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...memorandum...

To	DIRMIN, Norway	Cc:	
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Contribution			
Date	26 January, 2020		

SUMMARY OF THE WORK UNDERTAKEN AT THE LITLAGA PROJECT, NORWAY

1. *Project location*

Litlaga project was acquired by Northern Lights Minerals (private company registered in Australia, ACN 608 335 119). The project is located in the northern part of the Nordland county of Norway, approximately 40 km south of the city Bodo (Fig. 1) and can be accessed from Bodo by the bitumean road (Fig. 2).

The project includes 3 licenses, main of which is the area-1 (Fig. 1) where outcrop of Ni-Cu sulphide mineralisation was found. This area was explored during 2015-2019. Coordinates of the license Area -1 are presented in the Table 1. Other licenses have not been explored and therefore not discussed in this report.

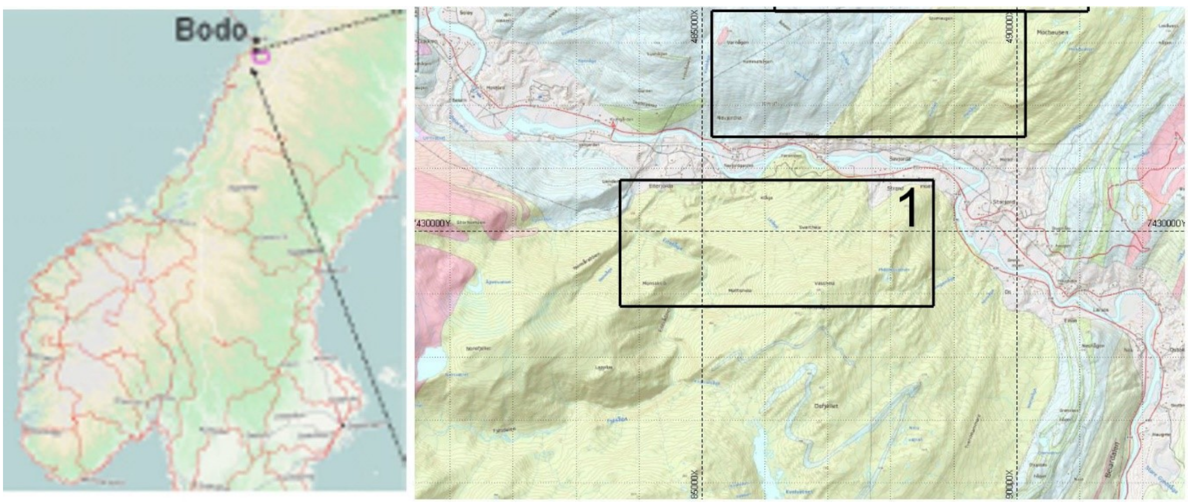

Fig 1: *Map showing location of the Litlaga project. Area-1 is proposed for drilling*

Fig 2: *Access roads, Google image*

Table 1: Coordinates (UTM zone 33, WGS84) of the Area-1

	East	North	Area (sq. m)
Area 1	488678.0	7430810.0	9,980,809
	483700.0	7430810.0	
	483700.0	7428805.0	
	488678.0	7428805.0	

2. *Mining History*

The high grade sulphide ores was mined in 1891-1892 yielding approximately 685 metric tons of ore with an average grade 6-7 wt-% Ni (unpublished NGU reports: Vogt 1901, p. 16, 1902, p. 9, Henriksen 1897, 1898). Ore was hand sorted and the most of the higher-grade ore was shipped whereas lower-grade ores were left on site (NGU, unpublished data).

The mined length of the high-grade ore body is approximately 20 - 25 m and mined depth is approximately 25 m (unpublished NGU reports: Vogt 1892, p. 17) (Fig.3).

