

**PREFACE****STRUCTURE OF THE EIS**

This Draft Environmental Impact Statement (EIS) presents the results of a rigorous identification and assessment of the physical/biological, social, cultural, economic and built environment impacts of the Queensland Curtis LNG (QCLNG) Project. It identifies measures to manage direct, indirect and cumulative impacts and to maximise benefits for Queensland and Australia. It is the primary source of information for public comment on the Project and is the document upon which the Commonwealth and Queensland Governments will rely in deciding whether to approve the Project.

The Draft EIS is ordered into the following volumes:

- *Volume 1:* EIS Process Overview
- *Volume 2:* Project Description
- *Volume 3:* Assessment of the Environmental Impacts of the Gas Field Component
- *Volume 4:* Assessment of the Environmental Impacts of the Pipeline Component
- *Volume 5:* Assessment of the Environmental Impacts of the LNG Component
- *Volume 6:* Assessment of the Environmental Impacts of Swing Basin and Shipping Channel Construction
- *Volume 7:* Greenhouse Gas Management
- *Volume 8:* Assessment and Management of Social, Cultural and Economic Impacts
- *Volume 9:* Gas Field Component Environmental Management Plan
- *Volume 10:* Pipeline Component Environmental Management Plan
- *Volume 11:* LNG Component Environmental Management Plan
- *Volume 12:* Stakeholder Consultation
- *Volume 13:* EPBC Assessment Report

**ACKNOWLEDGMENTS**

QGC Limited (QGC) is the Proponent of the QCLNG Project. The company engaged consultants and other specialists to help prepare documentation for this EIS. These independent third parties assisted in gathering or collating baseline data, assessing impacts and recommending management and monitoring measures. Specialist sub-consultants prepared various studies, the results of which are included in this EIS. A list of these sub-consultants is provided in *Appendix 1.4*.



Environmental Resources Management (ERM) Australia coordinated the preparation of this Draft EIS and undertook the impact assessment for the LNG Component and Shipping Operations of the QCLNG Project.



Environmental and Licensing Professionals Pty Ltd (ELP) and Unidel Group Pty Ltd (Unidel) prepared the impact assessment for the Gas Field and Pipeline Components of the QCLNG Project.



Elliott Whiteing Pty Ltd coordinated the social, cultural and economic impact assessment for the whole of the QCLNG Project.

**READING THE EIS**

The Draft EIS for the QCLNG Project is presented in a series of **volumes** containing **chapters** with detailed information about specific activities, impacts or components related to the Project. Additional information supporting, or with direct relevance to, the chapters is presented in **annexes** at the end of each volume. Standalone technical reports are included as **appendices** following the volumes.

The *Executive Summary, Volume 1* and *Volume 2* provide a broad introduction to the QCLNG Project, offering an overview of the Project's impacts and how QGC intends to manage negative impacts and maximise benefits. These sections will allow stakeholders to identify areas of particular interest and guide them towards more detailed, technical information contained in later chapters and appendices.

People interested in impacts and benefits in the Gladstone region from the LNG Component of the QCLNG Project should consult *Volumes 1, 2, 5, 6, 7, 8* and *11*.

People interested in impacts and benefits from the Pipeline Component between Gladstone and Dalby should consult *Volumes 1, 2, 4, 8* and *10*.

People interested in impacts and benefits from the Gas Field Component in the area around Dalby and Chinchilla should consult *Volumes 1, 2, 3, 7, 8* and *9*.

*Volume 12* contains information on the stakeholder engagement process QGC followed in preparing this EIS while *Volume 13* presents a report on actions requiring assessment under the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*.

**EIS SUBMISSIONS**

Stakeholders wishing to make a submission in relation to this Draft EIS should do so in writing to:

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**GLOSSARY OF TERMS AND ACRONYMS**

<b>Term/Acronym</b>	<b>Definition</b>
%	per cent
°C	degrees Celsius
µg/m <sup>3</sup>	Microgram/cubic metre
µS cm <sup>-1</sup>	microsiemens per centimetre
2P	Proven and Probable
3P	Proved, Probable and Possible
AADT	Annual Average Daily Traffic
AAPA	Aboriginal Areas Protection Authority
AASS	actual acid sulfate soils
ABL	Assessment Background Level - a single figure background noise level for each assessment period (day, evening and night). It is the tenth percentile of the measured L <sub>90</sub> statistical noise levels.
ABS	Australian Bureau of Statistics
AC	alternating current
ACCC	Australian Agricultural College Corporation
ACF	Australian Conservation Foundation
<i>ACH Act (Qld)</i>	<i>Aboriginal Cultural Heritage Act 2003 (Qld)</i>
ACI	American Concrete Institute
ACMA	Australian Communications and Media Authority
ADG	Australian Dangerous Goods
ADWG	Australian Drinking Water Guidelines
AEP	annual exceedence probability
AETS	Australian Emissions Trading Scheme
AGE	Australasian Groundwater and Environmental Consultants Pty Ltd
AGO	Australian Greenhouse Office
AGRU	acid gas removal unit
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AHL	Aboriginal Hostels Limited
AHTS	anchor handling and tug supply
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
AIC	Australian Institute of Criminology
AIHW	Australian Institute of Health & Welfare
AIS	Automatic Identification System
ALARP	as low as reasonably practicable
Allision	The impact of a moving vessel against a stationary object (e.g. jetties, fixed pipework, etc).
alluvium	unconsolidated material deposited in a fluvial system
ALOHA	Areal Locations of Hazardous Atmospheres
AMC	Australian Maritime College
AME	Asia and Middle East region
AMSA	Australian Maritime Safety Authority
ANZECC	Australia and New Zealand Environment and Conservation Council

