

Glossary, Abbreviations and Units

Glossary

Term	Definition
Aerobic	Having or providing oxygen.
Algal mat	A thin layer of algae formed over the surface of the benthos.
Ambient	Surrounding or background.
Ambient noise	The sum of the noise from all sources, near and far, in a given environment.
Anaerobic	Having or producing no oxygen.
Anthropogenic	Caused by humans or human activity.
ANZECC/ ARMCANZ	The Australian and New Zealand Environment and Conservation Council and the Agriculture and Resource Management Council of Australia and New Zealand.
Aquifer	Rock or sediment in a formation, group of formations or part of a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.
Autotrophic	Organisms that undergo photosynthesis, ie primary producers.
Average Minimum Background Noise Level	Assessed as the background noise level per standard time interval that was exceeded for ninety per cent of the interval, defined in AS1055 as the rating background noise level.
Average recurrence interval (ARI)	The average or expected value of the period between exceedances of a given variable.
A-weighted	Filtering a sound level so that a microphone output approximates the frequency response of a human ear to the sound.
Background noise	The noise ordinarily present and continuous at a given location, excluding extraneous noise and the noise source of interest. Commonly measured using the statistical parameter, L_{A90} , the A-weighted noise level that was exceeded for ninety per cent of the monitoring period.
bcm	Is a measure of overburden removed from mining operations.
Benthos	The sediment at the bottom of a waterway.
Biodegradation	Breakdown of substances by micro-organisms, particularly bacteria and fungi.
Biomass	Quantity of living organic matter.
Bioregion	Region where the floral or faunal communities are similar.
Bund	An embankment constructed around an area to prevent the inflow or outflow of liquids. Also called Bunding.
Carcinogenicity	Any substance which tends to produce a cancer in a body.
Catchment	A water intake area or all parts of a drainage basin.
Channelisation	The formation of deeper channels within a waterway.
Chromosols	Soils with a clear or abrupt textural B2 horizon where the pH is 5.5 (water) or greater in the upper B2 horizon. This B2 horizon is often brightly coloured.
CONCAWE	Method of noise modelling and is the only method dealing explicitly with the influence of wind and the stability of the atmosphere using Pasquill stability categories.
Confined Aquifer	An aquifer that is overlain by a confining bed. The confining bed has a significantly lower hydraulic conductivity than the aquifer.

Term	Definition
Conglomerate	Sedimentary rock consisting of poorly sorted grains (typically pebbles surrounded by finer materials, such as sand or silt).
Consolidate	The process or processes by which loose soft or liquid earth materials (e.g. sand) become firm and coherent (e.g. sandstone).
dB	Abbreviation for decibel—the unit of sound measurement.
dB(A)	'A' Weighted overall sound pressure level.
Decibel (weighted) dBA	The measurement of sound pressure level in which the amplitude of the sound signal is negatively weighted in frequencies below 1000 Hz in accordance with a weighing scale known as the 'A' weighing scale. This scale was established to closely simulate human perception of the relative level of pure tone sounds.
Dermosols	Soils which have B2 horizons with structure more developed than weak throughout the major part of the horizon, and which also lack a strong texture contrast between the A and B horizons.
Desiccation	Drying out due to the effects of the environment.
Dissolved Oxygen (DO)	The amount of oxygen dissolved in water.
Drainage pattern	The pattern formed by drainage lines, gullies, streams and rivers.
Draw down	A lowering of the watertable of an unconfined aquifer or the potentiometric surface of a confined aquifer caused by pumping of the groundwater from wells.
Easement	A right held by the Proponent to make use of the land of another, for example, for the installation and operation of a pipeline. Also referred to as a right of way.
Ecological Sustainable Development (ESD)	Development that improves the quality of life in a way that maintains the ecological processes on which life depends.
Ecotone	The transitional zone between two vegetation types (ecosystems).
Environmental Authority	Licence or Approval issued under the EP Act to conduct specified 'Environmentally Relevant Activities'.
Environmental flow	Freshwater flow that is maintained solely for environmental reasons.
Environmental impact assessment procedures	Federal or State requirements that must be followed to enable approval to be obtained for a project to proceed.
Environmentally Relevant Activities	Activities listed under the EP Act that require an Environmental Authority.
Ephemeral	A stream that flows briefly only in direct response to precipitation in the immediate locality and the channel of which at all times remains above the watertable.
Equivalent persons	Unit of measurement used to determine the demand for sewerage reticulation services.
Eutrophic	A body of water impacted by high nutrients.
Eutrophication	The process by which water bodies, such as lakes, estuaries, or slow-moving streams receive excess nutrients that stimulate excessive plant growth. This enhanced plant growth, reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die.
Free Field	A sound field in a medium of such extent that the effects of the boundaries are negligible throughout the region of interest.

