

## Mining Glossary

This is a summary of the most relevant mining terms we use in our reports. A full glossary is available from:  
<http://www.mininglife.com/Glossary/a.asp>

**A\$** - Australian dollars

**Aeromagnetic** - measurement of the strength and orientation of the earth's magnetic field acquired using an airborne instrument

**Ag** - the symbol for silver (Argentum) on the Periodic Table

**Anomaly** – an area which exploration has shown to be different from the surrounding area or region

**Assay** – a test to determine the level of a particular element in a sample

**Au** – the symbol for gold (Aurum) on the Periodic Table

**Backwardation** - the current or spot price for a commodity is higher than the price that will be paid for delivery at some defined time in the future (the reverse of "contango")

**CIL** – Carbon-in-leach – a process for recovering gold from rock where the gold is dissolved by cyanide in the same tank as it is absorbed onto carbon

**CIP** – Carbon-in-pulp – a process of recovering gold from rock where the gold is dissolved by cyanide in a series of tanks, and the carbon onto which the gold is absorbed is passed in a counter-current direction

**Concentrate** – the product of a treatment plant by which the abundance of a particular mineral species is upgraded above the abundance in the ore which is fed into the plant

**Contango** – the current or spot price for a commodity is lower than the price that will be paid for delivery at some defined time in the future (the reverse of "backwardation")

**Cu** – the symbol for copper (Cuprum) on the Periodic Table

**Deduction units** – The % deducted from concentrate grades to calculate the metal paid for by a smelter. e.g. copper conc's typically deduct 1.1 units so a concentrate grading 28% copper would be paid as grading 26.9% copper (effective 96%)

**Diamond drilling** – a method of drilling in which a cylinder of rock is recovered by drilling with a diamond-impregnated bit

**EL** - Exploration Licence – a tenement granted by the relevant authority which enables an entity to explore for a specified suite of minerals

**ELA** – Exploration Licence Application – an application for a tenement that has yet to be granted by the relevant authority

**EP** – Exploration Permit – see EL

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**EPA** – Exploration Permit application – see ELA

**Electrowinning (EW)** – the recovery of metal from a solution by electrolysis (also see solvent extraction)

**Feasibility study** – an assessment of the legal, environmental, social, cultural heritage and governmental aspects of a proposed project as well as the technical aspects of mining, processing and marketing the product is coupled with financial analysis to determine the viability of the project

**Flotation** – a wet chemistry process by which particular minerals are induced to become attached to bubbles and to float, while other minerals sink

**Footwall** – the rock which lies below the ore

**g** – gram – a measure of weight

**g/t** – gram per tonne – the grade of a precious metal deposit

**goaf** – the caved area behind a longwall. See “Longwall”

**Grade** – the level of a valuable mineral or element in a rock

**Gravity survey** – the measurement of the gravitational field of the earth

**Gravity concentration** – using the different densities of minerals to separate valuable minerals from rock, or from each other

**Grinding** – the process of reducing rock to flour-sized particles for further processing

**ha** – hectare – an area 100m by 100m

**Hanging wall** – the rock which lies above ore

**Heap leach** - To dissolve minerals or metals out of an ore heap using chemicals. During heap leaching of gold, a cyanide solution percolates through crushed ore heaped on an impervious pad or base pads.

**JORC Code** – Joint Ore Reserve Committee Code – sets the standard for reporting resources and ore reserves

**Joint Venture** – JV – an agreement to operate an area, either in exploration or production, where each party pays an agreed proportion of the costs and receives an agreed proportion of the product

**Kriging** – a geostatistical method of interpolation which predicts unknown values from data observed at known locations, and is used to determine ore resources and ore reserves

**lb** – a measure of weight in the Imperial System – equal to 454 grams

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**Leaching** – a hydrometallurgical process by which the valuable metals are removed from the rock

**Lode** – the body of ore or valuable mineral, commonly tabular in shape

**Longwall** - Employs a rotation drum, which is pulled mechanically back and forth across a face of coal that is usually around 200m wide. The loosened coal falls onto a conveyor for removal from the mine. Longwalls are operated in panels up to 4km long. The area behind a longwall is allowed to cave and is termed the "goaf".

