

Section 8

Glossary of Acronyms, Symbols, Units and Technical Terms

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GLOSSARY OF ACRONYMS

AADT	Annual Average Daily Traffic.	DoH	Department of Housing (NSW).
adb	air dried basis.	DoL	Department of Lands (NSW).
ADO	Automotive Diesel Oil.	DoP	Department of Planning (NSW).
AEMR	Annual Environmental Management Review.	DP	Deposited Plan.
AGO	Australian Greenhouse Office.	DPI	Department of Primary Industries (NSW).
AHD	Australian height datum (in metres).	DPI (MR)	Department of Primary Industries (Mineral Resources) (NSW).
AHIMS	Australian Heritage Information Management System.	EA	Environmental Assessment.
ALS	Australian Laboratory Services.	EAT	Emersons Aggregate Test.
ANZECC	Australian and New Zealand Environment and Conservation Council.	EC	Electrical Conductivity.
ARI	Annual Recurrence Interval	ECRTN	Environmental Criteria for Road Traffic Noise.
AS	Australian Standard.	EL	Exploration Licence.
CEC	Cation Exchange Capacity.	EPA	Environment Protection Authority.
CIB	Chemical Induced Backwash.	EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).
CL	Coal Lease.	EP&A Act	Environmental Planning and Assessment Act 1979 (NSW).
CHPP	Coal Handling and Preparation Plant.	ESD	Ecologically Sustainable Development.
DA	Development Application.	GAB	Great Artesian Basin.
dB(A)	decibels, A-weighted scale.	GWMA	Groundwater Management Area.
DEC	Department of Environment and Conservation (NSW).	HVAS	High Volume Air Sampling.
DEH	Department of Environment and Heritage (Commonwealth).	IBC	Idemitsu Boggabri Coal Pty Limited.
DIPNR	Department of Infrastructure, Planning and Natural Resources (NSW) (Now Department of Planning).	INP	Industrial Noise Policy.
DLWC	Department of Land and Water Conservation (NSW) (Now Department of Natural Resources).	LALC	Local Aboriginal Land Council.
DNR	Department of Natural Resources.	LEP	Local Environmental Plan.
		LGA	Local Government Area.
		MF	Microfiltration.



MLA	Mining Lease Application.	SCSC	Specialist Consultant Studies Compendium.
MOP	Mining Operations Plan.	SEPP	State Environmental Planning Policy.
MR	Main Road.	SH	State Highway.
MREMP	Mining, Rehabilitation and Environmental Management Process.	SIS	Species Impact Statement.
NATA	National Association of Testing Authorities.	SMU	Soil Mapping Unit.
NEPC	National Environment Protection Council.	SR	Shire Road
NEPM	National Environment Protection Measure.	SWMP	Surface Water Management Plan.
NHMRC	National Health and Medical Research Council.	TAPM	The Air Pollution Model.
NPW Act	National Parks and Wildlife Act 1974 (NSW).	TDS	Total Dissolved Solids.
NPWS	National Parks and Wildlife Service (NSW).	TSC Act	Threatened Species Conservation Act 1995 (NSW).
NVC Act	Native Vegetation Conservation Act 1997 (NSW).	TSP	Total Suspended Particulate
PB	Parsons Brinckerhoff.	UCS	Uniaxial Compressive Strength.
PET	Polyethylene terephthalate	UF	Ultra Filtration.
PHA	Preliminary Hazard Analysis	WCM	Whitehaven Coal Mining Limited.
PSA	Particle Size Analysis	WHO	World Health Organisation
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).		
RH	Relative Humidity.		
RIC	Rail Infrastructure Corporation.		
RO	Reverse Osmosis.		
ROM	Run-of-Mine.		
RTA	Roads and Traffic Authority (NSW).		
RBL	Rating Background Level		



GLOSSARY OF SYMBOLS AND UNITS

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



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.
NTU	Nephelometric turbidity units.
OU/m³	Odour units per cubic metre.
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.

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.

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 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.

backfill – material used to fill created void.

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.

basalt – fine-grained, dark volcanic igneous rock.

baseline monitoring – monitoring performed prior to site development.

bath house – employee amenities located on a mine site, including toilets, showers, hand basins, lockers and change area.

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).

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.

box cut – an area excavated from ground level to provide the entry to an underground mine (via an adit or portal).

buffer – a physical barrier / structure or width of land that encloses, partially encloses, or defines a particular environment. A buffer serves to minimise the impacts of non-desirable external influences on the adjoining environment.

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 drain – drain 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.

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.

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 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 (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 a through 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;
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).

Development Application - an application a 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).

drift – a gentle decline (typically about 1:6.5 (V:H)) mined from the surface to a coal seam to be mined. Drifts can provide access for personnel and materials and/or coal conveyors.

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, 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.

