
GLOSSARY OF TECHNICAL TERMS

“3C products”	Computer, communication and consumer electronics
“AN-FO”	means ammonium nitrate/fuel oil (most often No. 2 fuel oil, or diesel fuel, but sometimes kerosene or even molasses). It is by far the most widely used explosive in coal mining, quarrying, metal mining, and civil construction.
“Briquetting”	The process when small particles of solid materials are pressed together to form coherent shapes of larger size.
“CaO”	Calcium oxide, commonly known as burnt lime, lime or quicklime, is a widely used chemical compound. It is a white, caustic and alkaline crystalline solid. As a commercial product, lime often also contains magnesium oxide, silicon oxide and smaller amounts of aluminium oxide and iron oxide. Calcium oxide is usually made by the thermal decomposition of materials such as limestone, that contain calcium carbonate (CaCO_3 ; mineral name: calcite) in a lime kiln.
“Calcination”	<p>The process of heating a substance to a high temperature but below the melting or fusing point, causing loss of moisture, reduction or oxidation, and dissociation into simpler substances. The term was originally applied to the method of driving off carbon dioxide from limestone to obtain lime (calcium oxide). Calcination is also used to extract metals from ores.</p> <p>For example, the calcination process of dolomitic limestone ($\text{CaCO}_3 \bullet \text{MgCO}_3$), which may be used as the raw material, involves heating the limestone at high temperatures to decompose the carbonates and produce calcined dolomite (of which magnesium oxide forms a component). The reaction, which results in CO_2 emissions, is as follows:</p> $\text{CaCO}_3 \bullet \text{MgCO}_3 = \text{CaO} \bullet \text{MgO} + 2\text{CO}_2 \uparrow$

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“Calcite/ CaCO_3 ”

The carbonate mineral, calcite, is a chemical or biochemical calcium carbonate corresponding to the formula CaCO_3 and is one of the most widely distributed minerals on the Earth’s surface. It is a common constituent of sedimentary rock, limestone in particular. It is also the primary mineral in metamorphic marble. It also occurs as a vein mineral in deposits from hot springs, and also occurs in caverns as stalactites and stalagmites. Calcite is often the primary constituent of the shells of marine organisms, e.g., plankton (such as coccoliths and planktic foraminifera), the hard parts of red algae, some sponges, brachiopoda, echinoderms, most bryozoa, and parts of the shells of some bivalves, such as oysters and rudists). Calcite represents the stable form of calcium carbonate.

“Canada Code”

CIM Standards on Mineral Resources and Reserves — Definitions and Guidelines, developed by the CIM Standing Committee on Reserve Definitions which establishes definitions and guidelines for the reporting of exploration information, mineral resources and mineral reserves in Canada.

“Canada Code — Limestone”

CIM Best Practice Guidelines — Estimation of Mineral Resources and Mineral Reserves. These guidelines have been prepared by the Canadian Institute of Mining and Metallurgy and Petroleum (CIM) led Estimation Best Practices Committee. They are intended to assist the Competent Person(s) in the planning, supervision, preparation and reporting of Mineral Resource and Mineral Reserve (MRMR) estimates.

“Clinker”

A manufactured product made by blending different raw materials and firing them at a high temperature in order to achieve precise chemical proportions of lime, silica, alumina and iron in the finished product which is also known as cement clinker

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“Cold Test”

Cold test is also known as “no-load commissioning” or “no-load test” which will be performed after the completion of installation and inspection of machinery and equipment in the Perak Magnesium Smelter. It is a procedure to be performed by the EPC Contractor in accordance with the EPC Contract to ensure that all the parts of the machinery and equipment to be installed in the Perak Magnesium Smelter are in working order. The EPC Contractor will ensure that (i) all the parts are completely and correctly assembled; (ii) all the parts are functioning properly, individually and together, in accordance with the technical specifications under no-load condition and (iii) the machinery and equipment are in good condition to carry out the Hot Test. At the cold test stage, the furnace has not been heated and dolomite have not been fed into the system to produce magnesium ingots.

