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Fagområde Geologi	Dokument type Rapport	Forekomster Kvåvenfjell Trolldalen		
Råstofftype Malm/metall	Emneord Ni Cu Fe S			
Sammendrag				

FOR FALCONBRIDGE NIKKELVERK A/S

A/S SULFIDMALM

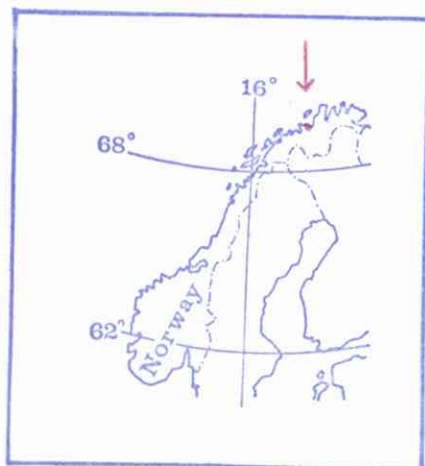
PROJECT 905-16

REPORT ON PROSPECTING IN THE KÅVEN AREA,
ØKSFJORD, WEST-FINNMARK.

OCTOBER 1972

by

H. A. ROSENQVIST



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A/S ✓

Please find attached Rosenqvist's report on prospecting in the Kåven area, West-Finnmark. Following up encouraging observations made in the 1971 field season, a search was made for sulphide bearing rock types. Sulphides appear widespread, but to be extremely low in Cu-Ni values. The best assays were 0.2% Ni, 0.15% Cu, 1.5% S from a boulder collected at the west of the area. Additional prospecting coverage in this area may be carried out during the course of "Operation Phoenix" in 1973.

BeB Gammann

INTRODUCTION.

The Øksfjord area, defined as the peninsula between Øksfjorden and Langfjorden, is a part of the mafic-ultramafic province of western Finnmark. (Fig. 1). This province has been the main general target for project 905-16 N. Assessment of the Ni-Cu potential of the area was started in 1971 (project 905-5) by a small program mainly using stream sediment geochemistry. Based on these investigations, a limited area - Kåven - was outlined for further exploration.

PREVIOUS WORK.

The geology of the Øksfjord area was mapped by Krauskopf in 1953 (NGU 188 pp 29-50). He interpreted the layered mafic complex of the area as a product of extreme metamorphism of a pile of basaltic volcanics. Krauskopf's mapping was a part of a regional exploration program - mainly for nepheline syenites, but also Ni-Cu-Pt and Cr - carried out by NGU. His conclusion on the economic potential stated that "the area is a most unpromising one and the discovery of important ore deposits is at least unlikely".

It should in this connection be noted that Krauskopf's view on the geology is not supported by geologists presently working in the area. Prof. Sturt and Dr. Robbins (Univ. of Bergen) consider the layered mafic complex as a plutonic intrusive. Dr. Robbins (now also acting as a consultant for Elkem-Spigerverket A/S) is presently remapping the Øksfjord area.

Sulfidmalms activities in the area, initiated by geological information from Sturt, started in August 1971. Stream sediment sampling combined with reconnaissance prospecting was carried out covering all but the northernmost section of the peninsula. The results of these investigations are reported in report no. 101-71-5. The main observations, giving encouragement, are summarized in fig. 2. A total of 25 points were claimed in the area outlined by these results.

PRESENT WORK.

Suggested by some discouraging assay results of sulphide mineralized rock samples from the 1971 survey, it was decided to carry out the present follow up work in a stepwise manner. This was also dictated by other interesting targets, which were brought to attention before the short field season.

The planned steps were:

1. Rough sulphide prospecting, followed by assaying of collected samples.
- 1'. Decision.
2. Geol. mapping, geophysics, extension of stream sediment survey.

Step 1 was carried out during 21-30.6., Sulfidmalm crew consisting of FE + LM/KS plus HaR (26-30.6.), whereby also claimed points were marked. The target was then "set on ice" awaiting assay results from the 10 best looking sulphide mineralized rock samples. When these turned out to be all but encouraging, no further work was done in the area.

GEOLOGY AND MINERALIZATION.

(1) Kåvenfjell SE - slope.

The area is dominated by a banded gabbro, usually of a rather anorthositic appearance. The general trend of the banding (layering) is NE/45°NW with variations as already shown by Krauskopf's mapping (fig. 2).

The gabbro complex in general is barren of sulphides. Very small and irregularly mineralized portions can however be found in mafic gabbro as well as in leucocratic variants. The sulphides, pyrrhotite with subordinated chalcopyrite, usually do not make up more than 5 vol. % of the mineralized rock. The sulphide mineralizations, found in the area, largely occur as

disseminations in small (10-50 m strike length) rusty mafic-ultramafic lenses and shear zones within the gabbro complex. These portions seem to occur irregularly distributed on the slope, although no attempt to map them was made.

