

# APPENDIX 3

## GLOSSARY

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Acid leaching	Leaching using acids (acid solutions) as reagents.
ADR	American Depositary Receipt; a security representing the right of ownership in the deposited securities of a foreign company, certified by receipts issued by a US depositary bank.
Agglomerate	Sintered ore produced in the process of agglomeration.
Agglomeration	A method of formation of relatively large porous blocks (agglomerates) from fine ore or powder ore by sintering (roasting) of ore. In this process, easily fusible materials fix solid particles with each other while getting harder.
Anode	Crude metal (nickel or copper) obtained from anode smelting and fed for electrolytic refining (electrolysis) whereby it is dissolved.
Blasting operations	Detonating explosives in natural rock formations for the purpose of controlled destruction and removal or changing its structure and form.
Cake	Solid residue from pulp filtering received as a result of leaching of ores, concentrates or intermediate metallurgical products as well as the purification of technological solutions.
Cathode	Pure metal (nickel or copper) obtained as a result of electrolytic refining of anodes.
Concentrate	A product resulting from ore enrichment, with a high grade of extracted mineral. The concentrate is named after the prevailing metal (copper, nickel, etc.).
Concentration	Artificial improvement in the mineral grades in the rock for metallurgic purposes by removing a major portion of waste rock not containing any beneficial minerals.
Conversion	Autogenous pyrrrometallurgical process, where ferrous and other detrimental impurities are oxidized and removed as slam. The result of the conversion is blister copper (copper concentrate smelting) or high grade matte (copper and nickel concentrate smelting).
Cuprous ores	Ores containing from 20% to 70% of sulfides. Mineralization is as follows: nickel — 0.2–2.5%, copper — 1–15%, platinum group metals — 5–50 g/t.
Deposit stripping	Permanent mining that opens access to the entire mineral deposit from the surface or its part of it, and provides for the preparatory mining.
Dilution	Contamination of a mineral resource with non-commercial grades and surrounding formations which leads to decreased content of a useful component in the mined material as compared to its original content. Dilution results in increased mining and transportation costs of the mineral resource, and deterioration of the technical and economic performance of concentrators. The level of dilution depends on the mode of occurrence, equipment used, development methods and mining work organization. For ore deposits with favorable geological conditions the dilution factor may be up to 10%, and goes up to 35–40% for difficult occurrence positions.
Disseminated ores	Ores containing from 5 to 30% of sulfides, from 0.2 to 1.5% of nickel, from 0.3 to 2% of copper, from 2 to 10 g/t of platinum group metals.

Drying	Removal of moisture from concentrates, performed in designated drying furnaces (to a moisture level below 9%).
Electrolysis	A series of electrochemical oxidations through reactions at electrodes in contact with an electrolyte by the passage of an electric current from an external source.
Extracted ore	Natural minerals containing metals or their compounds in the economically valuable amounts and forms.
Filtration	The process of reducing the moisture of the concentrates by moving liquids or gases through a porous medium.
Flash smelter	An autogenous smelter for processing of dry concentrates. Smelting occurs during the flow of crushed rock and gas oxidizer (air, oxygen) which suspends particles of melted metal. The heat generated by the oxidizing reaction is actively used in the process.
Floatation	A process of concentration by selectively attaching air bubbles to mineral particles within pulp. Dry mineral particles do not attach well to the air bubbles and rise through the suspension to the top of the pulp, producing foam. The minerals that moisten well do not attach to the bubbles and remain in the pulp. In this way, the metals are separated.
Gas condensate	Product produced from natural gas fields and representing a mixture of hydrocarbon liquids.
Heap leaching	Leaching conducted at a specific artificial or natural site with impermeable ground through spraying piles (heaps) of ore with chemical solutions.
High-grade matte	A metallurgical semi-product produced as a result of matte conversion. Depending on the chemical composition, the following types of high-grade matte are distinguished: copper, nickel and copper-nickel.
Horizon	All workings located along a specific layer and designated for mining.
Indicated mineral resources	Resources representing that part of mineral resources for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed.
Inferred mineral resources	Resources representing that part of mineral resources for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes which is limited or of uncertain quality and reliability.
Leaching	Selective dissolution of any or a number of components of the processed solid material in organic solvents or water solutions of inorganic substances.
Matte	Intermediate product in the form of alloy of ore sulfides and non-ferrous metals with varying chemical composition. Matte is the main product in which precious and auxiliary metals are accumulated.
Measured mineral resources	Resources representing that part of mineral resources for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and/or grade continuity.