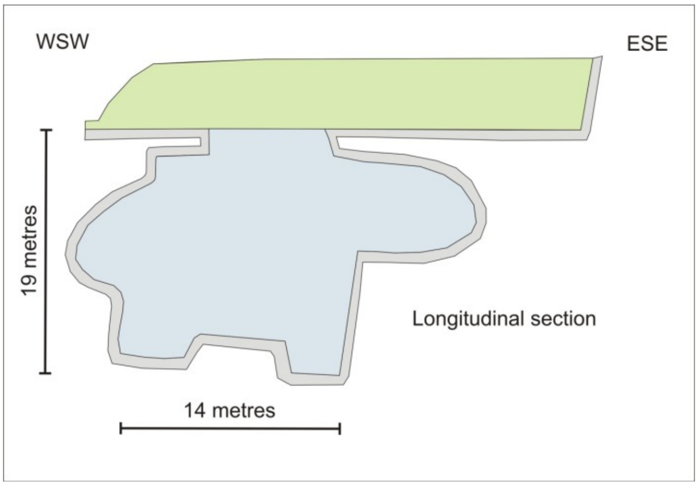

Fig 3: Sketch of the longsection of the Litlaga mine. The light green area represents the trench and the light blue area the underground workings (now water-filled). Based on the not-to-scale drawing given by Rosenlund and Borthen, 1916, based on the unpublished NGU data (Nilsson and Ihlen, 2018).

3. *Geological Background*

<u>*3.1 Regional geology*</u>

Ni-sulphide mineralisation of the Litlaga deposit is located within the Govddestind Nappe in the uppermost part of the Rødingsfjell Nappe Complex in the UmA (Fig. 4). The Govddestind nappe overlays the Beiar Nappe from which it is separated by the Habresåga Nappe (Brattli and Tørudbakken, 1987). The thrusts separating these nappes are truncated by the Høgtind granite intrusion which yielded a nine-point Rb/Sr isochron of 440 ± 30 Ma, i.e. early Silurian. This indicates that the amalgamation of the nappes occurred prior to the emplacement of the granite batholith which was deformed during the Scandian orogenic phase of continent-continent collision at about 425 Ma.

The Govddestind Nappe is composed of the layers and lenses of the dark grey garnetiferous two-mica schists and light grey quartz-muscovite schists intercalating with bands of calcite marbles, amphibolites and banded meta-sandstones (Fig. 5).

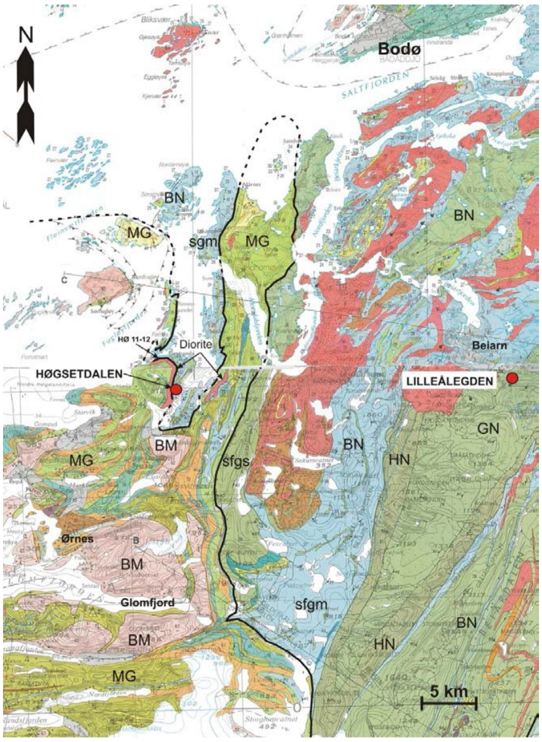

Fig 4: *Regional geological map of the southwestern part of the Salten region showing the location of the Høgsetdal and Lilleålegden Ni-deposits and the main lithotectonic units in the RNC of the UmA. These are, in order, from bottom to structural top: BM = basement gneisses, MG = Meløy Group, BN = Beiar Nappe, HN = Habresåga Nappe, and GN = Govddestind Nappe. The basal thrust of the BN is shown with a thick black line. The main lithologies include: Bluish = marbles, Brownish Early Palaeozoic diorite, Greenish = micaceous schists and gneisses, Pink = granitic orthogneisses of Paleoproterozoic age in the basement, Reddish = Early Paleozoic granitoids, sfgm = Sokumfjell Group marbles, sfgs = Sundsfjord Group schists, sgm = Saura Group marbles and Yellowish to orange = quartzites and arkosic gneisses. Compilation based on Gustavson (2003), Gustavson and Blystad (1995), Gustavson and Gjelle (1991)*

(a) (b)