ANZGFMWQ	Australia and New Zealand Guidelines for Fresh and Marine Water Quality
AP6	Asia Pacific Partnership on Clean Development and Climate (Australia, China, India, Japan, Republic of Korea and the United States)
APEC	Asia Pacific Economic Cooperation
API	American Petroleum Institute
APIA	Australian Pipeline Industry Association Ltd
APPEA	Australian Petroleum Production and Exploration Association
APZ	asset protection zone
AQF	Australian Qualification Framework
AQIS	Australian Quarantine Inspection Service
aquifer	any geological formation containing or conducting groundwater, especially one that supplies the water for wells, springs etc
aquitard	a zone within the earth that restricts the flow of groundwater from one aquifer to another
ARI	Average Recurrence Interval
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS	Australian Standard
ASGC	Australian Standard Geography Classification
ASRIS	Australian Soil Resource Information System
ASS	acid sulfate soils
ASSC	Australian Safety and Compensation Council
ASSMP	acid sulfate soils management plan
Associated water	Underground water taken or interfered with during the course of, or results from, the carrying out of activities at a petroleum well. Also known as production water or formation water.
AST	aboveground storage tank
ASX	Australian Stock Exchange
ATP	Authority to Prospect
ATSB	Australian Transportation Safety Board
ATSI	Aboriginal and Torres Strait Islander
ATSIC	Aboriginal and Torres Strait Islander Commission
ATSIS	Aboriginal and Torres Strait Islander Services
ATV	all-terrain vehicle
AWMP	Associated Water Management Plan
AWQG	Australian Water Quality Guidelines
AWRA	Australian Water Resources Assessment
BAL	Bushfire Attack Level
BAMM	Biodiversity Assessment and Mapping Methodology
BAT	best available technique
BBF	Building a Better Future: Indigenous Housing to 2010
BCA	Baseline Communities Assessment
BCJMY Group	a combined ILUA group, inclusive of Western Wakka Wakka, Barunggam, Yiman, Cobbe Cobbe and Jarowair, which are previous individual claimant groups
BCM	billion cubic meters

bd	business day
Bf	Beaufort (as in windscale)
BG	BG International Limited
bgl	below ground level
BH	Borehole
BHD	backhoe dredge
Bioregion	a specific bio-geographic zone with a repeating or similar biotic (flora and fauna) and abiotic (soils, terrain, geography, climate and rainfall) factors
BLEVE	Boiling Liquid Expanding Vapour Explosion
BMRG	Burnett Mary Regional Group
BOD	biochemical oxygen demand
boed	barrels of oil equivalent per day
BoG	boil-off gas
BoM	Bureau of Meteorology
BOP	Blow out Preventer
BP	Tug Bollard Pull (in tonnes)
BPPH	Benthic Primary Producer Habitat
BTEX	benzene, toluene, ethylbenzene and xylenes - volatile organic compounds found in petroleum derivatives
bund	raised bank around tanks and containers, designed to capture all contained liquids in a spill
CA	Condamine Alliance
CAC Act (Cth)	<i>Commonwealth Authorities and Companies Act 1997 (Cth)</i>
CaCO <sub>3</sub> /L	calcium carbonate per Litre
CAF	compressed asbestos fibre
CAMBA	China-Australia Migratory Bird Agreement
CASA	Civil Aviation Safety Authority
CATI	computer-assisted telephone interviewing
CAU	Cultural Advisory Unit
CBD	Central Business District
CBDROP	Condamine and Balonne Draft Resource Operations Plan
CBM	Depending on context this could be: 1. Conventional Buoy Mooring 2. Cool Bed Methane
CCC	Community Consultative Committee
CCHC	Community Child Health Centre
CCLO	Cross-Cultural Liaison Officer
CCMA	Condamine Catchment Management Association
CCR	Central Control Room
CCRCMP	Curtis Coast Regional Coastal Management Plan
CCS	carbon capture and storage
CCTV	closed circuit television
CDA	Central Development Area
CDEP	Community Development Employment Projects
CE	carbon efficiency
CEC	cation exchange capacity
CEMP	Construction Environmental Management Plan
CEO	Chief Executive Officer
CET	Clean Energy Target

