STATE OF ALASKA

Department of Natural Resources

Division of Geological & Geophysical Surveys

MINES & GEOLOGY BULLETIN

Vol. XXIX | September 1980 | No. 3

P.O. Box 80007 | Published Quarterly | College, Alaska 99708

Jay S. Hammond—Governor | *Robert E. LeResche — Commissioner* | *Ross G. Schaff—State Geologist*

*Pouch M, Juneau, AK 99811** | *941 Dowling Rd, Anchorage, AK 99502** | *3001 Porcupine Drive, Anchorage, Alaska 99501* | *P.O. Box 80007, College, Alaska 99708** | *P.O. Box 7438, Ketchikan, Alaska 99901**

IN THIS ISSUE

*Mining information office.

Gold recovery from placer concentrates by cyanidation

By Cleland N. Conwell, DGGS mining engineer

You may have thought you recovered all the gold from your sluice-box concentrate, but you probably left either flakes of gold that were not separated or gold that was not liberated from the quartz. This hard-to-recover gold might be dissolved in a weak cyanide solution, and then precipitated by zinc dust or absorbed by an ion-exchange resin or activated carbon (charcoal), thus adding to the overall profit of your operation.

Recovery by absorption and subsequent oxidation of the charcoal appears to be the preferred method.

Introduction

In a recent study initiated at the request of three placer-mine operators in the Circle mining district, DGGS experimented with recovering gold from cleaned placer concentrates. The operators, from different subdistricts, provided the samples. Each miner first screened the concentrate and recovered gold by gravity methods, and one operator went a step further and used mercury to amalgamate the gold.

In the gravity separation of gold from the gravels and gold from the concentrate, two principles---specific gravity and particle size and shape---oppose each other. This makes the final cleanup difficult by gravity methods alone. Adding mercury to amalgamate the gold flakes increases recovery, but three conditions must be present: a) the gold particle must have a clean surface, b) the mercury must be in contact with the gold, and c) the gold must be liberated from the matrix or at least have enough surface exposed to adhere to the mercury. A weak solution of less than 500 parts per million cyanide will dissolve gold.

The primary requirement for solution is a clean surface on the gold particle. The chemical reaction is:

$$4\ Au + 8\ CN^- + O_2 + 2H_2O \longrightarrow 4\ Au(CN)^-_2 + 4OH^-$$

In treating these placer concentrates, interfering ions such as zinc or copper were present in concentrations of less than 110 ppm; they did not appear to consume cyanide.

In addition to the cyanide (CN^-), oxygen (O_2) is required and the solution must be basic. In practice, the solution is buffered with CaO to hold a pH of 10 or better.

Acknowledgments

The author gratefully acknowledges the assistance of Fred Wilkinson, Joe Vogler, and E.N. Wolff for providing samples, P.D. Rao and Wolff for their suggestions, and the laboratory section of DGGS for the analyses. D.R. Stein performed the assays.

Procedure

In these experiments, the procedure outlined by Dorr and Bosqui (1950) was followed.

Each sample was separated into the basic particle-size fractions and visually examined for gold and mineral content. The samples were then amalgamated with mercury. Six cyanide tests were completed, with and without grinding. Gold was precipitated by zinc dust, activated carbon, and Dowex 21K.

Samples Submitted by Vogler

Nearly all the quartz and rock had been removed in the samples, and 99.9 percent of the material had a specific gravity of over 2.88 (bromoform heavy-liquid separation). If magnetite was originally present, it had been removed and the remaining material was mostly wolframite, a tungsten mineral with a specific gravity of 7 to 7.5, and cassiterite, a tin mineral with a specific gravity of 6.8 to 7. The specific gravity of the sample was 7.0.

Sample JV-1 was separated into size fractions and examined for gold flakes as indicated in table 1.

A 400-g sample was then amalgamated for 2 hr with 1 g of mercury. The mercury was recovered by panning and dissolved in nitric acid. The residue contained 60.62 mg of gold, or the equivalent of 4.42 oz of placer gold per ton (this includes the silver alloy with the gold.) The sample was then treated in a solution containing 500 ppm potassium cyanide and buffered with 0.90 g of calcium oxide to keep the pH of the solution above 11.0. The solution was sampled for gold after 3 and 5 hours of agitation. The assay of the solution was constant at the equivalent of 8.28 ppm, or equal to 8.28 mg of gold. The tails assayed 1.06 ppm (0.424 mg) gold. The test is summarized in table 2.

A second Vogler sample of slightly coarser similar material (table 3), was dissolved in cyanide without removal of gold by amalgamation (table 4). It took 72 hr to dissolve the gold.

Samples Submitted by Wolff

Ernest N. Wolff provided two samples from Coal Creek. These samples consisted of about 87 percent almandine, 8 percent spessartine, and 3 percent andradite garnet. Less than 0.5 percent of the sample was floated in a heavy- liquid (specific gravity, 2.88) separation. The grain-size analyses of sample EW-1 is indicated in table 5.

Gold was visible in all size fractions and observation under a 30-power binocular microscope revealed that it had not been liberated from the quartz grains. The sample was then amalgamated with 1 g of mercury for 1.5 hr. Quartz grains containing gold adhered to the mercury. The mercury was dissolved by acid and then the quartz dissolved with hydrofluoric acid; 643.4 mg of placer gold was recovered from the 400.0 g of sample. This is the equivalent of 46.91 oz of placer gold per ton. Assuming a fineness of 905 (Smith, 1937), then 643.4 x 0.905 = 582.28 mg of gold, or 42.22 oz/ton (46.91 x 0.905).

The sample was then ground to -100 mesh and treated with cyanide. There was no increase in gold in the cyanide solution after 8 hr. The solution contained 19.6 mg of gold; 1.8 mg remained in the tails (table 6).

A sample of slightly coarser material (EW-2) from Coal Creek was tested (tables 7 and 8). The 400-g sample was treated in a cyanide solution for 48 hr.

Sample submitted by Wilkinson

The sample submitted by Fred Wilkinson had been amalgamated, and no gold was noted by casual visual observation. A preliminary assay indicated 0.80 oz of gold per ton. The screen analysis indicated the material was not as well sorted as the Vogler and Wolff samples (table 9).

In this sample 44 percent of the material was lighter than 2.88 specific gravity. The light fraction was composed primarily of metamorphic rock fragments and mica grains. The heavy fraction (56 percent) contained a variety of minerals, including cassiterite, garnet, scheelite, ilmenite, magnetite, zircon, tourmaline, pyrite, arsenopyrite, and galena. The sample assayed 6.45 percent tin and 3.68 percent tungsten.

The sample was first subjected to a cyanide test without grinding (table 10); the recovery is indicated in table 11. The gold was effectively dissolved in 5 hr.

A second trial (table 11) was made with the same material ground to -100 mesh; dissolving time was 5 hr.

Inasmuch as the Wilkinson sample represented the greatest amount of concentrate, a second screen analysis was completed for a heavy-liquid separation. Each grain-size fraction was separated into sink-float fractions, examined with a binocular microscope, and assayed. The results are shown in table 12.

One characteristic of the gold particles was a length-to-width ratio of at least 3. The gold appeared to be clean and should have been collected by the mercury. The flakes of gold probably did not come in contact with mercury during the amalgamation process.

