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Tittel
Ni-Cu-Co exploration on the Senja Island, Northern Norway, 2007

| Forfatter | Dato År | Bedrift (Oppdragsgiver og/eller oppdragstaker) |
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| Jokela, Jukka | 25.01 2008 | Store Norske Gull AS |

| Kommune | Fylke | Bergdistrikt | 1: 50 000 kartblad | 1: 250 000 kartblad |
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| Berg | Finnmark | | 13332 14331 | Tromsø |

| Fagområde | Dokument type | Forekomster (forekomst, gruvefelt, undersøkelsesfelt) |
|---|---|---|
| Geologi<br>Geofysikk | | Hamn |
| **Råstoffgruppe** | **Råstofftype** | |
| Malm/metall | Ni Cu Co | |

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

Det ble utført mindre rekognoserende geologisk kartlegging, med besøk på 84 blottninger med tilhørende måling av suscessibilitet, samt et kort magnetometrisk profil.

Resultatet av felundersøkelsene er at Hamn-intrusjonen har et potensiale til en økonomisk malm. De viktigste mineralene i den forbindelse er Ni, Co og Co

# Store Norske Gull:
# Ni-Cu-Co exploration on the Senja Island, NW Norway, 2007.

## Summary

A recognizing field trip was done to the Senja Island in early summer 2007. Bedrock mapping and lithological sampling was carried out in the North Western part of the Hamn intrusion during the field trip.

According the studies carried out during this field season the ultramafic part of Hamn intrusion has potential of economic nickel ore.

Intensive exploration program of geological mapping, geophysical surveying and diamond drilling will be planned to continue exploration work in the Hamn target area.

## 1. Introduction

### 1.1. General

The Hamn mafic-ultramafic intrusion is located on the Senja Island in Troms County, NW Norway (map sheet 1333 1). All available geological and topographical data from the Senja Island was collected and processed with GIS tools during spring 2007 for the base of further fieldwork in this area of interest.

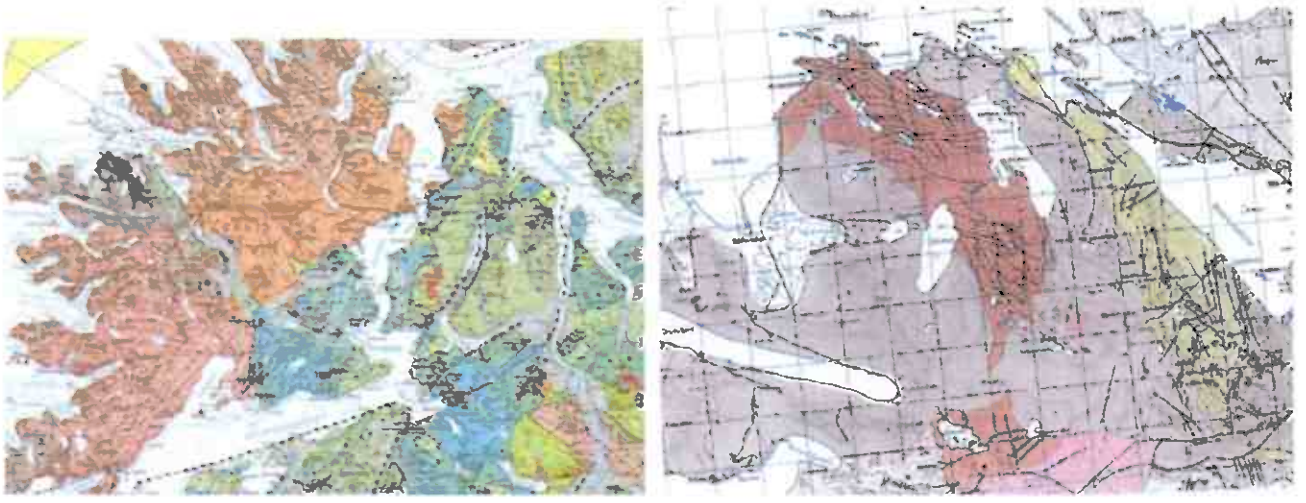


**Figure 1. Geology of the Senja Island (A) and the Hamn mafic-ultramafic intrusion (B) (NGU geological maps)**

### 1.2. Geology

The Hamn mafic-ultramafic intrusion covers an area of ca. 2x8 km in NW-SE direction with a separate body of 1.5x2 km south of the main body. Surrounding country rocks in the area are mainly intensively migmatized metasediments and metavolcanic rocks.

Hamn nickel deposit is located in the NW end of the intrusion on the ocean shoreline. This deposit was one of the first nickel mines in Norway as well as in the world. Ore deposit was mined during the period 1872-1886. Approximately 1000 tones of nickel and cobalt and 500 tones of copper were produced from ore with average grade of 0.9% Ni. The main ore lens at Hamn is some 80 m long and 15 m wide at the surface wedging out downwards. Mining was finished in 75 meters depth because of flooding of the seawater. Sulphides in the ore are pyrrhotite, pentlandite and chalcopyrite as breccia mineralizations and as disseminations in gabbro and pyroxenite layers. A typical assay of rich mineralization gives 2.5% Ni, 0.13% Co, 0.33% Cu, 6.8% S. (H.Papunen & al, 1985; C.Riiber, 1946).

