

Section 7

Glossary of Technical Terms, Acronyms and Symbols



GLOSSARY OF TERMS

acid – substance with a pH less than 7.0; the lower the pH, the higher the corrosive ability of the substance.

acid formation – the process whereby acid is formed by the oxidation of minerals (particularly sulfides) exposed to air and water.

acid mine drainage (AMD) – runoff of acidic water, typically from mine waste rock, following acid formation within the rock.

acoustic bund – a natural or artificial structure (e.g. a hill or a bund) that inhibits the transmission of sound.

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

aerial air photographs – photographs of landscape taken from a plane (typically areas 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 the 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 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.

alkalinity – in water analysis a measure of the carbonates, bicarbonates, hydroxides and occasionally the borates, silicates and phosphates in the water.

Alluvial/alluvium – 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 proposal.

amenity – the desirability of an area.

ANFO – mixture of ammonium nitrate and fuel oil (diesel) used as an explosive.

aquifer – rock or sediment capable of holding and transmitting groundwater.

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.

backfill – material used to fill created void.

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

background noise levels – 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).

basin – the drainage area of a river and its tributaries or of a groundwater system.

bench – a step in the face of a quarry or mine which could be up to 25 m high.

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



borehole – a well, usually of less than 20 cm 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.

catch drains – drains used to intercept and redirect runoff.

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

channel – river or irrigation channel, includes bed and bank.

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

coal seam – a layer of coal within the geological strata.

colliery – coal mine.

community – a combination of plants that are dependant 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.

contractor – specialist brought in to perform a specific task, such as the construction of mine infrastructure or the excavation (mining) of the open pit.

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

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

culvert – large pipe or channel carrying water underneath a structure (e.g. a road or railway track) or underneath the ground.

cumulative – increasing by successive additions.

decibel - unit expressing difference in power between acoustic signals.

Development Application - an application to the local council or other Authority for approval of an activity deemed to require an approval prior to commencement.

dip - the angle that rock strata make with a horizontal surface measured at right angles to the strike.

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

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

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 suppressant – any substance used to prevent dust disturbance.

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

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



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

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.

Emerson Class No. – ranking given to a soil or clay according to the Emerson crumb test.

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

emission factor – an expression for the rate at which a pollutant is generated as a result of some activity, divided by the level of that activity.

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 constraints - limitations on a project by components of the environment.

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.

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. An excavator would be used around the perimeter of the lakes.

exploration licence (EL) – a licence issued by the Department of Mineral Resources for exploration in a defined area.

fault - a fracture in rock along which there has been observable displacement.

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

feasibility study – a preliminary technical and economic study to assess the viability of a project.

fill – material imported and emplaced to raise the general surface level of a site.

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

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.

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.



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

habitat 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.

haul road – road used in a quarry for haulage of rock from the active face to the crusher and for general site access.

haultruck – a truck specifically designed for hauling and tipping soil or rock within the quarry or similar situation.

heritage – the things of value which are inherited.

highwall - exposed wall of excavation designed to stand open for mine life.

hydraulic conductivity (k) – the rate of flow of water in an aquifer through a cross section of unit area under a unit hydraulic gradient, at the prevailing temperature. Usually expressed in units of metres per second or metres per day.

hydraulic gradient - the direction of flow of groundwaters.

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

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.

indigenous – belonging to, or found naturally in, a particular environment (see also exotic).

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

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.

Interburden – rock strata in between coal seams.

inversion - 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.

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

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

mitigation measures – measures 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.

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

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

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

Open-cut– large hole excavated in an open-cut mining operation to remove the ore.

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

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).



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.

precautionary principle - 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.

Project Site - the total area covered by the project, including pit, processing plant, overburden dumps, stockpiles, bunds, ponds, etc.

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 quarrying and its stabilisation with grasses, trees and shrubs.

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

remnant vegetation - native woodland remaining after widespread clearing has taken place.

resource - an estimate of potentially usable coal in a defined area based on preliminary information.

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

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

Run-of-Mine (ROM) - ore or overburden in condition as loaded from open cut.

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

scraper - irregularly shaped artefact that has been modified in a manner that suggests use in scraping activities, notably woodworking.