Recovery of Gold from Solution

Gold was recovered by three different methods: a) zinc precipitation, b) activated charcoal absorption, and c) absorption on a resin (Dowex 21K). Ion exchange offers a fourth option. The charcoal absorption is now favored over zinc precipitation, the method of the 1930s. The new technology may be ion exchange, with liquid or resin.

The zinc precipitation requires a clarified solution and removal of dissolved air (oxygen). It is improved by the addition of a lead salt such as lead acetate or nitrate. In a test, 1 g of zinc dust was added to 0.85 l of deaerated solution assaying 19.6 ppm gold (table 13).

Charcoal will absorb gold from a cyanide solution. Loading is a function of surface area, and there does not appear to be a uniform maximum; rather, the amount of charcoal needed depends on the method of charcoal manufacture. Apparently, the charcoal or activated carbon will load to over 1,000 oz of gold per ton of carbon. The practice at Homestake is to load to 450 oz per ton (McQuiston and Shoemaker, 1975). About 2 lb (avoirdupois) of activated carbon is required to collect 1 oz (troy) or gold. In commercial mills, gold is stripped from the charcoal by the Zadra process (Zadra and others, 1952). In the laboratory, gold was recovered from the charcoal by slow oxidation. This method could be used by a small operator. The laboratory results with 1.2 l of solution assaying 115.6 ppm are shown in table 14.

Gilmore (1967) describes a resin in pulp ion-exchange method. In the laboratory, 3.8 l of solution assaying 4.46 ppm was stripped with 10 g of Dowex 21K. The gold was recovered by slow oxidation of the resin (table 15).

Adamson (1973) suggests that gold be stripped by a liquid ion exchange but laboratory tests were inconclusive.

In our experiments, stripping with activated carbon and subsequent oxidation of the charcoal appeared to be the best method for a small operation. After dissolving the zinc dust in hydrocloric acid to recover the gold, the gold dust adhered to the beaker. The gold remained as delicate spheres

after the Dowex 21K was oxidized; if the fumes were properly vented, this could be the second choice to charcoal. Figure 1 shows the flow of the cyanide solution through the concentrate and stripping of the gold from the pregnant solution by charcoal.

Gold Recovery Summarized

This procedure is recommended for the recovery of gold from placer concentrates:

1) Screen and size the concentrate.

2) Recover as much of the gold as possible by gravity methods.

3) Recover particulate gold by amalgamation. This step may require cleaning of the gold particles by chemical action or attrition. Many operators use either an amalgamation rotating drum or cement mixer to provide the contact of gold with the mercury and the agitation necessary to clean the gold.

4) Recovery of the balance of the gold from the concentrate by cyanidation, which is a chemical process requiring careful solution control. Both the pH and strength of the solution must be carefully controlled, and the solution should be assayed to determine when the reaction has reached completion. The stripping of the solution requires careful control. The concentrate must be analyzed to determine if the gold is free or, as in the Coal Creek samples, in quartz, so that grinding is required for liberation. If the proper procedures are followed, additional gold can be recovered by cyanidation. Figure 1 is a flow diagram of gold recovery by using cyanide and carbon.

References Cited

Adamson, R.J., 1973, Gold metallurgy in South Africa: Cape Town, Cape and Transvaal Printers Ltd., p. 335-340.

Dorr, J.V.N., and Bosqui, F.L., 1950, Cyanidation of gold and silver ores: New York, McGraw-Hill, p. 27-45.

Gilmore, A.J., 1967, A proposed use for ion exchange in gold cyanidation: Canadian gold metallurgists, 4th Dept. Energy, Mines, and Resources Research Rept., Ottawa, Proceedings, Canada, p. 11-20.

McQuiston, F.W., and Shoemaker, R.S., 1975, Gold and silver cyanidation plant practice: Amer. Inst. Mining, Metallurgical, and Petroleum Engineers Monograph, p. 55.

Smith, P.S., 1941, Fineness of gold from Alaska placers: U.S. Geol. Survey Bull 910-C, p. 189.

Zadra, J.B., Engel, A.L., and Heiner, H.J., 1952, Process for recovery of gold and silver from activated carbon by leaching: U.S. Bur. Mines Rept. Inv. 4843, 32 p.

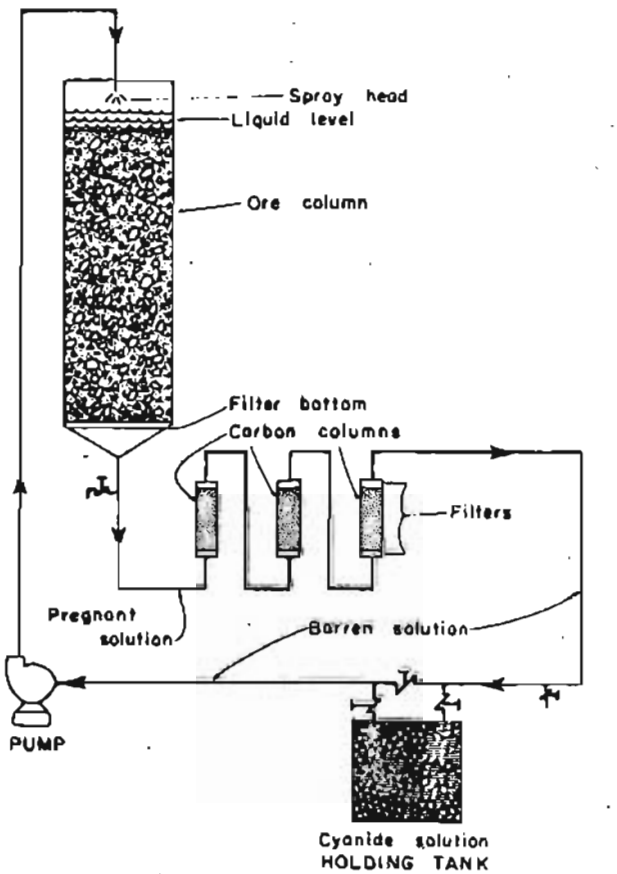

Fig. 1. Flow diagram of gold recovery by cyanide solution.

Table 1. Sieve analyses of sample JV-1.

Mesh size	Weight (g)	Percent of total	Percent passing	Percent retained	Remarks
+16	0		100.00	0	No visible gold
-16 + 32	2.88	0.72	99.28	0.72	Visible gold
-32 + 60	40.44	10.11	89.17	10.83	Visible gold
-60 + 120	342.24	85.56	3.61	96.39	Visible gold
-120	14.44	3.61	0	100.00	No visible gold
Total	400.00	100.00			

Table 2. Gold recovery from sample JV-1.

Gold	Weight (mg)	Percent of total
Recovered by amalgamation	60.62*	87.45
Recovered by cyanidation	8.28	11.94
Remaining in tails	0.42	0.61
Total	69.32	100.00
Computed assay of heads		5.05 oz/ton
Assay of tails		0.03 oz/ton
Total recovery of gold		99.39 percent

*Including silver

Table 3. Sieve analyses of sample JV-2.

