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Lime and Phosphate Deposits Cited for Possible Agricultural Use

By C.N. Conwell, DGGS Mining Engineer, and G.R. Eakins, DGGS Chief Mining Geologist

Alaska contains 25 million acres of land suitable for agriculture, three-fifths of which are suitable for farming; the rest could be productive range lands (Tomlin, 1974). Alaskan soils have a wide range in natural fertility, although nitrogen, phosphorous, and sometimes potassium are in short supply. Nevertheless, calcium and sulphur are believed to be the only secondary elements that must be added to soils for good plant growth. Strongly acid soils must be heavily limed to secure a more favorable plant growth. The lime, in addition to reducing soil acidity and supplying calcium, makes the soluble iron and aluminum less toxic. Ground limestone or marls (calcareous clays and silts) are common lime sources. Most soils requiring lime would need an initial application of 3 to 5 tons of high-grade liming material per acre (Laughlin, 1974).

Samuel Rieger (1974), soil scientist of the U.S. Department of Agriculture, indicated that an application of 225 pounds of the phosphate P_2O_5 per acre increased a yield of potatoes from 8 to 13 tons per acre. Cleland Conwell (1976a), in monitoring the application of grass and fertilizer in the reclamation of mined land at the Usibelli Mine in Healy, reported on the excellent growth of grasses with the application of fertilizer.

Of the required nutrients that must be added to Alaska soils—nitrogen, phosphorous, lime, and sometimes potassium—all but potassium are available within Alaska. The Collier-Carbon Plant near Kenai produces urea, a source of nitrogen which, though less effective as a fertilizer than ammonia nitrate, may be economically used in most applications. The phosphate rock and the lime rock or marls may be applied to the soils after being finely ground. Phosphates, however, are usually treated with acid to increase the P_2O_5 content to 50 percent or more. High-grade or commercial raw phosphate rock is generally considered to contain a minimum of 30 percent P_2O_5.

Limestone

The only preparation required for agricultural limestone is fine grinding to at least -100 mesh (-149 microns). No references to the use of Alaskan limestone for agriculture have been found.

Limestone for agriculture does not require the purity of certain other industrial uses such as cement. The limestone should be close to either currently cultivated areas or projected agricultural developments.

Moxham and Eckhart (1956) described marl deposits in the Knik Arm area, reporting small reserves and an inferred resource of probably less than 1 million tons. The marl could be used but would be inferior to limestone.

Large masses of high-calcium recrystallized limestone occur along the north side of the Matanuska

Valley in the drainage of Kings River north of the Castle Mountain fault. The Kings River area has extensive high-grade limestone deposits 6 to 8 miles from the East Fork. The deposits could supply all the foreseeable demand for cement in the Cook Inlet-Anchorage region and the railroad belt. The limestones, which are exceptionally pure, occur 8, 16, and 17 miles north of the Glenn Highway between mileposts 71 and 72 (Mihelich and Jasper, 1961).

Moxham, Eckhart, and Cobb (1959) reported on limestone in the Windy Creek area. The report, primarily concerned with limestone for cement, describes two deposits of Devonian age that are of adequate size and chemical quality; they are located 7 and 11 miles west of Alaska Railroad milepost 325. A larger limestone deposit of lesser quality but still quite suitable for agricultural use lies 1 mile east of the railroad. The three deposits, which have estimated reserves of 180 million tons, would be an excellent source of limestone and would be accessible because of their proximity to the railroad; however, they are within the boundaries of McKinley National Park.

There is a small limestone deposit at Fox, about 10 miles north of Fairbanks. The deposit is probably too small for commercial development.

Another possible neutralizing agent might be the fly ash from the power plant at Healy. The ash contains approximately 15 percent CaO, nearly 0.75 percent P_2O_5, and 1.5 percent K_2O. The coal ash was analyzed by the U.S. Geological Survey and reported by Conwell (1976b). Lu and Rao (1971) state: "The high alkali characteristics of fly ash can be utilized as a low-cost neutralizing agent." Also, the material is available in a particle size suitable for application. Very little additional research would be required to evaluate the benefits of this material for agricultural use.

Phosphates

Known and documented phosphate beds occur in the Mississippian Lisburne ground and in the Triassic Shublik Formation along the northern front of the Brooks Range and adjoining foothills. Although samples by Patton and Matzko (1959), Detterman (1970), and Tourtelot and Tailleur (1971) indicate a range of values from 12 to 30 percent P_2O_5, the actual extent and thickness of the beds are unknown.

The sequence of beds containing phosphate rock occur both east and west of the pipeline haul road and should be accessible for agricultural use. However, there would be land problems. Although some beds are on state-selected land, most are in the Arctic National Wildlife Range or in the Native regional deficiency areas. Also, access may be limited because of possible inclusion in one of the four national systems that exclude mining.

There is another recorded location of phosphate. Wedow (1948) reported phosphatic material in the Calico Bluff formation opposite the mouth of the Tatonduk River, near Eagle. The phosphate beds north of the Brooks Range and near Eagle are associated with anomalously high radioactivity. White (1951) reports anomalously high radioactivity in carboniferous black shale on the north side of the Porcupine River upstream from the Coleen. The radioactivity, by association, might indicate a third area in which to search for phosphate beds.

Legal Status

Phosphates are leasable minerals, either from the state or the federal government. If on state lands, the applications for a phosphate lease are covered by section 38.05.155 of the Alaska Statutes.

Agricultural-grade limestone would be a salable mineral, much the same as sand as gravel, on either state or federal lands.

Demand

To mine and process either of these materials, there must be a demand—and the present demand on the 17,000 acres currently under cultivation might not be adequate to justify mining and processing. Fifty thousand acres may be released in the Delta area for agriculture, and another 300,000 acres of land are being considered for agricultural development in the Nenana area. If these are developed, there would be a need for a local supply of these nutrients.

If mined, both the phosphates and limestones would have to be processed for agricultural application. The processing in either case might be grinding into a very fine powder, probably less than 100 mesh, with the phosphates being further refined to a higher grade product with sulphuric acid, such as that produced as a by-product of smelters.

Summary

Lime and phosphate are needed as nutrients to the soil in Alaska. The materials are available; limestone is close to the railroad and phosphates are near the haul road to Prudhoe Bay. However, there are deterrents to the development of some of these sources: some phosphates are located in the Arctic wildlife range, or on d-2 lands selected for inclusion in the national park system, and some limestones are found in McKinley National Park.

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New Claims Tail Off

Nome, Fairbanks, southeastern Alaska, and Talkeetna were the most active recording districts in the past three months, according to Mildred Brown, DGGS mining-information specialist. There were but 2,268 new claims filed for the November 1976—January 1977 period, a sharp reduction from the 8,107 filed for the preceding 3 months.

Anchorage	50	Haines	7
Cordova	1	Seward	1
Fairbanks	436	Juneau	231
Glennallen	61	Ketchikan	265
Iliamna	7	Palmer	68
Nenana	24	Petersburg	70
Barrow	1	Kotzebue	3
Nome	789	Talkeetna	231
Mt. McKinley	3	Rampart	6
Ft. Gibbon	2	Chitina	12

Total 2,268

Miners Can Still Patent Claims on Some Native Lands

(from a BLM news release)

Miners who seek federal patent or ownership to their claims on lands selected by Alaska Natives, but missed the Dec. 18, 1976, deadline for filing applications, may still apply before the land is conveyed to Native ownership, Bureau of Land Management (BLM) State Director Curtis V. McVee said today.

McVee said that prior to Dec. 18, applications for survey leading to patent of mining claims on Native-selected or conveyed lands assured that the claims would be considered for patent under federal laws. Now, a miner may still file his application for survey with the intent of patenting his claim until lands selected by Alaska Natives are actually conveyed to them.

Although Alaska Natives have selected 105 million acres, McVee said that under terms of the Alaska Native Claims Settlement Act only 40 million would be conveyed.

A miner seeking patent or title to his claim on Native-selected lands should submit to BLM an application for mineral survey, a certified copy of the location notice, a deposit for processing the application, and the name of the authorized U.S. mineral surveyor chosen by the applicant, McVee said.

Further information and applications for mineral survey and patent are available for BLM's Cadastral Survey Office, 807 G St., in Anchorage.

Cost Data for Cleaning Mineral Processing Waste Water Summarized by Mines Bureau

(from Dept. of the Interior news release)

Costs of treating waste water to meet new Federal clean water guidelines will prompt the Nation's mineral industries to develop processes that generate less waste water and find better treatment methods for what they do generate, according to the Interior Department's Bureau of Mines.

A new Bureau publication summarizes the probable costs of aeration, addition of lime, and sedimentation as methods the mineral industry can use to meet Environmental Protection Agency (EPA) guidelines for point discharge effluent limitations—maximum amounts of pollutants in waste water at the point where the treatment facility discharges to a stream. The industry must comply with part of the guidelines by July 1, 1977 and with the rest by July 1, 1983.

While much mineral industry waste water is suitable for reuse in the process that produced it, costs for recirculation generally have been more than for new water, the Bureau said. Treating this waste to meet EPA guidelines changes the economics, however, and the report cites recycling of process water as probably the simplest and most promising way to quickly reduce

the amount of waste water that mineral processors must treat.

For the long run, the Bureau advocates a whole new approach: a "system" that interacts all phases of mineral production to optimize waste disposal costs. If mineral operations continue"...to be fragmented into mining, milling, and metallurgy, and waste disposal is treated as an isolated portion of the operation, waste disposal costs will soar for the entire industry," the report says.