Sample 30 (for location see fig. 3) represent the richest mineralization found. Here fine grained pyrrhotite occurs interstitially between the silicates of a mafic gabbro type. Chalcopyrite can be seen in minor quantities associated with the pyrrhotite. The visually estimated sulphide content here is 10%. The lateral dimensions of the mineralized portion is approx. 10x50 m.

Sample 27 shows how the sulphides are enriched in comparatively olivine rich bands of 1 cm's width. This very interesting and rather promising fact could not be observed at a larger scale. The reason for that might simply be that ultramafic differentiates of the layered gabbro complex do not exist at larger scales in the area. (See text below).

One major belt of peridotite, 15-20 m wide, runs conformably along the slope. This belt, with its yellow - rusty weathering surface, corresponds to the "promising gossan zone" noted and claimed during the 1971 survey. The rock types in the belt varies from pure dunites to peridotites consisting of olivine, pyroxenes and plagioclase. The main ore mineral of this ultramafic belt is magnetite (sample 31), whereas py only seem to occur as occasional small grains.

Outside the main peridotite belt, ultramafic rocks also dominate on the ridge SE of Dalvannen (fig. 3) and the ground immediately NE of Kåvann. Sulphides of any importance were not found in these localities.

NE of Kåvann peridotite occurs in a 100-200 m wide zone (90/60 N), where it is brecciated by an anorthositic gabbro into angular rafts. This is a clear evidence of time difference between the emplacement of layered

gabbro and the peridotites. Hence, the more or less conformable peridotite belts can not be regarded as syngenetic ultramafic differentiates of the gabbro complex.

The brecciated zone above can be interpreted as a result of

- 1) gabbro intrusion brecciating an older peridotite
- 2) peridotite intrusion in gabbro, whereby anatectic leucocratic gabbro differentiates reintruded and brecciated the peridotite. (Brian Sturt's ideas on W. Seiland).

(2) Trolldalen.

Rough and rapid prospecting of this valley showed that sulphide mineralization can be found in ultramafics, gabbro, as well as in syenite.

A steep cliff, facing east, in the northernmost part is heavily rusty. The cliff, which probably is the expression of a fault in 200 - 210° steep W, consists of a light greenish syenite cut by mafic dikes. The rusty weathering is caused by a rather evenly distributed pyrrhotite dissemination in the syenite. Estimated content of pyrrhotite up to 10 vol. % (sample 37 B). One exceptionally heavily po-mineralized syenite sample (37A) was collected from a local boulder. Assay results showed the mineralization to be non nickelferous.

Of more interest is the sulphide dissemination frequently observed in gabbroic boulders west of BH-vann and northwards. Mineralization occurs in mafic as well as leucocratic types, the former giving some encouragement in positive DMG-tests.

Sample 35 A, representing this mafic gabbro type, is similar to sample 30 described above. The sulphides, po and subordinated cp, are rather evenly distributed and constitute a good 10% of volume. The source of this nicely mineralized boulder is regarded local (W - NW of BH-vann), but has not been traced.

A dunite, exposed approx. half way up the walley contains pyrrhotite but only in insignificant amounts (sample 25).

(3) Rock samples and assay results.

The location of rock samples are marked on fig. 3.

Assays of ten mineralized samples were carried out using a X-ray fluorescence method by the Falconbridge lab. in Kristiansand.

No	Description	Boulder	Assay			
			Ni	Cu	Fe	S
16 ØK 21	Fine grained po (+cp) diss gabbro.		0,04	0,08	18,0	1,7 %
22	Faintly po (+cp) diss. banded gabbro.					
23	Strangly weathered mafic band in gabbro. Sulphide diss.		<0,01	0,14	9,8	0,78 %
24	Faintly po (+cp) diss. mafic gabbro.		<0,01	0,07	8,8	0,98 %
25	Fine grained black dunite. Weakly sulphide diss.					
26	Fine grained sulphide diss. in anorthositic gabbro.	Δ				

No	Description	Boulder	Assay			
			Ni	Cu	Fe	S
16 Øk 27	Po (+cp) enriched dark bands in gabbro.					
28	Po (+cp) diss. mafic gabbro.		<0,01	0,06	10,8	0,61 %
29A	Narrow rusty shear zone in gabbro.					
B	Rusty, weathered lens in gabbro.					
30	Po (+cp) diss. mafic gabbro.		<0,01	0,10	15,4	1,5 %
31	Magnetite-bearing peridotite.	Δ				
32	Peridotite (with plg.).					
33	Po (+cp) diss. mafic gabbro.	Δ	0,01	0,06	11,4	0,40 %
34	Po (+cp) diss. mafic gabbro.	Δ	<0,01	0,06	8,8	0,92 %
35A	Nice po (+cp) diss. mafic-ultramafic rock.	Δ	0,20	0,15	8,2	1,5 %
35B	Nice po (+cp) diss. anorthositic gabbro.	Δ				
36	Strongly po-mineralized gabbro.	Δ	<0,01	0,01	17,8	4,6 %
37A	Strongly po-mineralized syenite.	Δ	<0,01	0,01	45,8	26,4 %
37B	Po-diss. syenite.	Δ				

Δ = local boulder.

