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Tittel

Technical report on the Råna Nickel-copper project, Ballangen, Norway
Exploration activities 2007
TEKSTDEL

Forfatter
Vognsen, Mikkel

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Råna ApS

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Ballangen	Nordland		13312	Narvik

Fagområde
Geologi
Geofysikk
Geokjemi

Dokument type

Forekomster (forekomst, gruvefelt, undersøkelsesfelt)
Bruvann Arnes Rånbogen

Råstoffgruppe
Malm/metall

Råstofftype
Ni Cu

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

Mineralised +/- graphite-rich, massive to disseminated sulphide mineralized mafic-ultramafic boulders and in-situ rocks have been found in several places. The sulphide mineralization style show a broad variety, dominated by magmatic disseminated sulphides in ultramafic rocks. Semi- to massive sulphide veins and mineralized magmatic breccias has been intersected in several drill cores. Ni content varies significantly between the different mineralization styles.

Soil sampling in the 2007 season showed elevated nickel values in several large areas, based on a 20x20m soil sample grid. This approach provided for an excellent base for screening "prospective" from "none-prospective" areas, both in vegetation covered areas and barren rock and scree dominated mountain slope.

Geophysical surveys were conducted within selected areas. Ground based Mag and EM Beep-Mat geophysical surveys were used to confirm the presences of conductors. Prior to the 2007 diamond drilling campaign, a geophysical 3D model was produced, indicating drill target conductors located both on the Arnes bloc and Rånbogen block.

BILAG 1 med vedlegg SH-001 - SH-010, se rapport BV 4961
BILAG 2 med vedlegg SH-011 - SH-017, se rapport BV 4962

TECHNICAL REPORT ON THE RÅNA NICKEL-COPPER PROJECT, BALLANGEN, NORGE

EXPLORATION ACTIVITES 2007

Prepared for

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Exploration Licenses:
no. 0334-0447/2005-NB
no. 0596/2007-NB
no. 0597/2007-NB

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Summary

Introduction

The purpose of this report is to provide a technical report compliant with the mineral concession requirements to The Directorate of Mining with the Commissioner of Mines at Svalbard (Bergvesenet) for exploration activities on mineral claims owned or optioned by Råna ApS and Bruvann ApS in the Råna area, northern Norway.

Work on the Råna Nickel-Copper project is conducted within the exclusive mineral exploration license no. 0334-0447/2005-NB, no. 0596/2007-NB, and no. 0597/2007-NB issued by the Directorate of Mining with the Commissioner of Mines at Svalbard, Norway.

Property Description

The license area is comprised of several individual licenses. Råna ApS hold ca 34 km^2 exploration license area set to expire on 31 December 2011 and Bruvann ApS holds ca 1 km^2 exploration and mining license set to expire on 31 December 2010.

From late May to late October, 2007, extensive fieldwork was carried out, including a diamond drill campaign with a total of 2738 m drilled core. The activities were the continuation of the extensive geological investigation program which geologists from Scandinavian Highlands Holdings A/S (SH) have carried out in the area since summer 2005. The exploration activities follow two parallel lines: Re-evaluation of the remaining ore body in the Bruvann mine and renewed exploration in the fertile mafic-ultramafic blocks in the northern part of the Råna intrusion.

The License area covers the northern part the Råna intrusion, including the Bruvann Mine. The Råna intrusion is an orogenic mafic–ultramafic intrusion of Silurian age (ca 437 Ma) (Tucker *et al.*, 1990) now situated in Caledonian host rocks. The intrusion is likely to be of allochton nature.

History

Earlier work in the license area is diverse. The eastern part of the Bruvann ore body was discovered in 1912. Exploration activities continued in the area up thru the 20'Th century by various organizations/companies and the Norwegian Geological Survey (NGU), resulting in volume indications of the ore in Bruvann deposit. Together with the work around the Bruvann deposit some regional work was made. Especially the area to the north of the Bruvann deposit was goal for pitting and trenching activities, leading to the discovery of several smaller Ni-occurrences.

