


Section 7



Glossary of Terms, Acronyms and Symbols

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GLOSSARY OF ACRONYMS

AADT	Annual Average Daily Traffic.	DWE	(Former) Department of Water & Energy.
AEMR	Annual Environmental Management Review.	EC	Electrical Conductivity.
AGO	Australian Greenhouse Office.	ECRTN	Environmental Criteria for Road Traffic Noise.
AHD	Australian height datum (in metres).	EEC	Endangered Ecological Community
AHIMS	Australian Heritage Information Management System.	EL	Exploration Licence.
ANZECC	Australian and New Zealand Environment and Conservation Council.	EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).</i>
ARI	Annual Recurrence Interval	EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW).</i>
AS	Australian Standard.	ESD	Ecologically Sustainable Development.
dB(A)	decibels, A-weighted scale.	I&I NSW	(Former) Industry & Investment NSW.
DECC	(Former) Department of Environment and Climate Change (NSW).	INP	Industrial Noise Policy.
DECCW	(Former) Department of Environment Climate Change and Water (NSW).	LALC	Local Aboriginal Land Council.
DSEWPac	Department of Sustainability, Environment, Water, Heritage, Populations and Communities (Commonwealth).	LEP	Local Environmental Plan.
DoH	Department of Housing (NSW).	LGA	Local Government Area.
DoP	(Former) Department of Planning (NSW).	LPMA	(Former) Land & Property Management Authority (NSW).
DP	Deposited Plan.	MIC	Maximum Instantaneous Charge
DPI	Department of Primary Industries	ML	Mining Lease
DPI-MR	(Former) Department of Primary Industries - Mineral Resources. (See I&I NSW).	MLA	Mining Lease Application.
DP&I	Department of Planning and Infrastructure (NSW)	MOP	Mining Operations Plan
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services	MR	Main Road
		NATA	National Association of Testing Authorities.
		NEPC	National Environment Protection Council.
		NEPM	National Environment Protection Measure.



NHMRC	National Health and Medical Research Council.	ROM Pad	Run of Mine Pad
NOW	NSW Office of Water.	RTA	Roads and Traffic Authority.
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW).</i>	RBL	Rating Background Level
NPWS	(Former) National Parks and Wildlife Service (NSW).	SEPP	State Environmental Planning Policy.
NVC Act	<i>Native Vegetation Conservation Act 1997 (NSW).</i>	SH	State Highway.
OEH	Office of Environment and Heritage (NSW)	SR	Shire Road
PHA	Preliminary Hazard Analysis	TDS	Total Dissolved Solids.
PSA	Particle Size Analysis	TSC Act	<i>Threatened Species Conservation Act 1995 (NSW).</i>
POEO Act	<i>Protection of the Environment Operations Act 1997 (NSW).</i>	TSP	Total Suspended Particulate
RH	Relative Humidity.	TSS	Total Suspended Solids
		WM Act	<i>Water Management Act 2000.</i>



GLOSSARY OF SYMBOLS AND UNITS

°	degrees.	L/s	litres per second.
°C	degrees Celsius.	L _{A10}	sound level exceeded 10% of the sampling time.
%	percentage.	L _{A90}	sound level exceeded 90% of the sampling time.
\$M	million dollars.	L _{Aeq}	the L _{Aeq} is the “equal energy” average noise levels, and is used in some instances for the assessment of traffic noise effects or the risk of hearing impairment due to noise exposures.
<	less than.	L _{Aeq(1 hour)}	the “equal energy” average noise level over 60 minutes – used for assessing impacts of noise from motor vehicles on public roads.
≤	less than or equal to.	L _{Amax}	the absolute maximum noise level measured in a given time interval.
>	greater than.	m	metre.
≥	greater than or equal to.	m AHD	metres Australian Height Datum.
bcm	bank cubic metre – a volume of 1m ³ in the ground prior to disturbance.	M	million.
cm	centimetre (= 10mm).	m ²	square metre.
dB	decibel, unit used to express sound intensity.	m ³	cubic metre.
dB(A)	the unit of measurement of sound pressure level heard by the human ear, expressed in “A” scale.	m/s	metres per second.
g	gram (= 0.001 kilogram).	Mbcm	million bank cubic metres.
g/m²/month	grams per square metre per month – unit for deposited dust.	mg	milligram (weight unit = 0.001 gram).
ha	hectare (100m x 100m).	mg/L	milligrams per litre (parts per million).
kg	kilogram (= 1 000 grams).	ML	megalitre.
kL	kilolitre (= 1 000 litres).	mm	millimetre (= 0.001 metres).
km	kilometre (= 1 000 metres).	mm/s	millimetres per second
km²	square kilometre (= 1 million m ²).	Mt	million tonnes (metric tonne = 1 000kg).
km/hr	kilometres per hour.	Mtpa	million tonnes per annum.
kV	kilovolts.		
kW	kilowatts.		
L	litre.		
lcm	loose cubic metre – a volume of 1m ³ after excavation.		



