to 0.0033 oz/yd³ PGM. The sizes by volume of the PGM grains

were 5.4% +30 mesh, 2.7% -30/+35 mesh, and 91% -35 mesh. It was calculated that approximately 55,000 yd³ of material was mined. The Goodnews Bay Mining Camp is on ground that has not been mined. Microprobe analyses of the PGM grains contained from 0.5 to 1.9% Rh, 0.3 to 0.9% Ru, 47 to 88.4% Pt, 0.7 to 37.4% Ir, 0.5 to 9.2% Os, and 4.1 to 9.0% Fe (appendix C). The recovered grains consisted of iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, osmiridium with lesser iron-platinum alloy, and osmium.

Some of the dredge tailings along the Salmon River were sampled. Ten 0.1 yd³ placer samples taken from nine sample sites (197-205, fig. 6, appendix B) contained from 0 to 0.0037 oz/yd³ PGM. PGM grain sizes by volume were 6.9% +20 mesh, 12.3% -20/+30 mesh, 6.8% -30/+35 mesh, 11% -35/+45 mesh, 37% -45/+60 mesh, 26.0% +60 mesh (fig. 8). Microprobe analyses of the recovered PGM grains contained from 0.6 to 1.1% Rh, 0.4 to 0.7% Ru, 60.3 to 85.5% Pt, 3.8 to 25.6% Ir, 1.2 to 6.3% Os, and 5.9 to 8.9% Fe (appendix C). The recovered grains consisted of iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, osmiridium (iridium with minor osmium), sperrylite, and tetraferroplatinum (appendix C). A sample (196, fig. 6, appendix B) was taken from a weathered (saprolite) dunite which is exposed in a bench cut near Boulder Creek. The sample contained PGM, but it was later proven that the sample was contaminated by the PGM-bearing overlying gravels.

RESOURCE ESTIMATE:

Platinum Creek - Inferred: 50,000 yd³ of tailings with
0.0026 oz/yd³ PGM.

Fox Gulch - Measured (36): 20,000 yd³ of virgin ground
with 0.02 oz/yd³
Inferred: 160,000 yd³ of tailings with 0.012 oz/yd³

Squirrel Creek - Measured (36): 37,000 yd³ of virgin ground with
0.0135 oz/yd³ PGM
Inferred: 50,000 yd³ of tailings with 0.002
oz/yd³ PGM.

Salmon River (33)-

Measured dredge reserve

Bench paystreak.....37,882,300 yd³ with 0.0023 oz/yd³ PGM

Indicated dredge reserve

Bench paystreak.....24,530,000 yd³ with 0.0017 oz/yd³ PGM

Measured dragline reserve...496,000 yd³ with 0.0084 oz/yd³ PGM

Indicated dragline reserve..500,000 yd³ with 0.007 oz/yd³ PGM

Bundzten (11) postulated that there were 62,900,000 yd³ of material with 500,000 oz of PGM in the Salmon River.

The dredge mined approximately 40 million yd³ of virgin ground, with an a recovery of between 0.002 and 0.026 oz/yd³ PGM (figs. A-1 and 2). If the dredge were 60% efficient, as stated by Ron Dowers of Hanson Properties (28), then there should be 40 million yd³ of tailings which range from 0.0013 to 0.017 oz/yd³ PGM.

MINERAL DEVELOPMENT POTENTIAL: The Bureau investigation of the Salmon River property indicates that there is a high mineral development potential for a large mining operation in the Salmon River and small operations in the tributaries. The tailings of the Salmon River, however, need to be tested more thoroughly and a feasibility study should be conducted before any development could occur. The tailings are a good building material source for southwest Alaska.

RECOMMENDATIONS: Drilling or bulk sampling by trenching of the tailings in the Salmon River is recommended before mining is conducted. An efficient recovery system that is capable of recovering PGM from the clay-rich gravels is also needed.

REFERENCES: 1-2, 11-13, 16-20, 23, 26-31, 33-36, 38, 51, 55, 57, 61-64, 66, 69-70, 72, 75, 77-82, 91, 93-95, 97-98, 100-101, 106-108, 115.

FIGURE A-1. AMOUNT OF MATERIAL MINED
BY THE GOODNEWS BAY MINING CO.

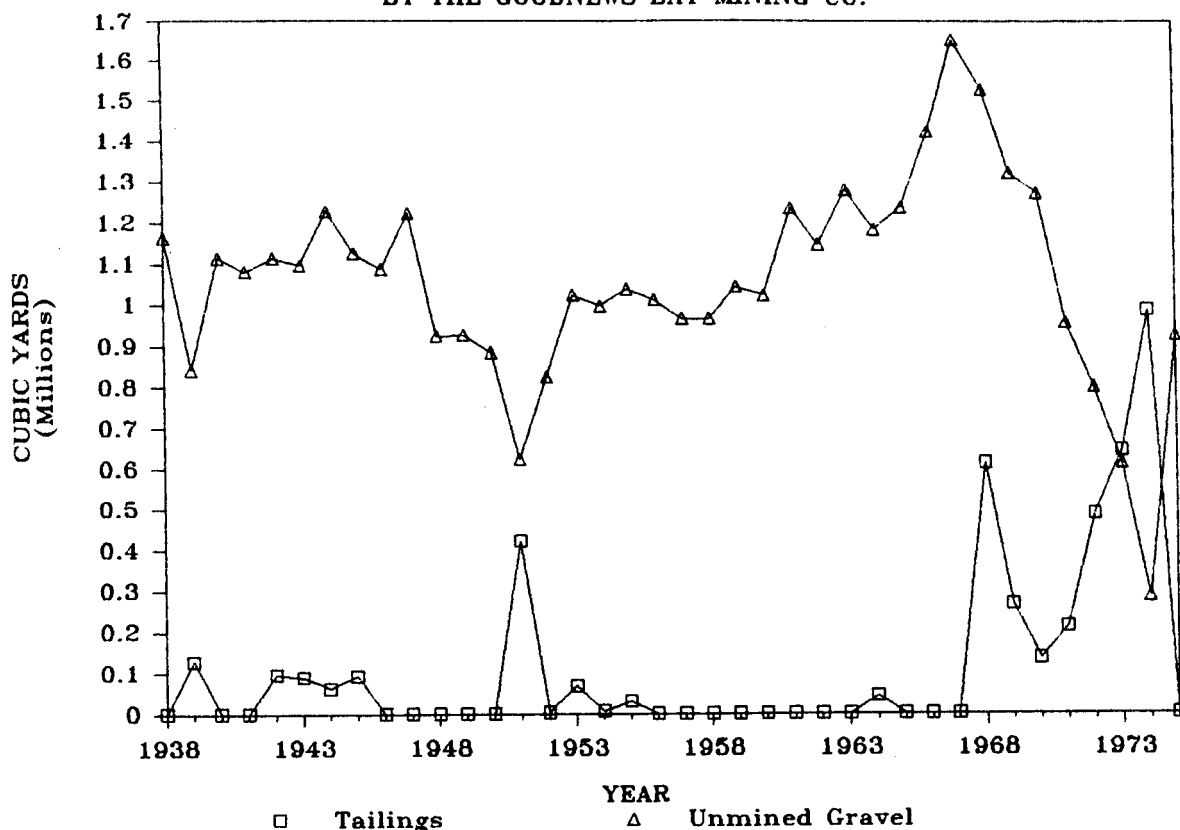
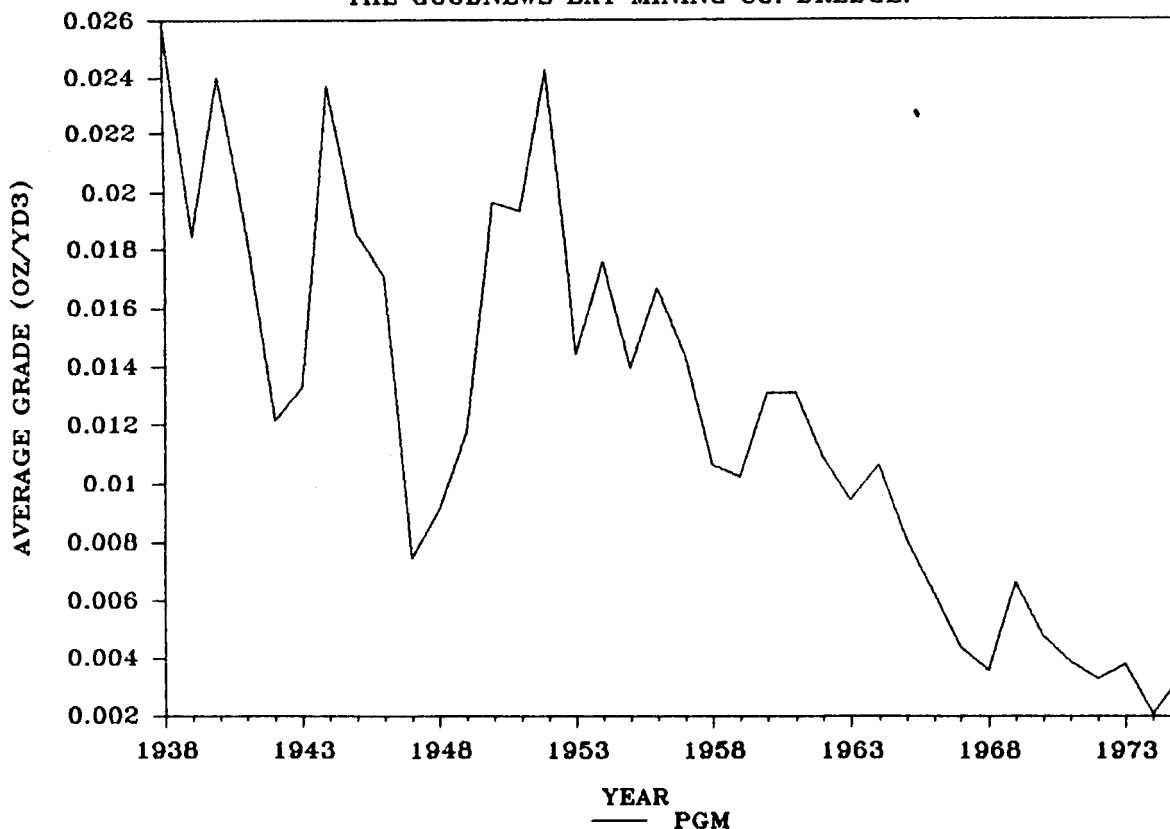


FIGURE A-2. AVERAGE RECOVERED GRADE BY
THE GOODNEWS BAY MINING CO. DREDGE.



NAME: Red Mountain (West Side)

Map Location No. 23

Kardex No. 11,17

Mineral Survey No. _____

MAS No. 2

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Pt, Fe.

Recording District: Bethel.

Quadrangle: Hagemeister Is. D-6.SW 1/4 Sec 34 T14S R75W

Meridian: Seward.

Geographic: South of the town of Platinum.

Elevation: 600 ft.

Access: By road 3 mi south of Platinum.

HISTORY:

Production: Minor.

1930-34 - \$10.00 per day of platinum was recovered from the Prospector's channel (105).

1936 - Considerable ground staked. Hand drill hole sunk to a depth of 30 ft on a group of 18 claims owned by Haraldson, Wicklund, Brevick, and Burness. 152 milligrams of platinum were recovered (79).

1937 - A power drill was purchased. 13 holes were drilled, with trace to a few milligrams recovered. The 1936 hole was redrilled with negative results (79).

1963 - Six pan concentrate samples taken from the west side of Red Mountain by Berryhill. A trace of gold and platinum were found in each sample (4).

1965 - A recovery plant was taken to a site on top of Red Mountain and small amounts of platinum were recovered from the residual material (63).

1969 - 62 claims staked.

1981 - Ulrich, S.D. (105) mapped and sampled the sediments on the west side of Red Mountain.

WORKINGS AND FACILITIES: Prospector's channel dug in the vicinity of Cabin Creek (local name for the creek).

GEOLOGIC SETTING: Red Mountain is composed of dunite. The west side of Red Mountain consists of colluvium from Red Mountain, glacial outwash and moraines, and alluvial fans. Fourteen holes drilled in 1936 and 1937 ranged from 30 to 110 ft deep, with bedrock reached in the 110 ft deep hole (78). Eighty-eight milligrams of PGM were found over 30-ft intercept in a 4-in drill hole in one sample (78). The other drill holes contained little or no PGM.

Ulrich (105) reported that the glacial bluff is composed of a broad range of grain sizes, the percentages of which vary considerably from location to location. Gravel comprises approximately 50% of the bluff material. The sediment is very poorly to extremely poorly sorted. In these deposits Pt values decrease steadily away from Red Mountain. Ulrich (105) found that the sample closest to Red Mountain contained 0.7 ppm Pt and the sample beyond Dead Walrus Creek $\frac{1}{2}$ a name assigned to a creek by Bond (6) and Ulrich (105) $\frac{3}{4}$ contained no Pt. The Os, Ir, and Rh values were comparable to the Dead Walrus Creek samples.

A recessional moraine in the area is composed of 40% gravel, 55% sand, and 2.5% mud.

Ulrich (105) reported that the alluvial fans have a broad range of elemental values, however, they are generally characterized by higher Pt and Pd values than the glacial bluff samples, and greater Pd, Mg, and lesser Fe, Cr, As, Mn, and U values than the stream deposits.

Ulrich (105) found that Dead Walrus Creek had the highest Pt values of any creek sampled in 1981. This may be attributed to the fact that the creek drains a more Pt rich portion of Red Mountain or that an older stream channel may have been cut by the creek. The majority of PGM grains recovered in the creek are less than 120 mesh in size. The sediments in the creek are poorly to very poorly sorted and are composed of variable amounts of sand and gravel. A large percentage of the samples are composed of heavy and magnetic minerals. Ulrich (105) postulated that the PGM grains in Dead Walrus Creek were in the process of being washed into the ocean, with little deposition along the beach.

Ulrich (105) concluded from her study of the piedmont deposits that:

1. The abundance of Pt in the glacial bluff samples decreases away from Red Mountain due to mixing with Pt-deficient glacial sediments.
2. The glacial bluff and moraine samples are composed of sediment collected from a variety of source rock types; whereas the remainder of the piedmont samples are composed primarily of weathered Red Mountain ultramafic material.
3. The moraine is compositionally and texturally intermediate to the glacial bluff and stream deposits. This is the result of cursory sorting by meltwater streams.

BUREAU INVESTIGATION: The Bureau took six pan concentrate samples from the west side of Red Mountain in 1963 (4). Only trace amounts of gold and platinum were found.

Six 0.1 yd³ placer samples were taken from five sample sites (178, 180-183, fig. 6, appendix B), taken from the bluffs in 1986 by the Bureau, contained from 0 to 0.0005 oz/yd³ PGM and 0 to 0.0004 oz/yd³ Au. The recovered PGM grains were -60 mesh in size. The recovered Au grain mesh sizes were 5.5% +30, 61.5% -30/+35, and 33% -60. Microprobe analyses of grains from sample site 178 contained 1.4 to 1.6 % Rh, 0.9 to 1.0% Ru, 35.5 to 49.4% Pt, 33.7 to 44.7% Ir, 7.1 to 11.2% Os, and 4.0 to 4.6% Fe (appendix C). Iron-platinum alloy with 8 to 30% platinum and osmiridium (iridium with minor osmium) were identified in the sample.

RESOURCE ESTIMATE: A resource estimate can not be made because no economic quantities of placer minerals were found in the bluffs.

MINERAL DEVELOPMENT POTENTIAL: Sampling of the bluffs by drilling in 1936-37, Ulrich, and the Bureau indicates that this property has a low mineral development potential.

RECOMMENDATIONS: None.

REFERENCES: 1, 4, 16-20, 23, 31, 62-63, 78-79, 100-101, 105, 108.

NAME: Platinum-Salmon River Beach

Map Location No. 24

Kardex No.

Mineral Survey No.

MAS No. 1

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: PGM, Au.

Recording District: Bethel.

Quadrangle: Goodnews Bay A-8 & Hagemeister Is. D6. T14 & 15S R75W

Meridian: Seward.

Geographic: Beach from the town of Platinum to the Salmon River.

Elevation: Sea level.

Access: Overland access along the beach from Platinum.

HISTORY:

Production: None.

1963 - U.S. Bureau of Mines drilled and sampled
the beaches (4).

1981 - Bond, S.C. and Ulrich, S.D. sampled
the beach for the Univ. of Texas (6, 105).

1985 - U.S. Bureau of Mines redrilled and bulk
sampled some of the beach (3).

WORKINGS AND FACILITIES: None.

GEOLOGIC SETTING: The beach is from 10 to 100 ft wide. It is bordered on its east side by low to high (10- to 50-ft) bluffs of glaciofluvial and glacial outwash material. This material is also the bedrock on which the beach sands rest. Beach material north of Red Mountain ranges from 1 in thick near the bluffs to an unknown depth (probably less than 20 ft) at the surf line. Black sands (up to 3 in thick) are concentrated along the interface between the beach sands and the bedrock. Black sands are also found intercalated with the beach sands as the sands thicken away from the bluffs.

The mid-wash zone sediments are classified as sandy gravel and contain approximately equal amounts of sand and gravel (105). These sediments are the most poorly sorted of the beach sediments. Approximately 75% of the minerals are light. No PGM is being concentrated in this zone (105).

The upper-swash zone is located at or just behind the beach crest. This zone is characterized by the largest mean grain size of the beach sediments, and by moderate sorting of the grain sizes (105). This zone contains over 90% gravel, and less than 10% sand. Approximately 80% of the minerals are light in the upper grain sizes, but in the lower grain sizes the ratio of light to heavy minerals is 1:1 (105). No PGM was detected by Ulrich (105) from this zone. No PGM would be predicted from this zone because it gets eroded and deposited twice per day.

The near back-beach or the seaward portion of the backbeach is rich in PGM. The area has the smallest mean grain-size of any beach sample and is poorly sorted. Grains are concentrated in the 45 to 100 mesh

size fractions (105). Magnetite and chromite grains are from 45 to 80 mesh in size (105). PGM is being concentrated by daily tidal spillover events that take place beyond the high-tide line.

The far back-beach sediments contain over 90% sand, less than 10% gravel, and almost no mud. These sediments are poorly sorted and have variable grain-size distributions. The most abundant size range is between 10 and 35 mesh (105). The Pt content ranged from 0.01 to 0.07 ppm (105). Ulrich (105) concluded that this is an excellent target for further Pt exploration. Large concentrations would not form in this region, because the beach is rapidly eroding (approximately 7 in/year). At least 690 yd³/year of bluff detritus is contributed to the beach system over a 1 mi length of beach north of Red Mountain (105).

Washover fan deposits are highly variable in their grain-size content because each layer within the deposit represents a separate pulse of a storm event. The deposits are composed of rhythmically-alternating, low-angle, landward-dipping, coarse, fine, and rare heavy mineral layers (105). Ulrich (105) found during her sampling that the Pt content ranged from 0.01 to 10 ppm.

BUREAU INVESTIGATION: The Bureau sampled the beaches in 1963, 1985, and 1986. A 3-in diameter auger was used in 1963 and 1985, which accounted for low sample volumes. Results from the drilling of the beach north of Red Mountain in 1985 indicated that the beaches contained from 0.0009 to 0.0352 oz/yd³ PGM (3). Berryhill (4) recovered minor Cr and less than 39 lb/yd³ Fe.

In 1986, the Bureau sampled the beaches between Platinum and Chagvan Bay. Sampling was conducted on 1 mi, 0.5 mi, and 0.25 mi intervals, with time restrictions being the dominant factor limiting the sampling density. Sixty-one samples of the beach between Platinum and the Chagvan Bay were taken from twenty-eight sample sites (176-183, 219-238, figs. 4 and 6, appendix B). The samples contained from 0 to 0.1029 oz/yd³ Au and 0 to 0.26 oz/yd³ PGM. The highest concentrations of PGM and gold were found in the Flat Cape area, with the lowest concentrations being north of Red Mountain and south of the Salmon River. The grain size distribution for gold was 1% +20 mesh, 4.5% -20/+30 mesh, 11% -30/+35 mesh, 26.5% -35/+45 mesh, 20% -45/+60 mesh, and 37% -60 mesh (fig. 11). The grain size distribution for PGM was 0.3% +20 mesh, 2.6% -20/+30 mesh, 6.7% -30/+35 mesh, 10.6% -35/+45 mesh, 4% -45/+60 mesh, and 75.8% -60 mesh (fig. 12). Microprobe analyses of the PGM grains found that they contained from 0.5 to 4.5% Rh, 0.2 to 1.0% Ru, 32 to 89.1% Pt, 1.6 to 47.8% Ir, 0.8 to 15.9% Os, and 3.2 to 8.9% Fe (appendix C). The grains were iron-platinum alloy with 8 to 30% iron, iron-platinum alloy with minor osmiridium inclusions, osmiridium (iridium with minor osmium), iron-platinum alloy with oriented inclusions of Ru-Ir arsenides, osmiridium with lesser iron-platinum alloy, rhodium, hollingsworthite, iridosmine, osmium, iridarsenite, irarsite, iridium, sperrylite, platarsite, tulameenite, and tetraferroplatinum (appendix C). Fineness values for the gold grains ranged from 548 to 863 (table 3).

Sixteen placer samples (178, 180, 181-183, 220, 222-231, fig. 6, appendix B) of the glacial material that comprises the bluffs along the beach were taken. Sampling consisted of cutting a channel from the top of the bluffs to sea level. The samples contained from 0 to 0.0005 oz/yd³ Au and from 0 to 0.0013 oz/yd³ PGM. The best samples were found in the Flat Cape area. The grain size distribution for gold was 1.3% +30 mesh, 19.3% -30/+35 mesh, 8.4% -35/+45 mesh, 38.5% -45/+60 mesh, and 32.5% -60 mesh (fig. 11). The grain size distributions for PGM were 0.7% +30 mesh, 8% -30/+35 mesh, 1.5% -35/+45 mesh, 13% -45/+60 mesh, and 68.8% -60 mesh (fig. 12). Microprobe analyses of the PGM grains found 0.7 to 1.7% Rh, 0.4 to 1.0% Ru, 7.2 to 86.2% Pt, 3 to 69.4% Ir, 0.6 to 20.2% Os, and 0.3 to 8.2% Fe (appendix C). Ferroan platinum with 8 to 30% iron, ferroan platinum with minor osmiridium inclusions, osmiridium (iridium with minor osmium), ferroan platinum with oriented inclusions of Ru and Ir arsenides, and hollingsworthite were found (appendix C). Fineness values for the gold grains ranged from 688 to 900 (table 3).

RESOURCE ESTIMATE: The mean area method was used to calculate the resources using the limits of the area sampled. The beach was subdivided into the area north of Red Mountain and the area between Red Mountain and the Salmon River.

Area north of Red Mountain: Inferred: 27,000 yd³ averaging 0.0001 oz/yd³ Au, and 0.0008 oz/yd³ PGM
Area south of Red Mountain: Inferred: 39,000 yd³ averaging 0.0033 oz/yd³ Au, and 0.0073 oz/yd³ PGM

MINERAL DEVELOPMENT POTENTIAL: The beach south of Red Mountain has a high mineral development potential because there are some areas of the beach (e.g. Flat Cape) that contain high values of PGM and Au.

RECOMMENDATIONS: The Bureau sampling indicated that PGM and gold values on the beach are highly variable. There is a strong correlation between the amount of PGM on the beach and the presence of PGM and gold in the bluffs. The highest values are found at the base of the bluffs, with values decreasing with the distance from the bluffs. Although, there are economic values of PGM and gold in the beach sands, the reserves are too low to support a large placer operation.

REFERENCES: 1, 3-4, 6, 16-21, 23, 31, 40, 61-63, 105, 108, 116.

NAME: Red Mountain

Map Location No. 25

Kardex No. 5, 13

15

Mineral Survey No.

MAS No. 7

LOCATION:

Deposit Type: Lode.

Mining District: Goodnews Bay. Commodities: PGM, Au, Cr.

Recording District: Bethel.

Quadrangle: Hagemeister Is. D6. Sec 26 T14S R75W Meridian: Seward.

Geographic: An 1887 ft mountain located 4 mi south of Platinum.

Elevation: 1880 ft.

Access: Road to the base of the mountain.

HISTORY:

Production: None reported.

1935 - Platinum was identified in basic dike rock from Squirrel Creek by Paul Hopkins of the USGS (93).

1960 - 148 lode claims staked.

1965 - Residual soils sluiced by the Goodnews Bay Mining Co. near the head of Squirrel Creek. Minor PGM and gold were noted (62).

1981 - Ulrich, S.D. studied the ultramafic pluton (105).

1982 - 1984 - Southworth and Foley mapped and sampled the ultramafic pluton (100-101).

WORKINGS AND FACILITIES: Some pits.

GEOLOGIC SETTING: Red Mountain is located on the Bering Sea, approximately 4 mi south of Platinum. Red Mountains is a Jurassic age ultramafic intrusive body. Southworth and Foley (100-101) have determined that the intrusive is an Alaskan-type concentrically zoned ultramafic body. The body consists of the following rocks: dunite, wehrlite, magnetite clinopyroxenite, hornblende clinopyroxenite, and hornblendite. Much of the dunite has been altered to serpentinite.

Workers have found higher platinum and palladium values associated with high chromite and magnetite concentrations in the intrusive. However, no workable concentrations of either metal have been found in the dunite of the Red Mountain ridge. Mertie (63) suggests that PGM may be found as residual concentrations along the ridge. He also thought that small concentrations of PGM-bearing dunites may be found in the mass (63). All the headwater tributaries of the Salmon River flowing eastward from this ridge have fluvial deposits that are PGM-bearing.

Ulrich (105) examined the body and concluded that:

1. Olivine is the only primary silicate in the dunite and formed as a result of magmatic cumulus processes.
2. Serpentine is present in all samples but ranges in abundance from 30 to 90%. Serpentinization may have occurred during late-stage hydrothermal reactions or as an unloading process. Semi-quantitative analyses show surprisingly high values of Cr, Fe, Ni. All three are probably present as discrete magnetite, chromite, and Ni-bearing phases.
3. Chromite is typically euhedral and ranges in size from 0.1 to 0.8 mm. Although the majority of chromite crystals are unaltered, a few are surrounded and/or have fractures lined with secondary magnetite. This secondary magnetite most likely formed during serpentinization reactions. The chromite is compositionally similar to that in other concentric-type ultramafic bodies.
4. Chromium-aluminum magnetite crystals are approximately the same size as the chromite crystals, however most of the magnetite grains are partly dissolved and irregular in shape. As with chromite, this dissolution appears to have occurred during serpentinization.
5. Cooperite, $(Pt_{.80}Fe_{.20})S_{.82}$, and smaller grains of a Pt-Fe alloy, (Pt_2Fe) , were identified in the olivine. The cooperite is partly mantled by the Pt-Fe alloy. The alloy is similar in composition to the platinum in the beach placer.

BUREAU INVESTIGATION: The Bureau worked on Red Mountain from 1982 to 1984. The results of the work are published in Bureau OFR 51-86 and a University of Alaska Master's thesis (100-101). Minor platinum and palladium values were found, but no lode sources were identified. The headwaters of Fox and Squirrel Creeks were identified as having the greatest possible PGM accumulations.

The Bureau took 3 samples of weathered dunite from the Red Mountain ridge in 1986. The samples (184-185, 218, fig. 6, appendix B) were 0.1 yd³ in size and were processed through a hydraulic concentrator. The samples contained from trace to 0.0011 oz/yd³ PGM and trace to 0.0002 oz/yd³ Au. The highest value occurred in sample 218 and was from the headwaters of Fox Gulch. The PGM grain sizes by volume were 1.7% +35 mesh, 3.5% -35/+45 mesh, 15.5% -45/+60 mesh, and 79.3% -60 mesh. The grain sizes by volume for the recovered gold were 5.9% +30 mesh, 5.9% -30/+35 mesh, 11.7% -35/+45 mesh, 53% -45/+60 mesh, and 23.5% -60 mesh.

RESOURCE ESTIMATE: Data and the sample values were insufficient to calculate a resource.

MINERAL DEVELOPMENT POTENTIAL: PGM and gold were found in weathered dunite on top of Red Mountain. The sampling proved that the mountain is a source of the PGM and some gold; however, as a lode deposit, all of the present available data indicates that the property has a low mineral development potential.

RECOMMENDATIONS: Detailed sampling with at depth with using a drill is needed.

REFERENCES: 1, 5, 11, 15, 16, 18-20, 22, 24-25, 31, 34, 37, 40, 48, 61-64, 66-67, 93, 100-101, 105, 108, 114-115.

NAME: Susie Mountain

Map Location No. 26

Kardex No.

Mineral Survey No.

MAS No.

LOCATION:

Deposit Type: Lode.

Mining District: Goodnews Bay. Commodities: Cu.

Recording District: Bethel.

Quadrangle: Hagemester Is. D5. Sec 16 T14S R75W Meridian: Seward.

Geographic: Headwaters of Susie Creek on Susie Mountain,

approximately 10 mi southeast of Platinum.

Elevation: 1000 ft.

Access: By road from Platinum, then by foot up the mountain.

HISTORY:

Production: None.

1972 - Allen L. Clark reported a copper
occurrence (16).

WORKINGS AND FACILITIES: None noted.

GEOLOGIC SETTING: Jurassic age ultramafic rocks consisting of a dunitic-werhlite core rimmed by clinopyroxenite are located on the northwest side of Susie Mountain. The rocks are in contact with Mesozoic and Paleozoic age sedimentary and volcanic rocks. The ultramafic rocks may be the eastern extension of the Red Mountain ultramafic complex.

BUREAU INVESTIGATION: Southworth and Foley (100-101) looked at the geology of Susie Mountain in 1982-84 and found chalcopyrite present in the magnetite clinopyroxenites and hornblende clinopyroxenites. However, chalcopyrite usually comprises less than 1% of the rock.

RESOURCE ESTIMATE: No resource could be calculated because of insufficient data.

MINERAL DEVELOPMENT POTENTIAL: The occurrence has a low mineral development potential because there are low concentrations of copper minerals present.

RECOMMENDATIONS: None.

REFERENCES: 16, 18, 100-101.

NAME: Unnamed Occurrence

Map Location No. 27

Kardex No.

Mineral Survey No.

MAS No. 10

LOCATION:

Deposit Type: Lode.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Hagemeister Is. D5.NE 1/4 Sec 9 T15S R73W Meridian: Seward

Geographic: At the head of a tributary of the Unaluk River.

Elevation: 1000 ft.

Access: By helicopter or from Chagvan Bay up the Kinegnak River by boat, then overland by foot.

HISTORY:

Production: None.

1972 - Allen L. Clark (USGS) reported lode gold at this locality (18).

WORKINGS AND FACILITIES: None.

GEOLOGIC SETTING: Medium to coarse grained, locally pegmatitic, gabbroic intrusive rocks consisting of hornblende, clinopyroxene, and calcic plagioclase. The intrusive locally contains olivine and commonly shows compositional layering. It ranges from 159.3 to 186.9 my (55). The gabbro is in contact with a Permian limestone and undifferentiated Mesozoic and Paleozoic volcanic and sedimentary rocks.

BUREAU INVESTIGATION: The Bureau mapped and sampled the area in 1986. Eleven samples (162-166, fig. 4, appendix B) were taken. A pan concentrate sample (166, fig. 4, appendix B) taken from a saddle on the mountain contained 240 ppb Au and 125 ppb Pt. A sample of chert (165, fig. 4, appendix B) from the contact of the gabbro and chert contained 70 ppb gold.. Three small flakes of gold were recovered in a 0.1 yd³ placer sample (160, fig. 4, appendix B) from a south flowing creek.

RESOURCE ESTIMATE: A resource could not be calculated because of insufficient data.

MINERAL DEVELOPMENT POTENTIAL: The occurrence has a low mineral development potential.

RECOMMENDATIONS: None.

REFERENCES: 16, 18, 55, 108.

NAME: Chagvan Bay

Map Location No. 28

Kardex No.

Mineral Survey No.

MAS No. 5

LOCATION:

Deposit Type: Lode.

Mining District: Goodnews Bay. Commodities: Cr, PGM, Au.

Recording District: Bethel.

Quadrangle: Hagemeister Is. D6. Sec 34 T15S R75W Meridian: Seward.

Geographic: Shallow bay of Kuskokwim Bay, located between the mouth of the Salmon River and Chagvan Mountain.

Elevation: Sea level.

Access: By road from Platinum to the Salmon River, then along the beach.

HISTORY:

Production: None.

1963 - U.S. Bureau of Mines drilled 5 auger holes along the beach (4).

WORKINGS AND FACILITIES: None.

GEOLOGIC SETTING: Glacial outwash, which is exposed as low lying hills and plains are present along Kuskokwim Bay. Beach accumulations include sand dunes and beach sands. The Goodnews Bay Mining Co. drilled buried bench gravels that trend into Chagvan Bay from the Salmon River. The gravels extend to 250 ft below sea level (62).

BUREAU INVESTIGATION: In 1963, Berryhill (4) took pan concentrates from 5 auger holes. Chromite and magnetite were the major (greater than 10%) constituents. Traces of gold and platinum were also found. Iron concentrations, calculated for material in place, were less than 31 lb/yd³ (4). Reconnaissance pan samples were taken in the area in 1985. PGM and gold were noted in the pans.