Mining activities was established in 1989 by Nikkel & Olivin A/S. The business base was the Falconbridge resource calculations and an assumption about simultaneous production of olivine and aggregates. Mining started less than one year later. Outokumpu bought the concentrate.

Neither the olivine- nor the aggregate production had commercial success and after only three years of production Outokumpu bought the majority in Nikkel & Olivin A/S. In 1997 Outokumpu made a strategic decision that the company should redraw from mining. The mines that represented value were sold and Bruvann mine was closed as scheduled in 2001

The total mined tonnage from 1989 to 2001 was 8.2 Mt with a grade of 0.52 wt% Ni and a cut off in the range 0.43 – 0.47 wt% Ni depending on the nickel price.

Outokumpu had a small exploration program running from 1996 – 2001. The exploration had a strong focus on supply to the existing mine facilities and was therefore almost entirely limited to the surroundings of the existing mine. A regional Helicopter borne HEM / Magnetic survey covering the northern part of the intrusion was made in 1996. It outlined an area with high conductivity on the western part of the Ránbogen block (Fig. 1), 5 km east of the mine but the anomaly was not followed up.

In 2001 several diamond drill holes were made in the Arnes block (Fig.1) approximately 2 km to the north of the mine but though the indications were promising, the exploration activities stopped together with the mining. Scandinavian Highlands A/S obtained exploration license for the northern part of the Råna Intrusion including the Bruvann mine in 2005.

Status of Exploration

Mineralised +/- graphite-rich, massive- to disseminated sulphide mineralised mafic-ultramafic boulders and in-situ rocks have been found in several places. The sulphide mineralisation styles show a broad variety, dominated by magmatic disseminated sulphides in ultramafic rocks. Semi- to massive sulphide veins and mineralised magmatic breccias has been intersected in several drill cores. Ni content varies significantly between the different mineralisation styles.

Soil sampling in the 2007 season showed elevated nickel values in several large areas, based on a 20 x 20 m soil sample grid. This approach provided an excellent base for screening prospective from non-prospective areas, both in vegetation covered areas and barren rock and scree dominated mountain slopes.

Geophysical surveys were conducted within selected areas. Ground based MAG and EM Beep-Mat geophysical surveys were used to confirm the presences of conductors. Prior to the 2007 diamond drill campaign, a geophysical 3D model was produced, indicating drill target conductors located both on the Arnes block and Ránbogen block.