NTU	Nephelometric turbidity units.
PM₁₀	particulate matter <10µm in diameter.
SWL	standing water level.
t	tonne (= 1 000kg).
tpa	tonnes per annum.
V:H	vertical to horizontal ratio
µS/cm	microsiemens per centimetre – unit of electrical conductivity
µm	micrometres (= 0.001mm)
µg/m³	micrograms (1 x 10 ⁻⁶ grams) per cubic metre



GLOSSARY OF TERMS

A horizon – part of soil profile immediately below the topsoil.

activated carbon – a form of carbon that has been processed to make it extremely porous and thus to have a very large surface area available for adsorption or chemical reactions

adverse weather conditions (in respect of dust) – conditions, such as high wind, that assist the movement of dust from the mine towards receptors.

adverse weather conditions (in respect of noise) – conditions, such as temperature inversions or gentle winds (<3m/s) from the mine towards receptors.

aerial photograph – a photograph of the landscape taken from a plane (typically covering several kilometres across) used for the surveying and interpretation of vegetation type, geology, land use, etc.

aerial survey – survey of a landscape from an aeroplane, typically involving aerial photography, to determine specific characteristics (e.g. mineral potential or land use).

airblast overpressure – a shock wave from a blast transmitted through the air, normally measured in dB(Linear).

air pollutant – a substance in ambient atmosphere, resulting from the activity of man or from natural processes, causing adverse effects to man and the environment (also called "air contaminant").

air pollution emissions inventory – all information, collection and processing system containing data on emissions of, and sources of, air pollution from both man-made and natural causes.

air quality criteria – quantitative relationship between a pollutant's dose, concentration, deposition rate or any other air quality-related factors, and the related effects on receptors, e.g. humans, animals, plants, or materials. Air quality criteria serve as the scientific basis for formulating ambient air quality standards or objectives.

alkaline – having a pH greater than 7.0.

alluvial – pertaining to material, such as sand or silt, deposited by running water (e.g. a creek or river).

ambient level – existing level of a phenomenon without the influence of the project.

amenity – the desirability of an area.

amphibian – animals (such as frogs) adapted to live both on land and in water.

anecdotal evidence – informal, oral or written evidence of an event.

aquifer – rock or sediment capable of holding and transmitting groundwater; a layer of water-bearing material which is permeable and can transmit significant quantities of water.

aquitard – a layer of water-bearing material which is relatively impermeable and cannot transmit significant quantities of water.

arboreal – pertaining to tree habitats.

archaeology – the scientific study of human history, particularly the relics and cultural remains of the distant past.

artefact – anything made by human workmanship, particularly by previous cultures (such as chipped and modified stones used as tools).

atmospheric stability – a measure of turbulence which determines the rate at which the effluent is dispersed as it is transported by the wind.

attenuation – reduction in sound pressure levels between two locations.

average annual daily traffic (AADT) – unit of assessment of traffic flow along a road.

average annual rainfall – the average amount of rain to fall at a specific location over the period of 1 year (measured in millimetres).

