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## Geological exploration

Geological exploration is one of Nornickel's core businesses ensuring sustainable extraction volumes and an optimal structure of mineral reserves.



**TAIMYR PENINSULA**

(Norilsk Nickel's Polar Division)

Exploration is underway at Maslovskoye Field, deep horizons and flanks of the Oktyabrskoye and Talnakhskoye Fields, and the northern flank of Norilsk-1 Field. Industrial limestone was prospected and appraised in the Verkhne-Tomulakhskaya Area of the Norilsk Industrial District.

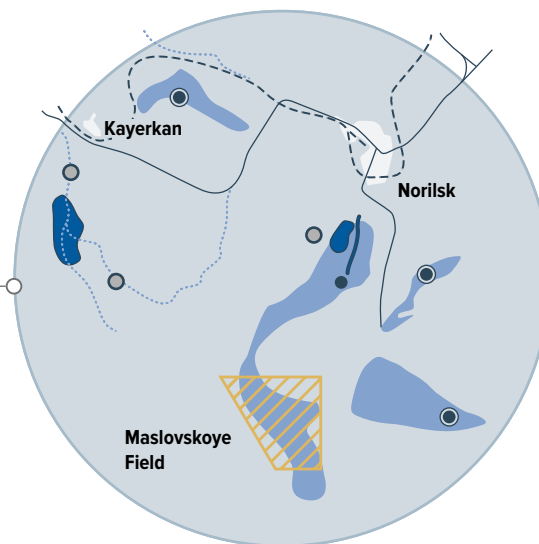
In 2016, the Company also kept prospecting for sulphide ores in Lebyazhninskaya, Razvedochnaya, Mogenskaya, Khalilskaya, Nizhne-Khalilskaya and Nirungdinskaya Areas of the Norilsk Industrial District, 150 km south-east of Norilsk.

**Maslovskoye Field**



The Field is located in the Norilsk Industrial District, 12 km south of Norilsk-1 Field

- Outlines of ore-bearing intrusives
- Outlines of open-pit minings
- Operations area
- Coal-bearing deposits
- Copper-and nickel ore deposits:**
- Operated
- Off-balance
- Railroad
- Motorways
- Winter roads



Global estimated reserves of disseminated ores make it possible to classify Maslovskoye Field as one of the largest platinum-copper-nickel deposits. Areas of rich ore veins were found in the disseminated ores of this field. In 2015, the Group was granted a license to explore and mine copper-nickel sulphide ores.

In 2016, exploration project for Maslovskoye Field was prepared and reviewed by dedicated bodies. A feasibility study of permanent exploratory standards is underway.

**Balance reserves of Maslovskoye Field**

Metal	C <sub>1</sub> + C <sub>2</sub> mineral reserves	Metal content in ore
Ore (mln t)	215	
Palladium (koz)	32,262	4.56 g/t
Platinum (koz)	12,479	1.78 g/t
Nickel (kt)	728	0.33%
Copper (kt)	1,122	0.51%
Cobalt (kt)	34	0.016%
Gold (koz)	1,304	0.19 g/t

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### Flanks and deep horizons of the Talnakhsky Ore Cluster (copper ores)

Cu


The Group's geological exploration of the unregistered reserves focuses on the follow-up exploration of rich and cuprous ores at Oktyabrskoye and Talnakhskoye Fields.

Field boundaries

- a** Oktyabrskoye
- b** Talnakhskoye

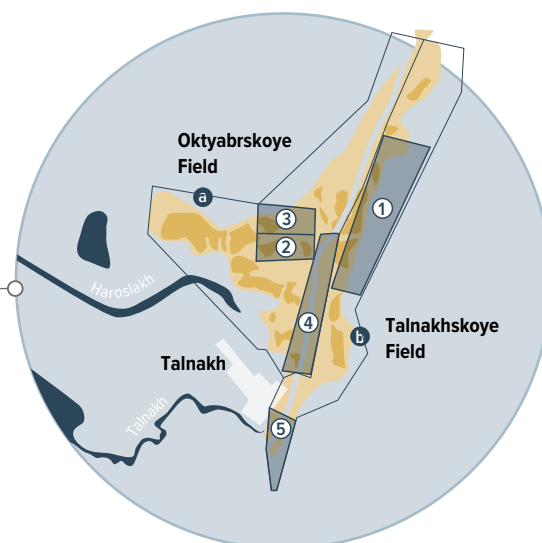
Allotment boundary

- a** Oktyabrskoye Field
- b** Talnakhskoye Field

 Rich ore deposits

Boundaries of exploration areas

- 1** Eastern flanks of the Skalisty mine
- 2** Flanks of Severnaya 3 deposit
- 3** Flanks of Severnaya 4 deposit
- 4** Southern flank of the Talnakh deposit
- 5** Southern flank of the Mayak mine



#### Taimyrsky and Skalisty Mines

Geological exploration (follow-up exploration) is underway in the northern flanks of Taimyrsky Mine and eastern flanks of Skalisty Mine to properly assess the boundaries of the producing deposits and convert C<sub>2</sub> reserves to the C<sub>1</sub> category. This has already resulted in reassessing 9,983 kt of copper-nickel reserves of the Severnaya 3 deposit.

#### Norilsk-1 Field

Exploration completed at the shaft pillar of Norilsk-1 Field. Off-balance reserves in the amount of 25.5 mln t as entered into the government books were converted from the underground mining reserves into reserves intended for open pit operations.