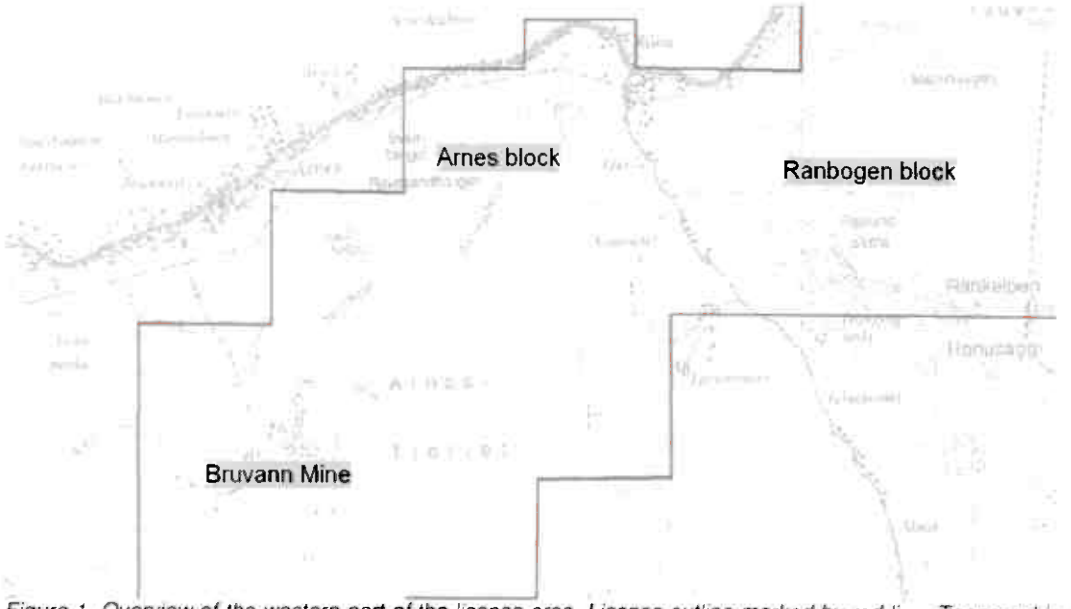

Figure 1. Overview of the western part of the license area. License outline marked by red line. Topographic map sheet M711, Statens Kartverk (1:50.000; 1331 I, Skjomen). Figure orientated N-S.

Geological Activities

Detailed exploration within the exclusive mineral exploration license involved several approaches. A rock and soil sampling campaign were conducted throughout the season. Simultaneously with the rock sampling a detailed geological mapping of the most favourable areas were performed. Ground based geophysical surveys were performed aiding the location of promising drill targets and areas of general interest.

The first part of the field work, between 20 May and 27 June, was carried out by a 10 man team, consisting of three SH geologists and one SH geophysic. 6 geological assistances were working on the Råna project with varying field durations. The second part, between 9 July and 6 August was carried out by a 6 man team, run by one SH geologist and five assistances. The third and last part of the field work involved the drill program and ran from 17 August to 22 October. Three SH geologists and four assistances, excluding the drill personnel (eight) were involved in the last part of the field season. The duration of each participant's field work varies and the number of people involved has constantly over entire field work season been adjusted, to meet the immediate needs and avoid "overpopulation" of camp.

Soil sampling

A total of 4000 soil samples were collected. A sampling grid of 20 x 20 m grid was laid out on both the northern mountain slopes of the Rånkeipen and Arnes (Fig. 2 and 4). All soil samples were analysed using a handheld XRF gun (model INNOV-X CLASSIC™, http://www.innovxsys.com).

