



Bergvesenet

Postboks 3021, N-7441 Trondheim

Rapportarkivet

Innlegging av nye rapporter ved: Peter

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Kommer fra ..arkiv Folldal Verk AS	Ekstern rapport nr	Oversendt fra Folldal Verk a.s.	Fortrolig pga	Fortrolig fra dato:
Tittel Program för Kisgruvan - Kongsberg				
Forfatter Flood, Boye		Dato År 20.04 1983	Bedrift (oppdragsgiver og/eller oppdragstaker) LKAB Prospektering AB	
Kommune Kongsberg	Fylke Buskerud	Bergdistrikt	1: 50 000 kartblad 17142	1: 250 000 kartblad Skien
Fagområde Geologi	Dokument type		Forekomster (forekomst, gruvefelt, undersøkelsesfelt) Kisgruvan	
Råstofgruppe Malm/metall	Råstofftype Cu, Zn, S, Se, Ag, Au, Co			

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

Rapporten er et program for videre nder søkelse av forekomsten. Innledningsvis gis en oversikt over drift og tidligere arbeider, boringer etc. Til slutt gis en anbefaling for videre undersøkelser. Her anbefales, gjennomgang av NGU's Bergarkiv, geologisk kartlegning av Kisgruvestråket i skala 1:2000, utvidet prøvetakning og måling av det magnetiske totalfelt.

26 APR. 1983

Ort

Håksberg

Meddelande

Från	Sign.	Datum	Nr	Blad
B. Flood	BF/h	1983-94-20	83-103	
Till: Johan Heim Claes Lundqvist Claes Boström		Utförd av		
		Sammanfattning till		

Program för Kisgruvan - Kongsberg

Kisgruvan är associerad med ett typiskt fahlband ca 8 km S om Kongsberg, se bil. 1.

Gruvbrytning efter koppar pågick i den nordliga delen av fältet under förra århundradet.

Fältet är inmutat av staten (USB) som utförde nya undersökningar inklusive borrhningar under slutet av 70-talet. FV A/S har å Samarbetsgruppens (FV - LKAB/SP) vägnar ansökt om att få överta Statens rättigheter. Detta är formellt uppgjort, men ett arbetsprogram måste först inlevereras.

Intressanta element är Cu, Zn, Ag, Au, Se och S.

Bakgrund till detta programförslag är NGU:s senaste rapport, se bilaga 2.

I bilaga 3 ses en uppdelning av fältet i den södra (S), mellersta (M) och norra (N) delen. Tidigare gruvbrytning ägde rum på (N) medan diamantborrning för det mesta har varit koncentrerad inom (S). I tillägg till dbh, avmärkt på bil. 3, har det år 1945 och 1951 borrats 20 hål inom S. En påföljande malmeräkning indikerade ca 600 kt.

Den senare borrhningen och provtagningen av NGU indikerade dock lägre halter än tidigare påvisade, speciellt beträffande Ag och Au. NGU anger sannolika halter till

0.5-1 % Cu
0.5-1 % Zn
ca 20 % S
400 g/t Se
10 -"- Ag
<0.5 -"- Au
<200 -"- Co

Mineraliseringsbredden kan uppgå till ett 20-tals meter.

NGU:s borrhning blev utförd på kända gruvhål-skärp och elektromagnetiska mätningar, se bilaga 3.

Generellt kan sägas att dessa undersökningar har minskat möjligheterna för ekonomiska fynd inom fältet, men borrhningarna är mycket glesa inom (M) och (N), särskilt då 6-78 är borrarat in i ett gruvhål.

Se. utgör också ett frågetecken inom denna fyndighet - hur sitter det ? - är det utvinningsbart ? - är det säljbart ? (se bil. 4).

Se. är för det mesta en biprodukt från kopparproduktionen - kopparanoder håller i snitt ca 500 ppm Se.