The Bureau sampled the Kuskokwim Bay side of Chagvan Bay in 1986. At the north end of Chagvan Bay there are bluffs composed of glacial till and the beach deposits are from 1 to 1.5 ft thick at the base of the bluffs. The beach sands become thicker (greater than 4.5 ft) to the south. Four 0.1 yd³ placer samples (235-238, fig. 4, appendix B) taken contained from 0 to 0.0010 oz/yd³ Au and 0 to 0.0006 oz/yd³ PGM. Sizes by volume of the PGM grains were 7.3% +60 mesh and 82.7% -60 mesh. Sizes by volume of the gold were 3.7% +30 mesh, 10% -30/+35 mesh, 34.5% -35/+45 mesh, and 51.8% -45/+60 mesh. Microprobe analyses of the recovered PGM grains in sample 235 contained 0.9% Rh, 0.4% Ru, 67.8% Pt, 17.2% Ir, 3.6% Os, and 5.8% Fe (appendix C). The identified grains were iron-platinum alloy, with 8 to 30% iron, iron-platinum alloy, with minor osmiridium inclusions, osmiridium (iridium with minor osmium), osmiridium, with lesser ferroan platinum, iron-platinum alloy with oriented inclusions of Ru-Ir arsenides, hollingsworthite, osmium, iridarsenite, irarsite, and sperrylite (appendix C). A gold fineness for sample 235 was 856 (table 3).

RESOURCE ESTIMATE: No resource could be calculated because no economic quantities of placer minerals were found and the available data is insufficient.

MINERAL DEVELOPMENT POTENTIAL: Chagvan Bay has an unknown mineral development potential; however, the sampling by the Bureau indicates that there are low surficial accumulations of PGM and gold.

RECOMMENDATIONS: Drill hole sampling is necessary to properly evaluate the bay.

REFERENCES: 4, 16, 18-20, 23, 31, 62, 68, 108.

NAME: Security Cove

Map Location No. 29

Kardex No.

Mineral Survey No.

MAS No. 11

LOCATION:

Deposit Type: Placer.

Mining District: Goodnews Bay. Commodities: Au.

Recording District: Bethel.

Quadrangle: Hagemeister Is. C6, NE 1/4 Sec 2 T18S R77W

Meridian: Seward.

Geographic: Main tributary to Security Cove on the southwest side.

Elevation: Sea level to 45 ft.

Access: Boat.

HISTORY:

Production: None reported.

1937 - Gold reported in the bed of a small
creek (78).

WORKINGS AND FACILITIES: Minor pits.

GEOLOGIC SETTING: The small creek flows across extensive gravel deposits between the Gap and Jagged Mountains. The gravel overlies Paleozoic age schistose calcareous siltstones, limestones, and tuffaceous rocks.

BUREAU INVESTIGATION: The Bureau sampled the creeks and the beach at Security Cove in 1986. Four 0.1 yd³ stream placer samples (249, 251-252, 254, fig. 4, appendix B) contained from trace to 0.0033 oz/yd³ Au. The gold particles were rough, nuggety, and iron-stained. Gold particle grain sizes by volume were 33.4% +20 mesh, 20% -20/+30 mesh, 20% -30/+35 mesh, and 26.6% -35/+60 mesh. Fineness for two samples (249-250) were 781 and 834 (table 3). Three PGM grains were found in sample 249. Microprobe analyses of the PGM grains found that they contain 0.5% Rh, 0.2% Ru, 84% Pt, 3.2% Ir, 1.4% Os, and 7.7% Fe (appendix C). The grains were iron-platinum alloy with 8 to 30% Fe, iron-platinum alloy with minor osmiridium inclusions, and osmiridium (iridium with minor osmium) (appendix C). Three 0.1 yd³ beach samples (246-247, 249, fig. 4, appendix B) were taken along Security Cove. Trace amounts of gold (less than 4 flakes per 0.1 yd³ sample) were recovered.

The bluffs on the west side of the cove were sampled (250, 253, fig. 4, appendix B). The rocks are sheared metavolcanics and argillaceous sediments. The shear zones strike from N45° to 55°E and dip 60° to 75°NW, are from 4 to 15 ft wide, and contain abundant pyrite in pods, stringers, and disseminations. Sample 253 contained 0.34% Pb (appendix B).

RESOURCE ESTIMATE: A resource could not be calculated because of insufficient data.

MINERAL DEVELOPMENT POTENTIAL: Samples taken from onshore indicate that there is a moderate placer mineral development potential.

RECOMMENDATIONS: Drilling and/or trenching is needed.

REFERENCES: 16, 18, 78, 108.

APPENDIX B.--SAMPLE RESULTS OF THE GOODNEWS BAY MINING DISTRICT.

Explanation

Map No/Sample No/Yr : Refers to map and field sample numbers and the year sample was taken. Sample locations are shown on figures 4, 5, and 6.

Material Type : Refers to type of material collected at the sampling site. The following material types were collected.

Argillite
Breccia
Chert
Fel Plut - Felsic plutonic rock
Fel Volc - Felsic volcanic rock
Gneiss
Hornfels
Limestone
Limonite
Maf Plut - Mafic plutonic rock
Maf Volc - Mafic volcanic rock
Peg - Pegmatite
Placer - Concentrates from 0.1 yd³ of material
Qtz - Quartz
Quartzite
Sandstone
Schist
Shale
Siltstone
Slate
Soil - Soil sample
Str Sed - Stream sediment sample
Till - Glacial till material
Ultramaf - Ultramafic plutonic rock
Volc - Volcanic rock

Rock Type : Refers to rock types in the area of sampling as shown on the 1:250,000 scale geologic map (55). The rock types are:

Fel Int - Felsic intrusive rocks
Fel Volc - Felsic volcanic rocks
Maf Int - Mafic intrusive rocks
Maf Volc - Mafic volcanic rocks
Meta - Metamorphic rocks
Qac - Alluvium and colluvium
Qal - Alluvium
Qg - Glacial deposits
Qm - Marine, beach unconsolidated deposits
Sed - Sedimentary rocks

Tailings - Tailings from mined material
 Umaf Int - Ultramafic intrusive rocks
 Volc - Volcanic rocks

Rock Age : Refers to the geologic age of the underlying rock groups as shown on the 1:250,000 scale geologic maps (55). The rock ages are:

Quaternary
 TK - Tertiary-Cretaceous
 Cretaceous
 KJ - Cretaceous-Jurassic
 Jurassic
 Permian
 MzPz - Mesozoic-Paleozoic
 DO - Devonian-Ordovician
 Paleozoic

Quad 4 mile/1 mile : Refers to the 1:250,000 and 1:63,360 scale USGS quadrangle maps covering the area.

Sec/T/R/Mer : Refers to section, township, range, and meridian in which the samples were taken.

Location/Property : Refers to the geographic location of the sampling site and/or the name of the mine, prospect, or occurrence.

KX/MAS : Refers to the Kardex (1), and Minerals Availability System (108) number for the mine, prospect, or occurrence.

Project : Refers to the mining district where the sample was taken.

Sample type : Refers to the type of sample taken. The following sample types were taken.

- Chip - A sample taken of ore or rock in a regular series, chips taken in a continuous line or at uniformly spaced intervals.
- Grab - A collection of mineral and rock fragments taken at random from an outcrop or float.
- Pan - A sample taken from surficial material, which is concentrated using a 16 in diameter pan.

Placer - A 0.1 yd³ sample taken from surficial material which is concentrated in a sluicebox or pan.

Sediment- Material taken from the bottom of an active stream bed.

Soil - Sample taken from the C-soil horizon.

Specimen- Representative sample, not taken for chemical analysis.

ICP : Refers to induced coupled plasma technique analysis. Given in ppm unless noted otherwise.

AA/Wet : Refers to quantitative atomic absorption spectrophotometric analysis. Given in ppb.

Assay : Refers to fire assaying technique analysis. Given in troy ounces per short ton.

Oz/yd³ : Refers to amount of gold and/or PGM recovered from a placer sample by sluicing or panning.

G : Refers to analyses greater than the detection limits.

Upper detection limits for ICP and AA/Wet analyses are:

Chromium - 10,000 ppm

Gold - 10,000 ppb

Platinum - 10,000 ppb

L : Refers to analyses less than the detection limits.

Detection limits for ICP and AA/Wet analyses are shown in the following table (values are in ppm unless otherwise indicated):

Element	ICP	AA/Wet
: Aluminum	: 0.01%	
: Antimony	: 10	
: Arsenic	: 10	
: Barium	: 1	
: Beryllium	: 0.5	
: Bismuth	: 2	
: Cadmium	: 0.5	
: Calcium	: 0.01%	
: Chromium	: 1	
: Cobalt	: 1	
: Copper	: 1	
: Gallium	: 10	
: Gold	:	5
: Iron	: 0.01%	
: Lanthanum	: 10	
: Lead	: 2	
: Manganese	: 1	
: Magnesium	: 0.01%	
: Molybdenum	: 1	
: Nickel	: 1	
: Palladium	:	20
: Phosphorus	: 10	
: Platinum	:	50
: Potassium	: 0.01%	
: Silver	: 0.2	
: Sodium	: 0.01%	
: Strontium	: 1	
: Thallium	: 10	
: Tin	: 2	
: Titanium	: 0.01%	
: Tungsten	: 10	
: Uranium	: 10	
: Vanadium	: 1	
: Zinc	: 1	

NOTE

: For placer and pan type samples: ICP, AA/Wet, and/or Assay analyses were conducted on material weighing between 0.06 and 10 pounds, which had been concentrated from sluicing or panning between 20 and 300 pounds of unconsolidated material (approximate weights of 1 pan and 0.1 yd³, respectively).

If results are listed under the Oz/yd³ column for a given sample: ICP and AA/Wet analyses were conducted on concentrates from which the visible gold and PGM were previously separated. The results under the Oz/yd³ column refer to the weight of the physically separated gold and PGM recalculated into an oz/yd³ measure.

If there are only results under the ICP and Assay columns, then analyses were conducted on concentrates from which no gold was previously separated. The assayed samples had been previously concentrated by a factor of 150 to 200 times.

Oz/yd³ values can be calculated for the concentrates taken from a 0.1 yd³ placer sample using the following equation:

$$(0.000011)(\text{weight of concentrate in grams})(\text{troy oz/st precious metal value from analysis}) = \text{Oz/yd}^3.$$

Pound/yd³ values can be calculated for the concentrates taken from a 0.1 yd³ placer sample using the following equation:

$$(0.022)(\text{weight of concentrate in grams})(\% \text{ concentration from analysis}) = \text{Pound/yd}^3.$$

The weight of the placer concentrates are listed below:

<u>Map no.</u>	<u>Sample no.</u>	<u>Concentrate weight (grams)</u>
1	6530	81
2	6503	47
3	6504	104
4	6531	76
6	6535	41
7	6505	47
8	6520	32
10	6506	79
11	6507	70
12	6508	132
13	6509	85
14	6522	30
15	6521	51
16	6527	170
17	6510	99
18	6526	180
19	6536	63
20	6528	119
21	6529	213
22	6551	13
26	6513	40
27	6514	84
29	6553	208
30	6554	54
32	6516	105
33	6515	84
34	6517	117
35	6555	72
36	6518	89
37	6525	22
38	6524	155
39	6523	94
40	6511	117
41	6656	42
44	6639	52
45	6637	40
46	6638	80
47	6693	33
48	6694	54
49	6695	60
50	6715	63
51	6716	80
52	6717	52
53	6718	16
54	6696	57
55	6697	77
56	6719	82
57	6720	50
59	6722	52
60	6723	53

<u>Map no.</u>	<u>Sample no.</u>	<u>Concentrate weight (grams)</u>
61	6736	119
62	6735	86
63	6734	68
64	6733	72
65	6732	82
66	6731	90
67	6725	100
68	6724	28
69	6831	281
70	6830	251
71	6757	39
72	6829	251
73	6783	106
74	6782	184
75	6714	140
76	6756	28
77	6755	45
78	6713	48
81	6753	35
83	6752	43
84	6751	16
98	6605	57
99	6537	121
106	6557	135
115	6541	108
116	6538	94
117	6539	80
118	6665	57
121	6664	28
122	6663	28
123	6558	80
124	6559	232
125	6540	74
126	6818	120
127	6817	69
128	6816	135
129	6815	99
130	6814	317
131	6813	228
132	6812	242
133	6810	93
134	6811	200
135	6544	65
138	6560	157
142	6561	115
143	6543	79
145	6542	49
146	6519	83
147	6556	209
148	6563	138
149	6545	80
150	6564	26
151	6546	71

<u>Map no.</u>	<u>Sample no.</u>	<u>Concentrate weight (grams)</u>
152	6566	146
153	6547	88
159	6567	31
160	6550	99
161	6580	125
162	6645	190
167	6568	46
168	6549	83
169	6548	83
170	6562	254
171	6674	40
172	6569	57
175	6789	216
176	6653	263
177	6652	816
178	6584	205
178	6585	205
178	6582	151
178	6581	87
178	6583	151
179	6589	234
179	6588	3070
179	6587	642
179	6586	379
180	6622	1670
180	6623	535
180	6590	345
180	6624	450
180	6621	103
181	6625	267
181	6626	430
181	6627	252
181	6628	386
182	6641	575
182	6629	277
182	6642	523
182	6640	237
182	6630	333
183	6634	451
183	6636	158
183	6633	92
183	6635	451
184	6827	207
185	6828	197
186	6785	133
187	6786	189
187	6502	93
188	6501	167
189	6787	178
190	6739	121
191	6738	139
193	6788	153
194	6760	81

<u>Map no.</u>	<u>Sample no.</u>	<u>Concentrate weight (grams)</u>
195	6761	205
196	6570	58
197	6748	39
198	6749	28
199	6791	76
200	6781	100
201	6779	89
201	6778	132
202	6780	251
203	6792	126
204	6793	118
205	6750	48
206	6597	141
207	6598	116
208	6599	120
209	6579	93
210	6578	138
211	6577	157
212	6576	65
213	6575	175
213	6784	74
214	6574	306
215	6573	122
216	6572	146
217	6571	387
218	6826	84
219	6698	296
219	6700	391
219	6699	274
220	6730	192
220	6727	563
220	6726	455
220	6728	420
221	6729	374
221	6742	423
221	6741	409
222	6737	56
223	6744	276
223	6745	522
223	6743	74
224	6747	113
224	6746	476
224	6762	551
225	6799	112
225	6809	299
225	6800	130
226	6763	150
226	6765	258
226	6764	251
227	6797	89
227	6798	149
227	6801	354
228	6768	146

<u>Map no.</u>	<u>Sample no.</u>	<u>Concentrate weight (grams)</u>
228	6766	83
228	6767	389
229	6796	122
229	6795	122
229	6794	171
230	6708	580
230	6770	174
230	6769	136
230	6707	382
231	6710	257
231	6709	170
231	6711	166
232	6771	294
232	6759	455
232	6758	253
233	6773	64
233	6774	475
233	6772	563
234	6776	307
234	6775	217
234	6777	336
235	6836	600
236	6837	293
237	6838	173
238	6839	81
244	6808	70
245	6807	87
246	6806	111
247	6805	87
249	6804	78
249	6803	82
250	6670	50
252	6671	36
254	6596	59

Map No/Sample No/Yr	: 1/6530/86	:	2/6503/86	:	3/6504/86
Material Type	: Placer	:	Placer	:	Placer
Rock Type	: Qg	:	Qg	:	Qg
Rock Age	: Quaternary	:	Quaternary	:	Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/C-4	:	Goodnews Bay/C-4	:	Goodnews Bay/C-4
Sec/T/R/Mer	: 3/7S/66W/Sew	:	11/7S/66W/Sew	:	23/7S/66W/Sew
Location/Property	: Igmiumanik Cr. Trib.	:	Igmiumanik Cr. Trib.	:	Igmiumanik Cr. Trib.
KX/MAS	:	:	:	:	:
District	: Goodnews Bay	:	Goodnews Bay	:	Goodnews Bay
Sample Type	: Placer	:	Placer	:	Placer
	:	:	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.38%			:7.35%			:6.25%		
: Antimony	: L			: L			: L		
: Arsenic	:30			:10			:20		
: Barium	:615			:715			:530		
: Beryllium	: L			: L			: L		
: Bismuth	: 5			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.22%			:2.21%			:2.02%		
: Chromium	:1320			:865			:370		
: Cobalt	:21			:13			:17		
: Copper	:47			:44			:43		
: Gallium	:10			:10			:10		
: Gold	:	L		:	35		:	20	
: Iron	:8.73%			:7.94%			:13.9%		
: Lanthanum	:20			:20			:20		
: Lead	: 8			:12			: 6		
: Manganese	:2070			:1490			:2370		
: Magnesium	:3.17%			:1.62%			:1.85%		
: Molybdenum	: 1			: L			: 1		
: Nickel	:67			:36			:29		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:780			:745			:985		
: Platinum	:	L		:	350		:	L	
: Potassium	:1.81%			:2.09%			:1.56%		
: Silver	: L			: L			: L		
: Sodium	:1.81%			:2.06%			:1.74%		
: Strontium	:166			:240			:180		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:1.05%			:1.06%			:1.89%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:174			:169			:280		
: Zinc	:161			:122			:225		

Map No/Sample No/Yr	: 4/6531/86	: 5/6532/86	: 5/6533/86
Material Type	: Placer	: Shale	: Limestone
Rock Type	: Qg	: Sed	: Sed
Rock Age	: Quaternary	: Cretaceous	: Cretaceous
Quad 4 mile/1 mile	: Goodnews Bay/C-4	: Goodnews Bay/C-4	: Goodnews Bay/C-4
Sec/T/R/Mer	: 18/7S/65W/Sew	: 20/7S/65W/Sew	: 20/7S/65W/Sew
Location/Property	: Igmiumanik Cr. Trib.	: Igmiumanik Cr. Trib.	: Igmiumanik Cr. Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Chip	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.04%			:5.54%			:2.65%		
: Antimony	: L			: L			: L		
: Arsenic	:30			:40			:40		
: Barium	:620			:955			:290		
: Beryllium	: L			: L			:1.0		
: Bismuth	: L			: L			: 3		
: Cadmium	: L			: L			:1.0		
: Calcium	:2.66%			:1.96%			:26.2%		
: Chromium	:675			:120			:30		
: Cobalt	:19			: L			:12		
: Copper	:48			:73			:35		
: Gallium	:10			:20			:70		
: Gold	:	445		:	L		:	L	
: Iron	:7.8%			:10.6%			:2.76%		
: Lanthanum	:20			:50			: L		
: Lead	:12			:18			:14		
: Manganese	:1520			:295			: G		
: Magnesium	:2.74%			:0.65%			:0.47%		
: Molybdenum	: 1			: 8			: 2		
: Nickel	:60			:13			:28		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:785			:8860			: G		
: Platinum	:	L		:	L		:	L	
: Potassium	:1.84%			:1.65%			:0.27%		
: Silver	: L			:1.2			:0.6		
: Sodium	:2.16%			:1.42%			:1.37%		
: Strontium	:240			:305			:330		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:0.92%			:0.34%			:0.16%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:189			:390			:57		
: Zinc	:150			:95			:120		

Map No/Sample No/Yr	: 5/6534/86	:	6/6535/86	:	7/6505/86
Material Type	: Fel Plut	:	Placer	:	Placer
Rock Type	: Fel Int	:	Qg	:	Qg
Rock Age	: Cretaceous	:	Quaternary	:	Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/C-4	:	Goodnews Bay/C-4	:	Goodnews Bay/C-5
Sec/T/R/Mer	: 20/7S/65W/Sew	:	35/7S/66W/Sew	:	34/7S/67W/Sew
Location/Property	: Igmiumanik Cr. Trib.	:	Igmiumanik Cr. Trib.	:	Awayak Cr.
KX/IAS	:	:	:	:	:
District	: Goodnews Bay	:	Goodnews Bay	:	Goodnews Bay
Sample Type	: Grab	:	Placer	:	Placer
	:	:	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:10.3%			:6.37%			:7.11%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:10			:20		
: Barium	:1530			:815			:650		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	:2.5			: L			: L		
: Calcium	:1.93%			:1.4%			:1.68%		
: Chromium	:32			:355			:240		
: Cobalt	: 9			:18			:12		
: Copper	:39			:55			:51		
: Gallium	:30			:10			:10		
: Gold	:	L		:	100		:	L	
: Iron	:8.06%			:6.16%			:7.6%		
: Lanthanum	:70			:10			:20		
: Lead	:12			:10			:10		
: Manganese	:690			:2070			:1320		
: Magnesium	:1.68%			:1.96%			:1.59%		
: Molybdenum	:13			: 2			: L		
: Nickel	:29			:57			:32		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:4910			:525			:875		
: Platinum	:	L		:	L		:	100	
: Potassium	:2.57%			:1.73%			:1.63%		
: Silver	:0.4			: L			: L		
: Sodium	:2.47%			:1.52%			:1.87%		
: Strontium	:325			:125			:196		
: Thallium	:20			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:1.06%			:0.54%			:0.85%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:121			:134			:164		
: Zinc	:275			:165			:132		

Map No/Sample No/Yr	: 8/6520/86	: 9/6594/86	: 9/6614/86
Material Type	: Placer	: Chert	: Argillite
Rock Type	: Qg	: Sed	: Sed
Rock Age	: Quaternary	: Cretaceous	: Cretaceous
Quad 4 mile/1 mile	: Goodnews Bay/C-5	: Goodnews Bay/C-5	: Goodnews Bay/C-5
Sec/T/R/Mer	: 29/7S/67W/Sew	: 29/7S/67W/Sew	: 29/7S/67W/Sew
Location/Property	: Nimgun Cr. Trib.	:	:
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:5.24%			:3.11%			:4.91%		
: Antimony	: L			: L			: L		
: Arsenic	:20			: L			:40		
: Barium	:5980			:935			:415		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:0.80%			:0.08%			:0.40%		
: Chromium	:140			:145			:90		
: Cobalt	:14			: 3			: 9		
: Copper	:48			:58			:69		
: Gallium	:10			: L			: L		
: Gold	:	5		:	L		:	L	
: Iron	:10.6%			:1.75%			:3.61%		
: Lanthanum	:10			: L			:10		
: Lead	:10			: 6			: 6		
: Manganese	:1210			:230			:525		
: Magnesium	:1.35%			:0.59%			:0.66%		
: Molybdenum	: L			: L			: 7		
: Nickel	:37			:24			:23		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:535			:145			:565		
: Platinum	:	L		:	L		:	L	
: Potassium	:1.31%			:0.77%			:0.66%		
: Silver	: L			:0.2			:0.6		
: Sodium	:1.05%			:0.34%			:2.17%		
: Strontium	:129			:37			:141		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:1.01%			:0.13%			:0.26%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:195			:55			:132		
: Zinc	:153			:29			:65		

Map No/Sample No/Yr	: 10/6506/86	: 11/6507/86	: 12/6508/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/C-5	: Goodnews Bay/C-5	: Goodnews Bay/C-6
Sec/T/R/Her	: 11/7S/67W/Sew	: 9/7S/68W/Sew	: 11/7S/69W/Sew
Location/Property	: Awayak Cr.	: Nimgun Cr.	: Nimgun Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 7.05%			: 6.42%			: 6.76%		
: Antimony	: L			: L			: L		
: Arsenic	: 20			: 20			: 30		
: Barium	: 875			: 675			: 760		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 1.35%			: 2.6%			: 2.68%		
: Chromium	: 125			: 285			: 480		
: Cobalt	: 12			: 19			: 20		
: Copper	: 48			: 54			: 59		
: Gallium	: 10			: 10			: 10		

: Gold	:	L	:	L	:	L
: Iron	: 5.39%		: 12.4%		: 12.3%	
: Lanthanum	: 20		: 20		: 20	
: Lead	: 12		: 12		: 16	
: Manganese	: 1090		: 2350		: 2170	
: Magnesium	: 1.48%		: 2.2%		: 2.22%	
: Molybdenum	: 1		: L		: 4	
: Nickel	: 30		: 46		: 62	

: Palladium	:	L	:	L	:	L
: Phosphorus	: 560		: 1650		: 995	
: Platinum	:	L	:	L	:	L
: Potassium	: 1.76%		: 1.37%		: 1.47%	
: Silver	: L		: L		: L	
: Sodium	: 1.74%		: 1.66%		: 1.74%	
: Strontium	: 190		: 198		: 194	
: Thallium	: L		: L		: L	
: Tin	: 1		: 1		: 1	
: Titanium	: 0.51%		: 1.29%		: 1.09%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	: 118		: 250		: 255	
: Zinc	: 107		: 174		: 148	

Map No/Sample No/Yr	: 13/6509/86	: 14/6522/86	: 15/6521/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/C-6	: Goodnews Bay/C-6	: Goodnews Bay/C-5
Sec/T/R/Mer	: 35/7S/69W/Sew	: 3/8S/69W/Sew	: 2/8S/68W/Sew
Location/Property	: Nimgun Cr. Trib.	:	: Nimgun Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.55%			:5.26%			:6.59%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:20			:20		
: Barium	:485			:615			:855		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.56%			:2.58%			:2.13%		
: Chromium	:150			:1050			:165		
: Cobalt	:14			:18			:13		
: Copper	:49			:38			:46		
: Gallium	:10			:10			:10		

: Gold	:	L	:	175	:	L
: Iron	:8.14%		:14%		:6.83%	
: Lanthanum	:10		:20		:20	
: Lead	:10		:10		:12	
: Manganese	:1920		:2300		:1470	
: Magnesium	:1.78%		:2.5%		:1.72%	
: Molybdenum	: L		: L		: L	
: Nickel	:33		:41		:34	

: Palladium	:	L	:	L	:	L
: Phosphorus	:965		:965		:805	
: Platinum	:	L	:	L	:	L
: Potassium	:1.58%		:1.07%		:1.45%	
: Silver	: L		: L		: L	
: Sodium	:2.23%		:1.39%		:1.77%	
: Strontium	:230		:154		:205	
: Thallium	: L		: L		: L	
: Tin	: 1		: 1		: 1	
: Titanium	:1.05%		:1.91%		:0.91%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:174		:295		:163	
: Zinc	:136		:215		:114	

Map No/Sample No/Yr	: 16/6527/86	: 17/6510/86	: 18/6526/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-6	: Goodnews Bay/B-5
Sec/T/R/Mer	: 24/8S/68W/Sew	: 21/8S/69W/Sew	: 33/8S/68W/Sew
Location/Property	: Nimgun Cr.	: Canyon Cr. Trib.	: Goodnews R. Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.16%			:7.52%			:6.62%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:30			:30		
: Barium	:930			:680			:1000		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.93%			:2.3%			:1.56%		
: Chromium	:125			:170			:140		
: Cobalt	:13			:15			:15		
: Copper	:53			:54			:56		
: Gallium	:10			:10			:10		
: Gold	: L			: L			: L		
: Iron	:6.71%			:7.71%			:7.04%		
: Lanthanum	:10			:20			:20		
: Lead	: 8			: 8			:10		
: Manganese	:1380			:1960			:1560		
: Magnesium	:1.75%			:1.69%			:1.67%		
: Molybdenum	: L			: L			: L		
: Nickel	:36			:42			:39		
: Palladium	: L			: L			: L		
: Phosphorus	:935			:915			:850		
: Platinum	: L			: L			: L		
: Potassium	:1.74%			:1.68%			:1.76%		
: Silver	: L			: L			:0.4		
: Sodium	:2.13%			:1.96%			:1.69%		
: Strontium	:220			:215			:173		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:0.77%			:0.77%			:0.75%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:161			:185			:162		
: Zinc	:119			:130			:128		

Map No/Sample No/Yr	: 19/6536/86	: 20/6528/86	: 21/6529/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-5	: Goodnews Bay/B-5
Sec/T/R/Mer	: 24/8S/67W/Sew	: 25/8S/67W/Sew	: 13/9S/68W/Sew
Location/Property	: Goodnews Lake Trib.	: Goodnews R. Trib.	: Goodnews R. Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:8.59%			:7.91%			:7.64%		
: Antimony	: L			: L			: L		
: Arsenic	: L			:20			:20		
: Barium	:695			:655			:575		
: Beryllium	: L			: L			: L		
: Bismuth	: 3			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.08%			:2.06%			:1.82%		
: Chromium	:200			:88			:130		
: Cobalt	:18			:14			:16		
: Copper	:68			:54			:58		
: Gallium	:10			:10			:10		
: Gold	: L			: L			: L		
: Iron	:8.11%			:5.48%			:7.54%		
: Lanthanum	:20			:20			:20		
: Lead	: 8			: 8			:10		
: Manganese	:2150			:1390			:2130		
: Magnesium	:2.13%			:1.56%			:1.84%		
: Molybdenum	: 3			: L			: L		
: Nickel	:40			:28			:38		
: Palladium	: L			: L			: L		
: Phosphorus	:900			:840			:935		
: Platinum	: L			: L			: L		
: Potassium	:2.20%			:2.21%			:1.94%		
: Silver	: L			: L			: L		
: Sodium	:2.28%			:2.57%			:2.18%		
: Strontium	:260			:255			:215		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:0.91%			:0.59%			:0.80%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:179			:127			:166		
: Zinc	:153			:91			:145		

Map No/Sample No/Yr	: 22/6551/86	: 22/6552/86	: 23/6591/86
Material Type	: Placer	: Str. Sed.	: Volc.
Rock Type	: Qg	: Maf Volc.	: Maf Volc.
Rock Age	: Quaternary	: KJ	: KJ
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-5	: Goodnews Bay/B-5
Sec/T/R/Mer	: 31/9S/67W/Sew	: 31/9S/67W/Sew	: 1/10S/68W/Sew
Location/Property	: Goodnews R. Trib.	: Goodnews R.	:
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Sediment	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.98%			:8.07%			:6.96%		
: Antimony	: L			: L			: L		
: Arsenic	:40			:20			:10		
: Barium	:790			:860			:1080		
: Beryllium	: L			: L			: L		
: Bismuth	: 2			: L			: L		
: Cadmium	: L			:1.5			: L		
: Calcium	:0.54%			:0.53%			:1.12%		
: Chromium	:200			:45			:64		
: Cobalt	:37			:43			: 7		
: Copper	:83			:102			:42		
: Gallium	: L			:10			:10		

: Gold	:	5	:	5	:	L
: Iron	:8.42%		:7.85%		:3.20%	
: Lanthanum	:10		:10		:20	
: Lead	:14		:18		: 8	
: Manganese	:3550		:4000		:665	
: Magnesium	:0.93%		:0.68%		:0.79%	
: Molybdenum	: 2		: 3		: 3	
: Nickel	:73		:76		: 4	

: Palladium	:	L	:	L	:	L
: Phosphorus	:770		:1110		:465	
: Platinum	:	L	:	L	:	L
: Potassium	:1.80%		:2.01%		:2.59%	
: Silver	:0.4		:0.4		:0.2	
: Sodium	:1.24%		:1.21%		:3.61%	
: Strontium	:171		:225		:170	
: Thallium	: L		: L		: L	
: Tin	:NA		: 1		: 1	
: Titanium	:0.56%		:0.52%		:0.30%	
: Tungsten	: L		: L		:11	
: Uranium	: L		: L		: L	
: Vanadium	:145		:140		:61	
: Zinc	:220		:245		:46	

Map No/Sample No/Yr	: 24/6613/86	: 25/6657/86	: 25/6658/86
Material Type	: Volc.	: Str. Sed.	: Str. Sed.
Rock Type	: Maf. Volc.	: Maf Volc.	: Maf Volc.
Rock Age	: KJ	: KJ	: KJ
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-5	: Goodnews Bay/B-5
Sec/T/R/Mer	: 1/10S/68W/Sew	: 6/10S/67W/Sew	: 6/10S/67W/Sew
Location/Property	:	:	:
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Sediment	: Sediment
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.76%			:7.4%			:NA		
: Antimony	: L			: L			: L		
: Arsenic	:10			:20			:40		
: Barium	:1100			:620			:1030		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			:3.5		
: Calcium	:1.06%			:0.77%			:0.58%		
: Chromium	:78			:48			:47		
: Cobalt	: 8			:24			:61		
: Copper	:42			:75			:150		
: Gallium	:10			: L			: L		
: Gold	: 5			: L			: L		
: Iron	:3.13%			:5.61%			:7.97		
: Lanthanum	:10			:10			:20		
: Lead	:12			:16			:18		
: Manganese	:740			:3260			:7600		
: Magnesium	:0.79%			:0.63%			:0.79%		
: Molybdenum	: 3			: 5			: 4		
: Nickel	: 6			:41			:105		
: Palladium	: L			: L			: L		
: Phosphorus	:505			:1520			:945		
: Platinum	: L			: L			: L		
: Potassium	:2.35%			:1.51%			:2.14%		
: Silver	:0.4			:0.2			:0.2		
: Sodium	:3.20%			:1.25%			:1.54%		
: Strontium	:187			:210			:300		
: Thallium	: L			: L			: L		
: Tin	: 4			:NA			:NA		
: Titanium	:0.30%			:0.47%			:0.64%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:59			:132			:147		
: Zinc	:44			:205			:285		