Fig 5: Volcano-sedimentary sequence that hosts Litlaga mafic intrusion and associated Ni-S mineralisation: (a) fine-grained banded quartz-biotite schists; (b) fine-grained banded (1-10 cm wide) quartz-feldspar-biotite-mica schists (interpreted as the meta-psammitic rocks) dipping steeply to the southeast

3.2. Project scale geology

The mineralisation is confined to a poorly exposed mafic intrusion, which is only partially exposed on the outcrop (Fig. 6). Main rock forming minerals are amphibole, pyroxene (hypersthene), labradorite and anorthite, indicating a possible noritic composition of the intrusive rock. Minor biotite, quartz and accessory garnet were also noted and are assigned to metamorphic processes (unpublished NGU reports). The mafic (norite) intrusion is possibly occurs parallel to the NE-SW striking and steeply dipping dark grey wall-rock gneisses. Sulphide mineralisation is distributed mainly along the south-eastern contact zone of the NW-dipping body (Fig. 6) which is striking 70°ENE and appears to be situated in the hinge zone of an isoclinal synform.

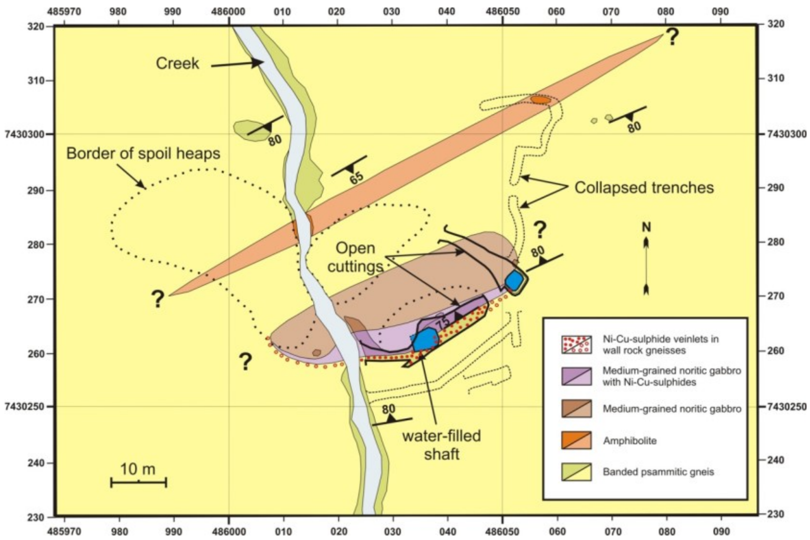

Fig 6: Geological map of the Litlaga deposit. Only exposed rocks are presented on the map (unpublished NGU data). Yellow colour denoted the areas where bed rocks are concealed under the till

The Ni-Cu mineralisation occurs as lenses of the massive /breccia ore, surrounded by sulphide veinlets and disseminated mineralisation (Figs. 7a,b.c). Main minerals are pyrrhotite-pentlandite-chalcopyrite, with minor millerite and accessory titano-magnetite and magnetite.