CFC	chlorofluorocarbons
CG	Coordinator-General of the State of Queensland
CGE	computational general equilibrium
CH <sub>4</sub>	Methane
CHCU	Cultural Heritage Coordination Unit
CHEM	Chemical Hazards and Emergency Management
CHMP	Cultural Heritage Management Plan
CHMS	Cultural Heritage Management Strategy
CIIP	Curtis Island Industry Precinct
CINICH	Curtis Island Non-Indigenous Cultural Heritage
CLR	Contaminated Land Register
CM	coal measures
CMD	Coastal Management District
CMIT	CSIRO Manufacturing and Infrastructure Technology
CNOOC	China National Offshore Oil Corporation
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2-e</sub>	carbon dioxide equivalent - refers to the global warming potential of a gas relative to carbon dioxide
COAG	Council of Australian Governments
colluvium	loose earth material that has accumulated at the base of a hill, through the action of gravity
COLREGS	International Regulations for Preventing Collisions at Sea 1972
COMAH	Control of Major Accident Hazards (UK)
common user infrastructure	infrastructure such as the bridge and road to Curtis Island and other facilities within the proposed extension to the Gladstone State Development Area to be developed by the State.
controlled action	actions deemed likely to have a significant impact on Matters of National Environmental Significance under the terms of the <i>EPBC Act</i> .
CP	cathodic protection
CPI	corrugated plate interceptor
CPP	Central Processing Plant - receives gas from the Field Compression Stations and dries and pressurizes the gas to its export pressure
CPRS	Carbon Pollution Reduction Scheme
CQ AIICCA	Central Queensland Aboriginal and Islanders Child Care Agency
CQANM	Central Queensland - A New Millennium, 2002
CQPA	Central Queensland Ports Authority (now Gladstone Ports Corporation)
CQRGMF	Central Queensland Regional Growth Management Framework
CQSS2	Central Queensland Strategy for Sustainability – 2004 and Beyond
CQU	Central Queensland University
CRA	Commonwealth Rent Assistance
CRC	Cooperative Research Centre

critically endangered species or ecological community	a listed threatened species and ecological community is categorised as critically endangered in terms of the <i>EPBC Act</i> (Cth) if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future
cross-governmental	involving Commonwealth, State and Local Government
CSC	former Calliope Shire Council
CSD	cutter suction dredge
CSG	coal seam gas, also known as coal seam methane or coal bed methane
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSU	community safety unit
Cth	Commonwealth
CUI	common user infrastructure
DAE	dilute acid extraction
DAF	dissolved air floatation
dB(A)	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
DCDB	Digital Cadastre Database
DCS	Depending on the context this could be: 1. Distributed Control System 2. Department of Community Services
DDMRB	Darling Downs-Moreton Rabbit Board
DEEDI	Department of Employment, Economic Development and Innovation
DERM	Department of Environment and Resources Management (Qld) – previously EPA
DES	Department of Emergency Services (Qld)
DETA	Department of Education, Training and the Arts (Qld)
developer	Person responsible for developing an infrastructure (other than the Proponent)
DEWHA	Department of Environment, Water, Heritage and the Arts (Cth)
DFDE	duel fuel diesel electric
DGA	diglycolamine
DGL	dangerous goods location
DGP	Divisions of General Practice
<i>DGSMA</i>	<i>Dangerous Goods Safety Management Act 2001</i>
DIP	Department of Infrastructure and Planning (Qld)
DIPNR	Department of Infrastructure, Planning and Natural Resources (NSW)
DIWA	Directory of Important Wetlands (Australia)
DJSI	Dow Jones Sustainability Index
DLE	dry low emissions
DLGSR	former Department of Local Government, Sport and Recreation (Qld)
DMDRP	former Department of Local Government, Sport and Recreation (Qld)



DME	Depending on the context this could be: 1. dimethyl ether 2. Department of Mines and Energy (Qld)
DMR	Department of Main Roads (Qld)
DNRW	Department of Natural Resources and Water (Qld) - now falls under the responsibility of the Department of Environment and Resource Management (DERM)
DO	dissolved oxygen
DOGIT	Deed of Grant in Trust
DOS	degree of separation
DoTARS	Department of Transport and Regional Services (Cth)
DP	Deposited Plan
DPA	Dugong Protection Area
DPI&F	Department of Primary Industry and Fisheries (Qld) (now the Department of Employment, Economic Development and Innovation)
DRG	Diagnosis Related Group
Drill cuttings	Any material (typically called solids) removed from a borehole while drilling petroleum wells.
DSA	design storage allowance
DSDTI	Department of State Development, Trade and Innovation (Cth)
DTM	Digital Terrain Model
DTMR	Department of Transport and Main Roads
DTRDI	Department of Tourism, Regional Development and Industry (Qld) - now falls under the responsibility of the Department of Employment, Economic Development and Innovation (DEEDI)
DUAP	Department of Urban Affairs and Planning (Qld)
Duricrusts	A thin hardened layer of soil on the surface or near the surface of the Earth which has formed due to accumulation of soluble minerals such as Silica, Alumina or Iron.
DWDM	dense wave division multiplexer
DWT	deadweight tonnes
e.g.	Example
EA	environmental authority issued in terms of the <i>Environment Protection Act 1994</i> (Qld)
EAA	East Asian Australasian
EC	electrical conductivity – a measure of the mineral salt content of water
Ecotone	A transition area between two different plant communities (e.g. forests and grassland). These areas often contain species that are not found in the two overlapping communities.
EDRPAC	Eastern Downs Regional Planning Advisory Committee
EEC	endangered ecological community
EHS	Environmental, Health and Safety (Guidelines)
EIA	Environmental Impact Assessment. EIA refers to the assessment process i.e. the term is to be used as a verb.
EIS	Environmental Impact Statement, as defined by Part 4 of the <i>SDPWO Act</i> (Qld) – EIS refers to the process as well as the EIS report.
EMA	Energy Market Authority

