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Field Geology (Or, a Woman's Work is Never Done) by Kristina M. O'Connor, DGGs Geologist

The look on my husband's face was priceless. His jaw dropped and he stammered, "What in the world happened to you?" I did look pretty strange as I climbed out of the helicopter after a particularly long and exhausting day. My rain jacket and jeans were soaked through and covered with sand and Devil's Club needles. My boots were so full of water that I squished with every step, and I could only drag my heavy pack.

Over a hot cup of coffee, I described a typical(?) day in the life of a lady geologist in the Talkeetna Mountains.....

The morning had been overcast and rainy, so we couldn't fly. Don McGee, Mitch Henning, and I spent the time working on our maps and airphotos. Shortly before noon, the weather cleared a bit, and Don and I flew to Doone Creek to map the geology of that area. Our plan was to have the helicopter drop us off near the headwaters of the creek and pick us up downstream later in the day. Having flown up the creek, we felt confident that there would be no problem in traversing down to the Chickaloon River. Everything looked so easy from the air!

The first hour or so went quickly and easily. Don and I mapped, noted several strikes and dips, and gathered samples as we worked our way downstream. The heli-

copter was due to arrive any minute when we realized that there was no place for it to land. The banks of the stream rose 50 feet in the air, and the stream bed itself was much too narrow. A glance downstream convinced us that we could walk all of the way down to the Chickaloon River in a mere 2 hours. After all, it was only 4 miles or so. As the helicopter flew over, Don used the walkie-talkie to tell Cliff Wilson, the pilot, to fly to the mouth of the stream and wait for us there.

An hour later, having walked only about 2 miles and getting very wet and discouraged, it was decided that this little stroll was going to take somewhat longer than we had originally planned. Don called Cliff and told him to go back to camp and return for us at about 7:00 pm. By now it was about 3:00 pm.

During the course of the day, the tributary had changed from a happy mountain stream to a raging torrent. At first we could hop gracefully across the stream by stepping from rock to rock, but eventually the tributary grew too wide for that, and an especially slippery boulder decided for me that from then on I would just trudge through the icy water. Between crossing and recrossing the stream and scattered rain showers, it was impossible to stay dry. It was becoming difficult to carry on a reasonable conversation, so except for the squish of my boots and the occasional muttering of my partner, I was left in peace to contemplate my fateful decision to become a geologist.

About five o'clock we stopped for a rest in what

seemed like the Grand Canyon. From there I could finally see the Chickaloon River valley. It certainly was a sight for sore eyes, and it was less than a mile to a perfect landing spot for the helicopter! I needed no more encouragement than that, but as I struggled to get my pack onto my aching back, Don walked downstream about 10 feet and turned around with an unhappy look on his face. "This is as far as we go," he said. "There is a 200-foot waterfall there." I walked over and looked for myself. As I turned around, Don asked, "Are you sure you want to be a geologist?" "Yes," I gulped.

Since we hadn't grown wings yet and therefore couldn't fly down over the waterfall, Don and I had to find another means of escape. After a brief period of frantic exploration, we decided that the only way down was to climb out of the stream valley (up approximately 50 feet) and traverse diagonally down the ridge over which the stream was falling. It was helpful that the stream banks and ridge were covered with vegetation. Unfortunately, most of it was Devil's Club! Aside from a few stings and slivers, we made it through relatively unscathed. At the bottom, we were confronted with a final test. There was a large pile of dead trees and the stream to negotiate before we could reach the dry gravel bed where the helicopter could land.

In the process of climbing over the logs, a branch reached out and grabbed my leg. As I gracefully bowed to touch my forehead to the sand, I saw a hornets' nest on the offending limb, which by that time, was waving frantically in the air. I scrambled to my feet and shouted my discovery to Don, who was standing right next to the nest. Obviously the hornets resented this intrusion of their privacy and began to assemble for attack. Forgetting how exhausted I was, I flew over the rest of the logs and the stream (without getting wet!) and collapsed a good distance downstream. Don was only one step behind me. When I finally caught my breath and looked at Don, I started laughing. I just couldn't believe that the whole day had really happened!

After a short rest, I stood up to stretch and happened to glance downstream. Needless to say, I was astounded to see the familiar orange color of the helicopter peeking through the trees around the bend about half-mile away. Don confirmed what I saw and tried to contact the pilot, Cliff Wilson, on the walkie-talkie, but there was no answer. That was strange, because the radio was usually left on. Well, if the mountain wouldn't come to Mohamed, Mohamed would just have to go to the mountain. Discovering that we both had hidden reserves of energy and cursing Cliff for not answering our call, Don and I ran the last half-mile--only to find nothing! To this day I still marvel at the power of persuasion.

By then it was 6:30 pm. The sun had moved behind the mountains, a breeze had sprung up, and we were beginning to feel the cold. Just as Don and I started gathering wood for a fire, we heard the cheery chop-

chop of the helicopter. I was never so glad to see that machine in all my life! And I was so tired that I dozed off during the flight back to camp.