### 1.3. Exploration rights

Store Norske Gull owns 82 claims (Hamn 1-82) on the Senja Island covering the Hamn mafic-ultramafic intrusion.

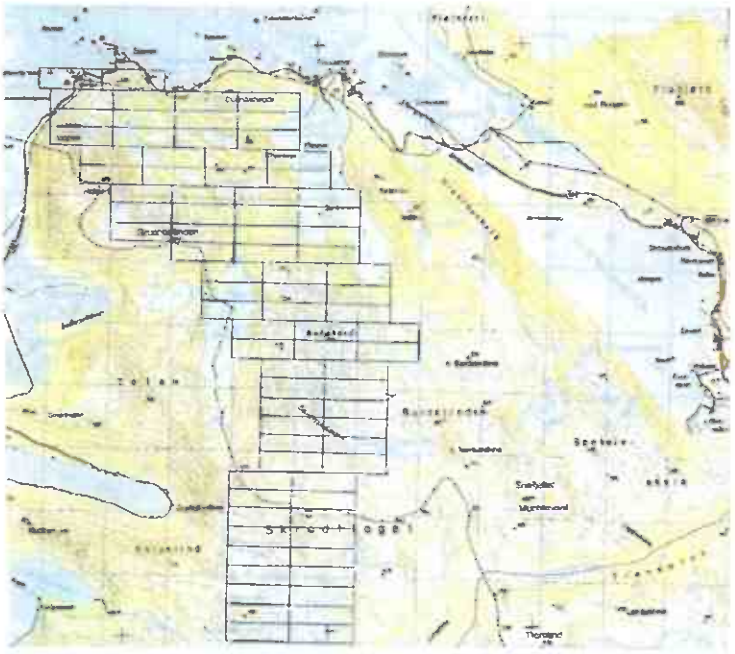


**Figure 2. SNG's claims on the Senja Island.**

## 2. Fieldwork 2007

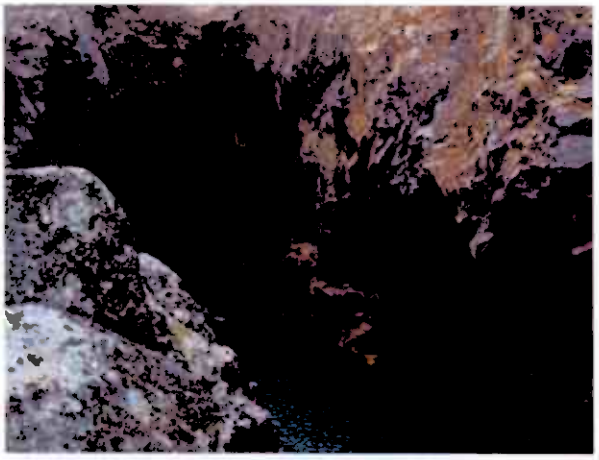
Senior geologist Jukka Jokela (SNSK) and PhD. Hannu Makkonen (GTK) made a recognizing field trip to Senja Island in early summer 2007. Aim of the field trip was to do preliminary geological mapping and lithological sampling over the Hamn mafic-ultramafic intrusion. Mapping was concentrated in to the northern parts of the intrusion because of the difficult snow circumstances in the area deeper in the inland. Work was carried out partly from the town of Gryllefjord and partly by camping on the mountainous area. Access to the mountainous area was done by helicopter transport.

Bedrock mapping was made mainly in profiles in the NW part of the intrusion. Altogether 84 outcrop observations were made in the area. Locations of outcrops were measured by handheld

GPS. Magnetic susceptibility was measured on every outcrop. In the mine crosscut and in the Storvatnet area a short magnetic profile was measured by Jalander magnetometer.

Sample treatment, petrographical studies, lithogeochemical analyses and petrophysical studies were contracted out to the Geological Survey of Finland (GTK).

Altogether 94 samples were analyzed with different methods (XRF-ICP-PGE-Au-S) in GTK laboratories.



**Figures 3-4. The old Hamn nickel mine on the Senja Island.**

**Figures 5-6. Storvatnet area and the north eastern edge of the intrusion.**

## 3. Results

According the studies carried out during the field season 2007 the Hamn intrusion and the related nickel deposit have much in common with the Finnish 1.88 Ga Svecofennian nickel bearing intrusions.

The intrusion is formed from a basaltic magma containing ca. 12 w-% MgO. The intrusion was made by two main magma pulses. Probably the first pulse produced the gabbros and second pulse produced the ultramafic, nickel potential rock types. The magma has reached a throughout sulphur saturation resulting in sulphide segregation in some stage of the intrusion history.

According the studying results 2007 the ultramafic part of the Hamn intrusion has potential of economic Ni-ore. Economically most important metals are Ni, Co and Cu.

## 4. Further exploration 2008

The whole Hamn intrusion will be geologically remapped with the emphasis of ultramafic rocks during the field season 2008.

Airborne helicopter geophysical survey (magnetic and electromagnetic TEM) will be carried out during the spring 2008. Gravimetric profiles will also be measured through the intrusion to get better information of the volume of the ultramafic parts of intrusion.

Diamond drilling project will be started in the fall 2008 to get more information of sulphide bearing ultramafic rocks. Geophysical drillhole survey is also needed at this stage. Drilling will be planned with the help of new geological and geophysical data and interpretations.

Jukka Jokela

Espoo 25.01.2008

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