Map No/Sample No/Yr	: 26/6513/86	: 27/6514/86	: 28/6592/86
Material Type	: Placer	: Placer	: Sandstone
Rock Type	: Qg	: Qg	: Sed
Rock Age	: Quaternary	: Quaternary	: KJ
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-5	: Goodnews Bay/B-5
Sec/T/R/Mer	: 14/10S/67W/Sew	: 17/10S/67W/Sew	: 10/10S/68W/Sew
Location/Property	: Kukatklik R.	: Kukaktlik R. Trib.	:
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.94%			:7.84%			:7.67%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:30			:10		
: Barium	:405			:615			:585		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.7%			:1.93%			:2.58%		
: Chromium	:185			:150			:75		
: Cobalt	:13			:15			:12		
: Copper	:35			:52			:51		
: Gallium	:10			: L			:10		
: Gold	:	L		:	L		:	L	
: Iron	:8.83%			:9.31%			:4.14%		
: Lanthanum	:10			:10			:10		
: Lead	: 8			:10			: 6		
: Manganese	:2230			:1950			:685		
: Magnesium	:2.4%			:2.01%			:1.59%		
: Molybdenum	: L			: 2			: 1		
: Nickel	:31			:32			:20		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:1210			:895			:660		
: Platinum	:	L		:	L		:	L	
: Potassium	:1.57%			:1.92%			:1.96%		
: Silver	: L			: L			:0.2		
: Sodium	:2.02%			:1.88%			:3.07%		
: Strontium	:240			:230			:365		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:1.43%			:0.99%			:0.43%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:193			:196			:103		
: Zinc	:137			:160			:58		

Map No/Sample No/Yr	: 29/6553/86	: 30/6554/86	: 31/6593/86
Material Type	: Placer	: Placer	: Sandstone
Rock Type	: Volc/Sed	: Qg	: Sed
Rock Age	: KJ	: Quaternary	: KJ
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-5	: Goodnews Bay/B-5
Sec/T/R/Mer	: 3/10S/68W/Sew	: 33/9S/68W/Sew	: 10/10S/68W/Sew
Location/Property	: Goodnews R.	: Goodnews R.	:
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.13%			:6.14%			:7.36%		
: Antimony	: L			: L			: L		
: Arsenic	:10			: L			:10		
: Barium	:580			:625			:135		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.54%			:2.77%			:5.81%		
: Chromium	:90			:245			:75		
: Cobalt	:11			:19			: 9		
: Copper	:38			:70			:34		
: Gallium	:10			:10			:20		
: Gold	: L			: L			: L		
: Iron	:6.29%			:13.9%			:3.98%		
: Lanthanum	:10			:20			: L		
: Lead	:12			: 6			: 6		
: Manganese	:1360			:1840			:655		
: Magnesium	:1.46%			:2.21%			:1.16%		
: Molybdenum	: L			: L			: L		
: Nickel	:21			:38			:11		
: Palladium	: L			: L			: L		
: Phosphorus	:720			:885			:420		
: Platinum	: L			: L			: L		
: Potassium	:1.81%			:1.43%			:0.60%		
: Silver	:0.4			: L			:0.2		
: Sodium	:2.25%			:1.56%			:1.82%		
: Strontium	:225			:149			:147		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:0.76%			:1.52%			:0.47%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:142			:315			:97		
: Zinc	:114			:158			:58		

Map No/Sample No/Yr	: 32/6516/86	: 33/6515/86	: 34/6517/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Volc/Sed
Rock Age	: Quaternary	: Quaternary	: KJ
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-5	: Goodnews Bay/B-5
Sec/T/R/Mer	: 22/10S/68W/Sew	: 26/10S/68W/Sew	: 33/10S/68W/Sew
Location/Property	: Kukaktlik R. Trib.	: Kukaktlik R. Trib.	: Kukaktlik R. Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.65%			:6.96%			:6.82		
: Antimony	: L			: L			: L		
: Arsenic	:30			:20			:30		
: Barium	:940			:645			:490		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.35%			:1.45%			:2.54%		
: Chromium	:96			:84			:350		
: Cobalt	:14			:12			:20		
: Copper	:47			:46			:54		
: Gallium	:10			: L			:10		
: Gold	:	L		:	L		:	15	
: Iron	:8.19%			:6.14%			:13.4%		
: Lanthanum	:10			:10			:20		
: Lead	:12			:10			: 8		
: Manganese	:1960			:1530			:3760		
: Magnesium	:1.21%			:1.39%			:2.38%		
: Molybdenum	: 3			: L			: 2		
: Nickel	:28			:28			:42		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:940			:580			:1020		
: Platinum	:	L		:	L		:	L	
: Potassium	:1.49%			:1.64%			:1.52%		
: Silver	: L			: L			: L		
: Sodium	:1.55%			:1.78%			:1.54%		
: Strontium	:196			:198			:185		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:0.82%			:0.67%			:1.36%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:176			:131			:280		
: Zinc	:140			:110			:195		

Map No/Sample No/Yr	: 35/6555/86	: 36/6518/86	: 37/6525/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Volc/Sed	: Qg	: Qg
Rock Age	: KJ	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-5	: Goodnews Bay/B-6
Sec/T/R/Mer	: 31/10S/68W/Sew	: 23/10S/69W/Sew	: 10/9S/69W/Sew
Location/Property	: Kukaktlik R. Trib.	: Goodnews-Kukaktlik R.	: Goodnews R. Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.10%			:7.60%			:6.56%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:20			:30		
: Barium	:550			:560			:850		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.79%			:2.04%			:2.15%		
: Chromium	:250			:96			:330		
: Cobalt	:19			:14			:17		
: Copper	:58			:53			:55		
: Gallium	:10			:10			:10		
: Gold	: L			: 400			: L		
: Iron	:9.40%			:6.44%			:10.5%		
: Lanthanum	:10			:20			:20		
: Lead	: 8			:10			:12		
: Manganese	:3590			:1590			:2320		
: Magnesium	:2.03%			:1.57%			:2.41%		
: Molybdenum	: 1			: 1			: L		
: Nickel	:46			:33			: 43		
: Palladium	: L			: L			: L		
: Phosphorus	:1040			:995			:915		
: Platinum	: L			: L			: L		
: Potassium	:1.83%			:1.72%			:1.62%		
: Silver	:0.4			: L			: L		
: Sodium	:1.77%			:2.10%			:1.67%		
: Strontium	:172			:225			:170		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:1.03%			:0.70%			:1.37%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:198			:153			:220		
: Zinc	:191			:105			:195		

Map No/Sample No/Yr	: 38/6524/86	: 39/6523/86	: 40/6511/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Volc/Sed	: Qg	: Sed
Rock Age	: MzPz	: Quaternary	: Permian
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 18/9S/69W/Sew	: 24/9S/70W/Sew	: 11/9S/70W/Sew
Location/Property	: Canyon Cr. Trib.	: Canyon Cr. Trib.	: Canyon Cr. Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.84%			:5.71%			:7.39%		
: Antimony	: L			: L			: L		
: Arsenic	:30			:20			:20		
: Barium	:785			:480			:760		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: 3			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.08%			:2.85%			:2.87%		
: Chromium	:195			:3180			:150		
: Cobalt	:14			:24			:15		
: Copper	:62			:47			:49		
: Gallium	:10			:10			:10		
: Gold	:	L		:	L		:	L	
: Iron	:7.15%			:11.7%			:6.85%		
: Lanthanum	:20			:10			:10		
: Lead	: 8			: 8			: 8		
: Manganese	:1620			:2430			:1400		
: Magnesium	:1.98%			:2.4%			:1.78%		
: Molybdenum	: L			: L			: 2		
: Nickel	:41			:86			:39		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:825			:865			:830		
: Platinum	:	L		:	L		:	L	
: Potassium	:1.58%			:1.07%			:1.52%		
: Silver	: L			: L			: L		
: Sodium	:1.98%			:1.60%			:2.07%		
: Strontium	:195			:198			:255		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:0.84%			:1.53%			:0.78%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:173			:275			:170		
: Zinc	:153			:167			:109		

Map No/Sample No/Yr	: 40/6512/86	: 41/6612/86	: 41/6656/86
Material Type	: Placer	: Maf Volc.	: Placer
Rock Type	: Sed	: Maf Volc.	: Sed
Rock Age	: Permian	: MzPz	: Permian
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 11/9S/70W/Seew	: 7/9S/70W/Sew	: 7/9S/70W/Sew
Location/Property	:	: Bear Cr.	: Bear Cr.
KX/MAS	:	: 3/9	: 3/9
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: 4 pans	: Grab	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.42%			:8.27%			:5.94%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:170			:10		
: Barium	:525			:140			:600		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			:14		
: Calcium	:4.56%			:9.31%			:2.54%		
: Chromium	:220			:66			:1100		
: Cobalt	:16			:30			:20		
: Copper	:49			:83			:66		
: Gallium	:10			:30			:10		
: Gold	:	L		: 45			: G	0.624	
: Iron	:5.94%			:6.42%			:8.42%		
: Lanthanum	: L			: L			:10		
: Lead	: 8			: 6			: 6		
: Manganese	:1230			:1260			:1940		
: Magnesium	:1.68%			:3.11%			:2.06%		
: Molybdenum	: L			: L			: L		
: Nickel	:78			:17			:57		
: Palladium	:	L		: 20			: 40		
: Phosphorus	:710			:520			:730		
: Platinum	:	L		: L			: 6200		
: Potassium	:1.47%			:0.55%			:1.28%		
: Silver	: L			:0.4			:0.6		
: Sodium	:1.64%			:0.79%			:1.66%		
: Strontium	:225			:305			:215		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			:NA		
: Titanium	:0.50%			:0.39%			:0.79%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:137			:220			:260		
: Zinc	:97			:96			:139		

Map No/Sample No/Yr	: 42/6660/86	: 43/6659/86	: 44/6600/86
Material Type	: Str. Sed.	: Chert	: Fel Plut
Rock Type	: Sed	: Sed	: Fel Int
Rock Age	: MzPz	: MzPz	: TK
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 12/9S/71W/Sew	: 12/9S/71W/Sew	: 18/9S/70W/Sew
Location/Property	: JFM and Associates	: JFM and Associates	: Bear Cr.
KX/MAS	: 37/9001	: 37/9001	: 3/9
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Stream Sediment	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:5.81%			:3.95%			:8.86%		
: Antimony	: L			:10			: L		
: Arsenic	:50			:10			:180		
: Barium	:410			:5210			:2040		
: Beryllium	: L			: L			:0.5		
: Bismuth	: L			: L			:10		
: Cadmium	: L			: L			: L		
: Calcium	:2.08%			:1.37%			:2.42%		
: Chromium	:115			:125			:57		
: Cobalt	:14			:24			: 5		
: Copper	:68			:91			:49		
: Gallium	: L			: L			: L		
: Gold	: L			: L			: 725		
: Iron	:3.49%			:4.92%			:3.17%		
: Lanthanum	:10			:10			:10		
: Lead	:12			:24			: 6		
: Manganese	:1020			:9520			:175		
: Magnesium	:1.80%			:1.19%			:0.72%		
: Molybdenum	: 2			: 1			: 1		
: Nickel	:57			:69			: 4		
: Palladium	: L			: L			: L		
: Phosphorus	:1600			:430			:1070		
: Platinum	: L			: L			: L		
: Potassium	:0.74%			:0.56%			:2.36%		
: Silver	:0.2			:0.2			:0.4		
: Sodium	:1.47%			:0.82%			:2.39%		
: Strontium	:171			:182			:685		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			: 1		
: Titanium	:0.41%			:0.22%			:0.30%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:88			:72			:53		
: Zinc	:69			:96			:15		

Map No/Sample No/Yr	: 44/6611/86	: 44/6639/86	: 45/6637/86
Material Type	: Sandstone	: Placer	: Placer
Rock Type	: Sed	: Volc/Sed	: Volc/Sed
Rock Age	: MzPz	: MzPz	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 18/9S/70W/Sew	: 18/9S/70W/Sew	: 13/9S/71W/Sew
Location/Property	: Bear Cr.	: Bear Cr.	: Danielson Cr.
KX/MAS	: 3/9	: 3/9	: 3/9
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.71%			:7.05%			:6.63%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:20			:50		
: Barium	:510			:530			:685		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: 2			: 2		
: Calcium	:0.61%			:3.18%			:3.08%		
: Chromium	:71			:465			:1150		
: Cobalt	:24			:17			:24		
: Copper	:70			:67			:102		
: Gallium	: L			: L			: L		

: Gold	:	10	:	110	:	G
: Iron	:4.65%		:10.2%		:12.3%	
: Lanthanum	: L		:10		:10	
: Lead	: 6		: 4		: 4	
: Manganese	:3910		:2190		:3130	
: Magnesium	:1.28%		:2.54%		:2.91%	
: Molybdenum	: L		: L		: L	
: Nickel	:35		:52		:49	

: Palladium	:	L	:	L	:	325
: Phosphorus	:425		:740		:780	
: Platinum	:	L	:	300	:	G
: Potassium	:2.53%		:1.43%		:1.36%	
: Silver	:0.2		:0.4		:0.4	
: Sodium	:2.17%		:1.88%		:1.56%	
: Strontium	:190		:255		:210	
: Thallium	: L		: L		: L	
: Tin	: 1		: 1		: 1	
: Titanium	:0.45%		:1.01%		:0.99%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:120		:250		:355	
: Zinc	:58		:151		:159	

Map No/Sample No/Yr	: 46/6638/86	: 47/6693/86	: 48/6694/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Sed	: Volc/SEd	: Sed
Rock Age	: MzPz	: MzPz	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 18/9S/70W/Sew	: 20/9S/70W/Sew	: 20/9S/70W/Sew
Location/Property	: Bear Cr.	: Fox Cr.	: Fox Cr.
KX/MAS	: 3/9	: 19/7	: 19/7
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:5.44%			:5.39%			:4.83%		
: Antimony	: L			: L			:10		
: Arsenic	:20			:10			:30		
: Barium	:425			:695			:930		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	:1.5			:13			:13		
: Calcium	:3.21%			:1.43%			:1.55%		
: Chromium	:2800			:1220			:1100		
: Cobalt	:22			:24			:27		
: Copper	:58			:69			:77		
: Gallium	: L			: L			:10		

: Gold	:	220	:	60	:	10
: Iron	:11.6%		:14.1%		:16.6%	
: Lanthanum	:10		:10		:20	
: Lead	: 2		: 6		: 8	
: Manganese	:3030		:3470		:7720	
: Magnesium	:2.72%		:2.14%		:2.01%	
: Molybdenum	: L		: 1		: 6	
: Nickel	:57		:47		:53	

: Palladium	:	25	:	L	:	L
: Phosphorus	:700		:885		:1170	
: Platinum	:	6500	:	L	:	L
: Potassium	:1.01%		:1.09%		:0.94%	
: Silver	:0.2		:0.2		:0.2	
: Sodium	:1.26%		:1.05%		:0.97%	
: Strontium	:170		:131		:140	
: Thallium	: L		: L		: L	
: Tin	: 1		:NA		:NA	
: Titanium	:1.25%		:1.96%		:1.62%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:330		:410		:440	
: Zinc	:181		:290		:285	

Map No/Sample No/Yr	: 49/6695/86	: 50/6715/86	: 51/6716/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Volc/Sed	: Qg	: Qg
Rock Age	: MzPz	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 29/9S/70W/Sew	: 23/9S/71W/Sew	: 36/9S/71W/Sew
Location/Property	: Fox Cr.	: Slate Cr.	: Slate Cr.
KX/MAS	: 19/7	: 8, 10/4	: 8, 10/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:4.42%			:3.45%			:2.71%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:20			:10		
: Barium	:510			:250			:210		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	:12			: L			: L		
: Calcium	:3.55%			:5.57%			:4.26%		
: Chromium	:925			:1020			:1260		
: Cobalt	:26			:38			:36		
: Copper	:51			:55			:50		
: Gallium	:20			: L			: L		

: Gold	:	420	:	760	0.0001	:	2200	0.0008
: Iron	:15.3%		:20.3%			:24.3%		
: Lanthanum	:20		:10			:10		
: Lead	: 2		: L			: L		
: Manganese	:4050		:3220			:3620		
: Magnesium	:3.01%		:5.36%			:4.25%		
: Molybdenum	: 2		: L			: L		
: Nickel	:42		:72			:68		

: Palladium	:	L	:	L	:	L
: Phosphorus	:955		:835		:830	
: Platinum	:	L	:	L	:	L
: Potassium	:0.77%		:0.26%		:0.18%	
: Silver	:0.6		: L		:3.8	
: Sodium	:1.06%		:0.63%		:0.47%	
: Strontium	:180		:159		:110	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:2.13%		:3.24%		:4.31%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:740		:1110		:1410	
: Zinc	:187		:225		:265	

Map No/Sample No/Yr	: 52/6717/86	: 53/6718/86	: 54/6696/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Sed
Rock Age	: Quaternary	: Quaternary	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-7	: Goodnews Bay/B-6
Sec/T/R/Mer	: 25/9S/71W/Sew	: 36/9S/71W/Sew	: 31/9S/70W/Sew
Location/Property	: Slate Cr.	: Caribou Cr.	: Fox Cr.
KX/MAS	: 8, 10/4	: 8, 10/4	: 19/7
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:5.10%			:3.28%			:4.13%		
: Antimony	: L			: L			: L		
: Arsenic	:20			: L			:40		
: Barium	:495			:410			:1620		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:5.90%			:3.77%			:2.91%		
: Chromium	:805			:1670			:1120		
: Cobalt	:34			:31			:29		
: Copper	:54			:54			:76		
: Gallium	: L			: L			: L		

: Gold	:	1760	L	:	15800	0.0015:	L	0.0003
: Iron	:15.7%			:25.6%			:26.5%	
: Lanthanum	:10			:20			:20	
: Lead	: L			: L			: 5	
: Manganese	:2960			:6020			:9210	
: Magnesium	:5.16%			:3.38%			:2.99%	
: Molybdenum	: L			: L			: 8	
: Nickel	:67			:59			:60	

: Palladium	:	L	:	L	:	L
: Phosphorus	:880		:885		:1040	
: Platinum	:	L	:	L	:	L
: Potassium	:0.44%		:0.22%		:0.72%	
: Silver	: L		:4.6		:1.5	
: Sodium	:1.03%		:0.46%		:1.02%	
: Strontium	:255		:108		:160	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:2.69%		:4.26%		:3.61%	
: Tungsten	: L		:85		: L	
: Uranium	: L		: L		: 2	
: Vanadium	:760		:1290		:935	
: Zinc	:205		:250		:310	

Map No/Sample No/Yr	: 55/6697/86	: 56/6719/86	: 57/6720/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-7	: Goodnews Bay/B-6
Sec/T/R/Mer	: 36/9S/71W/Sew	: 1/10S/71W/Sew	: 2/10S/71W/Sew
Location/Property	: Fox Cr.	: Slate Cr.	: Slate Cr.
KX/MAS	: 19/7	: 8, 10/4	: 8, 10/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 5.39%			: 3.47%			: 2.59%		
: Antimony	: L			: L			: L		
: Arsenic	: 20			: L			: L		
: Barium	: 3010			: 615			: 265		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 3.49%			: 4.38%			: 3.84%		
: Chromium	: 550			: 1120			: 1210		
: Cobalt	: 26			: 35			: 32		
: Copper	: 70			: 57			: 50		
: Gallium	: 10			: L			: L		
: Gold	:	L	L	:	350	0.0009	:	19400	0.0014
: Iron	: 13.5%			: 23.7%			: 26.7%		
: Lanthanum	: 10			: 10			: 10		
: Lead	: 5			: L			: L		
: Manganese	: 3510			: 4210			: 4560		
: Magnesium	: 3.25%			: 4.27%			: 3.64%		
: Molybdenum	: 6			: L			: L		
: Nickel	: 56			: 65			: 61		
: Palladium	:	L		:	L		:	L	
: Phosphorus	: 835			: 805			: 690		
: Platinum	:	L		:	L		:	L	
: Potassium	: 1.05%			: 0.28%			: 0.18%		
: Silver	: 1.5			: L			: 0.4		
: Sodium	: 1.43%			: 0.55%			: 0.40%		
: Strontium	: 225			: 130			: 83		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.75%			: 4.00%			: 4.98%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 470			: 1270			: 1500		
: Zinc	: 200			: 250			: 285		

Map No/Sample No/Yr	: 58/6721/86	: 59/6722/86	: 60/6723/86
Material Type	: Sandstone	: Placer	: Placer
Rock Type	: Sed	: Qg	: Qg
Rock Age	: MzPz	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 10/10S/71W/Sew	: 10/10S/71W/Sew	: 10/10S/71W/Sew
Location/Property	: Slate Cr.	: Slate Cr.	: Olympic Cr.
KX/MAS	: 8, 10/4	: 8, 10/4	: 18/5
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:9.39%			:3.87%			:5.18%		
: Antimony	: L			: L			: L		
: Arsenic	: L			:10			:20		
: Barium	:2460			:870			:675		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:0.49%			:5.14%			:6.26%		
: Chromium	:26			:700			:675		
: Cobalt	: 6			:33			:26		
: Copper	:26			:50			:49		
: Gallium	: L			: L			:10		

: Gold	:	L	:	8500	L	:	10000	0.0004
: Iron	:6.33%		:16.5%			:15.1%		
: Lanthanum	: L		:10			:10		
: Lead	: 2		:12			: L		
: Manganese	:350		:3810			:2750		
: Magnesium	:1.53%		:5.07%			:3.58%		
: Molybdenum	: 4		: L			: L		
: Nickel	:15		:50			:48		

: Palladium	:	L	:	L	:	L
: Phosphorus	:1330		:835		:975	
: Platinum	:	L	:	L	:	L
: Potassium	:1.85%		:0.28%		:0.46%	
: Silver	:0.2		:0.8		:1.4	
: Sodium	:3.37%		:0.70%		:0.89%	
: Strontium	:360		:141		:205	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:0.35%		:3.22%		:2.49%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:175		:750		:765	
: Zinc	:67		:215		:200	

Map No/Sample No/Yr	: 61/6736/86	: 62/6735/86	: 63/6734/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 3/10S/71W/Sew	: 3/10S/71W/Sew	: 3/10S/71W/Sew
Location/Property	: Olympic Cr.	: Olympic Cr.	: Olympic Cr.
KX/MAS	: 18/5	: 18/5	: 18/5
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/ys ³	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/ys ³
: Aluminum	:5.29%			:5.84%			:4.78%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:20			:10		
: Barium	:740			:560			:380		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			:3.5			: L		
: Calcium	:7.84%			:4.36%			:6.47%		
: Chromium	:625			:305			:685		
: Cobalt	:26			:18			:26		
: Copper	:47			:53			:52		
: Gallium	:10			:20			:20		

: Gold	:	400	0.0041	:	5300	:	8400	0.0006
: Iron	:13.1%			:7.44%		:17.1%		
: Lanthanum	:10			:10		:10		
: Lead	: L			: 1		: L		
: Manganese	:2540			:1420		:2920		
: Magnesium	:4.28%			:2.71%		:3.96%		
: Molybdenum	: L			: L		: L		
: Nickel	:52			:32		:52		

: Palladium	:	L	:	L	:	L
: Phosphorus	:700		:820		:720	
: Platinum	:	600	:	L	:	L
: Potassium	:0.50%		:1.01%		:0.49%	
: Silver	: L		:0.2		: L	
: Sodium	:0.94%		:1.82%		:0.84%	
: Strontium	:192		:300		:179	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:2.2%		:0.99%		:2.98%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:665		:350		:940	
: Zinc	:190		:109		:235	

Map No/Sample No/Yr	: 64/6733/86	: 65/6732/86	: 66/6731/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qal	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 3/10S/71W/Sew	: 34/9S/71W/Sew	: 27/9S/71W/Sew
Location/Property	: Olympic Cr. Trib.	: Olympic Cr.	: Olympic Cr.
KX/MAS	: 18/5	: 18/5	: 18/5
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay
: Aluminum	:5.90%			:5.07%			:5.69%		
: Antimony	:10			: L			: L		
: Arsenic	:10			:20			:60		
: Barium	:900			:350			:475		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	:3.5			: L			: 7		
: Calcium	:3.36%			:8.00%			:11.70%		
: Chromium	:290			:640			:415		
: Cobalt	:22			:25			:17		
: Copper	:68			:50			:47		
: Gallium	:10			:20			:20		
: Gold	:	980		:	5300	0.0045	:	7800	
: Iron	:8.33%			:14.5%			:9.74%		
: Lanthanum	:10			:10			: L		
: Lead	: 6			: L			: 4		
: Manganese	:2570			:2610			:1750		
: Magnesium	:2.86%			:3.92%			:3.23%		
: Molybdenum	: 1			: L			: L		
: Nickel	:47			:46			:32		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:835			:675			:860		
: Platinum	:	L		:	L		:	L	
: Potassium	:1.35%			:0.50%			:0.83%		
: Silver	:0.2			:2.8			:1.8		
: Sodium	:1.46%			:0.75%			:1.18%		
: Strontium	:280			:170			:305		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.90%			:2.48%			:0.94%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:295			:735			:405		
: Zinc	:188			:210			:158		

Map No/Sample No/Yr	: 67/6725/86	: 68/6724/86	: 69/6831/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qa1	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 15/10S/71W/Sew	: 9/10S/71W/Sew	: 9/10S/71W/Sew
Location/Property	: Slate Cr.	: Cascade Cr.	: Wattamuse Cr.
KX/MAS	: 8/ 10/4	: 17, 26/6	: 1, 2, 4-7, 9, 31/3
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³
: Aluminum	:3.75%			:7.41%			:1.92%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:40			:20		
: Barium	:445			:1110			:385		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			:4.5			: L		
: Calcium	:4.08%			:4.05%			:2.31%		
: Chromium	:970			:310			:715		
: Cobalt	:31			:16			:33		
: Copper	:52			:69			:69		
: Gallium	: L			:10			: L		

: Gold	:	1760	0.0005	:	3000	:	G	0.7583
: Iron	:23.1%			:7.72%			:36.3%	
: Lanthanum	:10			:10			:10	
: Lead	: 6			: 6			: 5	
: Manganese	:3780			:1990			:5360	
: Magnesium	:3.45%			:2.07%			:1.54%	
: Molybdenum	: L			: 3			:12	
: Nickel	:57			:31			:28	

: Palladium	:	L	:	L	:	L
: Phosphorus	:730		:960		:905	
: Platinum	:	L	:	L	:	L
: Potassium	:0.34%		:1.80%		:0.55%	
: Silver	:0.4		:0.8		:5.0	
: Sodium	:0.60%		:1.63%		:0.55%	
: Strontium	:130		:270		:121	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:4.27%		:1.13%		:9.44%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:1290		:275		:2050	
: Zinc	:260		:131		:310	

Map No/Sample No/Yr	: 70/6830/86	: 71/6757/86	: 72/6829/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-6	: Goodnews Bay/B-6	: Goodnews Bay/B-6
Sec/T/R/Mer	: 9/10S/71W/Sew	: 4/10S/71W/Sew	: 9/10S/71W/Sew
Location/Property	: Wattamuse Cr.	: Cascade Cr.	: Wattamuse Cr.
KX/MAS	: 1, 2, 4-7, 9, 31/3	: 17, 26/6	: 1, 2, 4-7, 9, 31/3
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:1.55%			:8.84%			:1.76%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:40			: L		
: Barium	:290			:1030			:675		
: Beryllium	: L			: L			: L		
: Bismuth	: L			:13			: L		
: Cadmium	: L			: 5			: L		
: Calcium	:2.19%			:4.37%			:2.06%		
: Chromium	:815			:505			:1150		
: Cobalt	:19			:19			:23		
: Copper	:70			:55			:66		
: Gallium	: L			:10			: L		

: Gold	:	5000	0.6615	:	1830	0.0017	:	1070	0.0108
: Iron	:39.6%			:6.43%			:40.5%		
: Lanthanum	:10			:10			:10		
: Lead	: 5			:10			: 5		
: Manganese	:5920			:1810			:5490		
: Magnesium	:1.61%			:2.61%			:1.47%		
: Molybdenum	:14			: L			:10		
: Nickel	:31			:48			:35		

: Palladium	:	L	:	L	:	L
: Phosphorus	:865		:645		:735	
: Platinum	:	L	:	L	:	L
: Potassium	:0.43%		:1.28%		:0.47%	
: Silver	:1.5		: L		:2.5	
: Sodium	:0.43%		:1.90%		:0.52%	
: Strontium	:81		:325		:116	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:11.2%		:1.57%		:5.98%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:2510		:248		:1960	
: Zinc	:355		:138		:335	

Map No/Sample No/Yr	: 73/6783/86	: 74/6782/86	: 75/6714/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 4/10S/71W/Sew	: 5/10S/71W/Sew	: 5/10S/71W/Sew
Location/Property	: Wattamuse Cr.	: Wattamuse Cr.	: Wattamuse Cr.
KX/MAS	: 1, 2, 4-7, 9, 31/3	: 1, 2, 4-7, 9, 31/3	: 1, 2, 4-7, 9, 31/3
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.38%			:1.54%			:2.63%		
: Antimony	: L			: L			: L		
: Arsenic	:10			: L			:30		
: Barium	:495			:360			:365		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.38%			:2.20%			:2.11%		
: Chromium	:705			:1030			:600		
: Cobalt	:20			:15			:20		
: Copper	:62			:71			:57		
: Gallium	: L			: L			:10		

: Gold	:	G	0.0053	:	G	0.0083	:	G	0.0087
: Iron	:33.1%			:39.6%			:30.4%		
: Lanthanum	:20			:20			:20		
: Lead	: 5			: 5			: L		
: Manganese	:4820			:5760			:3696		
: Magnesium	:1.53%			:1.31%			:1.26%		
: Molybdenum	: 9			:14			: 9		
: Nickel	:29			:30			:23		

: Palladium	:	L	:	L	:	L
: Phosphorus	:635		:1460		:1460	
: Platinum	:	L	:	L	:	L
: Potassium	:0.57%		:0.03%		:0.35%	
: Silver	:2.5		:3.5		:1.4	
: Sodium	:0.66%		:0.06%		:0.47%	
: Strontium	:157		:12		:140	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:4.89%		:10.9%		:6.04%	
: Tungsten	: L		:30		: L	
: Uranium	: L		: L		: L	
: Vanadium	:1420		:2440		:1850	
: Zinc	:290		:290		:260	

Map No/Sample No/Yr	: 76/6756/86	: 77/6755/86	: 78/6713/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Volc/Sed	: Volc/Sed	: Volc/Sed
Rock Age	: MzPz	: MzPz	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 4/10S/71W/Sew	: 33/9S/71W/Sew	: 31/9S/71W/Sew
Location/Property	: Cascade Cr.	: Cascade Cr.	: Wattamuse Cr.
KX/MAS	: 17, 26/6	: 17, 26/6	: 1, 2, 4-7, 9, 31/3
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³
: Aluminum	:6.48%			:5.50%			:6.44%		
: Antimony	: L			: L			: L		
: Arsenic	:90			:60			:380		
: Barium	:550			:320			:525		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			:1.5			: L		
: Calcium	:5.14%			:6.05%			:8.35%		
: Chromium	:290			:290			:390		
: Cobalt	:18			:26			:15		
: Copper	:52			:50			:59		
: Gallium	: L			: L			:10		
: Gold	:	6200		:	3700		:	G	0.0013
: Iron	:9.30%			:12.80%			:13.4%		
: Lanthanum	:10			:10			: L		
: Lead	: L			: L			: L		
: Manganese	:2000			:2900			:3100		
: Magnesium	:2.51%			:2.90%			:2.40%		
: Molybdenum	: L			: L			: L		
: Nickel	:37			:33			:36		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:790			:880			:975		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.88%			:0.52%			:0.64%		
: Silver	: L			: L			: L		
: Sodium	:1.45%			:1.13%			:0.84%		
: Strontium	:320			:260			:200		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.40%			:2.34%			:3.91%		
: Tungsten	: L			: L			:55		
: Uranium	: L			: L			: L		
: Vanadium	:350			:510			:555		
: Zinc	:159			:230			:210		

Map No/Sample No/Yr	: 79/6712/86	: 80/6706/86	: 81/6753/86
Material Type	: Fel Plut	: Maf Plut	: Placer
Rock Type	: Fel Int	: Maf Int	: Volc/Sed
Rock Age	: TK	: TK	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 31/9S/71W/Sew	: 32/9S/71W/Sew	: 32/9S/71W/Sew
Location/Property	: Wattamuse Cr.	: Wattamuse Cr.	: Cascade Cr.
KX/MAS	: 1, 2, 4-7, 9, 31/3	: 1, 2, 4-7, 9, 31/3	: 17, 26/6
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:15.10%			:6.55%			:5.03%		
: Antimony	: L			: L			: L		
: Arsenic	:140			: L			:100		
: Barium	:1260			:85			:345		
: Beryllium	: 2			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: 1			: 5			: L		
: Calcium	:6.32%			:6.11%			:4.25%		
: Chromium	:100			:91			:375		
: Cobalt	:10			:33			:38		
: Copper	:230			:73			:59		
: Gallium	:10			:10			:10		

: Gold	:	55	:	L	:	G	0.766
: Iron	:3.95%		:8.36%		:13.50%		
: Lanthanum	:10		:10		:10		
: Lead	: 8		: 2		: L		
: Manganese	:445		:1440		:2190		
: Magnesium	:0.85%		:3.59%		:2.63%		
: Molybdenum	: 4		: L		: 2		
: Nickel	: 5		:29		:45		

: Palladium	:	L	:	L	:	L	
: Phosphorus	:1810		:865		:500		
: Platinum	:	L	:	L	:	L	
: Potassium	:2.55%		:0.34%		:0.43%		
: Silver	: L		:0.2		:2.4		
: Sodium	:2.79%		:2.91%		:1.04%		
: Strontium	:1270		:290		:220		
: Thallium	: L		: L		: L		
: Tin	:NA		:NA		:NA		
: Titanium	:0.48%		:1.92%		:2.11%		
: Tungsten	: L		: L		: L		
: Uranium	: L		: L		: L		
: Vanadium	:75		:335		:935		
: Zinc	:30		:63		:220		