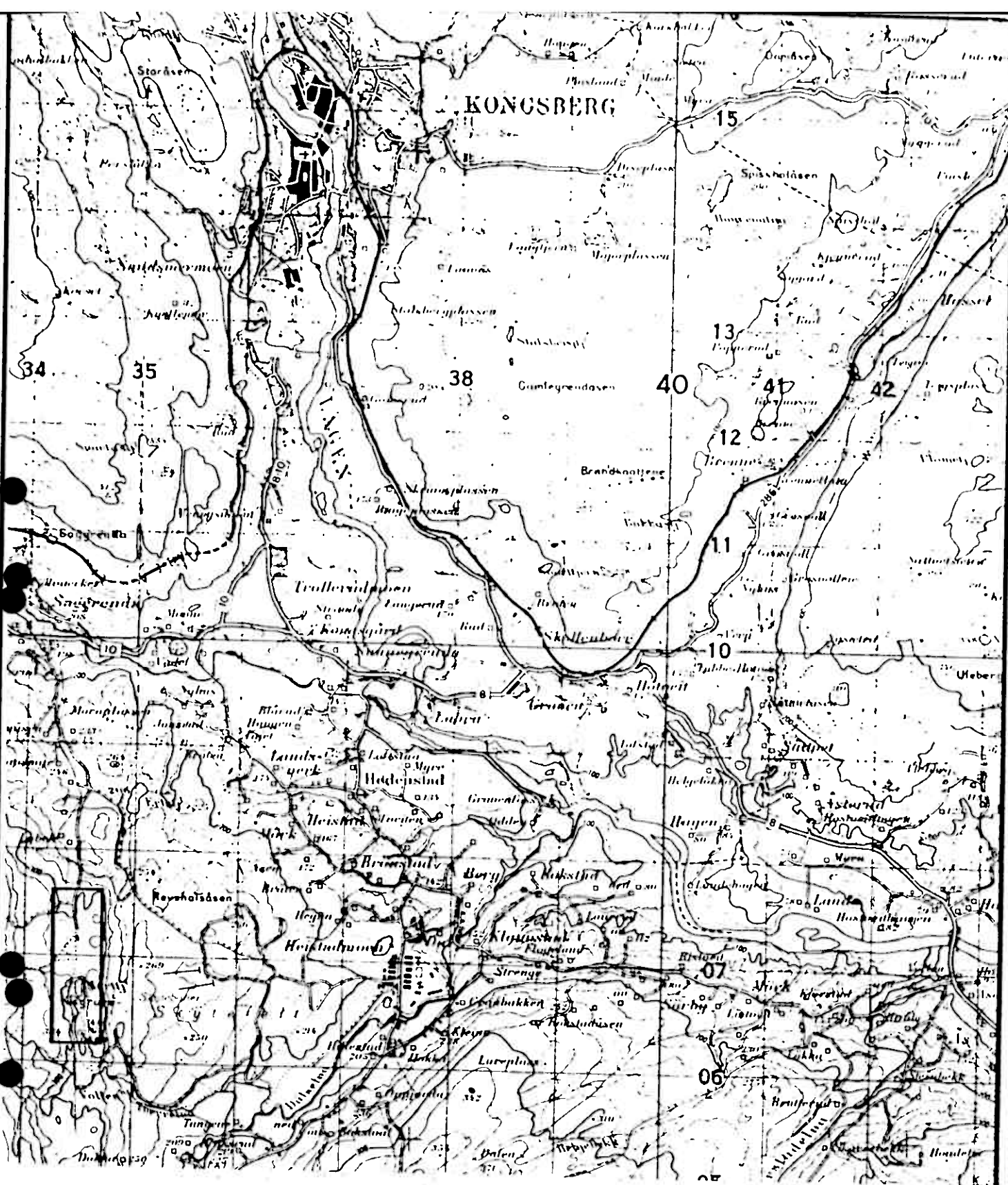
Kisgruvan är i första hand ett intressant typexempel inom Kongsberg - Modumfältets fahlbandsmineraliseringar.

Det föreslås följande:

1. En noggrann genomgång av allt material på NGU:s Bergarkiv
2. Geologisk kartering av Kisgruvestråket i skala 1:2000
3. Utvidgad provtagning inom (N) och (M)
4. Magnetisk totalfältsmätning ca 10 linjer på 400 m med 200 m linjeavstånd. (Viktigt att veta vilket detaljmagnetiskt uttryck ett fahlband kan ha).

Bergslagsenheten

Boye Flood



UNDERSØKT OMRÅDE

Bil. 1

USB 1978

OVERSIKTSKART

KISGRUVA/KONGSBERG, BUSKERUD

NORGES GEOLOGISKE UNDERSØKELSE
TRONDHEIM

MÅLESTOKK

1:50 000

OBS.