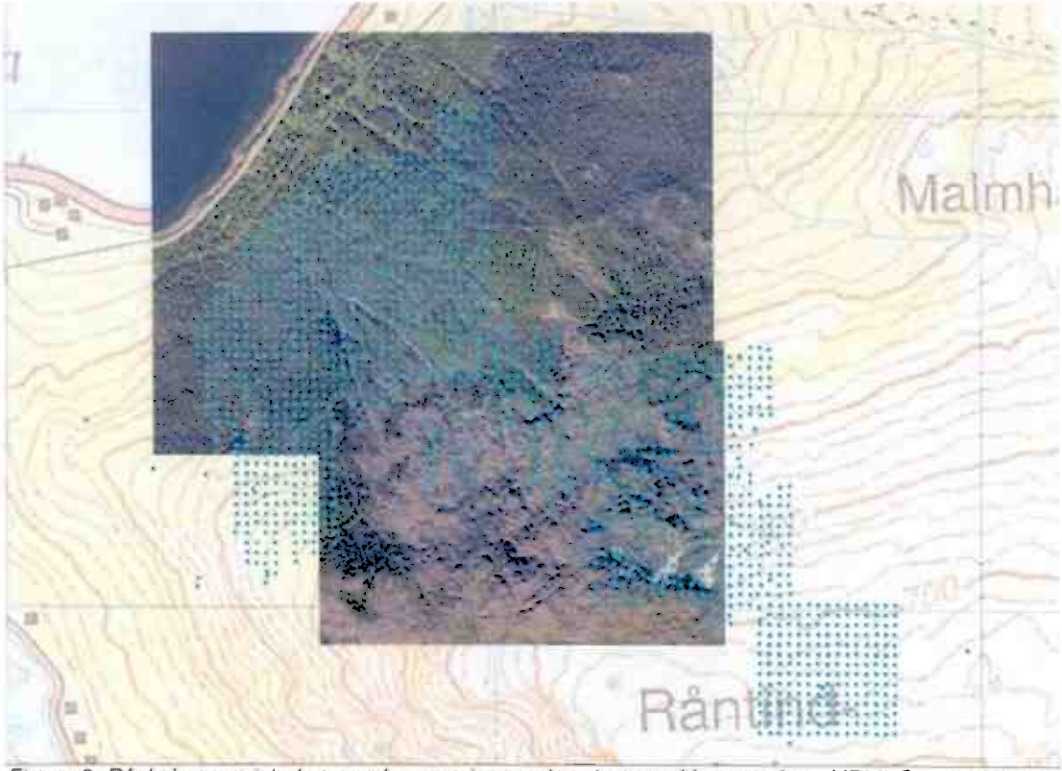

Figure 2. Rånkeipen aerial photography superimposed on topographic map sheet M711, Statens Kartverk (1:50.000; 1331 I, Skjomen). Soil sample locations shown as light blue dots. Frame approximately 1 x 2 km. Figure orientated N–S.

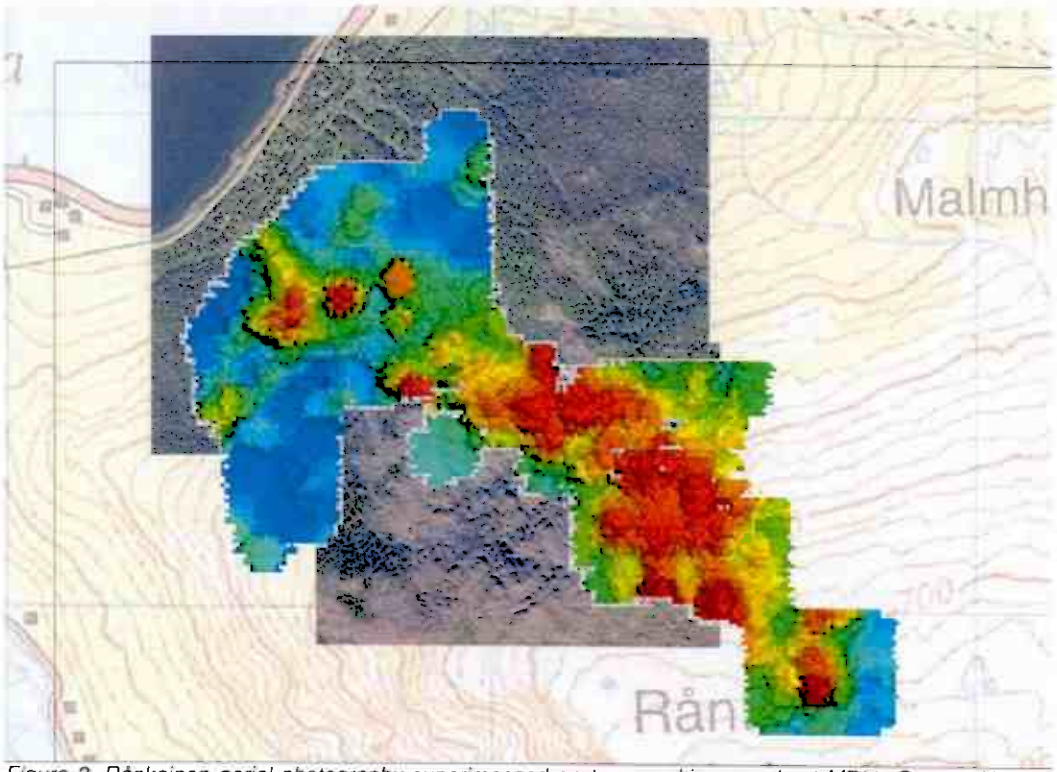

Figure 3. Rånkeipen aerial photography superimposed on topographic map sheet M711. Statens Kartverk (1:50.000; 1331 I. Skjomen). Geochemical nickel anomaly based on soil samples. Frame approximately 1 x 2 km. Figure orientated N–S.

On figure 3 above, the high nickel anomalies found on the slopes of Rånkeipen are shown in orange to red colouration. A NNW–SSE trending anomaly is evident, but the actual size of the anomaly, must be corrected for possible downslope contamination.