Term	Definition
Frequency (Hz)	The human ear responds to sound in the frequency range of 20 Hertz to 20,000 Hz. A combination of sound pressure and frequency determine perceived loudness. The centre frequency of an octave is double the frequency of the lower octave. Sound measurements are usually taken at 16 one third octave bands between 50 and 5000 Hz.
Gaussian (applied to mathematics)	Normal statistical distribution, usually appearing in graph form as a “bell” curve.
Geomorphology	The description and interpretation of landforms.
Greenhouse gases	Gases such as carbon dioxide and methane which, when dispersed in the atmosphere, tend to trap heat.
Hazchem	Abbreviation used for the hazardous chemical substances coding system used in the Australian Code for the Transportation of Dangerous Goods by Road and Rail. The system is defined in the Australian Standard AS 1216 and uses a classification and labelling system adopted by the United Nations.
Heavy vehicle	A truck, transport or other vehicle with a gross vehicle weight above a specified level (for example: over 8 tonnes).
Heterotrophic	Of bacteria, fungi etc – organisms that do not undergo photosynthesis.
Horizon	A consistently coloured and textured layer of soil.
Hydraulic	Of or relating to water or other liquid in motion; operated, moved, or effected by water or liquid.
Hydrocarbon	A compound consisting of hydrogen and carbon.
Initial Advice Statement (InAS)	A document used to initiate the environmental impact assessment procedures of the Queensland Government.
Intermittent noise	A noise whose sound pressure level suddenly drops to the background level several times during the period of observation, the time during which the level remains at a constant value different from that of the background level being of the order of 1s or more.
ISC3	Industrial source Complex Version 3 (ISC3) is a standard USEPA steady state Gaussian plume regulatory model which provides indications of ground level concentrations of airborne pollutants.
L ₁₀	Noise level exceeded for 10% of the measurement period. This represents the upper intrusive noise level and is often used to represent traffic/ music noise.
L ₉₀	Noise level exceeded for 90% of the measurement period. This represents the background noise level excluding nearby sources. Also known as L _{BG} .
Leachate	Elements or compounds in solution which have been dissolved from water flowing over a material.
L _{eq}	Energy averaged noise level over the measurement period. This measure is commonly used when comparing the criterion noise level under the Environmental Noise Regulations and for comparison with relevant standards for air conditioning noise.
Lithosols	Soils which are limited in depth by continuous coherent and hard rock within 10 cm of the surface.
L _{max}	Maximum instantaneous noise level during a measured period.
Macroinvertebrate	An invertebrate large enough to be seen without magnification.
Macrophyte	A plant large enough to be seen with the naked eye.