TEGN.

TRAC.

KFR.

TEGNING NR.

1650/7B-01

KARTBLAD NR.

1714-II



Norges geologiske undersøkelse

Bil. 2

Leiv Eiriksons vei 39 Postboks 3006
Tlf. (075) 15 860 7001 Trondheim

Postgironr. 5 16 82 32
Bankgironr. 0633.05.70014

Rapport nr. 1650/7B

Åpen/Forfattet

Tittel:

Diamantboring ved Kisgruva

Oppdragsgiver:

Ind.dep/USB

Forfatter:

Ingvar Lindahl

Forekomstens navn og koordinater:

Kisgruva, 345071

Kommune:

Kongsberg

Fylke:

Buskerud

Kartbladnr. og -navn (1:50000):

1714 II - Kongsberg

Utført:

Diamantboring 1978

Bearb./Anal. 1979-80

Sidetall: 14

Tekstbilag: 3

Kartbilag: 3

Prosjektnummer og -navn:

1650, Undersøkelse av Statens bergrettigheter

Prosjektleder:

Ingvar Lindahl

Sammendrag:

Data fra tidligere diamantboringer fra Kisgruva er sammenstilt og analysene samlet. Rapporten omhandler videre diamantboringer utført i USB-regi i 1978, tilsammen 537,60 m fordelt på 7 hull. Kisgruve-mineraliseringen er en fahlbånd-type med kobber og sink. I tillegg fører kisen omkring 400 g/t Se, og 10 g/t Ag. Det er gjort en økonomisk vurdering av mineraliseringen datert mai 1981. Konklusjonen er at forekomsten kan inneholde 2-3 mill t. kis, og at det bør søkes utmål på den.