The report discusses pertinent parts of the EPA guidelines and describes effluent treatment as practiced in Idaho's Coeur d'Alene mining district. Cost-capacity graphs provide a guide to the effect of waste treatment for different processes, and therefore, to costs associated with meeting the guidelines. Tables provide data on effluent produced, and on probable effluent treatment costs, for various processes.

"Implications of the Water Pollution Control Act of 1972 for the Mineral Resource Industry, a Survey," Bureau of Mines Information Circular 8681, is for sale by the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, at $1.15 a copy. Orders should include GPO Catalog No. I28.27: 8681.

AGS Publishes New Symposium Guidebook

The Alaska Geological Society recently published a new guidebook entitled "Recent and ancient sedimentary environments in Alaska." It consists of 20 different papers and includes maps, various diagrams, and photographs. The price is $20 per copy, and may be ordered from the Alaska Geological Society, P.O. Box 1288, Anchorage, AK 99510.

The Importance of Choice

By William H. Dresher

(The following is the last half of a speech given by Dr. Dresher, Director of the Arizona Bureau of Mines, at the Western Conference of the Council of State Governments, held last July in Salt Lake City.—Ed. note.)

It was revealed last September by Jack Carlson, then Assistant Secretary of the Interior for Energy and Minerals, and now candidate for the Senate of the United States representing Utah, that as of 1974, mineral explorationists were locked out of 73 percent of the land where mineral raw materials and mineral fuels are most likely to exist—our public lands. Seventy-three percent in 1974 as compared with 17 percent in 1968—just think of that! American land on which we have the right to search and develop minerals, which is now withheld, is equal in size to every state east of the Mississippi River, excluding Maine. What is worse, until two of Mr. Carlson's employees, Gary Bennethum and L. Courtland Lee, painstakingly extracted the information from the Federal Register and other public documents at their own initiative and on their own time no one, not even the "decision-makers" of Washington, had any inkling of the magnitude of the withdrawal which had taken place! It is worth mentioning in passing here that the total amount of land used in the U.S. for mining operations has been roughly equal to the land occupied by the State of Connecticut. The amount now withdrawn from exploration and mining is over 400 times that ever used for mining in the United States!

A few weeks ago, I visited Washington and stopped in to see Roland Reed and Jim Gill, Deputy Assistant Secretaries of the Interior, Minerals and Energy, respectively. I was interested in obtaining from them first-hand a detailed breakdown of the withdrawn lands in each of your states. That data, ladies and gentlemen, does not exist today in spite of the fact that the problem has been known for nearly a year now! The Federal government itself does not yet have such data in any one place. Yes, the data for Idaho has been completed and the Utah data is now in preliminary form, but Dr. Reed estimates that two to three man-years per state are required to compile these statistics. Bill Fisher, the Assistant Secretary of the Interior, has informed me recently that a Departmental task force has been organized and is working on this matter. The assignment is now in the hands of Jack Horton, Assistant Secretary for Land and Water Resources. If you wish to pursue the matter further yourself, please contact your congressman and ask him to request that the information be compiled for your state. These withdrawals certainly will have vital economic consequences to your state in future years.

Unfortunately, the land withdrawal process has not stopped yet and if allowed to continue at the present rate all of our public lands will be off base to mineral development by 1980. In addition to the specific withdrawal acts already on the books new ones are foreseen. The Endangered Species Act, already being talked about in the Congress, would be an all encompassing general withdrawal action. Included in the act would be the habitats of 3 to 4 thousand plant species. Included in this will also be certain species of butterflies and land snails. It makes me wonder, how soon will you and I be the endangered ones?

The United States Geological Survey and the United States Bureau of Mines have been directed to conduct mineral surveys on national forest areas designated as wilderness areas as well as those designated as primitive areas. In addition, they have been directed to conduct mineral surveys on other areas being considered for wilderness designation, designated Forest Service roadless areas, Department of the Interior game ranges and one national monument.

The study of Forest Service primitive areas and contiguous tracts, totaling 7.2 million acres, has been completed—at least it has been superficially completed for no mineral appraisal of this scale can be sufficiently thorough to truly call it complete. Of the wilderness

areas designated in the 1964 Act, field work will have been completed on some 1.1 million acres by the end of 1976 leaving 4.8 million acres to be completed by 1984—the final date of land closure under the 1964 Act. Mineral surveys must also be completed on 176,000 acres of the 212,616 acres named as wilderness in the Eastern Wilderness Act, 7.8 million acres in five Interior game ranges and the Glacier Bay National Monument I spoke of before and, if the proposed BLM Organic Act is enacted, an additional 85 million acres will have to be examined.

The collective FY 1976 budget for this responsibility was $4.4 million—approximately one-tenth of that being spent in my State of Arizona this year by private industry in its search for additional copper deposits! The U.S.G.S. and the U.S.B.M. have neither the funds nor the manpower required to examine these areas before withdrawal is finalized. Secretary of the Interior Thomas Kleepe himself has pointed out to the Congress that only a superficial examination is possible. In his letter to Representative James Haley, Chairman of the House Committee on Interior and Insular Affairs last April 7th, he said, "...Some people believe that an initial mineral survey definitely establishes the existence or non-existence of minerals and provides sufficient information to decide wilderness designation is the best single purpose use of a National Forest area in perpetuity. In reality, however, an initial mineral survey provides essential but relatively limited information."

It is obvious to all of us with mining concern that none of these lands will be examined with sufficient thoroughness to conclusively proclaim them to be "non-mineral." First of all, it would be a superhuman task to apply the same concentrated effort to the tens of millions of acres involved that a mining company finds necessary to apply to a few thousands of acres in the delineation of a new mineral deposit for commercial development. Second, new exploration tools and techniques are constantly being devised and thus making it possible to find mineral deposits which were concealed to older techniques. Further, new developments in metallurgical technology have continually made possible the processing of lower and lower grade ores. Let me give you a first-hand example of this. In 1920, the U.S.G.S. reported upon an area south of Tucson regarding its mineral potential. Following this report, the Commissioner of the General Land Office, in 1922, instructed the Registrar and Receiver in Phoenix that the land,"...is hereby classified as non-mineral in character." A close examination of an aerial photograph made in 1937, 15 years later, shows no evidence of mining activity in the area covered—an area of some 525 square miles of land—15 miles across by 35 miles long. Yet, today that very area of that photograph hosts five major copper mines which, in 1974, produced some $603 million of copper—over 300,000 tons, or 10 percent of the copper consumed by the entire country in that year!

Other actions besides withdrawals also obstruct our access to minerals on the public lands. The Environmental Impact Statement, the one tool available to us to assess the pros and cons of any action in the Federal sector, has itself become an instrument of defacto withdrawal. The sheer massiveness of the number of statements issued each year and the lengthy review process for each has deferred projects to the point of extinction. The Kaiparowits power plant here in southern Utah is a good example. Seven years ago, in 1969, when the agreements between the utilities involved and the Department of the Interior were signed the project cost was estimated to be $750 million. In April of this year, when the California utilities decided to bow out, the cost was estimated at $3.5 billion! Time itself is a withdrawing action and time is becoming a scarce commodity too!

The United States Geological Survey, which has administrative responsibility for the mineral leasing program and regulatory authority over leased mineral and mineral fuel development and production, estimates that it must read and evaluate approximately 2,200 environmental impact statements each year. For those which it prepares itself, the cost is approximately $1.5 million each! Clearly, there are neither the funds nor the manpower available to adequately handle the administrative red tape we have created for ourselves and yet the process still continues. Carried to its extremes the EIS procedure can effectively block all progress.

Mineral fuels on public lands are leaseable. That is, before the development of a mineral fuel deposit on public lands the operator must acquire a lease from the Federal government through competitive bidding. Lease sales are deemed to be a significant impact on the environment; hence, an EIS and the public hearing process are required for each lease sale. The Bureau of Land Management has recently proposed that this process be advanced to the drilling state and in my State of Arizona this restriction has already taken place on the Black Mesa where Dresser Industries is attempting to initiate a new coal mine. In other words, under the proposed regulations, the process by which the mineral fuel deposit itself is evaluated—drilling—is deemed to be a "significant disturbance of the environment" and the whole EIS procedure multiplied tens of hundreds of times over for just this one important function—the leasing of public lands to provide us with the mineral fuels which are required to replace those we must import!

My friends in the geothermal energy development business tell me that the singlemost prohibitive factor in the development of geothermal energy in the United States is the fact that geothermal energy sources have been declared leaseable and they are thus subject to all of the obstacles I have described—and yet, ladies and gentlemen, geothermal energy is one of the few sources of non-depletable energy we expect to have at our disposal in the future! In our attempts to regulate we are

often curtailing the development of the very activity we wish to promote!

The movement to overregulate has become a national problem. The solution to each of our problems seems to be to control and to regulate and yet, the additive sum of a regulatory government often breeds more problems than it solves. That's why we fought for and gained our independence from Great Britain 200 years ago this month. You, my friends, at the state level of government are in the position to make yourselves heard on this issue. Not by a "Boston Tea Party," but by a loud and firm protest about what a "foreign" government—Washington—is doing to your state!