Map No/Sample No/Yr	: 82/6754/86	: 83/6752/86	: 84/6751/86
Material Type	: Maf Plut	: Placer	: Placer
Rock Type	: Maf Int	: Volc/Sed	: Volc/Sed
Rock Age	: TK	: MzPz	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 29/9S/71W/Sew	: 29/9S/71W/Sew	: 30/9S/71W/Sew
Location/Property	: Cascade Cr.	: Cascade Cr.	: Cascade Cr.
KX/MAS	: 17, 26/6	: 17, 26/6	: 17, 26/6
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:8.53%			:8.37%			:9.10%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:40			:20		
: Barium	:300			:385			:245		
: Beryllium	: L			: L			: L		
: Bismuth	: L			:14			:12		
: Cadmium	: L			: 3			: 3		
: Calcium	:5.54%			:6.57%			:7.48%		
: Chromium	:135			:980			:1790		
: Cobalt	:35			:51			:45		
: Copper	:210			:93			:86		
: Gallium	:10			:10			:10		

: Gold	:	L	:	14200	0.0005	:	3300	0.0009
: Iron	:6.88%		:19.4%			:12.6%		
: Lanthanum	:10		:10			: L		
: Lead	: L		: L			: L		
: Manganese	:1520		:2910			:2250		
: Magnesium	:3.35%		:3.46%			:3.23%		
: Molybdenum	: L		: 4			: L		
: Nickel	:58		:77			:75		

: Palladium	:	L	:	L	:	L
: Phosphorus	:770		:450		:360	
: Platinum	:	L	:	L	:	1300
: Potassium	:0.60%		:0.59%		:0.49%	
: Silver	: L		: L		:1.0	
: Sodium	:2.49%		:1.31%		:1.23%	
: Strontium	:485		:300		:350	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:0.92%		:3.87%		:2.48%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:225		:1420		:515	
: Zinc	:58		:320		:200	

Map No/Sample No/Yr	: 85/6669/86	: 85/6704/86	: 85/6705/86
Material Type	: Soil	: Maf Plut	: Siltstone
Rock Type	: Maf Int	: Maf Int	: Sed
Rock Age	: TK	: TK	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 31/9S/71W/Sew	: 31/9S/71W/Sew	: 31/9S/71W/Sew
Location/Property	: Wattamuse Cr.	: Wattamuse Cr.	: Wattamuse Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Soil	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:11.4%			:5.84%			:5.82%		
: Antimony	: L			: L			: L		
: Arsenic	:200			:10			:10		
: Barium	:320			:200			:3070		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: 3			: 6			: L		
: Calcium	:0.67%			:5.46%			:0.62%		
: Chromium	:162			:38			:130		
: Cobalt	:49			:31			:14		
: Copper	:250			:129			:22		
: Gallium	:10			:20			:10		
: Gold	:	20		:	L		:	L	
: Iron	:7.74%			:10.70%			:4.12%		
: Lanthanum	:10			:10			:10		
: Lead	:14			: 2			: 4		
: Manganese	:1240			:1680			:1170		
: Magnesium	:0.59%			:2.49%			:1.46%		
: Molybdenum	: 1			: L			: 2		
: Nickel	:102			: 9			:30		
: Palladium	:	L		:	L		:	10	
: Phosphorus	:805			:810			:185		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.43%			:0.42%			:0.70%		
: Silver	:0.2			:0.2			:0.2		
: Sodium	:0.76%			:2.94%			:3.46%		
: Strontium	:104			:180			:157		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.94%			:1.91%			:0.37%		
: Tungsten	:30			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:285			:380			:137		
: Zinc	:110			:106			:23		

Map No/Sample No/Yr	: 86/6668/86	: 87/6667/86	: 88/6702/86
Material Type	: Volc	: Soil	: Hornfels
Rock Type	: Volc	: Meta	: Meta
Rock Age	: MzPz	: TK	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 36/9S/72W/Sew	: 36/9S/72W/Sew	: 36/9S/72W/Sew
Location/Property	: Wattamuse Cr.	: Wattamuse Cr.	: Wattamuse Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Soil	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:8.26%			:9.47%			:6.44%		
: Antimony	: L			:70			: L		
: Arsenic	: L			:5050			: L		
: Barium	:2140			:300			:320		
: Beryllium	: L			: L			: L		
: Bismuth	: L			:65			: L		
: Cadmium	: L			:15			: 3		
: Calcium	:5.82%			:1.04%			:8.24%		
: Chromium	:175			:48			:240		
: Cobalt	:19			:93			:30		
: Copper	:61			:550			:177		
: Gallium	:10			: L			: L		

: Gold	:	L	:	6550	:	L
: Iron	:5.55%		:8.91%		:7.15%	
: Lanthanum	:20		: L		: L	
: Lead	:40		:784		: 2	
: Manganese	:945		:2430		:2030	
: Magnesium	:3.05%		:0.80%		:4.36%	
: Molybdenum	: 1		: 2		: L	
: Nickel	:28		:66		:50	

: Palladium	:	L	:	10	:	10
: Phosphorus	:1440		:350		:520	
: Platinum	:	L	:	L	:	L
: Potassium	:2.92%		:2.02%		:0.47%	
: Silver	:0.2		:15.4		:0.2	
: Sodium	:2.69%		:1.18%		:2.32%	
: Strontium	:640		:147		:255	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:0.56%		:0.66%		:1.01%	
: Tungsten	: L		:30		: L	
: Uranium	: L		: L		: L	
: Vanadium	:154		:225		:265	
: Zinc	:97		:860		:99	

Map No/Sample No/Yr	: 88/6703/86	: 89/6701/86	: 90/6666/86
Material Type	: Fel Volc	: Fel Plut	: Maf Plut
Rock Type	: Fel Volc	: Fel Int	: Maf Int
Rock Age	: MzPz	: TK	: TK
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 36/9S/72W/Sew	: 36/9S/72W/Sew	: 36/9S/72W/Sew
Location/Property	: Wattamuse Cr.	: Wattamuse Cr.	: Wattamuse Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:5.47%			:7.04%			:10.2%		
: Antimony	: L			: L			: L		
: Arsenic	:10			: L			: L		
: Barium	:130			:1740			:1950		
: Beryllium	: L			: L			:0.5		
: Bismuth	: L			: L			: L		
: Cadmium	: 6			: L			: L		
: Calcium	:6.39%			:4.75%			:5.98%		
: Chromium	:41			:140			:82		
: Cobalt	:32			: 9			:12		
: Copper	:270			:47			:39		
: Gallium	: L			: L			:10		
: Gold	:	5		: L			: L		
: Iron	:10.50%			:3.93%			:4.42%		
: Lanthanum	:10			:10			:20		
: Lead	: 8			:14			:22		
: Manganese	:2240			:715			:710		
: Magnesium	:2.87%			:2.16%			:1.43%		
: Molybdenum	: L			: 2			: L		
: Nickel	:18			:11			: 8		
: Palladium	:	L		: L			: L		
: Phosphorus	:665			:880			:1560		
: Platinum	:	L		: L			: L		
: Potassium	:0.42%			:2.21%			:2.92%		
: Silver	:0.2			:0.2			:0.2		
: Sodium	:2.34%			:2.40%			:2.94%		
: Strontium	:141			:535			:815		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.95%			:0.43%			:0.53%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:555			:113			:118		
: Zinc	:124			:59			:64		

Map No/Sample No/Yr	: 91/6595/86	: 92/6603/86	: 93/6604/86
Material Type	: Qtz	: Str. Sed.	: Fel Plut
Rock Type	: Fel Int	: Fel Int	: Fel Int
Rock Age	: TK	: TK	: TK
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 1/10S/72W/Sew	: 1/10S/72W/Sew	: 1/10S/72W/Sew
Location/Property	: Wattamuse-Granite Cr.	: Wattamuse-Granite Cr.	: Wattamuse-Granite Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Sediment	: Specimen
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:0.18%			:6.26%			:		
: Antimony	:40			:10			:		
: Arsenic	:2850			:2330			:		
: Barium	:30			:660			:		
: Beryllium	: L			: L			:		
: Bismuth	:400			: L			:		
: Cadmium	: L			: 1			:		
: Calcium	:0.04%			:4.12%			:		
: Chromium	:155			:125			:		
: Cobalt	: 1			:15			:		
: Copper	: 4			:61			:		
: Gallium	: L			:10			:		

: Gold	:	G	2.18	:	1300	:
: Iron	:0.55%			:6.36%		:
: Lanthanum	: L			:30		:
: Lead	:22			:10		:
: Manganese	:45			:1020		:
: Magnesium	:0.02%			:2.20%		:
: Molybdenum	: L			: L		:
: Nickel	: 5			:14		:

: Palladium	:	L	:	L	:
: Phosphorus	:15		:4100		:
: Platinum	:	L	:	L	:
: Potassium	:0.02%		:1.11%		:
: Silver	:6.6		:0.2		:
: Sodium	:0.01%		:1.79%		:
: Strontium	: 4		:370		:
: Thallium	: L		: L		:
: Tin	: 2		: 1		:
: Titanium	:0.01%		:0.86%		:
: Tungsten	:184		: L		:
: Uranium	: L		: L		:
: Vanadium	: 3		:220		:
: Zinc	: L		:79		:

Map No/Sample No/Yr	: 94/6832/86	: 95/6602/86	: 96/6833/86
Material Type	: Fel Plut	: Qtz	: Fel Plut
Rock Type	: Fel Int	: Fel Int	: Fel Int
Rock Age	: TK	: TK	: TK
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-7	: Goodnews Bay/B-5
Sec/T/R/Mer	: 1/10S/72W/Sew	: 1/10S/72W/Sew	: 1/10S/72W/Sew
Location/Property	: Wattamuse-Granite Cr.	: Wattamuse-Granite Cr.	: Wattamuse-Granite Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:11.60%			:0.68%			:7.02%		
: Antimony	: L			:190			:10		
: Arsenic	: L			:1000			:170		
: Barium	:540			:210			:30		
: Beryllium	: L			: L			: 2		
: Bismuth	: L			: 2			: L		
: Cadmium	: L			: L			:0.5		
: Calcium	:8.84%			:0.04%			:23.00%		
: Chromium	:130			:185			:195		
: Cobalt	:41			: L			:10		
: Copper	:890			: 5			:108		
: Gallium	:40			: L			:70		

: Gold	:	25	:	1250	:	85
: Iron	:5.52%		:0.45%		:2.85%	
: Lanthanum	: L		: L		: L	
: Lead	: L		: 2		:24	
: Manganese	:740		:39		:395	
: Magnesium	:2.58%		:0.02%		:2.61%	
: Molybdenum	: L		: L		: L	
: Nickel	:35		: 6		:17	

: Palladium	:	L	:	10	:	L
: Phosphorus	:2660		:30		:215	
: Platinum	:	L	:	L	:	L
: Potassium	:0.50%		:0.06%		:0.04%	
: Silver	:0.6		:0.6		:1.0	
: Sodium	:1.93%		:0.03%		:0.31%	
: Strontium	:1160		:13		:445	
: Thallium	: L		: L		: L	
: Tin	:NA		: 1		:NA	
: Titanium	:0.21%		:0.01%		:0.27%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:97		: 5		:44	
: Zinc	:45		: 3		:64	

Map No/Sample No/Yr	: 96/6834/86	: 96/6835/86	: 97/6601/86
Material Type	: Qtz	: Maf Plut	: Hornfels
Rock Type	: Fel Int	: Maf Int	: Meta
Rock Age	: TK	: TK	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-5	: Goodnews Bay/B-5	: Goodnews Bay/B-7
Sec/T/R/Mer	: 1/10S/72W/Sew	: 1/10S/72W/Sew	: 2/10S/72W/Sew
Location/Property	: Wattamuse-Granite Cr.	: Wattamuse-Granite Cr.	: Wattamuse-Granite Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Specimen
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:0.44%			:4.04%			:		
: Antimony	:30			: L			:		
: Arsenic	: G			:1300			:		
: Barium	:85			:370			:		
: Beryllium	: L			: L			:		
: Bismuth	:41			:30			:		
: Cadmium	: L			: L			:		
: Calcium	:0.58%			:8.46%			:		
: Chromium	:460			:225			:		
: Cobalt	: 3			: 9			:		
: Copper	:31			:1870			:		
: Gallium	: L			:10			:		
: Gold	:	5300		:	3300		:		
: Iron	:3.16%			:6.86%			:		
: Lanthanum	: L			:10			:		
: Lead	:26			: L			:		
: Manganese	:50			:1270			:		
: Magnesium	:0.09%			:2.39%			:		
: Molybdenum	: L			: 8			:		
: Nickel	: 6			:20			:		
: Palladium	:	L		:	L		:		
: Phosphorus	:95			:2160			:		
: Platinum	:	L		:	L		:		
: Potassium	: L			:0.93%			:		
: Silver	:2.2			:17.4			:		
: Sodium	:0.02%			:0.34%			:		
: Strontium	:27			:220			:		
: Thallium	: L			: L			:		
: Tin	:NA			:NA			:		
: Titanium	:0.01%			:0.16%			:		
: Tungsten	: L			: L			:		
: Uranium	: L			: L			:		
: Vanadium	: 5			:195			:		
: Zinc	: 6			:109			:		

Map No/Sample No/Yr	: 98/6605/86	: 99/6537/86	: 100/6691/86
Material Type	: Placer	: Placer	: Argillite
Rock Type	: Qg	: Qg	: Sed
Rock Age	: Quaternary	: Quaternary	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 12/10S/72W/Sew	: 7/10S/71W/Sew	: 13/10S/72W/Sew
Location/Property	: Granite Cr. Trib.	: Granite Cr.	: Sugtutlig Mountain
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: 1 pan	: Placer	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 6.91%			: 3.76%			: 6.59%		
: Antimony	: L			: L			: L		
: Arsenic	: 140			: 10			: L		
: Barium	: 1280			: 540			: 530		
: Beryllium	: 1			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 3.69%			: 2.54%			: 3.43%		
: Chromium	: 175			: 365			: 165		
: Cobalt	: 8			: 93			: 10		
: Copper	: 35			: 33			: 465		
: Gallium	: L			: 10			: 10		
: Gold	:	20		:	85		:	75	
: Iron	: 5.64%			: 30.9%			: 4.46%		
: Lanthanum	: 30			: 20			: 10		
: Lead	: 14			: 4			: 26		
: Manganese	: 1080			: 4640			: 585		
: Magnesium	: 1.75%			: 2.00%			: 2.15%		
: Molybdenum	: 3			: 5			: 3		
: Nickel	: 10			: 16			: 28		
: Palladium	:	L		:	L		:	L	
: Phosphorus	: 1060			: 880			: 690		
: Platinum	:	L		:	L		:	L	
: Potassium	: 2.74%			: 0.95%			: 1.35%		
: Silver	: 0.2			: L			: 1.4		
: Sodium	: 2.24%			: 1.06%			: 3.01%		
: Strontium	: 465			: 181			: 455		
: Thallium	: L			: 10			: L		
: Tin	: 1			: 1			:		
: Titanium	: 0.79%			: 9.17%			: 0.41%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 130			: 1390			: 134		
: Zinc	: 68			: 185			: 565		

Map No/Sample No/Yr	: 101/6692/86	: 102/6679/86	: 103/6686/86
Material Type	: Argillite	: Qtz	: Schist
Rock Type	: Sed	: Ila f Int	: Maf Int
Rock Age	: MzPz	: Jurassic	: Jurassic
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 3/10S/72W/Sew	: 34/9S/72W/Sew	: 34/9S/72W/Sew
Location/Property	: Velvet Cr.	: Velvet Cr.	: Velvet Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:4.31%			:0.53%			:8.09%		
: Antimony	: L			: L			: L		
: Arsenic	:10			: L			: L		
: Barium	:2250			:10			:30		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:0.39%			:0.40%			:7.10%		
: Chromium	:115			:385			:100		
: Cobalt	:16			:23			:35		
: Copper	:105			:335			:910		
: Gallium	:10			: L			: L		

: Gold	:	L	:	10	:	25
: Iron	:3.42%		:1.16%		:6.36	
: Lanthanum	:10		: L		: L	
: Lead	:210		:10		: 2	
: Manganese	:1200		:85		:1030	
: Magnesium	:1.11%		:0.40%		:3.27%	
: Molybdenum	: 5		: L		: 2	
: Nickel	:30		:11		:25	

: Palladium	:	L	:	L	:	L
: Phosphorus	:335		:145		:460	
: Platinum	:	L	:	L	:	L
: Potassium	:1.89%		: L		:0.25%	
: Silver	:0.2		:2.8		:0.2	
: Sodium	:1.00%		:0.05%		:3.15%	
: Strontium	:124		:14		:260	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:0.27%		:0.10%		:0.28%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:140		:15		:250	
: Zinc	:110		: 5		:28	

Map No/Sample No/Yr	: 103/6687/86	: 104/6680/86	: 105/6688/86
Material Type	: Schist	: Schist	: Schist
Rock Type	: Maf Int	: Maf Int	: Maf Int
Rock Age	: Jurassic	: Jurassic	: Jurassic
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 34/9S/72W/Sew	: 34/9S/72W/Sew	: 34/9S/72W/Sew
Location/Property	: Velvet Cr.	: Velvet Cr.	: Velvet Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.57%			:8.84%			:7.84%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			: L		
: Barium	:80			:20			:32		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:6.67%			:12.30%			:5.92%		
: Chromium	:80			:140			:130		
: Cobalt	:32			:63			:22		
: Copper	:195			:2230			:72		
: Gallium	:10			:10			: L		

: Gold	:	L	:	130	:	5
: Iron	:7.68%		:8.00%		:6.88%	
: Lanthanum	: L		: L		: L	
: Lead	: 2		: 2		: 4	
: Manganese	:960		:770		:1410	
: Magnesium	:2.93%		:0.90%		:3.95%	
: Molybdenum	: 1		: 6		: L	
: Nickel	:14		:26		:28	

: Palladium	:	L	:	L	:	L
: Phosphorus	:575		:730		:505	
: Platinum	:	L	:	L	:	L
: Potassium	:0.49%		:0.09%		:0.26%	
: Silver	:0.2		:0.6		:0.2	
: Sodium	:2.68%		:0.47%		:3.62%	
: Strontium	:210		:735		:245	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:0.35%		:0.29%		:0.21%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:305		:215		:220	
: Zinc	:37		:11		:84	

Map No/Sample No/Yr	: 105/6689/86	: 105/6690/86	: 106/6557/86
Material Type	: Schist	: Schist	: Placer
Rock Type	: Maf Int	: Maf Int	: Qg
Rock Age	: Jurassic	: Jurassic	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 34/9S/72W/Sew	: 34/9S/72W/Sew	: 9/10S/72W/Sew
Location/Property	: Velvet Cr.	: Velvet Cr.	: Velvet Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:9.47%			:6.58%			:4.78%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			:10		
: Barium	:20			:35			:520		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:13.10%			:7.48%			:4.64%		
: Chromium	:170			:57			:1520		
: Cobalt	:22			:26			:35		
: Copper	:280			:49			:35		
: Gallium	:10			:10			:10		
: Gold	:	15		:	L		:	50	
: Iron	:6.88%			:7.73%			:18.6%		
: Lanthanum	: L			: L			:10		
: Lead	:14			:26			: L		
: Manganese	:810			:890			:2310		
: Magnesium	:0.93%			:3.14%			:3.15%		
: Molybdenum	: L			: 1			: L		
: Nickel	:12			: 8			:65		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:885			:270			:770		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.08%			:0.37%			:0.50%		
: Silver	:0.2			:0.2			: L		
: Sodium	:0.56%			:1.86%			:0.98%		
: Strontium	:923			:230			:205		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			: 1		
: Titanium	:0.43%			:0.34%			:4.13%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:210			:400			:905		
: Zinc	: 6			:40			:150		

Map No/Sample No/Yr	: 107/6678/86	: 108/6685/86	: 109/6684/86
Material Type	: Maf Plut	: Maf Plut	: Maf Plut
Rock Type	: Maf Int	: Maf Int	: Maf Int
Rock Age	: Jurassic	: Jurassic	: Jurassic
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 33/9S/72W/Sew	: 32/9S/72W/Sew	: 32/9S/72W/Sew
Location/Property	: Tatlignagpeke Mountain	: Tatlignagpeke Mountain	: Tatlignagpeke Mountain
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:8.90%			:10.30%			:10.80%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			: L		
: Barium	:50			:115			:40		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:9.95%			:9.30%			:11.40%		
: Chromium	:59			:99			:71		
: Cobalt	:39			:30			:41		
: Copper	:171			:187			:485		
: Gallium	:10			:10			:30		

: Gold	:	L	:	L	:	L
: Iron	:10.30%		:7.48%		:8.06%	
: Lanthanum	:		: L		: L	
: Lead	: 2		: 2		: 2	
: Manganese	:815		:1470		:860	
: Magnesium	:4.34%		:3.96%		:4.12%	
: Molybdenum	: L		: L		: L	
: Nickel	:28		:21		:39	

: Palladium	:	L	:	L	:	20
: Phosphorus	: L		:805		: L	
: Platinum	:	L	:	L	:	L
: Potassium	:0.20%		:0.60%		:0.09%	
: Silver	:0.2		:0.2		:0.2	
: Sodium	:1.12%		:2.61%		:1.32%	
: Strontium	:335		:545		:535	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:0.66%		:0.60%		:0.53%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:510		:325		:495	
: Zinc	:60		:90		:53	

Map No/Sample No/Yr	: 110/6677/86	: 111/6683/86	: 112/6676/86
Material Type	: Ultramaf	: Maf Plut	: Gneiss
Rock Type	: Umaf Int	: Maf Int	: Meta
Rock Age	: Jurassic	: Jurassic	: Jurassic
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 32/9S/72W/Sew	: 30/9S/72W/Sew	: 30/9S/72W/Sew
Location/Property	: Tatlignagpeke Mountain	: Tatlignagpeke Mountain	: Tatlignagpeke Mountain
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:0.35%			:8.53%			:10.00%		
: Antimony	:20			: L			: L		
: Arsenic	: L			: L			: L		
: Barium	:20			:81			:60		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:0.17%			:11.00%			:1.02%		
: Chromium	:310			:57			:180		
: Cobalt	:122			:35			: 2		
: Copper	:26			:245			:17		
: Gallium	: L			:30			: L		
: Gold	:	L		:	L		:	L	
: Iron	:10.70%			:9.36%			:3.37%		
: Lanthanum	: L			: L			: L		
: Lead	: 2			: 4			: 6		
: Manganese	:1100			:1360			:300		
: Magnesium	:17.80%			:4.39%			:0.80%		
: Molybdenum	: L			: L			: 2		
: Nickel	:555			:32			: 5		
: Palladium	:	10		:	L		:	L	
: Phosphorus	:68			: L			:135		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.01%			:0.17%			:0.11%		
: Silver	:0.2			:0.2			:0.2		
: Sodium	:0.09%			:1.35%			:3.83%		
: Strontium	: 9			:530			:116		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.02%			:0.80%			:0.30%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:16			:410			:43		
: Zinc	:78			:94			: 6		

Map No/Sample No/Yr	: 112/6682/86	: 113/6655/86	: 114/6654/86
Material Type	: Maf Plut	: Maf Plut	: Maf Plut
Rock Type	: Maf Int	: Maf Int	: Maf Int
Rock Age	: Jurassic	: Jurassic	: Jurassic
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 30/9S/72W/Sew	: 30/9S/72W/Sew	: 30/9S/72W/Sew
Location/Property	: Tatlignagpeke Mountain	: Tatlignagpeke Mountain	: Tatlignagpeke Mountain
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:10.80%			:9.08%			:7.35%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			: L		
: Barium	:195			:70			:35		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:10.00%			:10.10%			:8.70%		
: Chromium	:98			:180			:215		
: Cobalt	:31			:40			:48		
: Copper	:235			:54			:52		
: Gallium	:20			:30			:20		

: Gold	:	L	:	L	:	L
: Iron	:7.82%		:6.57%		:7.36%	
: Lanthanum	: L		: L		: L	
: Lead	:102		: 6		:20	
: Manganese	:1300		:1090		:1260	
: Magnesium	:4.11%		:6.15%		:7.31%	
: Molybdenum	: L		: L		: L	
: Nickel	:25		:54		:66	

: Palladium	:	L	:	L	:	20
: Phosphorus	:1260		: L		: L	
: Platinum	:	L	:	L	:	L
: Potassium	:0.72%		:0.20%		:0.12%	
: Silver	:0.2		:0.2		:0.2	
: Sodium	:2.37%		:1.27%		:0.97%	
: Strontium	:525		:380		:290	
: Thallium	: L		: L		: L	
: Tin	:NA		:NA		:NA	
: Titanium	:0.64%		:0.21%		:0.20%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	:280		:172		:157	
: Zinc	:70		:68		:52	

Map No/Sample No/Yr	: 114/6675/86	: 115/6541/86	: 116/6538/86
Material Type	: Maf Plut	: Placer	: Placer
Rock Type	: Maf Int	: Volc/Sed	: Qg
Rock Age	: Jurassic	: MzPz	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 30/9S/72W/Sew	: 12/10S/73W/Sew	: 1/10S/73W/Sew
Location/Property	: Tatlignagpeke Mountain	: Barnum Cr.	: Barnum Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 9.25%			: 5.37%			: 5.99%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			: L		
: Barium	: 115			: 230			: 305		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 9.79%			: 5.45%			: 6.58%		
: Chromium	: 79			: 2390			: 3750		
: Cobalt	: 33			: 31			: 47		
: Copper	: 90			: 38			: 52		
: Gallium	: 10			: 10			: 10		
: Gold	:	L		: 5600			: 5		
: Iron	: 8.00%			: 15.9%			: 23.4%		
: Lanthanum	: L			: 10			: 10		
: Lead	: 2			: L			: L		
: Manganese	: 1160			: 2370			: 2620		
: Magnesium	: 4.30%			: 2.92%			: 3.75%		
: Molybdenum	: L			: L			: L		
: Nickel	: 29			: 68			: 100		
: Palladium	:	L		: L			: L		
: Phosphorus	: 400			: 445			: 475		
: Platinum	:	L		: L			: L		
: Potassium	: 0.71%			: 0.48%			: 0.41%		
: Silver	: 0.2			: L			: L		
: Sodium	: 1.68%			: 1.10%			: 1.10%		
: Strontium	: 530			: 265			: 305		
: Thallium	: L			: L			: L		
: Tin	: NA			: 1			: 1		
: Titanium	: 0.54%			: 3.93%			: 4.58%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 315			: 740			: 1200		
: Zinc	: 63			: 121			: 159		

Map No/Sample No/Yr	: 117/6539/86	: 118/6665/86	: 119/6661/86
Material Type	: Placer	: Placer	: Chert
Rock Type	: Qg	: Qg	: Sed
Rock Age	: Quaternary	: Quaternary	: HzPz
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 34/9S/73W/Sew	: 23/9S/73W/Sew	: 14/9S/73W/Sew
Location/Property	: Barnum Cr. Trib.	: Barnum Cr. Trib.	: Nagotligageivik Mtn.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Grab
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay
: Aluminum	:4.36%			:3.14%			:7.70%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:30			: L		
: Barium	:395			:140			:1590		
: Beryllium	: L			: L			: 1		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:4.82%			:4.28%			:4.79%		
: Chromium	:2740			:6060			:49		
: Cobalt	:30			:44			: 9		
: Copper	:57			:58			:53		
: Gallium	: L			: L			:20		

: Gold	:	415	0.0004	:	50	0.0010	:	L	
: Iron	:14.9%			:30.5%			:3.43%		
: Lanthanum	:10			:10			: L		
: Lead	: L			: 5			:14		
: Manganese	:3410			:4800			:2040		
: Magnesium	:2.63%			:2.14%			:0.88%		
: Molybdenum	: L			: 4			: 1		
: Nickel	:87			:115			:11		

: Palladium	:	L	:	L	:	L			
: Phosphorus	:375		:350		:860				
: Platinum	:	L	:	L	:	L			
: Potassium	:0.69%		:0.28%		:2.37%				
: Silver	:1.5		:1.5		:0.2				
: Sodium	:1.36%		:0.55%		:2.05%				
: Strontium	:290		:210		:265				
: Thallium	: L		: L		: L				
: Tin	:NA		:NA		:NA				
: Titanium	:5.35%		:6.14%		:0.37%				
: Tungsten	: L		: L		: L				
: Uranium	: L		: L		: L				
: Vanadium	:810		:1470		:66				
: Zinc	:170		:235		:66				

Map No/Sample No/Yr	: 120/6662/86	: 121/6664/86	: 122/6663/86
Material Type	: Qtz	: Placer	: Placer
Rock Type	: Sed	: Qg	: Qg
Rock Age	: MzPz	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-7
Sec/T/R/Mer	: 15/9S/73W/Sew	: 22/9S/73W/Sew	: 27/9S/73W/Sew
Location/Property	: Barnum Cr.	: Barnum Cr. Trib.	: Barnum Cr. Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:4.93%			:3.48%			:2.26%		
: Antimony	: L			: L			: L		
: Arsenic	: L			:30			:20		
: Barium	:2380			:230			:120		
: Beryllium	:0.5			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.56%			:4.02%			:1.43%		
: Chromium	:155			:6220			: G		
: Cobalt	: 6			:38			:175		
: Copper	:18			:60			:53		
: Gallium	:10			:10			: L		

: Gold	:	L	:	1940	0.0002	:	560	0.0002
: Iron	:1.81%		:	:28.5%		:	:34.7%	
: Lanthanum	:10		:	:10		:	: L	
: Lead	:12		:	: 5		:	:350	
: Manganese	:1550		:	:4310		:	:2430	
: Magnesium	:0.53%		:	:2.13%		:	:3.43%	
: Molybdenum	: L		:	: 4		:	: 5	
: Nickel	: 8		:	:107		:	:460	

: Palladium	:	L	:	L	:	15
: Phosphorus	:210		:	:340	:	:135
: Platinum	:	L	:	L	:	3500
: Potassium	:2.21%		:	:0.35%	:	:0.10%
: Silver	:0.2		:	:1.5	:	:1.0
: Sodium	:0.98%		:	:0.61%	:	:0.22%
: Strontium	:305		:	:210	:	:61
: Thallium	: L		:	: L	:	: L
: Tin	:NA		:	:NA	:	:NA
: Titanium	:0.16%		:	:5.68%	:	:1.5%
: Tungsten	: L		:	: L	:	: L
: Uranium	: L		:	: L	:	: L
: Vanadium	:25		:	:1270	:	:1190
: Zinc	:33		:	:225	:	:615

Map No/Sample No/Yr	: 123/6558/86	: 124/6559/86	: 125/6540/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Sed
Rock Age	: Quaternary	: Quaternary	: Permian
Quad 4 mile/1 mile	: Goodnews Bay/B-7	: Goodnews Bay/B-7	: Goodnews Bay/B-8
Sec/T/R/Mer	: 33/9S/73W/Sew	: 21/10S/73W/Sew	: 16/10S/74W/Sew
Location/Property	: Barnum Cr. Trib.	: Camp Cr.	: Cot Mountain Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.28%			:6.97%			:6.11%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:10			:10		
: Barium	:385			:1220			:1100		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: 3		
: Cadmium	: L			: L			: L		
: Calcium	:4.33%			:0.53%			:1.07%		
: Chromium	:1930			:95			:165		
: Cobalt	:24			:10			:10		
: Copper	:50			:50			:26		
: Gallium	: L			: L			: L		
: Gold	:	50	0.0002	:	L		:	50	
: Iron	:13.1%			:4.65%			:6.36%		
: Lanthanum	:10			:20			:10		
: Lead	: L			:10			: 6		
: Manganese	:3240			:1150			:1670		
: Magnesium	:2.19%			:1.36%			:1.7%		
: Molybdenum	: L			: 2			: 2		
: Nickel	:64			:28			:21		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:295			:470			:620		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.64%			:2.58%			:1.90%		
: Silver	:1.5			: L			: L		
: Sodium	:1.03%			:1.34%			:1.71%		
: Strontium	:260			:107			:118		
: Thallium	: L			: L			: L		
: Tin	:NA			: 1			: 1		
: Titanium	:4.66%			:0.46%			:1.00%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:685			:99			:129		
: Zinc	:151			:93			:102		

Map No/Sample No/Yr	:	126/6818/86	:	127/6817/86	:	128/6816/86
Material Type	:	Placer	:	Placer	:	Placer
Rock Type	:	Qm	:	Qm	:	Qm
Rock Age	:	Quaternary	:	Quaternary	:	Quaternary
Quad 4 mile/1 mile	:	Kuskokwim Bay/A-1, B-1	:	Kuskokwim Bay/A-1, B-1	:	Kuskokwim Bay/A-1, B-1
Sec/T/R/Mer	:	11/11S/75W/Sew	:	23/11S/75W/Sew	:	25/11S/75W/Sew
Location/Property	:	Beach	:	Beach	:	Beach
KX/MAS	:		:		:	
District	:	Goodnews Bay	:	Goodnews Bay	:	Goodnews Bay
Sample Type	:	Placer	:	Placer	:	Placer
	:		:		:	

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:5.14%			:4.98%			:4.45%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:20			:20		
: Barium	:460			:500			:440		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:3.73%			:3.39%			:3.77%		
: Chromium	:3020			:2880			:5740		
: Cobalt	:26			:25			:37		
: Copper	:42			:52			:47		
: Gallium	: L			: L			:10		
: Gold	:	150	L	:	70	L	:	L	0.0003
: Iron	:11.4%			:11.2%			:14.3%		
: Lanthanum	:10			:20			:20		
: Lead	:10			:15			:10		
: Manganese	:1670			:1980			:2290		
: Magnesium	:2.17%			:2.24%			:2.76%		
: Molybdenum	: 3			: 3			: 5		
: Nickel	:78			:75			:114		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:645			:605			:590		
: Platinum	:	L	L	:	L		:	L	L
: Potassium	:0.85%			:0.86%			:0.69%		
: Silver	:1.0			: L			:1.5		
: Sodium	:1.69%			:1.69%			:1.39%		
: Strontium	:270			:260			:250		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.42%			:1.88%			:2.20%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:365			:360			:465		
: Zinc	:149			:150			:175		

