LOWER FITZROY RIVER
INFRASTRUCTURE PROJECT

Appendix C

Glossary and abbreviations

SunWater
MAKING WATER WORK

Gladstone Area Water Board

Glossary and Abbreviations

Project specific terminology

Abbreviation	Term
Project	Lower Fitzroy River Infrastructure Project
the EIS	Lower Fitzroy River Infrastructure Project environmental impact statement
the Proponent	Gladstone Area Water Board and SunWater Limited

Acronyms and abbreviations

Acronym	Term
AADT	Annual Average Daily Traffic
AATOC	Annual Average Time of Closure
ABS	Australian Bureau of Statistics
ADT	Average Daily Traffic
ACH Act	*Aboriginal Cultural Heritage Act 2003* (Qld)
ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail
ADWG	Australian Drinking Water Guidelines
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ALC	Agricultural Land Class
AMTD	Adopted middle thread distance
ANZECC	Australia and New Zealand Environmental Conservation Council
ARI	Average recurrence interval
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ANCOLD	Australian National Committee on Large Dams
AS	Australian Standard
AS/NZS	Australian Standard/New Zealand Standard
ASS	Acid Sulfate Soils
ATSI	Aboriginal and Torres Strait Islander
AUL	Auxiliary left turn
AUL(S)	Auxiliary left turn (with a short left turn slot)
AUR	Auxiliary right turn

Acronym	Term
AWQG	Australian Water Quality Guidelines
BAL	Basic left turn
BAMM	Biodiversity Assessment and Mapping Methodology
BAR	Basic right turn
BCA	Benefit Cost Analysis
BCR	Benefit Cost Ratio
BHC	Benzene hexachloride
BoM	Bureau of Meteorology
CAMBA	China-Australia Migratory Bird Agreement
CCIS	Climate Change Impact Statement
CEC	Cation Exchange Capacity
CEMP	Construction environmental management plan
CFI	Carbon Farming Initiative
CH	Chromosols
CH_4	Methane
CHMP	Cultural Heritage Management Plan
CHRC	Central Highlands Regional Council
CHR(S)	Channelized Right Turn Treatment with a Short Turn Slot
CID	Community Infrastructure Designation
CLR	Contaminated Land Register
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CQCHM	Central Queensland Cultural Heritage Management Pty Ltd
CQRP	Central Queensland Regional Plan
CQIRP	Central Queensland Integrated Rail Project
CQRWSS	Central Queensland Regional Water Supply Strategy
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSG	Coal Seam Gas
DAF	Department of Agriculture and Fisheries
DAFF	Department of Agriculture, Fisheries and Forestry

Acronym	Term
DATSIMA	Department of Aboriginal and Torres Strait Islander and Multicultural Affairs
DCCEE	Former Department of Climate Change and Energy Efficiency
DDT	Dichlorodiphenyltrichloroethane
DE	Dermosols
DEEDI	Former Department of Employment, Economic Development and Innovation
DEHP	Department of Environment and Heritage Protection
DERM	Former Department of Environment and Resource Management
DEWHA	Former Department of the Environment, Water, Heritage and the Arts
DEWS	Department of Energy and Water Supply
DMP	Damage Mitigation Permit
DNRM	Department of Natural Resources and Mines
DO	Dissolved oxygen
DoE	Department of the Environment
DOGIT	Deed of Grant in Trust
DPI	Former Department of Primary Industries
DIP	Former Queensland Department of Infrastructure and Planning
DSD	Department of State Development
DSDIP	Department of State Development, Infrastructure and Planning
DSEWPaC	Former Department of Sustainability, Environment, Water, Population and Communities
DSITIA	Department of Science, Information Technology, Innovation and the Arts
DTMR	Department of Transport and Main Roads
EB	Eden Bann Weir
EC	Electrical conductivity
EFOs	Environmental flow objectives
EIS	Environmental Impact Statement
EMP	Environmental management plan
EMQ	Emergency Management Queensland
EMR	Environmental Management Register
EO Act	*Environmental Offsets Act 2014*
EO Regulation	Environmental Offsets Regulation 2014

Acronym	Term
EO Policy	Queensland Environmental Offsets Policy Version 1.0
EP Act	*Environmental Protection Act 1994* (Qld)
EP Regulation	Environmental Protection Regulation 2008
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EPC	Exploration Permits for Coal
EPM	Exploration Permits for Minerals
EPP	Exploration Permits for Petroleum
EPP	Environmental Protection Policy / Policies
EPP Water	Environmental Protection Policy Water
ERA	Environmentally Relevant Activity / Activities
ESA	Equivalent Standard Axle
ESAL	Equivalent Standard Axle Load
ESAs	Environmentally Sensitive Areas
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development
EVR	Endangered, vulnerable and rare
FBA	Fitzroy Basin Association
FE	Ferrosols
FH	Freehold
FIA	Failure impact assessment
FPFW	First Post Winter Flow
FSC	Fitzroy Shire Council
FSL	Full supply level
FTE	Full Time Equivalent
FullCAM	Full Carbon Accounting Model
GARID	Guidelines for Assessment of Road Impacts of Development
GAWB	Gladstone Area Water Board
GBRMP	Great Barrier Reef Marine Park
GBRMP Act	*Great Barrier Reef Marine Park Act 1975* (Cth)
GBRMPA	Great Barrier Reef Marine Park Authority