EMP	Depending on the context this could be: 1. Environmental Management Plan 2. Environmental Management Precinct
EMQ	Emergency Management Queensland
EMR	Environmental Management Register maintained by DERM (Qld)
EMS	Environmental Management System
endangered RE	endangered regional ecosystem as defined in terms of the <i>VM Act</i> (Qld)
endangered species or ecological community	a listed threatened species or ecological community is categorised as endangered in terms of the <i>EPBC Act</i> (Cth) if, at that time it is not critically endangered and is facing a very high risk of extinction in the wild in the near future.
ENM	Environmental Noise Model – noise modelling program
ENVID	environmental hazard identification
Environmental Offset	action taken to counter-balance any unavoidable negative impacts that might result from an activity or a development.
EP	equivalent persons
<i>EP Act</i> (Qld)	<i>Environment Protection Act 1994</i> (Qld)
EPA	Environmental Protection Agency (Qld) - now falls under the responsibility of the Department of Environment and Resource Management (DERM)
<i>EPBC Act</i> (Cth)	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (and as subsequently amended) (Cth)
EPC	Engineering, Procurement and Construction
EPFI	Equator Principle Financial Institution
ephemeral	a freshwater channel that flows only periodically e.g. does not flow during dry seasons
EPP	Environmental Protection Policy
EPPA	Environmental Property Protection Association
ERA	Environmentally Relevant Activity
ERFA	Eastern Red Fire Ant
ERM	Environmental Resources Management (Australia) Pty Ltd
ERP	Emergency Response Plan
ES&H	Environment, Safety and Health
ESA	Depending on the context this could be: 1. Environmental Site Assessment 2. equivalent standard axes
ESC	erosion soil control
ESD	Depending on the context this could be: 1. Ecologically Sustainable Development 2. emergency shut down (valve or system)
ESE	east-south-easterly
ESIA	Environmental and Social Impact Assessment. ESIA refers to the assessment process i.e. the term is to be used as a verb
ESP	exchangeable sodium percentage – the proportion of sodium adsorbed onto a material surface as a proportion of the total cation exchange capacity
EV	environmental values
EVR	endangered, vulnerable or rare

FaHCSIA	Department of Families, Housing, Community Services and Indigenous Affairs (Cth)
FAR	field auxillary room
FBBP	Fitzroy Basin Biodiversity Plan
FCS	The Field Compression Station removes free water from the raw gas and undertakes the initial compression of gas in order for this to be piped to the Central Processing Plant for further processing.
FEED	Front-End Engineering and Design
FEL	front end loading
FGS	Fire and Gas System
FHA	Fish Habitat Area
FIFO	fly-in fly-out
FIT	Formation Integrity Test
Flash Fire	The combustion of a flammable vapour and air mixture in which the flame front passes through the mixture at less than sonic velocity, such that a negligible damaging overpressure is generated.
FMO	Finance Minister's Orders
FNM	field non-manual
FPQ	Forestry Plantations Queensland
FPZ	fire-proofing zone
FTE	full-time equivalent
GAB	Great Artesian Basin
GABROP	Great Artesian Basin Resource Operations Plan
GAMSET	Gladstone Area Maths, Science and Engineering Teachers
GAMsv3	Gladstone Airshed Monitoring System (Version 3)
GAPDL	Gladstone Area Promotion and Development Ltd
GARID	Guidelines for Assessment of Road Impacts of Developments
Gas Pipeline Network	Export Pipeline, Collection Header, Collection Lateral and Trunklines
GAWB	Gladstone Area Water Board
GBR	Great Barrier Reef
GBRCMP	Great Barrier Reef Coast Marine Park (Qld)
GBRMP	Great Barrier Reef Marine Park (Cth)
GBRMPA	Great Barrier Reef Marine Park Authority (Cth)
GBRNHA	Great Barrier Reef National Heritage Area
GBRWHA	Great Barrier Reef World Heritage Area
GDP	gross domestic product
GEIDB	Gladstone Economic and Industry Development Board
GFNICH	Gas Field Non-Indigenous Cultural Heritage
GHG	greenhouse gas
GHGMP	Greenhouse Gas Management Plan
GICC	Government Indigenous Coordination Centre
GIIP	Good International Industry Practice
GIRTP	Gladstone Integrated Regional Transport Plan 2001 – 2030
GIS	Geographic Information System
GJ	gigajoule
glc	ground level concentration
GLNG	Gladstone LNG Project (i.e. Santos Project)