Term	Definition
Masking	The raising of a listener's threshold of hearing for a given sound due to the presence of another sound.
Microchiropteran	Of bats, small or micro bat species.
Oxidation-Reduction Potential (ORP)	The reduction and oxidation characteristics of water, which gives an indication of what oxygen levels are likely to be.
Particulate matter	Minute airborne particles.
Perched Aquifer	A region in the unsaturated zone where the soil may be locally saturated because it overlies a low-permeability unit.
Perennial	Lasting for an indefinite amount of time.
Permeability	The capacity of a material to transmit fluid.
PET richness	The richness of pollution-sensitive invertebrate taxa (Plecoptera (stoneflies), Ephemeroptera (mayflies), and Trichoptera (caddisflies)) within an area.
Porosity (primary)	The porosity that represents the original pore openings when a rock or sediment formed.
Porosity (secondary)	The porosity that has been caused to by fractures or weathering in a rock or sediment after it has been formed.
Potentiometric Surface	A surface that represents the level to which water will rise in tightly cased wells. The <i>water table</i> is a particular potentiometric surface for an unconfined aquifer.
Power Factor Correction	A technique to improve the efficiency of alternating current electric motors.
Quantitative	An assessment based on the amount or number of something.
Rainfall Residual Mass Curve	$\text{Rainfall residual mass for month}_x = (\text{Actual rainfall for month}_x - \text{average rainfall for month}_x) + (\text{the cumulative sum of } (\text{Actual rainfall for month} - \text{average rainfall for month}) \text{ for all previous months})$ <p>This technique creates a cumulative plot of above average or below average rainfall for each month¹. A positive slope on the graph equates to a period of above average rainfall, while a negative residual mass slope equates to a period of lower than average rainfall. This method enables correlation of rainfall with water level fluctuation within groundwater bores, and is similar to the curve created by the twelve month moving average of the monthly rainfall data.</p>
Recharge	Water flowing into an aquifer.
Recharge Area	An area in which there are downward components of hydraulic head in the aquifer. Infiltration moves downward into the deeper parts of an aquifer in a recharge area.
Remnant vegetation	Patches of vegetation amongst a clearing.
Riffle	An area within a stream that is characterised by shallow water, rocky sediment and fast water flows.
Riparian	Pertaining to, or situated on the bank of, a body of water, especially a watercourse such as a river.
Run	An area in a stream that is characterised by moderately straight channels and medium water flow.

¹ The rainfall residual mass method was developed by Dr Noel Merrick, Deputy Director, National Centre for Groundwater Management, University of Technology, Sydney to enable correlation of groundwater level fluctuation to rainfall events.

Term	Definition
Salinity	The total content of dissolved solids in groundwater, commonly expressed as parts of dissolved solids per million parts of solution (ppm), or milligrams of dissolved solids per litre of solution (mg/L). The significance of salinity depends on its nature as well as the amount of the dissolved solids.
Saturation	The extent or degree to which the voids in rock contain water; usually expressed as a percent related to total void or pore space.
Semi-confined Aquifer	An aquifer confined by a low-permeability layer that permits water to slowly flow through it. During pumping of the aquifer, recharge to the aquifer can occur across the confining layer. Also known as a leaky artesian or leaky confined aquifer.
Senescing	Aging and deteriorating, e.g pools that dry out over time.
SIGNAL 2	An index of macroinvertebrate communities that gives an indication of the types of pollution and other physical and chemical factors affecting a site.
Sodic	Having a high sodium content.
Sodicity	The level of exchangeable sodium cations in the soil, typically expressed as a percentage (ESP). It relates to likely dispersion on wetting and hence ability to be eroded and transported in stormwater. An ESP of greater than 6 % is sodic and greater than 15 % is strongly sodic. ESP levels can be lower in soils that are more saline.
Sound Attenuation	The reduction in the intensity or in the sound pressure level of sound which is transmitted from one point to another.
Sound Power Level	The total sound energy radiated from a source per unit of time. Ten times the logarithm to the base 10 of the ratio of a given power to a reference power.
SoundPLAN	Noise assessment model.
Steady-state noise	A noise having negligibly small fluctuations of sound pressure level within the period of observation.
Subcatchment	An area within a catchment drained by one or more tributaries of the main water body.
Substrate	The underlying base to something, e.g. the streambed.
TAPM	The Air Pollution Model (TAPM) is a three dimensional meteorological and air pollution model developed by the Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) Division of Atmospheric Research.
Temperature inversion	Air temperature usually decreases with height. However, the temperature sometimes increases with height in certain layers. Inversions may be elevated, ie the inversion occurs aloft, or may be surface-based.
Total dissolved solids (TDS)	The concentration of common dissolved salts found in water and reported by volume (mg/L).
Total suspended solids (TSS)	The concentration of filterable particles in water (retained on a 0.45 μ m filter) and reported by volume (mg/L).
Toxicity	The degree of poison or ill effects that a substance produces.
Traditional owners	Traditional Aboriginal owners or other Aborigines to whom the protection of an area is entrusted in accordance with Aboriginal tradition.
Trophic	Pertaining to food webs.
Turbidity	A measure of the cloudiness of water which is determined by the amount of light scattered by suspended particles.
Unconfined Aquifer	An aquifer in which there are no confining beds between the zone of saturation and the surface. There will be a <i>water table</i> in an unconfined aquifer.