B horizon – subsoil material located below the A horizon material and above the parent rock.



background dust level – dust level in the absence of mining and processing activities.

background noise level – the level of the ambient sound indicated on a sound level meter in the absence of the sound under investigation (eg sound from a particular noise source; or sound generated for test purposes).

bank cubic metre – a volume of 1m³ in the ground prior to disturbance.

baseline monitoring – monitoring performed prior to site development.

batter – an engineered slope of soil or rock fill on either side upslope or downslope of a road, embankment or mine waste storage.

bench – a horizontal step in the face of a quarry or mine which could be up to 1m to 5m wide (if terminal).

biodiversity offset strategy – a method of providing for disturbance attributable to the project through additional or compensatory measures.

blasting – the operation of breaking rock by means of explosives.

bore – a well, usually of less than 20cm diameter, sunk into the ground and from which water is pumped.

bulldozer – an item of tracked mobile earth moving equipment fitted with a front blade and with rear rippers used for pushing and ripping soil and rock.

bund – embankment of clay or weathered rock emplaced for visual or acoustic screening or to control surface water flow.

carved tree – tree carved to signify an important site, e.g. ceremonial or burial site.

catch bank – an earth bank constructed to divert water away from disturbed areas.

catchment area – the area determined by topographic features within which rainfall will contribute to runoff at a particular point.

cation – an ion having a positive charge and characteristically moving toward a negative electrode.

Carbon in Leach (CIL) Process – the process by which gold is removed from carbonaceous material. Cyanide solution is added to crushed ore to dissolve the gold. Activated carbon is then added onto which the gold is adsorbed. The gold bearing carbon is then heated and passed through a series of electrowinning cells, where the gold plates onto the stainless steel cathodes.

channel (natural) – river or irrigation channel, includes bed and bank.

channel (surface water control structure) – extraction used to intercept and redirect runoff.

clay – a size term denoting particles, regardless of mineral composition, with diameter less than 0.004 mm.

community – a combination of plants that are dependent on their environment and influence one another and modify their own environment. They form together, with their common habitat and other associated organisms, an ecosystem, which is also related to neighbouring ecosystems and to the macroclimate of the region.

concentration – the amount of a substance, expressed as mass or volume, in a unit volume of air.

conductivity – the measurement of the ability of a substance (either a measure of solid, liquid or gas) to transmit electricity; a measure of the salt content.

conservation – the management of resources in a way that will benefit both present and future generations.

contour bank – an earth bank constructed across a slope parallel to contours.

cross-section – a two-dimensional representation of an area presented as if the area had been cut along its length.

crusher – that part of a processing plant where the coal is mechanically crushed into smaller pieces.



crushing – the mechanical process of reducing rock size usually by pressure or impact.

culvert – large pipe or channel carrying water underneath a structure (eg. a road).

cumulative – increasing by successive additions.

cyanide – a chemical compound that contains the cyano group (C≡N). Cyanide is used to dissolve gold and silver from ore.

cyclone – a classifier that makes use of centrifugal forces that greatly accelerate the rate at which particles separate. The centrifugal force is generated by injecting the feed slurry under pressure.

day time (noise) – that period of the day between 7:00am and 6:00pm.

decibel – unit expressing difference in power between acoustic signals.

density – 1. The mass of a substance (e.g. sediment) divided by its volume; water has a density of exactly 1 kilogram per litre;
2. The coverage of vegetation (e.g. trees) per unit of distance (along a linear transect) or unit of area (in an area transect).

dispersibility – a characteristic of soils relating to their structural breakdown in water into individual particles.

Dore – gold bars smelted at the mine Site which commonly contain 95% gold. Dore may contain small concentrations of silver, copper and traces of other metals.

drainage line – a passage along which water concentrates and flows towards a stream, drainage plain or swamp intermittently during or following rain.

drawdown – the difference between the water level observed during pumping and the non-pumping water level (static water level or static head).

drilling – the action of boring holes (usually less than 30 centimetres in diameter and up to several kilometres deep) into the ground, typically to establish a water bore or to investigate the geology found at depth.

dust – particles of mostly mineral origin generated by erosion of surfaces and the mining and handling of materials.

dust concentration – the amount of a substance, expressed as mass or volume, in a unit volume of air.

electrical conductivity (EC) – the ability of a substance (either solid, liquid or gas) to transmit electricity, often used as a measure of salinity.