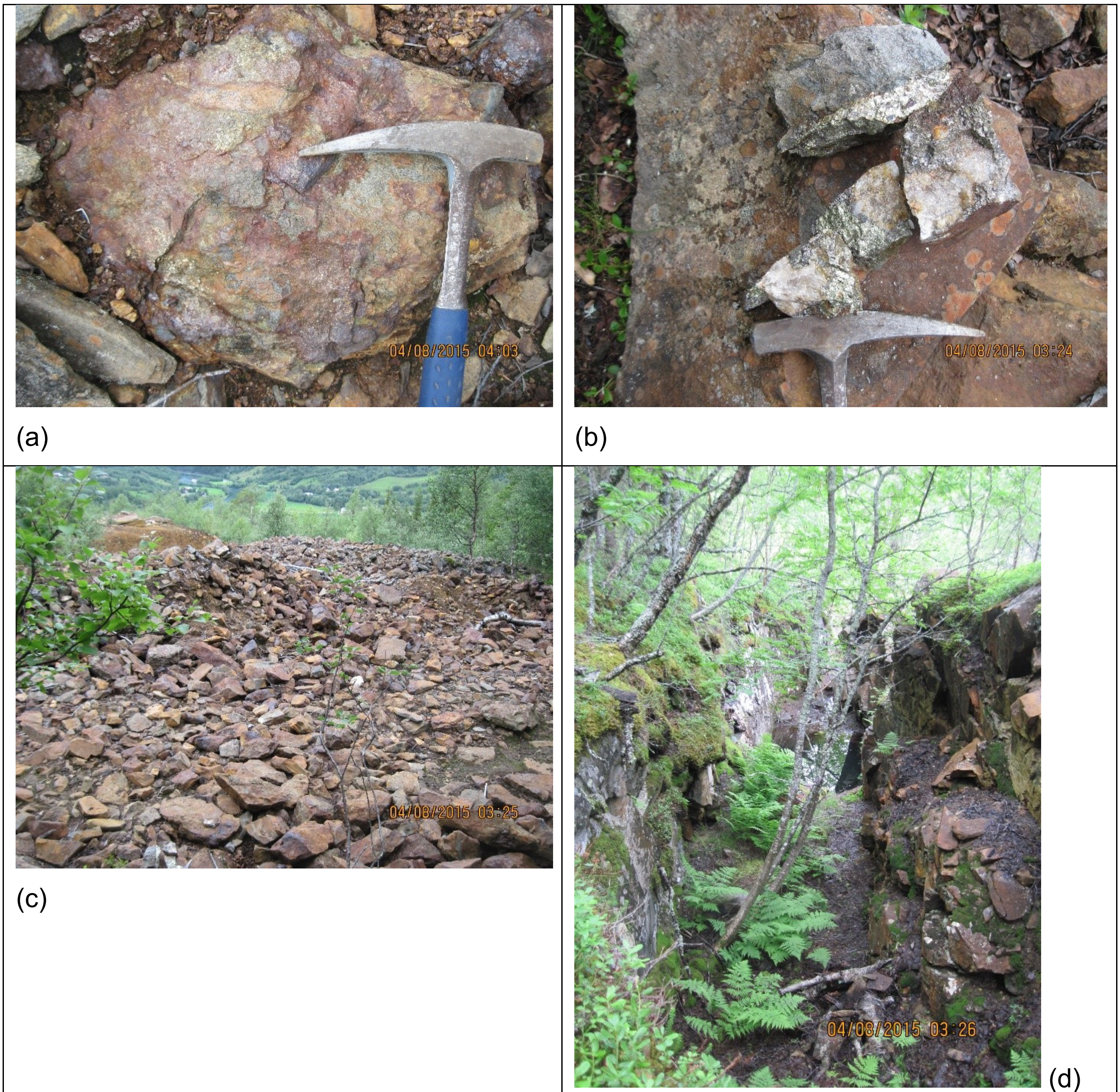

Fig 7: Samples of the Ni-Cu sulphide mineralisation left on the ROM pad of the historic mine: (a) massive mineralisation; (b) sulphide veinlets, stringer zone distributed in the host schists/gneisses; (c) ROM pad of the historic mine; (d) historic trench where disseminated Ni-Cu sulphides remained on the trench walls

The sulphide-bearing part of the medium-grained (2-5 mm) gabbro has a characteristic grey colour (Fig. 7d) whereas the barren part of the gabbro contains black mafic aggregates interstitial to light grey plagioclase laths. With the exception of some narrow zones along the contact of the gabbro, where a faint foliation is developed, both gabbro types generally show an isotropic texture in contrast to the 4 m wide amphibolite zone northwest of the gabbro. This relationship is important since it shows that the formation of the Ni-Cu mineralisation occurred subsequent to the deformation of the amphibolites and at a late stage in the tectonomagmatic evolution of the Goddvestind Nappe. The gabbro was possibly emplaced coeval with the granite batholith plutons towards the west where the similar gabbro (norite) intrusions are also present (Fig. 4).

Mineralisation in the deposit is distributed along the foot-wall (i.e. south-eastern) contact of the intrusion where it represented by lenses and veinlets of massive and semi massive mineralisation and dense dissemination of the sulphides. Further away from the contact the mineralisation gradually becomes disseminated mineralisation and finally disappears approximately 4 m from the contact. The footwall gneisses and schists host stringer-type Ni-Cu sulphide mineralisation. Thickness of the stringer sulphide halo, according to studies undertaken by the NGU geologists (P.Ihlen and L-P, Nilsson) is approximately 2 m, which accords well with observations of the Northern Lights Minerals geologists.