“Competent Person”

Under the JORC Code, amongst other things, a “Competent Person” must have a minimum of five years experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which that person is undertaking. The key qualifier in the definition of a Competent Person is the word “relevant”. Determination of what constitutes relevant experience can be a difficult area and common sense has to be exercised. For example, in estimating mineral resources for vein gold mineralisation, experience in a high-nugget, vein-type mineralisation such as tin, uranium, etc. will probably be relevant whereas experience in, say, massive base metal deposits may not be. The key word “relevant” also means that it is not always necessary for a person to have five years experience in each and every type of deposit in order to act as a Competent Person if that person has relevant experience in other deposit types. For example, a person with (say) 20 years experience in estimating mineral resources for a variety of metalliferous hard-rock deposit types may not require five years specific experience in (say) porphyry copper deposits in order to act as a Competent Person. Relevant experience in the other deposit types could count towards the required experience in relation to porphyry copper deposits. As a general guide, persons being called upon to act as Competent Persons should be clearly satisfied in their own minds that they could face their peers and demonstrate competence in the commodity, type of deposit and situation under consideration.

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VALMIN Code defines competence as having relevant education, qualifications, experience, professional expertise and holding appropriate licences (where required) so as to have a reputation that gives authority to statements made in relation to particular matters.

Under the UK Code, a Competent Person must have a minimum of five years experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which that person is undertaking. The wordings on the key qualifier of the word “relevant” are almost identical to those found under the JORC Code.

US Code defines a Competent Person as an engineer, geoscientist or other mining professional who must have a minimum of five years experience which is relevant to the style of mineralization and type of deposit under consideration and to the activity which that person is undertaking. The wordings on the key qualifier of the word “relevant” are almost identical to those found in the UK Code.

The Canada Code defines a “Competent Person” as an individual who is an engineer or geoscientist with at least five years of experience in mineral exploration, mine development or operation or mineral project assessment, or any combination of these; has experience relevant to the subject matter of the mineral project and the technical report. The wordings on the key qualifier of the word “relevant” are almost identical to those found in the UK Code.

UNFC defines Competent Person(s) as a person(s) with the appropriate qualifications to assess resources/reserves of the type of commodity in question. The qualifications and experience required will vary from country to country.

“Dolomite/ $\text{CaMg}(\text{CO}_3)_2$ ”

A common rock forming mineral comprising calcium, carbon, magnesium and oxygen, which is also known as dolomitic limestone

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“Hot Test”

The hot test or hot-load test will be conducted by our trained operational personnel under the supervision of the EPC Contractor after completion of the Cold Test. It will include heating up parts of the Perak Magnesium Smelter to its required specifications, and putting raw materials into the machinery and equipment. It will ensure that the plant is running under normal condition. The hot test is followed by the performance test which will include certain measurements including quality of output (i.e. magnesium ingots), capacity test, consumption of raw materials and utilities used test, and other related test to ensure the plant is working according to specifications and is producing the required output. Once these tests are completed, magnesium ingots will be produced for commercial purposes.

During the hot test, there will be certain adjustments made to the temperature etc. to ensure the conditions of the production are met. Eventually the throughput will increase and the Perak Magnesium Smelter will be ready for production on a commercial scale.

“Industrial Minerals”

Canada Code — Limestone: An Industrial Mineral is any rock, mineral or other naturally occurring substance of economic value, exclusive of metallic ores, mineral fuels and gemstones; that is, one of the non-metallic minerals.

An estimate need not attain or incorporate a rigorous and complete understanding of all factors and inter-relations at an early stage in the life of a project. The classification of the mineral deposit as Probable/Proven Mineral Reserves should always reflect the level of understanding of the project, which is a function of the stage of exploration/development.

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In estimating either a mineral resource or a Mineral Reserve for an industrial mineral deposit, the Competent Person should give priority to: (i) the value of the intended mineral product; (ii) market factors; and (iii) applicability of the market criteria to the mineral deposit being assessed. The classification of an industrial minerals deposit as a MRMR is affected to a significant degree by a number of factors that are less applicable to metallic mineral deposits, including: particular physical and chemical characteristics; mineral quality issues; market size; the level of the producer's technical applications knowledge; market concentration; and transportation costs.