GLPRRI	Gladstone Land Port Rail Road Infrastructure
GLS	Global LNG Shipping
GM	genetically modified
GP	General Practice/ Practician
GPC	Gladstone Ports Corporation (formerly Central Queensland Ports Authority)
GPNL	Gladstone Pacific Nickel Limited
GPS	Global Positioning System
GQAL	Good Quality Agricultural Land (defined in State Planning Policy 1/92: Development and the Conservation of Agricultural Land)
GR	grid reference
GRC	Gladstone Regional Council
GRP	gross regional product
GSDA	Gladstone State Development Area
GSHAP	Global Seismic Hazard Assessment Program
GSP	gross state product
GST	goods and services tax
GTG	gas turbine generator
GTL	gas-to-liquid
GTT	Gaz Transport and TechniGaz
GVTS	Gladstone Vessel Traffic Service
GWP	global warming potential
GWTP	Gladstone Water Treatment Plant
H <sub>2</sub> S	hydrogen sulfide
ha	hectares (10 000 m <sup>2</sup> )
HACC	Home and Community Care
HAT	highest astronomical tide
HAZID	Hazard Identification
HAZOP	Hazard and Operability
HDD	horizontal directional drilling
HDPE	high-density polyethylene
HERBRECS	Queensland Herbarium database
HFC	hydro fluorocarbons
HFO	heavy fuel oil
HHV	high heating value
HIA	Housing Industry Association
HICB	Hazardous Industries and Chemical Branch
HIL	Health Based Investigation Level (ANZECC site contamination standard)
HIPAP	Hazardous Industry Planning Advisory Paper
HP	horse power
HPV	high point vent
HPZ	Habitat Protection Zones
Hs	heights
HSA	Health Service Area
HSD	Health Service District
HSE	Health, Safety and Environment
HSEQ	Health, Safety, Environment and Quality
HSSE	Health, Safety, Security and Environment

HVAC	heating, ventilating and air conditioning
Hz	hertz
IAC	inlet air chilling
IAS	Initial Advice Statement (as defined by part 4 of the <i>SDPWO Act</i> ) (Qld)
ICC	Indigenous Coordination Centres
ICHA	Initial Cultural Heritage Assessment
ICN	Industry Capability Network (Australian and New Zealand)
ICOMOS	Australian International Council on Monuments and Sites
ICSS	Integrated Control and Safety System
IDAS	Integrated Development Assessment System
IEC	International Electrotechnical Commission
IEP	Indigenous Employment Program
IFC	International Finance Corporation
IFD	intensity frequency duration
IGC	International Gas Code - International Maritime Organization's (IMO) <i>International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk</i>
ILUA	Indigenous Land Use Agreement
IMCA	International Maritime Contractors Association
IMO	International Maritime Organization
INA	International Navigation Association
intertidal	the coastal zone between the high tide mark and low tide mark
<i>IPA (Qld)</i>	<i>Integrated Planning Act 1997 (Qld)</i>
IPCC	Intergovernmental Panel on Climate Change
IPWEA	Institute of Public Works Engineering Australia
ISIR	Individual-Specific Individual (Fatality) Risk. Also referred to as Individual Risk per Annum (IRPA)
ISM code	International Safety Management Code for the Safe Operation of Ships
ISO	International Standards Organisation
ISRP	Indigenous Sport and Recreation Program
IUCN	International Union for Conservation of Nature
IYEC	Indigenous Young Employment Program
JAMBA	Japan-Australia Migratory Bird Agreement
Jet Fire	The combustion of a material emerging with high momentum from an orifice.
JSA/ JHA	Job Safety Analysis/Job Hazard Analysis
JSEA	Job Safety and Environmental Analysis
Jump up	an upthrow or down throw fault that leads to the slight elevation of the Earth's surface.
KCl	potassium chloride
KCS	key coastal sites
kHz	kilohertz
km	kilometre
km <sup>2</sup>	square kilometres
KP	kilometre point
kPa	kilopascal
kph	kilometres per hour

KRA	Key Resource Area
kV	kilovolts
kW	kilowatt
L s <sup>-1</sup>	litres per second
L <sub>1</sub>	the noise level exceeded for 1 % of a measurement period
L <sub>10</sub>	a noise level which is exceeded 10% of the time - it is approximately equivalent to the average of maximum noise levels
L <sub>90</sub>	commonly referred to as the background noise, this is the level exceeded 90% of the time
lacustrine	Lacustrine wetlands are large, open, water-dominated systems (for example, lakes) larger than eight hectares. This definition also applies to modified systems (for example, dams), which possess characteristics similar to lacustrine systems (for example, deep, standing or slow-moving waters).
LAN	local area network
LAT	lowest astronomical tide
LCA	Lifecycle Assessment
LCZ	landscape character zone
LDGL	Large Dangerous Goods Location
LEL	lower exposure limit
L <sub>eq</sub>	the summation of noise over a selected period of time - it is the energy average noise from a source, and is the equivalent continuous SPL over a given period
LFL	Lower Flammable Limit - The minimum quantity of flammable gas (usually expressed as % by volume) which when mixed with air will support combustion. For methane-air mixtures, the LFL is 5% by volume, and for propane-air mixtures, the LFL is 2% by volume.
LG	local government
LGA	local government area
LIMP	Local Incident Management Plan
LIMT	local incident management team
L <sub>max</sub>	the maximum root mean squared SPL received at the microphone during a measuring interval
LNG	liquefied natural gas
LNG Facility	the LNG component of the Project, inclusive of the LNG Plant, marine facilities, storage tanks etc
LNG Plant	LNG processing plant proper i.e. part of the broader LNG Facility
LNG Terminal	jetty and associated marine infrastructure
LNGC	Liquefied Natural Gas Carrier
LOR	limits of reporting
LOS	level of service
LOTE	Language other than English
LPD	low point drain
LPG	liquefied petroleum gas
LRAM	Land Resource Assessment Management Pty Ltd
LVIA	Landscape and Visual Impact Assessment
m	metres