Both Don and I were exceedingly thankful that our camp was located right next to the King Mountain Lodge, so that we could enjoy a good, hot meal that neither of us had to cook. After the meal and the telling of our tale of woe, I crawled into my tent and collapsed.

Tidal Forces and Earthquakes (from Geotimes, December 1974)

The combined gravitational pull of Sun and Moon seems to trigger a certain class of earthquakes, says Thomas H. Heaton, a graduate student in geophysics at California Institute of Technology. This class of quakes includes temblors greater than magnitude 5, occurring at depths of less than 30 km, whose fault motion is at least 30% in the vertical (slip-dip) direction.

In 34 quakes of this class, Heaton found that all had occurred when the tidal forces of Sun and Moon were 'sympathetic' with the forces that ultimately caused the earthquake. Although the tidal forces may have been only .01% of the total force of the quake, Heaton surmised that they probably added just enough stress to a highly stressed area to trigger it.

Shallow earthquakes occurring on strike-slip faults, in which the motion is parallel to the surface of the Earth, do not seem to be affected by tidal stresses. In a group of 108 quakes in which the directions of the fault movement were known, Heaton found no evidence that strike-slip earthquakes, or those originating deeper than 30 km, were tidally triggered. These quakes had occurred in many parts of the world and were of various types, shallow and deep, strike-slip (horizontal motion) and slip-dip (vertical motion). All but one were over magnitude 5, and most of them exceeded magnitude 6.

Potential Prospectors are Warned (from All-Alaska Weekly, January 31, 1975)

While interest in locating claims on federal lands is increasing with the rise in prices of gold and other minerals, Bureau of Land Management (BLM) State Director Curtis V. McVee asks potential prospectors to check laws and land status before staking a claim.

Claimants should be aware of requirements under both federal and state laws for locating and working claims on federal lands, McVee said. With increasing needs for most minerals, BLM looks forward to new discoveries on public lands.

McVee said that most of the lands withdrawn by the Alaska Native Claims Settlement Act are not open for the staking of mining claims. These include lands withdrawn for selection by native corporations and for possible additions to the national park, forest, wildlife refuge and wild and scenic rivers systems.

"Claims staked on lands withdrawn from mineral entry are not valid," said McVee, "and the claims are of no value to the prospector who staked them as he has gained no rights to explore or extract minerals."

In addition, McVee mentioned that a mining claim cannot be used as a recreation site, residence site, or for any other nonmining use since this constitutes trespass. "If anyone wants to stake a mining claim or use federal lands for other purposes, the first thing to do is check land status and legal requirements with a BLM Office," he said. "By checking first, a potential prospector can save himself time, money and loss of any investments or improvements he might make on lands closed to mineral entry."

Federal land ownership and land status can be checked in the Bureau of Land Management offices at 555 Cordova Street in Anchorage and at 1028 Aurora Drive in Fairbanks.

New Claims Double Since 1973

According to Carole Stevenson, DGGs mining information specialist, more than twice as many mining claims were filed in 1974 than were in 1973. The claims for last year totaled 11,887 compared to 5,664 for 1973. These are for new claims or additions to existing claims only—not affidavits of labor, deeds, or miscellaneous documents.

The claims listed below cover Dec. 1, 1974—Jan. 31, 1975, and total 830. The newest claims are in the following quadrangles:

| | | | |
|-----------|-----|----------------|-----|
| Anchorage | 18 | Nenana | 18 |
| Chandalar | 2 | Nome | 1 |
| Circle | 9 | Norton Bay | 4 |
| Eagle | 2 | Nulato | 8 |
| Fairbanks | 13 | Palmer | 16 |
| Healy | 65 | Port Alexander | 80 |
| Juneau | 139 | Ruby | 160 |
| Ketchikan | 17 | Seward | 33 |
| Kodiak | 1 | Talkeetna | 92 |
| Livengood | 18 | Tanacross | 3 |
| McCarthy | 2 | Tanana | 2 |
| Mt. Hayes | 7 | Teller | 7 |
| Nabesna | 1 | Tyonek | 77 |
| Naknek | 27 | Wiseman | 8 |

New DGGs AOF Released

Open file report 72, "Geochronology and generalized geology of the central Alaska Range, Clearwater Mountains, and northern Talkeetna Mountains," is now available to the public. Coauthored by D.L. Turner and T.E. Smith, this report contains 83 K-Ar mineral ages with analytical data for intrusive rocks and metamorphites in a 5000-square-mile area of south-central Alaska. The report includes a generalized geologic map

with age notations at 1:250,000 scale and 10 pages of text.

It may be purchased at Petroleum Publications, Inc., 409 West Northern Lights Blvd., Anchorage, Alaska 99503. \$3.65 without postage, \$4.05 with postage.

Geochemistry as a Prospecting Tool

by Alfred F. Trites

(Ed. note — This is the first of a series adapted from *The Mining Record* [Dec. 11, 1974]. The author is a consulting geologist in Denver.)