4. Exploration by Northern Lights Minerals

The area-1 has been explored by Northern Lights Minerals:

- In 2015 reconnaissance traverses were undertaken on the property and Ni-sulphide mineralisation found on the ROM pad of the historic mine was sampled for confirmation of the reported production grade. Additional samples have been collected from the walls of the historic trenches.
- in 2018 the area was surveyed by ground magnetic and the moving-loop electro-magnetic (MLEM) geophysical exploration methods.

4.1. Exploration results – verification sampling (2018)

Representative samples of the mineralisation have been sampled by the Norther Lights Minerals geologists that have confirmed its high grade and high Ni-Cu-PGE tenors (Table 2).

TABLE 2: Composition of the Ni-Cu mineralisation of the Litlaga deposit

SAMPLE	**Ni**	**Cu**	**Co**	**Pt**	**Pd**	
DESCRIPTION	%	%	ppm	ppm	ppm	
211428	**3.33**	**12.25**	848	0.02	**0.15**	grab samples from historic ROM pad (next to trench)
211428-1	**2.14**	**8.34**	591	0.01	**0.12**	
211428-2	**5.30**	0.80	**1100**	<0.005	**0.20**	
211428-3	**4.42**	0.14	867	<0.005	0.01	
211428-4	**3.76**	0.09	727	0.07	0.03	
211428-5	**1.18**	0.33	295	0.04	0.02	grab samples from the trech wall
211428-6	**1.08**	**1.90**	300	0.01	0.02	

4.2. Exploration results – ground magnetic survey (2018)

Magnetic survey has identified several high-magnetic anomalies that clearly defines the contact of the mafic-ultramafic intrusion with the host schists.

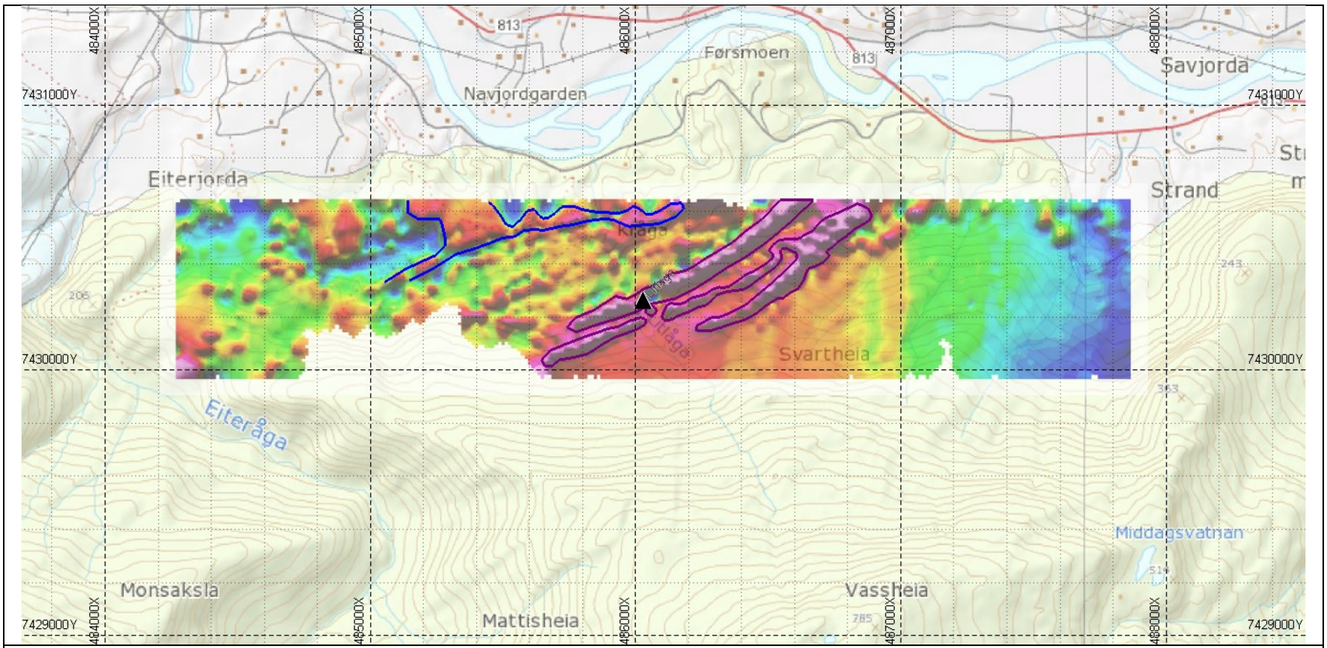

Fig 8: Magnetic anomalies (colour image) defined by the ground magnetic survey. Interpreted high-mag bodies, possibly the norite intrusions, are denoted by the outlines. Purple outlines are used for the high-priority targets. Symbol (triangle) denotes the Ni-Cu sulphide outcrop

4.3. Exploration results – MLEM survey (2018)

This program has identified several MLEM anomalies (conductive plates) which are coincident with the magnetic anomalies that are possibly generated by the mafic-ultramafic intrusions (Fig. 9).