Nøkkelord

Malmundersøkelse

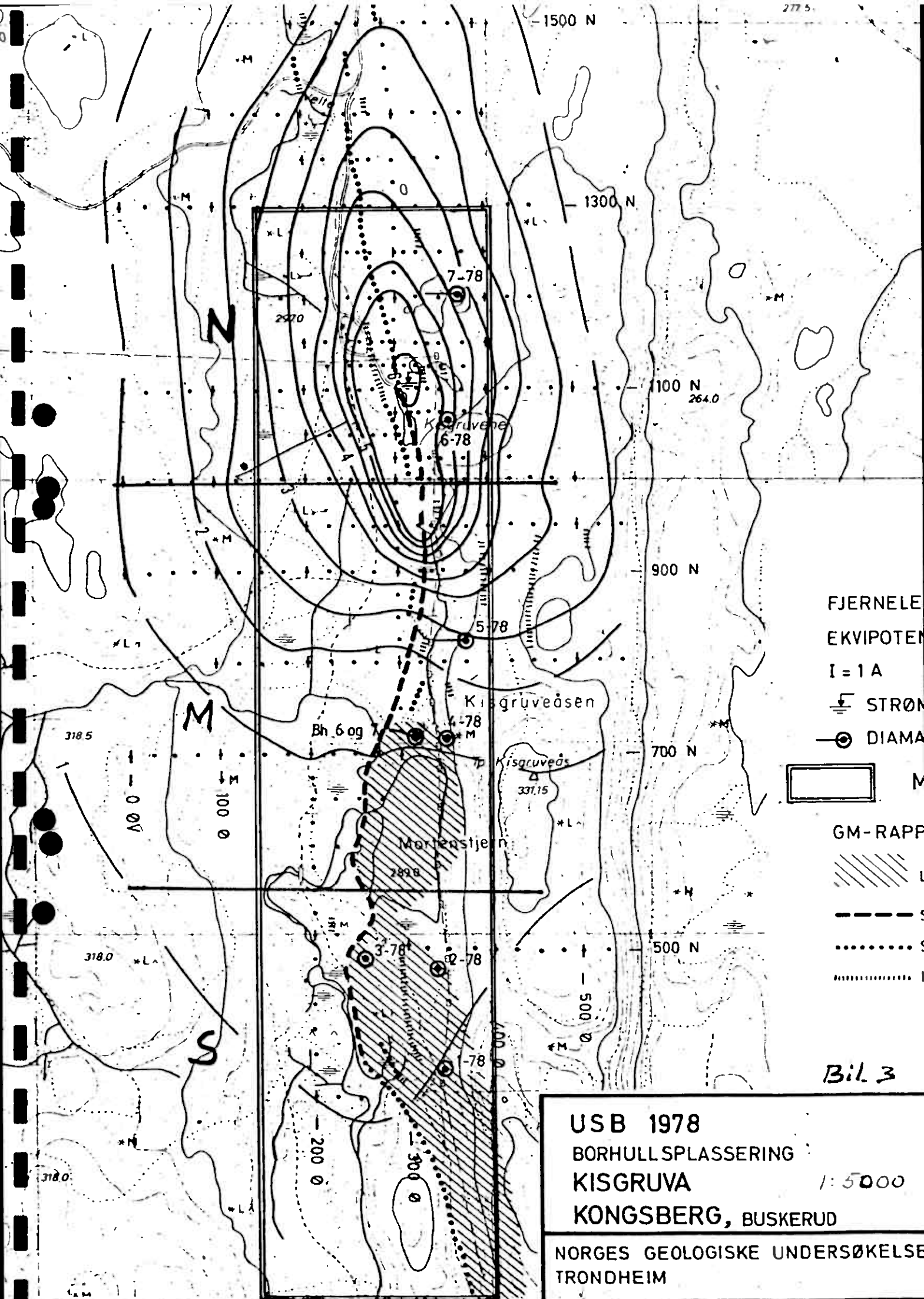
Cu + Zn

Diamantboring

Au, Se, Ag

Kisforekomst

Ved referanse til rapporten oppgis forfatter, tittel og rapportnr.



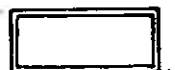
FJERNELEKVIPOTE

EKVIPOTE

$I = 1 \text{ A}$

STRØM

DIAMETER



GM-RAPPORT

U

S

S

S

S

Bil. 3

USB 1978

BORHULLSPASSERING

KISGRUVA

1:5000

KONGSBERG, BUSKERUD

NORGES GEOLOGISKE UNDERSØKELSE

TRONDHEIM

County, Wash. The ore will be hauled 20 mi to a flotation mill at Deep Lake, Wash., where the company recently purchased the plant from Washington Resources.

- Purchase of a grinding plant at Amelia, La., and mines in Nevada by Dow Chemicals from GH Fluids Services.
- Completion of second-phase expansions at both the Richwoods and Kingston claim washers of Desoto Mining Co. in Washington County, Mo. Desoto is owned by GH Fluids.
- Doubling of capacity at IMCO Services' Brownsville, Tex., grinding facilities to 200,000 st/yr. IMCO also plans to double capacity at its Houma, La., plant in the first quarter of 1982.
- Continuing development by Milchem Inc. of its Fancy Hill mine in Montgomery County, Ark., and construction of a flotation plant near the mine to upgrade mine production. Start-up is planned for the third quarter of 1982.
- Addition of another mill to NL Baroid's Dunphy, Nev., plant during the third quarter of 1981. NL Baroid has also started construction on a new grinding plant at Lake Charles, La., with start-up planned for October 1982.
- Construction of a mill by Old Soldier Minerals at Elk City, Okla., including a 54-in. mill. The company also plans to expand its Stormy Creek, Nev., jig plant in 1982.
- Continued production at the Old Spanish mine of Rocky Mountain Refractories in Nevada County, Calif.

Additions to barite capacity outside the US included:

- Construction of a grinding plant, consisting of two LM 13/2 Lopulco mills, by KCA Feosa Ltd. at Wuchow in southeast China. KCA has a compensation trade agreement with the

Chinese government to purchase the plant's production for two years.

- Beginning of mine development and preliminary work on a jig plant by Milchem Inc. in the Punta Colorado area in Chile. Milchem is working with local partners.
- Start of construction by Perubar SA at its Graciela mine in Peru. The plant will concentrate stockpiled, low-grade ore from previous operations.
- Addition of another Williams mill to Baroid de Venezuela's Punta Camacho, Venezuela, plant.

Outlook. Although the oil rig count leveled off during the last quarter of 1981, barite demand is still expected to increase by about 10% in 1982, because wells are being drilled deeper. Imports of barite will probably rise in 1982 in the US in response to some reductions in price, such as for Indian material, and lower water freight rates. China, Peru, India, Chile, and Morocco will continue to be important suppliers to the US. Because of the lower water freight rates for imported ore and increases in rail freight rates in 1981, Nevada production will probably decline in 1982. Crude ore prices in the US are expected to remain steady in 1982. Use of ground ilmenite and specular hematite as weighting agents has not appreciably affected barite consumption.