Mesh size	Weight in (g)	Percent of total	Percent passing	Percent retained	Remarks
+8	0	0	100	0	
-8 +16	0.84	0.21	99.79	0.21	Visible gold
-16 +32	93.16	23.05	76.74	23.26	Visible gold
-32 +60	306.00	75.70	1.04	98.95	Visible gold
-60 +120	3.40	0.84	0.20	99.80	Visible gold
-120	0.84	0.21	0	100.00	Several colors
Total	404.24	100.01			

Table 4. Gold recovery from sample JV-2.

Gold	Weight (mg)	Percent of total
Recovered by cyanidation	159.06	99.80
Remaining in tails	0.32	0.20
	159.38	
Computed assay of head	11.62 oz/ton	
Assay of tail	0.02 oz/ton	
Total recovery of gold	99.80 percent	

Table 5. Sieve analyses Coal Creek sample EW-1.

Mesh size	Weight (g)	Percent of total	Percent retained	Percent passing	Remarks
+10	1.36	0.34	0.34	99.66	Visible gold
-10 +16	27.24	6.81	7.15	92.85	Visible gold
-16 +35	197.16	49.29	56.44	43.56	Visible gold
-35 +60	145.68	36.42	92.86	7.15	Visible gold
-60	28.60	7.15	100.00	0.00	Visible gold
Total	400.04	100.01			

Table 6. Gold recovery, Coal Creek sample EW-1

Gold	Weight (mg)	Percent of total
Recovered by amalgamation	582.28	96.01
Recovered by cyanidation	19.60	3.23
Remaining in tails	4.60	0.76
Total	606.48	100.00
Computed assay of heads	43.99 oz/ton	
Assay of tails	0.14 oz/ton	
Recovery	99.24 percent	

Table 7. Sieve analyses, Coal Creek sample EW-2

Mesh size	Weight (g)	Percent of total	Percent retained	Percent passing	Remarks
+10	0.84	0.21	0.21	99.79	
-10 +16	31.96	7.99	8.20	91.80	Visible gold
-16 +35	231.92	58.00	66.20	33.80	Visible gold
-35 +60	106.71	26.69	92.89	7.10	Visible gold
-60	28.40	7.10	100.00	0.00	Visible gold
Total	399.83	99.99			

Table 8. Gold recovery, sample EW-2.

Gold	Weight (mg)	Percent total
Recovered by cyanidation	41.42	83.19
Remaining in tails	8.39	16.81
Total	49.81	100.00
Computed assay of heads	3.029 oz/ton	
Assay of tails	0.612 oz/ton	
Recovery	83.19 percent	

Table 9. Sieve analyses of sample EW-1.

Mesh size	Weight (g)	Total percent	Percent passing	Percent retained
+10	0.32	0.08	99.92	0.08
-10 +18	62.72	15.71	84.21	15.79
-18 +32	113.04	28.31	55.90	44.10
-32 +60	138.96	34.80	21.10	78.90
-60 +120	70.84	17.74	3.36	96.64
-120 +250	11.16	2.79	0.57	99.43
Pan	2.28	0.57		
Total	399.32			

Table 10. Gold recovered without grinding, sample EW-1.

Gold	Weight (mg)	Percent of total
Recovered by cyanidation	7.22	73.30
Remaining in tails	2.63	26.70
Total	9.85	100.00
Computed assay of heads	0.72 oz/ton	
Assay of tails	0.18 oz/ton	
Recovery	73.30 percent	

Table 11. Gold recovered with grinding sample EW-1.

Gold	Weight (mg)	Percent of total
Recovered by cyanidation	20.88	91.42
Remaining in tails	1.96	8.58
Total	22.84	100.00
Computed assay of heads	1.67 oz/ton	
Assay of tails	0.14 oz/ton	
Recovery	91.42 percent	

Table 12. Sink-float analyses, sample FW-1.

Sink* or float**		Weight	Percent of total	Percent of sink	ppm	ppm times weight	Remarks
-10/+18	F	41.71	10.59		0.87	36.29	- - -
	S	34.27	8.70	45.10	26.80	918.44	
		75.98	19.29				
-18/+35	F	55.96	14.20		0.30	16.79	
-18/+35	S	61.43	15.59	52.33	62.50	3839.38	Visible gold
		117.39	29.79				
-35/+60	F	37.18	9.44		0.31	11.53	
-35/+60	S	48.38	12.28	56.55	116.31	5627.08	Visible gold
		85.56	21.72				
-60/+120	F	33.36	8.47		0.44	14.68	
-60/+120	S	68.45	17.37	67.23	43.88	3003.59	Visible gold
		101.81	25.84				
-120	F	5.20	1.32		0.75	3.90	- - -
-120	S	8.07	2.05	60.83	19.10	154.14	
		13.27					
	Total	394.00	100.01			13,625.82	

**Specific gravity less than 2.88
*Specific gravity greater than 2.88
Computed assay 34.58 ppm gold or 1.01 ounces per ton.

Note: 41 percent of gold is in the -35/+60 sink fraction.

Table 13. Recovery of gold from solution by zinc dust.

Solution	Gold (mg)
Pregnant	16.66
Stripped	0.14
Recovery	99.16 percent

Table 14. Recovery of gold from solution with activated carbon.

Solution	Gold (mg)
Pregnant	136.72
Stripped	0.20
Recovery	99.85 percent

Table 15. Recovery of gold by resin, Dowex 21K.

Solution	Gold (mg)
Pregnant	16.95
Stripped	0.65
Recovery	96.31 percent

AOF's on snow avalanches, Southeastern geothermal sites, and McGrath geology highlight new DGGS publications

DGGS printed five new open-file reports and two updated information circulars during the quarter.

Snow Avalanche Reports

Three of the open-file reports (AOF 130-132, (below) are maps that depict areas where a potential exists for snow avalanches. The data presented have been compiled and generalized from known historical records, airphoto interpretation, and preliminary terrain analysis by the authors at various scales. Known and suspected avalanche activity, climatic conditions, and regional snowpack characteristics were correlated with mountainous terrain to produce a map of snow avalanche potential for each of three quadrangles---Anchorage, Seward, and Juneau.

- AOF-130, 'Provisional snow avalanche potential, Anchorage Quadrangle,' by Gail Davidson and S.W. Hackett, $3 (2 maps, scale 1:250,000).
- AOF-131, 'Provisional snow avalanche potential, Seward Quadrangle,' by Gail Davidson and S.W. Hackett, $3 (2 maps, scale 1:250,000).
- AOF-132, 'Provisional snow avalanche potential, Juneau Quadrangle,' by Gail Davidson and S.W. Hackett, $3 (2 maps, scale 1:63,360).

Geothermal Report

A lengthy treatise on 12 geothermal hot-spring sites in Southeastern Alaska is also available. The report, AOF-127, 'Assessment of thermal

springs sites in southern Southeastern Alaska - Preliminary results and evaluation,' is a 72-page text by DGGS geologists Roman J. Motyka, Mary A. Moorman, and John W. Reeder. The open-file report costs $3.50. The abstract follows.

"Information has been gathered on 13 reported thermal-spring sites, 12 in southern Southeastern Alaska and one in western British Columbia. Five of the reported sites could not be substantiated by DGGS. The eight known thermal spring sites are associated with granitic terrain and, except for Baker Island Hot Springs, occur within or near intensively fractured Cretaceous-age plutons of the Coast Range Batholith.