Both the West and the nation stand to benefit from the proper development of western mineral resources—both mineral fuel and mineral raw material. This development can be done in a responsible manner consistent with the environmental quality and the general lifestyle we Westerners want to preserve. The specter of Appalachia cannot be permitted to permeate our decisions. It is irrelevant, unnecessary and irresponsible to permit it to do so. Sheer political courage is needed to see us through the present dilemna—the courage of true leadership under fire—the courage of decision-making based on facts. America must leave all of her options open in order to face the future. We can achieve this only if we are permitted the freedom of choice—the choice of what lands to explore for mineral materials and fuels, the choice of which mineral deposits to develop, the choice of what materials and fuels to use to meet our needs. You, my friends, as representatives of the people of the western states, are in the position to make the needs of your states known to the Congress. The economy of your state and the well-being of your constituents depend upon the orderly development of your state's mineral resources.

Gravel Condemns Trans-Canada Pipeline

(from a Sen. Mike Gravel news release)

Sen. Mike Gravel (D-Alaska) said today that a Federal Power Commission official has made the wrong choice in recommending a trans-Canadian gas pipeline.

Gravel's statement followed the announcement that Administrative Law Judge Nathum Litt had recommended the Canadian route.

"The route which Litt recommends is longer and costlier than the all-Alaska route," Gravel said. "Fewer Americans will be hired than is the case for the Alaska route, and the largest share of pipeline taxes would go to Canada rather than the U.S."

He also said that "our current shortage of natural gas shows that we cannot wait for the long and risky trans-Canadian route."

Gravel initiated the procedural legislation under which Litt made his choice. In the Alaska Natural Gas Transportation Act of 1976, Congress ordered the FPC to recommend one of three competing routes. Litt's choice is preliminary to the recommendation of the FPC Commissioners.

The President is to make his own choice after studying the FPC recommendation, and the final approval of route is to be made by Congress.

The route chosen by Litt is the proposal of the Arctic Gas Pipeline Co., going through Canada's MacKenzie Valley in the Northwest Territory.

The competitors are El Paso Alaska Co., which would follow the trans-Alaska oil pipeline; and Northwest Pipeline Co., which would follow the oil line for about half its distance before turning into Canada via the Alcan Highway.

Gravel cited several factors which he said favor the El Paso route:

- Canada has not yet agreed to let any North Slope gas pipeline traverse its boundaries - - and internal problems, including the settlement of complicated Native land claims, would delay the Arctic route;
- The Arctic route would fall under foreign regulations;
- The El Paso route involves 809 miles of pipe, while Arctic requires 4,500 miles;
- Haul roads for the Alaska route are already in place, while the Arctic route is extremely remote;
- The Arctic route involves a $10 billion deficit balance of payments, but the El Paso route has no impact on balance of payments;
- El Paso would contract for all goods and services within the United States, while Arctic would purchase only six per cent in the U.S. for its route through Canada;
- Cost of the El Paso project (at 2.4 bcf/d capacity) is estimated at $6.5 billion – cost of the Arctic project (at 2.25 bcf/d) is put at $8.4 billion;
- Total direct employment in the United States at the peak of construction would be 22,500 for El Paso, 10,000 for Arctic -- and permanent employees in the U.S. after completion of the pipeline would be 1,470 for El Paso, 400 for Arctic;
- El Paso would pay $8.3 billion in federal income tax over the life of the project, Arctic would pay $1.5 billion to the federal government while paying $6.7 billion to Canada, largely financed by U.S. consumers;
- In other U.S. taxes, El Paso would pay $3.5 billion, Arctic would pay $700 million;
- The state of Alaska would get $2.8 billion in ad valorem and income taxes from El Paso over the life of the project, while Arctic would pay $230 million to the state.

Alaska is the only state in the U.S. that has a primary tin deposit.

New Plan on d-2 Lands Due

(from Anchorage Daily News, Jan. 29, 1977)

The state cochairman of the Joint Federal-State Land Use Planning Commission says that panel and the state both plan to present a unique classification system for Alaska's national interest lands to Congress.

And Walter Parker says that classification would allow greater flexibility in deciding use of the lands and increased input from the state.

Under section 17(d-2) of the Alaska Native Claims Settlement Act, Congress is to classify some 80 million acres of national interest lands in Alaska this year, and Parker told a luncheon meeting of the Bartlett Democrats on Thursday he believes the nation's lawmakers may meet that deadline.

The lands are to be classified under the Interior Department's four systems as national parks, national forests, wild and scenic rivers and wildlife refuges.

But both Gov. Jay S. Hammond and the commission plan to present proposals for a new classification to Congress, dubbed Alaska National Lands by the commission.

"We avoided the use of words like 'resource' and 'conservation,' which are not neutral words in Alaska any more." Parker said.

The concept was formulated after numerous public hearings by the state and the joint federal - state panel, and would be managed cooperatively by the state and the federal government.

Under the commission's plan, Parker said some 44 million acres would be classified under existing systems.

But there were other areas "which did not seem to fit into any of the systems at this time," he said, so an additional 45 million or 50 million acres has been lumped into the new category.

"The Alaska National Lands are not intended as multiple use lands in the traditional sense," he said.

Otherwise, the commission would have recommended designation in one of the multiple use systems already provided by Congress.

"Neither are Alaska National Lands intended as a holding pattern for future designation in a traditional system. They are seen by the commission as a new federal system unique to Alaska.

"They are a system which allows a high degree of flexibility but which requires choices between wilderness and resource development to be made in a measured way under the oversight of a federal - state commission."

Parker reminded the Anchorage-area Democrats that although the new system would permit state input to policy-making, "these are federal lands."

Parker said the commission plans to submit its proposal to Congress after a final vote on the package, which may come in March.

He said the concept may "get us out of the boundary problems that we might be facing over the next several generations" among the state's three major landowners—the federal government, the state and Alaska Native corporations formed under the claims act.

Parker said two factors led to formulation of the fifth classification—the possibility of future resource development and a desire to permit hunting, fishing and the continuation of subsistence lifestyles by state residents.

Udall's Bill is Opposed

(from Anchorage Daily News, Jan. 29, 1977)

The State Senate voted unanimous opposition today to the d-2 lands bill introduced in Congress recently by U.S. Rep. Morris Udall, D-Ariz.

The Senate passed a resolution objecting to the Udall proposal, which would classify 116 million acres of Alaska land as national parks, monuments, wildlife refuges and wild and scenic river systems.

The Udall proposal also would set aside 4.5 million acres of Southeast Alaska's Tongass National Forest as wilderness.

If approved by the House, the resolution would be sent to President Carter and a host of high-ranking national officials.

The Udall bill would "shift the emphasis from multiple-use management of land in the general interest to exclusive resource management in the interests of a few," the resolution states.

"The bill is much too far reaching," Sen. Kay Poland, D-Kodiak, said.

Although the proposal would allow subsistence hunting in some areas, Poland said, "subsistence doesn't even mean Alaska Natives can hunt.

"Only those who live a very restricted lifestyle may hunt," she added.

Newly Discovered Deposit Announced

The B & K Exploration and Development Co. is pleased to announce the discovery of a small "our" body located in Albuquerque, New Mexico. Initial detection of the deposit in March, 1976, occurred as a result of extensive exploration with a probing tool. After 9 months of development work the discovery has proved to be a small well-defined deposit (about 21" in length). Estimated weight of the deposit at 2:47 PM, Dec. 10, 1976, was 8 lbs. 4 oz.

The small deposit, henceforth called the "Erica Lynn Roberts" body, probably originated from an initial fusion of certain elements. The primary minerals of the Erica Lynn consist of sugar-n-spice and everything nice. The extremely high natural activity of the deposit is characterized by periodic emissions of decay products. This requires the Erica Lynn to be handled very carefully.

(Bill Roberts, a DGGS geological assistant for 3 years, is an exploration geologist with Sohio.—Ed. note.)

Study Supports State's Choice

(from the Anchorage Times, Dec. 9, 1976)

A draft environmental impact statement on the Borax & Chemical Corp. molybdenum mine near Ketchikan will list an access road endorsed by the state Fish and Game Department as the "preferred route" to the mining operation, Commerce Commissioner Tony Motley said today.

Motley said Gov. Jay Hammond's ad hoc task force on development of the Borax mine reached a consensus Tuesday that the access route proposed by Fish and Game should be favored over an alternative route proposed by Borax.

Motley said aide Richard Eakins was mistaken when he said Tuesday that no decision was made on which route should be preferred.

"Based on the information provided at the meeting, the consensus was that the preferred alternative was the Boca De Quadra route," Motley said. "And the draft EIS will so state."

But he said Borax reserved the right to continue to press for its route after the draft is published in January.

Borax officials have proposed construction of an access road to the mine, known as the Beaver Route, beginning at the head of Wilson Arm up the Blossom River.

Mountain Named for Late Dr. Patty

A 4,625-foot mountain in interior Alaska has been named for the late Dr. Ernest Patty, the University of Alaska's third president (1953-60). The peak is some 130 miles east northeast of Fairbanks near Woodchopper Creek and the Yukon River, an area Patty had mined extensively. Patty, 81 at the time of his death last year, was a professional mining engineer.

DGGS Hires Geologist

A surfing bum joined the ranks of the DGGS College staff last month. John T. Dillon, who grew up on the coast of California before he elected to head north, recently arrived, complete with bride and a trailer full of furniture, rock samples, and snow. The 29-year-old Mining Geologist III, who holds a Ph.D. from California-Santa Barbara, specialized in structure and petrology. This summer, however, he will be mainly concerned with the economic geology of the Brooks Range.

The seventh of 11 kids, Dillon grew up in the sunny southland where, in his words, he was a surfing nut. Now, however, he confines his athletics to cross-country skiing, hunting, and other sports with Mary, his wife of 2 months.

Alaska is the only state with platinum production.

