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**PRELIMINARY RESULTS OF HEAVY MINERALS CONCENTRATE ANALYSIS
FROM SELECTED INTERIOR AND WESTERN ALASKA PLACER MINES**

by

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THIS REPORT HAS NOT BEEN REVIEWED FOR
TECHNICAL CONTENT (EXCEPT AS NOTED IN
TEXT) OR FOR CONFORMITY TO THE
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INTRODUCTION

In the summer of 1990 the State of Alaska, Division of Mining, with assistance from the U.S. Bureau of Mines, undertook the collection of sluice box concentrate samples from placer mines operating on State claims to have them analyzed for heavy metals. Samples were obtained from eight interior and western Alaska mining districts (see Table 1). The concentrate samples were submitted to the U.S. Bureau of Mines who prepared the samples and contracted to have a comprehensive 59 element analysis performed, which includes nearly all heavy metal and rare earth elements of potential value. The elemental suite analyses was chosen on the basis of a knowledge of regional geology and what to reasonably expect from each submitted sample. In all, elemental analysis was performed on samples from 16 mines. This data, along with the elemental analysis reference information, is presented in Tables 2 and 3.

RESULTS

Analytical results were reviewed by the author, Roger Burleigh of the Fairbanks Office of the U.S. Bureau of Mines and Tom Bundtzen of the Fairbanks Office of the State of Alaska DGGs, resulting in the following general observations:

- 1) The high Rare Earth Element (REE) anomalies in sample number 27470 from Eureka Creek in the Manley District and sample number 27894 from Ketchem Creek in the Circle district probably indicate a nearby lode source of REE in the stream drainages. Sample number 27894 at Ketchem Creek stands out because of the association of rare earth elements found. Due to the fact these elements do not weather well, the collection site must be fairly close to the lode source. The concentrations of REE with higher atomic numbers suggests the presence of concentrations that may prove to be economic.
- 2) The mineral suite of arsenic, tungsten and gold observed in sample 27471 from the offshore Nome operation is very similar to the mineral suites observed in the onshore hardrock prospects such as the Rock Creek and Sophie Gulch lodes recently explored by Placer Dome U.S.
- 3) Several samples show a mineral suite indicative of high trace metal concentrates i.e. iron, nickel, tungsten, cobalt, tin and molybdenum. We speculate that most of the metal anomalies are derived from heavy equipment wear or welding rod. Without mineralogical confirmation, we cannot say for sure whether or not the anomalies are significant or spurious artifacts of contamination.
- 4) Tin anomalies in Midnight Creek (#27888, 27889) are accompanied by anomalous niobium (1456 ppm) and slightly anomalous tantalum (9 ppm). These metals are usually associated with hardrock tin deposits and can be economically important if a large enough quantity can be documented.

- 5) Willow Creek and Baby Creek contain slightly anomalous platinum metals; however, without further work, it is not possible to judge their significance.

SUMMARY

In summary, most of the samples showed concentrations of elements that would be expected in each of the respective mining districts. Additional exploration in the vicinity of the sample locations highlighted in "results" above may yield economically significant lode sources. Keep in mind these analysis are of sluice concentrates and should be interpreted more as indicators of relative metal relationships rather than absolute values of elements present in the stream gravels. All miners involved with this study are thanked for their participation.