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Term	Definition
Wastewater	Water used in a process to carry unwanted materials away or process water that can no longer be used or is surplus to the process.
Water Table	Level below which the ground is saturated with water.
Water Table	The surface in an unconfined aquifer or confining bed at which the pore water pressure is atmospheric.
Wind rose	A diagram summarising the frequencies of winds of different strengths and directions as measured at a specific point over an extended period of time.

Abbreviations

Term	Abbreviation
AADT	average annual daily traffic
ABS	Australian Bureau of Statistics
ACARP	Australian Coal Association Research Program
ACH Act	<i>Aboriginal Cultural Heritage Act 2003 (Qld)</i>
AEMSE	Australian Explosives Manufacturer Safety Committee
AEP	Annual Exceedance Probability
AGO	Australian Greenhouse Office
AHC	Australian Heritage Commission
AHD	Australian Height Datum
ALARP	as low as reasonably practical
AMD	acid mine drainage
AMG	Australian Map Grid
AMU	Agricultural Management Units
ANABAT	Ultrasound bat call detection system
ANC	acid neutralising capacity
ANFO	Ammonium Nitrate Fuel Oil
ANZECC	Australian and New Zealand Environment and Conservation Council
ARD	acid rock drainage
ARF	areal reduction factor
ARI	Average Return Interval
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS	Australian Standards
AS XXXX	Australian Standard number e.g. AS1940
AusRivAs	Australian River Assessment System
AS/NZS	Australian/New Zealand Standard
BBCGP	Bowen Basin Coal Growth Projects
BBKY	Barada/Barna/Kabelbara/Yetimarala
bcm	bank cubic metre
BCR	Benefit Cost Ratio
BEMP	Best Environmental Management Practices
BMA	BHP Billiton Mitsubishi Alliance
BMC	BHP Billiton Mitsui Co. Pty Ltd
BOD	biochemical oxygen demand
BoM	Bureau of Meteorology
C1	diesel fuel, class C1 combustible
Ca(OH) ₂	calcium hydroxide or slaked lime
CaCO ₃	calcium carbonate
CaO	calcium oxide

Term	Abbreviation
CEC	cation exchange capacity
CFMEU	Construction, Forestry, Mining and Energy Union
CG	Coordinator General
CH ₄	methane
CHMP	Cultural Heritage Management Plan
CHPP	Coal and Processing Processing Plant
CLR	Contaminated Land Register
CRG	Community Reference Group
CSR	Chromium Reducible Sulphur
CO ₂	carbon dioxide
CO ₂ -e	carbon dioxide equivalents
COD	chemical oxygen demand
CQCA	Central Queensland Coal Associates
CRC	Cooperative Research Centre
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DBCT	Dalrymple Bay Coal Terminal
DCC	Department of Climate Change
DEHWA	Commonwealth Department of Environment, Heritage, Water and Arts
DES	Queensland Department of Emergency Services
DET	Queensland Department of Employment and Training
DHGLP	the former Queensland Department of Housing, Local Government and Planning
DIP	Queensland Department of Infrastructure and Planning
DIR	Queensland Department of Industrial Relations
DLGP	Queensland Department of Local Government and Planning
DMC	Dense Medium Cyclone
DME	Queensland Department of Mines and Energy
DMR	Queensland Department of Main Roads
DNRME	former Queensland Department of Natural Resources Mines & Energy
DNRW	Queensland Department of Natural Resources and Water
DO	dissolved oxygen
DoH	Queensland Department of Housing
DPI&F	Queensland Department of Primary Industries and Fisheries
DTM	digital terrain model
EA	Environmental Authority
EAP	Employee Assistance Program
EC	Electrical Conductivity
EEC	Endangered Ecological Community
EEO Act	<i>Energy Efficiency Opportunities Act 2006</i>
EIS	Environmental Impact Statement

