Misc. prospects & data KTN & E.

12 November 1992

RECONNAISSANCE FLUID INCLUSION SURVEY OF 33 SAMPLES FROM SE ALASKA

OBJECTIVE OF STUDY: To determine the feasibility of using fluid inclusions to identify temperatures and pressure conditions of formation of quartz veins.

RESULTS:

1. Quartz in all samples contain millions of healed microfractures defined by planes of fluid inclusions, often crisscrossing back and forth across quartz grains.

2. Fluid inclusions are filled with variable amounts of liquid and vapor H_2O and CO_2, from all liquid-filled to all vapor-filled and everything in between. Thus, homogenization temperatures <u>for a single quartz grain</u> in a single sample could vary from 75 to 475°C, and it is predicted that most quartz grains would yield homogenization temperatures primarily in the range 125 to 325°C. These homogenization temperatures would have to be corrected for pressure effects, which could make true temperatures of formation as much as 200°C higher. Pressure estimates from fluid inclusions are difficult to make when the brines contain CO_2, as experimental data for the system H_2O-CO_2-NaCl are currently limited.

3. Fluid inclusions along single healed microfractures commonly show variable amounts of liquid and vapor H_2O and CO_2. This indicates that for many inclusions, the fundamental requirements (for yielding interpretable data) of trapping a homogeneous fluid and maintaining constant mass and volume since the inclusion formed have been been violated.

CONCLUSIONS:

1. The described characteristics of the fluid inclusions and the textures among them are sufficient data to define the general environment of formation: such characteristics are definitely <u>not</u> found in epithermal environments, nor are they found in "phallic-type" porphyry copper or porphyry molybdenum deposits. Such characteristics are unique to deeper environments: veins cutting rocks undergoing greenschist to amphibolite grade metamorphism (mesothermal veins), or veins within and around batholiths (deep skarns) or cupolas of batholiths.

2. All submitted samples contain quartz with fluid inclusions formed in deep environments. It is possible that the quartz veins could have been originally formed in shallower environments and subsequently buried, but there is no fluid inclusiion evidence that such is the case.

3. All quartz veins contain millions of planes of fluid inclusions, which may record millions of geologically instantaneous fluid conditions that could have existed over millions of years! Even if the basic requirements of inclusions had not been violated, a few fluid inclusion homogenization temperatures would only be recording several temperatures out of potentially millions of fluid events!

4. It is concluded that fluid inclusion microthermometry cannot be used to constrain exact P,T conditions of formations of the submitted specimens: many of the fluid inclusions do not satisfy basic requirements, and of those that do, they would only be recording a small part of the fluid history that existed during vein formation.

RECOMMENDATIONS:

1. Many studies of fluid inclusions from mesothermal veins have been conducted in the past. Most are very limited in usefulness: basically, hypotheses were presented from totally unconstrained data. Such poor work resulted from the limited knowledge of the researchers regarding fluid inclusion principles, and naivete of the researchers regarding the complexity of the hydrothermal systems through a protracted history. A few good studies are in the literature:

   - Diamond, L.W., 1990, Fluid inclusion evidence for P-V-T-X evolution of hydrothermal solutions in Late-Alpine gold-quartz veins at Brusson, Val d'Ayas, N.W. Italian Alps: Am.J.Sci., v. 290, p. 912-958.

   - Robert F., and Kelly, W.C., 1987, Ore-forming fluids in Archean gold-bearing quartz veins at the Sigma mine, Abitibi greenstone belt, Quebec, Canada: Econ.Geol., v. 82, p. 1464-1482.

   - Goldfarb, R.J., Leach, D.L., Pickthorn, W.J. and Paterson, C.J. 1988, Origin of lode-gold deposits of the Juneau gold belt, southern Alaska, Geology, v. 16, p. 440-443.

   Each of these author spent years in the field to find the best samples to study, years in the lab working on less than a dozen or so samples, and years trying to understand the data they collected! Unfortunately, this is the nature of the beast: studying fluid inclusions to learn about conditions of ore formation in mesothermal environments is extremely difficult, at best. Therefore, I do not recommend that any microthermometry be performed on any of the submitted samples.

2. The fluid inclusion petrography alone is evidence of the complex fluid histories experienced by the quartz veins. One has to wonder what, if anything, oxygen isotope data would mean for such samples without careful geologic and petrographic controls. Without such controls, oxygen isotope studies are not recommended.

3. For isotopic and fluid inclusion studies to provide meaningful information about the P,T conditions of vein formation, deposit scale studies will be necessary: data from only one sample tells us only one thing for the submitted samples--that it formed at depths greater than phallic porphyry systems (>4Km). To learn more, each deposit will have to be studied in great detail. But take caution: very few mesothermal veins will yield more from the

fluid inclusions and isotopes than simply the fact that they are deep, even with years of work!

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Division of Geological & Geophysical Surveys

PUBLIC-DATA FILE 92-22

ANALYTICAL RESULTS FROM THE SOUTHERN CLEVELAND PENINSULA AREA, CRAIG C-1 AND KETCHIKAN C-6 QUADRANGLES, SOUTHEAST ALASKA

by

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Alaska Department of Natural Resources
Division of Geological & Geophysical Surveys

November 1992

THIS REPORT HAS NOT BEEN REVIEWED FOR TECHNICAL CONTENT (EXCEPT AS NOTED IN TEXT) OR FOR CONFORMITY TO THE EDITORIAL STANDARDS OF DGGS.

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DEPARTMENT OF NATURAL RESOURCES
Division of Geological & Geophysical Surveys
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INTRODUCTION

This preliminary report lists the results from geochemical analyses of 30 rock and 1 stream sediment. Samples were collected during the 1992 field season as part of a geologic mapping project in the Helm Bay region on the southern Cleveland Peninsula, Craig C-1 and Ketchikan C-6 1:63,360 quadrangles. Milt Wiltse, Wyatt Gilbert, Melanie Werdon, Tom Homza, and Karen Clautice participated in the project.

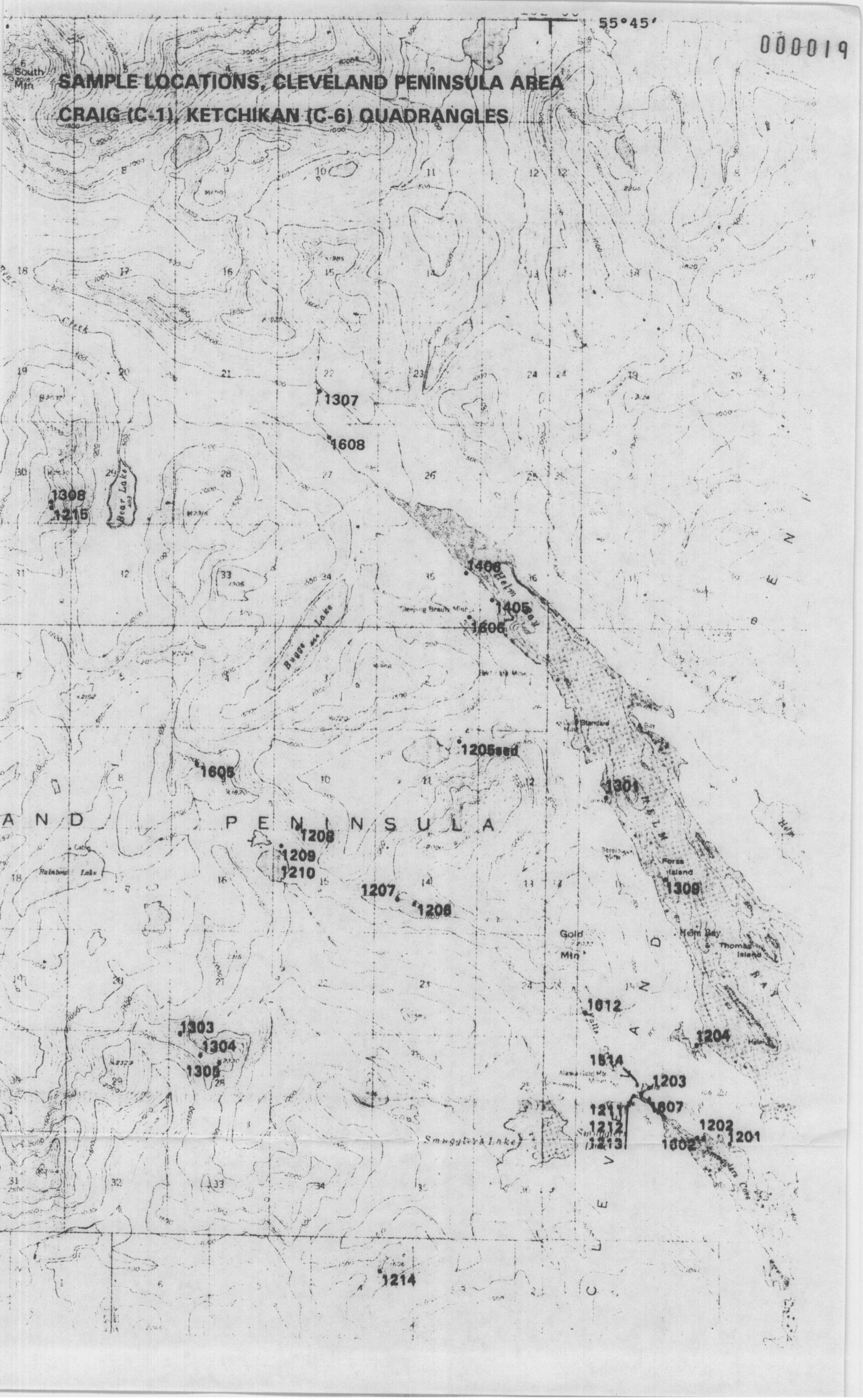
This study was conducted as part of a cooperative agreement between the U.S. Bureau of Mines and the Alaska Division of Geological and Geophysical Surveys to investigate the geology and mineralization of the Ketchikan Mining District.

SAMPLE NUMBER	1992 STATION NUMBER	LONG.	LAT.	BRIEF FIELD DESCRIPTION
1201	KC06,WM02	131.953	55.591	Pyritic, quartz muscovite schist
1202	KC07	131.960	55.592	6m wide zone of pyritic, white mica quartz tuff
1203	KC09,WG202	131.976	55.598	Gray-green mafic metavolcanic with thin carbonate lenses
1204	KC13	131.962	55.605	Light gray-green porphyroblastic metavolcanic (schistose to massive)
1205sed	KC28	132.023	55.648	Orange stained sediment in creek between lakes
1206	KC31	132.034	55.625	Pyritic, quartz sericite schist
1207	KC33	132.038	55.625	15cm wide quartz-epidote vein in mafic metavolcanics, perpendicular to foliation
1208	KC38	132.063	55.635	15cm wide quartz vein in dark gray slate/phyllite, perpendicular to bedding
1209	KC39	132.067	55.633	Quartz vein, 15-20cm wide, various cross-cutting directions
1210	KC39	132.067	55.633	Medium grained, slightly foliated, chlorite- and clay-altered granodiorite
1211	KC40	131.977	55.598	2-3 m of iron-stained quartz muscovite schist
1212	KC41	131.977	55.598	Pyritic, quartz-carbonate layer (1-5 cm) within quartz muscovite schist
1213	KC41	131.977	55.598	Quartz-carbonate vein (15 cm) within pyritic quartz muscovite schist
1214	KC66	132.042	55.572	Quartz vein within dark gray phyllite
1215	KC78	132.126	55.681	Quartz veining near contact between black slate and mafic metavolcanics
1301	WG222	131.986	55.640	Pyritic, quartz muscovite schist
1303	WG238	132.091	55.606	Hornfels at contact with granodiorite
1304	WG239	132.086	55.603	Dark gray slate
1305	WG240	132.082	55.602	Quartz veins in metavolcanics
1307	WG257	132.058	55.698	Quartz vein in dark green-black slate
1308	WG258	132.125	55.681	Pyritic zone near sediment/metavolcanic contact
1309	WG265	131.971	55.628	Light green volcaniclastic
1405	MW13	132.015	55.668	Pyrite-altered metavolcanic lens in metasediment
1406	MW14	132.021	55.672	Pyritic, quartz white mica schist, metasediment(?)
1514	TXH85	131.977	55.599	
1602	WM8A	131.962	55.592	Pyritic volcaniclastic
1605	WM19	132.088	55.644	Black slate with silty layers and minor quartz veining
1606	WM27	132.020	55.665	Chlorite-, carbonate-bearing quartz vein at Portland prospect
1607	WM75	131.974	55.597	White mica quartz schist
1608	WM97,WG254	132.056	55.691	Pyrite-bearing, iron-stained phyllite
1612	WM83	131.991	55.600	Pyritic, banded limestone with hematite(?)