Metal extraction	Ratio between the quantities of a component extracted from the original material to its quantity in the original material (as a percentage or fraction of an integer).
Metal grade	The ratio between the amount of metal in the material and the total gross weight of the material, expressed as percentage or grams per tonne (g/t).
Mine	A mining location for extraction of ores.
Mineral deposit	A mass of naturally occurring mineral material near to the surface or deeper underground, which is suitable for economic use in terms of quantity, quality and conditions.
Mineral resources	A concentration or occurrence of material of intrinsic economic interest in or on the Earth's crust in such form, quality and quantity that there are reasonable prospects for eventual economically viable extraction.
Mine workings	The general term for parts of a mine or quarry that have been excavated during mining.
Open mining	The process of extracting minerals by surface excavations in open mining.
Ore body	Natural occurrence of ores linked to a certain structural and geologic element or a combination of such elements.
Ore mixture	A mixture of materials in a certain proportion needed to achieve the required chemical composition in an end product. The metallurgical ore mixture may include ores, ore concentrates and agglomerates, return slag, dust from dust collecting units, metals (mostly in scrap).
Ore reserve	The economically mineable part of a measured or indicated mineral resource. It includes diluting materials and allowances for losses, which may occur when the material is mined.
Oxide	A compound of a chemical element with oxygen.
Probable ore reserves	The economically mineable part of an indicated, and in some circumstances, a measured mineral resource. It includes diluting materials and allowances for losses which may occur when the material is mined.
Proved ore reserves	Ore reserves that represent the economically mineable part of a measured mineral resource. It includes diluting materials and allowances for losses which may occur when the material is mined.
Pulp	A mixture of crushed minerals with water or a water solution.
Pyrometallurgical processes	Metallurgical processes performed at high temperatures. In accordance with the technological characteristics, the following types of pyrometallurgical processes are distinguished: roasting, smelting and conversion.
Refinement	The process of extracting high purity precious metals through their separation and removing impurities.
Rich ores	High-sulfide grade (over 70%) ores. Mineralization is as follows: nickel — 2–5%, copper — 2–25%, platinum group metals — 5–100 g/t.

Roasting	A process performed upon heating and keeping various materials (ores, concentrates and etc.) to eliminate light components and change the chemical composition of such material at temperatures enabling various chemical reactions between solid components of the processed material and gases and insufficient for the melting of solid components.
Shop area	A part of (metallurgical) shop.
Skip	A device in the form of an automatically unloading case that is moved along the pulleys of a skip-winding machine, designed to transport minerals or rock along vertical and reclining shafts to elevate an ore mixture.
Slag	Melted or solid substance with a varying composition covering the liquid product in the course of metallurgical processes (obtained from melting of ore mixture, processing of melted intermediate products and metal refining) and including waste rock, fluxing substances, fuel ash, sulfides and metal oxides, products of interaction between processed materials and lining of melting facilities.
Sludge	Powder product containing precious metals precipitated during electrolysis of copper and other metals.
Smelting	A pyrometallurgical process performed at temperatures enabling the complete melting of the processed metal.
Suction system	A mechanical device used to draw away (remove by force of suction) pollutant emissions and gases from workplaces and get samples of air or gas to test its contents and dust condition.
Sulfides	A compound of metals and sulfur.
Tailing pit	A complex of hydraulic structures used to receive and store mineral waste/tailings.
Tailings	Waste materials left over after concentration operations containing primarily waste rock with a minor amount of precious metals.
Thickening	The separation of liquid (water) from solid particles within the dispersion systems (pulp, suspension or colloid) based on natural precipitation of solid particles under gravity in waste basins, thickeners and centrifugally in cyclones.
Underground (sub-surface) mining	A set of stripping, preparatory and sloped excavation works on a natural resource.
Vanukov furnace	An autogenous smelter for processing of concentrates. Smelting is performed in a bath of liquid slag and matte which is intensively rabbled by a mixture of air and oxygen. The heat generated by the oxidizing reaction is actively used in the process.
Waste heat boiler (WHB)	A heat-retrieval unit used to produce steam without a furnace using the hot byproduct gas from metallurgic operations, industrial furnaces, power generators or combustion engines.

