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William A. Egan - Governor Charles F. Herbert - Commissioner

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IN THIS ISSUE

JOINT LAND USE ACCORD REACHED

(Western Mining News)
Oct. 27, 1972

A precedent was set in Wallace recently when three Coeur d'Alene Mining District mining firms relinquished surface rights to the U. S. Forest Service but retained subsurface mineral rights.

A total of 362 acres covered by 21 mining claims were involved in the Stevens Lake area south of Mullan. The acreage is being withdrawn for recreational purposes.

South Atlas Mines, Inc., Stevens Peak Mining Co. and Silver Crest Mines, Inc. signed the new "deed of assurance" plan which stipulates that no mining can be done from the surface and no buildings erected on the property but that subsurface minerals can be extracted from adits driven from outside the withdrawn area.

John Leasure, supervisor of the Coeur d'Alene National Forest, said he felt the new concept of multiple use planning was an asset to the area. Recognizing the value of minerals as a natural resource, foresters found this way to preserve beautiful areas and still leave room for mineral operations, he said.

Paul DeCelle, Wallace forest ranger, said an executive order signed in 1952 authorized this type of withdrawal but that legalities were not ironed out until recently.

He said other withdrawals in the district have included tracts at Lake Elsie, Settler's Grove and The Cedars, but in those cases the owners of mining claims relinquished all rights to their properties.

Negotiations are under way for withdrawing acreages at Revette and Glidden lakes in the Burke district under the new plan, he said.

ANTIMONY PICTURE CONFUSING

(Metals Week)
Nov. 13, 1972

Antimony prices in New York were confusing last week, with dealers reporting higher prices, but with consumers showing little interest in the metal. Prices were reportedly around the 55¢ to 57¢-a-lb level--they were previously at 53.5¢--but little or no trading was conducted at the higher prices. From all indications, the higher price was due to confusion concerning Chinese antimony.

Earlier, the Chinese were reportedly refusing any contracts involving British currency (MW, Nov. 6, p7). And last week reports circulating out of China indicated that prices were so high that it would be unprofitable for dealers to import the metal into the US. Dealers obviously felt the news would bull the market, but consumers paid little heed. Metals Week will continue its quote of 53.5¢ a lb until antimony can be readily sold at higher levels.

GOLD PRODUCTION OFF

(Western Mining News)
Oct. 27, 1972

The Bureau of Mines reported this week that gold production in the United States declined 17 per cent in August compared with July.

It said the decline was caused by a strike at the Homestake Mine in South Dakota which was settled in late August with signing of a four-year contract.

The August production totaled 84,100 ounces. Imports of gold totaled more than 876,000 ounces, a five-fold increase over July.

CONCRETE "BULLETS" USED AS TUNNELING MACHINE

(Engineering and Mining Journal)
October, 1972

A long-barrel cannon mounted on a dual-track army vehicle and shooting 10-lb concrete "bullets" is being used experimentally by the engineers of Physics International Co. to tunnel through 24 ft. of granite in the foothills of California's Sierra Mountains.

This unusual experiment, known as REAM--Rapid Excavation and Mining--is to determine if high-velocity impact is an alternative to blasting in hard rock tunneling and mining. J. D. Watson, project manager for Physics International, claims that this experiment "may be the first major advance in hard rock mining since tungsten-carbide bits came into use in the 1940s." The Advanced Research Projects Agency has put up $118,777 for the project, and the contract is being monitored by the US Bureau of Mines.

The shooting site, in Alpine County's Hope Valley, 15 mi south of Lake Tahoe, Calif., is a granite with a joint spacing of 6-8 ft. The cannon and its M107 mount was donated by the US Army. Modifications by Watson include a smooth bore 4.2-in. dia barrel which is 28 ft long. The bullet is a specially cast concrete shell in a 1/16 in. thick open end aluminum casing, which is 9 ft long.

Preparation for the test included removal of trees and undergrowth to reveal rock surfaces. The 13-ft-dia tunnel was line-drilled with 50 3-in.-dia holes, 20 ft deep, thereby outlining the portal. This process, known as kerfing, is for

boundary weakening, and no explosives are used. When the kerfing was completed (Watson estimates a two-day job), the cannon was positioned 50 ft from the face and aimed at the portal's upper left quadrant. A 1-in. plastic plate was snugly fitted behind the bullet to insure full impact of the exploding charge.