SAMPLE NUMBER	Au ppb	Ag ppm	Cu ppm	Pb ppm	Zn ppm	Mo ppm	Ni ppm	Co ppm	Cd ppm	Bi ppm	As ppm	Sb ppm	Fe pct	Mn pct
1201	123	<0.2	379	8	48	14	14	29	<1	<5	<5	<5	5.36	0.06
1202	8	<0.2	23	9	62	9	5	5	<1	5	7	<5	3.68	0.05
1203	11	<0.2	114	12	69	1	1	9	<1	<5	<5	<5	2.52	0.16
1204	<5	<0.2	50	<2	18	<1	22	26	<1	<5	<5	<5	3.31	0.07
1205	NA	<0.2	24	9	37	1	21	13	<1	<5	44	<5	3.58	0.07
1206	<5	<0.2	83	9	43	<1	14	15	<1	5	20	<5	3.25	0.06
1207	26	<0.2	70	3	17	<1	16	19	<1	6	545	<5	2.44	0.05
1208	<5	<0.2	7	<2	<1	2	12	2	<1	<5	<5	<5	1.09	0.01
1209	<5	<0.2	4	<2	<1	6	10	1	<1	<5	<5	<5	0.44	<0.01
1210	<5	<0.2	66	3	20	<1	68	26	<1	6	<5	<5	3.77	0.06
1211	32	<0.2	37	39	20	5	4	5	<1	<5	<5	<5	2.58	0.02
1212	<5	<0.2	93	8	29	1	7	6	<1	6	<5	<5	3.65	0.11
1213	<5	<0.2	13	7	24	3	6	5	<1	<5	<5	<5	2.87	0.18
1214	<5	<0.2	4	<2	<1	1	11	<1	<1	<5	<5	<5	0.45	<0.01
1215	<5	<0.2	4	<2	<1	5	9	1	<1	<5	61	<5	0.46	0.02
1301	<5	<0.2	52	17	31	5	12	20	<1	<5	27	<5	5.12	0.06
1303	<5	<0.2	56	7	61	2	31	13	<1	<5	<5	<5	4.66	0.05
1304	<5	<0.2	54	9	78	2	30	13	<1	<5	<5	<5	4.79	0.04
1305	<5	<0.2	21	<2	10	4	14	3	<1	<5	<5	<5	1.75	0.01
1307	<5	<0.2	47	6	73	1	23	11	<1	<5	<5	<5	4.75	0.05
1308	<5	<0.2	82	10	47	1	18	15	<1	6	11	<5	3.87	0.11
1309	82	<0.2	56	4	10	<1	4	6	<1	<5	<5	<5	1.98	0.06
1405	<5	<0.2	57	8	21	2	16	7	<1	<5	<5	<5	3.56	0.03
1406	<5	<0.2	38	11	40	1	15	5	<1	<5	<5	<5	3.42	0.05
1514	6	<0.2	71	10	217	5	3	9	<1	<5	<5	<5	3.34	0.04
1602	24	<0.2	230	5	49	2	5	7	<1	<5	<5	<5	2.56	0.10
1605	<5	<0.2	32	11	51	2	31	11	<1	<5	9	<5	3.51	0.05
1606	373	<0.2	9	2	<1	1	11	3	<1	<5	<5	<5	0.61	0.01
1607	44	<0.2	181	6	283	1	2	8	<1	6	<5	<5	3.03	0.35
1608	<5	<0.2	69	29	60	2	40	26	<1	5	16	<5	4.85	0.05
1612	<5	0.6	3	3	<1	4	<1	1	<1	<5	<5	<5	0.31	0.12

SAMPLE NUMBER	Te ppm	Ba ppm	Cr ppm	V ppm	Sn ppm	W ppm	Al pct	Mg pct	Ca pct	Na pct	K pct	Sr ppm	Y ppm	La ppm
1201	<10	21	61	55	<20	<20	2.40	2.08	1.17	0.06	0.10	173	5	<1
1202	<10	20	95	58	<20	<20	2.06	1.78	0.76	0.12	0.10	105	7	2
1203	<10	185	22	30	<20	<20	1.35	0.49	5.38	0.05	0.32	594	6	4
1204	<10	5	86	83	<20	<20	2.16	1.56	1.82	0.06	<0.01	303	6	5
1205	<10	48	33	67	<20	<20	2.04	0.97	0.51	0.01	0.06	57	6	5
1206	<10	12	53	93	<20	<20	2.26	1.63	1.39	0.06	0.04	114	5	2
1207	<10	18	71	113	<20	<20	1.30	0.95	0.81	0.21	0.08	32	8	2
1208	<10	6	530	11	<20	<20	0.22	0.10	0.10	0.01	0.02	16	1	<1
1209	<10	<2	501	3	<20	<20	0.04	0.02	0.03	<0.01	<0.01	4	<1	<1
1210	<10	<2	290	99	<20	<20	3.18	3.02	1.34	<0.01	<0.01	294	5	2
1211	<10	79	122	26	<20	<20	1.09	0.50	0.13	0.14	0.25	29	2	9
1212	<10	70	134	33	<20	<20	2.05	1.51	6.95	0.04	0.15	212	6	4
1213	<10	68	215	23	<20	<20	1.78	1.37	9.10	0.01	0.06	210	7	2
1214	<10	3	414	2	<20	<20	0.07	0.02	0.03	0.06	<0.01	4	<1	<1
1215	<10	8	439	2	<20	<20	0.02	<0.01	0.04	<0.01	<0.01	2	<1	<1
1301	<10	38	72	46	<20	<20	1.69	1.23	4.56	0.04	0.22	81	8	2
1303	<10	190	148	157	<20	<20	3.23	1.41	0.13	0.06	0.81	14	6	11
1304	<10	119	84	84	<20	<20	2.84	1.52	0.05	0.05	0.46	11	4	12
1305	<10	22	368	23	<20	<20	0.73	0.45	0.04	0.02	0.09	6	2	<1
1307	<10	67	117	44	<20	<20	2.57	1.47	0.68	0.05	0.17	40	7	3
1308	<10	87	66	89	<20	<20	2.86	1.55	1.74	0.03	0.22	64	5	2
1309	<10	180	77	17	<20	<20	0.94	0.33	4.69	0.06	0.40	216	2	<1
1405	<10	100	75	47	<20	<20	1.40	0.90	0.65	0.04	0.33	36	8	4
1406	<10	98	114	41	<20	<20	1.33	0.81	1.15	0.07	0.33	51	7	4
1514	<10	49	78	30	<20	<20	1.63	1.06	0.24	0.09	0.24	43	3	14
1602	<10	111	74	40	<20	<20	1.90	1.13	1.66	0.07	0.09	220	6	5
1605	<10	106	196	42	<20	<20	2.02	1.34	0.34	0.03	0.30	21	8	8
1606	<10	9	364	6	<20	<20	0.18	0.09	0.19	0.01	0.02	18	3	<1
1607	<10	167	56	18	<20	<20	0.71	1.23	7.81	0.05	0.41	250	3	8
1608	<10	102	153	52	<20	<20	2.37	1.45	1.55	0.05	0.27	90	10	9
1612	<10	6	2	14	<20	<20	0.03	0.15	>10.00	<0.01	<0.01	391	<1	<1

SAMPLE LOCATIONS, CLEVELAND PENINSULA AREA
CRAIG (C-1), KETCHIKAN (C-6) QUADRANGLES



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Geochemical Lab Report

A DIVISION OF INCHCAPE INSPECTION & TESTING SERVICES

REPORT: V92-00476.0 (COMPLETE)

REFERENCE INFO:

CLIENT: U.S. BUREAU OF MINES
PROJECT: NONE GIVEN

SUBMITTED BY: K. MAAS
DATE PRINTED: 9-JUN-92

ORDER		ELEMENT	NUMBER OF ANALYSES	LOWER DETECTION LIMIT	EXTRACTION	METHOD
1	Au	Gold	30	5 PPB	FIRE ASSAY	FIRE ASSAY @ 30 G
2	Ag	Silver	31	0.2 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
3	Cu	Copper	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
4	Pb	Lead	31	2 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
5	Zn	Zinc	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
6	Mo	Molybdenum	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
7	Ni	Nickel	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
8	Co	Cobalt	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
9	Cd	Cadmium	31	1.0 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
10	Bi	Bismuth	31	5 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
11	As	Arsenic	31	5 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
12	Sb	Antimony	31	5 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
13	Fe	Iron	31	0.01 PCT	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
14	Mn	Manganese	31	<0.01 PCT	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
15	Te	Tellurium	31	10 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
16	Ba	Barium	31	2 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
17	Cr	Chromium	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
18	V	Vanadium	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
19	Sn	Tin	31	20 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
20	W	Tungsten	31	20 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
21	La	Lanthanum	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
22	Al	Aluminum	31	0.01 PCT	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
23	Mg	Magnesium	31	0.01 PCT	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
24	Ca	Calcium	31	0.01 PCT	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
25	Na	Sodium	31	0.01 PCT	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
26	K	Potassium	31	0.01 PCT	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
27	Sr	Strontium	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA
28	Y	Yttrium	31	1 PPM	HCL:HNO3 (3:1)	INDUC. COUP. PLASMA

GENESIS OF GOLD VEIN DEPOSITS AT HELM BAY AND SMUGGLERS COVE

GENERAL GEOLOGY

Introduction

The Helm Bay/Smugglers Cove area is underlain by a northwest-trending series of Upper Paleozoic to Triassic metamorphic rocks intruded by plutonic rocks of Cretaceous to Tertiary age. The metamorphic rock packages in the Helm Bay area consist, from east to west, of: 1) dark-colored metasiltstone and metagraywacke along the west shore of Helm Bay; 2) a thick package containing units of dark-colored metasediments, light-colored metasediments, chlorite schist, felsic schist, and massive greenstone; 3) a mile-thick greenstone/diorite and; 4) most westerly, a package of light-colored metasedimentary rocks.

Foliation generally trends 140-160 degrees and dips steeply NE, but local variations are common. Bedding and foliation are relatively parallel but strongly foliated units many display notable differences between the two.

All rock units in the Helm Bay area are folded. Scale of folding varies from the large anticline and syncline on Gold Mountain and Boulder Creek to small crenulations. These folds generally plunge moderately NW but SE plunges are also common.

Mineral deposits in the area consists basically of quartz veins, fault-related quartz stringer and pyritic schist zones, and exhalative gold. The most notable deposit is the Gold Standard Mine from which 10,000 to 20,000 ounces of gold were produced. The Old Glory, Keystone, Free Gold and Portland prospects were also extensively explored in the early 1900's and the 1930's. The majority of deposits contain pyrite and gold with minor silver. Anomalous copper and mercury are also present but lead and zinc are depleted. This same gold/silver/copper/mercury association is also present in the stratabound exhalative gold strata at Smugglers Cove, suggesting that they could have been the source for mineralization in the Helm Bay area.

Rock Units

Rock units at Helm Bay consist, from east to west, of dark metasediments, a package of mafic metavolcanic rocks with interbedded metasediments, a large greenstone unit, and light and dark-colored metasedimentary rocks.

Dark metasedimentary rocks

The metasedimentary unit along Helm Bay consists of bck to ay phyllite derived from siltstone, graywacke, and black shale. Interbedded chlorite plagioclase schist are also present. Foliation is well developed and highly contorted in some areas. Kink folds and NW and SE-plunging folds are well displayed in beach outcrops. These rocks contain locally abundant veins and masses of foliation-concordant quartz which are generally barren except for small amounts of pyrite.

Light- and dark-colored metasedimentary rocks

The second metasedimentary package is made up of light-colored and black phyllite metamorphosed from siltstone, shale, graywacke and conglomerate. A thin band of these rocks outcrop above the Rainy Day prospect on the east side of Gold Mountain but a wide section of them underlies the area west of the greenstone/diorite. These rocks appear to be less well metamorphosed than those along the bay, being slates instead of phyllites and displaying a NE dip.

Mafic metavolcanic rocks and metasedimentary rocks

This rock package contains a variety of metavolcanic and metasedimentary rocks. These include greenstone, chlorite schist, pyritic quartz, sericite, chlorite schist, quartz, sericite schist and banded metasedimentary rocks.

Greenstone - The most common metavolcanic rock is a dense, poorly-foliated greenstone. Foliation in this rock varies from poor to moderate. Where cut by faults, the unit can be very schistose. This rock is usually mixed with chlorite schist and less commonly with felsic schists. The greenstone ranges from massive, almost dioritic in texture to a moderately foliated schistose greenstone with feldspar porphyroblasts (or possibly relic phenocrysts). These rocks probably represent mafic to intermediate volcanic flows.

Chlorite schist - Chlorite schist occurs throughout the area but also is found in a distinct band that stretches from Smugglers Cove to the Old Glory. Chlorite schist also occurs at the Keystone but it is not known whether it is part of the same package or just another section of the schist. The chlorite schist is a green, well foliated rock that has been highly contorted and folded. Within the chlorite schist are layers of greenstone, siliceous chlorite schist, and quartz muscovite schist.

Pyritic quartz, sericite, chlorite schist - In the Smugglers Cove area, Kennecott has mapped a series of more felsic schists including pyritic quartz, sericite, chlorite schist, quartz sericite schist, and siliceous chlorite schist. The pyritic quartz, sericite, chlorite schist, according to Kennecott's interpretation, represents an exhalite (Kennecott, 1985). This rock contains abundant quartz with sericite and lesser chlorite plus about 5% disseminated pyrite and up to 2% chalcopyrite. Gold is also present in this unit in concentrations of 1.5 to 3.4 ppm. The schist is closely associated with siliceous chlorite schist and quartz sericite schist.

Quartz, sericite schist - Quartz sericite schist is found in many parts of the Helm Bay area. A large band outlines the Gold Mountain fold but other sections outcrop at the mouth of Boulder Creek, at the Last Chance prospect (Helm) and near the Free Gold prospect. This rock commonly appears to grade into chlorite or greenstone schists.

Pyrite is commonly present as disseminated cubes forming up to a few percent of the rock. In the Smugglers Cove area, Kennecott believes that this rock is associated with the exhalite as it contains low gold anomalies locally (Kennecott, 1985).

Greenstone

Underlying the Gold Standard area, Bald Mountain and Bugge Basin is a 1 to 2-mile-thick greenstone unit. This massive rock unit displays poor foliation, and ranges in texture from medium-grained to fine-grained equigranular to trachyitc (with aligned feldspars) to schistose. Borders of athe body tend to be more highly foliated while the central bulk of the unit is usually massive. Faulted areas tend to be well foliated and to be chlorite schists but schistosity diminishes rapidly away from the fault. This rock is primarily composed of saussuritized plagioclase and chloritized hornblende. The texture commonly appears to be phaneritic plutonic but its origin is uncertain. AKDGGS geologist noted metasedimentary that rocks at one point along the western margin appeared hornfelsed and Bureau geologists noted obvious intrusive relationships between a diorite and metasedimentary rocks near Bear Lake (the apparent NW extension of the unit). Not all workers are convinced the unit is not volcanic, however. The foliated borders indicate that the greenstone has undergone metamorphism.

Plutonic Rocks

There are a variety of plutonic rocks in the Helm Bay area. Between Smugglers Cove and Helm Bay is a quartz diorite body, a sill or dike of granite porphyry outcrops at the Rainy Day prospect, and a large hornblende diorite/granodiorite stock outcrops west of Bald Mountain.

Metadiorite - The Smugglers Cove quartz diorite consists of apparently fresh, unaltered diorite in the core but the margins are distinctly metamorphosed and display a foliation continuous with that in the surrounding schists. This suggests emplacement during the late stage of the metamorphic event.

Granite porphyry - The vein at the Rainy Day prospect is hosted in a granite porphyry. This body is several hundred feet thick, trends 140 degrees and has aplitic margins. It does not extend SE to the beach, about 1,000 ft away and the NW extension of the body is not known. The rock is a medium- to coarse-grained biotite granite with phenocrysts of feldspar. Near the Rainy Day prospect, the biotite has been altered to chlorite but the rock has not been metamorphosed.

Diorite/granodiorite - West of the mineralized area is a stock of hornblende diorite/granodiorite. The rock is fresh and unmetamorphosed.

Structure

Faults

The Helm Bay area is cut by a variety of faults ranging from a major structure which probably follows Helm Bay itself to abundant small shears. The Helm Bay lineament has been thought to be a major fault although rocks on both sides of Helm Bay are very similar. This is probably a later feature which has had little influence on the Helm Bay mineralization.