A similar Ni anomaly has been found on the northern slopes of the Arnes block. Here the 20 x 20 m soil samples grid (Fig. 4) show a NNE–SSW trending Ni anomaly. The Ni anomaly shown in Figure 5, is sub- to parallel with larger mapped ultramafic rock units. Downslope contamination is less of a problem compared to the anomaly found on Rånkeipen.

Figure 4. Arnes aerial photography superimposed on topographic map sheet M711. Statens Kartverk (1:50.000; 1331 I, Skjomen). Soil sample locations shown as light blue dots. Frame approximately 1 x 2 km. Figure orientated N–S.

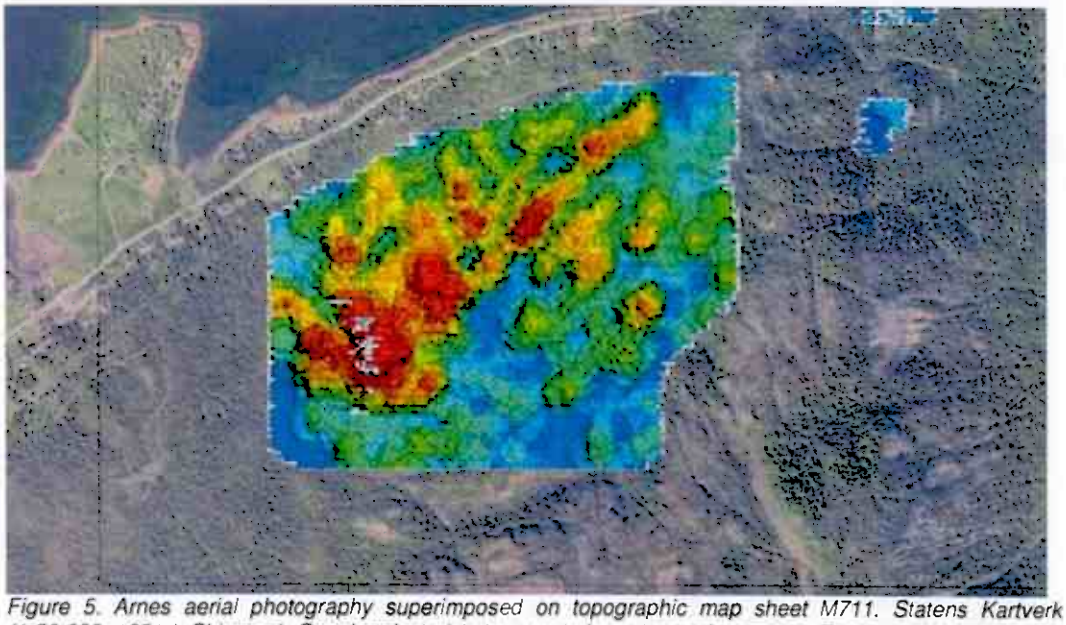

Figure 5. Arnes aerial photography superimposed on topographic map sheet M711. Statens Kartverk (1:50.000; 1331 I, Skjomen). Geochemical nickel anomaly based on soil samples. Frame approximately 1 x 2 km. Figure orientated N–S.

Rock sampling

In addition to soil samples ca 400 surface rock grab samples have been collected during the 2005, 2006, and 2007 season. The rock samples have been ICP-MS analysed by ALS Chemex in Ojebyn, Sweden. Both in-situ and boulders with massive sulphides have been found. Out of the localities sampled in the 2007 season, the highest values in a rock grab showed: 2,3 % Ni and 0,3 % Cu.

Geological mapping, inspection and interpretation

Inspection and additional sampling of known sulphide mineralised locations were done in the early part of the season. Numerous new sulphide mineralised locations were found and sampled. Generally the outcropping rock is rotten and non-weathered mineralised samples can be hard to locate. Both mineralised boulders and in-situ rocks were sampled.

The objectives for detailed mapping include: I) Mapping of known mineralised locations and possible expansion of the areas. II) Understanding the various mineralisation types and their petrogenetic origin. III) Mapping and structural measurements of ore hostrock.