The bullet was fired at an initial velocity of 5,500 fps by a case charge of 24 lb of black powder, and upon impact, displaced about 1 1/2 tons of granite. Visual results indicate that in this type of material, the kerfing process is quite effective and fragmentation is satisfactory. Watson stated that 40% of the shot material was minus 4 in., with the remaining muck effectively broken so that no secondary shooting was necessary. Material more than 300 times the weight of the bullet was broken.

In order to optimize production, Watson experimented with a seven-shot pattern. Shots were placed three near floor level, two at mid-portal, and two at the top. Results showed that a full foot of advance could be realized in this particular opening.

The two apparent disadvantages--noise and shock wave generation in flight and at impact when the cannon is fired--were discounted by Watson. He stated that a barrel silencer would muffle the noise, and shock wave generations were at the same level as with buried explosives.

As for the economics, Watson estimated he was spending $2 per round on propellant and $1 on each bullet. Mass production of bullets and utilization of liquid propellant would reduce these costs significantly, he added, estimating that the cannon method for tunneling could save $8 per cu yd over conventional drilling and blasting costs.

Other interesting applications for the cannon include: secondary shooting of large hung-up points and boulders inaccessible to traditional mobile drills in open-pit mines; trimming of protruding boulders on benches; unblocking draw points in mines; and elimination of hard toes in a minimum amount of time.

LOOKING FOR GOLD

(Western Mining News)
Oct. 6, 1972

According to The Northern Miner, American Smelting and Refining Co. is conducting one of the most interesting gold projects in the Nome, Alaska, area.

Asarco for three years has been testing and evaluating offshore gravel deposits on extensive leases it took over from Shell Oil Co. More than 1,100 test holes are said to have been drilled from the winter ice pack down through 70 feet of water.

WIM: MINI SKIRTS WITH A PURPOSE

(The Mining Record)

By Duane H. Haley

DENVER-Time was when it would have been hard to imagine two things having a more remote connection than mining and mini skirts. But not any longer.

A long-time friend of mining, Sen. Gordon Allott (R-Colo.), graciously accepted the first honorary membership in a new organization unique to mining. The presentation was made by an attractive mini-skirted redhead, Miss Shirley Hunter. Miss Hunter is secretary to the Colorado Mining Association, and charter member and vice president of "Women in Mining (WIM), the only known club organized exclusively by and for women working in the mining industry.

A welcome addition to an industry so often characterized by a shabby old prospector and burro, the ladies have organized with a definite purpose in mind.

"The purpose for establishing this organization was that we felt there was a definite need for a group of this nature within the mining industry," Miss Hunter explained.

"We want to further educate members in the technical aspects regarding the mining industry, with the goal of increasing our interest, becoming of greater service, and to acquaint members with other women employed within the industry."

An extensive schedule of continuing education programs have been planned for future meetings. They will include a seminar in which all facets of the mining industry will be discussed by volunteer experts in their fields, and a November field trip to the Colorado School of Mines to tour the facilities of the school's Edgar Mine.

WIM members were drawn from 20 different Denver-based mining firms. Primarily composed of secretaries, membership in this one-of-a-kind club is open to all women working in industries related to mining.

CAN YOU HELP?

Newsletter of the Council on Education in the Geological Sciences Number 47 October 1972

Howard University in Washington, DC, one of the foremost universities in the country with a student body composed mainly of minority groups, has instituted a major in geology. Individuals, industrial concerns, and geology departments could make a significant contribution to the establishment of the department by donating geologic literature, rocks, fossils, and other necessary items. Metamorphic rocks of the Piedmont and Tertiary fossils from the Coastal Plain could be exchanged for other needed materials. For further information, write: Department of Geology, Howard University, Washington, DC 20001.

NORTHWEST MINING ASSOC. CONVENTION

The Northwest Mining Association will hold its annual convention in Spokane, Washington, December 1 and 2nd. Mr. Gilbert R. Eakins, mining geologist with this division, will attend and present a paper, "Mineral Exploration in Alaska, 1972."

BLM MOVES TO NEW OFFICE

(Fairbanks Daily News-Miner)

The Bureau of Land Management's Fairbanks District office has moved into it's new office at 1028 Aurora Drive, in Fairbanks.