In the non-oilfield barite industry, Sherwin Williams has closed its barium chemical plant in Kansas, and China has started to export barium carbonate to the US market. The chemical grade producers continue to explore for reserves. ■

SELENIUM

PRODUCTION EXPECTED TO SUP IN RESPONSE TO COPPER CUTBACKS

G. Reid Bowby, marketing representative
Noranda Sales Corp. Ltd.

Apparent selenium consumption in the US rose to 1,167,000 lb in 1981, up from 756,000 lb in 1980, according to US Bureau of Mines estimates. Because these estimates are based on refinery production (rather than refinery shipments), plus the net of imports minus exports, plus the change in producer stocks, the increase is primarily attributable to higher US selenium production in 1981 than in 1980, when supply was diminished by a five-month copper strike. US imports for consumption increased an estimated 12% in 1981, while US exports declined by 11%. Producer stocks are forecast to be down to 600,000 lb.



Supply. In 1981, Western World selenium production rose to about 3.2 million lb from 3.0 million lb in 1980. The increase is attributable to higher US production, which more than balanced slightly lower production in Canada, Japan, and Europe. Lower world production is forecast for 1982, because depressed copper prices will result in a reduction in copper production. After 1982, selenium production will remain constant at 3.2 million lb and increase marginally as copper output responds to better market conditions.

In 1981, there were no new selenium producers, while one producer recovering selenium from slimes was believed to have suspended selenium recovery operations. Photocopier selenium

scrap remains a major source for the market, displacing sales of virgin selenium metal.

Demand. Western World selenium consumption increased to 2.7 million lb in 1981, up from 2.5 million lb in 1980. The increase occurred mainly in the US during the first six months of the year. In the second half, demand fell as the US economy weakened. European consumption of selenium declined in 1981, while Japanese, Asian, and South American demand remained relatively unchanged. Selenium usage by industry was estimated as follows: electronics and photocopying, 35%; glass, 25%; pigments, 25%; metallurgical, 10%; and chemicals and others, 5%.

The photocopying market continues as the major growth market. An amorphous layer of high-purity selenium on a photocopier drum acts as a photoreceptor, which, when charged with electricity, converts an optical image into an electrostatic image. The alloying of selenium with other elements, such as tellurium, will alter the photoreceptor's electrical and spectral response characteristics. The US photocopier market has been estimated to be growing at 18% per year, with competition between North American and Japanese manufacturers remaining intense, especially for the small-size, low-volume copiers.

Use of selenium as a decolorizer by the glass industry has been

US selenium statistics

(000 lb)

	1978	1979	1980	1981*
Production	509	587	311	600
Shipments for consumption ..	324	467	311	400
Imports for consumption	800	684	625	700
Exports	227	333	180	160
Year-end producer stocks ...	507	627	627	600
Apparent US consumption ...	897	818	756	1,167

Source: US Bureau of Mines; e—Estimated.

declining in recent years, partly due to economic conditions, partly due to substitution of plastic containers for glass beverage bottles, and partly due to increasing production of colored glass rather than clear flint glass. The glass industry also has been introducing thinner-gauge glass to reduce container weights, which has reduced raw material requirements. Greater use of cullets, or recycled glass, has reduced raw material requirements, too, while lowering operating costs, extending furnace life, and reducing emissions. Glass-industry demand for selenium is not expected to decline further in the future. The plastic-container share of the market for 2-liter beverage containers has stabilized, and the attempt to introduce 1/2-liter plastic containers is being firmly resisted by glass manufacturers.

Pigment industry demand declined in 1981, both in the US and Europe, as a result of lower automotive and construction activity. The imposition of the Swedish cadmium ban for most products that employ cadmium sulphoselenide pigments has been extended until 1985. Meanwhile, the need for and environmental impact of these pigments will receive further study.

Metallurgical demand for selenium has been increasing, primarily as a result of the success of selenium-alloyed, low-antimonial-lead, maintenance-free batteries. The main market for this type of battery is in Europe. The use of selenium in free-machining steel alloys remains constant.