m/s	metres per second
m <sup>3</sup>	cubic metre
MAE	Major Accident Event
MAOP	maximum allowable operating pressure
MARPOL 73/78	International Convention for the Prevention of Pollution from Ships (1973 and 1978 protocols)
MARVS	maximum allowable relief valve settings
max	maximum
mbgl	metres below ground level
MCATSIA	Ministerial Council on Aboriginal and Torres Strait Islander Affairs (Cth)
MCC	master control centre
MDL	mineral development lease
mg/L	milligrams per litre
µg/L	micrograms per litre
MHF	Major Hazard Facility
MHWS	mean high water spring
MIC	maximum instantaneous charge
ML	Depending on the context this could be: 1. mega litre (1 000 000 L) 2. local (richter) magnitude
MLA	mining lease application
MLV	mainline valve
mm	millimetres
µm	micron (millionth of a metre)
MNES	Matters of National Environmental Significance protected by Part 3 of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
MOF	Materials Offloading Facility
Mpa	megapascal
MPI	Maximum Potential Intensity
<i>MR Act</i>	<i>Minerals Resources Act 1989 (Qld)</i>
MRF	Material Recovery Facility
MRL	mandatory reporting level
MRV	main range volcanics
MSDS	Material Safety Data Sheet
MSQ	Maritime Safety Queensland (Qld)
mtpa	million tonnes per annum
MVA	mega volt amperes
MVC	mechanical vapour compression evaporator
MW	megawatt
N	nitrogen
N <sub>2</sub> O	nitrous oxide
Na <sub>2</sub> Cl	sodium chloride
NACC	National Aboriginal Consultative Committee
NAGD	National Ocean Disposal Guidelines for Dredged Material
NAL	noise assessment location
NATA	National Association of Testing Authorities
NBRC	North Burnett Regional Council
<i>NC Act (Qld)</i>	<i>Nature Conservation Act 1992 (Qld)</i>

NCB	North China Bay
NDI	non-destructive inspection
NEPM	National Environment Protection Measure
NES	Depending on the context this could be: 1. National Environment Significance 2. National Exposure Standards
NF	nanofiltration
NFPA	National Fire Protection Agency (United States)
NGERS	National Greenhouse and Energy Reporting System
NGGI	National Greenhouse Gas Inventory
NHA	National Heritage Area
NHMRC	National Health and Medical Research Council
NICP	National Indigenous Cadetship Program
NIMPIS	National Introduced Marine Pest Information System
NNTT	National Native Title Tribunal
NODGDM	National Ocean Disposal Guidelines for Dredged Material
NOHSC	National Exposure Standards for Atmospheric Contaminants
not of concern RE	not of concern regional ecosystem as defined in terms of the VMA (Qld)
NOx	oxides of nitrogen
NPI	National Pollutant Inventory
NRAS	National Rental Affordability Scheme
NRM	National Resource Management Plan
NRU	nitrogen rejection unit
NSW DECC	NSW Department of Environment and Climate Change
NTRB	Native Title Representative Body
NTU	nephelometric turbidity units
NWDA	North West Development Area
NWI	National Water Initiative
NWQMS	National Water Quality Management Strategy
NZS	New Zealand Standard
OBE	operational basis earthquake
OC	organic chlorinated (pesticides)
OCIMF	Oil Companies International Maritime Forum
OEMP	Operational Environmental Management Plan
of concern RE	of concern regional ecosystem as defined in terms of the VM Act (Qld)
OGP	International Association of Oil & Gas Producers
OLS	obstacle limitation surface
OP	organic phosphorated (pesticides)
OPE	Operating Basis Earthquake
Overpressure	For a pressure pulse (blast wave), the pressure developed above atmospheric pressure.
OWL	operating water level
OWS	oil-water separators
P&G Act (Qld)	<i>Petroleum and Gas (Production and Safety) Act 2004 (Qld)</i>



P&ID	process and instrumentation diagrams
pa	per annum
PA	public address system
PAH	polycyclic aromatic hydrocarbon
palustrine	Palustrine wetlands are primarily vegetated non-channel environments of less than eight hectares. They include billabongs, swamps, bogs, springs, soaks etc, and have more than 30 per cent emergent vegetation.
PANS-OPS	Procedures for Air Navigation Safety – Aircraft Operations
PASS	potential acid sulfate soils
PCA	Potential Commercial Area
PCB	polychlorinated biphenyls
PCCC	Port Curtis Coral Coast
PCCC Group	an amalgamated claim of previously registered Indigenous claims, being Gooreng Gooreng, Bailai, Taribelung Bunda and Gurang
PCDP	Public Consultation and Disclosure Plan
PCIMP	Port Curtis Integrated Monitoring Program
PCS	Process Control Systems
PCU	passenger car equivalents
PCYC	Police Citizens Youth Club
PEI	Public Estate Improvement
PES	potential explosion site
PFL	petroleum facility licence
PG	Packing Group
PGA	peak ground acceleration
PHA	Preliminary Hazard Assessment
PHIDU	Population Health Information Development Unit
PIANC	Permanent Association of Navigation Congresses
PIDS	perimeter intruder detection system
PIFU	Planning Information and Forecasting Unit
PJ	petajoules
PL	petroleum lease
PLA	petroleum lease application
PLB	Pond Log Book
PLNICH	Pipeline Non-Indigenous Cultural Heritage
PM <sub>10</sub>	particulate matter less than 10 microns in diameter
PM <sub>2.5</sub>	particulate matter less than 2.5 microns in diameter
Pool Fire	The combustion of material evaporating from a layer of liquid at the base of the fire.
POP	Pond Operational Plan
PPE	personal protective equipment
PPL	petroleum pipeline licence
ppm	parts per million
ppv	peak particle velocity - the maximum velocity of a particle of the transmission medium, used in assessment of vibration
Project	the Queensland Curtis LNG Project
Proponent	QGC Limited – A BG Group Business
PSHA	probabilistic seismic hazard analysis
PSI	per square inch