Alaskans doing business with the Fairbanks district office may find it a pleasant change, said Fairbanks district manager Richard H. LeDosquet. The new office space, formerly used by Burgess Construction Co., has room for all offices and personnel previously located at 516 Second Ave., in downtown Fairbanks, and additional room for warehousing, radio shops and heavy equipment maintenance shops.

Along with the new office space, the Fairbanks office will have new hours. When it opens for business at its new location Nov. 20, office hours will be 8 a.m. to 4:30 p.m.

LeDosquet invited Fairbanks residents to visit the new office, adding that ample off-street parking is provided.

The Fairbanks district fire control division, with its office, yards and facilities, will remain at its present location at 3 1/2 Mile Airport Way, LeDosquet said.

HAVELOCK SPEAKS UP ABOUT EPA APPLICATIONS

(Fairbanks Daily News-Miner)
Wednesday, Nov. 15, 1972

KETCHIKAN, Alaska (AP)--Atty. Gen. John Havelock said Tuesday that unfair and unequal application of the National Environmental Policy Act has resulted from judicial enforcement of the law.

Havelock, in an address to the Ketchikan Rotary Club, said the federal Environmental Protection Agency should be strengthened in an effort to "limit the current haphazard private enforcement actions attempted by special interest groups through the courts."

Unless Congress acts to bolster the agency, he said, "The good intentions behind the law will drown in a sea of bureaucratic paper work and litigation."

The attorney general said: "The judicial process is too slow, lacks central direction and results in unequal and unfair application, as Alaskans know only too well. Proper enforcement of the environmental act calls for expert evaluation and swift action on a broad executive-administrative basis."

Havelock also said he was concerned about increased American reliance on foreign energy sources.

TOO MANY RESTRICTIONS

(The Mining Record)
Nov. 1, 1972

WASHINGTON--The coal industry must be freed from unrealistic and unreasonable restrictions if it is to help the nation avert a major energy crisis, NCA President Carl E. Bagge said this week in a speech to the Kentucky Rural Electric Cooperative Corp. at Louisville.

"The fact that coal, representing 88 per cent of our known domestic fuel resources, is currently being harassed in both its production and use, is dramatic evidence of the dangerous confusion now permeating the nation's fuel affairs," Mr. Bagge said.

The Kentucky coal industry is currently experiencing a major depression, he said. "Increasingly stringent air pollution control regulations are narrowing the market for Kentucky's high sulfur coal and the state's punitive 30 cents per ton severance tax, combined with the expense of implementing the Coal Mine Health and Safety Act, have brought on mine showdowns and layoffs," Mr. Bagge said.

"Today the nation faces an energy crisis, and yet our most abundant fuel is already regulated out of many markets. We import foreign oil, at increasing risk and expense. We negotiate with uncertain foreign sources for natural gas, but the immediate future of coal is so uncertain that investors hesitate to finance new mines with no assurance of a market.

"Prospects for coal look good in the decade of the 1980's but to coal men that is like being promised a medal posthumously," he said.

There are signs, however, that government is becoming aware of the fact that restrictions on coal must be eased to allow it to help fill the nation's energy gap, Mr. Bagge said. The Environmental Protection Agency is now studying a report which estimates that by 1975, when state implementation plans are scheduled to take effect, there will be a shortage of more than 300 million tons of coal low enough in sulfur to meet air quality standards. The report proposes that plans be modified in at least ten states--including Kentucky--which would encounter about 90 per cent of the low sulfur coal deficit, he said.

NIXON VETOES MINE TRAINING BILL

(The Mining Record)
Nov. 8, 1972

WASHINGTON--President Nixon vetoed a bill to set up mining and minerals research centers throughout the United States and to provide matching grants and other aids to promote the training of mining and mineral engineers.

The bill (S 635) was one of nine which the President announced he would not sign on grounds that they would exceed his budget. He said it was unneeded because of workable existing programs.

NCA earlier urged Mr. Nixon to sign the bill. NCA President Carl E. Bagge said in a telegram, "This bill will stimulate interest in the declining mining engineering profession, the expansion of which is desperately needed for energy production, conservation, environmental protection, and health and safety in mining.

The bill provided a research center in each state, to be set up at the state school of mines or its equivalent, and authorized a grant of $200,000 to each institution in the first year, rising to $400,000 in the third and subsequent years.

Mr. Nixon vetoed also the appropriation for the Labor Department and the Department of Health, Education and Welfare for the current fiscal year, saying it overspent by $535 million. He vetoed another version of the bill earlier.