Map No/Sample No/Yr	: 129/6815/86	: 130/6814/86	: 131/6813/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/A-8	: Goodnews Bay/A-8	: Goodnews Bay/A-8
Sec/T/R/Mer	: 7/12S/75W/Sew	: 17/12S/75W/Sew	: 28/12S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:5.05%			:2.83%			:3.21%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:20			:20		
: Barium	:495			:365			:270		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:3.26%			:2.58%			:2.38%		
: Chromium	:2470			: G			: G		
: Cobalt	:26			:80			:115		
: Copper	:41			:50			:56		
: Gallium	:10			: L			: L		
: Gold	:	30	L	:	L	0.0003	:	L	0.0001
: Iron	:8.97			:23.7%			:28.7%		
: Lanthanum	:20			:10			:10		
: Lead	:10			: 5			: 5		
: Manganese	:1490			:2230			:2280		
: Magnesium	:2.29%			:3.14%			:3.14%		
: Molybdenum	: L			: L			: 4		
: Nickel	:79			:225			:305		
: Palladium	:	L	:	L	:	L	:	L	:
: Phosphorus	:565			:325			:375		
: Platinum	:	L	L	:	L	0.0001	:	500	L
: Potassium	:0.86%			:0.34%			:0.35%		
: Silver	:1.0			:1.0			:1.0		
: Sodium	:1.74%			:0.76%			:0.78%		
: Strontium	:260			:163			:158		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.28%			:2.25%			:1.73%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:290			:805			:960		
: Zinc	:120			:320			:460		

Map No/Sample No/Yr	: 132/6812/86	: 133/6810/86	: 134/6811/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/A-8	: Goodnews Bay/A-8	: Goodnews Bay/A-8
Sec/T/R/Mer	: 2/13S/76W/Sew	: 7/13S/75W/Sew	: 20/12S/74W/Sew
Location/Property	: Beach	: North Spit Beach	: Goodnews Bay Beach
KX/MAS	:	:	: 33/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 2.42%			: 5.49%			: 6.32%		
: Antimony	: L			: L			: L		
: Arsenic	: 20			: 20			: 10		
: Barium	: 170			: 505			: 550		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 1.72%			: 3.81%			: 2.77%		
: Chromium	: G			: 1660			: 330		
: Cobalt	: 118			: 25			: 16		
: Copper	: 50			: 56			: 56		
: Gallium	: L			: 10			: 10		
: Gold	:	L	0.0004	:	1490	0.0002	:	20	L
: Iron	: 32.6%			: 8.85%			: 5.48%		
: Lanthanum	: 10			: 20			: 10		
: Lead	: 5			: 75			: 10		
: Manganese	: 2070			: 1510			: 1150		
: Magnesium	: 2.37%			: 2.43%			: 1.61%		
: Molybdenum	: L			: L			: L		
: Nickel	: 295			: 72			: 35		
: Palladium	:	L		:	20		:	40	
: Phosphorus	: 205			: 735			: 595		
: Platinum	:	L	0.0002	:	6300	0.0005	:	2500	L
: Potassium	: 0.24%			: 0.94%			: 1.24%		
: Silver	: 1.0			: 1.0			: 1.0		
: Sodium	: 0.48%			: 1.90%			: 2.2%		
: Strontium	: 107			: 290			: 260		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.68%			: 1.17%			: 0.66%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1170			: 265			: 171		
: Zinc	: 450			: 147			: 104		

Map No/Sample No/Yr	: 135/6544/86	: 136/6650/86	: 137/6651/86
Material Type	: Placer	: Quartzite	: Limestone
Rock Type	: Volc/Sed	: Sed	: Sed
Rock Age	: MzPz	: D0	: D0
Quad 4 mile/1 mile	: Goodnews Bay/A-8	: Goodnews Bay/A-8	: Goodnews Bay/A-8
Sec/T/R/Mer	: 2/12S/74W/Sew	: 27/11S/74W/Sew	: 22/11S/74W/Sew
Location/Property	: Sphinx Cr. Trib.	: Carter Cr.	: Carter Cr.
KX/MAS	:	: 9/	: 9/
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.65%			:0.16%			:0.10%		
: Antimony	: L			: L			:10		
: Arsenic	: L			: L			:30		
: Barium	:345			:30			:10		
: Beryllium	: L			: L			: 1		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.35%			:0.50%			: G		
: Chromium	:82			:370			:14		
: Cobalt	:16			: 2			: L		
: Copper	:57			: 9			:15		
: Gallium	:10			: L			:90		
: Gold	:	: L		:	: L		:	: L	
: Iron	:10.90%			:8.85%			:0.10%		
: Lanthanum	:10			: L			: L		
: Lead	: 6			:184			:44		
: Manganese	:3240			:200			:42		
: Magnesium	:2.22%			:0.93%			:0.15%		
: Molybdenum	: L			: 2			: 2		
: Nickel	:25			:15			: 1		
: Palladium	:	: L		:	: L		:	: L	
: Phosphorus	:890			:415			:60		
: Platinum	:	: L		:	: L		:	: L	
: Potassium	:1.67%			: L			:0.04%		
: Silver	: L			:0.2			:0.2		
: Sodium	:2.41%			: L			: L		
: Strontium	:245			:11			:235		
: Thallium	: L			: L			: L		
: Tin	: 1			:NA			:NA		
: Titanium	:1.45%			:60			:30		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:250			: 9			: 3		
: Zinc	:179			:14			:10		

Map No/Sample No/Yr	: 138/6560/86	: 139/6649/86	: 140/6648/86
Material Type	: Placer	: Limestone	: Quartzite
Rock Type	: Qg	: Sed	: Sed
Rock Age	: Quaternary	: D0	: D0
Quad 4 mile/1 mile	: Goodnews Bay/A-8	: Goodnews Bay/A-8	: Goodnews Bay/A-8
Sec/T/R/Mer	: 10/11S/74W/Sew	: 26/11S/74W/Sew	: 26/11S/74W/Sew
Location/Property	: Indian R. Trib.	: Limestone Ridge	: Limestone Ridge
KX/MAS	:	: 9/	: 9/
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 7.06%			: 0.12%			: 0.75%		
: Antimony	: L			: 10			: L		
: Arsenic	: L			: 20			: L		
: Barium	: 765			: L			: 75		
: Beryllium	: L			: 1			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 1.37%			: G			: 0.04%		
: Chromium	: 76			: 14			: 335		
: Cobalt	: 10			: L			: 3		
: Copper	: 41			: 15			: 5		
: Gallium	: L			: 80			: L		
: Gold	: L			: L			: L		
: Iron	: 5.26%			: 0.12%			: 1.69%		
: Lanthanum	: 10			: L			: L		
: Lead	: 8			: 10			: 10		
: Manganese	: 1070			: 33			: 48		
: Magnesium	: 1.33%			: 0.12%			: 0.19%		
: Molybdenum	: 2			: L			: L		
: Nickel	: 22			: 2			: 14		
: Palladium	: L			: L			: L		
: Phosphorus	: 535			: 80			: 20		
: Platinum	: L			: L			: L		
: Potassium	: 2.08%			: 0.05%			: 0.07%		
: Silver	: 0.6			: 0.2			: 0.2		
: Sodium	: 2.17%			: 0.02%			: 0.01%		
: Strontium	: 147			: 186			: 8		
: Thallium	: L			: L			: L		
: Tin	: 1			:			:		
: Titanium	: 0.51%			: 40			: 0.07%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 115			: 3			: 6		
: Zinc	: 100			: 7			: 8		

Map No/Sample No/Yr	: 141/6647/86	: 142/6561/86	: 143/6543/86
Material Type	: Limonite	: Placer	: Placer
Rock Type	: Sed	: Qg	: Qg
Rock Age	: D0	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/A-8	: Goodnews Bay/A-8	: Goodnews Bay/A-8
Sec/T/R/Mer	: 26/T1S/74W/Sew	: 36/T1S/74W/Sew	: 31/T1S/73W.Sew
Location/Property	: Limestone Ridge	: Sphinx Cr.	: Poker Cr.
KX/MAS	: 9/	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³
: Aluminum	:1.17%			:6.49%			:5.01%		
: Antimony	:30			: L			: L		
: Arsenic	:200			: L			:10		
: Barium	:105			:310			:415		
: Beryllium	: 8			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: 4			: L			: L		
: Calcium	:0.10%			:4.25%			:4.14%		
: Chromium	:57			:265			:785		
: Cobalt	:89			:20			:30		
: Copper	:22			:30			:77		
: Gallium	:100			: L			: L		
: Gold	:	L		:	4500		:	6100	0.0004
: Iron	:59.3%			:9.13%			:15.3%		
: Lanthanum	: L			:10			:10		
: Lead	: 2			: 8			: L		
: Manganese	:860			:2050			:3240		
: Magnesium	:0.52%			:2.59%			:3.50%		
: Molybdenum	: L			: L			: L		
: Nickel	:68			:30			:64		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:115			:555			:580		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.12%			:1.05%			:1.07%		
: Silver	:0.2			: L			:1.5		
: Sodium	:0.03%			:1.99%			:1.75%		
: Strontium	:14			:235			:260		
: Thallium	:20			: L			: L		
: Tin	:NA			: 1			:NA		
: Titanium	:0.04%			:2.64%			:3.65%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: L			:285			:760		
: Zinc	:475			:90			:205		

Map No/Sample No/Yr	: 144/6646/86	: 145/6542/86	: 146/6519/86
Material Type	: Siltstone	: Placer	: Placer
Rock Type	: Sed	: Qg	: Qal
Rock Age	: D0	: Quaternary	: KJ
Quad 4 mile/1 mile	: Goodnews Bay/A-8	: Goodnews Bay/A-7	: Goodnews Bay/A-6
Sec/T/R/Mer	: 24/11S/74W/Sew	: 5/11S/73W/Sew	: 17/11S/69W/SEw
Location/Property	: Limestone Ridge	: Indian River	: Goodnews R. Trib.
KX/MAS	: 97	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:3.22%			:5.84%			:7.36%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:10			:20		
: Barium	:225			:455			:360		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:0.05%			:3.01%			:2.23%		
: Chromium	:180			:400			:100		
: Cobalt	: 3			:28			:12		
: Copper	:13			:44			:42		
: Gallium	: L			:10			:10		
: Gold	: L			: 30			: L		
: Iron	:5.62%			:15.1%			:8.18%		
: Lanthanum	: L			:10			:10		
: Lead	:14			: 6			: 8		
: Manganese	:37			:2140			:1940		
: Magnesium	:0.48%			:2.61%			:1.64%		
: Molybdenum	: L			: L			: L		
: Nickel	: 6			:36			:21		
: Palladium	: L			: L			: L		
: Phosphorus	:25			:525			:870		
: Platinum	: L			: L			: L		
: Potassium	:0.29%			:1.28%			:1.34%		
: Silver	:0.4			: L			: L		
: Sodium	:0.36%			:1.69%			:1.98%		
: Strontium	:19			:146			:220		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:0.14%			:2.86%			:1.05%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 8			:585			:182		
: Zinc	:13			:149			:138		

Map No/Sample No/Yr	: 147/6556/86	: 148/6563/86	: 149/6545/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Volc/Sed	: Qg
Rock Age	: Quaternary	: KJ	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/A-6	: Goodnews Bay/A-6	: Goodnews Bay/A-6
Sec/T/R/Mer	: 5/12S/69W/Sew	: 17/12S/69W/Sew	: 18/12S/69W/Sew
Location/Property	: Goodnews R. Trib.	: Goodnews R. Trib.	: Goodnews R.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.87%			:7.04%			:7.12%		
: Antimony	: L			: L			: L		
: Arsenic	: L			:10			:10		
: Barium	:1130			:540			:265		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: 2			: 2		
: Calcium	:2.25%			:3.12%			:3.57%		
: Chromium	:195			:230			:235		
: Cobalt	:16			:21			:17		
: Copper	:66			:83			:54		
: Gallium	: L			:10			:10		
: Gold	:	L		:	L		:	L	
: Iron	:8.37%			:8.84%			:9.51%		
: Lanthanum	:10			:10			:10		
: Lead	: 6			: 2			: 2		
: Manganese	:2000			:1590			:2200		
: Magnesium	:2.04%			:3.33%			:2.33%		
: Molybdenum	: L			: L			: L		
: Nickel	:31			:60			:39		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:1140			:850			:790		
: Platinum	:	L		:	L		:	L	
: Potassium	:1.52%			:1.38%			:1.23%		
: Silver	: L			:0.2			:0.2		
: Sodium	:2.18%			:1.87%			:2.15%		
: Strontium	:260			:170			:250		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:0.96%			:1.26%			:1.29%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:197			:215			:215		
: Zinc	:134			:136			:138		

Map No/Sample No/Yr	: 150/6564/86	: 150/6565/86	: 151/6546/86
Material Type	: Placer	: Siltstone	: Placer
Rock Type	: Sed	: Sed	: Qg
Rock Age	: KJ	: KJ	: Quaternary
Quad 4 mile/1 mile	: Goodnews Bay/A-6	: Goodnews Bay/A-6	: Goodnews Bay/A-6
Sec/T/R/Mer	: 27/12S/71W/Sew	: 27/12S/71W/Sew	: 35/12S/71W/Sew
Location/Property	: Tivyagak Cr. Trib.	: Tivyagak Cr. Trib.	: Tivyagak Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Grab	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.50%			:3.06%			:8.15%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:10			:10		
: Barium	:245			:145			:215		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	:1.5			: L			: 2		
: Calcium	:5.71%			:0.62%			:5.78%		
: Chromium	:590			:81			:530		
: Cobalt	:15			: 4			:18		
: Copper	:127			:13			:56		
: Gallium	:20			: L			:10		
: Gold	:	360		:	L		:	1100	
: Iron	:9.20%			:3.44%			:9.36%		
: Lanthanum	:10			:10			:10		
: Lead	: 2			:12			: 2		
: Manganese	:1520			:2350			:1360		
: Magnesium	:2.66%			:0.54%			:2.53%		
: Molybdenum	: L			: L			: L		
: Nickel	:33			:27			:35		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:795			:195			:640		
: Platinum	:	L		:	L		:	L	
: Potassium	:1.17%			:0.38%			:1.25%		
: Silver	:0.2			:0.2			:0.2		
: Sodium	:1.88%			:0.93%			:1.88%		
: Strontium	:580			:132			:575		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	:1.04%			:0.18%			:0.92%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:265			:34			:250		
: Zinc	:114			:42			:104		

Map No/Sample No/Yr	: 152/6566/86	: 153/6547/86	: 154/6615/86
Material Type	: Placer	: Placer	: Maf Volc
Rock Type	: Volc/Sed	: Maf Volc	: Maf Volc
Rock Age	: MzPz	: MzPz	: MzPz
Quad 4 mile/1 mile	: Goodnews Bay/A-7	: Goodnews Bay/A-7	: Hagemeister Island/D-4
Sec/T/R/Mer	: 7/13S/72W/Sew	: 23/13S/73W/Sew	: 8/14S/72W/Sew
Location/Property	: Goodnews R. Trib.	: Puyulik Cr.	:
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Grab
:	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 7.51%			: 7.43%			: 7.73%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: L			: 20		
: Barium	: 215			: 145			: 215		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: 2			: 4.5			: 3		
: Calcium	: 5.09%			: 6.10%			: 7.99%		
: Chromium	: 290			: 430			: 66		
: Cobalt	: 19			: 15			: 35		
: Copper	: 66			: 49			: 76		
: Gallium	: 20			: 20			: L		
: Gold	:	: L		:	: L		:	: L	
: Iron	: 11.40%			: 14.40%			: 7.26%		
: Lanthanum	: L			: L			: 10		
: Lead	: 2			: 2			: 2		
: Manganese	: 1690			: 1240			: 1110		
: Magnesium	: 2.89%			: 2.20%			: 3.94%		
: Molybdenum	: L			: L			: L		
: Nickel	: 53			: 55			: 42		
: Palladium	:	: L		:	: L		:	: L	
: Phosphorus	: 470			: 270			: 405		
: Platinum	:	: L		:	: L		:	: L	
: Potassium	: 1.23%			: 0.94%			: 0.55%		
: Silver	: 0.2			: 0.2			: 0.2		
: Sodium	: 2.03%			: 1.66%			: 1.84%		
: Strontium	: 375			: 465			: 375		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: NA		
: Titanium	: 0.85%			: 0.69%			: 1.0%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 295			: 355			: 415		
: Zinc	: 109			: 82			: 81		

Map No/Sample No/Yr	: 155/6617/86	: 156/6616/86	: 157/6619/86
Material Type	: Maf Plut	: Maf Volc	: Maf Plut
Rock Type	: Maf Int	: Maf Volc	: Maf Int
Rock Age	: Jurassic	: MzPz	: Jurassic
Quad 4 mile/1 mile	:Hagemeister Island/D-5:Hagemeister Island/D-5:Hagemeister Island/D-5		
Sec/T/R/Mer	: 18/14S/72W/Sew	: 18/14S/72W/Sew	: 30/14S/72W/Sew
Location/Property	:	:	:
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Chip	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.49%			:7.84%			:4.23%		
: Antimony	: L			: L			: L		
: Arsenic	: L			:10			: L		
: Barium	:635			:1080			:40		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: 4			:2.5			: 2		
: Calcium	:5.96%			:7.10%			:4.60%		
: Chromium	:50			:155			:670		
: Cobalt	:29			:27			:77		
: Copper	:58			:72			:91		
: Gallium	:10			: L			: L		
: Gold	: L			: L			: L		
: Iron	:8.39%			:6.26%			:8.20%		
: Lanthanum	:10			:10			:10		
: Lead	: 2			: 2			: 2		
: Manganese	:1520			:1110			:1110		
: Magnesium	:2.78%			:3.72%			:13.7%		
: Molybdenum	: L			: L			: L		
: Nickel	:16			:41			:870		
: Palladium	: L			: L			: L		
: Phosphorus	:855			:640			:540		
: Platinum	: L			: L			: L		
: Potassium	:1.20%			:0.59%			:0.08%		
: Silver	:0.2			:0.2			:0.2		
: Sodium	:2.42%			:2.05%			:0.62%		
: Strontium	:330			:420			:124		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.40%			:1.04%			:0.86%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:400			:250			:132		
: Zinc	:75			:112			:93		

Map No/Sample No/Yr	: 158/6618/86	: 159/6567/86	: 160/6550/86
Material Type	: Maf Volc	: Placer	: Placer
Rock Type	: Maf Volc	: Qg	: Qg
Rock Age	: MzPz	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-5	: Hagemeister Island/D-5	: Hagemeister Island/D-5
Sec/T/R/Mer	: 30/14S/72W/Sew	: 31/14S/72W/Sew	: 11/15S/73W/Sew
Location/Property	:	: Unaluk R. Trib.	: Unaluk R. Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.76%			:5.87%			:6.67%		
: Antimony	: L			: L			: L		
: Arsenic	: L			:10			:10		
: Barium	:70			:210			:455		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: 3			: 3			: 4		
: Calcium	:6.81%			:5.35%			:4.90%		
: Chromium	:155			:1330			:1100		
: Cobalt	:30			:22			:24		
: Copper	:140			:74			:44		
: Gallium	:10			:20			:20		
: Gold	:	L		:	1100		:	3300	
: Iron	:7.51%			:11.80%			:12.90%		
: Lanthanum	: L			:10			:10		
: Lead	: 2			: 2			: 2		
: Manganese	:1040			:1730			:2140		
: Magnesium	:3.69%			:3.34%			:2.22%		
: Molybdenum	: L			: L			: L		
: Nickel	:68			:79			:63		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:1100			:605			:555		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.80%			:0.74%			:0.87%		
: Silver	:0.2			:0.2			:0.2		
: Sodium	:1.93%			:1.48%			:1.93%		
: Strontium	:265			:300			:310		
: Thallium	: L			: L			: L		
: Tin	:NA			: 1			: 1		
: Titanium	:1.68%			:2.31%			:1.53%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:265			:390			:480		
: Zinc	:105			:130			:115		

Map No/Sample No/Yr	: 161/6580/86	: 162/6645/86	: 163/6819/86
Material Type	: Placer	: Slate	: Hornfels
Rock Type	: Qal	: Sed	: Meta
Rock Age	: Quaternary	: MzPz	: Jurassic
Quad 4 mile/1 mile	: Hagemeister Island/D-5	: Hagemeister Island/D-5	: Hagemeister Island/D-5
Sec/T/R/Mer	: 13/15S/74W/Sew	: 4/15S/73W/Sew	: 4/15S/73W/Sew
Location/Property	: Kinegnak R.	: Unaluk R.	: Unaluk R.
KX/MAS	:	: /10	: /10
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 5.34%			: 7.05%			: 7.07%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: 50			: 10		
: Barium	: 120			: 1.38%			: 545		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: 4			: L			: L		
: Calcium	: 8.20%			: 2.46%			: 4.79%		
: Chromium	: 805			: 70			: 79		
: Cobalt	: 31			: 13			: 27		
: Copper	: 33			: 36			: 100		
: Gallium	: 10			: L			: 20		
: Gold	:	L		:	L		:	L	
: Iron	: 13.10%			: 5.00%			: 6.41%		
: Lanthanum	: L			: 10			: 10		
: Lead	: 2			: 2			: L		
: Manganese	: 1690			: 295			: 1110		
: Magnesium	: 3.75%			: 1.30%			: 2.78%		
: Molybdenum	: L			: 3			: L		
: Nickel	: 72			: 18			: 31		
: Palladium	:	10		:	L		:	L	
: Phosphorus	: 385			: 1060			: 685		
: Platinum	:	L		:	L		:	L	
: Potassium	: 0.49%			: 0.17%			: 1.00%		
: Silver	: 0.2			: 0.4			: L		
: Sodium	: 1.25%			: 4.23%			: 2.52%		
: Strontium	: 475			: 260			: 215		
: Thallium	: L			: L			: L		
: Tin	: 1			: 2			: NA		
: Titanium	: 1.6%			: 0.88%			: 0.87%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 575			: 140			: 250		
: Zinc	: 85			: 16			: 76		

Map No/Sample No/Yr	: 163/6820/86	: 164/6821/86	: 165/6643/86
Material Type	: Siltstone	: Maf Plut	: Chert
Rock Type	: Sed	: Maf Int	: Sed
Rock Age	: MzPz	: Jurassic	: MzPz
Quad 4 mile/1 mile	:Hagemeister Island/D-5:	Hagemeister Island/D-5:	Hagemeister Island/D-5:
Sec/T/R/Mer	: 4/15S/73W/Sew	: 4/15S/73W/Sew	: 9/15S/73W/Sew
Location/Property	:UnaIuk R.	:UnaIuk R.	:UnaIuk R.
KX/MAS	: /10	: /10	: /10
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:7.09%			:8.07%			:2.73%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:10			:20		
: Barium	:485			:205			:240		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.46%			:6.32%			:1.42%		
: Chromium	:57			:65			:315		
: Cobalt	:16			:31			: 9		
: Copper	:29			:78			:530		
: Gallium	:10			:20			:10		
: Gold	:	L		:	L		:	70	
: Iron	:7.64%			:6.84%			:2.12%		
: Lanthanum	:20			:10			:20		
: Lead	: 4			: L			: 4		
: Manganese	:1770			:1190			:275		
: Magnesium	:2.41%			:2.82%			:1.39%		
: Molybdenum	: L			: 1			: L		
: Nickel	:22			:28			:28		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:900			:830			:130		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.62%			:1.00%			:0.02%		
: Silver	:0.4			: L			:1.0		
: Sodium	:2.40%			:2.34%			:0.30%		
: Strontium	:56			:415			:63		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			: 1		
: Titanium	:0.84%			:1.02%			:0.19%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:160			:280			:37		
: Zinc	:74			:74			:19		

Map No/Sample No/Yr	: 165/6644/86	: 166/6822/86	: 166/6823/86
Material Type	: Maf Plut	: Maf Plut	: Maf Plut
Rock Type	: Maf Int	: Maf Int	: Maf Int
Rock Age	: Jurassic	: Jurassic	: Jurassic
Quad 4 mile/1 mile	: Hagemeister Island/D-5	: Hagemeister Island/D-5	: Hagemeister Island/D-5
Sec/T/R/Mer	: 9/15S/73W/Sew	: 3/15S/73W/Sew	: 3/15S/73W/Sew
Location/Property	: Unaluk R.	: Unaluk R.	: Unaluk R.
KX/MAS	: 710	: 710	: 710
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: 1 Pan	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 8.60%			: 6.67%			: 7.49%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: 30			: 20		
: Barium	: 470			: 810			: 275		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 9.28%			: 1.66%			: 6.92%		
: Chromium	: 120			: 135			: 140		
: Cobalt	: 32			: 25			: 29		
: Copper	: 128			: 101			: 103		
: Gallium	: 20			: L			: 20		
: Gold	: L			: 240			: L		
: Iron	: 5.68%			: 8.92%			: 6.38%		
: Lanthanum	: L			: 20			: L		
: Lead	: 4			: 6			: L		
: Manganese	: 2370			: 3000			: 1200		
: Magnesium	: 4.32%			: 0.86%			: 3.35%		
: Molybdenum	: L			: 17			: L		
: Nickel	: 96			: 23			: 47		
: Palladium	: 10			: L			: L		
: Phosphorus	: 425			: 935			: 610		
: Platinum	: L			: 125			: L		
: Potassium	: 0.03%			: 0.50%			: 0.51%		
: Silver	: 0.4			: L			: 0.4		
: Sodium	: 2.04%			: 1.21%			: 2.19%		
: Strontium	: 75			: 129			: 315		
: Thallium	: L			: L			: L		
: Tin	: 1			: NA			: NA		
: Titanium	: 0.40%			: 0.96%			: 0.86%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 134			: 230			: 255		
: Zinc	: 115			: 56			: 72		

Map No/Sample No/Yr	: 166/6824/86	: 166/6825/86	: 167/6568/86
Material Type	: Maf Plut	: Breccia	: Placer
Rock Type	: Maf Int	: Maf Int	: Qg
Rock Age	: Jurassic	: Jurassic	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-5	: Hagemeister Island/D-5	: Hagemeister Island/D-5
Sec/T/R/Mer	: 3/15S/73W/Sew	: 3/15S/73W/Sew	: 33/14S/73W/Sew
Location/Property	: Unaluk R.	: Unaluk R.	: Kinegnak Cr. Trib.
KX/MAS	: /10	: /10	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 7.30%			: 5.64%			: 6.03%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: 10			: 10		
: Barium	: 600			: 95			: 365		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: 4		
: Calcium	: 7.06%			: 7.39%			: 6.25%		
: Chromium	: 135			: 205			: 2780		
: Cobalt	: 29			: 10			: 21		
: Copper	: 101			: 40			: 66		
: Gallium	: 20			: 30			: 10		
: Gold	: L			: L			: L		
: Iron	: 6.15%			: 2.28%			: 11.70%		
: Lanthanum	: L			: L			: 10		
: Lead	: L			: L			: 4		
: Manganese	: 1100			: 560			: 2070		
: Magnesium	: 3.30%			: 0.91%			: 3.06%		
: Molybdenum	: L			: L			: L		
: Nickel	: 48			: 10			: 85		
: Palladium	: L			: L			: L		
: Phosphorus	: 565			: 120			: 620		
: Platinum	: L			: L			: L		
: Potassium	: 0.64%			: 0.02%			: 0.71%		
: Silver	: L			: L			: 0.2		
: Sodium	: 1.95%			: 0.12%			: 1.56%		
: Strontium	: 295			: 32			: 375		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: 1		
: Titanium	: 0.83%			: 0.10%			: 2.01%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 255			: 77			: 375		
: Zinc	: 67			: 17			: 98		

Map No/Sample No/Yr	: 168/6549/86	: 169/6548/86	: 170/6562/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-5	: Hagemeister Island/D-5	: Goodnews Bay/A-7
Sec/T/R/Mer	: 20/14S/73W/Sew	: 6/14S/73W/Sew	: 23/13S/74W/Sew
Location/Property	: Kinegnak R.	: Wind Cr. Trib.	: Ukfigag Cr.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 7.17%			: 8.18%			: 5.99%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: 10			: L		
: Barium	: 155			: 215			: 180		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: 2.5			: 1.5			: L		
: Calcium	: 7.95%			: 6.43%			: 6.31%		
: Chromium	: 1120			: 215			: 200		
: Cobalt	: 17			: 14			: 40		
: Copper	: 37			: 42			: 67		
: Gallium	: 10			: 10			: 10		
: Gold	: L			: L			: L		
: Iron	: 8.46%			: 7.04%			: 19.8%		
: Lanthanum	: L			: 10			: 10		
: Lead	: 2			: 2			: 2		
: Manganese	: 1610			: 1170			: 1560		
: Magnesium	: 3.59%			: 2.51%			: 3.37%		
: Molybdenum	: L			: L			: L		
: Nickel	: 72			: 27			: 58		
: Palladium	: L			: L			: NA		
: Phosphorus	: 555			: 570			: 585		
: Platinum	: L			: L			: L		
: Potassium	: 0.80%			: 1.28%			: 0.66%		
: Silver	: 0.2			: 0.2			: L		
: Sodium	: 1.81%			: 2.10%			: 1.32%		
: Strontium	: 545			: 605			: 665		
: Thallium	: L			: L			: L		
: Tin	: 1			: 1			: 1		
: Titanium	: 1.20%			: 0.69%			: 1.42%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 260			: 210			: 905		
: Zinc	: 86			: 74			: 85		

Map No/Sample No/Yr	: 1/1/66/4/86	: 1/2/6569/86	: 1/3/6620/86
Material Type	: Placer	: Placer	: Ultrama
Rock Type	: Qg	: Qg	: Umaf Int
Rock Age	: Quaternary	: Quaternary	: Jurassic
Quad 4 mile/1 mile	: Goodnews Bay/A-7	: Hagemeister Island/D-5	: Hagemeister Island/D-5
Sec/T/R/Mer	: 34/13S/74W/Sew	: 22/14S/74W/Sew	: 16/14S/74W/Sew
Location/Property	: Smalls R.	: Fog Cr.	:
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 7.38%			: 3.06%			: 0.38%		
: Antimony	: L			: L			: 20		
: Arsenic	: 10			: L			: L		
: Barium	: 255			: 62			: 15		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: 7			: 10			: L		
: Calcium	: 6.72%			: 3.05%			: 0.22%		
: Chromium	: 485			: 7670			: 940		
: Cobalt	: 23			: 86			: 113		
: Copper	: 70			: 46			: 12		
: Gallium	: 20			: 20			: L		
: Gold	:	100		:	30		:	L	
: Iron	: 10.4%			: 21.30%			: 8.35%		
: Lanthanum	: 10			: L			: L		
: Lead	: 2			: 2			: 2		
: Manganese	: 1920			: 1740			: 1330		
: Magnesium	: 2.87%			: 5.49%			: 20.00%		
: Molybdenum	: 1			: L			: L		
: Nickel	: 32			: 260			: 685		
: Palladium	:	L		:	45		:	L	
: Phosphorus	: 740			: 260			: 55		
: Platinum	:	L		:	250		:	L	
: Potassium	: 0.95%			: 0.17%			: 0.02%		
: Silver	: 0.2			: 0.2			: 0.2		
: Sodium	: 1.97%			: 0.46%			: 0.05%		
: Strontium	: 710			: 140			: 7		
: Thallium	: L			: L			: L		
: Tin	: NA			: 1			: NA		
: Titanium	: 1.19%			: 1.66%			: 0.04%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 385			: 1310			: 17		
: Zinc	: 131			: 250			: 63		

Map No/Sample No/Yr	: 174/6681/86	: 175/6789/86	: 176/6653/86
Material Type	: Ultrama f	: Placer	: Placer
Rock Type	: Umaf Int	: Qg	: Qm
Rock Age	: Jurassic	: Quaternary	: Quaternary
Quad 4 mile/1 mile	:Hagemeister Island/D-5:	Hagemeister Island/D-6:	Hagemeister Island/D-6
Sec/T/R/Mer	: 17/14S/74W/Sew	: 12/14S/75W/Sew	: 4/14S/75W/Sew
Location/Property	:Susie Mountain	:McCann Cr.	:Beach
KX/MAS	:	: 9/9	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:1.18%			:2.49%			:4.11%		
: Antimony	:10			: L			: L		
: Arsenic	: L			: L			:20		
: Barium	:20			:75			:585		
: Beryllium	: L			: L			: L		
: Bismuth	: L			:35			: L		
: Cadmium	: 1			: L			: L		
: Calcium	:6.95%			:1.61%			:2.73%		
: Chromium	:1690			: G			: G		
: Cobalt	:95			:187			:55		
: Copper	:40			:41			:69		
: Gallium	: L			: L			: L		
: Gold	:	L		:	L	0.0008	:	920	0.0001
: Iron	:7.96%			:25.7%			:26.8%		
: Lanthanum	: L			: L			:10		
: Lead	: 6			: 5			: 5		
: Manganese	:1350			:2090			:3680		
: Magnesium	:15.90%			:5.51%			:3.11%		
: Molybdenum	: L			: 5			: 7		
: Nickel	:385			:445			:166		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:95			:40			:420		
: Platinum	:	L		:	4500	0.0018	:	150	0.0002
: Potassium	:0.04%			:0.12%			:0.08%		
: Silver	:0.2			:2.0			:1.5		
: Sodium	:0.18%			:0.23%			:0.93%		
: Strontium	:52			:59			:175		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.16%			:0.89%			:4.79%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:82			:635			:1250		
: Zinc	:74			:625			:360		