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

source - the place where pollutants are emitted into the atmosphere. Sources may be point, area or line sources. Often the term "source" is used for a whole plant or an installation. In air pollution modelling, the terms "continuous source" and "instantaneous source" are used:

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

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.

stemming - the fine material placed in a blast drill hole after the explosive to ensure blast force is directed laterally.

stockpile - a pile used to store material (such as low-grade ore) for future use.

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

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.

Site Water Management Plan (SWMP) - a plan to manage the capture, storage and use of Project Site surface water.



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

syncline – a fold in the form of an basin.

temperature inversion - an increase in air temperature with height.

topography – the physical relief and contour of a region.

topsoil – the upper layer of soil, usually containing more organic material and nutrients than the subsoil beneath it.

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).

weathered materials – rock affected to any degree by the processes of chemical or physical weathering.

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

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.



GLOSSARY OF SYMBOLS

°C – degrees Celsius.

% - percentage.

< - less than.

> - greater than.

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

CB – Catch Bank

cm – centimetre

dB – decibel, unit used to express sound intensity.

DB – Diversion Bank

dB(A) – the unit of measurement of sound pressure level heard by the human ear, expressed in “A” scale.

g/m²/month – grams per square metre per month unit for deposited dust.

ha – hectare (100 m x 100 m).

hr – hour

kcal/kg – kilocalories per kilogram.

kg – kilogram (weight measure).

kg/ha – kilograms per hectare.

kL – kilolitre (thousand litre).

km – kilometre (1000 m).

km² – square kilometer.

km/hr – kilometres per hour.

L – litre.

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.

L_{Aeq 15 minute} – Average equivalent noise level measured over 15 minutes.

L_{Aeq 24 hour} – Average equivalent noise level measured over 24 hours.

L_{Amax} – the absolute maximum noise level measured in a given time interval.

m – metre.

m AHD – metres Australian Height Datum.

M – million.

m² – square metre.

m³ – cubic metre.

mg – milligram (weight unit).

mg/L – milligrams per litre (parts per million).

MIC – Maximum Instantaneous Charge.

ML – megalitre.

mm – millimetre (= 0.001 metres).

m/s – metres per second.

mm/s – millimeters per second.

Mt – million tonnes (metric tonne = 1 000 kg).

Mtpa – million tonnes per annum.

PM₁₀ – particulate matter <10µm in diameter.

SB – Sediment Basin

SD – Storage Dam

SWL – standing water level.

t – tonnes.

tpa – tonnes per annum.

tsp – total suspended particulates.

µS/cm – microsiemens per centimeter.

V:H – ratio of vertical to horizontal.



GLOSSARY OF ACRONYMS

Adb – air dried basis; a standard or benchmark basis for comparing coal qualities where free moisture is air dried from a crushed sample.

AEMR – Annual Environmental Management Review

AHD – Australian height datum (in metres).

ALS – Australian Laboratory Services

AMD – Acid Mine Drainage

ANZECC – Australian and New Zealand Environment and Conservation Council.

AS – Australian Standard.

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

BMP – Blast Management Plan

dB(A) – decibels, A-weighted scale; unit used for most measurements of environmental noise; the scale is based upon typical responses of the human ear to sounds of different frequencies.

DECC – Department of Environment and Climate Change

DOP – Department of Planning

DPI-MR – Department of Primary Industries – Mineral Resources

DWE – Department of Water & Energy

EC - electrical conductivity.

EL – Exploration Licence

EP&A Act – Environmental Planning and Assessment Act 1979.

EPL – Environment Protection Licence

FFMP – Flora / Fauna Management Plan

LEP – Local Environmental Plan.

MOP – Mine Operations Plan

MREMP – Mining, Rehabilitation and Environmental Management Process

NHMRC – National Health and Medical Research Council.

NMP – Noise Management Plan

REP – Regional Environmental Plan

ROM – Run-of-Mine

SEPP – State Environmental Planning Policy

SMU – Soil Mapping Unit

SoEE – Statement of Environmental Effects

SWMP – Site Water Management Plan

TSS – Total Suspended Solids

USBM – United States Bureau of Mines

VWD – Void Water Dam



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