TABLE 1

<u>Sample Number</u>	<u>Operator</u>	<u>District</u>	<u>Creek</u>	<u>APMA Number</u>
27470	Mark Krenzke	Hot Springs	Eureka Creek	F907060
27471	WestGold	Nome	Offshore Nome	F905856
27472	WestGold	Nome	Offshore Nome	F905856
27882	Mike Morgan	Rampart	Slate Creek	F907504
27883	Les Maxwell	Fortymile	Baby Creek	F907269
27884	Forest Hayden	Fortymile	Squaw Gulch	F907231
27885	Mike Busby	Fortymile	Chicken Creek	F906794
27886	Mike Busby	Fortymile	Willow Creek	
27887	Doug Green	Koyukuk	Smally Creek	
27888	Sphinx Mining	Ruby	Midnight Creek	F906907
27889	Sphinx Mining	Ruby	Midnight Creek	F906907
27890	Sphinx Mining	Ruby	Midnight Creek	F906907
27891	Helen Wilson	Fortymile	Canyon Creek	F906621
27892	Ken Hanson	Circle	Faith Creek	F907047
27893	Richard Goodson	Fortymile	Fortymile River	F907222
27894	Brian Johnson	Circle	Ketchem Creek	F907250
27895	Don Reed	Fairbanks	Vault Creek	F907293
27896	Don Reed	Fairbanks	Vault Creek	F907293
27897	Rick Swenson	Hot Springs	Doric Creek	F906872
27898	Jim Childs	Fairbanks	Nugget Creek	F909159
27899	Jim Childs	Fairbanks	Nugget Creek	F909159
27900	Helen Wilson	Fortymile	Canyon Creek	F906621

TABLE 2 (con't)

Sample number	45 W PPM	46 Ca PPM	47 La PPM	48 Ce PPM	49 Sm PPM	50 Eu PPM	51 Tb PPM	52 Yb PPM	53 Lu PPM	54 Sc PPM	55 Mf PPM	56 Ta PPM	57 Th PPM	58 U PPM	59 Ma PCT	60 Br PPM	61 Rb PPM	62 Zr PPM	63 Ta PPM	64 Nb PPM	65 Y PPM	66 Pt PPB	67 Pd PPB
X2 27470	30	2	3270	5630	492.0	52	38	7	3.4	16.0	55	7	290.0	18.0	0.62	<4	30	4100					
X2 27471	>2000	<1	83	230	12.0	<2	<1	38	2.8	4.7	10	11	36.0	36.0	<8.00	293	<28	<1000					
X2 27882	<2	3	28	73	6.3	<2	1	<5	<0.5	15.0	3	1	6.1	3.7	0.61	<1	64	<500					
X2 27883	21	<1	17	<10	2.6	<2	1	13	1.9	27.0	<2	<1	2.5	2.6	0.14	<1	<10	<500				178	18
X2 27884	42	<1	23	<10	3.8	<2	<1	9	1.2	24.0	6	2	6.0	3.5	0.44	<1	<10	<500				94	14
X2 27885	414	<1	29	36	4.8	<2	<1	<5	1.4	64.2	28	9	7.2	2.5	0.25	<1	<10	1400					
X2 27886	130	<1	8	<10	1.6	<2	<1	<5	1.0	17.0	3	2	1.8	2.6	0.10	<1	<10	<500				211	13
X2 27887	<83	1	62	<150	8.9	2	<1	<23	7.6	28.0	24	<1	<3.6	<14.0	<1.30	<18	23	1300					
X2 27888																			9	1456			
X2 27890	>2000	<1	99	100	13.0	3	2	23	1.6	51.2	5	13	11.0	4.6	<0.05	17	<10	<500					
X2 27891	>2000	<1	17	<10	1.8	<2	<1	6	0.6	16.0	3	2	2.2	4.0	0.21	21	<10	<500					
X2 27892	28	3	23	48	4.0	<2	<1	<5	<0.5	19.0	5	<1	7.7	2.7	0.66	<1	62	<500					
X2 27893	317	<1	25	<33	3.9	<2	1	7	0.8	25.0	12	14	6.3	3.2	0.82	<1	14	<500					
X2 27894																							5
X2 27896	554	<1	40	98	7.1	<2	2	26	3.1	54.6	15	39	12.0	11.0	0.09	4	<10	1400					
X2 27897	241	3	41	130	6.3	<2	<1	<5	<0.5	13.0	<2	12	2.7	4.9	0.79	<1	44	<500					
X2 27898	397	2	47	73	6.7	3	<1	16	1.1	18.0	<2	2	14.0	2.8	0.57	7	78	<500					
X2 27900	54	<1	13	<46	1.4	<2	<1	<5	1.4	15.0	<2	3	1.4	4.8	0.28	<1	<10	<500					