PSL	petroleum survey licence
PSSA	Particularly Sensitive Sea Area
Q Max	tanker size for a new class of LNG vessels
QA	Quality Assurance
QAL	Queensland Alumina Limited
QAS	Depending on the context this could be: 1. Queensland Ambulance Service 2. Quality Assurance System
QASSIT	Queensland Acid Sulfate Soils Investigation Team
QC	quality control
QCLNG Project	Queensland Curtis LNG Project
QCOSS	Queensland Council of Social Service Inc
QCWA	Queensland Country Women's Association
QERL	Queensland Energy Resources
QF	Q-Flex
QFRS	Queensland Fire and Rescue Service
QGC	A BG Group Business. The QCLNG Project Proponent.
QGCL	Queensland Gas Company Limited
QGEOP	Queensland Government Environmental Offsets Policy
QH	Queensland Health
QHC	Queensland Heritage Council
QHR	Queensland Heritage Register
Qld	Queensland
QMDC	Queensland Murray Darling Committee
QPS	Queensland Police Service
QPWS	Queensland Parks and Wildlife Service
QR	Queensland Rail
QRA	Quantitative Risk Assessment
QRFS	Queensland Rural Fire Service
QSNTS	Queensland South Native Title Service
QUAKES	Queensland University Advanced Centre for Earthquake Studies
QUDM	Queensland Urban Drainage Manual
Queensland Bilateral Agreement	An agreement between the Australian Government and the State of Queensland under section 45 of the <i>EPBC Act (Cth)</i> relating to environmental assessment.
QWQG	Queensland Water Quality Guidelines
Ramsar wetland	A wetland listed under <i>The Convention on Wetlands (1975)</i> an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation of wetlands.
RBL	Rating Background Level - an overall single figure background noise level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
RCMP	Regional Coastal Management Plan
<i>RD Act</i>	<i>Racial Discrimination Act 1975 (Cth)</i>
RE	regional ecosystems
regasification	The process by which LNG is heated, converting it into its gaseous state

regional ecosystems	defined in terms of the <i>VMA</i> (Qld) as vegetation communities that are consistently associated with a particular combination of geology, landform and soil. In Queensland, regional ecosystems are being used increasingly for detailed nature conservation planning, as a surrogate for biodiversity.
RGMF	Regional Growth Management Framework
RGTCT	RG Tanna Coal Terminal
RIA	Road Impact Assessment
RIAR	Regional Indigenous Australian Reference Group
RL	relative level (compared to AHD)
RNE	Register of the National Estate
RO	reverse osmosis
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
ROTAP	rare or threatened Australian plants
ROW	Right-of-Way
RPT	Depending on the context this could be: 1. rapid phase transition 2. regular public transport
RRC	Roma Regional Council
SAA	Standards Australia Association
SAAP	Supported Accommodation Assistance Program
Santos	Santos Ltd
SAP	sampling analysis plan
SAR	sodium adsorption ratio - measure of the proportion of sodium to magnesium and calcium in water
SCADA	supervisory control and data acquisition
SCMP	State Coastal Management Plan
SCR	state-controlled roads
SD	Statistical Division
SDD Project	Port of Gladstone Western Basin Strategic Dredging and Disposal Project
<i>SDPWO Act</i> (Qld)	<i>State Development and Public Works Organisation Act 1971</i> (Qld)
SEDA	South East Development Area
SEIFA	Socio-Economic Indices for Areas
Semi-evergreen	plants that drop their leaves in response to special or unusual environmental conditions.
SEMP	Social Environment Management Plan
sensitive receptor	potentially sensitive place, in particular, any place of work, residence, recreation, education or worship at which noise, vibration and/or air emissions from the Project could reach and/ or visual elements of the Project can be seen.
SEP	stakeholder engagement plan
SEPP	State Environment Protection Policy (Vic)
SES	State Emergency Service
SEVT	Semi-Evergreen Vine Thicket
SHS	State High School
SIA	Social Impact Assessment
SIAR	State Indigenous Australian Reference Group