Can a prospector who is untrained in geology or chemistry use geochemistry to find ore deposits? If so, what kinds of samples should he take and what types of ore deposits could he expect to find? In a series of articles I will discuss the answers to these and other questions which so often are in the minds of those pursuing the fascinating — and sometimes lucrative — search for mineral deposits.

Types of Sampling

The prospector will find the sampling of either the soils or the rocks in many places to be adequate to give a general indication of the presence of certain metallic elements being sought. More sophisticated methods of sampling stream, lake or spring waters over large areas, sampling stream sediments, sampling trees for molybdenum or gold, or collecting mercury in plastic hoods are usually left in the hands of exploration groups with the finances and expertise to conduct such investigations which can be extremely involved.

The sampling of the soil has proven to be a quick, economic and adequate method of evaluation in many of the areas I have examined. The sampling is simple and can be handled easily by one man. The results usually are meaningful as long as the soil sampled has been formed by the weathering of the underlying rock.

Selecting Soils for Sampling

Ask yourself several questions as you examine the soil to decide if the method will work on your area. Is the soil in place or has it been transported to its present site? Is it similar in color to the underlying rock? Are the rock fragments in it similar to the types known to exist in the immediate area?

Be sure the soil you intend to sample is in place. You are interested in determining the metal content of the rock below by the soil, its weathered product, at the surface. Naturally, soils transported and deposited at their present site by streams or glaciers bear no relationship to the rock beneath them. Stream-laid sediments can spread out for scores or even hundreds of feet along many valleys and can form blankets on higher terraces many feet above the valley floors. Moraines can form thick deposits along the edges and sometimes across the typical U-shaped valleys of glaciated areas. Generally speaking, the thinner soils along ridge crests or on upper

slopes have been formed there and are dependable. Soils found on many mountain slopes and on terraces at the foot of ranges have had their origin from rock much higher on the slope and are of little or no use.

If the color of the soil is in marked contrast with that of the rock known to exist in the area you should be suspicious of it. Any alteration of colors in the rock, such as the browns, yellows or reds of the iron oxides or the blacks of manganese or iron oxides should appear to some extent in the soil.

The types of undecomposed rock in fragments in the soil may also give some clues. If fragments do not match the parent rock known to exist in the area and unfamiliar varieties are found as you examine the soil, again be on guard.

After you have determined the soil within your area to be derived in place or at least moved for only short distances that you can recognize or interpret you are then ready to lay out a soil sampling program that will give you the maximum possible information for the outlay of time and expense.

Panning for Gold

(from The Mining Record, Feb. 5, 1975)

Panning for gold is one of those romantic-sounding practices which is best observed by amateurs and performed by professionals.

"It takes a year or two of fairly constant practice to become an expert gold panner," says Doug Colp, a mining engineer who's been panning gold for nearly 40 years. Colp ramrods Ranchers Exploration Alaskan gold exploration project, a job that includes panning gold from the concentrates produced at the camp. The gold-bearing concentrates are produced by passing material from drill holes through a mechanical separator to remove rocks and pebbles, leaving only sand and fine gravel.

"It normally takes me about 20 minutes to complete a pan of concentrates," says Colp, "with the exact time depending on the type of gold. The gold here is flat and flaky, and takes a bit longer to pan than gold which is fat and plump."

Colp's panning technique is simple. He dumps half of shovelful of concentrates into his 16-inch-diameter pan, fills it with water from a tin wash tub standing in front of him, and begins the gentle swirling motion which floats the lighter particles, leaving the heaviest in the bottom of the pan. Larger bits of gravel are isolated with a thumb or finger and raked over the side.

Finally, only the gold and grains of black iron ore — magnetite — remain. Colp then dumps this metal onto a sheet of paper and separates the iron by passing a magnet over it. The gold — now about 87 per cent pure — is weighed and logged. "A skilled panner should recover at least 95 per cent of the gold in his pan," says Colp, "and be able to tell, within 10 per cent, how much gold he has recovered without weighing it."

The Alaska Native Claims Settlement Act and the Alaskan Miner

by James Barker, BLM Mining Engineer

(Ed. note — This is the first in a series of articles by the Bureau of Land Management. The series is to inform the public — especially the small mine operator — of the current mineral situation in Alaska).

On December 18, 1971, the Congress of the United States passed the Alaska Native Claims Settlement Act (ANCSA) which set aside approximately 116.4 million acres from which 40 million acres will be selected for native ownership. Land ultimately conveyed will carry all rights, surface and subsurface, to the selected lands. Much of these selected lands will be concentrated on land favorable for petroleum and minerals.

What then can the miner who has a valid prior existing claim on potential native lands do to protect his interests? Valid existing rights claimed prior to December 18, 1971 are protected by the Act in Section 11. (a) (1) of ANCSA. One of the rights received on a mining claim is the right to apply for and receive patent to a valid mineral discovery providing all regulations pertaining to patent are met. Another right is ingress and egress to the claim across adjacent public lands for sustaining the claim. These two rights can be lost unless the miner takes immediate action.