ecology – the relationship between living things and their environment.

ecologically sustainable development (ESD) – using, conserving and enhancing the community's resources so that ecological processes on which life depends are maintained and the total quality of life, now and in the future can be increased.

ecosystem – the totality of biological processes and interactions within a specified physical environment.

emission – a discharge of a substance (e.g. dust) into the environment.

environment – a general term for all the conditions (physical, chemical, biological and social) in which an organism or group of organisms (including human beings) exists.

environmental constraint – limitation on a project by components of the existing environment.

environmental policy – statement by an organisation of its intentions and principles, in relation to the overall environmental performance, which provides a framework for action and for the setting of its environmental objectives and targets.

ephemeral – not permanent, e.g. a stream that flows only seasonally or after rainfall or a lake that periodically dries out.

erodibility – the tendency of soil, earth or rock to erode.

erosion – the wearing away of the land surface (whether natural or artificial) by the action of water, wind and ice.



erosion potential – the susceptibility of a parcel of land to the prevailing agents of erosion. It is dependent on a combination of climate, landform, soil, land use and land management factors.

evaporation – the loss of water as vapour from the surface of a liquid that has a temperature lower than its boiling point.

evening (noise) – that period of the day between 6:00pm and 10:00pm.

excavate – to dig into natural material or fill using an excavator or other machinery.

excavator – item of earth moving equipment fitted with a bucket on an articulated boom and used for digging material from a face in front of, or below the machine.

existing air quality – the quality of the ambient air near ground level, expressed as concentrations or deposition rates or air pollutants – also expressed as ambient air quality.

exotic – introduced or foreign, not native.

fauna – a general term for animals (birds, reptiles, marsupials, fish etc.) particularly in a defined area or over a defined time period.

front-end loader – machine used to lift and place soil, earth, rocks, etc. on a construction site.

fugitive emission – emission not entering the atmosphere from a stationary vent (stack). Examples of fugitive dust sources include vehicular traffic on unpaved roads, handling of raw materials, wind erosion of dusty surfaces, etc.

geotechnical – technical or engineering aspects relating to soil, rock and other materials.

grader – an item of earthmoving equipment, rubber tyred and fitted with a centrally mounted blade and rippers used to shape and trim the ground surface.

gradient – rate of change of a given variable (such as temperature or elevation) with distance.

grassland – an extensive area of largely treeless land covered mainly by natural grasses.

greenhouse – the heating of the earth's surface because outgoing long-wavelength radiation from the earth is absorbed and re-emitted by the carbon dioxide and water vapour in the lower atmosphere and eventually returns to the surface.

ground vibration – oscillatory motion of the ground caused by the passage of seismic waves originating from a blast.

groundcover – vegetation that grows close to the ground (such as grasses and herbs) providing protection from erosion.

groundwater – all waters occurring below the land surface; the upper surface of the soils saturated by groundwater in any particular area is called the water table.

groundwater depression – localised lowering of the regional water table.

habitat – the place where an organism normally lives; habitats can be described by their floristic and physical characteristics.

haul road – road used in a mine for haulage of material mined and for general site access.

haul truck – a truck specifically designed for off-road hauling of material mined.

head (hydraulic head) – energy contained in a water mass, produced by elevation, pressure or velocity.

heritage – the things of value which are inherited.

heritage significance – of aesthetic, historic, scientific, cultural, social, archaeological, natural or aesthetic value for past, present or future generations.

hydraulic gradient – the direction of flow of groundwaters.

hydrogeology (geohydrology) – the study of groundwater and the related geologic aspects of surface waters.

impact – the effect of human induced action on the environment.



in situ – a term used to distinguish material (e.g. rocks, minerals, fossils, etc.) found in its original position of formation, deposition, or growth, as opposed to transported material.

infiltration – the process of surface water soaking into the soil.

in-flow – flow directed into a particular feature, such as a lake or a mine pit.

infrastructure – the supporting installations and services that supply the needs of a project eg. road or rail.

inter-generational equity – the principle that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

intermittent – flows periodically, irregularly.

invertebrate – commonly, animals without a backbone (jellyfish, worms, molluscs, etc.).

ion – an atom or compound that has gained or lost an electron, so that it is no longer electrically neutral but carries a positive or negative charge.

landform – a specific feature of a landscape (such as a hill) or the general shape of the land.

loam – loose soil composed of clay and sand, especially a kind containing organic matter and of great fertility.