"Thermal-spring surface temperatures range from 21°C (Twin Lakes) to 91.5°C (Bailey Bay). The greatest discharge occurs at Chief Shakes hot springs (450 lpm). Bell Island Hot Springs, which has about a 100-l/min discharge and a 70°C temperature, has had the most development. Two previously unreported thermal-spring sites, Barnes Lake warm springs and Bradfield hot springs, have a low rate of discharge and respective surface temperatures of about 25° and 54°C.

"The known thermal springs probably originate from circulation of meteoric waters through deep-seated fracture and fault systems. The chemical constituents of the alkali-sulfate to alkali-chloride thermal waters are probably derived from interaction of the deeply circulating meteoric waters with the granitic wall rocks. Chemical geothermometry suggests subsurface temperatures of 55° to 151°C. If waters are being heated solely by conduction from wall rocks, circulation depths must be about 1.5 to 5 km, assuming geothermal gradients of 30° to 50°C/km.

"Subsurface reservoirs associated with thermal springs in southern Southeastern Alaska are of low temperature and are probably limited in extent, compared to geothermal fields now being used elsewhere in the world. Only the Bell Island and Bailey Bay sites now offer any potential for generation of electricity; these sites could also be used for a variety of direct uses such as space heating, wood or lumber processing, and perhaps aquaculture. The other sites have less potential but could be used locally for space heating or agriculture enhancement."

McGrath-area Geology

Farther to the north, two DGGS staffers compiled a report on the McGrath area. It is:

. AOF-134, 'Preliminary geology of the McGrath-upper Innoko River area, western interior Alaska,' by T.K. Bundtzen and G.M. Laird, $4 (36 p. text, 2 maps, scale 1:63,360 and 1:125,000). The abstract follows.

"The McGrath-upper Innoko River area contains a Late Paleozoic chert-argillite-limestone unit, Early(?) Cretaceous limy sandstone and impure limestone, and a thick section of mid- to Late Cretaceous lithic sandstone, siltstone, shale, and conglomerate. Late Cretaceous alkaline plutonic complexes, dike swarms, and associated mafic volcanics consisting of basalt, andesite, and minor tuffaceous sedimentary rocks intrude and overlie the bedded rocks. Glacial, eolian, alluvial, and colluvial deposits are abundant. Dominant structures are northeast-trending folds and high-angle faults.

"Placer gold deposits have been mined from modern and older stream terraces in the Ophir mining precinct and the Candle Hills; total production is believed to be at least 500,000 ounces of gold. The gold placers in the Ophir area are found downslope and downstream from basaltic to rhyolitic dike swarms and are also concentrated along faults and dikes trending across the stream channels. The dike swarms contain anomalous amounts of gold, nickel, yttrium, chromium, and zirconium. Fractures in plutons and nearby hornfels zones locally contain anomalous amounts of base and precious metals which are probably the lode source of gold placers in the Candle Hills."

In addition, DGGS has updated two oldies but goodies in the Information Circular department. IC-3, 'Hand-placer mining methods,' has 10 pages, including four figures. Information Circular 18, 'Amateur gold prospecting,' is 5 pages long. Both are free.

Alaska Miners Association to meet Oct. 23-25

The 1980 Annual Alaska Miners Association Convention and Trade Show has been scheduled for Oct. 23-25 at the Hotel Captain Cook in Anchorage.

A growing exploration boom in the state, particularly for gold and other noble metals, is expected to make it the largest gathering in the association's history.

One reason for that expectation is the fact that nearly 500 persons attended a recent placer mining conference cosponsored by the AMA, nearly double the number that attended the 1979 AMA convention.

While the greatest interest is probably in the more valuable metallic minerals, exploration is being conducted for nearly every commercial mineral. Some of the world's largest deposits of copper, molybdenum, and nickel have been discovered here in recent years and are being assessed for their mining feasibility.

Tentative plans for the trade show this year call for an exhibit of large-equipment items in an outdoor exhibit adjacent to the convention site, according to Riz Bigelow, president of WGM, Inc. and convention chairman.

More information on the trade show and convention may be obtained by writing the Alaska Miners Association, 509 W. 3rd., Suite 17, Anchorage, AK 99501 or calling (907) 276-0347.

New mining claims top 5,000 again

The number of new claims filed with the state recorders totaled 5,012 which is the second time in a row that the quarterly total has exceeded the 5,000 mark this year. Most of the activity centered in the Fairbanks-Circle area.

The DGGS mining-information office in College has processed 12,640 new claims so far this year, more than double what had come in by this time last year, said mining specialist Mildred Brown. "This is directly attributable to the high prices of gold this year," she said.

The totals by recording district are:

	June	July	August
Fairbanks	361	1,240	998
Manley Hot Sp.	73	4	42
Nulato	31	14	23
Mt. McKinley	0	2	0
Nenana	8	15	6
Rampart	0	6	0
Fort Gibbon	9	2	0
Kotzebue	4	0	0
Talkeetna	28	152	334
Palmer	14	72	95
Nome	42	100	65
Juneau	125	37	6
Haines	18	5	7
Skagway	0	1	0
Petersburg	45	30	30
Ketchikan	3	58	17
Anchorage	13	0	16
Cordova	1	0	14
Chitina	20	8	2
Bethel	0	0	59
Kuskokwim	720	0	5
Kodiak	30	0	2
Total	1,545	1,746	1,721

State may ask leases for mining on its lands

(from Fairbanks Daily News-Miner, Aug. 25, 1980)

It will be a decision that could radically change hard-rock mining procedures in Alaska, but the attorney general's formal opinion on requiring leases for all mining on state lands won't be released for another four to six weeks.

A draft opinion though, is being circulated among the mining industry and other concerns before that final opinion is written, Attorney General Wilson Condon said today.

"This is not our usual practice, and it won't be our usual practice. This is a subject of great importance to a lot of people. It's a problem that hasn't been addressed directly in the 21 years of statehood, and it's got to be addressed," he said.

The opinion revolves around the interpretation of Section 6(i) of the 1959 Alaska Statehood Act, which could be read to mean a possible forfeiture of state-selected lands if the state does not have a mineral leasing system in place.

There apparently have never been state-issued mining leases, and the usual practice of granting claims through the process of discovery and patent is similar to that used by the federal government on its lands.

But with congressional resolution of the Alaska lands issue now imminent, the question of mineral leasing has moved to the forefront.

How the state should handle hard rock mining on lands it owns and has selected has been a question lingering in the background for years, although there have been no court challenges on the practice of allowing claims.

Section 6(i) states that on mineral lands conveyed to the state under its land selections, the state must require in all sales, grants, deeds or patents, a reservation to the state of all minerals in the lands. Mineral deposits "shall be subject to lease by the state as the state Legislature may direct," or the land could be subject to forfeiture.

Currently there are some resources that require leases, such as oil, gas and coal.

The request for an attorney general's opinion regarding leasing was made last fall by a division of the Department of Natural Resources.

That request asked only about claims on state-selected lands that the U.S. Department of Interior has not yet tentatively approved for conveyance to the state.

The draft opinion goes beyond that question, and apparently will lay the base for all future laws and regulations on the question of mineral leases and mining activities.