Sample number	68 Sn PCT	69 Ti PCT	70 W PCT	71 La PPM	72 Ce PPM	73 Pr PPM	74 Nd PPM	75 Sm PPM	76 Eu PPM	77 Gd PPM	78 Tb PPM	79 Dy PPM	80 Ho PPM	81 Er PPM	82 Tm PPM	83 Yb PPM	84 Lu PPM	85 Sc PPM	86 Th PPM	87 U PPM		
X2 27888	76.6																					
X2 27890		16.8																				
X2 27891																						
X2 27892																						
X2 27893																						
X2 27894	51.3		1.33	48	186	30	220	108	1.5	130	31	200	56	200	34	270	48	45	440	570		

NOTE: Samples 27470-27472, 27882-27887 and 27896-27900 were not analysed using these methods.

Sample Number	Location	Operator	Comments	Sample Number	Location	Operator	Comments
27470	Eureka Creek	Mark Krenzke		27890	Midnight Creek	Sphinx Mining	Ilmenite - slightly radioactive
27471	Offshore Nome	WestGold	High Grade concentrate, "Tramp metal"	27891	Canyon Creek	Helen Wilson	Good concentrate
27472	Offshore Nome	WestGold	High Grade concentrate, "Tramp metal"	27892	Faith Creek	Ken Manson	
27882	Slate Creek	Mike Morgan		27893	S. Fork 40 Mile River	R. Goodson	Well-washed concentrate
27883	Baby Creek	Maxwell Mine	High grade-radioactive	27894	Ketchikan Creek	Brian Johnson	Radioactive - lots of minerals
27884	Baby Creek/Squaw Gulch	Wayden Exploration	High Grade - lots of magnetite	27895	Vault Creek	Don Reed	Slightly radioactive
27885	Chicken Creek	Mike Busby	Magnetite	27896	Treasure Creek	Don Reed	
27886	Willow Creek	Mike Busby	Magnetite	27897	Doric Creek	Rick Swenson	
27887	Smally Creek	Douglas Green	Considerable Tramp Metal	27898	Mugget Creek	Jim Childs	
27888	Midnight Creek	Sphinx Mining	Cassiterite - fine grain	27899	Mugget Creek	Jim Childs	
27889	Midnight Creek	Sphinx Mining	Cassiterite - coarse grain	27900	Canyon Creek	Helen Wilson	Many minerals; coarse

Note: All analysis performed by Bondar-Clegg & Company LTD of Canada.
See page 5 & 6 for element key and methods utilized for analysis.