There are several faults which cut Gold Mountain. The most prominent of these, herein called the Gold Mountain fault, trends 165 degrees and forms the central branch of Falls Creek on the south side of Gold Mountain. The northern extension of the fault forms the conspicuous gully on the north side of Gold Mountain. This fault appears to cut two 015-degree faults which form other forks of Falls Creek on the south flank of Gold Mountain. From the apparent offset in the alignment of the fault pieces which form the gully east of the Old Glory adits and west of the Jewel adit, the Gold Mountain fault probably has a few hundred feet of right lateral offset.

There are many small faults and shears in the Helm Bay area. The majority of these faults follow foliation and have a maximum of a few feet of offset but a few notable exceptions cross foliation and appear to have larger displacements. Two types of small faults are differentiated herein by the presence or absence of mineralization. Unmineralized faults and shears usually parallel mineralized ones and can have gouge zones several inches thick. A few of these unmineralized faults also cross foliation and truncate mineralized faults. These faults tend to be larger structures, commonly with more than one strand with up to one foot of gouge.

Mineralized faults tend to be more complicated than unmineralized ones and usually consist of several anastomosing or splaying strands. The zones therefore are wider with broken rock occurring over 2 to 15 feet. Mineralized faults sometimes have large quartz veins in the fault zone and other time have a series of quartz stringers in crushed zones. The faults do not usually persist as strong, obvious structures for more than a few hundred feet before dying away to a simple, usually foliation-parallel, shear. The overall structure, however, may be continuous for many hundreds or even thousands of feet. The strong, mineralized fault zones fade to a thin shear which, some distance later, will intensify into a larger, conspicuous mineralized fault, again.

Folds

Rocks in the Helm Bay area are folded on all scales. The most conspicuous folds are small-scale folds and kink folds in the schistose rocks. These features have amplitudes that range from microscopic to several feet and probably larger. Areas with kink folds commonly display a secondary cleavage parallel to their axial planes but at right angles to the regional foliation. Plunges of the smaller folds are usually to the NW but SE plunges are also found. In both cases, plunge is usually low to moderate (10 to 40 degrees).

In addition to the smaller structures, the Helm Bay area has also been folded on a much larger scale. Rocks units crossing Gold Mountain have been folded into a very large open anticline and syncline with an amplitude of about 1.5 miles. The fold actually forms a monoclinal structure where the regional NW-trending foliation is bent to the NE at Gold Mountain. Foliation changes back to the normal NW trend in the area of the Gold Standard Mine. The fold was initially identified by Kennecott (1985) during their efforts to trace their exhalative horizon. The axis of the fold trends nearly E/W and plunges NW

Mineralization

In the Helm Bay area, most of the mineral deposits are associated with faults or shear zones. These faults and shear zones usually are a few feet wide and contain quartz veins or stringers. The wallrock and schistose partings are usually pyritic although intensity varies from weak to intense. Pyritic schists can contain between 0.5% and 20% disseminated pyrite cubes and extend from a few inches to several feet from the veins. The quartz veins commonly carry minor pyrite (up to 5%) and rare chalcopyrite. Much of the gold value come from pyrite in the schist (see Table 1) but nugget gold also occurs, usually along the margins of the veins. In almost all of the Helm Bay deposits, the gold to silver ratio is about 10/1 and there is virtually no lead or zinc and only minor copper. All mineralized systems (except Puzzler) strike parallel to the surrounding foliation but have dips that commonly crosscut the foliation. Of 18 veins systems in the Helm Bay area, 12 had strikes between 165 and 205 degrees, 5 others had strikes between 100 and 145 degrees, and 3 had strikes between 030 and 050 degrees.

Though most of the deposits are very similar, there are six more-or-less distinct styles: 1) faults with large quartz veins and pyritic alteration; 2) quartz vein swarms; 3) quartz veins with little or no wallrock alteration; 4) fault zones with quartz veins and stringers; 5) clean faults with large quartz veins and pyritic schist wallrock; and 6) polymetallic veins.

Faults with large quartz veins and pyritic alteration

In the northern part of the Helm Bay area are several deposits which consist of strong faults and thick quartz veins. These deposits include the Upper Gold

Standard and Portland Mines and the Free Gold and Sleeping Beauty prospects. All of these deposits are found in the massive greenstone unit. The greenstone, however, is generally well foliated in the mineralized zones by shear foliation parallel to the faults (which tend to parallel regional foliation). In these deposits, the big quartz veins occur on the footwall of faults and have conspicuous pyritic alteration of the wallrock schists for 1 to 5 feet away from the veins. The veins can be up to 5 feet thick and tend but pinch and swell rapidly. The pinches and swells plunge moderately NW forming NW-trending ore chutes.

Pyritic alteration of the wallrock adjacent to the quartz veins is marked by cubes of pyrite as large as one inch. This same type of alteration is also present at the Lower Gold Standard Mine and in fault zones with quartz stringers. Generally, the concentration of gold in the pyritic schist gives values higher than the quartz by itself. Pairs of adjacent samples taken from quartz and pyritic schist localities yielded the following results:

Table 1. - Comparison of gold values from quartz and from pyritic schist

Location	Quartz	Pyritic schist
Lower Gold Standard	0.25 opt	1.047 opt
Lower Gold Standard	0.24 opt	0.487 opt
Portland	0.07 opt	0.434 opt
Portland	0.18 opt*	0.28 opt
Portland Shaft	0.18 opt*	0.550 opt
Free Gold	0.18 opt	0.505 opt
Old Glory	0.05 opt	<0.3 opt

* includes thin bands of pyritic schist in the quartz

Quartz vein swarms

Swarms of large veins occur at the Lower Gold Standard Mine and at the Beulah and Snowstorm prospects. Most of the veins in these swarms are not directly related to faults but still occur in the vicinity of one or more faults. The faults and quartz veins generally strike parallel to foliation though they tend to dip across foliation at moderate or steep angles. At the Lower Gold Standard Mine there are two sets of veins, both of which strike more or less parallel to foliation, but one of which dips steeply east while the other dips moderately west. At the Beulah and Snowstorm prospects, which consist of en echelon sets of veins, the same two types of veins exist but are dominated by the west-dipping veins. The veins are usually a few inches to 3 feet thick although thicker bodies do exist locally. The Lower Gold Standard Mine appears to have a moderately NW-plunging ore zone much like the Free Gold, Portland and Sleeping Beauty. As shown above, the pyritic schists at the Lower Gold Standard Mine is an important source of gold.

Fault zones with quartz stringers and pyritic schist

Many of the Gold Mountain area deposits, including the Keystone, Old Glory, American Eagle, Annie, Lone Jack, Jewel and Novatney as well as the Puzzler, consist of fault zones several feet wide filled with quartz stringers and pyritic wallrock. This type of deposit is characterized by a strong fault with lesser splays or an anastomosing system of faults or shears. These fault or shear systems persist usually only a few hundred feet before fading away into the general schistosity. In some cases, the fracture systems die away only to be revived a few hundred feet away. The fractured or crushed zones associated with the faults or shears range in thickness from 1 to 20 feet and pinch and swell along strike. Quartz veins within the zones are usually little more than stringers up to a foot wide and a few tens of feet long. Locally, the veins may swell up to masses 10 feet across but these bodies usually pinch back down to a few inches within a few feet.

Wallrock on both sides of the faults are well foliated due to shearing. This foliation is usually parallel to the regional foliation since the faults parallel that foliation. The zone of most intense shearing is the zone of the greatest concentration of quartz stringers and is also the greatest alteration. This alteration consists of disseminated cubes of auriferous pyrite.

Quartz veins with no pyritic schist

A persistent quartz vein at the Lakeview prospect is controlled by a fault on the footwall but there is no pyritic schist, except very locally, along its margins. The vein trends about 100 degrees and cuts foliation. The Lakeview is the only example of this type of vein.

Veins not obviously related to faults

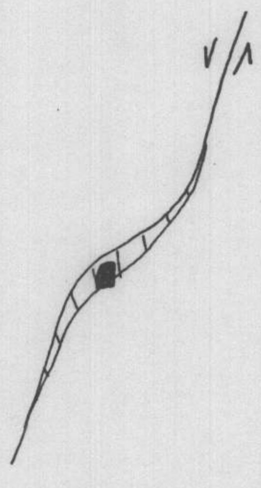
There are a few veins in the Helm Bay area that are not obviously associated with faults, including the Hoffman, Alexandra and US prospects. Instead of filling faults, they appear to fill tensional fractures and have little or no pyritic schist along their margins. The veins are usual only a hundred feet or so long and tend to dip moderately to the west. The veins at the Snowstorm and some of the Beulah veins are also hosted in tensional fractures instead of faults. These veins carry only rare pyrite but can have nuggets of gold along their margins.

Polymetallic veins

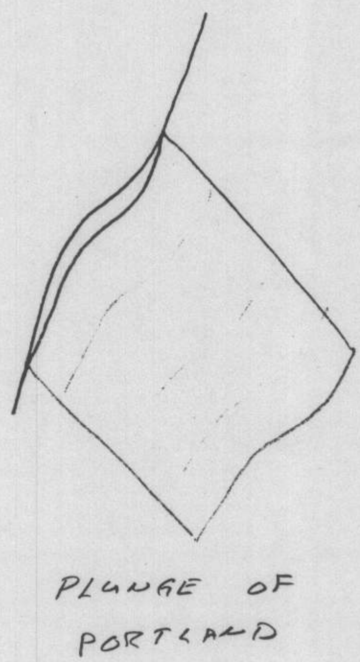
There are at least three veins in the Helm Bay area which are polymetallic. Two of these, the Rainy Day and Wixon, are associated with plutonic rocks, a granite porphyry and a diorite, respectively, while a quartz-calcite vein along Smugglers Cove may be metamorphic in origin. These veins, unlike other Helm Bay veins, contain galena and sphalerite along with chalcopyrite and pyrite.

Ore Controls

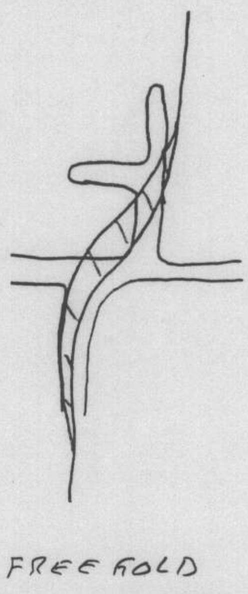
Though the deposits in the Helm Bay area are controlled faults, some of the deposits are localized along the faults by bends or warps of the fault plane. This localization is best shown at the Portland Mine. There the fault plane changes in dip from 70 degress to 45 degress. It is supposed that the fault resumes its 70 dip below. This created a pocket for deposition of the quartz (see below).



PORTLAND CROSS-SECTION



PLUNGE OF PORTLAND



FREEFOLD PLAN VIEW

This same warp control of veins is also present at the Sleeping Beauty, Free Gold, and Annie deposits. The Annie deposits are controlled by vertical warps in the faults while the Free Gold and Sleeping Beauty veins are apparently controlled by horizontal bending.

The large quartz lense exposed in the stopes at the Portland Mine can be seen to plunge NW at about 25 degrees. This same plunge also is evident at the Free Gold and Lower Gold Standard deposits.

Model for Ore Deposit Genesis at Helm Bay

The gold deposits at Helm Bay appear to have been created by the combination of late-metamorphic folding which prepared depositional sites for gold remobilized by metamorphism from an exhalite horizon. Late in the regional metamorphic event that affected the Helm Bay area, regional stresses changed so that a large-amplitude monoclinal anticline/syncline was formed. During creation of this fold, the area changed from a ductile regime to a more brittle one. This caused slippage along foliation surfaces parallel to the limbs of the developing fold which fractured and broke the rock. Gold, silver, copper and mercury remobilized by metamorphism from the exhalite unit, then migrated up faults to deposit in the more broken zones where the faults expanded.

Forming faults and fractured rock needed for conduits and depositional sites for mineralized fluids would have easily been done during folding of the rocks in the area. Rocks involved in the folding would have been more likely to form appropriate broken rock depositional sites than would the unfolded rocks away from the Helm Bay area. Using metamorphism to drive off metal-bearing fluids has been applied in other parts of Southeast Alaska (Juneau Gold Belt) and should provide a viable metals-transfer method at Helm Bay. The larger difficulty of this model involves the source of the mineralized fluids. The most obvious source is the exhalite unit at Smugglers Cove but other possibilities include the volcanic rocks of the area or plutonic activity.

The primary constraint to models of the Helm Bay area is the mineralogy of the vein deposits. The deposits all contain gold, silver (five to ten times less than gold), copper in small amounts, and mercury halos around the veins (Kennecott, 1985). Lead and zinc are essentially absent. The exhalite horizon at Smugglers Cove contains a similar suite of elements in similar concentrations. Kennecott generated separate correlation coefficients for elements at Smugglers Cove and for 15 vein systems in the Helm Bay area. Their correlation coefficients for gold against several metals are given below:

Table 2. - Correlation coefficients for Gold

	Ag	Cu	Hg	Zn	Pb
Smugglers Cove	.489	.710	.694	-.029	.022
Vein systems	.346	.241	.389	-.046	-.011

The results shows that both types of mineralization have the same basic elements.

The association of mineral deposits at Gold Mountain (Old Glory, Keystone, Last Chance, Jewel, Mountain Top) with the Smugglers Cove exhalite is easy to visualize because they are spatially associated. It is a bit more difficult to explain deposits farther away, such as the Gold Standard, Free Gold, Portland and Sleeping Beauty. But mineralization at all of these deposits fits the model. Copper is less notable at the Gold Standard area deposits than at Gold Mountain deposits but elemental mobility could account for the difference.

Regional metamorphism of volcanic rocks is a common source of metal-bearing fluids in other areas such the Juneau Gold Belt. With this model, gold is driven off frommafic volcanic rocks during metamorphism and redeposited in greenschist facies rocks. The principle argument against this model is the lack of lead and zinc at Helm Bay. Metamorphic deposits usually contain polymetallic metal assemblages. Another problem with a simple metamorphic source for the gold is that the Helm Bay deposits are concentrated in an area about four miles long and two miles wide but the Juneau Gold Belt is 100 miles long. A general metamorphic source for the gold at Helm Bay doesn't explain why the Helm Bay deposits are concentrated in such a small area.

A plutonic source could explain the concentration of deposits and could also explain why basalt is locally associated with the deposits at the Gold Standard and Free Gold. But it doesn't account for what is basically a monomineralic deposit. Vein deposits derived from plutonic sources are usually polymetallic and contain some lead and zinc. There is also no obvious source pluton except, possibly, for the granite porphyry at the Rainy Day and the diorite at the Wixon.