Term	Abbreviation
ELAM	Emergency and Long-term Accommodation Moranbah
EM Plan	Environmental Management Plan
EMP	Environmental Management Program
EMS	Environmental Management System
EP Act	<i>Environmental Protection Act 1994 (Qld)</i>
EPA	Queensland Environmental Protection Agency
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
EPP	Environmental Protection Policy
EPP (Air)	<i>Environmental Protection (Air) Policy 1997(Qld)</i>
EPP (Noise)	<i>Environmental Protection (Noise) Policy 1997(Qld)</i>
EPP (Waste)	<i>Environmental Protection (Waste Management) Policy 2000 (Qld)</i>
EPP (Water)	<i>Environmental Protection (Water) Policy 1997 (Qld)</i>
EPR	<i>Environmental Protection Regulation 1998 (Qld)</i>
ERA	Environmentally Relevant Activity
ESD	ecologically sustainable development
ESP	exchangeable sodium percentage
FFA	flood frequency analysis
GDP	gross domestic product
GHG	greenhouse gases
GPS	Global Positioning System
GQAL	good quality agricultural land
GRP	gross regional product
GSP	gross state product
Hazchem	hazardous chemicals
HAZOP	hazard and operability study
HIL	health investigation levels
HPCT	Hay Point Services Coal Terminal
HSEC	Health, Safety, Environment and Community
ID	internal diameter
IDAS	Integrated Development Assessment System
IEMS	Integrated Environmental Management System
IF	isolated find
InAS	Initial Advice Statement
IPA	<i>Integrated Planning Act 1997 (Qld)</i>
IPCC	Intergovernmental Panel on Climate Change
IRR	internal rate of return
ISO	International Standards Organisation
L10,1hr	Sound pressure level exceeded for 10% of a time interval of 1 hour

Term	Abbreviation
L _{90,1hr}	Sound pressure level exceeded for 90% of a time interval of 1 hour
Leq,1hr	Equivalent continuous sound pressure level determined over a time interval of 1 hour
LDAS	low density artefact scatter
LGA	Local Government Area
L _{max}	Peak sound pressure level
LoS	Level of Service
L _{p,LF}	The sound pressure level of low frequency noise as defined in the Draft EPA Ecoaccess guideline Assessment of Low Frequency Noise
LPPSRM	<i>Land Protection (Pest and Stock Route Management) Act 2002</i>
L _{r,1hr}	The specific noise level plus any adjustment for the character of the noise (tonal and/or impulsive) determined over a time interval of 1 hour
MIBC	Methylisobutylcarbonal – used in CHPP flotation cells.
minL _{90,1hour}	Median of the daily lowest 10 th percentile of L _{A90,1hr} values as defined in the EPA Ecoaccess guideline Planning for Noise Control
ML(s)	Mining Lease (s)
MLA	Mining Lease Application
MRA	<i>Mineral Resources Act 1989 (Qld)</i>
MRIP	Multi-Regional Impact Model
MSCL	mid steel cement lined
MSDS	material safety data sheets
Mt	million tonnes
Mt/a	million tonnes per annum
N ₂ O	nitrous oxide
NAF	non acid forming
NAPP	net acid producing potential
NATA	National Association of Testing Authorities
NC Act	<i>Nature Conservation Act 1992 (Qld)</i>
NCWR	<i>Nature Conservation (Wildlife) Regulations 2006 (Qld)</i>
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure for Ambient Air
NES	National Environmental Significance
NGA	National Greenhouse Accounts
NGER Act	<i>National Greenhouse & Energy Reporting Act 2007 (Cth)</i>
NHMRC	National Health and Medical Research Council
NPV	net present value
NNTT	National Native Title Tribunal
NO ₂	Nitrogen dioxide
NO _x	oxides of nitrogen
NPI	National Pollutant Inventory