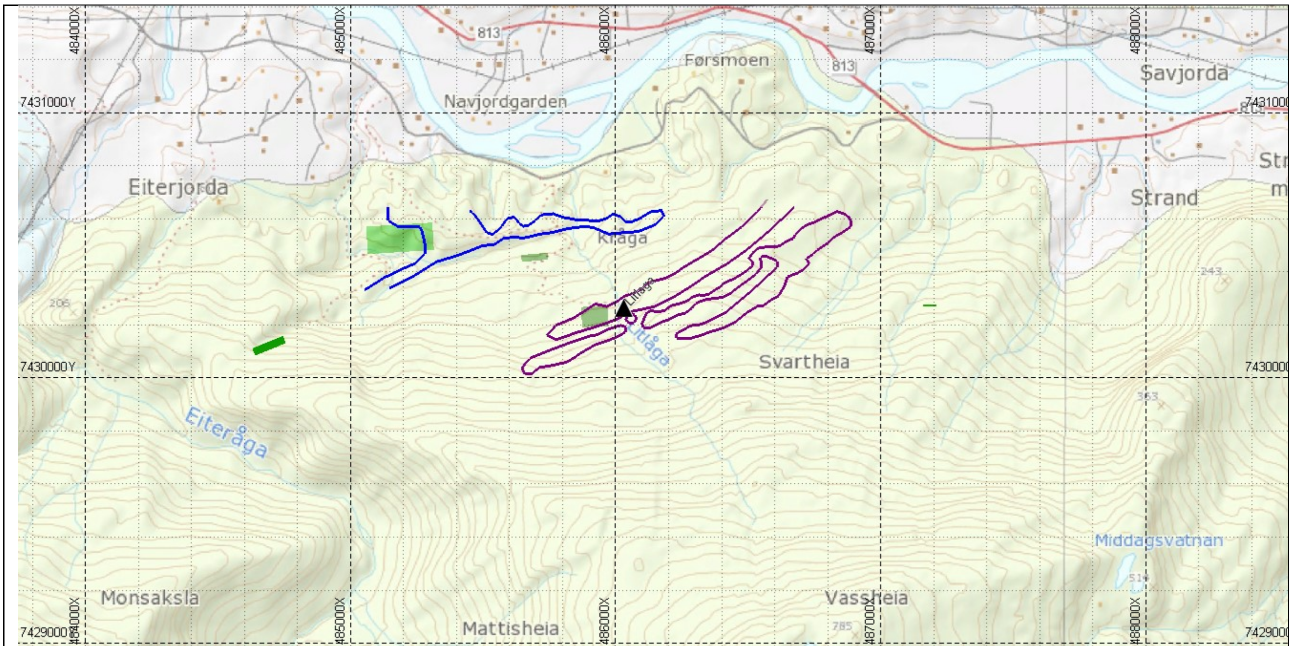

Fig 9: MLEM anomalies (green rectangles) defined by the ground electro-magnetic survey using the moving loop. High-mag anomalies that are interpreted as the possible norite intrusions are denoted as the coloured outlines. Purple colour is used for the priority targets

Two plates (01 and 02) are considered as the most prospective exploration targets in this area and have been chosen for drilling (Fig. 10).