ANNETTE ISLLAND

BRADFIELD CANAL QUAD (AND JUST TO SOUTH, BUT NORTH OF BEHM CANAL)

DUKE ISLAND AREA

EDGE POINT 21200056
PERCY ISLAND ULTRAMAFIC . . . 21220004

PROSPECTS EAST OF BEHM CANAL (KTN QUAD, EXCLUDING HYDER AREA)

ALAMO 1-8 21200085
CHICKAMIN RIVER 21200060
GLACIER 21200086
GNAT 21200059
GULLETTE PLACER 21200093
IXL NO. 1 21200092
NANJAN DISCOVERY 1 21200100
QUARTZ HILL 21200067
QUARTZ LEDGE 21200097
RED CLAIMS 1-20 21200095
RELIANCE LODE 21200096
ROE POINT 21200058
SITKLAN PASSAGE PEGMATITE . . 21220006
STONEWALL BAY 21200159
VERY INLET STEATITE . . . . . NONE
Unuk River Gold . . . . 21180082 Bradfld. Canal Qd.

SOUTH GRAVINA ISLAND

ABE 1-10 21200112
BLACK JACK 1-7 21200145
BOOTS 1-3 21200144
CARITA 21200012
CLUB 11-14 21200143
DALL 21200014
FRIDAY 1,2 21200140
GLORIA M. NO. 1 21200139
GRAM-BEE 21200132
JULIAN 1-3 21200141
SEAL COVE 21200015
THIN 1-3 21200147
WASHINGTON 21200013
ZIP 1-32, 39-46, 48-58 . . . 21200142

KETCHIKAN BELT AND N. GRAVINA ISLAND

ALASKAWONDA 21200020
BEACH 21200127
BEAR 1-17 21200109
BIRDS EYE 21200021
BLACK SWAN 21200069
CLAIRVOYANCE 21200130
EASTER 21200011
GOLD NUGGET 21200117
GOLD FLAKE 1-4 21200118
GOLDSTONE 21200116
GOLDSTREAM . . . . 21200016 — Goldstring + Goldstone = Goldstream
GREEN HORNET 1-4 21200125
HECKMAN 21200017

Holder Clay 21200126
HOADLEY 21200018
IRE 1-74 21200131
LITTLE SUE 21200128
M.S. 796 21200111
SIX POINT 21200010
TYPHOON 21200125
VENETTA 21200113
WHIPPLE CREEK 21200122
WHITE CLIFF 21200129
WHITE KNIGHT 21200009
WILDCAT 21200019

THORNE ARM AREA

BALTIC 21200028
LAKE 21200031
MASSACHUSETTS 21200030
SEALEVEL 21200016
TYEE 21200029

HYDER AREA

JUMBO (BEVACQUE) AREA . . . .
NORTHSTAR AREA . . . .
ENGINEER . . . .
FORTUNA . . . .
FORTUNA AREA . . . .
PHILIPS . . . .
PHILIPS AREA . . . .
JOE-JOE . . . .
HOGBACK RIDGE SHEAR . . . . .
KENO . . . .
SWENNINGS GREENPOINT . . . .
GREENPOINT . . . .
UPPER MARMOT BASIN AREA . . .
UPPER MARMOT BASIN . . . . .
JUMBO (BANDED MTN.) AREA . .
LOWER MARMOT BASIN . . . . .
HECKLA . . . .
WEST BANDED MOUNTAIN . . . .
CANTU . . . .
FRANCES . . . .
VELIKANJE PLACER . . . . . .
J & L AREA . . . .
COMMONWEALTH . . . .

Saved as \Scoggin\93Notes

000048

Some Notes and Observations From Field Investigations Conducted During the 1993 Field Season

by **Bob Scoggin**
9-28-93

From late May, 1993 through late August, 1993 I had the pleasure of serving as a field assistant to USBM geologist Peter Bittenbender while conducting field investigations in the Ketchikan Mining District. We examined prospects and mineral localities within the Sealevel area (at the NE end of Thorne Arm), South Gravina Island, the Hyder area (south of Texas Creek), and numerous other sites including: Baker Island, Granite Mountain, Rock Lake, McGilvery Creek, Deer Bay, Mary Island, Cat Island, Bostwick Inlet, Vallenar Bay, and others. Of the areas visited, the Sealevel, South Gravina Island, and Hyder areas contained the greatest concentrations of prospects and mineral occurrences

The Sealevel area, at the northeast end of Thorne Arm on Revillagegido Island, is host to the Lake, Tyee, Baltic, Massachusetts, Sealevel, Gold Banner, Goo Goo, Goo Goo Extension, and Sea Breeze claims. The ore deposits within most of these claims consist of sulfide-bearing quartz veins. Gold is associated with pyrite (and to a lessor extent chalcopyrite and galena) found as euhedral cubic crystals which occur both within the veins and in a silicified, altered zone that extends from the quartz veins up to 3-4 feet into the host meta-volcanics. The quartz veins are occasionally continuous for up to several thousand feet, but pinching and swelling are common as is truncation by faults. The quartz veins average 1-3 feet in thickness but range from 1 inch to 6 feet wide. The altered, silicified zone adjacent to the veins is almost always 2-4 feet thick. Vein trends are consistently east-northeast.

Good gold ± silver assay values were noted in both vein and altered host rock samples, but these grades are spotty and discontinuous. Low overall grades, and the generally narrow widths of the veins and altered zones, indicate, in my opinion, that the Sealevel area is not likely to generate much interest for additional exploration given current mining methods and metals markets. There may be potential for better grades and higher vein concentrations at depth. Perhaps future advances in mining methods and metals markets might renew interest in this area.

The region from Nahenta Bay to Seal Cove, including Dall Bay, on South Gravina Island contains numerous prospects most of which contain a chalcopyrite-bearing breccia. Due to it's association with shear zones, and the angularity of the clasts, my impression is that this is mostly a tectonic or secondary breccia, However, some of the mineralized breccia, particularly that observed at Nahenta Bay and Seal Cove, may actually be a primary (syndepositional) breccia which has been tectonically brecciated (post depositional). Thin section work should help to determine the true nature of the brecciation. The wide regional distribution of mineralized breccia outcrops across southern Gravina Island implies that exploration targets are possible, but the assay results of sampling to date indicate only moderate copper values with little gold or silver.

Current world copper reserves and prices would likely constrain serious interest in exploration of this area in the foreseeable future.

The Hyder area, in particular the area south of Texas Creek, contains numerous prospects, claims, and workings which could be represented by four categories: 1) quartz ± calcite veins that host gold, silver, lead, and copper, 2) shear zones which host sulfides of copper, lead, sphalerite, gold, and silver, 3) massive sulfides-- mostly massive sphalerite in silicified, altered meta-volcanics,and 4) small quartz ± calcite veins hosting molybdenite, usually at vein margins.

Prospects belonging to the first category include the Juneau and Edelweiss. Quartz ± calcite veins vary from less than 2 inches up to approximately 3 feet in width. Mineralization was observed to be spotty, and often occurs within small bands in the larger vein. Veins are discontinuous and vein density is generally low. Given the small size of the veins, spotty mineralization, and low vein density -- I believe these prospects have relatively low potential as exploration targets. One exception to the low vein densities is on Banded Mountain which hosts numerous parallel vein swarms. Unfortunately, assays from these veins do not indicate any outstanding exploration targets, and the occurrence is in a wilderness area.

Shear zone occurrences are generally localized and small and occur primarily in the Jumbo Bevacque area. Impressive chalcopyrite, galena, pyrite, and sphalerite seams were observed-- but these are generally only several inches in width, and could not be traced for more than several dozen feet in length. Although the small size of these occurrences is discouraging, their high grade entertains speculation that they may be distal expressions of greater mineralization at depth.

The third category, massive sulfides, is characterized by massive sphalerite found in float from the Jumbo Bevacque area. Mineralization appears to be generally banded and occurs in a highly silicified breccia that I believe to be altered meta-volcanics. We were unable to locate this mineralization in outcrop. Nevertheless, we did locate numerous occurrences in float. The distribution of the float implies that the source is beneath the summit icefield. Initial assay results indicate that only minor gold or silver are associated with this occurrence. Since this mineralization is not located in outcrop on lower slopes of the mountain, any substantial deposit would have to be lensoidal and steeply dipping so as to outcrop only beneath the summit icefield. Given the location of this occurrence near the contact between the Hazelton meta-volcanics and the Texas Creek Granodiorite, and its proximity to the Premier Mine, this occurrence warrants more than passing interest. Low gold and silver assay values, and the presence of an icefield where mineralization most likely outcrops, conspire to reduce the likelihood that significant exploration will occur soon.

The fourth category, molybdenite hosted in quartz-calcite veins, occurs primarily on lower slopes of Banded Mountain along the west side of the Through Glacier. Molybdenite occurs as thin sheets and partings along the contacts between quartz ± calcite veins and mafic meta-volcanics and meta-greywackes. The quartz ± calcite veins vary from less than 1/2 inch up to 6 inches thick, but are generally 1-2 inches thick. Molybdenite is more prevalent in the veins containing mostly quartz and less common in the veins containing mostly calcite. Vein densities are on the order of one every 6-8 feet but vein orientations vary. This molybdenite occurrence is significant in that it occurs over a large area along the lower east slopes of Banded Mountain, but the low vein densities result in low overall molybdenite grades. Since this occurrence is within a wilderness area, and because molybdenite grades are diluted by low vein densities, it is unlikely that any exploration will occur here in the foreseeable future.

In conclusion, for the three most promising areas visited during the 1993 field season, Sealevel, South Gravina Island, and Hyder south of Texas Creek; market constraints and current mining methods would probably rule out significant exploration efforts within the foreseeable future in all three areas. Nevertheless, these areas contain noteworthy mineral occurrences which may well warrant additional investigation and exploration efforts should market incentives change. It should be noted that the aforementioned comments are strictly my opinions, and that I lack formal training in mining economics, exploration strategies, and the geology of ore deposits.

①

S. Gravina 000054

Seal Cove Claims Cu, Au, Ag, Zn — M.S. 725

PP1 Cp & sphal.

- br near peg. - gs sc contacts
- ore in br zones

gangue: qtz w/ jasper & calc.

① Seal Bay: 2 pits, nr. tidewater
py in sc & peg w/ cp

✓ ② Bay View Claims: ~½ mi W. of Seal Bay
Victory Mining Co.

No. 2 claim { 20' open cut sc w/ cp, py, bn
30-40' extent of min'zn

No. 3 claim { 20' drift sc cp, py + sl
1' vn (N60W)

B314
B347 Sm. smelter shipment made: Qz vn w/ cp, along S. shore of bay
Qz vn w/ cp + py, 100' drift

PP1 ③ ✓ War Eagle Claim: ~40' shaft gs-sc

1909? B442 p-143: 700' adit

1910 B480 p-102: 1700' adit, 5' ore @ 2% Cu drift

1911 B520: 1900' adit

Victory (??) property

1913 B592: 2000'+ adit + short drifts + raises, cp + py + Au, cntry rk = ig.

2 adits ~100' vert. apart

ore in shr zones, CP w/ Au

up to 3' thick

N30E, 85E } approx. orient. of vn. in shear - adits drift @ same orient.

Patterson Co. — same structure

✓ Big Joe: B347 p140: 10' Qz vn, N-S strike, 3000', py + cp, in mm'd chl sc

& Hobo claim

B347: Hobo & War Eagle on 10' vn, py + cp,

④ ✓ Grotto Claim: { O'Brien, Trio, + Big 3

Victory Mining Co

200' adit (@ ~600' elev.) 25' wide ore zn. gs sc, x-cut + drift

30' " (650' elev) br gs sc

gs sc mineralized, but min'zn conc'd along shears

11% Cu across 5'

~¼ mi north of adit, 50' shaft, sc

B347: wide vn, 550' of drifts + x-cuts, in shr zns, chl sc, cong, altered volcanics

⑤ Jumbo: 50' elev., sm. x-cut, 5-10' zn w/ cp, py,

- flat area, no outcrops in vicinity

See Plat

000055 maybe is Washington claim

PP1 → 1/2 mi to E. of Erhart (Carita) claim
50' tunnel
ore = brecciated zone in porphyritic rk., cp w/ cc + qz gangue
TR fossils (B592, p 93-94)

Carita: Cu, Raw
Qz vein in calcareous cong. w/ stringers of cp
= Erhart claim (?)
- open cut, sm. vn in shr zn in porphy. rk
2' thick, cp high grade
4-5' low "

Washington: "past producer", Cu
20' drift
reddish pegmatite cntry rk. cut by diabase dike
mineralized along cont. of) + in shear
py & cp w/ Qtz & jasper gangue

Dall Exp, Cu, Au, Ag
Rossland & Deer Park Mining Co

US 339
Gladys I. Kloset
Irene Nichols } 1967

See plats

PP1
2 shafts + test pits
30' & 50-60' deep, flooded
cpy w/ qtz gangue
cntry rk: peg., chl-gs sc, diabase sc,
up to 30% Cu, + Au + Ag
avg 11% Cu, ~. 1/4 opt Au + Ag

Concord Group (B347 p. 139) = Apex Group (PP1, p. 72)

includes: Concord No's 2-4,
Blue Jay
Old Man
Sunrise
Grenadier

B347: Concord grp: shaft, 3-ft vn, N20W
mm & br cong.
py, cp w/ Qz, + carb.

PP1 Concord #2: 10' adit
along br peg/gs contact
cp w/ Qz, calc + Mn

Concord #'s 3,4: nr mtn. top, gs sc - peg contact
open cut, 18" to 2' py + sl in gs sc

Blue Jay: 50' adit, min'ztn @ peg-sc contacts

Old Man: sev. ft-thick min'zd zn, cp, sl
opencut

Sunrise: 1-1.5', sev. hund. ft extent, N75W, 80S,
peg - gs sc contact, "beautiful" cp ore
up to $72 / ton in Cu + Au, Ag

Grenadier: 10' deep cut, gs, sc, + peg
min. along shr zn's.

Sanford grp (B347, p. 139) open cuts, short shaft
chl-rich rk.

(B642, p. 93) shaft on shr zn in grn chl sc

Algonquin claim: (B642 p. 93-94)
Qz w/ cp, shr. in chl sc, open cuts
50' wide, N30E
+ banded Qz w/ specular iron

To N: 1500' long, 50' wide, Qz w/ stringers of specularite,
+ cp + bn

Anthony, Lizzie L., + Deer Lodge 1, 2 + 3 claims: (B642, p94)
sfc trenching, lrg, low-grade ore bodies
4-5, vert. // lodes → N20W
up to 200' thick
Qz w/ py, cp + spec. hm + Au

Gram Bee: Pb, Ag = Antler, Bonnie, Mary

Kardex (120-117) "Right hand side of an unnamed cove when facing a westerly direc. adjacent to Nelson Cove."