ANCSA specifies that the mining claimant has 5 years from the passage of the act to submit application for patent. This means that if the claimant wishes to receive patent to his claim, he must have filed a patent application and diligently begun proceedings towards patent by December 18, 1976. The mineral survey should at least be scheduled but does not necessarily have to be completed by the deadline. If the claimant fails to meet the deadline, he will have no further opportunity to receive patent from the United States, and the Federal government will claim no further jurisdiction over unpatented claims on native selected lands.

It is important to note that a locator who does not submit a patent application will not necessarily lose his claim. By virtue of *Pedis Possessio* he will still retain all rights allowed by an unpatented mining claim. However, after December 18, 1976, it will be possible for the native corporation to challenge the validity of the claim at any time. By virtue of ANCSA, the native corporations have the right to manage all surface resources (timber, sand, gravel, etc.) on claims staked since July 23, 1955, in the same manner as the Federal Government does at the present time.

The mining claimant who is within a native village withdrawal must consider two points. First, he must determine the land status of his claim. All native selections will be completed by December 17, 1975. This then allows the claimant 1 year to determine if his claim lies within native selected lands. If it does not,

the claim will remain under governmental jurisdiction subject to the regulations as on any other public domain land. If the claim does fall within the native selected lands, the claimant must resort to the procedures outlined previously.

Second, he must consider access to his claim. BLM is presently identifying access routes which are necessary for public use; however, it will be impossible for them to identify all such routes without public help. Because the identification of these routes is expected to be completed this month (March), it is important that any annually or seasonally used routes which are available for public use and for which there is a need be brought to the attention of BLM as soon as possible.

Claimants with claims on navigable waters or with access by air will have no problem retaining these modes of transportation as a method of access.

If the miner has a claim adjacent to an existing public road or trail, an easement must be requested from BLM. Such an easement would exist as a reservation in the land patent on the native lands and would provide a corridor for public transportation.

If a *group* of claimants has no current land access to their claims, application must be made to BLM for an easement reservation for public use. BLM, by law, can only reserve easements for public use and cannot make reservation for individual use.

A single claimant in need of access has several other alternatives he may attempt.

1. He may obtain, with native corporation concurrence, a right-of-way permit. However, the law is not clear on this procedure and some difficulty may occur.
2. He may apply for access by necessity through the court system. Again, the law is unclear on this procedure.
3. He may, after patent has been issued on the native lands, negotiate with the native corporation for an easement.
4. As a last resort, he may file with the State of Alaska to insert their authority under Alaska Statutes and proceed with Eminent Domain to obtain private ways of necessity, essential for resource extraction.

Mining claimants are now, as never before, in a situation in which their land and access status must be carefully evaluated and a course of action decided upon.

They have several deadlines which are fast approaching. In March 1975, easement recommendations will be submitted by BLM. On December 18, 1975, the village corporations will have filed all applications for native land selection and the miner may then obtain land status for his mining claim. And by December 18, 1976, applications for patent on mining claims must be filed.

After the last date, there will be no further new claims on native lands by the non-native, access may be

difficult to gain or improve, and there is always the possibility of legal contestation. The unpatented claimant must continue to show diligence and good faith towards perfecting the discovery while subject to the uncertainties of land tenure. Miners further interested in the legal ramifications of land tenure and access should refer to DGGs Information Circular 19, "The Status of Mining Claims Located on Native Lands." Miners are urged to bring their questions to their nearest BLM office (five in Alaska: Anchorage, Fairbanks, Glenallen, Tok, and Kotzebue).

The Alaska Mineral Industry

By D.C. Hartman, former State Geologist
(from Alaska Construction & Oil, January 1975)

The first recorded mining venture in Alaska began in 1848, when the Russian mining engineer Peter Dorosbin discovered placer gold on the Kenai Peninsula. In 1854, the Russians produced the first coal mined in Alaska at Port Graham; this operation continued for several years on a small scale, using the coal fuel steamships. Mineral production became one of the foundations of Alaska's economy in 1877, when the first lode gold mine went into operation near the former Russian capitol at Sitka. Since that date about \$1.3 billion worth of metals have been mined in Alaska, with gold and copper accounting for at least 97 percent of the total. Following the second world war, exhaustion of known large high-grade deposits and rising operating costs have brought the metal mining industry to a very low level. Mineral production for the past decade has averaged about \$35 million per year.

Despite these low production figures, a simple comparison of Alaskan mineral potential to that of the 11 western mining states of the lower 48 shows that there should be \$100 billion of metallic mineral resources available. Again comparing Alaska to the western U.S., we find that past mineral production there amounts to more than \$85,000 per square mile of territory, while Alaska, with comparable geology and potential, has produced about \$3,400 per square mile.

Obviously the mineral productive potential of Alaska has barely been touched. Besides the depletion of known deposits and rising costs mentioned above, other major factors holding down Alaskan production have been ready access to foreign mineral suppliers and the lack of modern geological maps of Alaska to use as framework for exploration.

The massive federal land withdrawals under the Alaska Native Claims Settlement Act of 1971 have been a strong deterrent to extensive exploration, and will continue to hinder exploration in many areas over the next few years, as the land ownership problems are gradually resolved. It is becoming apparent, however, that an important turning point has been reached.