#### Reserves re-entered into the government books

Metal	Inventories
Ore, mln t	11.8
Nickel, kt	352.8
Copper, kt	435.3
PGM, t	100.6

Reserves entered into the government books in 2016

**11.8**  
mln t of ore

#### A + B + C<sub>1</sub> + C<sub>2</sub> copper-nickel reserves entered into the government books in 2016

Metal	For open-pit mining	For underground mining
Ore, mln t	96.5	4.4
Nickel, kt	253.3	13.4
Copper, kt	310.6	15.2
PGM, t	421.4	21.5

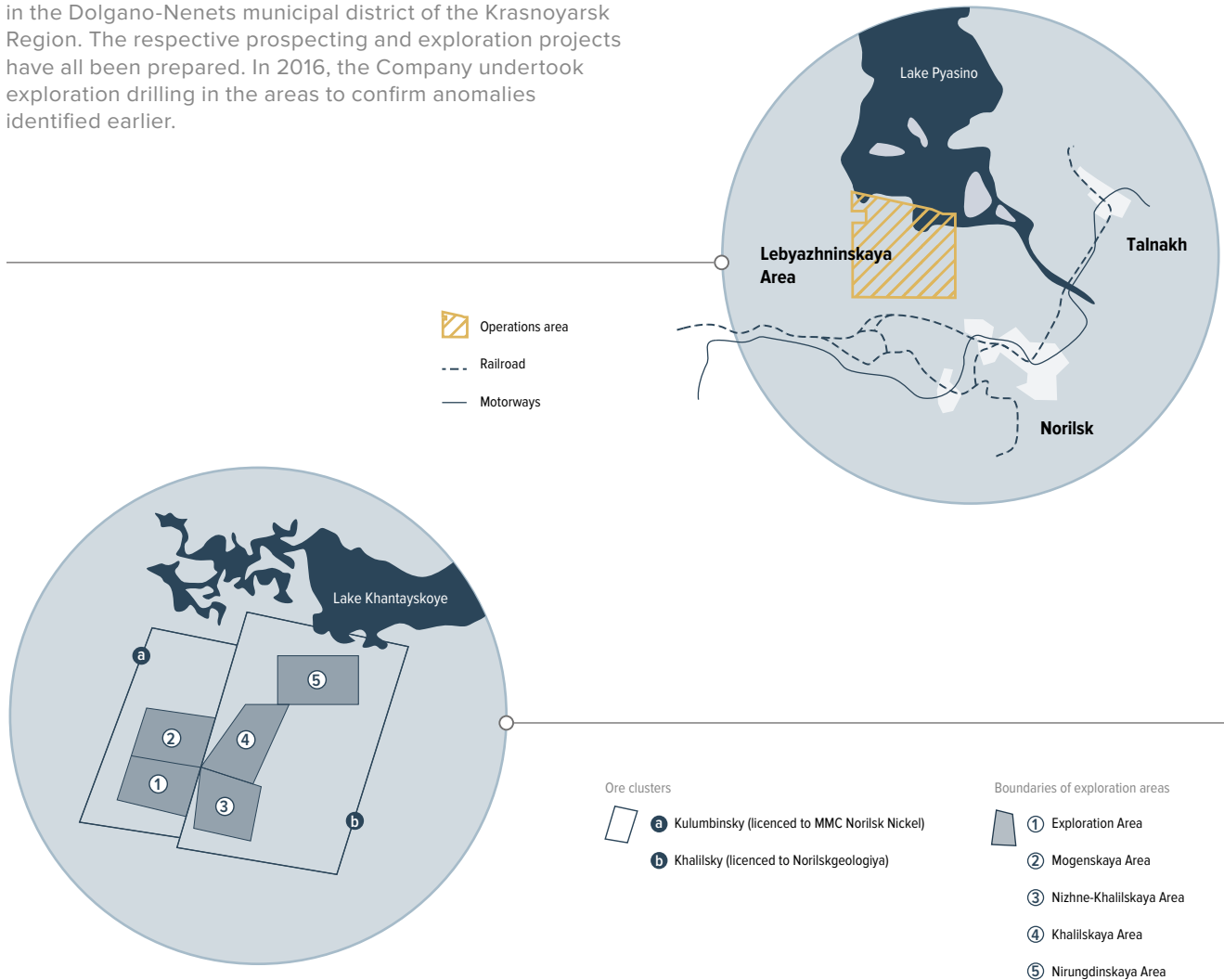
Reserves Cu-Ni ores entered into the government books

**96.5**  
mln t of ore

**Prospecting and appraisal of new copper-nickel sulphide ore fields**



In 2014, the Company received licenses permitting it to use subsurface for geological exploration for the purpose of prospecting and appraisal copper-nickel sulphide deposits in Lebyazhninskaya, Razvedochnaya, Mogenskaya, Khalilskaya, Nizhne-Khalilskaya and Nirungdinskaya Areas in the Dolgano-Nenets municipal district of the Krasnoyarsk Region. The respective prospecting and exploration projects have all been prepared. In 2016, the Company undertook exploration drilling in the areas to confirm anomalies identified earlier.



**Limestone prospecting and appraisal in Verkhne-Tomulakhskaya Area**

The license block is located in the Taimyrsky Dolgano-Nenetsky Municipal District and borders the northern part of the Talnakh District. The central point of the Area is 10 km away from the industrial facilities of Oktyabrsky and Taimyrsky Mines.

The Company appraised the Area, developed the permanent exploratory standards, and prepared a mineral reserves estimation report. In 2016, C<sub>1</sub> + C<sub>2</sub> limestone pit reserves totalling 116,686 kt were entered into government books. A certificate confirming the discovery of the Mokulaevskoye limestone deposit was issued to Norilsk Nickel. Upon the discovery, the Company applied for the relevant exploration and mining licence.