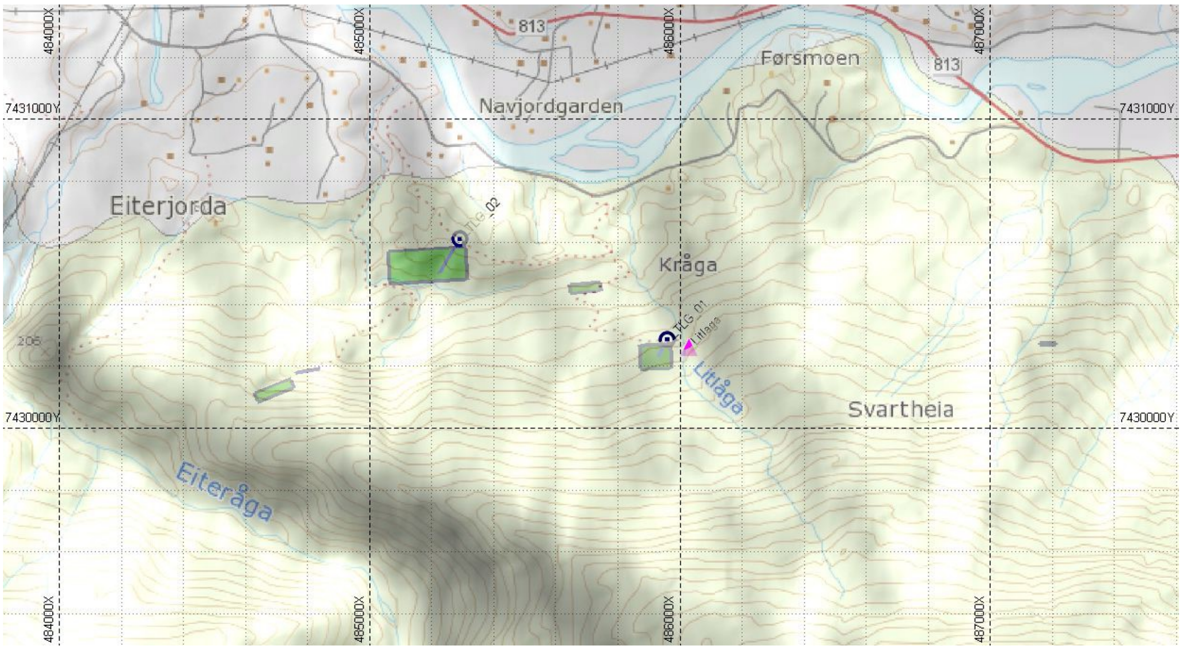

Fig 10: Map showing MLEM plates (green rectangles) representing the drilling targets for 2019 exploration program. Red triangle denotes the outcrop of the Ni-Cu sulphide mineralisation. Access tracks to the proposed drill sites are shown by dotted lines

In order to accurately locate the drillholes it was necessary to generate a digital terrane model (DTM). Unfortunately it was not available at the conventional SRTM survey, which has been limited at the latitude of 60° North. The data, that was used for DTM model was downloaded from a different site and it was compiled using the different data sources, including the old soviet military maps. Accuracy of the compiled set is claimed by the distributors as comparable with the SRTM3 v.2 set, but this has not been tested and verified by the author of this programme.

It is assumed, that accuracy of the DTM is sufficient for exploration drilling which primary goal is testing the MLEM anomalies.

Location of the proposed drillhole collars, together with Dip and Azi of the drillholes and depth of drilling are summarised in the Table 3. Location was chosen considering the best intersection of the targets (Fig. 11) and availability of the access tracks (Fig. 10). The latter was important in order to minimise the environmental impact of the proposed drilling and decrease the site preparation costs. Unfortunately, because of several subjective and non-subjective economic related reasons, the company has elected not to pursue the proposed drilling program and withdraw from the project.

Table 3: The proposed drillholes

Hole ID	East (UTM z33)	North (UTM z33)	RL	Dip	Bearing (Azi)	Depth, m
LTLG_01	485959.3	7430285.5	123.2	-70	210	250
LTLG_02	485289.8	7430614.1	54.9	-60	210	300