Term	Abbreviation
NTU	Nephelometric Turbidity Units
PAF	Potentially Acid Forming
PAWC	Plant Available Water Capacity
PCBs	Polychlorinated Biphenyls
PCI	Pulverized Coal Injection
PHA	Preliminary Hazard Analysis
PM ₁₀	particulate matter less than 10 µm in diameter
PM _{2.5}	particulate matter less than 2.5 µm in diameter
PPE	Personal Protective Equipment
ppm	parts per million
QAS	Queensland Ambulance Service
QFRS	Queensland Fire and Rescue Service
QH	Queensland Department of Health
QPWS	Queensland Parks and Wildlife Service
QR	Queensland Rail
QT	Queensland Department of Transport
QWQG	Queensland Water Quality Guidelines
RAFTS	Hydrologic, rainfall and runoff computer modelling program
RCP	Reinforced Concrete Pipes
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
RIP	Roads Implementation Program
ROM	Run of Mine
ROPS	Rollover Protective Structures
RVMC	Regional Vegetation Management Code for Southeast Queensland Bioregion
SDPWO Act	<i>State Development and Public Works Organisation Act 1971 (Qld)</i>
SIA	Social Impact Assessment
SKM	Sinclair Knight Merz
SO ₂	sulphur dioxide
SoR	State of Rivers
SPP	State Planning Policy
STP	Sewage Treatment Plant
SWL	Sound Power Level
TAPM	The Air Pollution Model
TDS	Total Dissolved Solids
TIA	<i>Transport Infrastructure Act 1994 (Cth)</i>
TLO	train load out
TMP	Transport Management Plan
TN	Total Nitrogen



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Term	Abbreviation
ToR	Terms of Reference as defined in Part 4 of the <i>State Development & Public Works Organisation Act 1971</i>
TSP	total suspended particulates
USEPA	United States Environmental Protection Agency
Vkt	Vehicle kilometres travelled
vpd	vehicles per day
VM Act	<i>Vegetation Management Act 1999</i>
WHAM	Whitsunday Hinterland and Mackay
WMP	Waste Management Plan
WONS	weed of national significance
WTP	water treatment plant

Units

Time Intervals	
s	second
d	day
hr	hour
hr/d	hour per day
a	annum
p/a	per annum
Length	
km	kilometre
m	metre
cm	centimetre
mm	millimetre
Mass	
kg	kilogram
t	tonne
t/a	tonnes per annum
t/h	tonnes per hour
Density	
g/m ³	grams per cubic metre
mg/l	milligram per litre
Area	
m ²	square metre
ha	hectare
Volume	
m ³	cubic metre
Mm ³	Million cubic metres
ML	Mega Litre (1,000,000 litres)
L	Litre
Flow Rate	
m ³ /s	cubic metre per second
m ³ /d	cubic metre per day
L/min	litres per minute
kg/d	kilogram per day
ML/d	megalitre per day
ML/a	megalitre per annum
Nm ³ /hr	Normalised flow rate; normal cubic metre per hour
CFU/100ml	Colony-forming units per 100ml of water
Org/100ml	Organisms per 100ml of water



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Energy	
GJ/day	giga joule per day
PJ/a	peta joule per annum
TJ	terra joule
kW	kilowatt
MW	megawatt
kJ/kg	kilojoule per kilogram
MWh	megawatt hour
Temperature	
°C	degrees Celsius
°F	degrees Fahrenheit
Noise	
dB	decibel (unweighted unless specified; same as dB(linear))
dB(A)	decibel (A-Weighted scale)
dB(linear)	decibel (unweighted)
Potential	
kV	kilovolt
mS/cm	milli Siemens per centimetre
μS/cm	micro Siemens per centimetre
Frequency	
Hz	hertz
Vibration	
mm/s	millimetres per second

Prefixes for Units

Quantity	Symbol	Value
exa	E	10^{18}
peta	P	10^{15}
tera	T	10^{12}
giga	G	10^9
mega	M	10^6
kilo	k	$10^3(1000)$
hecto	h	$10^2(100)$
deca	da	$10^1(10)$
deci	d	$10^{-1}(0.1)$
centi	c	$10^{-2}(0.01)$
milli	m	$10^{-3}(0.001)$
micro	μ	10^{-6}
nano	n	10^{-9}
pico	p	10^{-12}
femto	f	10^{-15}
atto	a	10^{-18}