DGGS Issues Last Call for 'Short Note - 1977' Manuscripts

Remember the midget bellhop named Johnnie who used to run around hotel lobbies yelling at the top of his lungs, "Call for Phillip Morrrrrris"? Well, DGGS is issuing its final call for short manuscripts for Geologic Report 55, "Short Notes on Alaskan Geology - 1977." If you wish to have one of your brief scientific articles included in this annual series, the deadline is April 15.

No more than six double-spaced manuscript pages (1,800 words) including references, figures, maps, and tables will be accepted for publication. Contributors are generally limited to one authorship (or coauthorship) per report. All figures, maps, and tables must be black and white (and camera ready), and suitable for reduction to a maximum size of 8-1/2" x 11" (including margins) when submitted. Two copies of the manuscript, typed double-spaced including references and figure captions, together with two clearly legible copies or prints of all illustrations, should be submitted to Editor, DGGS, College (p. 1). All material will be reviewed by the DGGS staff before being accepted for publication. Contributors should keep original copies of all material submitted, and while being reviewed it should not be submitted elsewhere for publication.

Proposed BLM Regulations Anger Miners--In Anchorage:

(from the Anchorage Daily News, Feb. 4, 1977)

An Alaska miner says he would like regulation of his livelihood "simplified so we don't have to go to a thousand agencies."

George Roe's testimony was added to that of other miners and environmentalists testifying at the Bureau of Land Management's Anchorage District office Wednesday. He was one of several mining operators who suggested the federal agency work on a "clearinghouse" program for state and federal paperwork.

The BLM hearings were the first of three scheduled this week to gather input from Alaskans on proposed surface management regulations authorized by the Federal Land Policy and Management Act.

The proposed regulations would require mining operators to file a letter of intent for activity on lands under BLM jurisdiction. If the agency determined the operation would be "significant," the operator would be required to provide a detailed description of the operation and measures planned to protect the environment.

Jim Hamilton, who described himself as an Alaskan contractor for mining exploration, said 40 per cent of the industry effort was expended trying to comply with regulations.

And he said bonding which would be required to cover possible damage to the environment should be eliminated or applied to all surface land users.

"Make the person who walks in the forest pay a bond." he suggested.

Several of those testifying asked the agency to differentiate between prospecting, sampling and mining operations. They said the U.S. Forest Service, which has regulations similar to those proposed by the BLM, makes those distinctions.

Earl Anthony, a University of Alaska faculty member and an Alaska miner, suggested the agency begin its definition of mining "with the use of machinery which can cause a disturbance."

He also suggested such a distinction be made in bonding requirements, "to exclude the individual, small family operations with no big equipment." He said applying the requirements, to small operations "amounts to putting people out of business, taking away their livelihood."

The miners also said it would be impossible in some cases to maintain the access roads and air strips as required by the regulations. In any event, such maintenance would be expensive and time-consuming, miners said, suggesting the BLM or the public help asorb some of that expense.

District Manager Richard Tindall said the regulations appeared to take that into consideration.

They state that free and public access must be permitted "except in areas where such access would unduly interfere with authorized operations or would constitute a hazard to health and safety."

The proposed regulations also state that restrictions on use of public access "will not be allowed without prior approval from the authorized officer."

Anthony and others also expressed concern about BLM personnel named to implement the proposed regulations. Anthony recommended decisions on when plans of operation were required to be made by a panel or a mining expert rather than an individual selected because he was "20 years in the BLM."

Howard MacWilliams, another miner, said his main objection to the rules was that they might be interpreted according to the "whims of whoever the appointed officer may be. They could change from year to year."

The Sierra Club came out in support of the small mining operator in its testimony, but challenged practices of large mining corporations. The remarks by Ted Whitesall prompted C.C. Hawley, president of the Alaska Miners Association, to say for the record, "No nation or group has ever been able to get a monopoly on mining."

He said most large firms are constrained by their own board of directors which are subject to political pressure.

The U.S. depends on Canada and Norway to supply 75 percent of its nickel. Alaska has huge potential nickel resources in Glacier Bay National Monument that cannot be developed.

And In Fairbanks:

(from All-Alaska Weekly, Jan. 14, 1977)

Alaska's miners are mighty unhappy about proposed new BLM regulations which Alaska Miners Association official Ernie Wolff describes as "very tightly circumscribed and regulated by an authorized officer who will have discretionary power over every facet of the mining operation."

New regulations for surface management of public land would be enforced by the Bureau of Land Management under the Federal Land Policy and Management Act of 1976. Operators would have to file a notice of intent, including a legal description of the involved lands, a map of the area, a description of the proposed operation and an outline of measures planned to protect the environment.

Plans have to include reclamation measures and research into archaeological and cultural values. Miners would have to put up bonds to cover surface protection measures to protect air and water quality, esthetic values, fish, wildlife and plant habitat, cultural values and survey monuments.

Former Association Past President Mark Ringstad said he believes the new regulations abridge both individual and property rights and says the association plans to submit formal comments; to work with the state's congressional delegation, and if necessary, to take the BLM to court.

Miners believe the new regulations if they become law, would escalate the cost of mining so greatly that it would virtually halt small operators, traditional to Alaska. Apparently they are now following advice given to them in October during the Miner's Association convention in Anchorage.

Stevens told them then that miners had to organize, rally public support, and lobby. He added, "There is a tremendous amount of misinformation about mining and its environmental effects" and the lack of knowledge has "resulted in the unrealistic environmental laws which continued this year to plague Alaska's miners."

However, Carl Jeglum, chief of the local BLM Division of Resource Management, said that the potential for environmental damage has increased considerably since the present mining laws were enacted in 1872.

"In the old days," he said, "a man would go in with a pick, a shovel, and a steam hoist, and he couldn't really do a whole lot of damage. But today, one man with a D-9 cat can cut a 15 to 20 foot swath across the country in minutes."

Advocates of the proposed changes feel they are needed to protect the land from abuses and by increasing numbers of mining operations. As more and more people come into areas such as the Forty Mile country, or the Yukon River near Circle, complaints to officials have increased regarding such things as stream siltation and destruction of fish habitat by mining and prospecting. Miners have had protected

status, especially in Alaska, and there are those that feel that mining operations need as much control as other industry.

One man who had several settling ponds below his sluicing operation reportedly claimed that other miners didn't like him because he was too conscientious about making an effort to protect the environment.

"But this is the way the world is going today," he said, "and we are just going to have to get used to it."

Nevertheless, most members of the mining community seemed to agree that the proposed regulations were overly restrictive.

"Some of them would be restrictive to the point of completely eliminating individuals and small companies," said Earl Beistline, dean of the University of Alaska's College of Mineral Industry.

"When a minimum bond of $100,000 has to be furnished to file a plan of operations, you have eliminated most small operations," he said in a speech to the local Engineers Association last week. "Bonding companies now usually require that the individuals have $100,000 in cash or negotiable securities to back up such a bond, and how many individual prospectors and miners have those resources?"

He criticised other aspects of the proposed regulations, such as the stipulation that "significant disturbance" to the environment should be determined by each of various employees authorized by the bureau; that roads built as access to mines must normally be removed after the mining is complete; that brush-cutting requires a plan of operations be filed, although in contradiction, surveying does not require a plan; and stipulations that miners comply with all air and water quality regulations, as well as protect fisheries and plant habitat, and cultural resources, etc., would require a large staff of engineers and scientists.

Beistline also was critical of another set of proposed changes in BLM mining regulations concerning recording mining claims, and filing proof of assessment work which was published in the Federal Register Dec. 10. These proposed regulations increase the paperwork and fees involved, and include requirements for surveying so that a person filing a claim would either have to be a surveyor or hire one.

"Might Does not Make Right"

(The following is an excerpt from the editorial page of the All-Alaska Weekly, Feb. 4, 1976—Ed. note.)

Indisputedly, Arctic Gas has been vigorously working for the past few years on its proposal, has spent more than $50 million, and has such momentum behind its proposal that it's almost impossible to stop.

Judge Litt indicates in his recommendation that the economic ills of Alaska cannot be taken into consideration in the route decision nor can the fact that Alaska needs natural gas to develop a petrochemical industry to employ Alaskans. It's the same old story of "Might makes right." And, of course, the big oil companies and the gas-hungry populous states have much more muscle than the lowly state of Alaska.

Judge Litt also recommends repeal of a provision in the gas line procedural bill assuring that Alaska can use and control its royalty gas in the pipeline.

The game plan is to siphon, as with a straw, nonrenewable energy from Alaska. Later, the mineral resources of Alaska will be extracted and the mineral resources and energy will be put together in the lower states for a high benefit ratio to the locations involved. Alaska will be pumped dry to satisfy the unquenchable thirst of others and in twenty years or so Alaska will be left cold with nothing but caverns and tailing piles.

Already the stage is set for stage two. The Bureau of Land Management has come out with proposed regulations that will put the small independent miners and prospectors out of business. Only the big national and multi-national corporations will be able to extract the minerals and natural resources; only the big corporations will be able to comply or get around regulations. The game plan is to lease mineral land as oil and gas land is now leased to the big corporations.

When Alaska was granted statehood, it supposedly was to be admitted into the union on an equal basis with the other states. Former Senator Sam Ervin said he was opposed to Alaska statehood because it was admitted on an unequal basis.

As time passes, the truth of Ervin's assertion is becoming more and more evident. In our wildest imagination, we cannot visualize of such exploitation as is being attempted in Alaska in states such as California or Texas. It just wouldn't happen.