J.P. Tangen, president of the Alaska Miners Association, said this morning that he has been in contact with the attorney general's office as the question has been researched, but has not seen a copy of the draft opinion.

Tangen said the state must weigh the question of possible forfeiture of its lands if it violates section 6(i), but he adamantly opposes lease requirements.

Most of the mining today is on federal lands, because it has been easy for miners to establish claims through the Bureau of Land Management, Tangen said.

"Up until this point in history, most of the state-selected land had not been conveyed to the state, so the state simply ignored any responsibility it might have in issuing leases on lands that were pending conveyance," Tangen said.

A wrong decision on leasing could mean the "state may be forced to relinquish its selection back to the federal government, which nobody wants," Tangen said, but he added that leasing requirements would have a negative impact on mining activities.

What Tangen fears is that to now require leases for hard-rock mining on state lands may cause miners who are not aware of changes in the law to unwittingly lose their rights.

"It's essentially a novel issue. The federal government has not challenged the state's interpretation up to this point," Tangen said.

"In the first instance, the state hasn't developed its regulations for lease format. At this point in time, there's not a single mine operating under a hard rock mining lease. There's never been a lease issued," said the Juneau attorney.

Tangen said further that "the practice of leasing state lands for mining and the practice of leasing minerals for mining has had a disastrous result around the United States. Coal leases (in other states) have been under moratorium for some 15 years."

The AMA president said Alaska could have a good experience with leasing, but the history of other states would indicate the odds for that are not good.

"If at all legally possible, we should avoid leasing like the plague," Tangen said. "The current situation is just fine, mining on state claims, that's what we should work toward."

Most mining today, he said, is a "mom and pop operation" with the miner's finances tied up in equipment and cost of operation.

Tangen fears that leasing would impose undue restrictions on miners and that leases may put more financial burden on miners who already are paying corporate income taxes plus mining license taxes on production. Rent or royalty fees might be imposed in leases, he said.

F.F. Barnes, USGS 'Alaskan coal pioneer'

Farrell F. Barnes, a major contributor to the present-day knowledge of Alaska's coal resources, recently passed away. The following tribute to 'Barney,' as he was known to most of his friends and colleagues, was submitted to the Mines and Geology Bulletin by Robert M. Chapman, a fellow geologist with the U.S. Geological Survey in Menlo Park, California.

'Farrell F. Barnes was born in Prineville, Oregon, in 1905, received his A.B., and A.M., degrees in geology from University of Oregon in 1929 and 1930, and the Ph.D., in geology from Northwestern University in 1935. He died May 7, 1980 at his home in Fort Bragg, California, and is survived by his wife, Marian, whom he married in 1934, and by a daughter and a son. Barney's early work was as geology instructor at Oregon 1929-35, as geologist with the U.S. Engineers 1935, and as geologist with the Soil Conservation Service 1935-39.

'His career in Alaska began as geologist for The Alaska Railroad 1939-44, and from late 1944 until retirement in January 1966 he was with the Alaskan Geology Branch of the U.S. Geological Survey. With the Survey, and also in part with the Railroad, he was primarily concerned with the geology, exploration, and development of Alaskan coal deposits. Most of his field work from 1944 through 1962 was in the coal-bearing areas of the Railbelt-Matanuska Valley, Kenai Peninsula, Bering River, and Beluga-Yentna Rivers. He authored or coauthored thirteen published reports and maps on these areas, and compiled and published four reports and maps covering the coal deposits of all of Alaska. In addition, his broad knowledge of Alaskan geology and coal resources was applied to many planning and administrative tasks within the Survey. Much could also be said about his many fine personal attributes.'

Don Triplehorn, University of Alaska geology professor, said, 'His death illustrates an important fact: Geologists with the most field experience in Alaskan coals are few in number and they are rapidly vanishing due to retirements and death. Perhaps more importantly, they are not being replaced by a younger generation.' Moreover, Triplehorn asks, 'Where will we be in 10-20 years when interest develops in Alaskan coals on a large scale and in a short time frame?'

Dr. Barnes' bibliography is available on request from DGGS, College.

'When the white man discovered this country, the Indians were running it. There were no taxes, no debts, women did all the work---and the white man thought he could improve on a system like that.'—Sign in Hobo's Bar in Galena.

State will buy Alaskan gold

(from Alaska Miner, Aug. 1980)

The State Treasury will buy Alaskan gold in bullion form whenever possible as soon as purchases begin with state pension monies.

There are four criteria which have to be met, though, before Alaskan gold can be purchased: it must be in bullion form; it must be of .995 fineness; it must be offered at a competitive price; and it must be secured in a licensed depository before purchase.

"Purchasing Alaskan gold is going to be a problem simply because we have no refinery in the state," said Peter Bushre, deputy commissioner of the treasury.

The legislation passed this spring allowing the state to invest 10 percent of state pension funds in gold specified that purchases must be in bullion.

The gold must also be secured in a licensed depository before it is purchased as a guarantee on its fineness.

"There are only six depositories in the U.S., located in Chicago and New York," said Bushre. The problem is securing gold when it is purchased is one of the decisions now in progress before gold purchases begin.

If a miner wished to sell his gold to the state it must first be refined to bullion form and then shipped by the refinery directly to the licensed depository. "The state would then, in effect, buy the miner's warehouse receipt," said Bushre.

"We will absolutely buy Alaskan miners' gold," he said. "Of course, the price must be competitive."

Anyone wishing to contact Bushre may write him at the Alaska Department of Revenue, Treasury Division, Pouch S-B, Juneau, AK 99811.

Purchases haven't started since the law went into effect July 1 due to the time involved in selecting a depository and seeking supplies of bullion. But bullion was not the only purchase allowed in the law; some of the pension funds could also be invested in foreign securities and time deposits.

"As you've probably noticed, our dollar has become stronger in the past 12 months," said Bushre, "Therefore, we haven't any immediate plans for investing in foreign securities."

Bushre *did* say, however, that securities in England, Germany, and Japan had been closely scrutinized for possible future investment.

BLM says new proposal eases regulations for small miners

(from Fairbanks Daily News-Miner, Sept. 16, 1980)

The Bureau of Land Management has recommend scrapping its proposed mining regulations in favor of an alternative plan that would be much less of a burden on small miners.

The final environmental impact statement on BLM's proposed mining regulations says small miners should still be required to control their impact on federal land and take some steps to restore land to original condition when they are through.

However, the "preferred alternative" put forward by BLM in the environmental impact statement would not require a performance bond or a detailed plan of operation from miners who dig up 5 acres or less each year in any single mining project.

Small miners would only have to notify BLM of their operations 10 days in advance, and the "weekend" miner would not have to notify BLM at all.

"This alternative is more sensitive to the concerns of small miners and their culture, whereas the proposed action may force some of them to lose interest in mineral exploration because of the burden that may be imposed on them in the plan approval process," the BLM said.

For miners who do have to submit plans of their operations to BLM for approval, the alternative sets a tight deadline for BLM action on the plans and requires performance bonds only at the discretion of local BLM officials.

"The preferred alternative should eliminate significantly the paperwork and 'red tape' required by both BLM and the mining industry...without circumventing the...responsibility of preventing unnecessary or undue degradation," the BLM statement concludes. "It is the least costly and most efficient way to implement the regulations.