With only 5% of the world's population and 7% of the world's land area, the United States consumes 30% of the world's mineral production. Our mineral requirements are so large that we must import many of our essential minerals, but we can no longer assume that mineral products will flow to our nation as freely as in the past. Added competition for minerals by both industrial and developing nations, plus the fact that many U.S.-developed foreign mining properties are being taken over by the affected nations, dictates that a much stronger domestic mining industry must be developed.

The U.S. balance of payments in mineral products is going from bad to worse, and, according to the U.S. Department of Interior, could reach an annual outflow of \$35 billion by 1985. This deficit is a strong incentive to domestic exploration and production. Another factor affecting Alaska is the growing dissatisfaction among western Canadian mining firms with restrictive provincial legislation, which has led in some cases to increased expenditures by Canadians for Alaskan exploration programs.

ALASKAN MINERAL ACTIVITY IN 1974

Arctic Alaska

Expenditures for mineral exploration in Alaska amounted to an estimated \$6 million in 1974. Of this sum, about \$2 million was invested in the high-grade copper-lead-zinc ore bodies north of Kobuk in the southwestern Brooks Range, where one copper deposit has already been evaluated at more than \$2 billion, and where other deposits along the trend may easily double this value. Intensive claim-staking along the copper trend was undertaken by Sunshine Mining Company in 1973-74 and by Watts, Griffis, and McQuat in 1974, and detailed field work and core drilling of copper prospects was carried out by Sunshine. Bear Creek Mining Company continued their development core-drilling program in this richly mineralized district. Elsewhere in the Arctic region in 1974, Noranda Mines was driving an exploratory drift on the Little Squaw lode gold property near Chandalar, and several companies were conducting reconnaissance exploration for gold and lead-silver deposits.

Western Alaska

Expenditures for exploration in Western Alaska were about \$200,000 in 1974. At Lost River, where Lost River Mining Company has established a commercial minable reserve of fluorite, tin, and tungsten ore, a small field party was conducting placer gold exploration. The Lost River mining program is at a temporary standstill pending the establishment of funding that will allow construction of a mining and shipping system, plus the necessary support of a town and other facilities.

Near Nome, UV Industries was reactivating gold dredges 5 and 6 for operation in 1974, and a grid of thaw-holes was being drilled to thaw the frozen gold-

bearing gravel ahead of the dredges. By 1976, a third dredge is planned for the Nome area. A work force of about 350 men is anticipated for the 1975 season. Offshore from Nome, American Smelting & Refining Company and Shell Oil Company plan a joint venture in subsea gold placer exploration. They may commence core drilling through the ice this winter, and reportedly are developing offshore gold dredging equipment for eventual production.

Rhinehart Berg is reportedly continuing work to refloat and reactivate his 14 dredge for gold in the Candle area.

Interior Alaska

About \$800,000 was spent on mineral exploration in the interior part of the state. Klondike Placer Gold Inc. continued extensive preparations for a major gold dredge operation at Livengood, where a preliminary expenditure of \$4 million is anticipated. Inspiration Development Company continued a drilling program in the large, very low-grade porphyry copper deposit at Bond Creek, near Nabesna.

Many prospectors were active in the Kantishna District, north of Mt. McKinley, but there was no significant production in this gold-silver-lead-antimony region during 1974. A small amount of antimony was produced in the Fairbanks District. Several small placer gold operators in the Circle-Central region were active in 1974, with production estimated at 1500 ounces. Ernie Wolff and Dan Cobin activated and were operating a gold dredge on Coal Creek, near Circle.

At Healy Creek, Usibelli Mines has continued to block out new coal reserves while producing some 700,000 tons of coal in 1974. They have delineated nearly 500 million tons of minable coal in the Healy-Lignite Creek area. One of the notable features of the Usibelli operation is their ongoing reclamation and seeding of mined-out property, which has resulted in a popular pasture area for Dall sheep.

The Purkey property, southwest of Mt. McKinley, is undergoing continued core-drilling in the search for lode tin deposits. The only known active mercury mine in Alaska is operated by the Lyman family at White Mountain, southeast of McGrath. Commercial quantities of cinnabar are shipped from this lode property during the summer months.

Considerable prospecting and drilling activity was carried out in the Fortymile district by Rioamex, Amoco Production Company, and others during 1974. Ranchers Exploration and Development Company was actively exploring for placer gold near Paxson. Other companies known to be active in the interior were Gulf Oil Company, U.S. Steel, Rio Tinto Canadian Exploration Ltd., Exxon Company, Cities Service Minerals Corporation, and Resource Associates.

South-Central and Southwestern Alaska

About \$200,000 was spent for exploration in these regions in 1974. Semco maintained a field exploration

effort to evaluate 131 claims covering 2600 acres of gold property off the southwest flank of Mt. McKinley.

