Section 8

Glossary of Technical Terms, Acronyms, Symbols and Units

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GLOSSARY OF TERMS

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

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 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 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.

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

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 proposal.

amenity – the desirability of an area.

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

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

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

anticline – a fold in the form of an up-turned basin.

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

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.

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.

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).

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

baseline monitoring – monitoring performed prior to site development.

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

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

blasthole – hole drilled into rock to position explosive for blasting.

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

blast rock – rock that is propelled into the air by the force of an explosion. Usually comes from pre-broken material on the surface or upper open face.

bore – 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.

Carboniferous – geological time interval for the period from 345 to 280 million years before present and has a duration of 65 million years.

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.

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

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.

conglomerate – sedimentary rock consisting of poorly sorted grains (typically pebbles surrounded by finer material, such as sand or silt).

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.

core – (archaeology) a piece of stone from which flakes have been removed; cores often show distinctive flake scars indicative of certain production techniques, such as blade or adze production.

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

crusher – that part of an ore-processing plant where the ore 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 (e.g. a road or railway track) or underneath the ground.

cumulative – increasing by successive additions.

deceleration lane – a lane used for decreasing speed before leaving the road.

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; gold has a density of 19.3 kilograms per cubic metre. 2. The coverage of vegetation (e.g. trees) per unit of distance (along a linear transect) or unit of area (in an area transect).

deposition – laying down of particulate material (e.g. sediment in a lake or tailings solids in a tailings storage).

detonator – a device that triggers an explosive.

diamond core – cylindrical-shaped drilling samples obtained by use of a diamond surfaced drilling bit.

diamond drill hole – drill hole constructed by equipment using rotary fluid flushing and a diamond faced bit to obtain core from the rock being drilled.

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).

drill core – the cylindrical sample of rock recovered by means of diamond drilling.

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 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.

Environmental Assessment (EA) – a formal description of a project and an assessment of its likely impact on the physical, social and economic environment. The EA is used as a vehicle to facilitate public comment and as the basis for analysing the project with respect to granting approval under relevant legislation.

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.

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.

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.

fugitive emissions – emissions 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.

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.

groundwater surface – the upper surface of the 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 quarry for haulage of rock from the active face to the crusher and for general site access.

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

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

heavy metals – normally trace metals of high density which occur in ore deposits and may be environmentally hazardous.

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.

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 sued 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).

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

inflow – 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.

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.

intermittent – flows periodically, irregularly.

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.

invertebrates – 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.

jointing - planes of discontinuity in rockmass which exhibit no evidence of relative movement.

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

lapse weather conditions – weather conditions that neither particularly exacerbate nor mitigate the dispersal of pollutant emissions (dust, noise etc.) from the project area.

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 associated with annual air quality standards. Long-term models usually address pollutant concentrations over several seasons to one year.

low loader – is a trailer which has a relatively low carrying deck and used to transport large items of equipment such as bulldozers or scrapers.

low-yielding – an aquifer which yields water at a low rate.

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

management strategy – a policy or direction that assists in actions required to address issues.

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

Mining, Rehabilitation and Environmental Management Process (MREMP) – process prepared under the auspices of the NSW Department of Mineral Resources as a vehicle for government agency control of the environmental management of a mining project from construction through operations to decommissioning, final rehabilitation and relinquishment of the mining lease.

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.

mudstone – sedimentary rock formed from the consolidation of silt and clay.

National Park – an area set aside for the protection of flora and fauna and for public recreation.

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).

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

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

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.

operations phase – that period of the mining project, after construction and prior to decommissioning, during which pit excavation and metal extraction takes place.

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

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.

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

Permian – the geological period of time from 280 to 225 million years.

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 – 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.

pump test – the systematic pumping of water from a bore to test the response of an aquifer.

quadrat – a square survey area.

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

Quaternary – geological period of time from 2 million years before present to present.

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.

Regional Environmental Plan (REP) – a plan prepared by the State Government Department responsible for planning where controls on development are considered on a regional and/or statewide basis.

rehabilitation – the preparation of a final landform after quarrying and its stabilisation with grasses, trees and shrubs.

reject material – comprises a mixture of high ash coal and non-coal materials such as sedimentary rock and clay.

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

relief – the variation in landscape elevation over a region.

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

reptiles – 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.

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.

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.

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

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 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.

short-term – a period of time associated with air quality standards for pollutant exposures ranging between one hour and twenty four hours.

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

silt-stop fencing – fine mesh fencing normally installed downslope of a sediment source, designed to trap silt and sediment and allow the water to pass through.

soil erosion hazard – the susceptibility of an area of land to erosion and includes rainfall erosivity, slope, soil erodibility and cover.

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.

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:

continuous source: source which emits pollution continuously over a time period much larger than the travel time to a point where the concentration is considered. Usually it is assumed that during this time period the emission is constant.

instantaneous source: source which emits pollution over a time period much short than the travel time of the emission to a point where its concentration is considered.

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.

specific energy – heat liberated by combustion of a fuel, ie. energy available per unit of mass.

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.

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

Surface 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.

temperature inversion – an increase in air temperature with height.

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 upper layer of soil, usually containing more organic material 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.

weathered rock – 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.

wildlife – non-domesticated fauna.

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.

GLOSSARY OF ACRONYMS

AADT Annual Average Daily Traffic.

Adb air dried basis.

AEMR Annual Environmental Management Review.

AHD Australian height datum (in metres).

AHIMS Australian Heritage Information Management System.

ALS Australian Laboratory Services.