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## ABBREVIATIONS AND ACRONYMS

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ARM	African Rainbow Minerals
AUD	Australian dollar
BWP	Botswana pula
Company	Open Joint-Stock Company Mining and Metallurgical Company Norilsk Nickel
CRU	Commodities Research Unit — a consultancy specializing in metal market research
CUSIP	Committee on Uniform Securities Identification Procedures — Identification code assigned to securities issues in the US and Canada.
DMS	Dense Media Separation — technology for concentration in difficult environments
ESPC	Enriched Stored Pyrrhotite Concentrate
FCSM	Federal Commission on Securities Markets
FFMS	Federal Financial Markets Service
GFMS	Gold Fields Mineral Services — a consultancy specializing in metal market research
Group	Open Joint-Stock Company Mining and Metallurgical Company Norilsk Nickel and its subsidiary companies
IFRS	International Financial Reporting Standards
IISI	International Iron and Steel Institute
IOB	International Order Book London Stock Exchange market trading in the most liquid international securities
ISIN	International Securities Identification Number A unique 12-digit alphanumerical code to identify a security assigned by national numbering agencies.
ISO	International Standardization Organization
JORC Code	Australasian code for the reporting of reserves of ores and metals developed by the Australasian Institute for Mining and Metallurgy, the Australian Institute of Geoscientists and Australasian Joint Ore Reserves Committee.
KZCM	OJSC "Krasnoyarsky Zavod Cvetnykh Metallov" (Krasnoyarsk Non-Ferrous Metal Plant)
LionOre	LionOre Mining International Ltd.

MICEX	Moscow Interbank Currency Exchange
Micon	Micon International Co Limited.
MMC	Mining and Metallurgical Company
MMC Norilsk Nickel	Open Joint-Stock Company Mining and Metallurgical Company Norilsk Nickel
MSA	Matte Separation Area
Norilsk Nickel	Open Joint-Stock Company Mining and Metallurgical Company Norilsk Nickel and its subsidiary companies
OGK	Wholesale Generating Company
OTC MARKET	Over the Counter Market (US)
NOF	Norilsk Enrichment Plant
PGM	Platinum group metals in a complex or in any combination of platinum, palladium, rhodium, ruthenium, osmium and iridium
RAS	Russian Accounting Standards
RTS	Russian Trading System
SEC	US Securities and Exchange Commission
SEDOL	Stock Exchange Daily Official List A 7 digit alphanumerical identification code assigned to all securities traded on the UK's organized securities market.
SPC	Stored Pyrrhotite Concentrate
TOF	Talnakh Enrichment Plant
TGK	Territorial Generating Company
WBMS	World Bureau of Metal Statistics

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# APPENDIX 4

## MEASUREMENT UNITS CONVERSION

Length		Area		Weight	
1 kilometer	0.6214 miles	1 square meter	10.7639 square feet	1 kilogram	2.2046 ponds
1 meter	3.2808 feet	1 square kilometer	0.3861 square miles	1 metric tonne	1,000 kilograms
1 centimeter	0.3937 inches	1 hectare	2.4710 acres	1 short ton	907.18 kilograms
				1 troy ounce	31.1035 grams

Length		Area		Weight	
1 mile	1.609344 kilometer	1 square feet	0.09290304 square meter	1 pound	0.4535924 kilogram
1 feet	0.3048 meter	1 square miles	2.589988 square kilometer	1 gram	0.03215075 troy ounce
1 inch	2.54 centimeter	1 acres	0.4046873 hectare		