Map No/Sample No/Yr	: 177/6652/86	: 178/6581/86	: 178/6582/86
Material Type	: Placer	: Till	: Till
Rock Type	: Qm	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 9/14S/75W/Sew	: 9/14S/75W/Sew	: 9/14S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 11, 17, 32/1, 2	: 11, 17, 32/1, 2
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 1.43%			: 6.17%			: 7.55%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: 10			: 10		
: Barium	: 105			: 280			: 360		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 0.93%			: 3.13%			: 3.58%		
: Chromium	: G			: 6140			: 1800		
: Cobalt	: 145			: 33			: 24		
: Copper	: 65			: 46			: 52		
: Gallium	: L			: L			: L		
: Gold	:	1120	0.0011	:	7800	0.0004	:	L	tr
: Iron	: 38%			: 8.05%			: 6.82%		
: Lanthanum	: L			: 10			: 10		
: Lead	: 5			: L			: L		
: Manganese	: 2120			: 1070			: 1120		
: Magnesium	: 2.25%			: 1.87%			: 1.93%		
: Molybdenum	: 3			: L			: L		
: Nickel	: 375			: 85			: 57		
: Palladium	:	10		:	330		:	L	
: Phosphorus	: 115			: 350			: 425		
: Platinum	:	1850	0.0038	:	G	0.0005	:	2500	0.0003
: Potassium	: 0.07%			: 0.65%			: 0.92%		
: Silver	: 1.0			: 1.0			: 1.0		
: Sodium	: 0.13%			: 1.47%			: 1.90%		
: Strontium	: 42			: 260			: 315		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.55%			: 0.83%			: 0.83%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1480			: 280			: 250		
: Zinc	: 515			: 133			: 106		

Map No/Sample No/Yr	: 178/6583/86	: 178/6584/86	: 178/6585/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 9/14S/75W/Sew	: 9/14S/75W/Sew	: 9/14S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 2.08%			: 3.67%			: 3.89%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: 10			: 10		
: Barium	: 150			: 230			: 235		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 1.48%			: 2.80%			: 2.57%		
: Chromium	: G			: G			: G		
: Cobalt	: 84			: 68			: 70		
: Copper	: 30			: 29			: 31		
: Gallium	: L			: L			: L		
: Gold	: L		tr	: 1000		tr	: 700		tr
: Iron	: 17.60%			: 11.70%			: 12.8%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: L		
: Manganese	: 1240			: 1190			: 1160		
: Magnesium	: 2.56%			: 4.76%			: 3.54%		
: Molybdenum	: L			: L			: L		
: Nickel	: 225			: 225			: 200		
: Palladium	: L			: L			: L		
: Phosphorus	: 115			: 195			: 195		
: Platinum	: L			: 200		tr	: 400		tr
: Potassium	: 0.12%			: 0.30%			: 0.34%		
: Silver	: 1.0			: 1.5			: 2.0		
: Sodium	: 0.26%			: 0.79%			: 0.82%		
: Strontium	: 71			: 155			: 145		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 0.89%			: 0.75%			: 0.75%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 560			: 365			: 415		
: Zinc	: 275			: 205			: 225		

Map No/Sample No/Yr	: 179/6586/86	: 179/6587/86	: 179/6588/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 16/14S/75W/Sew	: 16/14S/75W/Sew	: 16/14S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/I	: 32/I	: 32/I
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 2.04%			: 1.71%			: 2.23%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: L			: 10		
: Barium	: 70			: 120			: 140		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 0.88%			: 0.82%			: 0.94%		
: Chromium	: G			: G			: G		
: Cobalt	: 118			: 103			: 123		
: Copper	: 29			: 31			: 32		
: Gallium	: L			: L			: L		
: Gold	:	1250	0.0012	:	500	0.0002	:	L	0.0002
: Iron	: 20.9%			: 21.6%			: 23.5%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: L		
: Manganese	: 1460			: 1270			: 1530		
: Magnesium	: 1.94%			: 1.68%			: 2.05%		
: Molybdenum	: L			: L			: L		
: Nickel	: 285			: 245			: 300		
: Palladium	:	40		:	40		:	L	
: Phosphorus	: 40			: 75			: 75		
: Platinum	:	G	0.0058	:	4700	0.0005	:	2900	0.0014
: Potassium	: 0.09%			: 0.08%			: 0.09%		
: Silver	: 1.0			: L			: 1.0		
: Sodium	: 0.14%			: 0.12%			: 0.16%		
: Strontium	: 43			: 39			: 45		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 0.85%			: 0.83%			: 0.89%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 655			: 730			: 730		
: Zinc	: 410			: 340			: 430		

Map No/Sample No/Yr	: 179/6589/86	: 180/6590/86	: 180/6621/86
Material Type	: Placer	: Till	: Placer
Rock Type	: Qm	: Qg	: Qm - Tailings
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 16/14S/75W/Sew	: 16/14S/75W/Sew	: 16/14S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 11, 17, 32/1, 2	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Pan
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay
: Aluminum	:2.94%			:2.98%			:2.61%		
: Antimony	: L			: L			: L		
: Arsenic	: L			:10			:20		
: Barium	:165			:100			:60		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.44%			:2.18%			:1.86%		
: Chromium	: G			: G			: G		
: Cobalt	:137			:85			:105		
: Copper	:39			:27			:26		
: Gallium	: L			: L			: L		
: Gold	:	1200	0.0001	:	40	tr	:	50	
: Iron	:25.7%			:9.52%			:11.2%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: L		
: Manganese	:1830			:1060			:1190		
: Magnesium	:3.16%			:3.88%			:3.74%		
: Molybdenum	: L			: L			: L		
: Nickel	:353			:225			:255		
: Palladium	:	20		:	L		:	L	
: Phosphorus	:85			:135			:110		
: Platinum	:	5500	0.0013	:	800	tr	:	200	
: Potassium	:0.11%			:0.15%			:0.10%		
: Silver	:1.5%			:1.0			:1.0		
: Sodium	:0.22%			:0.44%			:0.27%		
: Strontium	:65			:105			:78		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.07%			:0.53%			:0.57%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:800			:245			:270		
: Zinc	:480			:310			:395		

Map No/Sample No/Yr	:	180/6622/86	:	180/6623/86	:	180/6624/86
Material Type	:	Placer	:	Placer	:	Placer
Rock Type	:	Qm	:	Qm	:	Qm
Rock Age	:	Quaternary	:	Quaternary	:	Quaternary
Quad 4 mile/1 mile	:	Hagemeister Island/D-6	:	Hagemeister Island/D-6	:	Hagemeister Island/D-6
Sec/T/R/Mer	:	16/14S/75W/Sew	:	16/14S/75W/Sew	:	16/14S/75W/Sew
Location/Property	:	Beach	:	Beach	:	Beach
KX/MAS	:	32/1	:	32/1	:	32/1
District	:	Goodnews Bay	:	Goodnews Bay	:	Goodnews Bay
Sample Type	:	Placer	:	Placer	:	Placer
	:		:		:	

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.58%			:2.80%			:2.42%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:10			:20		
: Barium	:150			:185			:205		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.37%			:1.71%			:1.80%		
: Chromium	: G			: G			: G		
: Cobalt	:108			:88			:155		
: Copper	:31			:35			:49		
: Gallium	: L			: L			: L		
: Gold	:	115	0.0008	:	L	0.0003	:	L	L
: Iron	:20.7%			:17.9%			:30.8%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: 5		
: Manganese	:1400			:1280			:2230		
: Magnesium	:2.45%			:3.14%			:4.1%		
: Molybdenum	: L			: L			: 3		
: Nickel	:270			:240			:430		
: Palladium	:	40		:	L		:	25	
: Phosphorus	:120			:170			:175		
: Platinum	:	G	0.0073	:	1500	0.0016	:	4250	0.0010
: Potassium	:0.15%			:0.17%			:0.19%		
: Silver	: L			: L			:1.5		
: Sodium	:0.31%			:0.44%			:0.43%		
: Strontium	:73			:94			:96		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.84%			:0.86%			:1.25%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:675			:620			:940		
: Zinc	:355			:275			:550		

Map No/Sample No/Yr	: 181/6625/86	: 181/6626/86	: 181/6627/86
Material Type	: Till	: Placer	: Placer
Rock Type	: Qg	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 16/14S/75W/Sew	: 16/14S/75W/Sew	: 16/14S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 11, 17, 32/1, 2	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:1.84%			:2.03%			:2.76%		
: Antimony	: L			: L			: L		
: Arsenic	: L			:20			:30		
: Barium	:75			:125			:140		
: Beryllium	: L			: L			: L		
: Bismuth	:20			:10			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.84%			:1.39%			:1.56%		
: Chromium	: G			: G			: G		
: Cobalt	:155			:160			:190		
: Copper	:38			:42			:46		
: Gallium	: L			: L			: L		
: Gold	:	L	L	:	L	L	:	L	L
: Iron	:20.2%			:28.5%			:35.6%		
: Lanthanum	: L			: L			: L		
: Lead	: 5			: 5			: 5		
: Manganese	:1860			:2100			:2480		
: Magnesium	:10.3%			:4.6%			:4.39%		
: Molybdenum	: 5			: 3			: 4		
: Nickel	:585			:465			:520		
: Palladium	:	10		:	L		:	L	
: Phosphorus	:170			:95			:260		
: Platinum	:	1400	L	:	800	0.0030	:	750	L
: Potassium	:0.10%			:0.12%			:0.15%		
: Silver	:1.5			:13			:1.0		
: Sodium	:0.28%			:0.29%			:0.35%		
: Strontium	:66			:67			:78		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.78%			:0.94%			:1.2%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:455			:835			:1000		
: Zinc	:490			:565			:675		

Map No/Sample No/Yr	: 181/6628/86	: 182/6629/86	: 182/6630/86
Material Type	: Placer	: Till	: Placer
Rock Type	: Qm	: Qg	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 16/14S/75W/Sew	: 21/14S/75W/Sew	: 21/14S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 11, 17, 32/1, 2	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.39%			:2.69%			:2.81%		
: Antimony	: L			:10			: L		
: Arsenic	:30			: L			:20		
: Barium	:135			:115			:140		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.50%			:3.53%			:3.06%		
: Chromium	: G			: G			: G		
: Cobalt	:175			:122			:155		
: Copper	:46			:40			:50		
: Gallium	: L			: L			: L		
: Gold	:	L	0.0007	:	L		:	L	L
: Iron	:33.6%			:20.1%			:31%		
: Lanthanum	: L			:10			: L		
: Lead	: 5			: 5			: 5		
: Manganese	:2350			:1640			:2220		
: Magnesium	:3.66%			:13.00%			:5.66%		
: Molybdenum	: 4			: 4			: L		
: Nickel	:470			:600			:455		
: Palladium	:	L		:	L		:	25	
: Phosphorus	:115			:230			:200		
: Platinum	:	200	0.0003	:	300	L	:	1050	0.0003
: Potassium	:0.14%			:0.22%			:0.17%		
: Silver	:1.5			:1.0			:1.5		
: Sodium	:0.32%			:0.64%			:0.45%		
: Strontium	:71			:143			:127		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.21%			:0.80%			:1.21%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:1010			:520			:935		
: Zinc	:635			:310			:550		

Map No/Sample No/Yr	: 182/6640/86	: 182/6641/86	: 182/6642/86
Material Type	: Till	: Placer	: Placer
Rock Type	: Qg	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 21/14S/75W/Sew	: 21/14S/75W/Sew	: 21/14S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 11, 17, 32/1, 2	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.03%			:1.72%			:1.26%		
: Antimony	:10			: L			: L		
: Arsenic	: L			:20			:20		
: Barium	:85			:120			:100		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:3.24%			:1.98%			:1.64%		
: Chromium	: G			: G			: G		
: Cobalt	:112			:120			:103		
: Copper	:38			:40			:34		
: Gallium	: L			: L			: L		
: Gold	:	: L	: L	:	: L	: L	:	: L	: 0.0001
: Iron	:17.7%			:25.6%			:24.5%		
: Lanthanum	: L			: L			: L		
: Lead	: 5			: 5			: 5		
: Manganese	:1500			:1800			:1590		
: Magnesium	:13.5%			:3.95%			:3.42%		
: Molybdenum	: 3			: L			: L		
: Nickel	:585			:350			:295		
: Palladium	:	: 15	:	: 15	:	:	: L		
: Phosphorus	:165			:135			:145		
: Platinum	:	: 1500	: 0.0002	:	: 3200	: 0.0001	:	: 3250	: 0.0034
: Potassium	:0.15%			:0.12%			:0.10%		
: Silver	:1.0			:1.5			:1.0		
: Sodium	:0.46%			:0.29%			:0.24%		
: Strontium	:112			:85			:68		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.86%			:1.04%			:1.06%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:535			:835			:870		
: Zinc	:255			:425			:335		

Map No/Sample No/Yr	: 183/6633/86	: 183/6634/86	: 183/6635/86
Material Type	: Till	: Placer	: Placer
Rock Type	: Qg	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 21/14S/75W/Sew	: 21/14S/75W/Sew	: 21/14S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 11, 17, 32/1, 2	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:4.46%			:2.12%			:2.02%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:20			:30		
: Barium	:255			:100			:110		
: Beryllium	: L			: L			: L		
: Bismuth	: 5			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:4.38%			:2.01%			:1.43%		
: Chromium	: G			: G			: G		
: Cobalt	:125			:160			:171		
: Copper	: 59			:46			:49		
: Gallium	: L			: L			: L		
: Gold	: L	: L	: L	: L	: L	: L	: L	: L	: L
: Iron	:23.3%			:31.8%			:35.6%		
: Lanthanum	:10			: L			: L		
: Lead	: 5			: 5			: 5		
: Manganese	:2070			:2200			:2400		
: Magnesium	:7.02%			:5.45%			:4.55%		
: Molybdenum	: 4			: 4			: 4		
: Nickel	:385			:475			:495		
: Palladium	: L	: L	: L	: L	: L	: L	: L	: L	: L
: Phosphorus	:355			:105			:150		
: Platinum	: 250	: 250	: 250	: 1650	: 1650	: 1650	: 5000	: 5000	: 5000
: Potassium	:0.52%			:0.11%			:0.10%		
: Silver	:1.5			:1.0			:1.5		
: Sodium	:1.25%			:0.26%			:0.22%		
: Strontium	:245			:79			:62		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.12%			:1.23%			:1.33%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:675			:1020			:1050		
: Zinc	:420			:545			:610		

Map No/Sample No/Yr	: 183/6636/86	: 184/6827/86	: 185/6828/86
Material Type	: Placer	: UltramaF	: UltramaF
Rock Type	: Qm	: Umaf Int	: Umaf Int
Rock Age	: Quaternary	: Jurassic	: Jurassic
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 21/14S/75W/Sew	: 23/14S/75W/Sew	: 14/14S/75W/Sew
Location/Property	: Beach	: Red Mountain	: Red Mountain
KX/MAS	: 32/1	: 5, 13, 15/7	: 5, 13, 15/7
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 2.25%			: 3.56%			: 1.16%		
: Antimony	: L			: L			: 10		
: Arsenic	: 30			: 20			: L		
: Barium	: 135			: 175			: 45		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 1.96%			: 6.25%			: 1.06%		
: Chromium	: G			: 3550			: G		
: Cobalt	: 155			: 72			: 164		
: Copper	: 57			: 42			: 40		
: Gallium	: L			: 10			: L		
: Gold	: L	: L		: L	: 0.0001		: 750	: L	
: Iron	: 34.1%			: 20.9%			: 19.5%		
: Lanthanum	: 10			: 10			: L		
: Lead	: 5			: 5			: 5		
: Manganese	: 2350			: 1410			: 1750		
: Magnesium	: 5.12%			: 8.24%			: 15.9%		
: Molybdenum	: 3			: L			: 3		
: Nickel	: 460			: 250			: 710		
: Palladium	: L			: L			: L		
: Phosphorus	: 200			: 85			: 75		
: Platinum	: 1300	: 0.0101		: L	: L		: 3600	: 0.0001	
: Potassium	: 0.12%			: 0.39%			: 0.04%		
: Silver	: 1.0			: L			: 1.5		
: Sodium	: 0.30%			: 1.00%			: 0.10%		
: Strontium	: 88			: 255			: 23		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.44%			: 1.22%			: 0.48%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1110			: 920			: 340		
: Zinc	: 550			: 149			: 420		

Map No/Sample No/Yr	: 186/6/85/86	: 187/6502/86	: 187/6/86/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qac	: Meta	: Umaf Int
Rock Age	: Quaternary	: MZPz	: Jurassic
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 14/14S/75W/Sew	: 14/14S/75W/Sew	: 14/14S/75W/Sew
Location/Property	: Clara Cr.	: Clara Cr.	: Clara Cr.
KX/MAS	: 1, 3, 6-7, 10/3	: 1, 3, 6-7, 10/3	: 1, 3, 6-7, 10/3
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:1.98%			:3.02%			:2.35%		
: Antimony	:10			:10			: L		
: Arsenic	: L			: L			: L		
: Barium	:10			:165			:65		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			:15		
: Cadmium	: L			: L			: L		
: Calcium	:1.81%			:2.61%			:1.84%		
: Chromium	: G			: G			: G		
: Cobalt	:93			:113			:149		
: Copper	:48			:58			:55		
: Gallium	: L			: L			: L		
: Gold	: L			: 3230			: 30		: L
: Iron	:14.20%			:13.3%			:22.5%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: 5		
: Manganese	:1300			:2070			:1900		
: Magnesium	:8.91%			:10.10%			:10.2%		
: Molybdenum	: L			: L			: 4		
: Nickel	:385			:385			:505		
: Palladium	: 70			: L			: L		
: Phosphorus	:80			:210			:		
: Platinum	: 8000			: 700	0.0087		:95	6400	0.0339
: Potassium	:0.06%			:0.41%			:0.12%		
: Silver	: L			: L			:1.5		
: Sodium	:0.27%			:1.22%			:0.42%		
: Strontium	:117			:157			:122		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.47%			:0.69%			:0.76%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:505			:375			:580		
: Zinc	:194			:295			:465		

Map No/Sample No/Yr	: 188/6501/86	: 189/6787/86	: 190/6739/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Umaf Int
Rock Age	: Quaternary	: Quaternary	: Jurassicry
Quad 4 mile/1 mile	:Hagemeister Island/D-6:	Hagemeister Island/D-6:	Hagemeister Island/D-6
Sec/T/R/Mer	: 14/14S/75W/Sew	: 13/14S/75W/Sew	: 24/14S/75W/Sew
Location/Property	:Clara Cr.	:Clara Cr.	:Dowry Cr.
KX/MAS	: 1, 3, 6-7, 10/3	: 1, 3, 6-7, 10/3	: 16/
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³
: Aluminum	:1.81%			:2.29%			:2.44%		
: Antimony	: L			: L			: L		
: Arsenic	:10			: L			: L		
: Barium	:35			:60			:45		
: Beryllium	: L			: L			: L		
: Bismuth	:28			: L			:22		
: Cadmium	: L			: L			: L		
: Calcium	:0.82%			:2.53%			:0.85%		
: Chromium	: G			: G			: G		
: Cobalt	:113			:150			:174		
: Copper	:18			:65			:36		
: Gallium	: L			: L			: L		
: Gold	: 10			: G			: L		L
: Iron	:17.9%			:34.6%			:13.6%		
: Lanthanum	: L			: L			: L		
: Lead	: L			:40			: L		
: Manganese	:1340			:2120			:2240		
: Magnesium	:5.93%			:4.63%			:11.00%		
: Molybdenum	: L			: L			: L		
: Nickel	:375			:390			:620		
: Palladium	: 20			: G			: 165		
: Phosphorus	: L			:80			:50		
: Platinum	: 2600			: G			: G		0.0035
: Potassium	:0.07%			:0.13%			:0.06%		
: Silver	: L			:1.5			:0.4		
: Sodium	:0.12%			:0.26%			:0.05%		
: Strontium	:35			:86			:24		
: Thallium	: L			: L			: L		
: Tin	: 1			:NA			:NA		
: Titanium	:0.63%			:1.68%			:0.91%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:440			:1340			:750		
: Zinc	:325			:465			:510		

Map No/Sample No/Yr	: 191/6738/86	: 192/6740/86	: 193/6788/86
Material Type	: Placer	: Peg	: Placer
Rock Type	: Umaf Int	: Umaf Int	: Qg
Rock Age	: Jurassic	: Jurassic	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 24/14S/75W/Sew	: 24/14S/75W/Sew	: 24/14S/75W/Sew
Location/Property	: Dowry Cr.	: Dowry Cr.	: Clara Cr.
KX/MAS	: 16/	: 16/	: 1, 3, 6-7, 10/3
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Grab	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:2.29%			:17.40			:2.31%		
: Antimony	:10			: L			: L		
: Arsenic	: L			: L			:10		
: Barium	:50			:960			:40		
: Beryllium	: L			:2.5			: L		
: Bismuth	: 9			: L			: L		
: Cadmium	: L			: 1			: L		
: Calcium	:1.00%			:7.87%			:2.13%		
: Chromium	: G			:44			: G		
: Cobalt	:161			: 8			:94		
: Copper	:34			:33			:33		
: Gallium	: L			:40			: L		
: Gold	:	L	0.0006	:	L		:	L	
: Iron	:22.7%			:1.23%			:21.00%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: 4			: L		
: Manganese	:2090			:420			:1710		
: Magnesium	:12.9%			:1.22%			:4.55%		
: Molybdenum	: L			: 2			: L		
: Nickel	:640			:29			:285		
: Palladium	:	130		:	L		:	130	
: Phosphorus	:55			:1190			:125		
: Platinum	:	G	0.0215	:	L		:	2150	
: Potassium	:0.07%			:3.47%			:0.09%		
: Silver	: L			: L			: L		
: Sodium	:0.08%			:3.59%			:0.30%		
: Strontium	:32			:5510			:120		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.93%			:0.14%			:1.05%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:760			:23			:1070		
: Zinc	:445			:24			:215		

Map No/Sample No/Yr	: 194/6760/86	: 195/6761/86	: 196/6570/86
Material Type	: Placer	: Placer	: Ultramaf
Rock Type	: Qg - Tailings	: Qg - Tailings	: Umaf Int
Rock Age	: Quaternary	: Quaternary	: Jurassic
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 24/14S/75W/Sew	: 24/14S/75W/Sew	: 24/14S/75W/Sew
Location/Property	: Dowry Cr.	: Dowry Cr.	: Salmon R.
KX/MAS	: 16/	: 16/	: 1-4,7-8,14,16,18-19/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: 1 Pan
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay
: Aluminum	:2.18%			:2.04%			:2.17%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			:10		
: Barium	:55			:85			:24		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.24%			:1.74%			:15.00%		
: Chromium	: G			: G			:865		
: Cobalt	:200			:155			:35		
: Copper	:45			:55			:28		
: Gallium	: L			: L			: L		
: Gold	:	70	L	:	80	0.0002	:	L	
: Iron	:30.2%			:35.6%			:5.61%		
: Lanthanum	: L			: L			: L		
: Lead	: 5			: 5			: L		
: Manganese	:2610			:2410			:900		
: Magnesium	:10.3%			:7.15%			:8.07%		
: Molybdenum	: 3			: L			: L		
: Nickel	:650			:490			:93		
: Palladium	:	160	:	L	:		200		
: Phosphorus	:30			:95			:70		
: Platinum	:	G	0.0015	:	3500	0.0007	:	G	
: Potassium	:0.06%			:0.10%			:0.04%		
: Silver	:1.0			:1.0			: L		
: Sodium	:0.11%			:0.20%			:0.17%		
: Strontium	:42			:60			:60		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.96%			:1.59%			:0.39%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:870			:1390			:210		
: Zinc	:640			:490			:42		

Map No/Sample No/Yr	: 197/6748/86	: 198/6749/86	: 199/6791/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg - Tailings	: Qg - Tailings	: Qg - Tailings
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 25/14S/75W/Sew	: 25/14S/75W/Sew	: 36/14S/75W/Sew
Location/Property	: Salmon R.	: Salmon R.	: Salmon R.
KX/MAS	: 1-4,7-8,14,16,18-19/4	: 1-4,7-8,14,16,18-19/4	: 1-4,7-8,14,16,18-19/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³
: Aluminum	:3.27%			:3.92%			:4.44%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:20			: L		
: Barium	:85			:105			:115		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:6.44%			:7.15%			:7.16%		
: Chromium	:5250			:1850			:4390		
: Cobalt	:66			:52			:80		
: Copper	:34			:59			:54		
: Gallium	: L			: L			: L		
: Gold	:	4900		:	5100		:	280	
: Iron	:11.60%			:15.30%			:24.6%		
: Lanthanum	: L			:10			:10		
: Lead	: L			: L			: 5		
: Manganese	:1410			:1360			:1630		
: Magnesium	:8.87%			:4.80%			:3.47%		
: Molybdenum	: L			: L			: L		
: Nickel	:270			:127			:161		
: Palladium	:	5		:	L		:	L	
: Phosphorus	:210			:395			:275		
: Platinum	:	1625		:	775		:	3900	0.0012
: Potassium	:0.18%			:0.26%			:0.28%		
: Silver	: L			: L			:1.5		
: Sodium	:0.72%			:0.82%			:0.91%		
: Strontium	:250			:270			:215		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.67%			:0.78%			:1.46%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:410			:680			:1030		
: Zinc	:112			:80			:168		

Map No/Sample No/Yr	: 200/6781/86	: 201/6778/86	: 201/6779/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg - Tailings	: Qg - Tailings	: Qg - Tailings
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 36/14S/75W/Sew	: 36/14S/75W/Sew	: 36/14S/75W/Sew
Location/Property	: Salmon R.	: Salmon R.	: Salmon R.
KX/MAS	: T-4,7-8,14,16,18-19/4	: T-4,7-8,14,16,18-19/4	: T-4,7-8,14,16,18-19/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 3.17%			: 2.04%			: 4.84%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: 70			: L		
: Barium	: 95			: 60			: 115		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 7.86%			: 3.97%			: 6.92%		
: Chromium	: 6160			: G			: 6250		
: Cobalt	: 87			: 115			: 73		
: Copper	: 54			: 57			: 59		
: Gallium	: L			: 30			: L		
: Gold	:	160		:	L		:	L	L
: Iron	: 27%			: 40.1%			: 25.1%		
: Lanthanum	: L			: L			: 10		
: Lead	: 10			: 10			: 10		
: Manganese	: 1810			: 1950			: 1700		
: Magnesium	: 4.75%			: 2.73%			: 2.79%		
: Molybdenum	: L			: L			: L		
: Nickel	: 188			: 255			: 156		
: Palladium	:	L		:	L		:	L	
: Phosphorus	: 140			: 115			: 200		
: Platinum	:	L	0.0015	:	L		:	200	L
: Potassium	: 0.26%			: 0.13%			: 0.50%		
: Silver	: 1.0			: 1.5			: 1.0		
: Sodium	: 0.62%			: 0.26%			: 0.75%		
: Strontium	: 205			: 143			: 385		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.42%			: 1.95%			: 1.44%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1130			: 1670			: 980		
: Zinc	: 205			: 310			: 168		

Map No/Sample No/Yr	: 202/6780/86	: 203/6792/86	: 204/6793/86
Material Type	: Placer	: Placer	: Siltstone
Rock Type	: Qg - Tailings	: Qg - Tailings	: Sed
Rock Age	: Quaternary	: Quaternary	: MzPz
Quad 4 mile/1 mile	:Hagemeister Island/D-6	:Hagemeister Island/D-6	:Hagemeister Island/D-6
Sec/T/R/Mer	: 36/14S/75W/Sew	: 36/14S/75W/Sew	: 36/14S/75W/Sew
Location/Property	:Salmon R.	:Salmon R.	:Salmon R.
KX/MAS	:1-4,7-8,14,16,18-19/4	:1-4,7-8,14,16,18-19/4	:1-4,7-8,14,16,18-19/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.01%			:3.34%			:2.41%		
: Antimony	: L			: L			: L		
: Arsenic	:130			: L			:80		
: Barium	:70			:140			:140		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.54%			:3.50%			:1.69%		
: Chromium	: G			: G			: G		
: Cobalt	:159			:129			:177		
: Copper	:60			:71			:78		
: Gallium	:40			: L			:20		
: Gold	: L			: L			: L		
: Iron	:47.4%			:34.7%			:48.9%		
: Lanthanum	: L			: L			: L		
: Lead	: 5			: 5			: 5		
: Manganese	:2520			:2440			:3200		
: Magnesium	:1.92%			:3.23%			:2.11%		
: Molybdenum	: L			: 3			: L		
: Nickel	:365			:315			:390		
: Palladium	: L			: L			: L		
: Phosphorus	:75			:110			:70		
: Platinum	: 800	0.0024		: 2500	0.0013		: 5400	0.0036	
: Potassium	:0.10%			:0.23%			:0.17%		
: Silver	:1.0			:2.5			:2.0		
: Sodium	:0.13%			:0.52%			:0.18%		
: Strontium	:95			:200			:98		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:2.13%			:1.68%			:2.27%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:1920			:1330			:1960		
: Zinc	:430			:345			:495		

Map No/Sample No/Yr	: 205/6750/86	: 206/6597/86	: 207/6598/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg - Tailings	: Qac - Tailings	: Qac - Tailings
Rock Age	: Quaternary	: MzPz	: MzPz
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 36/14S/75W/Sew	: 26/14S/75W/Sew	: 26/14S/75W/Sew
Location/Property	: Salmon R.	: Squirrel Cr.	: Squirrel Cr.
KX/MAS	: T-4,7-8,14,16,18-19/4	: 2f/4	: 2f/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 3.41%			: 1.71%			: 2.00%		
: Antimony	: L			: 10			: 10		
: Arsenic	: L			: L			: L		
: Barium	: 93			: 35			: 43		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 3.62%			: 2.70%			: 4.39%		
: Chromium	: G			: G			: G		
: Cobalt	: 126			: 102			: 102		
: Copper	: 63			: 20			: 21		
: Gallium	: 10			: L			: L		
: Gold	:	: L		:	: 175		:	: 10	
: Iron	: 40.3%			: 10.6%			: 10.5%		
: Lanthanum	: 10			: L			: L		
: Lead	: L			: L			: L		
: Manganese	: 2220			: 1220			: 1290		
: Magnesium	: 3.53%			: 9.81%			: 10.6%		
: Molybdenum	: L			: L			: L		
: Nickel	: 290			: 390			: 375		
: Palladium	:	: 15		:	: L		:	: L	
: Phosphorus	: 110			: 85			: 110		
: Platinum	:	: 2050	: 0.0037	:	: 300	: 0.0021	:	: 1000	: 0.0006
: Potassium	: 0.16%			: 0.06%			: 0.07%		
: Silver	: L			: L			: 1		
: Sodium	: 0.26%			: 0.13%			: 0.18%		
: Strontium	: 141			: 56			: 77		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 2.2%			: 0.37%			: 0.38%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1860			: 250			: 240		
: Zinc	: 320			: 280			: 280		

Map No/Sample No/Yr	: 208/6599/86	: 209/6579/86	: 210/6578/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qac - Tailings	: Qg - Tailings	: Qg - Tailings
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 26/14S/75W/Sew	: 35/14S/75W/Sew	: 35/14S/75W/Sew
Location/Property	: Squirrel Cr.	: Platinum Cr.	: Platinum Cr.
KX/MAS	: 2f/4	: 2d/4	: 2d/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.01%			:2.50%			:1.84%		
: Antimony	:10			: L			: L		
: Arsenic	: L			: L			: L		
: Barium	:35			:55			:39		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:0.79%			:2.82%			:1.97%		
: Chromium	: G			: G			: G		
: Cobalt	:145			:108			:115		
: Copper	:24			:36			:35		
: Gallium	: L			: L			: L		
: Gold	: L			: 140			: L		
: Iron	:15.5%			:20%			:20.5%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: L		
: Manganese	:1630			:1280			:1330		
: Magnesium	:12.6%			:5.4%			:4.85%		
: Molybdenum	: L			: L			: L		
: Nickel	:575			:315			:330		
: Palladium	: L			: 20			: 80		
: Phosphorus	:45			:45			:45		
: Platinum	: 3000	0.0033		: 3700	0.0012		: 8800	0.0039	
: Potassium	:0.05%			:0.08%			:0.06%		
: Silver	:1.5			: L			: L		
: Sodium	:0.06%			:0.19%			:0.08%		
: Strontium	:26			:83			:44		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.39%			:0.75%			:0.75%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:330			:605			:630		
: Zinc	:380			:290			:330		