But apparently because we are such a small state in terms of population and power, the federal government thinks it can get away with devouring our riches and ignoring our needs—exploitation, pure and simple.

Pray for a miracle. Economist Arlon Tussing believes developments in Canada itself will eventually kill the Arctic Gas proposal and that the Alcan route with some modification will eventually be approved. We certainly hope something stops the Arctic Gas route. It is not in either Alaska or the country's best interest and we don't believe it is in Canada's best interest either.

So far as we can tell, the Arctic Gas proposal is only the best interest of the big oil companies. And we certainly hope that they do not prevail. Might does not make right. *(For late development, see p. 15—Ed. note.)*

They Said It....

Russell H.W. Chadwick, former President of the Northwest Mining Association: "We perceive that keeping the people and the country in a 'primitive state' for the amusement of outsiders is nothing more than colonialism."

Don Bennett, Alaska State Representative (R-Fairbanks): "This trend toward dependency on foreign sources occurs in large part because the domestic mining industry is increasingly being barred from finding and developing mineral deposits within the United States."

Rep. Sam Steiger, R-Ariz., in fighting in the U.S. House to exempt the six national parks from the mining ban: "It is madness to us to deny future generations of this country access to these resources...simply to appease an emotional reaction by some people. We are pandering to special interests here, a militant group of environmentalists who do not have the best interests of the country at heart."

Celia Hunter of Fairbanks, national president of the Wilderness Society and member of the Federal Land Planning Committee: "I think this business of mining versus wild country is going to be with us for a long time."...We have to safeguard as much of the wild land as we can and "worry about the mineral problem when it comes up."

Dr. Ernest N. Wolff, associate director of the University of Alaska Mineral Industry Lab. "Alaska's economy in the future will be based on recreation and minerals—and possibly agriculture. These industries won't develop unless the people are allowed access to public land. The government is taking more power unto itself than ever before, especially in Alaska, because so much of the land is public-owned."

DGGS's Scope to Expand?

A bill was recently introduced in the Alaska State Senate (S.B. 58) to increase the duties of the Division of Geological and Geophysical Surveys by incorporating hydrological investigations into its charter. If enacted by the legislature, Alaska Statute (AS) 41.08 will state that DGGS shall be charged with performing "systematic collection, recording, evaluation, and distribution of data on the quantity, location, and quality of water of the state in the ground, on the surface of the ground, or along the coasts" because it is "in the public interest and necessary to the orderly domestic and industrial development of the state." AS 41.08 currently contains tenets delegating DGGS with conducting geological and geophysical surveys to determine the potential of Alaskan lands for production of metals, minerals, and fuels; the locations and supplies of ground waters and construction materials; and the potential geologic hazards to buildings, roads, bridges or other installations and structures.

The bill was referred to the Resources and Finance Committee January 18.

The United States Mineral Position in 1985

By Evan Just

(Dr. Just is Professor Emeritus, Mining and Mineral Economics, Stanford University. His paper, published in the 21st Annual Proceedings of the Rocky Mountain Mineral Law Institute, is, unfortunately, 2 years old. Nevertheless, we feel many of his points are still valid.—Ed. note.)

Prophecy is always an act of doubtful reliability, but it seems to me that economic forecasting concerning minerals is particularly difficult at the present time. There have been drastic price increases for the major minerals and unprecedented changes in output seem likely. We know how completely the economic professionals have "struck out" in predicting and coping with the present recession, thus you should be on guard with respect to any opinions about conditions ten years hence. Nevertheless, having been reckless enough to accept this assignment, I shall do my best to state one man's viewpoint.

What is one to believe about economic conditions only five years hence? Our politicians and economic soothsayers are almost unanimous in saying that the recession is bottoming out, with the implication that better times are in prospect. However, to be fair I acknowledge that many of them hedge about when we shall have full employment, or express concern over the impact of higher energy costs.

For my own part, I am among the minority that has little confidence in cheerful predictions until I see signs of correcting what made us sick. Fiddling with the money supply probably has economic effects, but it does not create wealth. In my opinion we are facing critical times because too many people have notions of something for nothing. Following this naive precept, our irresistible labor organizations are demanding and getting rewards unrelated to labor's contribution to productivity, and our politicians continue to spend beyond our means as though it can go on forever. These are the main spurs to an ever increasing and dangerous inflation, and if any of you believe it can be "cooled" while we reach new highs in deficit spending, bureaucratic waste and continued wage escalation, I am sorry for you.

Economic theory suggests that inflation can be countered by increasing productivity, which is all very well except that no nation in economic distress has ever set things right without undergoing the rigors of austerity. This, we, like the British, are simply refusing to do. We are dosing the poor old economy with more of the medicine that made it ill. Like a tired horse under the last desperate applications of the needle, it can

Double Agent?...A U.S. Borax official shocked a Ketchikan audience recently when he told them he was an active member of the Sierra Club. In explaining his company's mining plans near Ketchikan, Borax environmental affairs chief Dean Lemon told the Tongass Conservation Society he worked toward formation of a large state park in California and has worked for protection of California desert areas.

probably get up and run a few steps, or even a few times around the track, but it is sicker than ever. The British horse can't even get up. Write the rest of the scenario yourself.

Before we take a look at the future, it will be worth while to scrutinize the position of the present mineral industry in the national economy. I presume that everyone present is at least partially aware that minerals are so basic to civilized living that any alteration of their flow will correspondingly wrench our established way of life. Minerals not only furnish 96 percent of our energy and nearly all of our buildings, tools, machines, bridges, roads, railways, dams, conduits and transmission lines, but also they are necessary to the highly productive agriculture on which a populous world depends for food, wood, and fibers. However, despite this tremendous importance, our mineral production in its crude states demands only about 5 percent of our gross national effort, including the equipment and supplies that the mineral industry buys. This figure accounts for the escalated cost of energy sources. For many years the percentage has been near three.

The United States has by far the world's greatest mineral industry, accounting for 26 percent of world production against 18 percent for the nearest competitor, the Soviet Union. This enables us to enjoy a comparatively high self-sufficiency, as net imports in the last year of record, 1972, were only 10 percent of domestic production. However, if we include refined petroleum products, our imports were 20 percent of domestic production, as, between crude oil and refined products, we depend on imports for 1/3 of our petroleum needs. The increased cost of imported minerals, oil in particular, has probably raised this to nearly 50 percent, and we can probably expect 60 percent by 1985, even if reasonable restraints are placed on imports. Nevertheless, a total mineral cost of only about 8 percent of the gross national effort should resolve doubts about ability to pay in a society that enjoys many luxuries, planned obsolescence, tremendous waste, and is looking forward to a four-day week. I do not shrug off a difficult balance of payments problem, but as I see it, our mounting dependence on mineral imports is not so much an economic problem as a strategic one. We should not allow ourselves to become dangerously vulnerable to conditions over which we have no control that affect our national security profoundly. We cannot ignore the success of the Soviet Union in achieving superiority in missiles, naval power and ground forces, in turning the Third World against us, and in potential military containment of the Middle East.

We should also understand some basic facts about the shape of our mineral requirements. Of the value of our total domestic output in 1972, the fuels accounted for 69 percent. This portion is 53 percent oil, 25 percent gas and 22 percent coal. Of the remaining 31 percent of the total, 65 percent is nonmetallics and 35 percent metals. Note that the metals, which most of us think of when minerals are mentioned, compose only 1/9 of the total value. Now, the three major fuels, two metals, iron and copper, and three nonmetallics, cement, sand and gravel, and stone, eight in all, account for 92 percent of the value of our total production. The 83 other economic mineral products, including such important ones as aluminum, lead, zinc, magnesium, silver, molybdenum, tungsten, phosphates, potash, sulfur, salt, gypsum and fluorspar, all account for only 8 percent. In terms of consumption, including imports, because our principal imports consist of oil, iron ore and gas, the "big 8" account for 91 percent of the total. Of the fuels, in heating value, we have 51 percent oil, 33 percent gas, and 16 percent coal.

In economic and strategic terms, these "shape" data tell us that we can easily pay almost any likely price for all the fifteen minerals excluding the "big 8" on which we depend heavily or completely on imports. Of those within the "big 8," we are self-sufficient in coal, cement, sand and gravel, and stone, and by dint of some substitutions and somewhat higher cost, could become virtually so in copper and iron. This means that our focal points of concern should be with oil and gas, and if we choose to substitute action for endless confusion and bickering, we can make coal take over where they falter and still be energy self-sufficient by 1990. However, this is not likely, for two reasons. First, confusion and bickering have become embedded in our version of democracy, and second, because of the long lead times involved in major mineral developments, usually five to ten years, and with the help of the environmentalists and the legal profession, ten to twenty.

Probably there is more than ordinary interest in Western coal in this audience, thus it deserves some special discussion. You are no doubt aware that the low sulfur content of Western coal has made it attractive to electric power generators as far east as the eastern Mississippi valley, replacing high-sulfur coal from the Eastern and Middle Western states. This new demand has greatly activated Western coal development, but I would caution you against the notion that the center of gravity of coal production is going to move out here. My reasons are as follows:

(1) The nation cannot afford the economic dislocation or loss of reserves that would result from allowing the coal industry east of the Mississippi to wither.

(2) Although Western coal is low-sulfur, its heating value is only about half that of the Eastern coals, thus the customer has to buy, pay freight on, and cope with the dust problems of nearly twice the tonnage. This also doubles the sulfur, bringing it near the point achievable by physical treatment of Eastern coals.