"It is true that in some instances there will be a degree of unmitigated impacts that will create unnecessary damage," BLM says. "But these impacts are expected to be only temporary because BLM will monitor the operations to the extent possible to ensure that unnecessary or undue degradation does not take place."

If adopted as written, the new regulations would cover BLM land not under a wilderness study withdrawal or other special land use designation. The new proposal grew out of a 4-year struggle within the federal agency to write acceptable regulations covering mining under the federal Mining Law of 1872.

That law gives minerals and land ownership to prospectors who stake claims on open federal land and mine them to show the claims to be valid ones. Modern-day land managers prefer leasing mineral rights and retaining federal land ownership, but in recent years the 1872 law has withstood several attempts by federal officials and environmental groups to repeal it.

The Federal Land Policy and Management Act of 1976 requires that the Secretary of Interior "take any action necessary to prevent unnecessary or undue degradation" of public lands.

While other federal and state agencies regulate water quality and certain other aspects of mining, since FLPMA was passed BLM has weighed a number of proposals for regulations it might use to guard the land itself.

The proposals include requiring miners to submit detailed plans of operations for BLM approval in advance, and making miners put up bonds to ensure that they live up to the land reclamation rules.

Small miners say such regulations are too great a paperwork burden on them and they claim performance bonds would be impossible for most miners to obtain.

The current environmental impact statement is on the latest proposal for BLM mining regulations, and it puts forth a "preferred alternative" that instead amends the proposed regulations by drawing on existing National Forest Service mining rules and some of the public arguments presented for no action at all.

"The preferred alternative evolved as a result of the analysis of the written and verbal comments and the bureau's questionable capability to implement the proposed regulations," BLM said. Under the latest BLM plan:

. Miners must report immediately the discovery of any significant cultural or paleontological resources;

. Small miners must notify BLM of their activities at the beginning and end of their projects;

. And all miners must reshape and revegetate the lands "where reasonably practicable."

The small miners' exemption from writing plans of operations does not apply to areas of critical environmental concern, national recreation areas, national trail systems, areas limited or closed to off-road vehicles, and wild and scenic river corridors.

Columbia Glacier in Prince William Sound is the best known of the tidewater glaciers. Columbia's sparkling wall of blue ice moves on the average of 6 feet a day, which is considered very rapid. It has a spectacular front that is 150 to 250 feet high and 3 to 4 miles wide. It is about 25 miles long.

Urban Renewal. The U.S. Board on Geographic Names has decreed that the lake 1.5 miles east of Point Campbell and 5 miles southwest of Anchorage be named 'Little Campbell Lake.' Its unofficial designation had been 'Beercan Lake.'

DNR Deputy Commissioner Haynes, division directors visit Fairbanks area mining developments

By Thomas K. Bundtzen

On August 14th, Deputy Commissioner Jeff Haynes and eight DNR division directors toured mineral development facilities on Ester Dome, a well-known mining area a few miles northwest of Fairbanks. The DGGS-sponsored tour was designed to inform state officials of various mineral industry issues and to establish a closer relationship with the resurging gold-mining industry.

Accompanying Haynes were Nick Carney (Division of Agriculture), Ross Schaff (Minerals and Energy Management), Chip Dennerlein (Parks), Ted Smith (Forest, Land, and Water Management), Tom Bergstrom (Administration and Management), Wyatt Gilbert (DGGS), Reed Stoops (Research and Development), and Claude Hoffman (Technical Services). Also attending the trip were the author, chief mining geologist Gil Eakins, mining information clerk Carole Stevenson, and Mark Robinson of the Mineral Industry Research Laboratory, who cosponsored the tour.

Ester Dome has long been a center of gold mining, with nearly 60 known lode-gold and base-metal occurrences on its flank. These lodes were undoubtedly the bedrock source of the rich placers mined by both small operators and the dredges of the USSR&M Company in Sheep, Ready Bullion, Nugget, Ester, and Cripple Creeks. By 1965, mining activity had all but disappeared in the district, but when gold prices started soaring 2 years ago, mining interest was renewed. Today, there are several mechanized placer mines and two large-scale hard-rock exploration operations in the Ester Dome vicinity.

Grant Lode

The first property visited was the Grant Mine on Happy Road, owned by Roger Burggraf and operated under option by Tricon Incorporated of Vancouver, B.C. Prior to 1950, about 4,000 tons of ore averaging about 1 ounce gold/ton was mined from this deposit.

The ore consists of crushed gold-bearing schist and quartz cemented by iron, arsenic, and antimony oxides. Tricon has reopened the underground workings, which consist of a shaft and working levels at 150 and 200 feet. These drifts follow one of the several parallel ore structures that trend N. 20°- 40° E. and dip steeply to the southeast. According to Tricon geologist Wayne Murton, newly discovered ore structures identical in geometry and content with the original St. Patricks Creek vein lie en echelon to the previously known ore shoots.

The mine plant includes a steel head frame, a 6,000-lb-capacity shaft hoist, muckers which will eventually be on rails, a shop, and other facilities for mine personnel. The mill consists of a conveyor belt, primary jaw crusher, ball mill, and several diester tables for recovering the gold, which appears to be entirely free milling. The plant operates two 10-hour shifts and processes about 1 ton of ore/hour. The 15 employees include three underground miners, a hoist man, mill attendants, geologist, mining engineer, and an exploration crew.

Groundwater from the underground workings is pumped to the gravity mill, which uses no chemical process. A small settling pond north of the mine recovers the mill tailings. Gold recovered from the current pilot plant has largely paid for the initial investment. Tricon Incorporated, the operator for Silverado Mines, which holds other claims on Ester Dome, envisions several small underground mining operations that eventually will feed a larger mill.

Ryan Lode

The next mine examined was the well-known Ryan lode, currently under option by St. Joe American, of Spokane.

This deposit contains a large amount of low-grade milling ore that was, until recently, impractical to mine. It is similar to the Grant Mine in several respects: a) several thousand tons of 'high-grade' ore were selectively mined and milled on the

property before World War II, b) the ore zone is almost identical in character and lies almost along the same strike. So far the eight-man St. Joe American operation has, with a local drilling crew and two Nodwell mounted Acker drill rigs, explored the Ryan lode with 15 deep diamond drill holes. If exploration continues, further work will include underground development with a spiral incline to bulk sample various levels of the deposit for metallurgical testing.

St. Joe has also been drilling the nearby Mohawk gold-antimony-tungsten deposit. Project geologist Don Thompson indicated that the Ester Dome district "has excellent potential for sustaining a significant hardrock gold mining industry."

Typical Placer Operation

The last mine visited was a small-scale placer operation on Ready Bullion Creek near the village of Ester. Operator Bill Hennesey and three partners feed an elevated 40-foot-long sluice box with a front-end loader. Tailings are pushed down the bedrock drain with a bulldozer. Water used during the sluicing process is essentially recycled from a catchment pond. The DNR group was able to view the tailend of a 'clean-up,' complete with a growing wave of yellow metal as the sweeper moved down the box.

The tour culminated in a late lunch at the Pump House restaurant, a popular dining establishment on the Chena River that was a large-capacity pumping station a couple of generations ago. It supplied water for the USSR&M gold-dredging operations near Ester, several miles to the northwest.