Map No/Sample No/Yr	: 211/6577/86	: 212/6576/86	: 213/6575/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qg	: Volc/SEd
Rock Age	: Quaternary	: Quaternary	: MzPz
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 35/14S/75W/Sew	: 35/14S/75W/Sew	: 34/14S/75W/Sew
Location/Property	: Platinum Cr.	: Platinum Cr.	: Platinum Cr.
KX/MAS	: 2d/4	: 2d/4	: 2d/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.25%			:4.27%			:3.37%		
: Antimony	: L			: L			: L		
: Arsenic	: L			:10			:10		
: Barium	:45			:70			:65		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.10%			:3.82%			:5.05%		
: Chromium	: G			: G			: G		
: Cobalt	:119			:128			:92		
: Copper	:35			:41			:33		
: Gallium	: L			: L			: L		
: Gold	:	L		:	60		:	6700	0.0006
: Iron	:20.4%			:21.5%			:15.5%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: L		
: Manganese	:1450			:1740			:1360		
: Magnesium	:5.90%			:4.51%			:4.40%		
: Molybdenum	: L			: L			: L		
: Nickel	:365			:330			:230		
: Palladium	:	170		:	50		:	420	
: Phosphorus	:85			:90			:115		
: Platinum	:	G	0.0093	:	G	0.0046	:	G	0.0028
: Potassium	:0.07%			:0.18%			:0.16%		
: Silver	: L			: L			: L		
: Sodium	:0.11%			:0.41%			:0.36%		
: Strontium	:62			:176			:154		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.78%			:0.98%			:0.68%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:625			:615			:430		
: Zinc	:345			:460			:300		

Map No/Sample No/Yr	: 213/6784/86	: 214/6574/86	: 215/6573/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Volc/Sed	: Qg - Tailings	: Volc/Sed
Rock Age	: MzPz	: Quaternary	: MzPz
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 34/14S/75W/Sew	: 35/14S/75W/Sew	: 34/14S/75W/Sew
Location/Property	: Platinum Cr.	: Fox Gulch	: Fox Gulch
KX/MAS	: 2d/4	: 2c/4	: 2c/4
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:4.72%			:1.82%			:2.14%		
: Antimony	: L			: L			: L		
: Arsenic	:20			: L			: L		
: Barium	:55			:35			:37		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:6.20%			:5.00%			:0.77%		
: Chromium	: G			: G			: G		
: Cobalt	:52			:75			:142		
: Copper	:40			:38			:30		
: Gallium	: L			: L			: L		
: Gold	: L			: L			: L		
: Iron	:12.90%			:9.65%			:19.4%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: L		
: Manganese	:1200			:1030			:1660		
: Magnesium	:3.69%			:9.50%			:7.46%		
: Molybdenum	: L			: L			: L		
: Nickel	:146			:320			:490		
: Palladium	: 20			: L			: L		
: Phosphorus	:280			:95			:90		
: Platinum	: 2885			: 8500	0.0121		: 4000	0.0009	
: Potassium	:0.31%			:0.06%			:0.06%		
: Silver	: L			: L			: L		
: Sodium	:0.85%			:0.14%			:0.05%		
: Strontium	:330			:88			:32		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.66%			:0.41%			:0.57%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:365			:285			:485		
: Zinc	:187			:149			:445		

Map No/Sample No/Yr	: 216/6572/86	: 217/6571/86	: 218/6826/86
Material Type	: Placer	: Placer	: Ultramaf
Rock Type	: Umaf Int	: Umaf Int	: Umaf Int
Rock Age	: Jurassic	: Jurassic	: Jurassic
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 34/14S/75W/Sew	: 34/14S/75W/Sew	: 27/14S/75W/Sew
Location/Property	: Fox Gulch	: Fox Gulch	: Red Mountain
KX/MAS	: 2c/4	: 2c/4	: 5, 13, 15/7
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:1.78%			:1.64%			:2.8%		
: Antimony	:10			:10			: L		
: Arsenic	: L			: L			: L		
: Barium	:50			:40			:120		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.29%			:1.09%			:2.52%		
: Chromium	: G			: G			: G		
: Cobalt	:103			:96			:140		
: Copper	:30			:25			:71		
: Gallium	: L			: L			: L		
: Gold	:	L		:	5		:	L	0.0002
: Iron	:16.4%			:14.10%			:20%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			:15		
: Manganese	:1330			:1210			:2430		
: Magnesium	:9.31%			:8.39%			:9.54%		
: Molybdenum	: L			: L			: 5		
: Nickel	:440			:405			:625		
: Palladium	:	50		:	L		:	L	
: Phosphorus	:195			:135			:235		
: Platinum	:	G	0.0078	:	500	0.0378	:	1200	0.0011
: Potassium	:0.07%			:0.06%			:0.14%		
: Silver	: L			: L			:1.0		
: Sodium	:0.13%			:1.00%			:0.37%		
: Strontium	:65			:51			:423		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.63%			:0.54%			:0.62%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:455			:375			:310		
: Zinc	:260			:240			:630		

Map No/Sample No/Yr	: 219/6698/86	: 219/6699/86	: 219/6700/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 33/14S/75W/Sew	: 33/14S/75W/Sew	: 33/14S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.41%			:2.14%			:2.14%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:20			:20		
: Barium	:265			:125			:170		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.54%			:2.11%			:1.79%		
: Chromium	: G			: G			: G		
: Cobalt	:115			:125			:120		
: Copper	:43			:43			:42		
: Gallium	: L			: L			: L		

: Gold	:	L	L	:	L	L	:	L	0.0002
: Iron	:29.5%			:30.8%			:32.8%		
: Lanthanum	: L			: L			: L		
: Lead	: 5			: 5			: 5		
: Manganese	:1990			:2040			:2030		
: Magnesium	:2.44%			:2.39%			:1.86%		
: Molybdenum	: 4			: 3			: L		
: Nickel	:270			:305			:280		

: Palladium	:	L		:	L		:	L	
: Phosphorus	:185			:165			:195		
: Platinum	:	1400	0.0001	:	700	L	:	150	L
: Potassium	:0.24%			:0.17%			:0.21%		
: Silver	:1.0			:1.5			:1.0		
: Sodium	:0.55%			:0.41%			:0.48%		
: Strontium	:129			:99			:102		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.51%			:1.46%			:1.51%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:1100			:1100			:1250		
: Zinc	:390			:450			:415		

Map No/Sample No/Yr	: 220/6726/86	: 220/6727/86	: 220/6728/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 4/15S/75W/Sew	: 4/15S/75W/Sew	: 4/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.92%			:1.97%			:2.94%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:10			:10		
: Barium	:140			:155			:170		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			:40		
: Cadmium	: L			: L			: L		
: Calcium	:1.79%			:1.30%			:1.35%		
: Chromium	: G			: G			: G		
: Cobalt	:122			:120			:142		
: Copper	:33			:23			:35		
: Gallium	: L			:10			:10		
: Gold	:	L	0.0003	:		2900 0.0065	:		5300 0.0008
: Iron	:26.1%			:26.8%			:30.6%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: L		
: Manganese	:1770			:1870			:2110		
: Magnesium	:2.32%			:2.20%			:2.29%		
: Molybdenum	: L			: L			:15		
: Nickel	:290			:290			:350		
: Palladium	:	L		:		35	:		L
: Phosphorus	:90			:135			:185		
: Platinum	:	L	0.0004	:		3300 0.0025	:		1125 0.0003
: Potassium	:1.00%			:0.07%			:0.10%		
: Silver	: L			:0.4			: L		
: Sodium	:0.23%			:0.15%			:0.17%		
: Strontium	:85			:57			:70		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.14%			:0.77%			:1.31%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:930			:945			:1030		
: Zinc	:425			:430			:500		

Map No/Sample No/Yr	: 220/6730/86	: 221/6729/86	: 221/6741/86
Material Type	: Till	: Placer	: Placer
Rock Type	: Qg	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 4/15S/75W/Sew	: 4/15S/75W/Sew	: 4/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:3.46%			:2.91%			:2.12%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:10			:10		
: Barium	:125			:280			:245		
: Beryllium	: L			: L			: L		
: Bismuth	: 9			: L			: 9		
: Cadmium	: L			: L			: L		
: Calcium	:2.16%			:1.43%			:0.69%		
: Chromium	: G			: G			: G		
: Cobalt	:105			:137			:158		
: Copper	:34			:34			:40		
: Gallium	:10			:10			:10		
: Gold	:	L	L	:	L	0.0013	:	2500	0.0044
: Iron	:22.5%			:28.7%			:34.4%		
: Lanthanum	:10			: L			: L		
: Lead	: L			: L			: L		
: Manganese	:1850			:1970			:2140		
: Magnesium	:2.25%			:2.38%			:1.63%		
: Molybdenum	: L			: L			: L		
: Nickel	:240			:335			:370		
: Palladium	:	L		:	L		:	70	
: Phosphorus	:185			:50			: L		
: Platinum	:	200		:	900	0.0023	:	G	0.0062
: Potassium	:0.17%			:0.09%			:0.08%		
: Silver	: L			:0.4			: L		
: Sodium	:0.41%			:0.17%			:0.08%		
: Strontium	:122			:75			:30		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.27%			:1.24%			:1.44%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:740			:975			:1280		
: Zinc	:400			:475			:545		

Map No/Sample No/Yr	: 221/6742/86	: 222/6737/86	: 223/6743/86
Material type	: Placer	: Till	: Till
Rock Type	: Qm	: Qg	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 4/15S/75W/Sew	: 9/15S/75W/Sew	: 9/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.36%			:6.53%			:7.12%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:10			:10		
: Barium	:305			:385			:545		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: 7			: L		
: Cadmium	: L			: L			: 3		
: Calcium	:1.74%			:4.38%			:4.41%		
: Chromium	: G			:9610			:4550		
: Cobalt	:120			:56			:39		
: Copper	:36			:56			:56		
: Gallium	:10			:10			:10		
: Gold	:	430	0.0072	:	L	L	:	L	L
: Iron	:24.7%			:13.1%			:8.81%		
: Lanthanum	:10			:10			:10		
: Lead	: L			: L			: L		
: Manganese	:1840			:1620			:1350		
: Magnesium	:2.23%			:3.56%			:3.13%		
: Molybdenum	: L			: L			: L		
: Nickel	:270			:151			:115		
: Palladium	:	175		:	L		:	L	
: Phosphorus	:75			:460			:475		
: Platinum	:	G	0.0102	:	L		:	L	
: Potassium	:0.12%			:0.81%			:0.96%		
: Silver	: L			: L			: L		
: Sodium	:0.23%			:1.54%			:1.83%		
: Strontium	:74			:285			:320		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.31%			:1.29%			:0.99%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:935			:530			:345		
: Zinc	:400			:192			:145		

Map No/Sample No/Yr	: 223/6744/86	: 223/6745/86	: 224/6746/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 9/15S/75W/Sew	: 9/15S/75W/Sew	: 9/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 3.24%			: 2.78%			: 2.71%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: 10			: 10		
: Barium	: 380			: 425			: 180		
: Beryllium	: L			: L			: L		
: Bismuth	: 10			: 110			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 2.08%			: 1.71%			: 1.51%		
: Chromium	: G			: G			: G		
: Cobalt	: 148			: 151			: 164		
: Copper	: 44			: 44			: 46		
: Gallium	: 10			: 10			: 10		
: Gold	:	14100	0.0013	:	1070	0.0012	:	70	0.0392
: Iron	: 31.8%			: 32.9%			: 37.7%		
: Lanthanum	: 10			: L			: L		
: Lead	: L			: L			: L		
: Manganese	: 2290			: 2250			: 2380		
: Magnesium	: 3.13%			: 2.56%			: 2.42%		
: Molybdenum	: L			: 39			: L		
: Nickel	: 355			: 365			: 395		
: Palladium	:	105		:	45		:	55	
: Phosphorus	: 100			: 320			: 65		
: Platinum	:	G	0.0019	:	5525	0.0021	:	7250	0.0717
: Potassium	: 0.17%			: 0.14%			: 0.11%		
: Silver	: L			: L			: L		
: Sodium	: 0.29%			: 0.20%			: 0.15%		
: Strontium	: 99			: 79			: 62		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.66%			: 1.62%			: 1.68%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1220			: 1250			: 1440		
: Zinc	: 500			: 505			: 545		

Map No/Sample No/Yr	: 224/6747/86	: 224/6762/86	: 225/6799/86
Material Type	: Till	: Placer	: Placer
Rock Type	: Qg	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 9/15S/75W/Sew	: 9/15S/75W/Sew	: 16/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:7.33%			:2.31%			:3.17%		
: Antimony	: L			: L			: L		
: Arsenic	:10			: L			: L		
: Barium	:400			:210			:230		
: Beryllium	: L			: L			: L		
: Bismuth	:16			: 9			: L		
: Cadmium	: L			: L			: L		
: Calcium	:5.02%			:1.16%			:2.68%		
: Chromium	: G			: G			: G		
: Cobalt	:58			:155			:144		
: Copper	:58			:40			:53		
: Gallium	:10			:10			: L		
: Gold	:	L	L	: 1700	0.0044		: G	0.0443	
: Iron	:12.6%			:36.00%			:31.8%		
: Lanthanum	:10			: L			: L		
: Lead	: L			: L			: 5		
: Manganese	:1660			:2290			:2240		
: Magnesium	:4.76%			:2.08%			:3.37%		
: Molybdenum	: L			: L			: 4		
: Nickel	:180			:375			:355		
: Palladium	:	L		: 60			: 200		
: Phosphorus	:500			:45			:170		
: Platinum	:	700	L	: G	0.0095		: G	0.1378	
: Potassium	:0.93%			:0.09%			:0.29%		
: Silver	: L			: L			:2.5		
: Sodium	:1.83%			:0.12%			:0.66%		
: Strontium	:345			:50			:143		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.29%			:1.66%			:1.44%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:485			:1410			:1100		
: Zinc	:196			:525			:515		

Map No/Sample No/Yr	: 225/6800/86	: 225/6809/86	: 226/6763/86
Material Type	: Till	: Placer	: Till
Rock Type	: Qg	: Qm	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 16/15S/75W/Sew	: 16/15S/75W/Sew	: 16/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 5.58%			: 1.80%			: 6.45%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: 30			: 10		
: Barium	: 495			: 185			: 535		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: 16		
: Cadmium	: L			: L			: L		
: Calcium	: 4.63%			: 1.47%			: 4.94%		
: Chromium	: 3950			: G			: G		
: Cobalt	: 37			: 155			: 70		
: Copper	: 51			: 48			: 52		
: Gallium	: L			: L			: 10		

: Gold	:	80	0.0005	:	5500	0.0088	:	20	0.0004
: Iron	: 10.1%			: 38.6%			: 14.2%		
: Lanthanum	: 10			: L			: 10		
: Lead	: 5			: 5			: 6		
: Manganese	: 1350			: 2250			: 1570		
: Magnesium	: 2.96%			: 2.22%			: 4.18%		
: Molybdenum	: 3			: L			: L		
: Nickel	: 109			: 375			: 196		

: Palladium	:	L	:	30	:	L
: Phosphorus	: 790		: 45		: 345	
: Platinum	:	300	0.0013	:	8700	0.0157
: Potassium	: 0.88%		: 0.12%		: 0.67%	
: Silver	: 2.0		: 1.5		: L	
: Sodium	: 1.85%		: 0.21%		: 1.42%	
: Strontium	: 320		: 65		: 330	
: Thallium	: L		: L		: L	
: Tin	: NA		: NA		: NA	
: Titanium	: 0.79%		: 1.57%		: 1.26%	
: Tungsten	: L		: L		: L	
: Uranium	: L		: L		: L	
: Vanadium	: 280		: 1380		: 560	
: Zinc	: 130		: 545		: 210	

Map No/Sample No/Yr	: 226/6764/86	: 226/6765/86	: 227/6797/86
Material Type	: Placer	: Placer	: Till
Rock Type	: Qm	: Qm	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 16/15S/75W/Sew	: 16/15S/75W/Sew	: 15/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 3.85%			: 3.29%			: 5.69%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: L			: 10		
: Barium	: 165			: 115			: 410		
: Beryllium	: L			: L			: L		
: Bismuth	: 22			: 10			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 2.90%			: 0.99%			: 4.31%		
: Chromium	: G			: G			: 9040		
: Cobalt	: 142			: 210			: 55		
: Copper	: 43			: 48			: 64		
: Gallium	: 10			: L			: L		
: Gold	:	L	0.0011	:	6000	0.0007	:	L	
: Iron	: 28.1%			: 45.6%			: 11.4%		
: Lanthanum	: L			: L			: 10		
: Lead	: L			: L			: 5		
: Manganese	: 2080			: 2830			: 1250		
: Magnesium	: 3.32%			: 2.29%			: 2.78%		
: Molybdenum	: L			: L			: L		
: Nickel	: 335			: 500			: 142		
: Palladium	:	20		:	L		:	L	
: Phosphorus	: 125			: L			: 555		
: Platinum	:	4925	0.0044	:	3800	0.0014	:	400	L
: Potassium	: 0.21%			: 0.11%			: 0.87%		
: Silver	: L			: L			: 2.0		
: Sodium	: 0.44%			: 0.13%			: 1.82%		
: Strontium	: 128			: 44			: 320		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.42%			: 1.80%			: 0.86%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1100			: 1750			: 340		
: Zinc	: 465			: 675			: 200		

Map No/Sample No/Yr	: 227/6798/86	: 227/6801/86	: 228/6766/86
Material Type	: Placer	: Placer	: Till
Rock Type	: Qm	: Qm	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 15/15S/75W/Sew	: 15/15S/75W/Sew	: 15/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
XX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 2.39%			: 1.57%			: 5.05%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: 20			: 10		
: Barium	: 95			: 125			: 295		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 0.63%			: 1.09%			: 5.82%		
: Chromium	: G			: G			: G		
: Cobalt	: 235			: 148			: 61		
: Copper	: 53			: 45			: 48		
: Gallium	: L			: L			: L		
: Gold	: G	0.1029		: 50	0.0003		: L		L
: Iron	: 48.4%			: 37%			: 13.8%		
: Lanthanum	: L			: L			: 10		
: Lead	: 5			: 5			: 5		
: Manganese	: 2750			: 2140			: 1480		
: Magnesium	: 2.29%			: 1.86%			: 3.86%		
: Molybdenum	: 3			: L			: L		
: Nickel	: 540			: 360			: 165		
: Palladium	: 110			: 20			: L		
: Phosphorus	: L			: 30			: 360		
: Platinum	: G	0.2605		: 1200	0.0008		: L		L
: Potassium	: 0.10%			: 0.10%			: 0.65%		
: Silver	: 2.0			: 1.5			: 1.5		
: Sodium	: 0.15%			: 0.16%			: 1.47%		
: Strontium	: 32			: 45			: 350		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.59%			: 1.57%			: 1.08%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1720			: 1330			: 440		
: Zinc	: 745			: 515			: 235		

Map No/Sample No/Yr	: 228/6767/86	: 228/6768/86	: 229/6794/86
Material Type	: Placer	: Placer	: Till
Rock Type	: Qm	: Qm	: Qg
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 15/15S/75W/Sew	: 15/15S/75W/Sew	: 15/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:1.80%			:1.77%			:5.71%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			:10		
: Barium	:145			:110			:475		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:2.77%			:0.84%			:4.48%		
: Chromium	: G			: G			:5960		
: Cobalt	:114			:190			:54		
: Copper	:46			:50			:59		
: Gallium	: L			: L			: L		
: Gold	:	L	0.0002	:	L	0.0007	:	320	L
: Iron	:31.6%			:44.7%			:13%		
: Lanthanum	: L			: L			:10		
: Lead	: 5			: 5			: 5		
: Manganese	:2130			:2550			:1550		
: Magnesium	:3.32%			:1.96%			:4.25%		
: Molybdenum	: L			: L			: 3		
: Nickel	:285			:450			:170		
: Palladium	:	L		:	30		:	L	
: Phosphorus	:100			:25			:610		
: Platinum	:	1400	0.0008	:	2300	0.0015	:	300	L
: Potassium	:0.14%			:0.10%			:0.88%		
: Silver	:1.5			:1.0			:2.0		
: Sodium	:0.32%			:0.14%			:1.91%		
: Strontium	:105			:36			:320		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.57%			:1.65%			:0.96%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:1090			:1580			:375		
: Zinc	:360			:620			:163		

Map No/Sample No/Yr	: 229/6795/86	: 229/6796/86	: 230/6707/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6:	Hagemeister Island/D-6:	Hagemeister Island/D-6:
Sec/T/R/Mer	: 15/15S/75W/Sew	: 15/15S/75W/Sew	: 22/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 2.77%			: 3.13%			: 1.77%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			: 20		
: Barium	: 170			: 165			: 80		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 2.98%			: 1.77%			: 1.2%		
: Chromium	: G			: G			: G		
: Cobalt	: 142			: 200			: 175		
: Copper	: 53			: 53			: 50		
: Gallium	: L			: L			: L		
: Gold	: L	0.0002		: 300	0.0004		: L	0.0006	
: Iron	: 33.3%			: 41.3%			: 42.4%		
: Lanthanum	: 10			: L			: L		
: Lead	: 5			: L			: 5		
: Manganese	: 2380			: 2650			: 2570		
: Magnesium	: 4.01%			: 2.92%			: 2.01%		
: Molybdenum	: 3			: 4			: L		
: Nickel	: 365			: 470			: 410		
: Palladium	: L			: L			: 30		
: Phosphorus	: 150			: 105			: 80		
: Platinum	: 3600	0.0002		: 3000	0.0016		: 4600	0.0006	
: Potassium	: 0.22%			: 0.23%			: 0.09%		
: Silver	: 2.0			: 1.5			: 1.5		
: Sodium	: 0.45%			: 0.47%			: 0.15%		
: Strontium	: 131			: 95			: 47		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.63%			: 1.6%			: 1.72%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1170			: 1460			: 1590		
: Zinc	: 510			: 660			: 580		

Map No/Sample No/Yr	: 230/6708/86	: 230/6769/86	: 230/6770/86
Material Type	: Placer	: Till	: Placer
Rock Type	: Qm	: Qg	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 22/T5S/75W/Sew	: 22/T5S/75W/Sew	: 22/T5S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:2.57%			:3.05%			:1.98%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			: L		
: Barium	:60			:90			:65		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	:15.5			: L			: L		
: Calcium	:0.67%			:4.89%			:0.64%		
: Chromium	: G			: G			: G		
: Cobalt	:143			:115			:215		
: Copper	:28			:44			:51		
: Gallium	: L			: L			: L		

: Gold	:	L	0.0003	:	L	0.0001	:	L	0.0014
: Iron	:40.2%			:20%			:46.2%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: 5			: 5		
: Manganese	:2130			:1960			:2630		
: Magnesium	:1.67%			:4.15%			:1.93%		
: Molybdenum	: L			: 3			: 3		
: Nickel	:330			:270			:495		

: Palladium	:	45	:	50	:	L			
: Phosphorus	:	70	:	135	:	L			
: Platinum	:	7500	0.0005	:	L	0.0002	:	2400	0.0041
: Potassium	:	0.17%	:	0.20%	:	0.08%			
: Silver	:	L	:	1.0	:	1.0			
: Sodium	:	0.18%	:	0.52%	:	0.08%			
: Strontium	:	34	:	190	:	23			
: Thallium	:	L	:	L	:	L			
: Tin	:	NA	:	NA	:	NA			
: Titanium	:	1.38%	:	1.21%	:	1.63%			
: Tungsten	:	L	:	L	:	L			
: Uranium	:	L	:	L	:	L			
: Vanadium	:	1330	:	635	:	1690			
: Zinc	:	460	:	435	:	680			

Map No/Sample No/Yr	: 231/6709/86	: 231/6710/86	: 231/6711/86
Material Type	: Till	: Placer	: Placer
Rock Type	: Qg	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 22/15S/75W/Sew	: 22/15S/75W/Sew	: 22/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	: 32/1	: 32/1	: 32/1
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 5.61%			: 3.49%			: 4.36%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: L			: 10		
: Barium	: 140			: 110			: 165		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 9.06%			: 2.03%			: 3.71%		
: Chromium	: 7470			: G			: G		
: Cobalt	: 32			: 123			: 84		
: Copper	: 35			: 31			: 33		
: Gallium	: L			: L			: L		
: Gold	:	L	0.0002	:	2300		L	:	860
: Iron	: 5.96%			: 34.50%			: 22.00%		
: Lanthanum	: L			: L			: 10		
: Lead	: L			: L			: L		
: Manganese	: 1160			: 1900			: 1660		
: Magnesium	: 4.31%			: 2.32%			: 3.09%		
: Molybdenum	: L			: L			: L		
: Nickel	: 77			: 285			: 215		
: Palladium	:	L		:	L		:	L	
: Phosphorus	: 320			: 125			: 320		
: Platinum	:	800	0.0001	:	500		L	:	1100
: Potassium	: 0.80%			: 0.30%			: 0.47%		
: Silver	: L			: L			: L		
: Sodium	: 1.52%			: 0.51%			: 0.92%		
: Strontium	: 410			: 106			: 178		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 0.59%			: 1.14%			: 1.02%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 230			: 1000			: 670		
: Zinc	: 92			: 395			: 275		

Map No/Sample No/Yr	: 232/6758/86	: 232/6759/86	: 232/6771/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 27/15S/75W/Sew	: 27/15S/75W/Sew	: 27/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	: 3.45%			: 2.88%			: 1.80%		
: Antimony	: L			: L			: L		
: Arsenic	: 10			: 10			: L		
: Barium	: 100			: 75			: 100		
: Beryllium	: L			: L			: L		
: Bismuth	: 25			: 23			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 1.75%			: 1.32%			: 0.95%		
: Chromium	: G			: G			: G		
: Cobalt	: 171			: 165			: 164		
: Copper	: 42			: 40			: 46		
: Gallium	: 10			: 10			: L		
: Gold	:	L	L	:	L	L	:	L	0.0001
: Iron	: 34.2%			: 33.3%			: 38.7%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: L			: 5		
: Manganese	: 2460			: 2500			: 2390		
: Magnesium	: 2.4%			: 2.18%			: 1.77%		
: Molybdenum	: L			: L			: L		
: Nickel	: 395			: 390			: 395		
: Palladium	:	L		:	L		:	L	
: Phosphorus	: 65			: 60			: 55		
: Platinum	:	2400	L	:	L		:	1400	0.0001
: Potassium	: 0.14%			: 0.10%			: 0.11%		
: Silver	: L			: L			: 1.5		
: Sodium	: 0.25%			: 0.11%			: 0.16%		
: Strontium	: 75			: 53			: 45		
: Thallium	: L			: L			: L		
: Tin	: NA			: NA			: NA		
: Titanium	: 1.66%			: 1.75%			: 1.67%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 1300			: 1270			: 1420		
: Zinc	: 575			: 585			: 575		

Map No/Sample No/Yr	: 233/6772/86	: 233/6773/86	: 233/6774/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 27/15S/75W/Sew	: 27/15S/75W/Sew	: 27/15S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³
: Aluminum	:1.72%			:3.55%			:2.38%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			: L		
: Barium	:85			:170			:155		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:1.50%			:3.62%			:2.61%		
: Chromium	: G			: G			: G		
: Cobalt	:139			:145			:105		
: Copper	:43			:46			:40		
: Gallium	: L			: L			: L		
: Gold	:	L	L	: 50	L	L	:	L	L
: Iron	:33.5%			:28.3%			:25.7%		
: Lanthanum	: L			:10			: L		
: Lead	: 5			: 5			: 5		
: Manganese	:2220			:2420			:1810		
: Magnesium	:1.97%			:3.78%			:2.43%		
: Molybdenum	: L			: 3			: L		
: Nickel	:340			:360			:250		
: Palladium	:	L		: L			: L		
: Phosphorus	:85			:200			:160		
: Platinum	:	L	L	: L	L	L	: L	L	L
: Potassium	:0.11%			:0.29%			:0.23%		
: Silver	:1.5			:1.5			:1.5		
: Sodium	:0.19%			:0.67%			:0.52%		
: Strontium	:60			:174			:134		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.64%			:1.55%			:1.44%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:1230			:940			:950		
: Zinc	:500			:530			:350		

Map No/Sample No/Yr	: 234/6775/86	:	234/6776/86	:	234/6777/86
Material Type	: Placer	:	Placer	:	Placer
Rock Type	: Qm	:	Qm	:	Qm
Rock Age	: Quaternary	:	Quaternary	:	Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	:	Hagemeister Island/D-6	:	Hagemeister Island/D-6
Sec/T/R/Mer	: 34/15S/75W/Sew	:	34/15S/75W/Sew	:	34/15S/75W/Sew
Location/Property	: Beach	:	Beach	:	Beach
KX/MAS	:	:	:	:	:
District	: Goodnews Bay	:	Goodnews Bay	:	Goodnews Bay
Sample Type	: Placer	:	Placer	:	Placer
	:	:	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay
: Aluminum	: 2.23%			: 2.10%			: 1.60%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			: L		
: Barium	: 100			: 85			: 85		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 2.04%			: 2.05%			: 1.42%		
: Chromium	: G			: G			: G		
: Cobalt	: 140			: 140			: 130		
: Copper	: 45			: 44			: 42		
: Gallium	: L			: L			: L		

: Gold	:	3300	0.0001	:	L	0.0001	:	L
: Iron	: 32.3%			: 32.2%			: 30.4%	
: Lanthanum	: L			: L			: L	
: Lead	: 5			: 10			: 5	
: Manganese	: 2250			: 2210			: 2130	
: Magnesium	: 2.14%			: 2.23%			: 1.94%	
: Molybdenum	: 5			: 4			: L	
: Nickel	: 325			: 335			: 305	

: Palladium	:	L		:	L		:	L
: Phosphorus	: 125			: 90			: 95	
: Platinum	:	600	0.0001	:	L	0.0001	:	L
: Potassium	: 0.16%			: 0.13%			: 0.10%	
: Silver	: 1.0			: 1.0			: 1.0	
: Sodium	: 0.36%			: 0.29%			: 0.18%	
: Strontium	: 98			: 94			: 61	
: Thallium	: L			: L			: L	
: Tin	: NA			: NA			: NA	
: Titanium	: 1.60%			: 1.42%			: 1.61%	
: Tungsten	: L			: L			: L	
: Uranium	: L			: L			: L	
: Vanadium	: 1120			: 1050			: 1050	
: Zinc	: 510			: 515			: 465	

Map No/Sample No/Yr	: 235/6836/86	: 236/6837/86	: 237/6838/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qm	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/D-6	: Hagemeister Island/D-6	: Hagemeister Island/D-6
Sec/T/R/Mer	: 2/T6S/75W/Sew	: 11/T6S/75W/Sew	: 7/T6S/75W/Sew
Location/Property	: Beach	: Beach	: Beach
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay
: Aluminum	:1.64%			:2.83%			:3.26%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:20			:20		
: Barium	:75			:155			:184		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:0.88%			:2.02%			:2.85%		
: Chromium	: G			: G			: G		
: Cobalt	:154			:139			:107		
: Copper	:45			:48			:49		
: Gallium	: L			: L			:10		
: Gold	:	130	0.0010	:	20	0.0005	:	L	
: Iron	:37.1%			:34.2%			:28.1%		
: Lanthanum	: L			: L			:10		
: Lead	: 5			: 5			: 5		
: Manganese	:2180			:2280			:2560		
: Magnesium	:1.51%			:2.10%			:2.62%		
: Molybdenum	: L			: L			: 3		
: Nickel	:350			:320			:255		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:70			:160			:305		
: Platinum	:	L	0.0006	:	L	0.0001	:	L	
: Potassium	:0.09%			:0.24%			:0.35%		
: Silver	:2.0			:2.0			:2.5		
: Sodium	:0.15%			:0.56%			:0.74%		
: Strontium	:46			:124			:163		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.63%			:1.71%			:2.19%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:1370			:1260			:970		
: Zinc	:560			:530			:455		

Map No/Sample No/Yr	: 238/6839/86	: 239/6609/86	: 240/6608/86
Material Type	: Placer	: Str. Sed.	: Str. Sed.
Rock Type	: Qm	: Umf Int	: Umf Int
Rock Age	: Quaternary	: Paleozoic	: Paleozoic
Quad 4 mile/1 mile	: Hagemester Island/D-6	: Hagemester Island/C-6	: Hagemester Island/C-6
Sec/T/R/Mer	: 22/16S/75W/Sew	: 2/17S/76W/Sew	: 2/17S/76W/Sew
Location/Property	: Beach	: Chagvan Mountain	: Chagvan Mountain
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Sediment	: Sediment
	:	:	:

Element	ICP	AA/Wet	Oz/yd ³	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:4.27%			:7.73%			:7.62%		
: Antimony	: L			: L			: L		
: Arsenic	:20			: L			:10		
: Barium	:290			:420			:380		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:4.29%			:1.94%			:2.64%		
: Chromium	:7330			:46			:175		
: Cobalt	:46			: 7			:16		
: Copper	:41			:34			:50		
: Gallium	:10			: L			: L		
: Gold	:	330	L	:	L		:	L	
: Iron	:16.3%			:4.62%			:4.48%		
: Lanthanum	:20			:10			:10		
: Lead	:10			:12			:10		
: Manganese	:1910			:740			:880		
: Magnesium	:2.52%			:0.88%			:1.92%		
: Molybdenum	: 3			: 1			: 2		
: Nickel	:122			:14			:71		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:440			:1300			:1140		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.56%			:1.21%			:1.00%		
: Silver	:2.0			:0.4			:0.2		
: Sodium	:1.29%			:2.14%			:2.19%		
: Strontium	:270			:200			:188		
: Thallium	: L			: L			: L		
: Tin	:NA			: 1			: 1		
: Titanium	:1.83%			:0.61%			:0.57%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:510			:94			:104		
: Zinc	:195			:59			:65		