(3) The burning of Western coals will not only increase the problems of fly ash and nitrogen compounds, but I understand some plants burning low-sulfur coals have had to add sulfur in order to make the ash collecting systems work.

(4) Mine-mouth utilization in power plants will be handicapped by the cost of transmitting electricity long distances. Power plants, gasification plants and synthetic liquid fuel plants will have problems of water supply.

The National Coal Association, relying rather heavily on alteration of factors that now obstruct coal expansion, has recently announced plans for doubling coal output by 1985. About half of this expansion is planned for the West.

Looking forward to more or less normal growth, in 1970 the Bureau of Mines predicted growth rates between 3.4 percent and 5.5 percent in constant dollars for domestic mineral production. These rates would mean volume gains of 44 to 73 percent in ten years, or an average of about 60 percent. Viewed in the light of past accomplishments, except for oil and gas, such an accomplishment seems quite possible. It has been done for several decades, and there seems to be no reason why it cannot be duplicated for another ten years. Our mineral reserves, rates of discovery and technological improvements can support it. However, oil and gas compose over 60 percent of the value of our recent output, and we can hardly expect to keep this from declining. To hold decline to 1/3 will take increases over present high prices and a friendlier public attitude toward the oil and gas industries than has been evident in recent months. Now, if we presume a 1/3 decline in oil and gas output from now to 1985, which in the light of recent events must be considered somewhat optimistic, and an increased development of coal to make up partially for increased needs and self-sufficiency aims, we ought to total out with about a 25 percent overall value increase in 1975 dollars over the current level in 1985. This assumes that the recession is bottoming out and that we shall renew the growth trend in demand of recent decades for another ten years, except for a decline in oil and gas and a forced draft on coal. I regard this as an optimistic figure because of probable demand complications. This conclusion also assumes that the capital markets will not be so preempted by our spendthrift governments that expansion capital will be available at digestible cost.

Because drastic price changes and anticipated production adjustments in the most important commodities make the picture rather confusing, the following details are given about coal, gas and oil.

Coal accounted for 15 percent of the value of total mineral production in 1972. With an estimated threefold price increase by 1975, it is estimated at 20 percent for this year. For 1985, with a 65 percent increased production and a 17 percent added price increase in 1975 dollars, coal's percentage of total mineral production is estimated to rise to 27.

Gas accounted for 17 percent of total value in 1972. With an estimated 2½-fold price increase by 1975, the present percentage is estimated at 19. For 1985, with a 1/3 decline in output and a 2/3 price increase, its percentage in 1975 dollars is estimated at 15.

Petroleum, including natural gas liquids, accounted for 37 percent of total value in 1972. With an estimated 2½-fold price increase by 1975, the present percentage is estimated at 41. For 1985, with an estimated 1/3 decline in production and a 1/3 increase in price in 1975 dollars, its percentage of value of total mineral output is estimated at 32.

The metals were 11 percent and the nonmetals 20 percent in 1972. Even though their production is estimated to increase 60 percent between now and 1985, a more modest price increase is expected to hold their percentages to 11 and 15.

Because, as stated above, I am pessimistic over the probable state of the economy for about half of the next ten years, I am inclined to reduce the probable growth of the domestic mineral industry to about 20 percent over the present level by 1985, rather than the 25 percent indicated above.

Turning now to some factors that will influence our mineral position in 1985, we are caught in a dilemma between self-sufficiency and depletion. The United States has been depleting its mineral resources at a very high rate for several decades and common sense suggests that we should be depending as heavily on imports as is reasonably possible. However, as outlined above, our national security for the next decade will call for a forced draft on mineral reserves, particularly fuels. In this respect we are fortunate in having excellent reserves of coal, with some potential support in oil shale. The availability of imports is also likely to be restricted by a worsening of international good will toward us. In recent years American-owned mineral enterprises abroad have been subject to widespread harassment in the way of arbitrarily revised ownership, taxation and confiscations. The tendency to form cartel agreements, with the American consumer as the principal victim, has been well publicized. The Assembly of the United Nations has become an arena in which the Third World majority, egged on by the communists, delights in baiting the United States and designing plans to cripple its future. Cries are heard that we are raping the world of its resources, ignoring the tremendous outpouring of wealth that has flowed out of this country. A majority approved a resolution that it is a "national duty" to take over control of resource depleting operations, without any right of appeal to international tribunals by the victims. The Third World is holding up any resolution of title problems to oceanic resources, with the intention of reserving to itself the major benefits of development. This is of considerable importance to us as ocean mining, already important for oil and gas, should be ready to contribute to our needs for manganese, copper, cobalt and nickel in another ten years.

The environmental movement can have considerable impact on our mineral position in 1985, particularly in regard to the all-important energy situation. This audience is familiar with the success environmentalists have

had in delaying the Alaska pipeline, stalling offshore drilling, oil shale developments and power plant expansion, besieging copper smelters, coal burning power plants and strip coal operations, and in obstructing the development of Western coal. Now all of us are environmentalists to a considerable degree, but it should be evident that a compromise has to be made between environmental objectives and the continued insistence of the people on a rather good life. It seems to me that environmentalists are courting disaster to their laudable cause by cultivating a situation wherein the public will become so inconvenienced by power and transportation failures that it will override environmental protection that ought to be sustained. May I also suggest that the adversarial stance, so dear to the legal profession, has much to do with unnecessary delays in resolving these important problems. There must be a better way!

Mention has already been made that development of major mineral projects takes from five to ten years, even without hindrance by environmentalists, legal gadflies or crusading politicians. Thus, if a new sense of purpose and direction should miraculously inspire the nation tomorrow, it would be impossible to make much change by 1985 except by forced marshalling of capital, engineering talent and manpower, such as has only been done in wartime. No such sense of direction or marshalling of forces is in view, nor can we expect to be rid of adversaries. Nevertheless, from momentum already established you can expect about a 25 percent increase in the size of the domestic mineral industry by 1985, measured in constant dollars, if you are an optimist, and a 20 percent gain if you are a pessimist. Oil and gas will decline, and coal will grow at an accelerated rate. Our general dependence on imports, particularly for oil, will increase.

DGGS Announces New Reports and a New AOF System

DGGS recently canceled its arrangement with Petroleum Publications, Inc., for the printing and sale of open-file reports. Beginning March 1, open-file reports may be purchased from any DGGS mining-information office.

There are a few copies of most of the AOFs left. When the supply of these is exhausted, reprints will not be made; however, requestors may sign out the originals and mylars for most out-of-print reports at either the College or Anchorage offices and get copies made at their own expense. A list of AOFs is available on request.

New open-file reports include the following:

- AOF-103, "Reconnaissance geology, south-central Talkeetna Mountains, Alaska," by D.L. McGee and M.W. Henning. The report has one plate (scale 1:63,360) and costs $1.00.
- AOF-105, "General geology and geochemistry of the Healy D-1 and southern Fairbanks A-1 quadrangles and vicinity, Alaska," by W.G. Gilbert. The report consists of two plates (scale 1:63,360) and 10 pages of text, and sells for $2.00.
- AOF-106, "Aeromagnetic map index of northern Alaska," by S.W. Hackett and G.M. Laird (scale 1:1,000,000). It costs $1.00.

When the Bulletin last went to press, we announced the sale of three forthcoming reports—two geologic reports and an AOF—but not their particulars. The reports are now in and are available at any mining-information office. They are:

- Geologic report 51, "Short notes on Alaskan geology - 1976," which is a collection of recent geologic findings in the state. Similar to the *Journal of Research* put out by the U.S. Geological Survey, "Short Notes" is the first of what is expected to be an annual series. It is 35 pages long and sells for $2.00.
- Geologic report 54, "Salinity study, Cook Inlet basin, Alaska," by D.L. McGee. This report suggests, on the basis of data from exploratory boreholes drilled in the Cook Inlet, that "oil may be encountered at relatively shallow depths in the lower Cook Inlet." The report has six pages of text and seven plates, and sells for $3.00.
- AOF-104, "Physical parameters of potential petroleum reservoir and source rocks in the Kamishak-Iniskin-Tuxdeni region, lower Cook Inlet, Alaska," by W.M. Lyle and J.A. Morehouse. This open-file report, which consists of 76 pages of text and 13 blueline plates, costs $5.00 ($5.50 postpaid).

Also available is an updated information circular, No. 7, "Alaskan companies and prospectors - 1977." This large pamphlet (about 30 p. long), which lists known active operators in the state, is free.

Lastly, an individual report entitled "Geologic resource evaluation of the Talkeetna-Kashwitna area, Susitna River basin, Alaska" is available. Written by various members of the DGGS staff, the report has 16 pages of text, 7 plates, and 5 aeromagnetic maps. It may be inspected at any DGGS mining-information office; requesters may check out originals for reproduction at their own expense.

MINFILE Microfiche System Now Operating in Two DGGS Offices

The MINFILE system, a series of computerized mining-claim-information programs, is being implemented in two DGGS mining-information offices. Designed by John Baxandall of DNR's Division of Oil and Gas, the system maintains and retrieves information on registered mining claims in Alaska. The basis of the MINFILE is the DGGS Mineral Kardex system, which has an entry for every mineral property in Alaska that has either been recorded in literature or has been claimed under the mineral staking laws.

Once each month, the MINFILE is updated with the newest information available (new claims, assessment work, etc.), and the resultant computer listing of the data is photoreduced and mounted on microfiche cards, 4- by 6-inch affairs that each hold the equivalent of 268 computer pages. The cards are viewed with a microfiche reader, similar to a small television set.