During the entire tour, the operators freely discussed mining issues with the officials, who are in charge of managing Alaska's land and resources. Concern brought out by the miners included: environmental quality, land reclamation, encroachment of subdivisions into highly mineralized areas, and effects of regulations pertaining to mining.

As Burggraf explained, "Some local residents view an emerging local mineral industry with fear and apprehension. They don't want to see any more roads or development in the Ester or Cleary Hill areas. But they forget that virtually all the present existing roads were trails to mines and that many of the stands of lush deciduous trees and beautiful open meadows represent secondary vegetation that resulted from earlier mining activities."

Miners said they hoped that the state would intelligently dispose of lands outside of highly mineralized areas. Burggraf said, "I have no objections to recreationists such as cross country skiers, marathon runners, hikers, or dog teams using the surface estate of my mining claims as long as they stay on existing trails and don't get hurt. But the establishment of a subdivision or encroachment of a commercial venture could have a negative effect on our chances at establishing a mine."

All agreed that with cooperation from all points of view, gold mining on Ester Dome will continue to be a progressive reality that will provide significant employment opportunities and an economic base for the Fairbanks area.

Deputy Commissioner Haynes said he liked the idea of having meetings at different localities, followed with a tour to acquaint the DNR directors with local conditions and issues.

Senate approves by 78-14 vote on compromise Alaska Lands bill on withdrawal of 104 million acres

(from American Mining Congress News Bulletin, Aug. 22, 1980)

The Senate voted 78-14 this week to pass a compromise Alaska Lands bill that would put 104 million acres into national parks, wildlife refuges and other special management categories. The compromise was hammered out by Chairman Henry M. Jackson (D-WA) of the Energy and Natural Resources Committee and Sen. Paul Tsongas (D-MA), who had sought even greater land withdrawals.

An attempt by Sen. Mike Gravel (D-AK) to filibuster the measure to death was cut off by a 63-25 vote for

cloture. Alaska's other Senator, Ted Stevens (R), voted against the bill but said it was preferable to no bill at all and expressed hope that it would be passed by the House.

The House has already passed a bill, by a 360-65 vote, that would set aside 128 million acres and provide more stringent restrictions on mining, oil drilling and logging. But the feeling in the Senate is that any attempt to send the two versions to a conference committee for resolution would doom action for this session of Congress.

Senate and Udall May Head for Clash

House Interior Committee Chairman Morris Udal (D-AZ) has indicated, however, that he still finds the Senate bill "deficient" and will not accept it without changes. Thus a contest of wills between the two legislative bodies might be in the making.

"If they send the bill to conference, it's dead," commented Stevens. The hope of the Senate proponents, therefore, is that the House will simply pass the Senate version. Anything else would bring forth another filibuster by Gravel, and it's held unlikely that a motion to shut off debate could win again.

The Senate legislation would withdraw acreage exceeding in size the entire state of California. Some 43 million acres would be put into the National Park System and a similar area into wildlife refuges. Other lands would go into the National Wild and Scenic Rivers System and national forests.

Glacier threatens shipping

(from Geotimes, Sept. 1980)

Columbia Glacier in south-central Alaska appears to be verging on a drastic retreat that, in the next few years, could release many large icebergs into the shipping lanes of Prince William Sound near Port Valdez. The U.S. Geological Survey predicts that the glacier's rate of retreat will accelerate during the next 2 or 3 years. As a result, the discharge of icebergs will increase to about 20 to 27 million tons a day from 1982 to 1985. The Survey is responsible for notifying federal, state, and local authorities of geology-related hazards.

Because an increased flow of large icebergs could become a problem to tankers transporting oil from the southern terminal of the Trans-Alaska Pipeline at Valdez, about 175 km east of Anchorage, the Survey has been monitoring the 1,100-square-km glacier since 1974. The program has been intensified in recent years to determine the probable rate of retreat and rate of discharge of the resulting icebergs. During 1979, tankers carried over a million barrels of oil a day through Prince William Sound from the pipeline terminal en route to the first 48 states.

'Give or take a year,' said Mark F. Meier, chief of the Survey's glaciology program, Tacoma, Wash., 'we expect Columbia Glacier to have retreated about 5 miles by 1986. This will release about 10 cubic miles of ice, some of which will be discharged into the narrow Valdez Arm of Prince William Sound. Columbia Glacier is both unique and potentially unstable because it is the last glacier in North America that still extends out over and fills a deep fiord. Although the tip of the glacier now rests on shoals in shallow water, much of the bulk of the glacier actually occupies a deep channel, with a base up to 2,000 ft below sea level. The immediate danger is that once the front of the glacier retreats from the shoals into the deeper water of the fiord, the rate of breakup and retreat will increase dramatically. We now expect this accelerated retreat and breakup to take place during the next 2 to 3 years, perhaps beginning with this summer's calving season. As the glacier retreats at a speed of a mile or more per year, as much as 50 cubic miles of icebergs could be discharged into Prince William Sound over the next 30 to 50 years.'

A team of 12 Survey glaciologists has studied all of the 52 calving glaciers in Alaska. To construct a mathematical model for predicting the future discharge of icebergs from a calving glacier, they had to first determine the future positions of the

glacial front, the rate of ice flow to the front, and the effects of such parameters as changing channel geometry on the rate of calving.

Sohio VP blasts Interior Secretary

(from Alaska Airlines Private Line, Sept.-Oct. 1980)

In a letter sent to every member of the U.S. Senate, James J. Hohler, senior vice president of exploration for Sohio Petroleum Company, implies that Interior Secretary Cecil Andrus is misleading the public about the resource potential of the Arctic Wildlife Range. Hohler states, "Those of us who have spent years in Arctic Exploration disagree" with the secretary's public statement that the Arctic Wildlife Range has less potential than the National Petroleum Reserve-Alaska. "Our evaluation...leads to an assessment that the range may be one of the most promising future hydrocarbon provinces in the United States," he continued. In closing the letter, Hohler asked the senators to do everything in their power to see that exploration activities within the Wildlife Range be initiated as soon as practicable. The letter stressed a little-publicized fact that "even if a discovery as large as Prudhoe were made, facilities would only occupy about 1.5 percent of the vast 8.9 million-acre range."

USBM issues three reports

The U.S. Bureau of Mines has released three open-file reports (OFRs) for inspection. The reports, described below, may be examined at the USBM offices in Fairbanks (205 Resources Bldg, University of Alaska) and in Juneau (Douglas Is.).

OFR 70-80. Occurrences and potential for lead and zinc mineralization in the Mt. Schwatka region.

The Mt. Schwatka region is about 75 north of Fairbanks. Occurrences of lead and zinc were found in an area underlain by early to mid-Paleozoic marine sediments and volcanics. There appears to be an affinity between these occurrences and the succession of units known as the Fossil Creek volcanics-Ordovician (Silurian?). Volcanogenic zinc was found in a cherty, intermediate, tuffaceous breccia. Lead and zinc values also appear associated with the upper stratigraphic levels of the volcanics and controlled by the unconformity and/or fault contact with the overlying Tolovana Limestone. Manganese mineralization was identified in undifferentiated Paleozoic (Permian?) cherts and mafic volcanics to the west. There also appears to be a potential for asbestos deposits.