Best Practice in the estimation of a Mineral Resource or a Mineral Reserve of industrial minerals centres on determination of components of the market, value, and costs. Market considerations incorporate not only the requirement for detailed market analyses and, or contracts of sale, but also recognition that markets for many industrial minerals are relatively small, may have a high degree of producer concentration, or may have very high technical barriers to entry, thus imposing limits or constraints on achievable market volumes. Value is a function of (i) product quality in relation to consuming industry or customer specification; (ii) product price; and (iii) project robustness. Costs comprise (i) mining costs; (ii) processing costs; and (iii) transportation and special handling costs.

Industrial mineral deposits differ significantly from other more typical metallic mineral deposits and even amongst themselves. These differences may be reflected in the data density required for certain confidence intervals. For example, the sampling points (e.g. drill holes) required for an industrial mineral deposit that exhibits strong structural and grade continuity (e.g. a bed of homogeneous limestone) may be more widely spaced than they would be for a typical volcanogenic massive sulfide (VMS) deposit where either structure and, or grade are less uniform. The Competent Person shall use reasonable judgment in the context of the deposit type, style and formation of the particular mineral deposit being assessed, and the objective of the estimation process (i.e. inferred, indicated or measured Mineral Resource/Probable or Proven Mineral Reserve).

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Customer specifications for industrial mineral products are frequently based solely on physical properties rather than or in addition to, chemical characteristics. Sample testing should include those tests that will provide the physical characteristics and chemical analyses that relate to the specifications of the end product.

Determination of the chemical and physical characteristics of an industrial mineral often involves procedures and tests that are not part of the normal activity of an analytical laboratory. The Competent Person should ensure that the physical and chemical analytical work conducted on the industrial mineral is appropriate and relevant to the identification of the properties of interest in the intended application(s), and that the laboratory has the requisite experience and necessary equipment to conduct the required tests.

“JORC Code”

The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, prepared by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC).

“Magnesium”

A light, silvery-white, moderately hard metallic element that in ribbon or powder form burns with a brilliant white flame. It is used in structural alloys, pyrotechnics, flash photography, and incendiary bombs. Atomic number 12; atomic weight 24.305; melting point 649°C; boiling point 1,090°C; specific gravity 1.74 (at 20°C); valence 2. Symbol is Mg.

“MgO”

Magnesium oxide, or magnesia, is a white solid mineral that occurs naturally as periclase and is a source of magnesium. It has an empirical formula of MgO. It is formed by an ionic bond between one magnesium and one oxygen atom. Magnesium oxide is easily made by burning magnesium ribbon which oxidizes in a bright white light, resulting in a powder.

“Metallurgy”

The science of metals, especially the science of separating metals from their ores and preparing them for use, by smelting, refining, etc.

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“Mineral Reserves”

Canada Code: The economically mineable part of a measured or indicated mineral resource demonstrated by at least a preliminary feasibility study. This study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

UK Code: A ‘Mineral Reserve’ is the economically mineable part of a measured and, or indicated mineral resource. It includes diluting materials and allowances for losses, which may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, and include consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is justified. Mineral Reserves are sub-divided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves.

Mineral, ore, and dolomitic limestone are used interchangeably.

“Modifying Factors”

UK Code: Consideration of factors affecting extraction, including mining, metallurgical, economic, marketing, legal, environmental, social and governmental.

US Code: The term ‘Modifying Factors’ is defined to include mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors

JORC Code: The term ‘Modifying Factors’ is defined to include mining, metallurgical, economic, marketing, legal, environmental, social and governmental considerations.

“Off-take agreement”

An agreement where a prospective customer for a particular product such as magnesium ingots agrees to buy a part or the total output of the product from a producing mine at pre-determined prices and conditions over a number of years.

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“Pidgeon Process”

Pidgeon process is one method of producing magnesium metal. In the Pidgeon Process, magnesium is produced from calcined dolomite under vacuum and at high temperatures using silicon as a reducing agent. The source of magnesium is from dolomitic limestone rock. In the process, the finely crushed dolomite is fed to rotary kilns where it is calcined, and where the carbon dioxide is driven off leaving a product of calcined dolomite. The calcined dolomite is then pulverized in a roller mill prior to mixing with finely ground ferrosilicon. The fine calcined dolomite and ferrosilicon are weighed in batch lots and mixed in a rotary blender. This mixture is then briquetted in briquetting pressing machine. Briquettes are then conveyed to the reduction furnaces. Magnesium crowns are then further moved to the refining process with flux to produce magnesium metal.