Geophysical surveys

Two different geophysical surveys were conducted during the 2007 season. The aim was to confirm and test already known geophysical anomalies and possibly expanded these. The background for the 2007 surveys was the air-born TEM-surveys carried out during 2005 and 2006.

A ground based MAG survey using a portable Cesium Magnetometer/Gradiometer (model G-858, http://www.geometrics.com/858-d.html) covered an area of 1,1 km^2. The MAG activities were concentrated on the mountain slopes of Råvkeipen and to a lesser extend on the Arnes block.

In addition to the MAG survey, a ground based EM Beep Mat (model BM8, http://www.gddinstrumentation.com/) survey was done, covering an area of ca 2,4 km^2, overlapping much of the MAG surveyed areas.

Diamond drill campaign

The diamond drill campaign in 2007 resulted in 2738 m, based on 11 drill holes using two wire-line diamond drill rigs. Two drill holes were located on the north-western part of the Arnes block and the remaining nine drill holes were located on the north-eastern part of the Rånbogen block. Figure 6 show the locations of both 2006 and 2007 diamond drill campaign.

All holes were drilled from the surface using conventional equipment, using a BQ core size (47 mm). Together with the 2006 drill campaign a total of 3982 m of core has now been drilled.

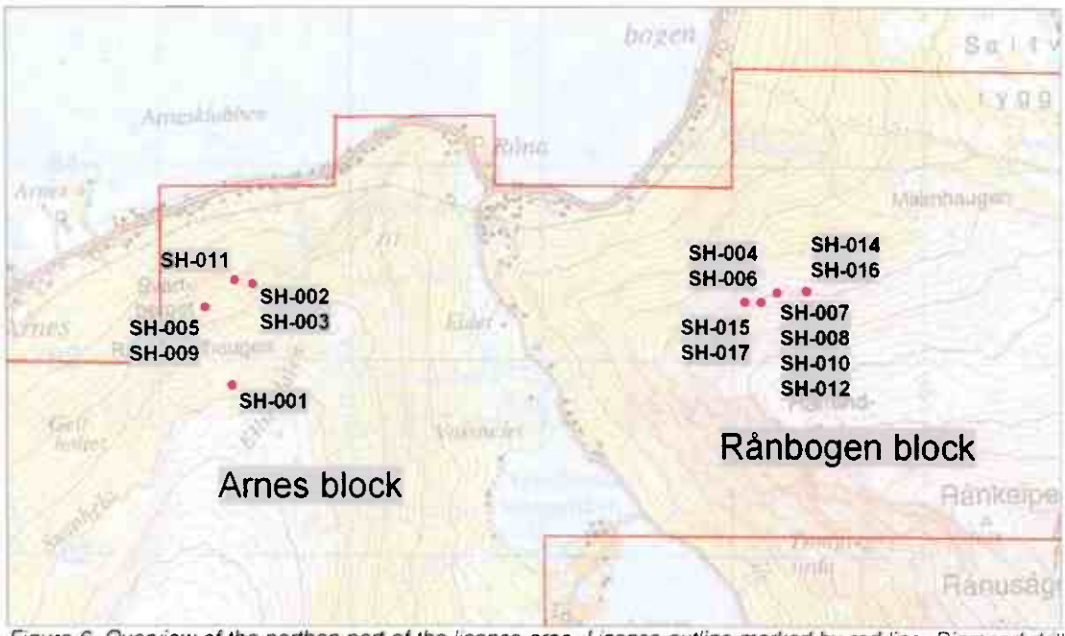

Figure 6. Overview of the northen part of the license area. License outline marked by red line. Diamond drill hole locations shown with pink dots. Topographic map sheet M711, Statens Kartverk (1:50.000: 1331 I, Skjomen). Figure orientated N-S.

References

Tucker, R., Boyd, R. & Barnes, S-J. 1990: A U-Pb zircon age for the Råna intrusion, N. Norway: new evidence of basic magmatism in the Scandinavian Caledonides in Early Silurian time. *Norsk Geologisk Tidskrift* **70**, 229-239.