**Bondar-Clegg
Reference Information**

Order	Element	Number of Analyses	Lower Detection Limit	Extraction	Method
1	Au	10	0.2 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
2	Cu	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
3	Pb	10	2 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
4	Zn	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
5	Mo	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
6	Ni	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
7	Co	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
8	Cd	10	0.2 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
9	Bi	10	5 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
10	As	10	5 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
11	Sb	10	5 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
12	Fe	10	0.01 PCT	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
13	Mn	10	0.00 PCT	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
14	Te	10	10 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
15	Ba	10	2 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
16	Cr	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
17	V	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
18	Sn	10	20 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
19	W	10	20 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
20	La	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
21	Al	10	0.01 PCT	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
22	Mg	10	0.01 PCT	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
23	Ca	10	0.01 PCT	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
24	Na	10	0.01 PCT	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
25	K	10	0.01 PCT	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
26	Sr	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
27	Y	10	1 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
28	Sc	10	5 PPM	HNO3-HCl Hot Extr.	Ind. Coupled Plasma
29	Au	16	5 PPB		Inst. Neutron Activ.
30	Ir	16	100 PPB		Inst. Neutron Activ.
31	Ag	16	5 PPM		Inst. Neutron Activ.
32	Zn	16	200 PPM		Inst. Neutron Activ.
33	Mo	16	2 PPM		Inst. Neutron Activ.
34	Ni	16	20 PPM		Inst. Neutron Activ.
35	Co	16	10 PPM		Inst. Neutron Activ.
36	Cd	16	10 PPM		Inst. Neutron Activ.
37	As	16	1 PPM		Inst. Neutron Activ.
38	Sb	16	0.2 PPM		Inst. Neutron Activ.
39	Fe	16	0.5 PCT		Inst. Neutron Activ.
40	Se	16	10 PPM		Inst. Neutron Activ.
41	Te	16	20 PPM		Inst. Neutron Activ.
42	Ba	16	100 PPM		Inst. Neutron Activ.
43	Cr	16	50 PPM		Inst. Neutron Activ.
44	Sn	16	200 PPM		Inst. Neutron Activ.
45	W	16	2 PPM		Inst. Neutron Activ.
46	Cs	16	1 PPM		Inst. Neutron Activ.
47	La	16	5 PPM		Inst. Neutron Activ.
48	Ce	16	10 PPM		Inst. Neutron Activ.
49	Sm	16	0.2 PPM		Inst. Neutron Activ.
50	Eu	16	2 PPM		Inst. Neutron Activ.
51	Tb	16	1 PPM		Inst. Neutron Activ.
52	Yb	16	5 PPM		Inst. Neutron Activ.
53	Lu	16	0.5 PPM		Inst. Neutron Activ.
54	Sc	16	0.5 PPM		Inst. Neutron Activ.
55	Hf	16	2 PPM		Inst. Neutron Activ.

Bondar-Clegg
Reference Information

Order	Element	Number of Analyses	Lower Detection Limit	Extraction	Method
56	Ta	16	1 PPM		Inst. Neutron Activ.
57	Th	16	0.5 PPM		Inst. Neutron Activ.
58	U	16	0.5 PPM		Inst. Neutron Activ.
59	Na	16	0.05 PCT		Inst. Neutron Activ.
60	Br	16	1 PPM		Inst. Neutron Activ.
61	Rb	16	10 PPM		Inst. Neutron Activ.
62	Zr	16	500 PPM		Inst. Neutron Activ.
63	Ta	1	1 PPM		Inst. Neutron Activ.
64	Nb	1	1 PPM		X-ray Fluorescence
65	Y	1	1 PPM		X-ray Fluorescence
66	Pt	3	5 PPB	Fire-Assay	DC Plasma Emission
67	Pd	3	1 PPB	Fire-Assay	DC Plasma Emission
68	Sn	2	0.01 PCT	Peroxide fusion	Atomic Absorption
69	Ti	1	0.01 PCT		
70	W	1	0.01 PCT	Peroxide fusion	Colourimetric
71	La	1	0.1 PPM		Inst. Neutron Activ.
72	Ce	1	1 PPM		Inst. Neutron Activ.
73	Pr	1	1 PPM		Inst. Neutron Activ.
74	Nd	1	1 PPM		Inst. Neutron Activ.
75	Sm	1	0.01 PPM		Inst. Neutron Activ.
76	Eu	1	0.1 PPM		Inst. Neutron Activ.
77	Gd	1	1 PPM		Inst. Neutron Activ.
78	Tb	1	0.1 PPM		Inst. Neutron Activ.
79	Dy	1	0.1 PPM		Inst. Neutron Activ.
80	Ho	1	0.1 PPM		Inst. Neutron Activ.
81	Er	1	1 PPM		Inst. Neutron Activ.
82	Tm	1	0.1 PPM		Inst. Neutron Activ.
83	Yb	1	0.1 PPM		Inst. Neutron Activ.
84	Lu	1	0.01 PPM		Inst. Neutron Activ.
85	Sc	1	0.1 PPM		Inst. Neutron Activ.
86	Th	1	0.5 PPM		Inst. Neutron Activ.
87	U	1	1 PPM		Inst. Neutron Activ.

All samples pulverized to -150 mesh prior to analysis.