User Options

The information compiled in the MINFILE system is arranged in four different formats, giving the user a variety of mining-claim "keys."

- Quad/serial - This is the complete computer file in Kardex number sequence; it includes all owner and claim names as well as the information on the claim and mineral forms.
- Coordinates (Quad/X2/Y2) - This is a display of all Kardex numbers in sequences by quadrangle number and by X and Y inches. This option enables the user to isolate mining properties within a given area.
- Owner name - This is an alphabetic display of all owners in the Kardex file.
- Claim name - This is an alphabetic display of all properties by claim or creek.

The microfiche system, now in use in the College and Anchorage mining-information offices, will soon be implemented in the Juneau and Ketchikan offices.

The microfiche cards will be made available to the public on a subscription basis; further information will be presented in the June *Bulletin*. The computer output listings will be available to subscribers through a computer service bureau; again, the June *Bulletin* will contain further details.

Mining Proposal Delayed

(from Fairbanks Daily News-Miner, Feb. 24, 1977)

Interior Secretary Cecil D. Andrus has agreed to postpone controversial new mining regulations while his department seeks further comment on the provisions, according to U.S. Sen. Mike Gravel, D-Alaska.

The regulations were proposed by the Bureau of Land Management on Dec. 6, with a 30-day comment period that was later extended an additional 30 days, expiring Feb. 5.

In a letter to Gravel, Andrus wrote, "I agree that the department must proceed cautiously and provide an opportunity for adequate public input." Andrus said the comment period will be extended to Apr. 5, an extra 60 days, and that BLM will schedule more regional public meetings on the proposals.

Gravel said Andrus also promised not to put the regulations into effect during the current field season.

The proposed new regulations include measures to protect surface and environmental quality. Miners have claimed they were so strict that small operators would be forced out of business, and large operators would find exploration and production costly and difficult.

Under the regulations miners would be required to file plans of operation outlining surface protection measures, and provide bonding to insure that restoration would take place.

Gravel, Sen. Ted Stevens and several other senators from Western states wrote to Andrus last month requesting the postponement.

The Bureau of Land Management held public meetings in Fairbanks and Anchorage to give the public a chance to comment on the regulations. At those meetings miners said almost unanimously that they could not continue to operate if the regulations were implemented.

Andrus told Gravel his department "received an enormous number of constructive comments on the regulations" from meetings in Alaska and other states. He did not announce a schedule for additional meetings.

After the comment period is closed Apr. 5, BLM may revise the regulations, drop them all together or issue them as originally proposed. If changes are made, the agency has the option of scheduling an additional comment period.

Gravel said Andrus' promise not to issue the regulations this season came after Alaska senators and miners told the secretary the regulations would be disruptive for the industry if put into effect for this year's season.

Inventory of Public Land for Mineral Accessibility is BLM Goal

(State Geologist Ross G. Schaff received a copy of "Recommendations for the inventory of the public lands of the United States for their availability to mineral exploration and development," written for the U.S. Bureau of Mines by W.T. Dresher, R.T. Moore, and L.J. Bradfish of the Arizona Bureau of Mines. In it, the authors made recommendations that affect the mineral resources of public domain. The following are excerpts from the 111-page report.—Ed. note.)

"One-third of the total land area of the United States is federally owned land or public lands. These lands are nearly equally divided between Alaska (345 million acres) and the lower-48 states (351 million acres). The Bureau of Land Management, with 470 million acres, is the largest land holder and the Forest Service, with 187 million acres, is the second largest land holder."

"One of the main variables for consideration in the inventory is how to treat Alaska. Alaska represents a very large fraction of the public lands and the public lands which are withdrawn from mineral entry. We have recommended that Alaska be treated in the same manner as any other state inventoried. We have anticipated that any cost saving in this state due to the fact that the majority of the withdrawn lands are under one authority—the Alaskan Native Claims Settlement Act—will

be more than made up by the fact that 87 percent of Alaska is unsurveyed and therefore will complicate the inventory."

"We have recommended that the respective state geological surveys be commissioned to conduct the inventory under contract with the Department of the Interior. There are numerous reasons why the state geological surveys are the organizations best suited for this purpose..."

- "The state geological surveys are the agencies most interested in their respective state's mineral resource potential and the ability to develop their potential. The states share in the proceeds of leases, royalties, and rentals derived from mineral development activities on the public lands within their states and therefore should act as partners with the Federal Government in questions such as lands withdrawn from mineral entry.
- The state geological surveys are, for the most part, objectively oriented scientific organizations, aware both of the value of and necessity for mineral production *and* the need for proper environmental concerns, reclamation provisions and optimum use of the land within their respective states.
- In most states the state geological survey is the principal agency wherein mineral resource information and mineral resource development expertise is situated.
- If a contractor from the private sector were to be asked to perform the inventory, in all likelihood he would obtain much of his information from the state geological survey of the state in which he was working and, in effect, "sell" it back to the government.
- Lastly, the choice of a state agency for the conduct of the inventory provides for a district separation of data collector and decision maker."

"Our project team has come to the conclusion that an inventory of the status of the public lands with regard to their accessibility for mineral exploration and development will be a very difficult, time consuming and expensive task."

"Our studies have also convinced us that the only way to be certain of the status of the public lands with regard to mining or, for that matter, any other use, is by the enactment of legislation which, in effect, wipes the slate clean of all unused, unneeded land withdrawals. We feel that this could be accomplished by an amendment to the BLM Organic Act (PL. 94-579) which could be constructed in a similar manner to Sec. 314 of that Act ('Recordation of Mining Claims and Abandonment') with the provision that all withdrawal actions which were not 'reconfirmed' within a three year period of time would be declared null and void."

"We further recommend, therefore, that a Federal program be instituted for the purpose of systematically defining the mineral estate of the public lands with particular emphasis on those areas which are under consideration for withdrawal or are already withdrawn."

Metals and Minerals Conference Scheduled for May

The 1977 Pacific Northwest Metals and Minerals Conference will be held May 4-6 at the Washington Plaza Hotel in Seattle. It will be jointly hosted by the Puget Sound Chapter of the American Society of Metals and the North Pacific Section, American Institute of Mining, Metallurgical and Petroleum Engineers.

Cochairmen W.E. Quist, ASM, and T.G. Stoebe, AIME, say the conference general session is devoted to minerals, materials, and energy and their reserves and utilization. Speakers include J. Granville Jensen, Professor of Geography, Oregon State University; John D. Morgan, Associate Director, U.S. Bureau of Mines; Robert S. Shoemaker, Bechtel Corp., 1977 SME President; and Harry Paxton, Vice President of U.S. Steel.

Following technical sessions sponsored by the ASM, AIME, the American Ceramic Society, and the American Association of Engineering Geologists will be lectures on service failures, extractive metallurgy, new materials advances, mining, new analytical techniques and instrumentation, geotechnical aids to mining, and resources for future supply of ceramics. For further information, contact S.D. Schwarz (phone (206)632-8020), 1105 N. 38th, Seattle, WA 98103.

---FORUM---

The Bulletin occasionally prints viewpoints found in editorials and letters to the editor of various publications. Readers with differing opinions are urged to send their rebuttals to us. However, we ask that you keep them brief.—Ed. note.

Mining Regulations

(from Fairbanks Daily News-Miner, Feb. 7, 1977)

January 17, 1977

Dear Editor:

The Jan. 3 News-Miner editorial "Good-bye Alaskan Prospectors" is a disservice to the community. It gives credibility to emotional outbursts which exaggerate the implications of the mining regulations recently proposed by BLM.

Notice....According to the BLM, anyone who has filed a claim on federal land after October 1976 should file a copy of their mining-claim location notice with the BLM, along with a $5 fee per location notice. BLM offices are in Anchorage and Fairbanks.

The regulations require a notice of intent which appears to be not much more than a short letter and a map describing the mining claim. It's hard for me to imagine that this is going to put small operators out of business.

If a plan of operation is required, it mostly asks that the miner give some thought to the land which he will disturb. A little planning can go a long way towards minimizing environmental disruption. Regulations for meeting water quality standards, and costs thereof, are not part of the BLM proposed regulations. Water quality degradation, not unlike reclamation, has costs to the public and should be paid for by the party which benefits from this action.

Regarding the bonds for reclamation, I suspect that most miners consider any bond to be "prohibitively expensive." However, this is a long established and equitable way of assuring the reclamation occurs. Considering that the miners are using free public land when staking a claim; it is not unreasonable to require them to clean up and attempt to restore the land to the condition it was in before their entry. If they don't like this cost of being in business, they can avoid it by purchasing private land for their mining efforts. Would that be any cheaper?

I'm surprised that the News-Miner attacked the discretion which is given to the authorized officer. This discretion allows for an enforcement policy which is more sensitive to individual cases. Considering that the situation in Alaska is somewhat different than the rest of the nation, I consider this to be desirable. Also, I am confident that the BLM in Alaska will tend to be fair in exercising its discretion. The alternative is rigid regulations which try to account for every foreseeable situation, but don't closely apply to very many. Local authority is limited under such circumstances.

You mention that "there isn't even an appeal process." If you had read the regulations you would have noticed Section 3809.6 Appeals, which describes the appeal process.

The editorial ends by suggesting that these rather simple regulations are strangling the minerals industry and creating grounds for a mineral crisis. I think that one can also make the point that because, until recently, resource development did not have environmental constraints to contend with, exploitation was based on false economies and became unnecessarily wasteful. If mineral demand and need were more in parity, the potential for crisis would be less.