Portland General Electric Company, a newcomer to the Alaskan scene, was granted a large block of coal prospecting permits in the Peters Creek area, west of Talkeetna. PGE intends to mount an aggressive drilling and evaluation program designed to assure a supply of steaming coal for their electric plants in Oregon, with an anticipated mining rate of up to 6 million tons of coal per year.

Ranchers Development Company was drilling in the Golden Zone area near Cantwell in an attempt to block out commercial ore deposits of copper and associated ores.

On the Alaska Peninsula, Phillips Petroleum Company was conducting surface geological and geophysical work in areas of copper mineralization in the vicinity of Perryville, reportedly in cooperation with the Bristol Bay native corporation; Skelly Oil Company was apparently also active in mineral exploration in that region.

Considerable exploration activity was reported in the Talkeetna Mountains region in 1974, by U.S. Steel and Cities Service, among others.

Southeastern Alaska

Nearly \$3 million was expended on exploratory programs in southeast Alaska, carrying on a fairly high level of activity. At least 8 companies were either conducting core drilling or geologic reconnaissance work. Phelps-Dodge was drilling for copper on Coronation Island, U.S. Borax Company drilled on Prince of Wales Island, Inspiration Development Company was drilling nickel prospects on Yakobi Island, El Paso drilled for base metals near Wrangell, and Amoco Production Company, Cominco Ltd., Homestake Mining Company, and Texas Gulf Sulphur Company were doing geological and geochemical reconnaissance work in various parts of southeastern Alaska.

The giant nickel-copper deposit at Glacier Bay, which has been delineated by Newmont Exploration Company in previous years, is lying idle while questions still are unresolved as to whether mining will ever be allowed within the National Monument boundaries. This may prove to be the largest nickel deposit in the United States.

It appears that the on-again-off-again plans to mine the enormous low-grade magnetic iron deposits at Klukwan, 26 miles northwest of Haines, have cooled at this time. At last report, Mitsubishi of Japan had apparently dropped their option to develop this property, probably because of a combination of costs, lack of local fuel, and the uncertainties of dealing with environmental protests against the proposed operation.

The only producing mine in this region is the Alaska Barite Company operation at Castle Island, a few miles west of Petersburg, Alaska Barite mines about 100,000 tons of barite per year from the sea floor and runs it

through a barge-mounted crushing plant at the site for sale as a drilling mud additive. Approximately a 10-year supply of minable barite has been blocked out at this location.

Expected Trends in 1975

In general, exploration activity is expected to increase in 1975, induced by rapidly rising commodity prices, increased investment by Canadian mineral companies, and gradual resolution of native land claims and federal withdrawals.

The enormous copper deposits of the southern Brooks Range will continue to be outlined by intensive drilling, and the first phases of investment for copper production should begin. Tentative production plans for this region involve a combination of surface and underground mining, with ore concentrates or crude copper to be shipped by Boeing 747 freight aircraft. As in the exploration phase, manpower will be largely furnished by the native communities of the region.

Gold production will climb significantly, supported by high prices which have encouraged the activation of several more dredge operations, and by the continuing increase in prospecting and mining by small operators.

As the native corporations have prepared to select their lands under the claims settlement act, several of them have entered into exploration agreements with oil companies and mining companies during 1974. These agreements generally provide that the company is granted an exclusive exploration area on lands withdrawn for selection by the corporation. In return, the exploration results are furnished to the corporation as guide to selections with greatest mineral value, and the company retains preferential rights to oil and gas or mining leases when the land is acquired by the native corporation. During 1975, as the native groups gain title to increasing amounts of land, this type of cooperative mineral exploration on native lands may show a significant increase as the natives attempt to establish an economic base in their corporate areas.

As the proved reserves of uranium in the U.S. are not nearly sufficient to fuel the nuclear power-generating capacity that is forecast for the next 20 years, the search for uranium deposits has been markedly accelerated. In Alaska, uranium exploration programs are being initiated by both private industry and by state and federal agencies; the Division of Geological and Geophysical Surveys has contracted with the U.S. Atomic Energy Commission to undertake a state-wide study of the uranium potential of Alaska, and the AEC is reportedly planning an airborne radiometric survey of parts of Alaska in 1975. To date, the only uranium produced in the state has come from the Ross-Adams lode deposit near Kendrick Bay, on Prince of Wales Island, southeast Alaska. Alaska has great potential for sedimentary deposits similar to those in the western U.S., which furnish 96% of all domestic uranium production.

The U.S. Geological Survey has initiated an intensive mapping and mineral exploration program dubbed AM-RAP (for Alaskan Mineral Resource Assessment Program) which was commenced in 1974. This program, authorized by Congress in response to serious impending mineral shortages, is intended to furnish a rapid inventory of Alaska's mineral resources for input to federal, state, and industry decisions on land use and development. Fourteen 1 inch to 4 mile quadrangles have been tentatively selected for resource appraisal over the next 4 years, as part of a 10-year program. The program will evaluate each quadrangle over a two-year period by means of simultaneous geologic mapping, geochemical surveys, geophysical analysis, and application of remote-sensing techniques (both airborne and satellite observations) with detailed computer processing of data.