AMD Acid Mine Drainage.

ANC Acid Neutralising Capacity.

ANFO Ammonium Nitrate and Fuel Oil.

ANZECC Australian and New Zealand Environment and Conservation Council.

AS Australian Standard.

CCA Community Conservation Area

CEC Cation Exchange Capacity.

CL Coal Lease.

CHPP Coal Handling and Preparation Plant.

DA Development Application.

dB(A) decibels, A-weighted scale.

DEC Department of Environment and Conservation (NSW).

DECC Department of Environment and Climate Change (NSW).

DEH Department of Environment and Heritage (Commonwealth).

DNR Department of Natural Resources (NSW).

DoH Department of Housing (NSW).

DoL Department of Lands (NSW).

DoP Department of Planning(NSW).

DP Deposited Plan.

DPI Department of Primary Industries (NSW).

DPI (MR) Department of Primary Industries (Mineral Resources) (NSW).

DUAP Department of Urban Affairs and Planning (NSW). (now DIPNR)

DWE Department of Water and Energy (NSW).

EAT Emersons Aggregate Test.

EC electrical conductivity.

ECRTN Environmental Criteria for Road Traffic Noise.

EIS Environmental Impact Statement.

EL Exploration Licence.

EPBC Act Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).

EP&A Act Environmental Planning and Assessment Act 1979 (NSW).

ESD Ecologically Sustainable Development.

GSC Gunnedah Shire Council.

GWP Global Warming Potential.

HVAS High Volume Air Sampling.

INP Industrial Noise Policy.

LALC Local Aboriginal Land Council.

LEP Local Environmental Plan.

LGA Local Government Area.

MIC Maximum Instantaneous Charge.

MLA Mining lease application.

MOP Mining Operations Plan.

MR Main Road.

MREMP Mining, Rehabilitation and Environmental Management Process.

NAG Net Acid Generation.

NAPP Net Acid Producing Potential.

NATA National Association of Testing Authorities.

NEPC National Environment Protection Council.

NEPM National Environment Protection Measure.

NHMRC National Health and Medical Research Council.

NPW Act National Parks and Wildlife Act 1974 (NSW).

NPWS National Parks and Wildlife Service (NSW).

NVC Act Native Vegetation Conservation Act 1997 (NSW).

PHA Preliminary Hazard Analysis

PSA Particle Size Analysis

PVS Peak Vector Sum

POEO Act Protection of the Environment Operations Act 1997 (NSW).

REP Regional Environmental Plan.

RFI Act Rivers and Foreshores Improvement Act 1948 (NSW).

ROM Run-of-Mine.

RTA Roads and Traffic Authority (NSW).

RBL Rating Background Level

SEPP State Environmental Planning Policy.

SMU Soil Mapping Unit.

SR Shire Road

SWMP Surface Water Management Plan.

TAPM The Air Pollution Model.

TSC Act Threatened Species Conservation Act 1995 (NSW).

TSP Total Suspended Particulate

USBM United States Bureau of Meteorology.

VBMP Vegetation and Biodiversity Management Plan.

WCM Whitehaven Coal Mining Pty Ltd.

WHO World Health Organisation

GLOSSARY OF SYMBOLS AND UNITS

°	degrees.
°C	degrees Celsius.
%	percentage.
$M	million dollars.
<	less than.
≤	less than or equal to.
>	greater than.
≥	greater than or equal to.
bcm	bank cubic metre – a volume of $1m^3$ in the ground prior to disturbance.
cm	centimetre (= 10mm).
D%	dispersion percentage.
dB	decibel, unit used to express sound intensity.
dB(A)	the unit of measurement of sound pressure level heard by the human ear, expressed in "A" scale.
deg	degrees.
g	gram (= 0.001 kilogram).
g/m²/month	grams per square metre per month – unit for deposited dust.
ha	hectare (100m x 100m).
kcal/kg	kilocalories per kilogram.
kg	kilogram (= 1 000 grams).
kL	kilolitre (= 1 000 litres).
km	kilometre (= 1 000 metres).
km²	square kilometre (= 1 million m^2).
km/hr	kilometres per hour.
kVA	kilowatt – amperes.
L	litre.
lcm	loose cubic metre – a volume of $1m^3$ after excavation.
L/s	litres per second.
L/t	litres per tonne.
L/hr	litres per hour.
L_{A10}	sound level exceeded 10% of the sampling time.
L_{A90}	sound level exceeded 90% of the sampling time.
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.
$L_{Aeq\ 1\ hour}$	the "equal energy" average noise level over 60 minutes – used for assessing impacts of noise from motor vehicles.
$L_{Aeq\ T}$	sound level of continuous noise which emits the same energy as the fluctuation sound over a given time period (T).
L_{Amax}	the absolute maximum noise level measured in a given time interval.
L_{AN}	the A-weighted sound pressure level exceeded by N% of a given measured period.
m	metre (= 100cm).
m AHD	metres Australian Height Datum.
M	million.
m²	square metre.
m³	cubic metre.
m/s	metres per second.
Mbcm	million bank cubic metres.
mg	milligram (weight unit = 0.001 gram).
mg/L	milligrams per litre (parts per million).
ML	megalitre.

MLpa megalitres per annum.

mm millimetre (= 0.001 metres).

mm/s millimetres per second

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

Mtpa million tonnes per annum.

PM_{10} 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

μm micrometres (= 0.001mm)

$\mu g/m^3$ micrograms (1×10^{-6} grams) per cubic metre

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