CONCLUSIONS AND RECOMMENDATION:

- 1) Field observations suggest that the ultramafic rocks of the area do not represent syngenetic differentiates of the main layered gabbro complex.
- 2) Sulphide bearing portions occur in the area, however of modest dimensions and with economically unimportant Ni-Cu content.
- 3) Stream sediment anomalies (1971-survey) are thought to reflect
 - a) secondary enrichment of heavy minerals (incl. ore minerals) in extremely rapid streams. Thus, the collected samples do not truly represent the stream catchment.
 - b) the Ni-Cu content of mafic-ultramafic rocks including sulphide mineralization.
- 4) In the light of our present knowledge (check assays on rock samples will be done *) further exploration work in the Kåven area is not recommended.

If check assaying reveals considerably higher Ni-Cu results then the following procedures should be considered

- a) Geological mapping and detailed prospecting of the Kåven area.
- b) VLF-EM profiling over the same area.
- c) Extended sulphide prospecting.

Encl. Fig. 1. Genl. location map.

- " 2. Summary of encouraging observations 1971.
- " 3. Location map for marked claim points and collected rock samples.

*) Check assays did unfortunately not change the picture.

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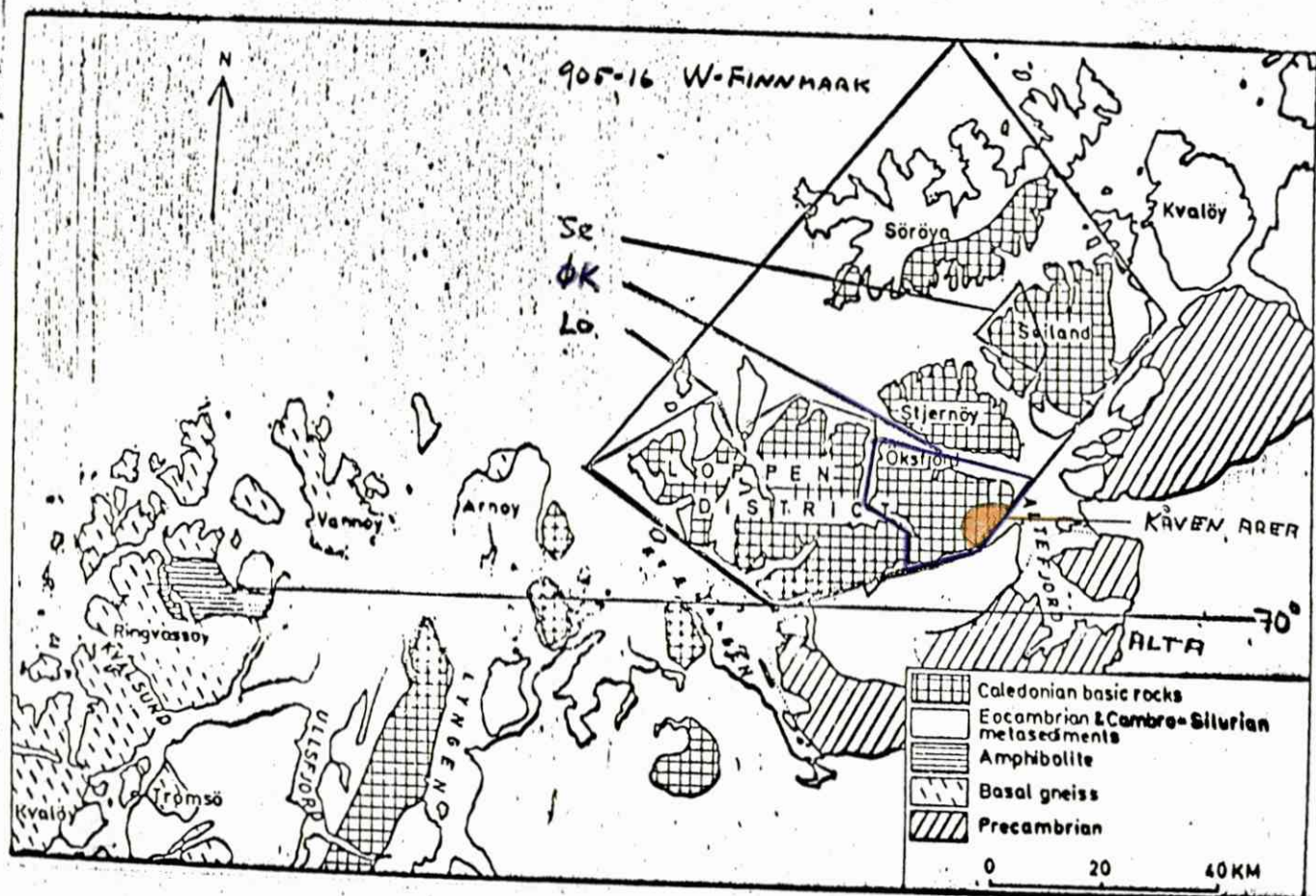


Fig 1 LOCATION MAP