Abe 1-10: Cu, Pb, Ag

Kardex 120-136 - includes: Gray, Sea, Ina, Chris, Zip, Thin

Amoco Min's had option 73-75 (Kardex 120-152)

Geophys. rpt.
Map cabinet - Claim map
Ownership file

} probably w/ DM&G files in Fairbanks (Div. of Mines & Geol?)

along w/ Ash, Moon, Chris, (& more?) claims: ddrilling, geochem, etc. trench, strip, geophys,

Gloria U_3O_8 (Melba 1-2)

Kardex 120-111 1956 — "N. of the creek entering the head of Dall Bay"

Friday 1,2 Cu, Fe

Roehm MR 191-5 p. 9-10 20' wide 1000' long siderite vein w/ some Cu, ± Pb, Zn

~~Kx 120-112 "@ high tide line of 1st sm. inlet to the SE of the head of Dall Bay"~~

Julian Cu Mix-up w/ #'s, ref's, dates, etc. betwen MAS & Kardex

Zip Cu, Pb, Ag
-assoc'd w/ Abel-10, Thin, Asl, Gray, Sea, Ina, (Chris, Moon)

Thin Cu, Pb, Ag

Club 11-14 U_3O_8

Kardex 120-101 "W. side of Dall Head about 1 mi S.W. of head of Dall Bay 1956

Boots 1-3 U_3O_8 1956

120-103 "S. shore of Dall Bay..."

Black Jack 1-7 U_3O_8

120-98 "Peninsula forming Dall Bay..."

Sm. amt. of mat., high grade = "sev. % Uranium"

host: basalt/gabbro ; vein in fault, 2½' sill or layer of orthoclase feldspar forms hw.

Carol 1-7 $CaCO_3$

Kx120-112 1st sm. inlet to the SE of head of Dall Bay; @ high tide line

Duke Island Area

Percy Isl. Ultramafic

Cr, Ni, Fe

Kx 122-007 - W. end Cow Isl. (Fe) 1954, 50' dd in 1956 — File CR122-K

Kx 122-008 - Sm. Isl. NW Percy Isl's (Fe) 837' dd in 1956

Kx 122-011 - Percy Isl. Grp. (File CR122-S)

Edge Point

Au, Ag 1966-71 CR120-J

SE end of Mary Isl.

dd 6 holes

East Island

Au placer! 1967 CR122-C

just SE of Duke Isl.

TED #1 - #5

Duke Isl. Ultramafic - Judd Hbr.

Cr, Ni, Fe

Boyles Bro's dd 1957

Misc. US Steel Iron claims

Al's notes: anchored @ Judd Hbr "fairly well protected"

Duke Isl. Ultramafic - Hall Cove

Cr, Ni, Fe 1954

1957 dd.

(Judd Hbr. & Hall Cove: most early ref's & first staking for Fe potential)

Cat Island

Cu

50 sacks Cu ore reportedly shipped in 1907 (Bufvers)

(4)

297

Behm Canal & E. of,

1XL Cu, Mo 1974 J.W. Huff (Kx)

in 1979 Gulf Minerals & Resources had property
some core drilling

Reliance Lode PY (Sulfur)

1953 J.S. Pritcher

Kx120-11 "Roe Point" → Lat & Long (or Kx) indicate SW of Roe Pt.

Stonewall Bay U_3O_8

Located claim (no Kx)

Roe Point — MOL claims in same folder
Mo, Cu, Au, Ag

PY, PO, CPY, 100' tunneling / xcutting
portal ~ 10' above high tide mark

min. along flt. in sc/gneiss belt (calc-mica sc & qtz-mica sc)

Red Claims 1968

Au, Cu, Mo 1969 drilling

Quartz Ledge Au

1978? no ref's

(4)

Nanjan Discovery Mo
(same as Mol Claims?)
Kx 120-5 AW included "shafts" pits, x-cutting, etc. 1960-63

Nanjan & Whistlepig grps.

Gullette Placer Au 1953-57
Kx 120-7 Mouth of Red River, Morton Arm
Kx 120-14
& Q.C. 1 & 2 "Head of Red River" 1953-55

Gnat Mo Raw Prospect 1958 ref & earlier

Chikamin River Cu, Fe ~1929 ref.
Raw prospect

Alamo 1-8 Cu, Fe 1969
Exp. Prospect
J.W. Huff - locater
El Paso Nat'l Gas optioned (1969)

Glacier Cu, Zn 1954
Exp. Prosp.

Very Inlet Steatite (massive talc) (1954) 1/4 mile up creek
in Qz-mica sc, some py, biotite
600' x 10-20' strike N15W
another o.c. (wht. talc) @ mouth of creek, below high tide line

Very Inlet Pb-Zn

gn & sp in qz-mica sc w/ garnets
15' x 6" x 6' deep N30W, 60E // foliation
20' adit - adjacent shoreline

Very Inlet Qz Veins

Mo, Py

in "granetized qz-mica sc" veins w/ feldspar, py & rare moly
230'+ x 2-5' N20W, 40-70E

Sitklan Passage Pegmatites

Mica

commercial size & grade (1953) mica
garnet & garnet sands on W. Kanagunut Isl.
& Port Tongass

- Peg. in 2 // belts from N. Sitklan Isl., N to Nakat Hbr. although not continuously exposed.
  - some peg exposed on SE Sitklan Isl.

"Vermiculite" source possible

- in peg's check for REE's, lithium, niobium, cesium, tantalum, uranium

000063

Ktn Area & N. Gravina Isl

White Knight Cu, Au (Raw Prospect?)

W. coast Gravina, SW (3 mi?) of Vallenar Bay
200 yds from shore - 50' adit w/ cpy
in diabase dike cutting graphitic slates

Six Point ~1899-1900 Au, Cu (Raw) Vallenar Bay, Gravina

PP1 "3 compartment shaft + some drifts" flooded
along intrusive contact w/ slaty ls & qtzite
py & Qtz gangue, only few ft wide
(south shore? B 592 p. 93)

Easter ~1900 Au

PP1 6' deep pit, py & aspy, N70W, 70N
- Qtz vein, 3800' along strike,
- clay slate (fw) & gs sc, (hw) up to ~20 opt Au (best reported)
- best ore: blue Qtz w/ gray sulfide (aspy?)

Goldstream = Miller Mine, Bell Claim, Cu, Au, Pb, Zn

thin zone 4-8' wide, 1000+ long

py, cpy, gn, sl, aspy

8-14' wide

"Past Producer" ~50' flooded shaft + 40' xcut
- Qz + calc veins in chl-sc - best: up to ~1 opt Au
- chl, talc & qz-sericite sc

gs sc - also 100' shaft w/ 300' drifts (1905)
115' " " 600' " (1907)
" " " 400' " in 2 levels (1908)

- mill on site, mainly free Au,

1907: Irving Consolidated Mining Co.

Au w/ gn & sph. in veins which xcut sc fol.
1908: 3000 tons ore mined, wharf & bldgs.
Au in particles & flakes

2 // ore zones, 90' apart, thinner one = richer

(6)

Ktn Area & N. Gravina (cont'd)

Heckman (befr 1902) Au, Past producer ??

PPI: chl sc, w/ qz + calc stringers/veins

py

B347: (close to beach) 60' shaft w/ 32' drifts, 8' wide lode

1/2 mi to N = 50' shaft

(B347) (NO MAS #) <1908

also Moonshine → 1/4 mi S. of Heckman,

2 // veins, strike NW, 18' & 6' wide

gs sc, 30' open cut → 12' shaft

Hoadley Au, Bi, (exp. prosp)

2 mi N of Ktn, 1/4 to 1/2 mi from beach

veins in syenite dike w/in sc, syenites to gabbros

older vein: N-S, 45W, w/ py + po

younger vein = higher Au free Au N20-35W, 50 SW, w/ aspy

short drifts, arrastre 4"-24" wide

veins contain tetradymite, a telluride of bismuth Bi_2Te_2S

- electromag survey 1960

Wildcat 1908 (in 1936 = Judy) Antimony (Sb), Bi, Au, Cu (exp. prosp.)

PPI 1 1/2 mi N. of Ktn, 1/2 mi from beach

vein in diorite in blk slt.

- up to 4500' long, 12"-15" wide

free Au, py & cpy ~1-1.5 opt Au

short tunnel, arrastre

B347 - SE of Hoadley claims

- same geol as Hoadley described: veins in syenite in sc

short tunnels & shafts 175' x-cut } 60' below & 200' of outcrops

Alaskawonda Au (exp prosp)
85' shaft, elev. 175', short tunnel
gs sc, py, cpy in Qz veinlets in gs sc

same ?

Birdseye Au, Pb, Zn (exp. prosp)
PP1 on beach, 1½? mi SE of Ktn
35' shaft, py in slt.
Qz vein (Qz lenses) in feldspatic (sed'ary?) rk.
betw. blk slate & chl sc
B347 4 mi S. of Ktn 3'-5' vein in porphyry dike
py, gn, sl, + Au

Black Swan Au, (exp. prosp) 1902
M.S. 550 patented now 16 owners
Kx only no published info See Plat

Bear 1-17 Au, (exp. prosp) 1972, '76
Kx 120-151 on E. side of Minerva Mtn nr. Ktn
no published info

M.S. 769 Shoenbar Grp
Many owners shaft #1 220' elev. (100' deep??)
2 shafts, opencuts 30' deep #2 210' "
py, cpy in sc See Plats

Venotta Au (exp. prosp)
Venetia M.S. 731 (1911) many owners
no info See Plat

Goldstone =Goldstring Au, (exp. prosp) Gravina Isl.
Patented M.S. 1479 1925 See Plat
have written to owners no info

Gold Flake 1-4 Au, Ag, Pb (exp. prosp.) Gravina
1959
AW: 1967-74 mainly brushing lines

Gold Nugget 1,2 Au (exp. prosp) S. of Saxman
Saxman-Herring Cove Rd.
M.S. 1475, 1926 See Plat
many owners no info

KerS ~~Whipple Creek 1,2 Sand & Gravel~~ ~11 mi N. of Ktn.
~~M.S. 226~~
~~still doing AW until 1963 (1st claimed 1953 : Kx)~~

Typhoon Au (exp. prosp)
6"-8" qz vein w/ py N30E, 70SE x-cuts bl+grn slt's

Green Hornet U_3O_8 1956
only Kx info

Holden Clay Deposit Clay!
clay up to 20' thick, extends 2 mi (?) up valley of
Vallenar Crk, exposures in crk.

Beach Au

M.S. 1413 1922 See Plat

Acc. to Ktn Assessors ofc. → 1413 is a USS (survey)
so owners not given; assume many owners!

Little Sue No2 Au (exp prosp) 1956
kx: 1/2 mi. N. of intersect. of Tongass Ave & Carlanna Rd.
No info except Kx

White Cliff Au in Ktn
M.S. 787 1909 See Plat
many owners! no info

Clairvoyance Au (exp. prosp) Gravina, E.
1963, 1974 AW
open cut only kx info

Ire 1-74 Cu (exp) W. side Gravina
kx: 1971, AW 73, 75-77
no info

Pd0000 sig 000068

Bufvers

MR 191-1A? (Kx120-25) (8)
MR 195-1C p.193

B520A p.26
B642B p.82
PE120-3
IR JCR 39 p.12,13

PP1 p.64 68,67
B347 p.147-48
PE120-4
IR SCR 3605 p.2,1
HGW 37 p.2
MR 120-6

Thorne Arm area

see Plat

Sea Level (SL): includes: GooGoo, Sea Breeze, Gold Banner

VMS?

USBM Bull 153 p.29

PP1 gs sc → actinolite, chl, qz w/ garnet ± calc
..."always impregnated w/ considerable py."
gs sc assoc'd w/ calc. schists
SL Mine: 2 // vns which follow a porphyry dike
2' + 5' vns, but dike also min'zd 2000' long
free Au, Au in py & gn, sl

GooGoo - Evis Mining Co.
sc, calc sc, gs veins cut dike & into cntry rk
" mainly min'zd in dike

Sea Breeze (in SL folder)
B347 2 short adits + opencuts
1'-8' veins in porphyry dike in gs Mz-Pz metavolcanics
gn, sl & Au + porphyry in wht. qtz

R08
B347

Golden Rod 320' elev, 16' vein, in gd, low values & min'ztn
Goo Goo 22' vn, 20' 35' shaft, in 15' adit is 3' vn, py, sl, gn free Au
Majestic (Motherlode) 20' vn in altered sc, py, sl, gn in qz, 10' adit
Golden Banner (Golden Tree) shft on ridge N of riv. 60' adit, sc w/ 1'-6' qz vn following porph dike, py, gn, sl, free Au in qz
Baby George @ mouth of Gokachin short adit on 10' qz vn in argillite (& qs) & gs
Wild West (Tidewater) S. bank of Gokachin @ mouth, only sfc. cuts qz stringers in ar & sc
High Horse (Monster) short adit on .5-3' vn in sc, py ± sl, py cubes abundant in sc
Slave min'zd sc w/ qz strngrs, sfc cuts, py w/ low Au values,
Queen & Baltic 2 short adits & 40' inclined sft on 1'-6' qz vn w/ py, sl, low Au
Baltic Star 1.5' qz vn 300' long in min'zd sc, py, sl, gn, low Au in qz

000071 000070

Mary

{ monthly
quarterly
pay sheets
overtime authorization }

{ Bruce ~~Stonestone~~ Johnstone 225-6508 } Robert — called re: Goldstream

Monday A.M.

① Call Albany & ~~SLC~~ — Dick McDonald 801-~~533~~-524-6138
~~Dave Olives~~ ~~Batt holder for flash~~

② Call ~~D. Johnson for maps~~ ~~Shirley re: travel~~ (Giblin)
a) ~~Ktn A-6~~ 4 copies
4X b) ~~blow-up: T77S, R91E,~~ Sects 16, 17, 20, +21 + 29 (portions of; Worn, Worn)
6 copies

③ ~~Call~~ a) ~~Seal~~ Cove Owners (27th flr.) MS 725 Bay View, etc
Davis, Wright & ~~Jones~~ Tremaine, Accounting Dept.
(206) 622-3150 (206) 628-7040 FAX
Susan Heathon — Ben Eggerton, (206) 628-7401 Eggerton
b) ~~Irene Nichols (for rpt. on Dall Bay)~~
586-6361
Plat — Assay rpt. — El Paso Nat. Gas → J.R. Heckman
{ c) Goldst~~ream~~ one + Goldstring Owners — Robert Gore 225-6949 Yes! — Nancy Murkowski
~~X~~ Sea Breeze : Ktn Pulp 225-2151
Goo Goo

⑤ ~~Call PTI for copy of bill to Ward Cove P.O.~~
~~1-800-478-7121~~ 9-5, M-F

⑥ (604) 926-1364
Call Terence Schorn (permission) Villebon (604)
re: access to adit on ~~Majestic Claim~~ Goo Goo Extension Claim

~~⑦~~ #429 A N. Tongass Hwy.
~~Call Specter for Toyo. parts~~

	080-40A	FAX shim & gasket	1958-9/75	#19.50
2X	080-35A	FAX W/ Seal	" - "	#2.10
	~~223-25~~	~~FT Axle R/Man~~		~~#3.99~~

~~Powers... 225-...~~

294-7309 warn hub svc kit #10.99
193+239 Warn hubs
Total 38.~~60~~ 7

lock tabs #38.67
2X 1.99 ea.
shipping #15 ??