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 Assessment (EA) – a report required to accompany a planning application for a major project – covering the project description, assessment of impacts and proposed safeguards and commitments.



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.

evasee – ducting associated with the ventilation fan.

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.

exploration licence (EL) – a licence issued by the Department of Primary Industries (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.

feeder breaker – coarse crusher that reduces coal from the continuous miner to a uniform size for conveying.

fill – material imported (either from elsewhere on-site or off-site) 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 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.

goaf - An area of the mine which has been previously mined and then used as a depository for waste from the workings.

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.

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 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.

heavy metal – normally trace metal of high density which occur in metallic 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.

hydraulic conductivity (k) – the rate of flow of water through the soil profile or 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.

igneous – a rock or mineral that solidified from molten or partly molten material.

impact – the effect of human induced action on the environment (modified from Westman, 1985).

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.

Indicative Mining Area (3 630ha) – area bound by the indicative limit of underground workings.

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 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.

interburden – rock strata in between coal seams.

intermittent – flows periodically, irregularly.

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.

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.

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.



load-out bin – metal storage bin which receives and stores coal prior to loading into trucks or train carts.

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.

longwall – a series of equipment, including hydraulic jacks and a shearer, used to mine coal in an underground mine.

longwall mining - an underground coal mining technique involving the full extraction of coal from a section of the coal seam or 'face' using mechanical shearers. Self advancing hydraulically powered supports temporarily hold the roof up while the coal is extracted. Once the coal is extracted, the roof is allowed to collapse.



Source: Joy Mining Machinery
(www.joy.com, 2005)

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.

major project – an activity as defined under the State Environmental Planning Policy (Major Projects).

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 Primary Industries (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 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.

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

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).

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.

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

operations phase – that period of the mining project, after construction and prior to decommissioning, during which extraction of the resource 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 or plant that lives for more than two growing seasons.

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.

pervious – permeability.

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.

Pit Bottom Area – the area at the base of the drifts which lead to the underground mine workings.

Pit Top Area (256ha) – main area of surface disturbance incorporating mine portals, surface buildings, rail loop, ROM and product coal stockpile areas etc.

Planning Application – an application to the Department of Planning for approval of a major project.

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.

portal – underground mine entry.

potable – water suitable for human consumption.

Potential Caveability Trial Area (10ha) – area where geotechnical data would be collected during secondary coal extraction causing subsidence.

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 Site – the area of land covered by the Project Approval and correspondent with the Mining Lease Application area; the total area covered by the project, including the surface facilities and indicative mining area, stockpiles, water management structures, etc.

Proponent – person, organisation or company proposing to carry out an activity / seeking Project Approval (ie. Narrabri Coal Pty Ltd).

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 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.

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 woodland – native woodland 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.

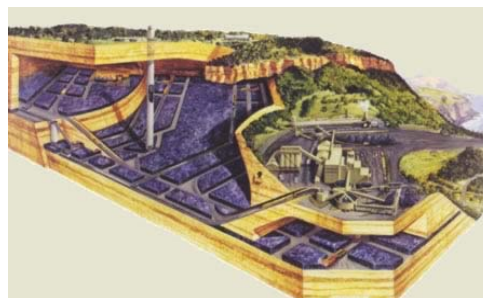
residence time – the time that inflowing water is retained in a wetland or basin before being discharged. The RT is related to the volume of the inflow versus the total storage volume of the basin or wetland.

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.

Riparian – pertaining to a river or stream bank.

room-and-pillar mining – room-and-pillar mining involves cutting a network of 'rooms' or panels into the coal seam and leaving behind 'pillars' of coal to support the roof of the mine. Initially, recoveries are reduced (to 50-60 per cent) because of the coal left in the pillars - however, this coal can sometimes be recovered at a later stage of mine life.



Cutaway of underground mine, south coast New South Wales, Australia (room and pillar method)

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

Run-of-Mine (ROM) – coal or overburden in condition as loaded from a coal mine.

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.

seam – layer of coal.

secondary extraction – removal of residual coal after extraction.

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.

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.

spontaneous combustion – spontaneous ignition of some or all of a combustible material, in this case coal.

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 (such as coal) 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.

subcrop – a geologic unit that is exposed beneath an overlying geologic layer.

subsidence – the act of overlying strata falling into the void left by underground mining.

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

surface infrastructure / surface facilities – all mine-related facilities and infrastructure located on the surface, in particular, within the Pit Top Area and Ventilation Shaft Area.

surface water – 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.

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).

syncline – a fold in the form of a basin.

temperature inversion – an atmospheric state where there is 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.

thermal coal – coal used in generating electricity.

underground coal mining – there are two main methods of extracting coal by underground mining: room-and-pillar (or, bord-and-pillar) and longwall mining.

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.

Ventilation Shaft Area (0.5ha) – area dedicated for operation of the ventilation fan for the entire mine.

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.