In summary, Alaska appears to be finally entering an era where exploration for minerals is being intensified and broadened in a long-range response to critical material shortages that are developing throughout the U.S. A number of very valuable deposits are being actively pushed toward production, and the current surge of exploration activity promises to establish a firm economic base for Alaska in the mineral industry.

Mines Bring Suit Against Government (from The Northern Miner, Dec. 26, 1974)

VANCOUVER — The British Columbia mining industry intends to fight the Mineral Royalties and Mineral Land Tax Act in court.

Eighteen B.C. mining companies are plaintiffs in a writ filed Friday, December 19, in the Supreme Court of British Columbia seeking to overturn the legislation on the grounds it is unconstitutional.

Defendants appearing on the writ are the Attorney General, the Mines Minister, the Administrator of Mineral Royalties and the Assessor of the Mineral Land Tax.

The filing of the writ was announced at a press conference on Friday last by W.J. Tough, president of the Mining Association of British Columbia. He said it was the most important decision by the mining industry in many years.

The Association, Mr. Tough said, has been advised that the acts are unconstitutional in that they impose an indirect tax — contrary to the British North America Act which allows the province to levy direct taxes only.

The group of mines seeks an injunction preventing, during the court action, collection of money under the act and also preventing the government suspending or cancelling a free miners license.

The Mineral Royalties Act (Bill 31) was proclaimed on Oct. 1, 1974, and the royalties are retroactive to Jan. 1. In November this year the companies subject to the provisions of the act paid royalties under protest and

indicated they believed the act ultra vires. According to the Mines Minister, mineral royalties collected by the B.C. government to the end of November totalled \$12.5 million. The royalties are payable monthly.

The Mineral Land Tax Act provides for taxation equivalent to royalties on mineral production from Crown granted mineral claims. Payments begin July, 1975.

In his statement read at the press conference, Mr. Tough said that we have to contest this legislation because the mining industry, British Columbia's second largest industry, is being put out of business by the accumulation of taxes imposed by provincial and federal governments.

"Even if these acts did not have the disastrous effects that are now becoming apparent, we would have to contest this legislation because in principle it is bad," he added.

Plaintiffs on the writ are: Canex Placer, Cominco, Reeves MacDonald Mines, Teck Corp., Texada Mines, Wesfrob Mines, Anaconda Canada, Bethlehem Copper, Brenda Mines, Craigmont Mines, Gibraltar Mines, Granby Mining, Granduc Operating Co., Granisle Copper, Lornex Mining, Similkameen, Utah Mines, and Western Mines. Mr. Tough said there is one other mining company considering joining the legal action.

To accept these acts, the Association president declared, is to accept the inevitable destruction of free mining enterprise in this province.

Four mines have closed down in British Columbia this year. Western Mines recently indicated it is considering cutting back production in view of the high taxation costs and the drop in metal prices. Granduc Operating is reducing production by more than 50% and Similkameen is cutting back on the work force by reducing stripping operations.

Mr. Tough said the mines will not willingly close but once the cash flow becomes negative a mine has little alternative.

He emphasized that the industry, by taking this legal action, is not seeking to avoid payment of fair and reasonable taxation.

"The acts impose taxation that must be paid before anything else... even when the mines are losing money.

"These royalties, combined with other B.C. taxes and federal income taxes, create tax rates ranging from 62% to more than 100% of income. This is an unconscionably high rate of taxation, and practically guarantees the demise of the industry.

"We told the provincial government when it introduced Bill 31 that it would destroy the industry. We told them the Bill would kill exploration, drive away capital, close down existing mines, threaten communities, and eliminate jobs.

"We attended discussions with the government to explore alternative forms of taxation to provide the government with revenues while allowing the industry

to continue operations together with exploration and development.

"All our proposals and warning were rejected. The Mineral Royalties Act was passed despite widespread public objection.

"Since the Bill was passed, mining exploration has declined. Mines have closed or reduced operations. Communities are threatened and many jobs have disappeared.

"As managers, we have a duty to our shareholders protect their companies. We also have a larger responsibility to provide jobs and sustain communities that are dependent on or were founded because of mining development."

Mines Minister Nimsick said if the mines want to challenge the statutes they can. Any statute, he added, can be challenged if they have the grounds and even if they don't. He said that the Mineral Land Tax Act was similar to that of Saskatchewan which had stood up to a court test. He said he did not want to comment further, because once it is in court it is subjudice.

Mining — Better but no Boom

(Adapted from Alaska Construction & Oil, January 1975)

Alaska's mining industry isn't exactly headed for a boom in 1975, but all indications point toward a much better year than 1974.

That's the consensus of mining companies surveyed recently by AC&O.

What's more, many of the respondents indicate Alaska's mining posture could be improved except for obstacles posed by ecologists and the government.

Still, while only 32 percent of the companies felt 1974 was a good year for the industry, 54 percent said 1975 would see improved conditions. This seems to be supported by project plans revealed in the survey. During 1974, only half the responding companies had embarked upon or completed major projects in Alaska. However, 72 percent said they would be involved in some form of Alaskan activity — primarily exploration — this year. Five percent said they were considering projects.