In August 1981, the US Food and Drug Administration approved the addition of selenium to feed additives for laying hens and minor food animals, so all food-animal diets can now be supplemented with selenium. While the feed market is a small one, it is growing and now represents about 4% of total selenium

demand. Continued growth is expected, as means for top dressing pastures with selenium are investigated, and as research into the nutritional aspects of selenium for animals and humans expands.

Chemical applications for selenium, including use as oxidizing agents, in catalysts, and in anti-dandruff shampoos, maintained their market shares in 1981.

Prices. Selenium prices declined throughout 1981, as free market quotations fell from \$5.00-5.75/lb in January to around \$4.00/lb at year end. Continued market over-supply, stagnant industrial consumption, and the ready availability of low-priced offshore imports contributed to the price drop. All North American producers withdrew their published producer prices in 1981, although unpublished producer prices are still being maintained at premiums to merchant price levels.

Outlook. Selenium production is not expected to increase in 1982 and may decline as refined copper production is cut back in reaction to low copper price levels. Consumption is forecast to remain at 1981 levels and increase thereafter, as the world economy comes out of its current recession. Prices are not expected to improve significantly until industrial demand increases.

The long-term market outlook remains very promising, because new uses for selenium are emerging. Selenium has unique electrophotographic properties, which will lead to market opportunities in new photoreceptor technologies, photographic imaging systems, and solar energy. ■

GOLD

LOWER PRICES RAISE DEMAND IN JEWELRY AND LOW-PREMIUM SECTORS

L.W.P. van den Bosch, president
Chamber of Mines of South Africa

The upward trend in the gold investment cycle that played such a prominent part in the gold price rise of 1979 and the relatively high level of prices in 1980 came to an end during the course of 1981.



Rapid inflation, to some extent caused by escalating oil prices; poor returns on other investment assets, characterized by declining interest rates; accelerating political tension; and pessimistic expectations about future economic performances had been the main reasons for the investment boom in gold. A large number of investors shifted a portion of their portfolios into gold bullion, gold coins, or gold-related assets such as gold certificates, gold futures, etc. Prominent

among these investors were central banks, other institutions, and individuals seeking to invest the substantial surpluses generated in OPEC and other oil-producing countries. Estimated investment demand in 1979—consisting of the purchase of gold coins, gold bullion, and net additions to reserves by central banks—amounted to about 42% of total gold demand. In 1980, this portion of the market rose to some 58% of total gold demand, while in 1981, the investment demand fell to an estimated 34% of total demand.

The fall in the investment demand for gold had its origins in

the generally declining levels of inflation enjoyed by most industrialized countries. For instance, in the US, the seasonally adjusted annual rate of inflation fell from over 18% in early 1979 to less than 9% during 1981. The monetary policies implemented in the US and the United Kingdom, where there was a strong commitment to a strict monetary policy, and in many other industrialized countries, to offset the inflationary impact of the 1979 oil price hike, led to a rapid escalation of interest rates, which, in many cases, reached unprecedented levels. These levels not only provided investors with an attractive alternative to gold and other hard-money assets but also made the costs of holding positions in gold on a margin basis inordinately expensive.

Disinvestment resulted in a noticeable fall in the gold price. In 1980, the average price of gold on the London gold market was \$US614/fine oz. In 1981, this average price declined to \$460, with the average monthly price falling from \$557 in January 1981 to \$412 in December 1981.

The declining trend in the gold price did have certain positive aspects, in that demand in some applications increased in response to the lower price levels. For instance, the consumption of gold in jewelry is expected to have amounted to around 650 mt in 1981, up from 350 mt in 1980. The increased off-take of gold used in jewelry fabrication was achieved despite the fact that the level of disposable income did not rise to any significant extent in most of the major industrialized economies.

Demand for low-premium gold also recovered in 1981. Purchases of gold in this form are made by small investors seeking an inflation hedge, and they tend to purchase it in the form of gold jewelry (which is sold by weight with very little value added of an artistic content), small gold bars or wafers, and gold bullion coins. A feature of gold purchased in this form is that the major source of demand is the developing nations of the world, rather than among the more sophisticated investors in the industrialized countries.

Estimates of demand for low-premium gold in 1981 indicate that some 200 mt of gold were absorbed in the Middle East in the form of jewelry and small bars, and about 300 mt of gold