Regarding your "big picture," maybe these environmental constraints are a blessing in disguise. It has been with other industries. One of the more positive supports to the economy during the most recent recessions was the massive construction of sewage treatment plants in order to achieve compliance with water quality standards. Also, the cyclic pulp and paper industry was forced to make substantial investments in pollution control just previous to another expansion and reduced the overexpansion, low profit cycle which typically followed.

In future "big picture" editorials, I suggest that you get a broader view before you start writing.

Sincerely,

George Matz
Executive Director
Fairbanks Environmental Center

Our Gangue....

By Frank Larson, DGGS editor

Just a few more weeks and it's all over, Gangue... Despite the mild winter--the mildest on record here--one still looks forward to spring, with all its wonders: birds, buds, Buds, potholes, and skirts....Spring used to awaken me, surfeit from the winter's diet of basketball and hockey, and reintroduce me to the world of girls.... Ahhh, I remember it still: Walking your True Love home down a darkened lane after the latest Randolph Scott movie....holding nervous hands still greasy from the popcorn, and humming the latest Sinatra hit, "Holding hands at midnight, 'Neath a starry sky,/ Gneiss work if you can get it, and you can get it if you try"....Spring still works its mysterious ways on me....The other day, for instance, on espying a callipygious young thing wending her way down the hall, I suddenly burst forth into that old Jonathan Winters' paean to spring, "My face broke out the other night, Oh God I'm in lo-ove".... Spring also means other things--like getting back tax returns, oiling up the ten-speed, spending tax returns, and taking April showers under the water spout with the old lady and other good friends....To the Little Squaw Mining Company, spring means the beginning of what they hope is a 100-day mining period at their Mikado mine in the Chandalar district. They intend to increase their capacity this year, beginning next month, to 100 tons per day of gold ore....To the Bristol Bay Native Corporation, spring means hope--hope that their well, being drilled by Phillips Petroleum, comes in big. Rumor has it that the operation, located 7 miles inland from Stepovak Bay, is showing thin oil sands....To LKB Resources, Inc., spring means greenery: The firm was recently awarded $763,000 to survey 26 two- and three-degree topographic-series Alaska quadrangles....To the oil companies who haven't come up with anything but mud in their exploratory drillholes in the Gulf of Alaska, spring means tax writeoffs. Shell and its minority partners paid the Federal Gummint $62 million for one lease tract last year, only to become the first Gulf operator to abandon an exploratory well there (drilled to 13,565 in 540 feet of water, 12 miles off the coast).... Yes, spring touches us all, including those wonderful folk, the senior citizens. Why just last week, a 78-year-old Skagway lady exchanged vows in the garden of her rest home with a man twice her age.....Cheers.

DGGS Sets Tentative Dates for 1977 Field Season

Starting in May, local supermarkets will encounter their annual run on Dinty Moore beef stew, beef jerky, and OFF as the DGGS staff prepares to head for the Bush. The 1977 field projects, which begin in mid-May on the Kenai Peninsula and end just before Labor Day, will run the gamut from mapping nearshore marine geologic hazards in Prince William Sound on a USGS research vessel to conducting surficial geologic investigations on the North Slope. The projects and personnel are listed below.

Geologists	Tentative field dates	Area	Purpose
Riehle, Reger	5/10 - 5/25	Kenai	Evaluate geologic hazards along the coast from English Bay to Kenai.
Riehle	5/25 - 6/1	Prince William Sound	Nearshore marine geologic hazards; mapping.
Riehle	4/20 - 5/10	Yakukat	Nearshore marine geologic hazards; mapping.
Reger, Henning, McGee	6/1 - 6/30	Matanuska-Susitna Valley	Mapping surficial geology and bedrock; evaluating geologic hazards; mapping surficial geology of Chugach State Park.
Gilbert, Bundtzen, Eakins	6/17 - 7/17	Lake Clark, Iliamna	Mapping and mineral-potential survey.
Pessel, Dillon[1]	6/15 - 7/31	Brooks Range	Bedrock mapping and mineral-potential survey.
Lyle, McGee, Henning[1]	6/15 - 7/25	Alaska Peninsula	Evaluation of coal-bearing beds; geochemical sampling; gravity readings; petroleum and mineral investigations.
Gilbert	7/22 - 8/8	Lime Hills	Bedrock mapping and mineral-potential survey, surficial investigations, and possible hydrologic survey.
McGee	8/9 - 8/10	Farewell	Surficial geology.
Eakins, Conwell[1]	7/27 - 8/4	Purkey-Pile prospect	Investigation of mineral deposits and potential.
Bundtzen	6/3 - 6/12	Eastern Alaska Range	Examination of metamorphic section.
Bundtzen	7/22 - 8/23	McGrath-Farewell	Bedrock mapping.

[1]Geophysical support by geophysicist S. Hackett.

Geologists	Tentative field dates	Area	Purpose
Updike	7/1 - 8/31	North Slope	Surficial geology.
Bruhn	7/1 - 8/31	Matanuska-Susitna Valley	Holocene tectonics.
Conwell, Triplehorn	7/1 - 8/31	Healy	Coal investigation.
Pewe	7/1 - 8/31	Fairbanks	Geologic hazards investigation.
Reger	8/1 - 8/31	Delta-Richardson	Complete field mapping of Big Delta A-4 quadrangle and mapping surficial deposits in the Richardson mining district.

DNR Commissioner Guy Martin Named to Interior Post

(from Anchorage Times, Mar. 2, 1977)

As expected, Guy Martin, state Commissioner of Natural Resources, today was named to be Assistant Interior Secretary for Land and Water Resources.

Sen. Mike Gravel, D-Alaska, said today the White House would send the nomination to Capitol Hill later in the day. The post requires Senate confirmation.

Gravel, who had thrown his support behind Martin for a top job at the Interior Department, expressed delight at President Carter's choice.

"Guy will have the highest appointed position for an Alaskan in six years," the senator said.

Former Gov. Walter J. Hickel served as Interior Secretary from 1969 to 1971 during the early years of the Nixon administration.

"Guy has done an outstanding job in the state and is familiar with Washington, D.C.," Gravel said. "He will make a real contribution at Interior."

Martin is the first of four assistants to be named to aid Cecil Andrus, the former Idaho governor who serves as Secretary of Interior.

In a statement from a spokesman, Andrus expressed pleasure "at having a person in the department who is intimately familiar with the department's vast responsibilities in the state of Alaska."

As assistant secretary, Andrus said, Martin will have a direct and active role in administering the agencies under him."

The Assistant Secretary for Land and Water Resources oversees the Bureau of Land Management—which controls the offshore drilling program, mineral leasing and native and state land withdrawals; the Bureau of Reclamation, land use and water planning, water resources and technology.

Martin's nomination will be considered by the Senate Energy and Natural Resources Committee, which has held speedy hearings on all of Carter's appointees for the Interior Department.

Martin formerly served as legislative assistant to the late Nick Begich, Democratic congressman from Alaska, and as Washington counsel for the State of Alaska under Egan administration.

Trespass: A Growing Concern

(from BLM News Release, May 20, 1976)

Before you build that summer cabin, make sure you own the land where you plan to build or you may be served with a notice of trespass and told to move.

Unauthorized uses of Federal land poses problems for the Bureau of Land Management (BLM) because of Alaska's rapidly changing land status and the state's increasing population.

Unauthorized occupancy of Federal lands in Alaska has been a matter of record since Alaska was purchased from Russia in 1867. However, with the passage of the 1958 Statehood Act and the 1971 Alaska Native Claims Settlement Act (ANCSA), more and more Federal land is becoming State or private land, making it imperative that unauthorized uses are terminated.

Unauthorized occupancy or occupancy trespass includes the placing of building or structures on National Resource Lands (Federal lands administered by BLM) for residential or business purposes without proper authorization. It is also considered trespass if an individual owns adjoining land and constructs buildings on National Resource Lands because he is unaware of the exact boundary line.

In addition occupancy trespass includes occupying a mining claim after it has been declared null and void as well as using an unpatented mining claim for purposes unrelated to mining.

One of the important uses of antimony is that of a fire retardant. Alaska has more antimony deposits than the other 49 states combined.

Metals Market

	Feb. 18, 1977	Three Months Ago	Year Ago
Antimony ore, stu equivalent European ore	$ 23.50-25.00	$ 23.50-25.00	$ 17.00-18.50
Barite (drilling mud grade per ton)	$ 17-28	$ 19-28	$ 17-28
Beryllium ore, stu	$ 40-42	$ 42.00	$ 40-42
Chrome ore per long ton (Transvaal)	$ 38-46	$ 38-48	$ 36-42
Copper per lb. (MW-prod.)	$ 0.68	$ 0.70	$ 0.63
Gold per oz.	$136.60	$135.60	$131.20
Lead per lb.	$ 0.29	$ 0.26	$ 0.19
Mercury per 76-lb flask	$156-165	$134.00	$125-130
Molybdenum conc. per lb.	$ 3.45	$ 3.20	$ 2.62
Nickel per lb. (cathode)	$ 2.41	$ 2.41	$ 2.20
Platinum per oz.	$162.40	$172.00	$155.00
Silver, New York, per oz.	$ 4.53	$ 4.47	$ 4.10
Tin per lb., MW composite	$ 5.16	$ 4.05	$ 3.26
Titanium ore per ton (ilmenite)	$ 55.00	$ 55.00	$ 55.00
Tungsten per unit (GSA domestic)	$139.15	$115.03	$ 81.93
Zinc per lb. (MW US PW)	$ 0.37	$ 0.37	$ 0.37

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