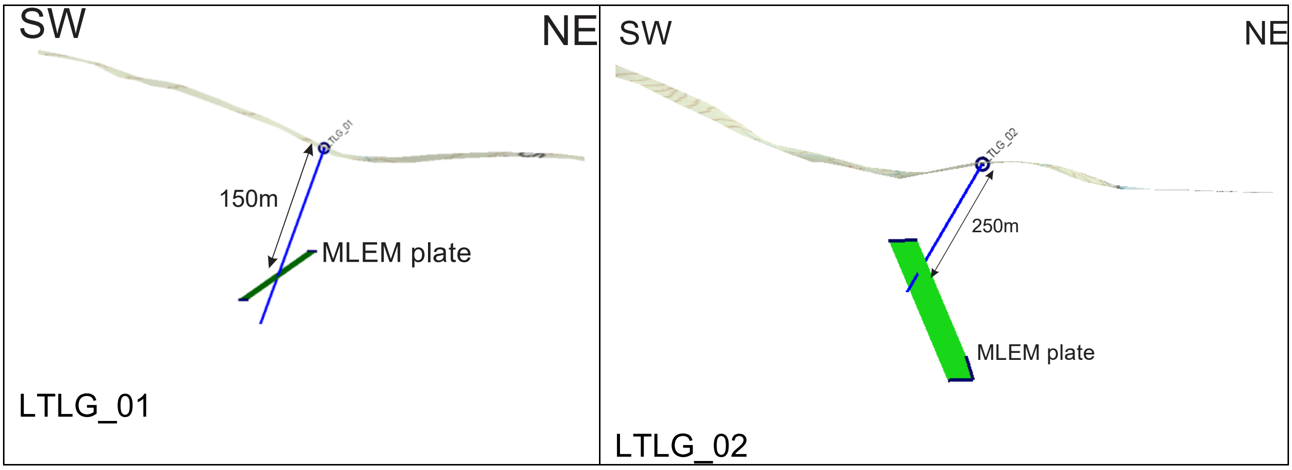

Fig 11: Cross-sections showing the proposed drill holes and the exploration targets (MLEM plates)

5. Conclusions

The Northern Lights Minerals has undertaken detailed geophysical exploration of the Area-1 that has identified several EM conductors coincident with the footwall contacts of the mafic-ultramafic intrusion delineated by the ground magnetic survey was undertaken by the Northern Lights Minerals. The above-mentioned EM conductors represent a plausible exploration target for massive/semi-massive Ni-sulphide mineralisation. Unfortunately, due to internal circumstances related to the changed economic environments the company has elected not pursue the proposed drilling programme.

6. References

Brattli, B. and Tørudbakken, B. 1987: Bergrunnskart Arstaddal 2028-IV, M. 1:50 000. Norges geologiske undersøkelse.

Gustavson, M. 2003: Berggrunnskart Glomfjord 1928-I, M 1:50 000, foreløpig utgave. Norges geologiske undersøkelse.

Gustavson, M. and Blystad, P. 1995: Geologisk kart over Norge, berggrunnskart Bodø, M 1:250 000, Norges geologiske undersøkelse

Gustavson, M. and Gjelle, S. 1991: Geologisk kart over Norge, berggrunnskart Mo i Rana, M 1:250 000, Norges geologiske undersøkelse

Nilsson, L-P and Ihlen, P. 2018. Unpublished data.

COMMENTS ON EXPLORATION:

a) basic materials, such as data registered by geophysical measurement, observations made through geological surveys, and analysis results obtained by geochemical sampling, etc.

(NLM) The assay table (Table 2) is presented in the report.

b) geological charts

(NLM) No new data collected. The maps used were made available from the NGU and were obtained from their website

c) geophysical anomaly charts

(NKM) Presented in the report Figures 8, 9, and 10.

d) geochemical anomaly charts, which shall contain the information needed to interpret them

(NLM) No new data collected because of restrictions in the area

e) an index map covering the explored areas, which shall show the geology of the areas, rock exposures, diamond drill holes, other relevant information and the search grid used in geophysical exploration

(NLM) Present in the report (Fig. 1)

f) a drill log with specified coordinates, along with associated analyses and sample descriptions, and profiles that specify the coordinates of the drill holes. The Directorate of Mining may, following consultation with the Geological Survey of Norway (Norges geologiske undersøkelse – NGU), provide that a representative selection of drill-core samples and sample materials shall be delivered to NGU's store of drill cores. The costs of delivery shall be covered by the exploring party

(NLM) No drilling undertaken

g) a series of maps showing profiles, which shall be accompanied by a specified key that includes colouring. Symbols, patterns and colouring shall follow the norm used in geological charts published by NGU (NGU publication 113, 1995)

(NLM) No new data collected because of restrictions in the area

h) reports containing reasoned conclusions based on the exploration materials, including the results of any attempts at enrichment, attempts at ore-dressing, etc.

(NLM) This is the closure report for permits 1, 3 and 4 (please see attached license documents, attached as the separate files). Permit 2 has been closed in the past year