The Labor-HEW bill contained funds for black lung benefits for disabled coal miners. However, because the veto of the bill had been threatened earlier, Congress in its last days passed a special appropriation continuing black lung funds until February 28 at an annual rate of $1.5 billion.

PUBLIC LAW 92-203--ALASKA NATIVE CLAIMS

(Nevada Mining Assoc. News Letter, No. 236)

Alaska natives will receive title to a total of 40-million acres of Alaska land and compensation of $962.5-million. The Act authorizes the Secretary of Interior to withdraw all unreserved public lands in Alaska from all forms of appropriations under the public land laws, including the mining (except locations for metalliferous minerals) and the mineral leasing laws for a period of 90 days. It directs the Secretary to make any further withdrawal that may be needed under his existing authority. In addition, the Act authorizes the Secretary to withdraw not to exceed 80-million acres of unreserved public land that he thinks may be suitable for addition to the National Park, Forest, Wildlife Refuge, and Wild and Scenic Rivers Systems. The withdrawal is for a maximum of 7 years. The Secretary must submit recommendations to Congress each 6 months, for 2 years, and the lands recommended for addition to the Federal Systems will remain withdrawn until Congress acts, but not to exceed 5 years.

EPA RECOMMENDS EFFLUENT LIMITS

The Environmental Protection Agency, (EPA) recently set recommended effluent limits for the mining industry.

Defined in milligrams per liter (mg/l) of discharge, the recommended effluent limit for suspended solids is 20 mg/l, 0.02 for cyanide, 0.5 for dissolved iron, and 0.1 for manganese.

These rigid limits, in accordance with the Federal Water Pollution Control Act Amendments of 1972, which sets the national goal for the elimination of pollutant discharge by 1985, were partially clarified by the Alaskan division of EPA, for

Alaskan purposes. Realizing that normal Alaskan situations exist, such as the Nenana River at Healy which frequently carrys a natural stream sediment concentration of 1,060 mg/l, the EPA will try to apply the limits with as much flexibility, for each individual situation, as possible. Besides considering the natural stream load, other factors might be whether the intake and discharge is from the same body of water, and the economics of the control methods. Not yet sure of the latitude they will have in applying these regulations, they hope to be able to use the limit as an indication of the increase over the natural concentration.

Figures from the Alaska Department of Environmental Conservation also indicate that interior water might not only have the same problem with suspended sediment, but also with iron content. A sample of three wells in Fairbanks, conducted in October, 1970, showed the dissolved iron content as high as 4.4 mg/l. A natural spring at Nome, in April of 1972, showed a content of 0.01 mg/l of dissolved iron, but also showed 3.1 mg/l of manganese.

Controls Used?

When asked how they were going to determine the applicable limits for each case, EPA officials said there would be a certain amount of on-site checking and assistance, supplemented by applications from the miners.

Anchorage EPA official, Mr. Keith Stewart, said he had visited approximately 11 mining camps, and found that most miners were dedicated in their business, and ready to comply with the new laws. He noted that they were, "...ready to move in the right direction," and they often suggested ways they could control their discharges. "We may come into ticklish problems, but they'll be solveable," said Stewart.

(Britch)

METRIC SYSTEM BUGGING YOU?

Get a pocket card that translates measurements from yards to meters, ounces to grams, etc. Ten cents each ($6.25 per hundred). Order from: Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.

HAVE ANY GOOD PHOTOS?

The National Museum of Canada is currently developing a new geology gallery. The proposed design will include many transparencies and photographs that will be selected for their technical and aesthetic quality. The Museum has a list of subjects that they are interested in for possible display. For more details, write Mr. Ridgeley Williams, Design and Display Division, National Museum of Canada, Ottawa, Ontario, Canada.

ENVIRONMENTAL CONSULTANTS DIRECTORY

An annual Directory of Environmental Consultants will be published beginning 1972. Environmentally concerned geologists interested in having their names and short resumes appear in the Directory should send a No. 10 self-addressed, stamped envelope to: Directory of Environmental Consultants, P. O. Box 8002, University Station, St. Louis, MO. 73108.

(The three articles above are reprinted from the Newsletter of the Council on Education in the Geological Sciences.)

ALASKAN COALS

A survey article concerning Alaskan Coal has appeared in the October issue of Mining Engineering, announced Mr. William C. Fackler, State Geologist, Department of Natural Resources.