**Magnetic survey** - measurement of the strength and orientation of the earth's magnetic field

**Metallurgical recovery** – commonly expressed as a percentage, it is the proportion of the valuable mineral or element that is recovered by the processing plant

Ni - the symbol for nickel on the Periodic Table

**Open Stope** – see "Stope"

**Ore** – mineral bearing rock which can be mined and treated profitably under the current economic conditions, or those conditions which are deemed to be reasonable. The term "ore" should not be used until a feasibility study is undertaken to generate a reserve.

**Ore reserve** – the economically mineable part of an Indicated or Measured Resource. An ore reserve allows for losses which may arise from an inability to extract the entire resource, and for dilution by material which doesn't contain the valuable component. A feasibility study assessing the legal, environmental, social, cultural heritage and governmental aspects of the project as well as the technical aspects of mining, processing and marketing is required, coupled with financial analysis to confirm the viability of the project, prior to reporting a reserve

**Ounce** (Troy) – 31.1034 grams – a measure of the weight of a precious metal

**Payable metal** - see deduction units

**Pb** - the symbol for lead (from Plumbum) on the Periodic Table

**Percussion drilling** – a method of drilling where a drill bit is turned on the end of a drill string and also hammers up and down, to drill a hole and generate chips of rock from the formations or strata penetrated by the bit

**Parts per million** – ppm – a measure of the grade of a precious metal deposit, or used in reporting geochemical sample results – equal to g/t

**Penalties** – Penalties are imposed for undesirable elements contained in concentrate's that increase the smelter's cost. There are no standard 'rejection limits' for the penalty elements, however 'dirtier' concentrates can only be sold for lower returns than cleaner concentrates. A short list of common penalty elements: antimony, arsenic, fluorine, mercury and zinc or lead in copper conc's.

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**Price participation (pp)** – The price participation mechanism increases the TC as the metal price increase above, and reduces the TC as the price decreases below and agreed base price. This allows smelters to participate in rises/falls in the metal prices (other than adjusting TC's) – also see Treatment Charges.

**Refining Charge (RC)** – The price paid by mining companies to smelters for refining the contained precious metals (and copper) in their concentrate's to produce a payable metal. The refining charge is based on the payable metal content (after deductions).

**Refractory ore** – an ore which is difficult to treat by simple, conventional or low-cost methods. In gold ore, this commonly refers to the gold mineralisation being contained in a silica or sulphide, where it is not amenable to cyanide treatment.

**Reserve** – see Ore Reserve

**Resource** – an in-situ mineral deposit from which valuable minerals may be recovered. Under the JORC Code there are Inferred, Indicated and Measured resources, depending on the level of information available, with "Inferred" the least known, and "Measured" offering the greatest level of confidence. On completion of a positive feasibility study, the Indicated Resource will generate a Probable Reserve, and the Measured Resource will generate a Proven Reserve.

**Reverse Circulation (RC)** drilling – a method of percussion drilling which minimises contamination of the sample

**Rotary Air Blast (RAB)** drilling – a method of drilling where the drilling tool is turned in the hole without any percussive or hammer effect

**Solvent Extraction/Electro Winning (SXEW)** - a type of heap leaching and subsequent processing used for secondary copper ores whereby the oxidized copper minerals are taken into solution. The copper-bearing solution is processed to recover metallic copper from the solution electrolytically. See also electrowinning.

**Stockpile** – material of value mined and stored for future treatment

**Stope** - The underground excavation within the orebody where the main production takes place. Depending on the orebody qualities, stope's can range from 5kt to 2mt.

**t** – tonne - a measure of weight equal to 1,000kg, or 2,204 lbs

**Tailings** – the material remaining after processing has removed the valuable minerals or material

**Treatment charge (TC)** – The charge paid by a mining company to have their concentrate treated through a smelting to produce saleable metal. This is quoted in US\$/t of concentrate.

**tpa** – tonnes per annum

**U** – the symbol for uranium.

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**US\$** - United States dollars

**Waste** – material other than ore which is removed during the mining process

**Yellowcake** –  $U_3O_8$  - the oxide of uranium commonly traded.  
Uranium quoted as US\$/lb is US\$/lb of  $U_3O_8$ .

**Zn** – the symbol for zinc (Zincum) on the Periodic Table