One of the largest roadblocks to massive development appears to be the lack of an adequate state-wide transportation system. Alaska is woefully deficient in highways, and railroad expansion is limited by the market.

Although completion of the 360-mile Yukon River — Prudhoe Bay haul road will undoubtedly provide access to mineral-rich areas of the Brooks Range and other mineral-bearing regions in Alaska's northern interior, access to the gravel highway is tightly controlled by Alyeska Pipeline Service Company and use will probably be limited until the pipeline is completed or the road dedicated as a public thoroughfare. Even then, native organizations are mounting opposition to unlimited public use, contending violation of the virgin area will upset not only the ecology, but the back-

ward socio-economic status quo.

Cities Service Minerals Corporation, one of two responding companies moving capital funding from British Columbia to Alaska because of adverse legislation, feels America cannot afford to lock up D-2 lands unless significant metal deposits are exempted.

"The Congressional Act establishing Glacier Bay National Monument should be amended to permit milling within monument boundaries," says the company, "and the Interior Department should allow further underground exploration of the Brady Glacier copper-nickel deposit."

Our Ganguer...

by Frank Larson, DGGS Editor

Psst. Hey Mate. Want to get fixed up with a little ore? The Lost River Mining Corporation is seeking an operating partner for the \$80 million development of its tin-tungsten property on the Seward Peninsula. Reserves are reported at 28.6 million metric tons of 18% fluorite ore; its zone 1 has 80,000 mt of 0.27% tin ore, and zone 4 has 16.5 million mt of 0.36% tin ore... Over in the Ambler River district, Sunshine Mining has staked 1,300 claims covering 24,000 acres. Staking of claims, geophysical studies, and diamond drilling will continue in the spring, when weather will permit further work. Eight drill holes along a 1/4-mile tract of the prospect intersected thicknesses ranging from about 4 to 27 feet of varying mixes of zinc-copper-lead-silver minerals, at depths of 80 to 500 feet... Speaking of deep, our new typist was overheard to remark on her new association with geologists, "All these guys ever seem to talk about is rocks." (Mona honey, you'll make Goldie Hawn look like a Rhodes scholar yet.).... Hoping some of you readers may be sports fans, I'll tell you about our basketball team. Yours truly, along with several other DGGS staff members totally devoid of motor skills, played for the Geology Dept. in the yearly intramural competition at the U. of A. (verb used in loosest sense here). You say you want a recap of the season? Well, suffice it so say that while the object of the game continues to elude us, the grand game of basketball has helped mold each of us into the humble, modest citizens and pillars of the community that we are. Three straight seasons without winning a game will do that, you know. The moral? Stick to rocks, and forget children's games.... That's what little Missie Dennis, of "Sycamore Valley, Ohio" advises us to do, too. She sent DGGS a post card saying, "Dear Sir:/please send me your rocks. Thank-you/your friend Missie." So we did (but not all of them, or we'd be out of jobs)... and finally, Stanley Baron, in his book *Brewed in America*, says an oil test near Franklin, PA, in 1831 inadvertently drilled into the storage vaults of Grossman's brewery and thus became the nation's first beer well... I'll drink to that.....Cheers.

Metals Market

| | Feb. 17, 1975 | Dec. 16, 1974 | Feb. 22, 1974 |
|--|---------------|---------------|---------------|
| Antimony ore, stu equivalent European ore | \$ 23-24 | \$ 31-32 | \$ 18.9-19.9 |
| Barite (drilling mud grade per ton) | \$ 17-21 | \$ 17-21 | \$ 14-18 |
| Beryllium ore stu. | \$ 30.00 | \$ 30.00 | \$ 30-35 |
| Chrome ore per long ton | \$ 55.00 | \$ 47.00 | \$ 33.00 |
| Copper per lb. (MW-prod.) | \$ 0.63 | \$ 0.72985 | \$ 0.6875 |
| Gold per oz. | \$189.50 | \$180.00 | \$163.30 |
| Lead per lb. | \$ 0.245 | \$ 0.245 | \$ 0.19 |
| Mercury per 76-lb. flask | \$228.00 | \$238.00 | \$295.00 |
| Molybdenum conc. per lb. | \$ 2.43 | \$ 2.30 | \$ 1.72 |
| Nickel per lb. | \$ 2.01 | \$ 1.85 | \$ 1.62 |
| Platinum per oz. | \$160.50 | \$190-200 | \$228.00 |
| Silver per oz., New York | \$ 4.49 | \$ 4.26 | \$ 5.91 |
| Tin per lbs. New York | \$ 3.73 | \$ 3.575 | \$ 3.75 |
| Titanium ore per ton (Ilmenite) | \$ 55.00 | \$ 55.00 | \$ 38.00 |
| Tungsten per unit | \$ 88.125 | \$ 88.265 | \$ 44.60 |
| Zinc per lb. | \$ 0.39324 | \$ 0.39155 | \$ 0.318 |

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