"Alaskan Coals May Prove a Big Plus in Future Exports Picture," was drawn from mining engineer Cleland N. Conwell's practical experience and research. It examines the current major coal fields in Alaska, and discusses the market, mining costs, and land ownership of Alaskan coals.

"This well-written article will not only interest the Alaskan miners and their associates, but should also stimulate anyone interested in Alaska's mining economy," said Mr. Fackler. Conwell pointed out that Fairbanks depends on coal for a major part of its power source.

Reprints are available upon request at the College office of the Division of Geological & Geophysical Survey.

1971 AEROMAG MAPS 1:250,000 ON OPEN FILE

Composite maps on scale of 1:250,000 of the 17 quads or partial quads of the State of Alaska 1971 Aeromagnetic Survey have been placed on open file and may be inspected at College, Anchorage, Juneau, and Ketchikan. Index map is free on request. Material from which copies can be made at private expense will be loaned by the College office to a local drafting reproduction company which will bill the purchasers directly. Orders for these maps received by the College office will be forwarded to the drafting reproduction company. Cost is estimated at $1 each for blueline copies and $10 each for mylars.

1972 AEROMAGNETIC SURVEY FLYING DELAYED

The contractor for the State of Alaska 1972 Aeromag flying has elected to delay the remaining flying. Areas completed include Eagle and Talkeetna Mountains quads, Anchorage D1 through D8, and most of Talkeetna quad (except C5 and D5). Areas remaining include Talkeetna C5 and D5, and the fill-in area of our 1971 survey in the Healy and Mt. Hayes quads. It is expected that aeromag maps of the completed areas will be available after the first of the year. The Aero Commander aircraft used in the 1972 survey is overdue on a flight which left Alaska for California November 22. A search is in progress but the aircraft has not yet been located.

NEW REPORTS ON ALASKAN GEOLOGY

The Bibliography and Index of Geology (v. 36, no. 7, July 1972) published by the Geological Society of America contains the following Alaskan entries:

Abe, Katsuyuki, 1972, Seismological evidence for a lithospheric tearing beneath the Aleutian Arc: Earth Planet. Sci. Lett., Vol. 14, No. 3, p. 428-432, illus. (incl. sketch maps)

Bingham, D. K., 1971, Paleosecular variation of the geomagnetic field in Alaska: Doctoral, Alaska

Biske, S. F., 1971, Korrelyatsiya paleogenovykh i neogenovykh kontinental'nykh otlozheniy Alyaski i Severo-Vostoka Azii po paleobotanicheskim dannym [Correlation of Paleogene and Neogene continental deposits of Alaska and northeastern Asia based on paleobotanical data]: Geol. Geofiz. (Akad. Nauk SSSR, Sib. Otd.), No. 8, p. 29-33, illus.

Bradley, W. C.; Fahnestock, R. K.; Rowekamp, E. T., 1972, Coarse Sediment Transport by Flood Flows on Knik River, Alaska: Geol. Soc. Am., Bull., Vol. 83, No. 5, p. 1261-1284, illus. (incl. geol. sketch map) *Glacial river, gravel size, shape, lithology and sorting*

Buschur, James; Rutstein, Milton; Walton, Fred; others, 1972, Crustal Lineations Based on Magnetic and Gravity Surveys; Bristol Bay, Southwest, Alaska [abstr.]: Eos (Amer. Geophys. Union, Trans.), Vol. 53, No. 4, p. 415

Chatterjee, Biswanath, 1971, Paleomagnetism of the Crater Creek basalts, Unmak Island, Aleutian Islands, Alaska: Master's, Alaska

Dingman, S. L.; Samide, H. R.; Saboe, D. L.; others, 1971, Hydrologic reconnaissance of the Delta River and its drainage basin, Alaska: U. S. Army, Cold Reg. Res. Eng. Lab., Res. Rep., No. 262, 81 p., illus. (incl. maps)

Dziewonski, A. M.; Gilbert, Freeman, 1972, Observations of overtones with a high radial order number [abstr.]: Eos (Amer. Geophys. Union, Trans.), Vol. 53, No. 4, p. 448

Egan, Christopher, 1971, Contribution to the late Neoglacial history of the Lynn Canal and Taku Valley sector of the Alaskan Boundary Range: Doctoral, Michigan State