000013 MPH 000072

'88

Start
8154
8402

Christopher
Naas

6/22

BOM SLC Dick McDonald
801-524-6138 ✓
Gerald Johnson
Cyanide amenability tests
crushed
float tests

Albany Cheryl Mardock Al Rule
1-503-967 5843

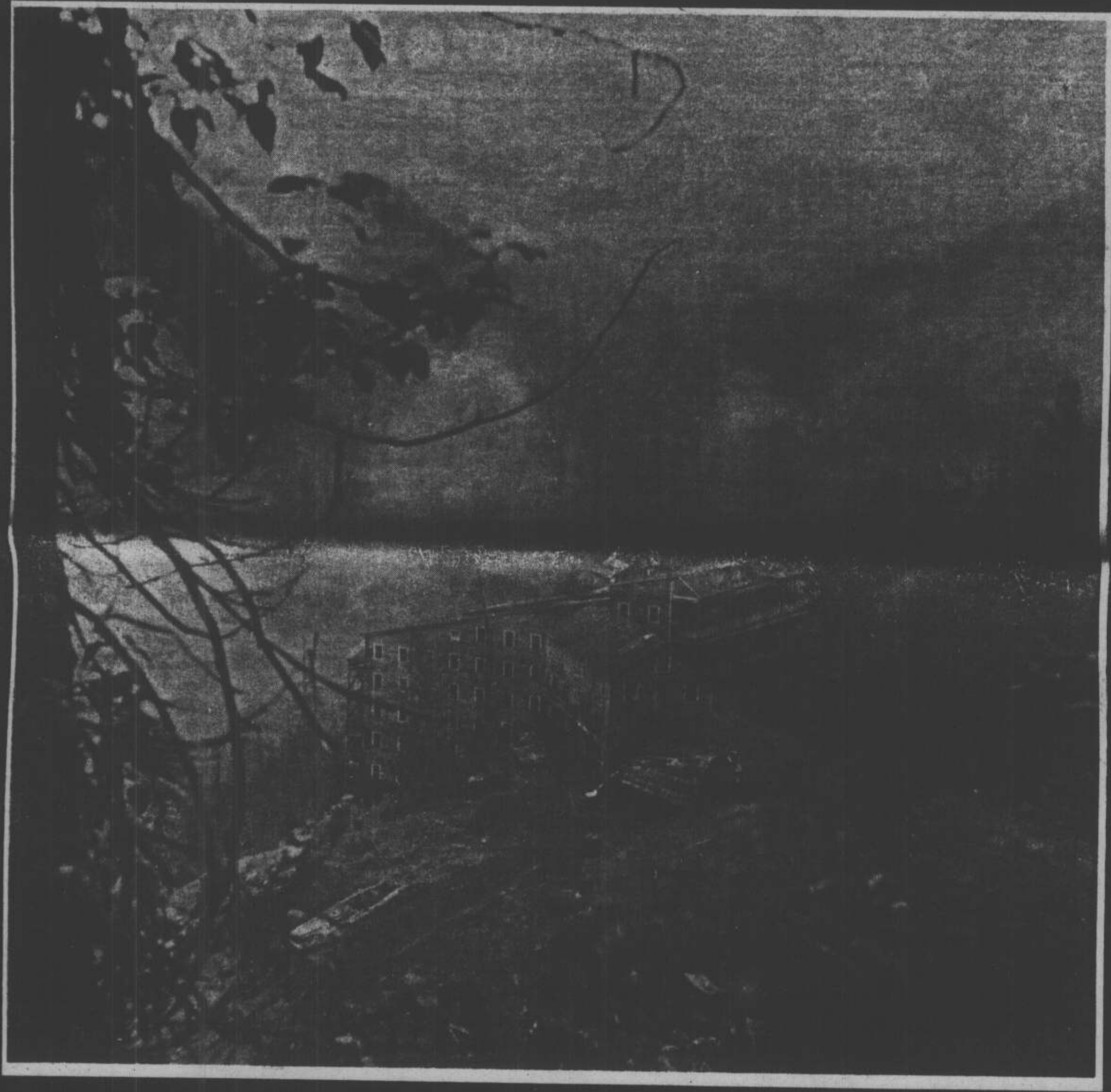
Sea Breeze, Goo Goo ✓ Timber Division
Dick Madden Ktn Pulp 225-2151
Timber Administration
Reception
Pulp mill
T. Schorn ← send rpt.
Dec. 90 MPH became CME
CME
MPH Consulting (?) still same name? NO!
Greg Hawkins
(604) 687-7938 ofc
873-6002 hm

~~Permission to publish!~~

000074

NEW ALASKAN

SEPTEMBER-OCTOBER, 1976 40¢



— IN THIS ISSUE —

"LOOK BACK AT THE FUTURE"

WHAT IMPACT DID EXTENSIVE ECONOMIC DEVELOPMENT HAVE ON SOUTHEAST'S "COOL JUNGLE" EARLY IN THIS CENTURY

000075

by historical editor Patricia Roppel

THOSE DISAPPEARING MINING TOWNS

CIRCA 1897 - 1930 IN THE KETCHIKAN AREA

Gold, copper, marble, palladium, silver, uranium, lead, and zinc. The Ketchikan mining District has produced them all.

In fact, this district can claim the first mineral deposit record in Alaska. This was a copper deposit near New Kasaan on Prince of Wales Island. Here in 1867 Charles V. Baronovich discovered a vein of chalcopyrite later known as the Copper Queen claim.

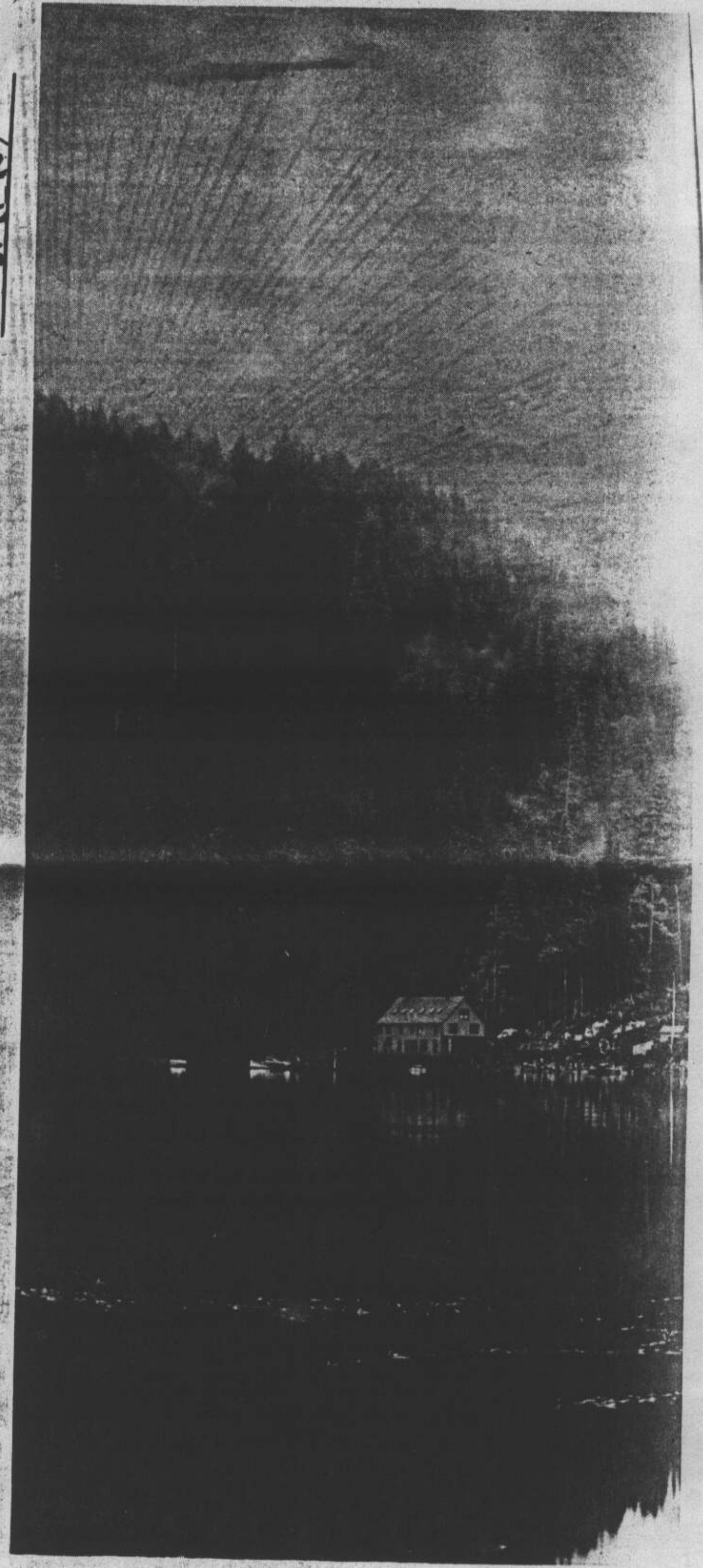
Baronovich's discovery, soon after the territory was purchased from Russia, was little known outside of Alaska, but it is questionable how much attention it would have attracted as few would have stampeded for copper.

It was gold that opened up the Ketchikan District. The gold fields of Windham and Holkham Bays, Sitka's Silver Bay, Juneau and Douglas Island had been known for over fifteen years before the prospectors and miners discovered that a gold belt extended as far south as the Canadian border.

With the resulting discovery and promotion of claims, mining camps began to spring up along the shores in many inlets and harbors. Each had distinct features and was independent of others except nearly all were dependent upon Ketchikan for supplies. Some of the camps grew into towns with post offices, while others remained tents or lone buildings in the wilderness.

These towns existed because of the mines they served,

(continued on page 10)



SULZER, company town for Alaska Industrial Company, was only a few buildings in the wilderness, as the mine had facilities located several miles away. PHOTO CREDIT: National Archives.

TODAY AT SEA LEVEL MINE

Numerous mine shafts penetrate the hills and mountains of Southeast Alaska but overgrowth make them difficult to find. Each shaft represents years of effort by a determined Alaska pioneer who proceeded to recover natural resources without concern for the environment. His efforst had little impact on S.E. Alaska's unforgiving wilderness.

New AK - June 1977 (Newspaper)

[redacted] [redacted]

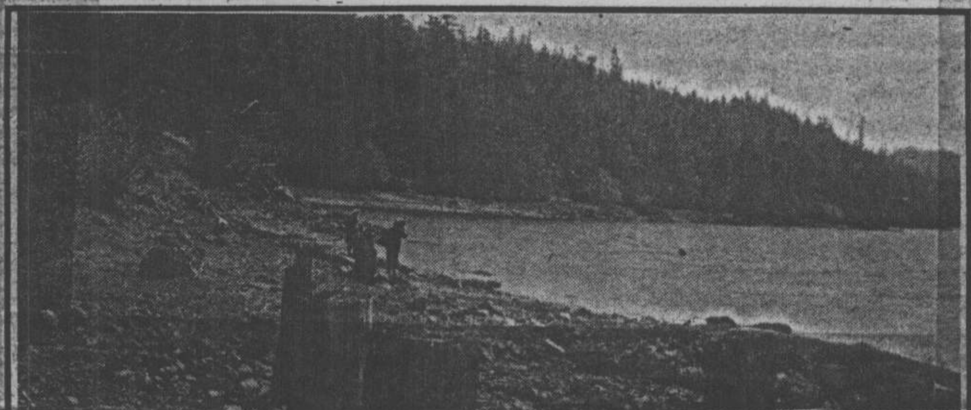
Amazingly, all the activity that occured early in the 19th century had virtually no impact on the fauna of Southeast Alaska. The salmon multiplied in adjacent streams, the deer and bear populations suffered no ill effects despite the fact that no one filed an environmental impact study. Which leads us to believe that the concept of "harvesting" all of our natural resources, both non - renewable and renewable, is more important than preservation of an unfragile wilderness.

We should be concerned about stocking our salmon streams through hatchery and aqua - culture programs. We should be concerned about properly managing the hunting of wild game. Man can co - exist with fish and game without depleting this resource. This too has been proven in Southeast Alaska.

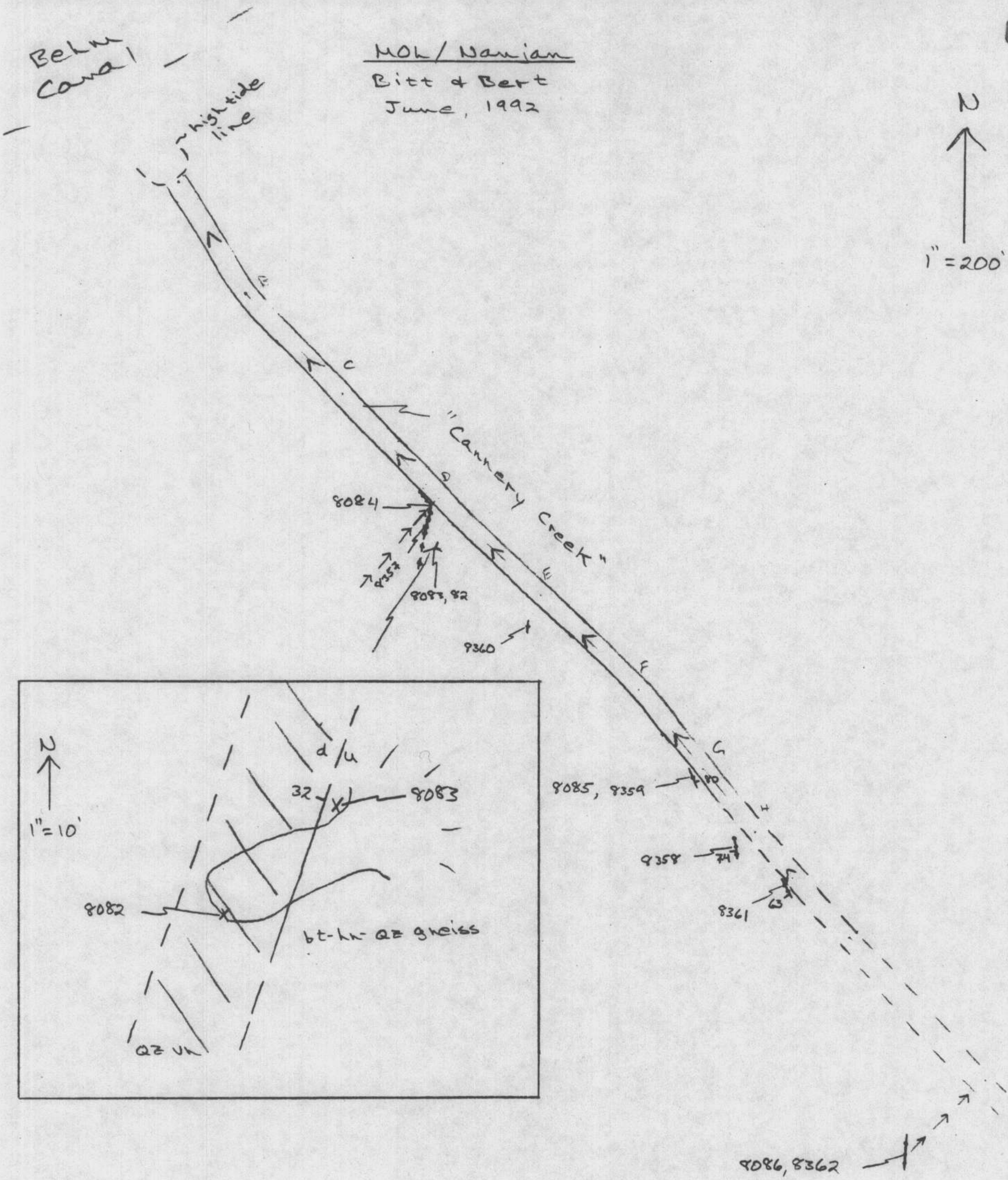
So we suggest that we look to the past in preparation for the future. Let's not try to identify and compare Southeast Alaska with the Midwest, New Mexico, Los Angeles, or even Washington State as we study the impact of an industry that will occupy an area that is a pin point in the panhandle's sixteen million acres. A pin point that will disappear TOTALLY a few decades after the pin is pulled.