“Probable Mineral Reserve”

JORC Code: A ‘Probable Ore Reserve’ is 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. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified.

UK Code: A ‘Probable Mineral Reserve’ is 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. Appropriate assessments, which may include feasibility studies, have been carried out, and include consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is justified.

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Canada Code: A 'Probable Mineral Reserve' is the economically mineable part of an indicated and, in some circumstances, a measured mineral resource demonstrated by at least a preliminary feasibility study. This study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

"Proven Mineral Reserves"

Canada Code: The economically mineable part of a measured mineral resource demonstrated by at least a preliminary feasibility study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

UK Code: A 'Proven Mineral Reserve' is 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. Appropriate assessments, which may include feasibility studies, have been carried out, and include consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is justified. The choice of the appropriate category of Mineral Reserve is determined primarily by the relevant level of confidence in the mineral resource and after considering any uncertainties in the modifying factors. Allocation of the appropriate category must be made by the Competent Person.

JORC Code: A 'Proven Reserve' is 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. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified

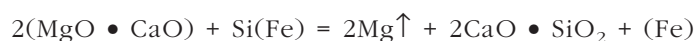
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UNFC: A Proven Mineral Reserve is the economically mineable part of a recoverable quantity assessed by a feasibility study or actual mining activity usually undertaken in areas of detailed exploration (measured recoverable quantity). It includes diluting materials and allowances for losses which may occur when material is mined and milled. Appropriate assessments, which include feasibility studies, have been carried out, and include consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate, with a high degree of confidence at the time of reporting, that extraction is justified.

“Reduction”

The process of extracting usable metal from an ore by heating to extreme temperatures in a furnace. Some metals may melt while being smelted and these can be run off or trapped in crucibles as ingots. But melting metals was not necessarily the aim; the main chemical reaction in smelting is that of reducing a metal oxide in the form of a bloom which can then be further worked by forging to drive off the remaining impurities.

The reaction in the Pidgeon Process during the reduction process is characterized as follows:



“Refining”

A process of removal of impurities, normally after extraction of a particular metal, and transformation into ingot form. It includes the finer processes of metallurgy. Crystallised magnesium is melted and the liquid magnesium after smelting is fed into continuous casting machine to cast into magnesium ingot, washed and packed as finished products.

“Specific gravity”

Specific Gravity (SG) is a special case of relative density defined as the ratio of the density of a given substance, to the density of water (H₂O). Substances with a specific gravity greater than 1 are heavier than water, and those with a specific gravity of less than 1 are lighter than water. Based on the SG-value of a given substance, the density of that substance can be calculated.

“Tonne”

Metric tonne

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“UK Code”	Code for Reporting of Mineral Exploration Results, Mineral Resources and Mineral Reserves (in United Kingdom, Ireland and Europe), prepared by the Institute of Materials, Minerals and Mining Working Group on Resources and Reserves in conjunction with the European Federation of Geologists, the Geological Society of London and the Institute of Geologists of Ireland.
“UNFC”	United Nations Framework Classification for Fossil Energy and Mineral Resources.
“US Code”	SME Guide for Reporting Exploration Results, Mineral Resources, and Mineral Reserves adopted by the United States Society for Mining, Metallurgy, and Exploration. The United States Securities and Exchange Commission (“US SEC”) regulates the reporting of exploration results, resources and reserves for public reporting. The reporting of exploration results, resources and reserves may also be subject to other national and international rules and regulations. These rules and regulations vary from time to time, and at any given time may not be totally in consistent with the content of the SME Guide.
“VALMIN Code”	Reporting guidelines for mineral reserves prepared by the VALMIN Committee, a joint committee of the Australasian Institute of Mining and Metallurgy, the Australian Institute of Geoscientists and the Mineral Industry Consultants Association.