Engdahl, E. R., 1972, MILROW and CANNIKIN Seismic Effects [abstr.]: Eos (Amer. Geophys. Union, Trans.), Vol. 53, No. 4, p. 442-443

Herreid, Gordon, 1971, Analyses of rock and stream-sediment samples, Hetta Inlet area, Prince of Wales Island Craig quadrangle, Alaska: Alaska, Div. Mines Geol., Geochem. Rep., No. 24 [2 p.], map. *Tables of geochemical analyses, map showing sample locations*

Jacob, K. H., 1972, Global Tectonic Implications of Anomalous Seismic P Traveltimes from the Nuclear Explosion Longshot: J. Geophys. Res., Vol. 77, No. 14, p. 2556-2573, illus. (incl. sketch maps) *Three-dimensional seismic ray tracing interpretation of P-wave residuals, plate tectonic structures of the United States and Canada*

McDonald, J. A.; Herrin, Eugene, 1972, Microbarographic and seismic signals from presumed atmospheric explosions [abstr.]: Eos (Amer. Geophys. Union, Trans.), Vol. 53, No. 4, p. 448

Munger, A. H. (ed.), 1971, California-Alaska oil and gas fields: (Munger Map Book) [Privately Printed], [306 p.], sketch maps, Los Angeles. *Compilation of maps showing well locations*

Nakano, Yoshisuke; Brown, Jerry, 1972, Mathematical modeling and validation of the thermal regimes in tundra soils, Barrow, Alaska: Arct. Alp. Res., Vol. 4, No. 1, p. 10-38, illus.

Northrop, John, 1972, T-phase Reflections from Underground Explosions and Earthquakes in the Aleutians; A Comparison [abstr.]: Eos (Amer. Geophys. Union, Trans.), Vol. 53, No. 4, p. 454

Packer, D. R.; Stone, D. B., 1972, An Alaskan Jurassic Palaeomagnetic Pole and the Alaskan Orocline: Nature; Phys. Sci., Vol. 237, No. 71, p. 25-26, sketch maps

Rowlett, H. E.; Jacob, K. H., 1972, Anomalous Upper Mantle Velocities in the Aleutians and Alaska from P-wave Residuals of the Nuclear Explosion CANNIKIN [abstr.]: Eos (Amer. Geophys. Union, Trans.), Vol. 53, No. 4, p. 451

Sbar, M. L.; Matumoto, T., 1972, Refraction Profiles in the Valley of Ten Thousand Smokes, Katmai, Alaska: Bull. Volcanol., Vol. 35, No. 2, p. 335-349, illus. (incl. sketch maps) *Determination of thickness of tuff from 1912 ash flow*

Yeend, W. E., 1972, Winter protalus mounds; Brooks Range, Alaska: Arct. Alp. Res., Vol. 4, No. 1, p. 85-87, illus. (incl. sketch map) *Genesis, interpretation, snow or ice transport along chutes*

Metals	METAL MARKET Nov. 27, 1972	Month Ago	Year Ago
Antimony ore, stu equivalent European ore	$7.35-8.35	$7.35-8.35	$8.64-10.00
Barite (drilling mud grade per ton)	$18-22	$18-22	$18-22
Beryllium powder, 98%, per lb.	$54-66	$54-66	$54-66
Chrome ore per long ton	$24-27	$24-27	$25-27
Copper per lb.	50.6¢	50.6¢	52.8¢
Gold per oz.	$62.35	$64.51	$43.25
Lead per lb.	14.5¢	14.5¢	14.0¢
Mercury per 76# flask	$255	$255	$258-263
Molybdenum conc. per lb.	$1.72	$1.71	$1.72
Nickel per lb.	$1.53	$1.53	$1.33
Platinum per oz.	$141.62	$130.42	$120-125
Silver, New York, per oz.	181¢	184¢	132.9¢
Tin per lb.	177.25¢	178.3¢	176.1¢
Titanium ore per ton (Ilmenite)	$30-35	$30-35	$30-35
Tungsten per unit	$55.00	$55.00	$55.00
Zinc per lb.	18.0¢	18.0¢	17.0¢

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IS THE FIRST STEP IN
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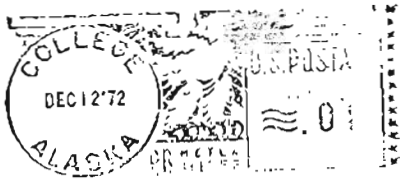

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