Let's look to the past as we anticipate the future. Just think, if all those mining companies, cannery operations, and native settlements that dotted S.E. Alaska during the past 100 years had been compelled to emboil themselves in today's environmental control processes in order to become established they probably never would have existed. Yet they did exist. And where are they today?

Our wonderfully recuperative rain forest jungle has absorbed them. They are now a part of the wilderness!

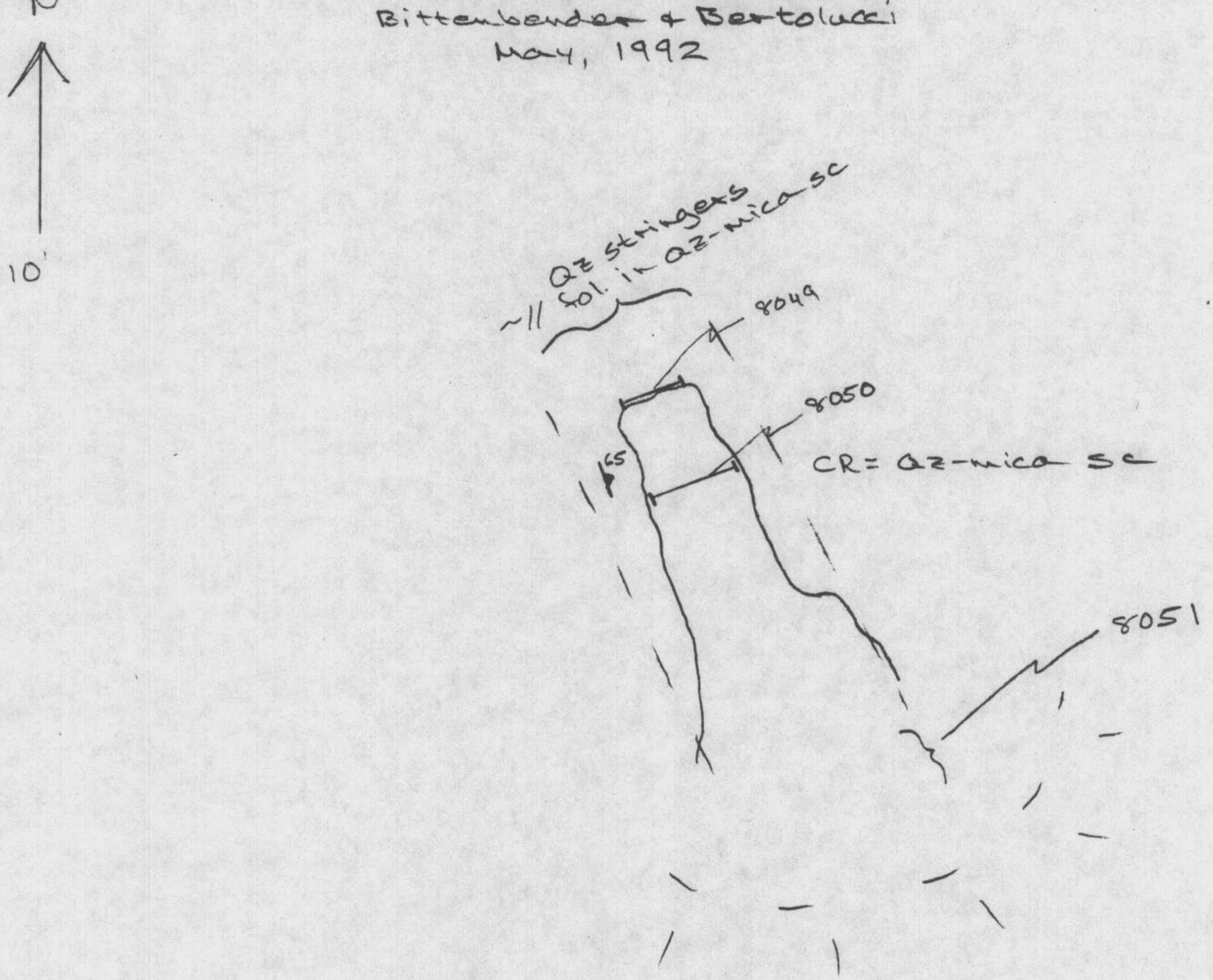


same article(?) in ↓
Roppel, New Alaskan, Sept-Oct, 1976


MOL/Nanjan
Bitt & Bert
June, 1992
Behm Canal
~high tide line
"Cannery Creek"
N
1" = 200'
C
D
E
F
G
8084
8357
8083, 82
8360
8085, 8359
8358
74
8361
63
8086, 8362
N
1" = 10'
d/u
32
8083
8082
bt-hn-Qz gneiss
Qz vn

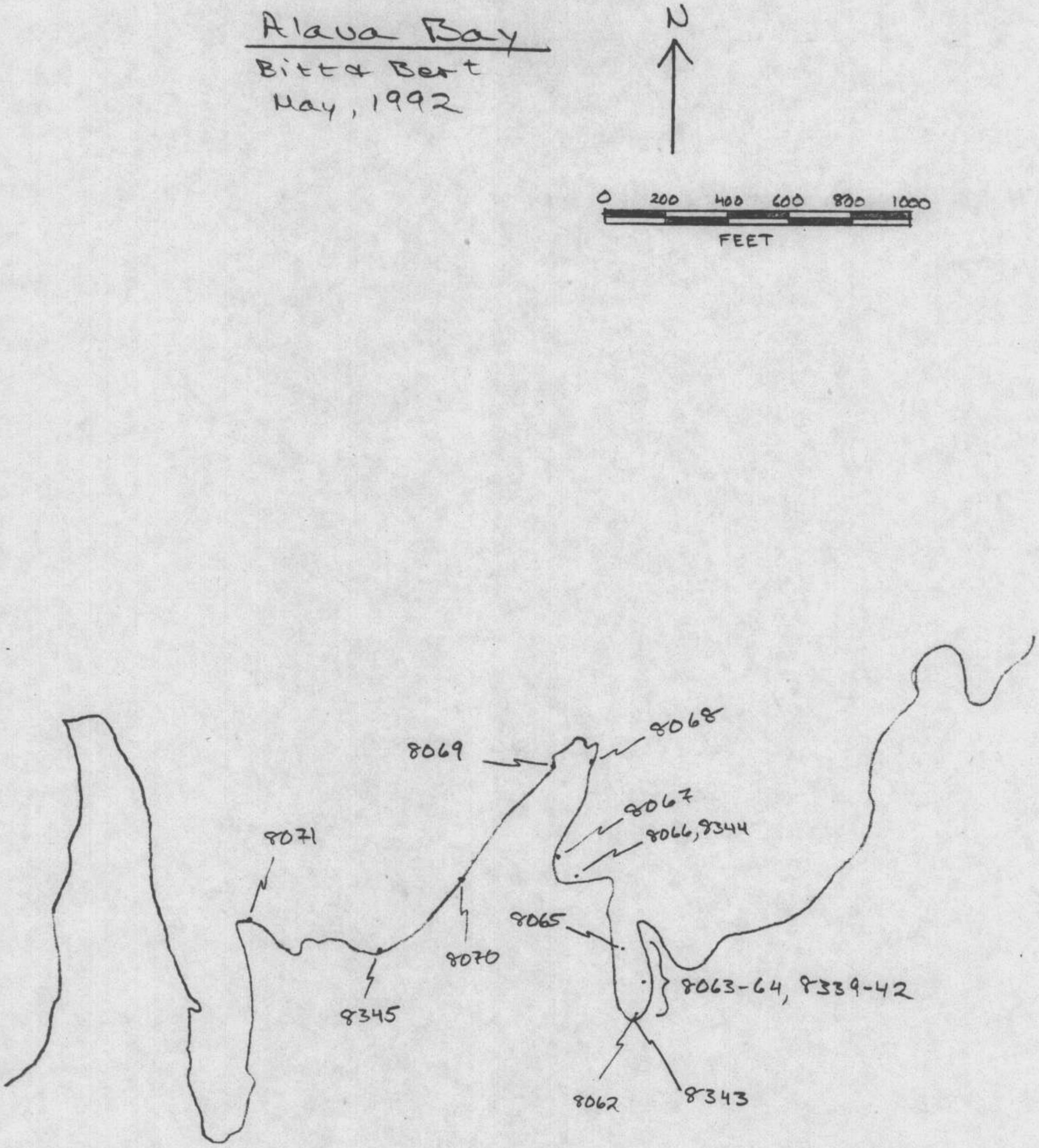
Very Inlet Pb-Zn

Bittenbender & Bertolucci
May, 1992



Alava Bay

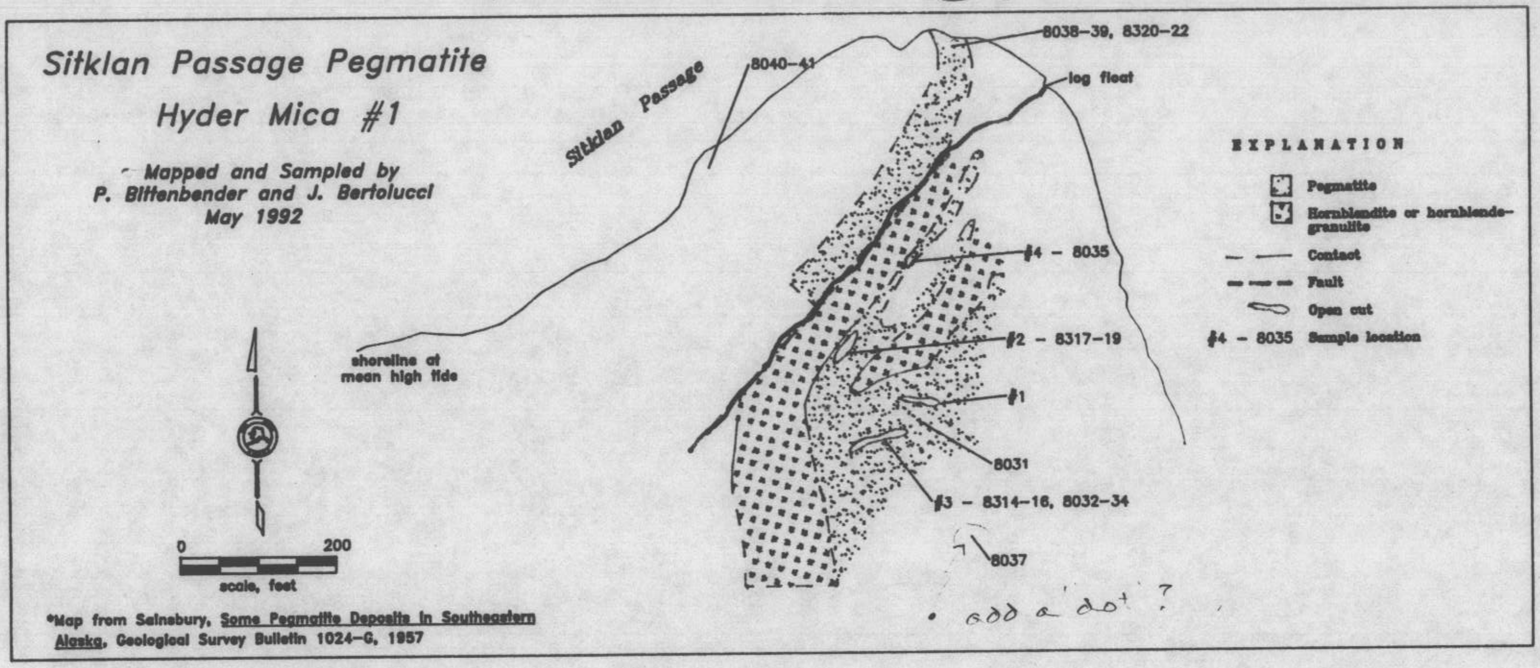
Bitt & Bert
May, 1992



Base from: D'Arcy P. Bannister
Alava Bay Magnetite Deposit
Examination Report
June, 1961
Alaska Ofc. of Min. Resources
} in Alava Bay folder

(note: may also want to digitize more of Bannister's base map. E.g., elev. contours, magnetic contours.)

I think (see notes) peg. dikes trend NW, not NE as shown below. So maybe not put in this map?