Local Environmental Plan (LEP) – a plan developed by a council to control development in part or all of their shire or municipality.

long-term – a period of time often associated with annual air quality standards. Long-term models usually address pollutant concentrations over several seasons to one year.

mammal – animal of the class mammalia, distinguished by the presence of hair and mammary glands.

maximum instantaneous charge (MIC) – the maximum amount of explosives detonated during each delay during a blast.

migratory – passing, usually predictably (based on aquatic species), from one region or climate to another, for purposes of feeding, breeding, or other biological purposes.

mine site – that area of the Project Site where mining, processing and related activities would be undertaken.

mitigation measure – measure employed to reduce (mitigate) an impact (such as the construction of a perimeter bund to reduce sound emissions).

mobile equipment – wheeled or tracked self propelled equipment such as trucks and front-end loaders.

monitoring – systematic sampling and, if appropriate, sample analysis to record changes over time caused by impacts such as mining; the regular measurement of components of the environment to understand a feature of the environment and/or establish that environmental standards are being met.

native – said of an organism or group of organisms that is restricted to a particular region or environment. A local inhabitant of a place.

natural – existing in, or formed by, nature (generally excludes anything obviously modified by human beings).

neutral – neither acidic nor basic (e.g. a pH equal to 7.0).

night time (noise) – that period of the day between 10:00pm and 7:00am.

noxious – introduced species considered to be harmful to native species or to the habitat of native species.

nutrient – generally refers to nitrogen and phosphorus, which are essential for biological growth.

particle size distribution – the relative proportions of particles (e.g. in a sediment) that fall within specific size categories.

particulate matter – small solid or liquid particles suspended in or falling through the atmosphere - sometimes expressed by the term particulates.



peak particle velocity (ppv) – a measure of ground vibration reported in millimetres per second (mm/sec).

perennial – refers to stream which has flow throughout the year or plant that lives for more than two growing seasons.

permeability – a material property relating to the ability of the material to transmit water.

pH – a measure of the degree of acidity or alkalinity of a solution; expressed numerically (logarithmically) on a scale of 1 to 14, on which 1 is most acid, 7 is neutral acid, and 14 is most basic (alkaline).

piezometer – a core drilled specifically for the monitoring of groundwater levels and water quality.

pollution – the alteration of air, soil, or water as a result of human activities such that it is less suitable for any purpose for which it could be used in its natural state.

population – a group of organisms all of the same species occupying a particular area.

potable – water suitable for human consumption.

precautionary principle – where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation; a principle of ESD which states that decisions about any proposed development should be guided by careful management to avoid serious and irreversible damage to the environment.

progressive rehabilitation – rehabilitation of mine or disturbed areas as soon as practicable after they are released during the life of the mine or after the final landform is achieved.

Project approval – approval for a project granted by the Minister for Planning Part 3A of the *Environmental Planning & Assessment Act*.

Project Site – the area of land which corresponds with the area of application for development consent and the Mining Lease Application area.

quadrat – a square survey area.

quantify – to determine the quantity or amount of a component in a substance.

recharge – the addition of water to an aquifer, directly from the surface, indirectly from the unsaturated zone, or by discharge from overlying or underlying aquifer systems.

rehabilitation – the preparation of a final landform after mining and its stabilisation with grasses, trees and shrubs. In mining, rehabilitation means restoring mined land so that it can be used for the same or some other purpose after mining has finished.

relative humidity – the ratio of actual moisture in the air to the amount the air could hold if saturated, at a given temperature.

remnant native vegetation – native vegetation remaining after widespread clearing has taken place.

reptile – cold-blooded vertebrates, including lizards, snakes, turtles, and crocodiles.

reserves – in the mining context refers to those parts of a resource where sufficient information is available to undertake mine planning.

resources – an estimate of potentially usable magnetite and limestone in a defined area based on preliminary information.