significant project	a project declared by the Coordinator-General as a significant project requires an Environmental Impact Statement (EIS) in accordance with Part 4 of the <i>State Development and Public Works Organisation Act 1971</i> (Qld)
SIGTTO	Society of International Gas Tanker and Terminal Operators
SIL	Safety integrity level
SIMOPS	Simultaneous Operations
SIRE	Ship Inspection Report Programme
SIS	Safety Instrumented System
SLA	Statistical Local Area
SMS	Safety Management System
SNAICC	Secretariat of National Aboriginal and Islander Child Care
SO <sub>2</sub>	sulphur dioxide
SOLAS	International Convention for the Safety of Life at Sea 1974
SOPEP	Ship Board Pollution Emergency Plan
SOW	scope of work
SO <sub>x</sub>	oxides of sulphur
SPL	Sound Pressure Level - the level of sound pressure, expressed in decibels, as measured by a standard sound level meter with a microphone. This differs from SWL in that this is the received sound as opposed to the sound 'intensity.'
SPMT	self propelled mobile transporters
SPOCAS	Suspended Peroxide Oxidation Combined Acidity and Sulfate
SPOP	Standard Pond Operating Procedures
SPOS	Peroxide Oxidisable Sulfur
SPP	State Planning Policy
SPP 1/03	State Planning Policy 1/03 Mitigating the Adverse Impacts of Road, Bushfire and Landslide (Qld)
SRA	Shared Responsibility Agreements
SS	socioeconomic status
SSE	Safe Shutdown Earthquake
stakeholder	any individual, group or organisation (government or non-government) with a legitimate interest in, or who may be affected by, the Project.
STARRT	safety task and risk reduction talk
STD	sexually transmitted disease
STEP	Structured Training and Employment Projects
STP	sewage treatment plant
SWL	Sound Power Level - a measure of the total power radiated by a source. The Sound Power of a source is a fundamental property of the source and is independent of the surrounding environment.
SWMA	Surface Water Management Areas
SWMP	Stormwater Management Plan
t	tonnes
TAFE	Technical and Further Education Institution
TAL	tonnes axle loading
TAPL	The Air Pollution Model

Taxon (plural taxa)	Any group or rank in a biological classification into which related organisms are classified (e.g. phylum, order, family, genus or species)
TBT	tributyltin - an organotin compound and the main chemical component of anti-fouling paints)
tbtu	trillion British thermal unit – gas measurement
TCEQ	Texas Commission on Environmental Quality
tCO <sub>2</sub> e/annum	tonnes of carbon dioxide equivalents per annum
TDS	total dissolved solids
TE	thermal energy efficiency
TED	turtle excluding device
TEEL	Temporary Emergency Exposure Limits
TEG	tri-ethylene glycol
temperature inversion	a positive temperature gradient - a meteorological condition where atmospheric temperature increases with altitude to some height
TJ	Terajoules
TLP	tempered liquid petroleum gas
TMSA	Tanker Management and Self Assessment (program prescribed by OCIMF)
TO	traditional owner
TOC	Total Organic Compound
<i>TOMPA</i>	<i>Transport Operations (Marine Pollution) Act 1995 (Qld)</i>
TOR	Terms of Reference (as defined by part 4 of the <i>SDPWO Act</i> )
Tp	spectral peak period
tpa	tonnes per annum
TPH	total petroleum hydrocarbons
TSHD	trailer suction hopper dredge
TSM	total suspended matter
TSP	total suspended particulates
TSS	total suspended solids
two-way movements	return trip of a vehicle
UCG	underground coal gasification
UCS	unconfined compressive strength
UHF	Ultra High Frequency
UIC	Upstream Infrastructure Corridor
UK	United Kingdom
UNCLOS	United National Convention on the Law of the Sea 1982
UNFCCC	United Nations Framework Convention on Climate Change
UPS	Uninterruptible power supply
UQ	University of Queensland
USEPA	United States Environmental Protection Authority
USQ	University of Southern Queensland
UTM	universal transverse mercator
UV	ultra violet
UXO	unexploded ordnance
VAF	Value Assurance Framework
VCE	Vapour Cloud Explosion
VDU	visual display unit
VET	vocational education and training

VHF	Very High Frequency
VLRA	valve regulated lead acid
VM Act (Qld)	<i>Vegetation Management Act 1999</i> (Qld)
VOC	volatile organic compound
VTS	Vessel Traffic Service
vulnerable species or ecological community	listed threatened species or ecological community is categorised as vulnerable in terms of the <i>EPBC Act</i> (Cth) if, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium-term future.
WAIV	wind intensified evaporation
WBBRP	Wide Bay Burnett Regional Plan
WBSDD	Western Basin Strategic Dredge Disposal Project
WCM	Walloon Coal Measures - main gas bearing units in the Surat Basin
WDRC	Western Downs Regional Council
WERD	Water Entitlements Register Database
WHA	World Heritage Area
WHMPA	World Heritage Marine Park Area
WHO	World Health Organization
WHR	waste heat recovery
WICT	Wiggins Island Coal Terminal
WIFI	wireless fidelity
WildNet	Environmental Protection Agency WildNet Database (Qld)
WQ	water quality
WQO	water quality objectives
WRGABP	Water Resource Great Artesian Basin Plan
WRP	Water Resource Plan
WSA	Waterway Suitability Assessment
WTP	water treatment plant
WTS	waste transfer station
WWF	World Wildlife Fund
ZVI	Zones of Visual Influence