OFR 42-80. Mineral deposits of the Cape Krusenstern area - A preliminary comment.

Mining claims were mapped and data on private and government-sponsored mineral exploration were compiled. Energy Research and Development Administration sampled waterborne sediments during a reconnaissance for uranium. The resultant sample analyses and all other available data on mining and prospecting activity were considered in relation to the geology. The combined data indicates that lead, zinc, silver, tin, gold, nickel, and platinum-group metals occur in the area in amounts that warrant field investigation.

OFR 38-80. Mineral investigations of the Misheguk Mountain and Howard Pass Quadrangles, National Petroleum Reserve-Alaska.

The 1977 mineral investigation program in NPR-A was designed to make a preliminary evaluation of known and reported mineral showings to follow up on the U.S. Geological Survey's 1977 regional geochemical results, and to sample 'color' anomalies (those due to oxidation of iron).

Significant mineralization was found at only 1 of 18 sites, the Drenchwater Creek area, where concentrations of base-metal sulfides occur in and near outcrop. The zinc-lead-silver bearing zone has been traced along strike and is at least 6,500 feet long and may possibly extend more than 10,000 feet. Minor mineralization has been found at other sites, including Mount Bupto (fluorite), Siniktanneyak Mountain (chromite), and Safari Creek (barite nodules).

Our Gangue....

By Frank Larson, DGGS editor

Because winter is rapidly approaching (snow on Sept. 1), we're going to introduce our southern readers (both of them) with a term common to the northern climes. "Bunny Boots" are multilayered, oversized, heavy, cumbersome, superinsulated GI-issue boondockers with white rubber exteriors (hence the name) with air valves on the ankles. (The valves, you see, are for releasing the air pressure at high altitudes; this keeps your toes from being squished like so many Concord grapes. But what if you once had to use them? What would happen? Once back safely on the ground, would you have to spend the rest of the winter limping around on two flats?.... (Hisssss, plop. Hisssss, plop. 'Zat you, Gollum?')....Bunny Boots are not stylish. They are not fur trimmed. Nor are they advertised in slick magazines. (In fact, they are not advertised at all. They are strictly Gummint Issue. To get a new pair you have to join the Army and wrangle a transfer to the tundra.) But above all, Bunny Boots are warm. They keep your tootsies toasty and never, never let you down....Wellll, almost never. Good buddy Russ once, somehow, managed to cut the tops of both his Bunny Boots. Eventually, water leaked into the inner layers. When it hit -40° or so, his feet still kept warm, but he found that the entrapped moisture always froze solid with the Bunny Boots in the toes-up position. This had two disconcerting consequences: a) he couldn't get the *!#% things off at night and had to sleep with his 'arctic booties' on, and b) his social life bottomed out rather quickly. ('Would you believe, Mother, he never takes his boots off?')....Yes, life can be tough on the Last Frontier.....With Bunny Boots, frostbite is vanquished forever. Even if you do get water inside the boot, it is no longer a cause for alarm. The vapor barrier will trap the water next to your foot, and soon it will seem as if you are simply warming up your chicken soup for lunch....One last word about Bunny Boots. They are huge. You will never see Gene Kelly dance in them. (Matter of fact, you'll never see Fred Astaire even lift them.) A Bunny Boot on an average-sized foot makes you look as if you have terminal gout....For instance, DGGS has this petroleum geologist, Bill Lyle. He is DGGS's Designated Giant. Bill stands about 6'7" in his socks (which his lovely wife, Monika, patiently fashions from discarded airport pylons), and has to order his size-15 footwear from a specialty catalog. Anyway, a few years back, Bill was asked to pinch-hit for a sick colleague and escort a group of energy experts from Japan around some of the coal fields near Anchorage. This he willingly did, but despite his outgoing, gregarious way, Bill could not seem to break through the reserve of the visitors. At the end of the tour, he asked the Oriental gentlemen if they would care to come over to his place for some saki or whatever. They conferred, and then politely acquiesced (possibly out of terror of offending their towering host). Once at Bill's, however, what do they spy in his rec room, taking up the space where the pool table used to be? You guessed it---his Bunny Boots. His size-26, rubber-coated kayaks. And quicker than you can say Jack Nakimura, the awed guests started fumbling for their Nikons. Soon, everybody was gaily gestuculating, laughing, and taking turns posing with Bill's Brobdingnagian Brogans. Those seven-league boots should have been nominated for a Nobel Peace Prize....Stepping right along, an all-day symposium on problems of mining and state regulations will preceed the AMA Convention in Anchorage (p. 8). Representatives of AMA and Lt. Gov. Terry Miller are jointly arranging the session to try to reduce misunderstandings and friction that sometimes arise between mining enterprises and state regulatory agencies. DNR, Fish & Game, and Environmental Conservation will take part....Speaking of conferences, the Mineral Industry Research Laboratory will host a 3-day confab, 'Focus on Alaska's Coals,' at the UA campus in Fairbanks Oct. 21-23 (see June M&GB). For program information, contact P.D. Rao, MIRL, UA, FBK, AK 99701 (figure that one out, puzzle fans) or call 479-7135....For our next vocabulary builder, perhaps we'll define the secret term old-time Alaskans have for surviving the long, dark winters. (Hint: It starts with 'M'---as in 'Mnemonic'---and rhymes with 'Wowie'.....Cheers.

Metals Market

	Sept. 4, 1980	3 Months Ago (5/16/80)	1 Year Ago (8/24/79)
Antimony metal per lb, NY dealer	$ 1.50	$ 1.58	$ 19.96-21.09*
Barite (drilling-mud grade per ton)	$ 30-60	$ 70-90	$ 24-47
Beryllium ore, stu	$ 75.00	$ 75-85	$ 60-65
Chrome ore per long ton (Transvaal)	$ 51.00	$ 54.00	$ 58.00
Copper per lb. (MW-prod.)	$ 0.947	$ 0.916	$ 0.91
Gold per oz.	$651.00	$516.50	$314.75
Lead per lb.	$ 0.42	$ 0.36	$ 0.58
Mercury per 76-lb flask	$390.00	$390.00	$300.00
Molybdenum conc. per lb. (Climax)	$ 10.31	$ 10.31	$ 8.84
Nickel per lb. (cathode)	$ 3.45	$ 3.50	$ 2.75
Platinum per oz. (maj. prod.)	$696.40	$566.40	$421.20
Silver, New York, per oz.	$ 17.20	$ 12.45	$ 9.78
Tin per lb., NY composite	$ 8.53	$ 8.58	$ 7.35
Titanium ore per ton (ilmenite)	$ 55.00	$ 55.00	$ 50.00
Tungsten per unit (GSA domestic)	$130.00	$129.00	$134.74
Zinc per lb. (MW-US PW)	$ 0.364	$ 0.375	$ 0.36

*Standard Ton Unit (20 lb)

Alaska Department of Natural Resources
Division of Geological & Geophysical Surveys
P.O. Box 80007
College, AK 99708

RETURN POSTAGE GUARANTEED

Bulk Rate
U.S. Postage Paid
Permit No. 39
Fairbanks, Alaska