revegetation – replacement of vegetation, principally grasses and legumes on areas disturbed by mining activities.

riparian – pertaining to a river or stream bank.

runoff – that portion of the rainfall falling on a catchment area that flows from the catchment past a specified point.

saline – water with high salt concentration.

salinity – the dissolved content of water expressed in terms of milligrams per litre.

scarred tree – tree with cuts in its bark or wood made by Aborigines.



screening – a process which separates crushed rock into various size fractions – this usually involves a mechanical vibration of the rock over a series of decks fitted with steel mesh, steel plate or polyurethane or rubber mats with fixed sized apertures.

sediment – material such as mud and sand that has been moved and deposited by water, ice or wind.

sediment basin – a small excavation designed to trap the coarse material washed from disturbed areas.

sequence (geological) – layers of (predominantly) sedimentary rocks sourced from a common geological environment or period.

silt – a classic sediment, most of the particles of which are between 0.063mm and 0.004mm in diameter.

solubility – the ability of a substance (such as copper) to dissolve in a solvent (such as water); solubility depends on such factors as temperature and pH.

species – a taxonomic grouping of organisms that are able to interbreed with each other but not with members of other species.

species diversity – a measure of the number of different species in a given area.

stable – used with respect to the atmospheric boundary layer, when the vertical temperature gradient is greater than the adiabatic lapse rate. Vertical air motions are suppressed. The turbulence intensity is low resulting in poor dispersion conditions.

stakeholder – person, group or organisation or company with an interest in an activity or outcome.

stockpile – a pile used to store material for future use.

storage capacity – the maximum volume of liquid able to be retained in a container (e.g. a reservoir or lake).

stormwater – surface water runoff immediately after rainfall.

stratigraphy – the succession and age of strata of rock and unconsolidated material. Also concerns the form, distribution and lithologic composition of the strata.

stripping – removal of vegetation and topsoil.

structure (soil) – the physical texture of the soil arising from the interrelationship between the grain size, composition, and organic nature of a soil.

subsoil – the layer of soil lying below the topsoil; usually contains less organic matter and is less fertile.

surface water – all water flowing over, or contained on, a landscape (e.g. runoff, streams, lakes etc).

suspended solids – analytical term applicable to water samples referring to material recoverable from the sample by filtration.

sustainable development – development that meets the needs of the present without compromising the ability of future generations to meet their needs (World Commission on Environment and Development 1990).

temperature inversion – a weather term for a surface defining the boundary between two layers of air or different temperatures; generally used in meteorology with respect to an increase of temperature with height in contrast with the usual decrease of temperature with height in the troposphere. An inversion layer is distinguished by its large stability, which limits the turbulence and therefore the dispersion of pollutants.

terrestrial – of or relating to the land, as distinct from air or water.

texture (of soil) – variations in composition, grain size distribution, and structure.

topography – the physical relief and contour of a region.

topsoil – the surface or upper layer of soil, usually containing more organic material, viable life forms, seeds and nutrients than the subsoil beneath it.

total suspended particulates (TSP) – the mass of all particulate matter suspended in a solution.



total suspended solids – a common measure used to determine suspended solids concentrations in a waterbody and expressed in terms of mass per unit of volume (e.g. milligrams per litre).

tributary – a stream or river that flows into a larger river or lake.

waste rock – in the mining context refers to non-economic material to be removed to allow access to the resource.

weed – any plant (in particular an herbaceous one) that survives in an area where it is harmful or troublesome to the desired land use.

wildlife corridor – a strip of vegetation that has a design purpose of allowing animals to pass from one area to another and acting as an undisturbed area for wildlife preservation.

wind direction – the direction from which the wind, averaged over a certain period of time, is blowing.

wind erosion – wearing away of exposed soil, earth, or rock surfaces by the abrasive action of wind-blown particles (e.g. grains of sand).

wind rose – diagrammatic representation of wind direction, strength, and frequency of occurrence over a specified period.

woodland – plant communities dominated by trees whose crowns shade less than 30% of the ground.

yield – (of a water bore) 1) the capacity of the bore to produce water. 2) the amount of water actually withdrawn.