Map No/Sample No/Yr	: 241/6632/26	: 242/6607/86	: 242/6631/86
Material Type	: Qtz	: Ultramaf	: Ultramaf
Rock Type	: Umaf Int	: Umaf Int	: Umaf Int
Rock Age	: Paleozoic	: Paleozoic	: Paleozoic
Quad 4 mile/1 mile	: Hagemeister Island/C-6	: Hagemeister Island/C-6	: Hagemeister Island/C-6
Sec/T/R/Mer	: 10/17S/76W/Sew	: 15/17S/76W/Sew	: 10/17S/76W/Sew
Location/Property	: Chagvan Mountain	: Chagvan Mountain	: Chagvan Mountain
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	: 4.43%			: 4.15%			: 4.39%		
: Antimony	: L			: 10			: 10		
: Arsenic	: 10			: 30			: L		
: Barium	: 14300			: 65			: 55		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	: 2.51%			: 2.45%			: 2.34%		
: Chromium	: 125			: 965			: 975		
: Cobalt	: 22			: 80			: 77		
: Copper	: 140			: 91			: 67		
: Gallium	: L			: L			: L		
: Gold	:	L		: 50			:	L	
: Iron	: 2.98%			: 7.73%			: 7.15%		
: Lanthanum	: L			: L			: L		
: Lead	: 2			: 8			: 2		
: Manganese	: 3580			: 985			: 980		
: Magnesium	: 0.73%			: 15%			: 14.5%		
: Molybdenum	: L			: L			: L		
: Nickel	: 61			: 865			: 800		
: Palladium	:	L		: L			: L		
: Phosphorus	: 9510			: L			: L		
: Platinum	:	L		: L			: L		
: Potassium	: 0.06%			: 0.3%			: 0.02%		
: Silver	: 0.4			: 0.2			: 0.6		
: Sodium	: 2.54%			: 0.23%			: 0.31%		
: Strontium	: 425			: 16			: 125		
: Thallium	: L			: L			: L		
: Tin	: 1			: 7			: 1		
: Titanium	: 0.29%			: 0.04%			: 0.05%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	: 176			: 21			: 25		
: Zinc	: 32			: 61			: 58		

Map No/Sample No/Yr	: 243/6606/86	: 243/6610/86	: 244/6808/86
Material Type	: Maf Plut	: Maf Plut	: Placer
Rock Type	: Umf Int	: Umf Int	: Qg
Rock Age	: Paleozoic	: Paleozoic	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/C-6	: Hagemeister Island/C-6	: Hagemeister Island/C-6
Sec/T/R/Mer	: T6/T7S/76W/Sew	: T6/T7S/76W/Sew	: 27/T7S/76W/Sew
Location/Property	: Chagvan Mountain	: Chagvan Mountain	: Security Cove Trib.
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Specimen	: Grab	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:			: 8.16%			: 8.39%		
: Antimony	:			: L			: L		
: Arsenic	:			: 20			: 10		
: Barium	:			: 45			: 105		
: Beryllium	:			: L			: L		
: Bismuth	:			: L			: L		
: Cadmium	:			: 1			: 0.5		
: Calcium	:			: 6.72%			: 7.63%		
: Chromium	:			: 170			: 2040		
: Cobalt	:			: 25			: 18		
: Copper	:			: 54			: 34		
: Gallium	:			: 10			: 10		
: Gold	:			:	35		:	20	
: Iron	:			: 6.17%			: 4.65%		
: Lanthanum	:			: 10			: L		
: Lead	:			: 2			: L		
: Manganese	:			: 1020			: 1110		
: Magnesium	:			: 4.23%			: 2.42%		
: Molybdenum	:			: 1			: L		
: Nickel	:			: 92			: 75		
: Palladium	:			:	L		:	L	
: Phosphorus	:			: 1340			: 285		
: Platinum	:			:	L		:	L	
: Potassium	:			: 0.09%			: 0.25%		
: Silver	:			: 0.2			: L		
: Sodium	:			: 2.71%			: 1.71%		
: Strontium	:			: 182			: 360		
: Thallium	:			: L			: L		
: Tin	:			: 2			: NA		
: Titanium	:			: 1.01%			: 0.77%		
: Tungsten	:			: L			: L		
: Uranium	:			: L			: L		
: Vanadium	:			: 140			: 155		
: Zinc	:			: 59			: 81		

Map No/Sample No/Yr	: 245/6807/86	: 246/6806/86	: 247/6805/86
Material Type	: Placer	: Placer	: Placer
Rock Type	: Qg	: Qm	: Qm
Rock Age	: Quaternary	: Quaternary	: Quaternary
Quad 4 mile/1 mile	:Hagemeister Island/C-6:	Hagemeister Island/C-6:	Hagemeister Island/C-6
Sec/T/R/Mer	: 33/17S/76W/Sew	: 31/17S/76W/Sew	: 1/18S/77W/Sew
Location/Property	:Security Cove Trib.	:Security Cove	:Security Cove
KX/MAS	:	:	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay
: Aluminum	:6.87%			:6.40%			:6.85%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:10			:20		
: Barium	:190			:200			:195		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			: L		
: Calcium	:6.06%			:4.58%			:5.01%		
: Chromium	:8290			:5660			:4560		
: Cobalt	:35			:22			:35		
: Copper	:76			:33			:76		
: Gallium	:10			: L			:10		

: Gold	:	40	:	L	:	G	0.756
: Iron	:6.79%		:5.27%		:6.85%		
: Lanthanum	: L		: L		:10		
: Lead	: L		: L		: L		
: Manganese	:1680		:1630		:1130		
: Magnesium	:2.45%		:2.08%		:1.94%		
: Molybdenum	: L		: L		: 1		
: Nickel	:119		:90		:104		

: Palladium	:	L	:	L	:	L	
: Phosphorus	:230		:310		:275		
: Platinum	:	L	:	L	:	L	
: Potassium	:0.45%		:0.38%		:0.49%		
: Silver	: L		:0.4		:0.8		
: Sodium	:1.42%		:1.46%		:1.62%		
: Strontium	:275		:240		:315		
: Thallium	: L		: L		: L		
: Tin	:NA		:NA		:NA		
: Titanium	:0.86%		:1.19%		:0.94%		
: Tungsten	: L		: L		: L		
: Uranium	: L		: L		: L		
: Vanadium	:210		:177		:205		
: Zinc	:183		:169		:133		

Map No/Sample No/Yr	: 248/6790/86	: 248/6802/86	: 249/6803/86
Material Type	: Qtz	: Argillite	: Placer
Rock Type	: Sed	: Sed	: Qg
Rock Age	: Paleozoic	: Paleozoic	: Quaternary
Quad 4 mile/1 mile	: Hagemeister Island/C-6:	Hagemeister Island/C-6:	Hagemeister Island/C-6:
Sec/T/R/Mer	: 12/18S/77W/Sew	: 12/18S/77W/Sew	: 1/18S/77W/Sew
Location/Property	: Security Cove	: Security Cove	: Security Cove Trib.
KX/MAS	:	:	: /11
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Grab	: Grab	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³
: Aluminum	:6.67%			:10.40%			:7.27%		
: Antimony	: L			: L			: L		
: Arsenic	:10			:30			:10		
: Barium	:135			:295			:160		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: L			: L		
: Cadmium	: L			: L			:2.5		
: Calcium	:1.97%			:1.61%			:7.18%		
: Chromium	:295			:175			:1680		
: Cobalt	:14			:17			:24		
: Copper	:49			:103			:40		
: Gallium	:10			:10			:10		
: Gold	:	L		:	L		:	10	0.0033
: Iron	:2.40%			:6.39%			:6.74%		
: Lanthanum	: L			:10			: L		
: Lead	: L			: L			:10		
: Manganese	:335			:650			:1680		
: Magnesium	:1.91%			:2.13%			:3.21%		
: Molybdenum	: 1			: L			: L		
: Nickel	:113			:73			:122		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:490			:925			:240		
: Platinum	:	L		:	L		:	1300	L
: Potassium	:0.59%			:0.83%			:0.39%		
: Silver	: L			: L			:1.0		
: Sodium	:2.08%			:1.59%			:1.79%		
: Strontium	:73			:154			:320		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:0.20%			:0.76%			:2.51%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:57			:205			:260		
: Zinc	:33			:108			:215		

Map No/Sample No/Yr	: 249/6804/86	: 250/6670/86	: 251/6673/86
Material Type	: Placer	: Placer	: FeI Volc
Rock Type	: Qm	: Qg	: FeI Volc
Rock Age	: Quaternary	: Quaternary	: Paleozoic
Quad 4 mile/1 mile	: Hagemeister Island/C-6	: Hagemeister Island/C-6	: Hagemeister Island/C-6
Sec/T/R/Mer	: 1/18S/77W/Sew	: 2/18S/77W/Sew	: 2/18S/77W/Sew
Location/Property	: Security Cove	: Security Cove	: Security Cove Trib.
KX/MAS	:	: /11	:
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Placer	: Grab
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³
: Aluminum	:6.28%			:6.67%			:4.34%		
: Antimony	: L			: L			: L		
: Arsenic	:20			:10			:30		
: Barium	:90			:135			:295		
: Beryllium	: L			: L			: L		
: Bismuth	: L			:20			: L		
: Cadmium	: L			: L			: L		
: Calcium	:5.54%			:6.43%			:2.25%		
: Chromium	: G			: G			:155		
: Cobalt	:82			:68			:106		
: Copper	:126			:56			:55		
: Gallium	: L			: L			:10		
: Gold	:	90		:	3600	0.0011	:	L	
: Iron	:12.70%			:14%			:17.20%		
: Lanthanum	: L			: L			: L		
: Lead	: L			: 5			:80		
: Manganese	:2080			:3050			:118		
: Magnesium	:1.90%			:3.12%			:0.23%		
: Molybdenum	: L			: 4			: L		
: Nickel	:169			:245			:105		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:390			:180			:505		
: Platinum	:	L		:	L		:	L	
: Potassium	:0.23%			:0.27%			:0.63%		
: Silver	: L			:3.0			:0.6		
: Sodium	:1.02%			:1.32%			:0.75%		
: Strontium	:330			:285			:73		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:2.01%			:3.37%			:0.20%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:450			:485			:74		
: Zinc	:360			:530			: 9		

Map No/Sample No/Yr	: 252/6671/86	: 253/6672/86	: 254/6596/86
Material Type	: Placer	: Fel Volc	: Placer
Rock Type	: Fel Volc	: Fel Volc	: Qg
Rock Age	: Paleozoic	: Paleozoic	: Quaternary
Quad 4 mile/1 mile	:Hagemeister Island/C-6:	Hagemeister Island/C-6:	Hagemeister Island/C-6
Sec/T/R/Mer	: 35/17S/77W/Sew	: 35/17S/77W/Sew	: 2/18S/77W/Sew
Location/Property	:Security Cove Trib.	:Security Cove	:Security Cove Trib.
KX/MAS	:	:	: /11
District	: Goodnews Bay	: Goodnews Bay	: Goodnews Bay
Sample Type	: Placer	: Select Grab	: Placer
	:	:	:

Element	ICP	AA/Wet	Assay	ICP	AA/Wet	Assay	ICP	AA/Wet	Oz/yd ³
: Aluminum	:8.27%			:7.94%			:8.67%		
: Antimony	: L			: L			: L		
: Arsenic	: L			: L			:10		
: Barium	:565			:60			:200		
: Beryllium	: L			: L			: L		
: Bismuth	: L			: 3			: L		
: Cadmium	: 2			:0.5			: L		
: Calcium	:4%			:3.12%			:6.68%		
: Chromium	:830			:135			:5490		
: Cobalt	:10			: 4			:25		
: Copper	:33			:25			:34		
: Gallium	:10			: L			: L		
: Gold	:	1910		:	L		:	105	tr
: Iron	:5.13%			:1.94%			:4.88%		
: Lanthanum	:10			: L			: L		
: Lead	: 8			:3460			: L		
: Manganese	:850			:165			:1320		
: Magnesium	:1.48%			:0.21%			:3.31%		
: Molybdenum	: 2			: 1			: L		
: Nickel	:29			: 4			:121		
: Palladium	:	L		:	L		:	L	
: Phosphorus	:640			:235			:210		
: Platinum	:	L		:	L		:	L	
: Potassium	:1.35%			:0.16%			:0.33%		
: Silver	:0.2			:0.4			:1.0		
: Sodium	:2.16%			:3.69%			:1.56%		
: Strontium	:410			:305			:240		
: Thallium	: L			: L			: L		
: Tin	:NA			:NA			:NA		
: Titanium	:1.27%			:0.18%			:1.66%		
: Tungsten	: L			: L			: L		
: Uranium	: L			: L			: L		
: Vanadium	:170			:63			:200		
: Zinc	:93			:14			:172		

APPENDIX C. - Scanning Electron Microprobe analyses of PGM grains.

EXPLANATION

Chemex Labs, Ltd. was contracted to provide Scanning Electron Microprobe (SEM) analyses of the recovered platinum grains. Chemex contracted with Bart Cannon of Cannon Microprobe of Seattle, Washington, to perform the work. The following explanation and tables are from the report done by Cannon Microprobe.

METHOD OF ANALYSIS

The contents of each sample vial were placed on the bottoms of individual mold cavities and set in casting resin.

The hardened castings were ground and polished on diamond laps to expose the grains from the plastic and to expose the interior of the grains.

The mineral grains in each sample were analyzed, one by one in an ARL EMX-SM electron microprobe using wavelength dispersive x-ray spectrometers.

Raw counts were obtained from three simultaneously read detector scalers, each set to a different key x-ray emission line. Grains were periodically numbered for later reference by thermally engraving the epoxy mounting medium near the grain with an electron beam.

Analysis sets used were: Pt M beta, Ir L alpha 1 (3), Os M alpha
Pd L gamma 1, Rh L beta 1, Ru L alpha 1
As L alpha 1, Sb L alpha, Bi M alpha
Cu L alpha 1, Fe K alpha, Au M beta

Probe standards used were pure metals, synthetic palladium arsenide, and synthetic isoferroplatinum.

Palladium, gold, bismuth, mercury, and antimony were found in significant amounts in only a few samples and thus count rates were not always collected.

The number of analyses indicated for each grain is in most cases a minimum number. Before conducting an analysis the grain was traversed beneath the electron beam to determine its homogeneousness. Grains such as the "Fe Platinum with minor osmiridium inclusions" were analyzed in the beam "sweep" mode to produce an average analysis.

Analyses were assumed to represent the whole grain, including that removed by grinding and that portion below the polished surface.

Grains were "weighted" by dividing them into three size fractions: small, medium, and large. Small grains were awarded a multiplier of 1; medium grains a multiplier of 2; and large a multiplier of 4. The average analysis of the total sample was derived from the averaged grain analyses.

Probe Operating Conditions

Accelerating Voltage = 20 kv
Beam Current = .1 ua
Spot Size = 1 - 2 micron

SUMMARY OF RESULTS

This study has shown that the fundamental mineralogy of each sample is simple and very consistent. Variation in platinum group metal concentrations of the different samples is a product of relative abundance of three major grain types.

Iron-platinum alloy, osmiridium, and iron-platinum alloy with osmiridium inclusions. Over a dozen other species of uncommon to extremely rare PGE-bearing minerals are also present.

Platinum

At least 90% of the platinum in the samples occurs as iron-platinum alloy, which contain from 7 to 28 wt% iron and from 70 to 91 wt% platinum. Only trace amounts of other PGE occur as dissolved constituents within the iron-platinum alloy itself.

The related, but structurally distinct phases; isoferroplatinum and tetraferroplatinum also occur, but in minor amounts. The mineral platiniridium, reported by some other investigators to be common in the district was found in only one grain in this study. The platinum arsenide sperrylite is relatively common as small grains and coatings, but could contribute less than 1% to the total platinum content. Several grains of the platinum sulpharsenide, platarsite were encountered.

At least half of the iron-platinum alloy grains contain very small widely scattered, to coarse thickly clustered inclusions of osmiridium. The osmiridium is commonly concentrated toward the center of the ferroan platinum grains.

The osmiridium grains themselves contain less than 3.5% total Pt, Ru, Rh, and Pd.

Iridium

More than 90% of the iridium in these samples is contained in the mineral osmiridium, which itself contains about 76% Iridium by weight.

Other minerals containing essential iridium, ranked according to abundance, include; iridarsenite, irarsite, iridosmine, iridium, and xingzhongite.

Perhaps 30% of the osmiridium grains occur as fully enclosed inclusions within the iron-platinum alloy. This association suggests a gradual phase equilibration of an original Pt/Ir alloy. Optically

homogenous iron-platinum alloy grains (grains containing no visible osmiridium) do not show high dissolved iridium and therefore it can be assumed that not all platinum grains were originally rich in iridium.

Osmium

About 80% of the total osmium occurs in the form of the mineral osmiridium which contains approximately 21% osmium.

10% of the osmium occurs as crystals of native osmium included in iron-platinum alloy grains. The native osmium contains about 12% dissolved iridium.

The remainder of the osmium occurs in the form of the rare accessory mineral ehrlichmanite and iridosmine.

Rhodium

Rhodium is only a minor constituent of the concentrates. It occurs most importantly as a dissolved constituent of osmiridium. Its concentration within the osmiridium is uniformly about 1.2 wt% throughout all of the samples.

The presence of other rare accessory rhodium minerals rarely contributes more than a few tenths of a per cent to total rhodium. Sample 181 which consists of a single grain of iron-platinum alloy with abundant inclusions of hollingsworthite (rhodium arsenide) displays a high rhodium value that is probably not meaningful due to small sample size.

Minerals containing essential rhodium, ranked in order of abundance, include: hollingsworthite, prassoite, ruthenarsenite, xingzhongite, and rhodium (?). A rhodium iridium iron alloy also occurs, and may be a new mineral.

Ruthenium

Ruthenium is a trace to minor component of the samples. It occurs in a dissolved state in the osmiridium. Concentrations range from 0.4 wt% to 1.1 wt% and average about 0.7 wt%.

Other reports indicate that the mineral laurite (ruthenium sulphide) is relatively common in the district. This study only located a single grain. Laurite occurs as tiny black octahedrons resembling magnetite or chromite. Perhaps they are thought to be a gangue mineral and hand removed from the samples prior to shipment to this lab.

One grain of ruthenarsenite was found.

Palladium

Palladium occurred in trace amounts only, generally in concentrations of 0.25% or less. No discrete palladium minerals were found.

This metal was not reported upon in the tabulation.

Chromite, Magnetite

Platinum group metals commonly encrust grains of chromite and magnetite, but no examples of these gangue minerals enclosing tiny PGM were noted.

Separation

High purity PGE separates will be impossible to produce due to the pervasive phase intergrowths.

Rhodium, iridium, and osmium sulphides and arsenides are very soft and commonly encrust the harder PGM minerals. Easy comminution will result in the loss of these very minerals during processing.

Analytical and Sampling Errors

Microprobe surface area scans were employed only occasionally. Therefore, in most cases a bulk analysis has been inferred from a series of point analyses.

The simple mineralogy of the samples makes this a valid method. The major source of error, however, lies in the crude estimation of the sizes of the individual grains, and the fact that not all of the platinum grains were exposed for analysis. Also some grains which were assigned small (multiplier one) grain status may at depth in the casting have actually been large grains.

Interpreting the Compositional Analysis Data Table

Key figures to note are in the "A", "B", and "C" columns. When correlating the weight per cent analyses with the total weight of the original sample, the PGM purity of that original sample must be considered. Using a ratio C/A will not directly produce the percentage PGM present since the PGM are generally 2 or 3 times larger than the gangue mineral grains. This disparity is reduced, however, since the PGM are usually at least 2.5 times heavier than the gangue minerals.

Analyses based upon the examination of less than 5 grains are of minimal value for larger generalizations.

The number of grains analyzed (column C) is usually greater than actually indicated.

Since some grains contain separately analyzed inclusions the figures in the three lettered columns may not always balance.

Interpreting the Mineralogical Analysis Data Table

This table is provided only as a general guide since grain size and total areal coverage is not included. Since inclusions are included in the grain count the grain numbers in this column may not balance with the data in the compositional table.

Column D is under represented since this distinction was not commented on very often during analysis.

Further Work

The analytical procedure used in this study has established the basic mineralogical nature of the concentrates, and suggests the PGE compositional trends of each sample.

The limited sample size of many of the concentrates results in data of limited statistical value.

Future analysis should be conducted as bulk, whole sample assays. Fusion of the sample followed by microprobe analysis should provide a better quantitative analysis and a faster turnaround time.

A - Total Grains in sample
 B - Platinoid Grains analyzed
 C - Total Platinoid Grains

Map No.	Sample No.	A	B	C	%Rh	%Ru	%Pt	%Ir	%Os	%Fe	Total
0133....	6810.....	1	1	1	0.7	0.4	88.0	2.1	0.9	7.1	99.2
0175....	6789.....	10	6	8	2.1	0.8	81.4	1.9	0.9	8.1	95.2
0199....	6791.....	8	8	7	0.8	0.3	84.5	1.8	0.6	8.3	96.3
0176....	6653.....	7	3	4	1.1	0.5	57.6	26.8	6.3	5.7	98.0
0177....	6652.....	62	25	37	0.9	0.5	73.3	14.4	2.6	7.2	98.9
0178....	6581.....	3	2	2	1.6	1.0	49.4	33.7	7.1	4.6	97.4
0178....	6582.....	19	3	6	1.4	0.9	35.5	44.7	11.2	4.0	97.7
0179....	6586.....	11	8	9	0.5	0.2	89.1	2.2	0.8	6.8	99.1
0179....	6587.....	8	2	3	1.2	0.5	46.3	34.5	11.0	4.6	98.6
0179....	6588.....	6	5	5	1.4	0.8	67.2	17.3	4.1	5.6	96.4
0179....	6589.....	1	2	1	1.4	0.8	11.7	65.0	15.6	3.2	97.7
0180....	6622.....	61	32	49	1.6	0.5	72.9	14.0	2.9	5.6	97.5
0180....	6623.....	9	6	7	1.5	0.9	54.0	30.0	7.8	3.2	97.4
0180....	6624.....	34	16	27	1.1	0.8	75.9	12.2	3.3	6.3	99.6
0181....	6626.....	1	2	1	4.5	0.5	82.2	1.6	2.4	6.8	98.0
0182....	6640.....	1	1	1	0.5	0.4	81.5	5.5	2.4	8.9	99.2
0182....	6641.....	2	2	2	1.2	0.8	48.3	14.8	15.9	3.8	84.8
0182....	6642.....	23	21	22	0.9	0.6	71.0	9.6	6.0	7.8	95.9
0183....	6634.....	69	10	12	0.8	0.4	66.1	18.8	5.4	4.5	96.0
0183....	6635.....	10	9	10	0.8	0.5	67.3	17.2	5.2	4.3	95.3
0183....	6636.....	21	18	21	2.7	0.5	63.2	20.4	5.8	4.8	97.4
0187....	6502.....	26	16	20	1.6	0.5	83.0	3.8	1.0	8.1	97.8
0190....	6739.....	17	8	12	0.8	0.4	78.3	8.6	1.2	7.1	96.4
0191....	6738.....	213	77	195	1.4	0.6	80.2	7.2	2.9	7.5	99.4
0194....	6760.....	14	6	9	1.5	0.9	63.4	18.0	6.8	6.6	97.2
0195....	6761.....	21	14	17	0.9	0.5	70.4	11.4	6.0	6.2	95.4
0202....	6780.....	2	2	2	0.6	0.4	83.5	4.4	1.7	7.6	98.6
0203....	6792.....	16	12	13	1.1	0.7	60.3	25.6	6.3	5.9	99.9
0205....	6750.....	2	2	2	1.1	0.6	85.5	3.8	1.2	8.9	98.5
0206....	6597.....	15	12	12	1.9	0.9	47.0	37.4	9.2	4.1	99.5
0207....	6598.....	1	1	1	0.5	0.3	88.4	0.7	0.5	9.0	99.4
0208....	6599.....	20	13	20	0.9	0.5	75.2	13.3	2.5	6.2	97.2
0209....	6579.....	2	5	2	0.8	0.5	77.8	8.1	3.2	8.4	98.8
0210....	6578.....	33	13	28	1.1	0.6	63.2	22.4	6.5	5.6	99.4
0211....	6577.....	190	27	131	1.6	1.0	45.6	37.8	8.7	4.1	98.8
0212....	6576.....	25	19	22	0.9	0.6	63.4	19.6	8.2	5.8	98.5
0213....	6575.....	43	22	37	1.3	0.8	48.6	26.7	13.4	4.4	95.2
0214....	6574.....	53	34	50	1.4	0.7	42.1	37.7	9.8	4.8	96.1
0215....	6573.....	1	1	1	0.7	0.4	87.2	2.8	0.9	7.4	99.4
0216....	6572.....	44	28	44	1.3	0.8	45.2	37.5	9.9	4.0	98.7
0217....	6571.....	177	45	136	1.9	1.0	37.7	41.3	11.3	3.8	97.0
0219....	6698.....	2	2	2	0.3	0.1	87.2	1.2	0.4	8.5	97.7
0219....	6699.....	2	2	2	1.5	0.6	47.0	36.2	9.2	4.8	98.3
0219....	6700.....	10	4	5	2.1	0.4	85.1	2.6	1.6	7.0	98.8
0220....	6726.....	6	4	4	0.6	0.3	84.2	1.7	1.8	8.1	96.7
0220....	6727.....	25	10	16	0.8	0.5	75.3	11.3	3.2	7.1	98.2

Map No.	Sample No.	A	B	C	%Rh	%Ru	%Pt	%Ir	%Os	%Fe	Total
0221....	6729.....	26	13	19	1.2	0.7	72.2	13.9	3.9	6.8	98.7
0221....	6741.....	72	25	56	1.8	0.6	58.2	24.2	6.9	5.4	96.1
0221....	6742.....	155	36	111	1.1	0.6	68.3	18.3	5.2	4.8	98.3
0223....	6744.....	23	13	17	1.6	1.0	54.8	26.0	9.1	4.4	96.9
0223....	6745.....	10	5	7	1.2	0.8	68.7	17.8	4.1	5.8	98.4
0224....	6746.....	+500	96	+420	1.0	0.6	71.0	12.2	4.7	7.2	96.7
0224....	6762.....	139	41	102	1.6	0.7	57.9	24.8	7.1	5.6	97.7
0225....	6799.....	510	91	450	0.8	0.5	74.8	11.9	3.5	6.1	97.6
0225....	6800.....	59	22	42	0.7	0.4	81.5	5.8	1.8	8.2	98.4
0226....	6763.....	22	3	12	1.1	0.7	59.2	27.3	6.5	4.8	99.6
0226....	6764.....	151	66	123	1.4	0.8	65.6	19.0	5.1	4.5	96.4
0226....	6765.....	32	10	25	1.1	0.6	67.9	16.8	3.7	5.5	95.6
0227....	6798.....	102	65	89	0.8	0.5	77.8	7.6	2.9	8.1	97.7
0228....	6766.....	1	1	1	1.7	0.9	7.2	69.4	20.2	0.3	99.7
0229....	6796.....	47	28	36	0.7	0.4	73.2	12.5	4.9	7.1	98.8
0230....	6707.....	1	1	1	0.7	0.4	81.3	5.0	2.4	7.5	97.3
0230....	6708.....	59	14	32	0.8	0.5	77.8	6.5	3.9	6.4	95.9
0231....	6709.....	2	1	1	0.9	0.5	86.2	3.0	0.6	6.8	98.0
0231....	6710.....	8	4	5	1.4	0.9	36.7	35.8	8.9	3.9	87.6
0231....	6711.....	1	1	1	0.5	0.3	87.9	1.2	0.7	9.3	99.9
0232....	6758.....	2	2	2	1.1	0.7	79.3	6.9	1.7	8.9	98.2
0232....	6771.....	4	2	2	0.7	0.4	84.0	3.2	1.4	6.8	96.5
0234....	6776.....	6	3	4	1.1	0.6	32.0	47.8	12.2	4.2	97.9
0235....	6836.....	83	36	72	0.9	0.4	67.8	17.2	3.6	5.8	95.7
0236....	6837.....	4	2	1	1.8	0.3	87.9	0.9	0.4	7.0	98.3
0249....	6803.....	6	2	3	0.5	0.2	84.0	3.2	1.4	7.7	97.1

A = Iron-Platinum alloy (Platinum with 8 to 30% Iron)
 B = Iron-Platinum alloy (with minor Osmiridium inclusions)
 C = Osmiridium (Iridium with minor Osmium)
 D = Osmiridium (with lesser Platinum)
 E = Iron-Platinum alloy (with oriented inclusions of Ru, Ir Arsenides)
 F = Rhodium
 G = Hollingsworthite (Rhodium Arsenide)
 H = Prassoite (Rhodium Sulphide)
 = Kashinite (Iridium, Rhodium Sulphide)
 = Sulrhodite (Rhodium Sulphide)
 I = Ehrlichmanite (Osmium Sulphide)
 J = Iridosmine (Iridium bearing Osmium)
 K = Osmium
 L = Xingzhongite (Lead, Copper, Iridium, Rhodium Sulpharsenide)
 M = Iridarsenite (Iridium Arsenide)
 N = Irarsite (Iridium Sulpharsenide)
 O = Iridium
 P = Sperrylite (Platinum Arsenide)
 Q = Platarsite (Platinum Sulpharsenide)
 R = Tulameenite (Platinum Copper Iron)
 S = Tetraferroplatinum (Platinum Iron)
 T = Laurite (Ruthenium Sulphide)
 U = Ruthenarsenite (Ruthenium Rhodium Arsenide)

Map No.	Sample No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
0133...	6810.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0175...	6789.....	4	-	-	-	1	-	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-
0176...	6653.....	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0177...	6652.....	14	7	3	-	-	-	1	-	1	-	1	-	1	-	-	2	-	1	-	-	-
0178...	6581.....	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0178...	6582.....	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0179...	6586.....	7	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
0179...	6587.....	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0179...	6588.....	2	1	2	1	1	-	1	-	-	-	-	-	1	1	-	-	-	-	-	-	-
0179...	6589.....	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0180...	6622.....	11	17	7	-	-	-	1	-	-	1	1	-	-	-	-	-	-	1	-	-	-
0180...	6623.....	2	3	3	-	1	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-
0180...	6624.....	5	7	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0181...	6626.....	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0182...	6640.....	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0182...	6641.....	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
0182...	6642.....	5	11	2	-	-	-	2	-	-	-	1	-	-	1	-	-	-	-	-	-	-
0183...	6634.....	3	7	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
0183...	6635.....	1	7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
0183...	6636.....	6	6	4	1	1	-	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-
0187...	6502.....	11	5	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-
0190...	6739.....	2	7	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0191...	6738.....	51	21	5	-	-	-	-	-	-	-	2	1	2	2	-	4	-	3	-	-	-
0194...	6760.....	1	4	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
0195...	6761.....	3	8	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0199...	6791.....	5	1	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
0202...	6780.....	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0203...	6792.....	2	7	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
0205...	6750.....	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Map No.	Sample No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
0206...	6597.....	2	5	10	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
0207...	6598.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0208...	6599.....	2	8	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0209...	6579.....	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0210...	6578.....	4	5	5	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
0211...	6577.....	4	10	13	-	-	-	2	-	-	-	-	-	-	-	-	-	-	1	-	-	-
0212...	6576.....	4	9	5	-	-	-	-	1	1	-	-	-	-	-	1	-	-	-	-	-	-
0213...	6575.....	6	7	9	-	-	-	-	-	-	2	-	-	2	-	-	2	-	-	-	-	-
0214...	6574.....	4	11	17	-	-	-	1	-	-	-	-	-	-	2	-	-	1	-	-	-	-
0215...	6573.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0216...	6572.....	4	7	16	-	-	-	1	-	-	-	-	-	-	4	-	2	-	-	-	-	-
0217...	6571.....	4	7	33	-	-	-	3	-	-	-	-	-	3	4	1	2	-	-	-	-	-
0219...	6698.....	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0219...	6699.....	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0219...	6700.....	3	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0220...	6726.....	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0220...	6727.....	6	2	1	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-
0221...	6729.....	7	4	2	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
0221...	6741.....	7	5	7	-	2	-	-	-	-	-	-	-	-	1	-	3	-	-	-	-	-
0221...	6742.....	4	20	6	-	-	-	2	-	-	-	-	-	-	1	2	-	3	2	-	-	-
0223...	6744.....	3	2	4	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-
0223...	6745.....	-	4	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0224...	6746.....	24	51	17	4	-	6	2	-	-	-	-	-	-	-	5	3	2	-	-	-	1
0224...	6762.....	18	9	11	-	2	-	1	-	-	-	1	-	1	-	-	2	-	-	-	-	-
0225...	6799.....	61	30	9	-	5	-	6	-	-	-	20	-	-	-	-	-	-	-	-	-	-
0225...	6800.....	16	8	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0225...	6809.....	7	5	4	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
0226...	6763.....	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0226...	6764.....	32	17	11	-	-	-	-	1	-	-	7	-	-	1	1	-	2	-	-	-	-
0226...	6765.....	5	2	3	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
0227...	6798.....	31	77	7	-	-	-	2	-	-	-	14	-	-	-	-	4	-	-	3	-	-
0228...	6776.....	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0229...	6796.....	17	8	4	-	-	1	-	-	-	-	2	-	-	-	-	1	-	-	-	-	-
0230...	6707.....	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0230...	6708.....	6	8	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
0231...	6709.....	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0231...	6710.....	1	-	2	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-
0231...	6711.....	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0232...	6758.....	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0232...	6771.....	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0234...	6776.....	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0235...	6836.....	22	30	17	2	2	-	7	-	-	-	2	-	1	3	-	2	-	-	-	-	-
0236...	6837.....	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0249...	6803.....	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-