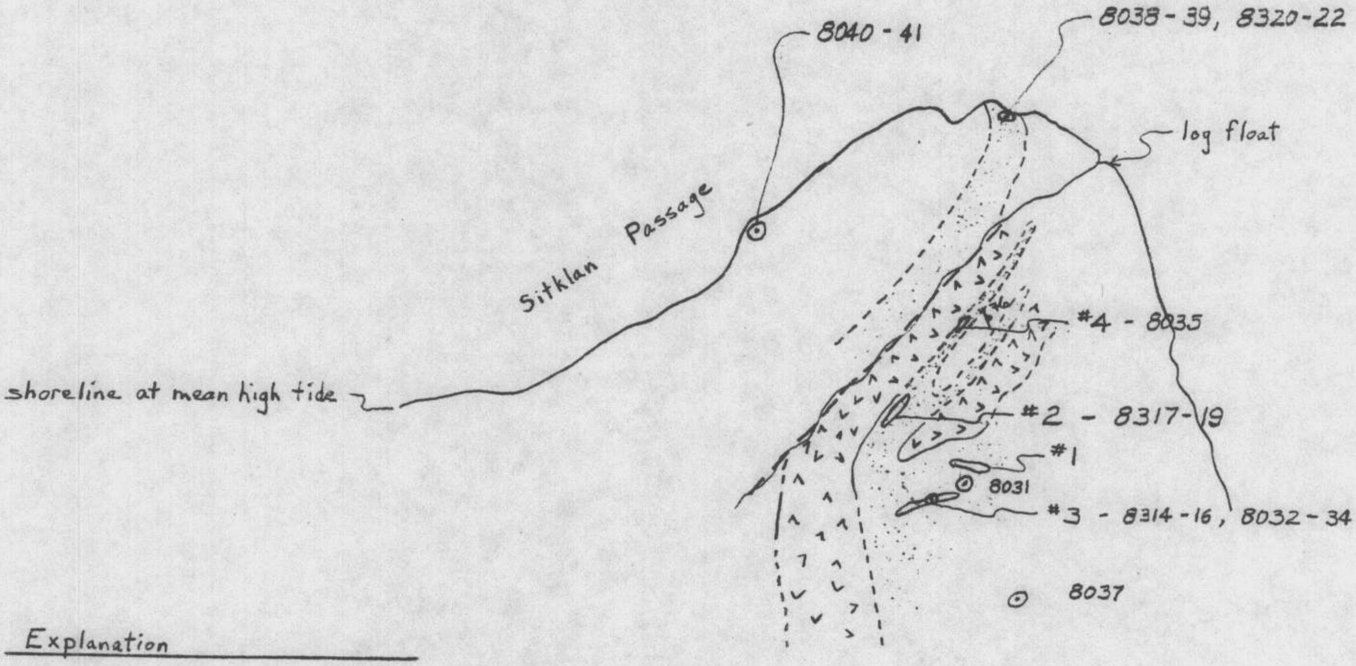


000083

Sitklan Passage Pegmatite - Hyder Mica #1

P. Bittenbender & J. Bertolucci, May 1992

155,
155



Explanation

- Pegmatite
- Hornblendite or hornblende - granulite
- Stream
- Contact
- Fault
- #1 Open cut in pegmatite
- Sample location

N

1" = 200'

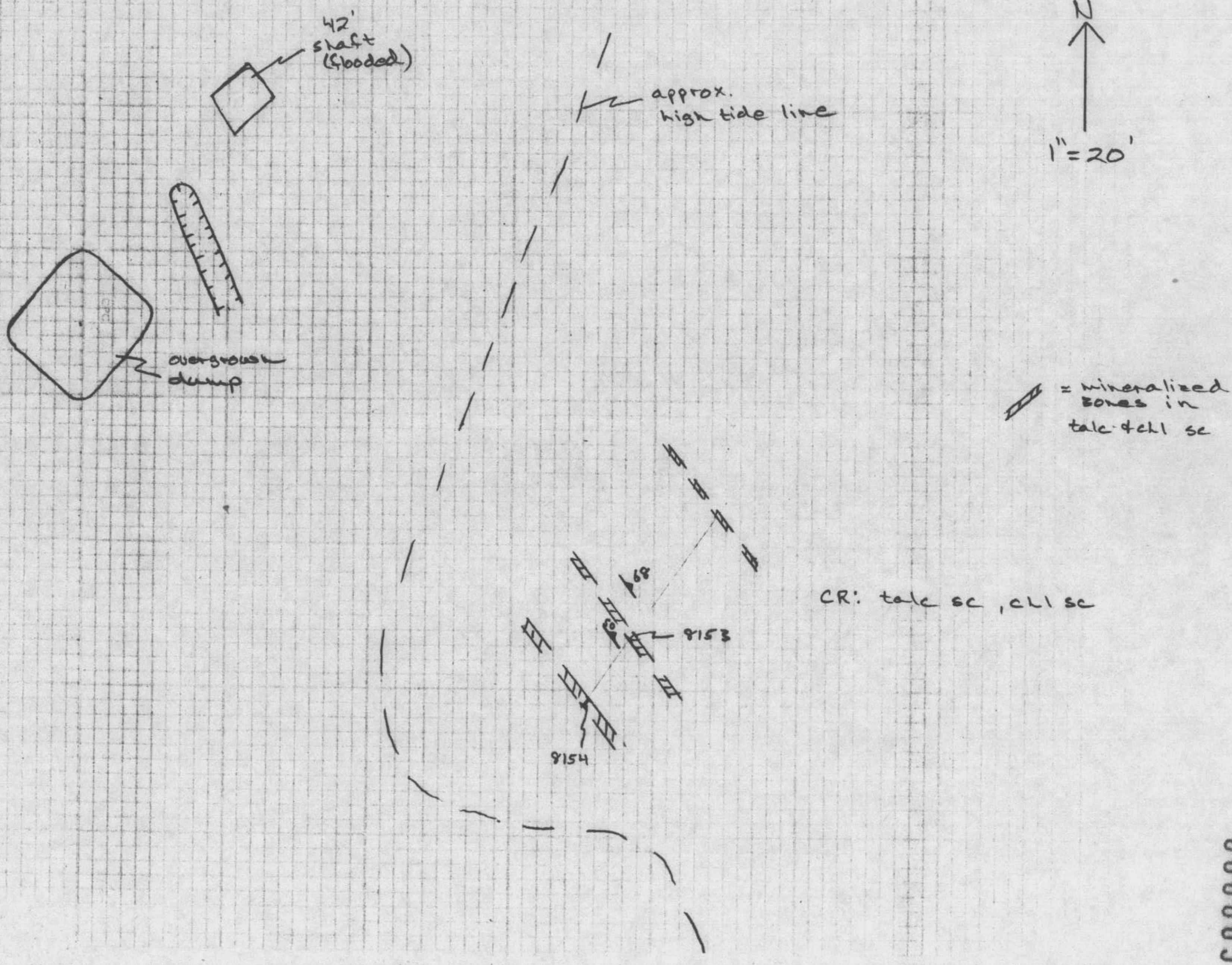
D.O

* Map from Sainsbury, Some Pegmatite Deposits in Southeastern Alaska, Geological Survey Bulletin 1024 - G, 1957

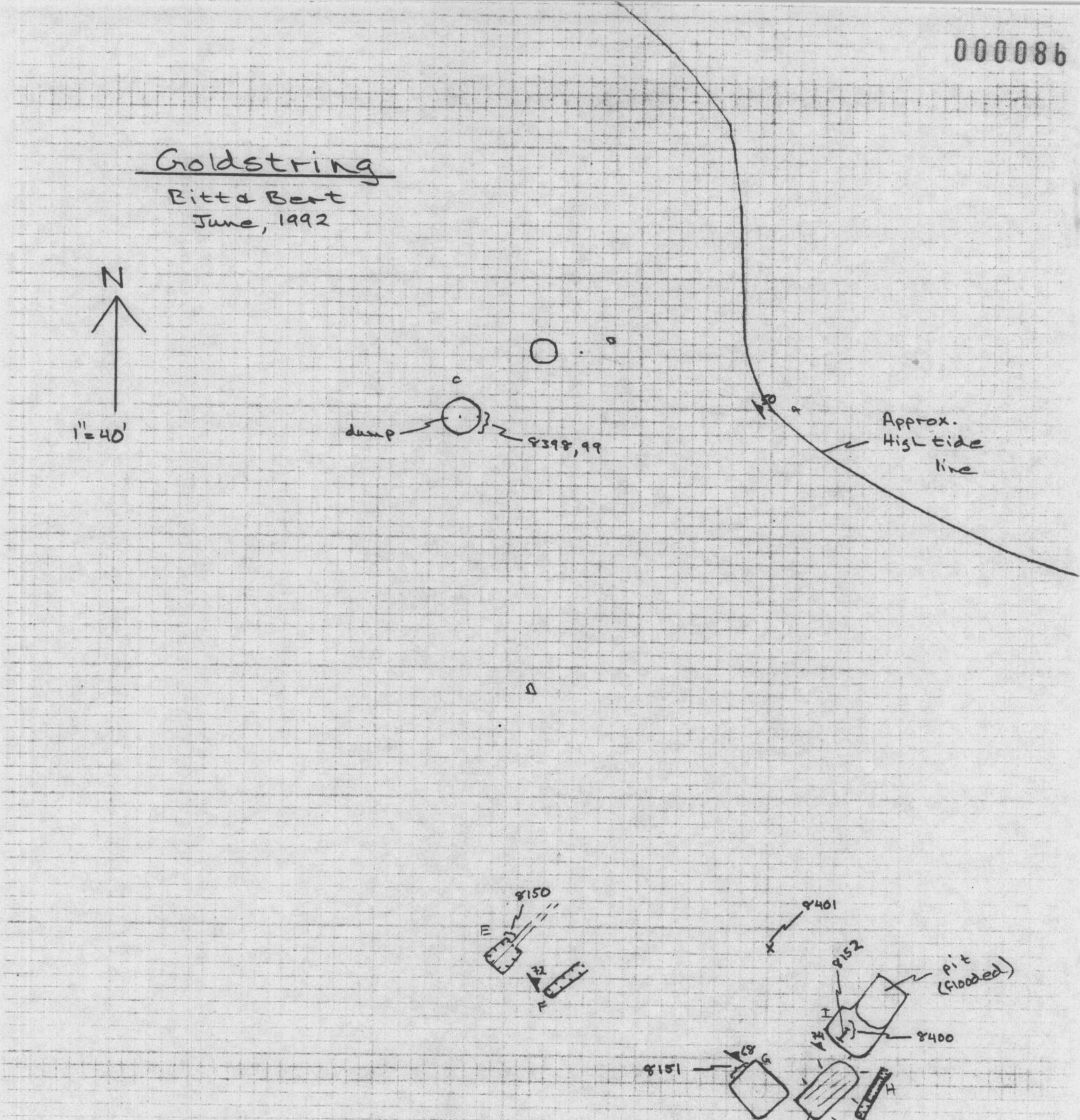
F:\KMD92\PEB92\PEBMMSPP

Goldstone

Bitt & Bert
July, 1992



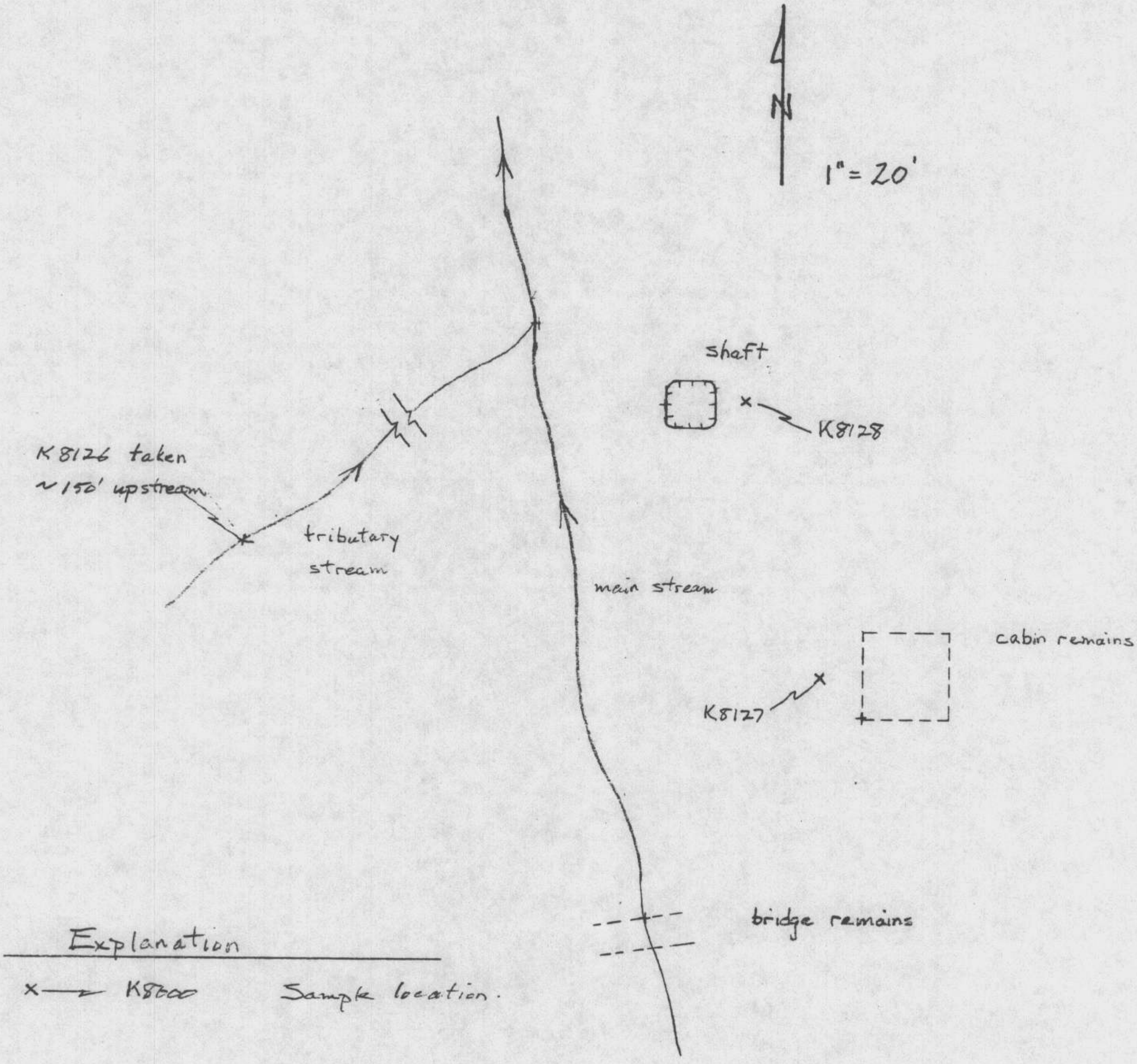
000086


Goldstring
Bitt & Bert
June, 1992
N
1" = 40'
c
dump
8398, 99
50
Approx.
High tide
line
D
8150
E
32
F
8401
8152
pit
(flooded)
I
8400
74
68
G
8151
H
dump

Easter claim

P. Bittenbender & J. Bertolucci

June 1992



SSE of Dent Cove area

Bitt & Bert
June, 1992