Acronym	Term
GBRWHA	Great Barrier Reef World Heritage Area
GDE	Groundwater dependent ecosystem
GFP	Proposed Gladstone-Fitzroy Pipeline
GHG	Greenhouse gas
GMA	Groundwater management area
GMU	Groundwater management units
GRC	Gladstone Regional Council
GQAL	Good quality agricultural land
GVA	Gross Value Added
GSDA	Gladstone State Development Area
HB	Handbook
HEP	Human error probability
HEV	High Ecological Value
HSE	Health, Safety and Environment
IAA	Important Agricultural Area
IAIA	International Association for Impact Assessment
IAS	Initial Advice Statement
ICN Gateway	Industry Capability Network Gateway
ICOMOS	International Council on Monuments and Sites
IDAS	Integrated Development Assessment System
IECA	International Erosion Control Association
IPA2	International Association of Public Participation
IPCC	Intergovernmental Panel on Climate Change
IQQM	Integrated Quantity and Quality Model
JAMBA	Japan-Australia Migratory Bird Agreement
KA	Kandosols
KRA	Key Resource Area/Areas
KU	Kurosols
LFRIP	Lower Fitzroy River Infrastructure Project
LGA	Local Government Area

Acronym	Term
LL	Lands Lease
LOS	Level of Service
LP Act	*Land Protection (Pest and Stock Route Management) Act 2002* (Qld)
LSC	Livingstone Shire Council
MCU	Material Change of Use
MDL	Mineral Development Licences
MIC	Maximum Instantaneous Charge
ML	Mining Lease
MNES	Matters of national environmental significance
N_2O	Nitrous Oxide
NC Act	*Nature Conservation Act 1992* (NC Act)
NEPM	National Environmental Protection Measure
NGA	National Greenhouse Account
NGER Act	*National Greenhouse and Energy Reporting Act 2007* (Qld)
NGERS	National Greenhouse and Energy Reporting Scheme
NHMRC	National Health and Medical Research Council
NO_2	Nitrogen Dioxide
NO_x	Nitrogen oxides (NO (nitric oxide) and NO_2)
NPI	National Pollution Inventory
NPV	Net Present Value
NROLA	*Natural Resources and Other Legislation Amendment Act 2010* (Qld)
NSESD	National Strategy for Ecologically Sustainable Development
NT Act	*Native Title Act 1993* (Qld)
NWQMS	National Water Quality Management Strategy
O_3	Ozone
OEMP	Operation environmental management plan
OESR	Office of Economic and Statistical Research
PAA	Priority Agricultural Areas
PAR	Population at risk
PASS	Potential Acid Sulfate Soils

Acronym	Term
PGA	peak ground acceleration
PIF	Private Infrastructure Facility
PLA	Priority Living Area
PLC	Programmable logic control
PPE	Personal Protective Equipment
PPL	Petroleum pipeline licence
PPV	Peak Particle Velocity
PRs	Performance requirements (under RVMC)
PV	Present Value
PVMO	Queensland Policy for Vegetation Management Offsets Version 3, 2011
QASSIT	Queensland Acid Sulfate Soils Investigation Team
QBOP	Queensland Biodiversity Offset Policy Version 1, 2011
QCCCE	Queensland Climate Change Centre of Excellence
QGEOP	Queensland Government Environmental Offsets Policy
QH Act	*Queensland Heritage Act 1992*
QPS	Queensland Police Service
QWQG	Queensland Water Quality Guidelines
RAP	Risk Adjusted Price
RCC	Roller compacted concrete
RE	Regional Ecosystem/s
REV	Relative Ecological Value
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
ROL	Resource operations licence
ROP	Resource Operations Plan
RRC	Rockhampton Regional Council
RPI Act	*Regional Planning Interests Act 2014* (Qld)
RU	Rudosols
RVMC	Regional Vegetation Management Code for Brigalow Belt and New England Tablelands Bioregions - Version 2.1
RW	Rookwood Weir
SARA	State Assessment and Referral Agency

Acronym	Term
SCA	Strategic Cropping Areas
SCADA	Supervisory Control and Data Acquisition
SCL	Strategic cropping land
SCL Act	*Strategic Cropping Land Act 2011*
SCR	State-controlled roads
SDAP	State Development Assessment Provisions
SDPWO Act	*State Development Public Works Organisation Act 1971* (Qld)
SEA	Strategic Environmental Areas
SEIS	Supplementary Environmental Impact Statement
SES	State Emergency Service
SF	State Forest
SIA	Social Impact Assessment
SiD	Safety in Design
SMP	Species Management Program
SO	Sodosols
SO_2	Sulfur Dioxide
SOI	Southern Oscillation Index
SP Act	*Sustainable Planning Act 2009* (Qld)
SPL	Sound pressure level
SPP	State Planning Policy / Policies
SRES	Special Report on Emissions Scenarios
SRN	Stock Route Network
SWER	Single Wire Earth Return
SWL	Sound power level
TE	Tenosols
TECs	Threatened Ecological Communities
TI Act	*Transport Infrastructure Act 1994* (Qld)
TIA	Traffic Impact Assessment
TMP	Traffic management plan
TN	Total Nitrogen

Acronym	Term
ToR	Terms of Reference
TP	Total Phosphorus
TSS	Total Suspended Solids
UAs	Unincorporated areas
USL	Unallocated State Land
VE	Vertosols
VM Act	*Vegetation Management Act 1999* (Qld)
VOCs	Volatile Organic Compounds
WASO	Water allocation security objective
WASC	Woorabinda Aboriginal Shire Council
Water Act	*Water Act 2000* (Qld)
WAVs	Worker accommodation villages
WBBCC	Wide Bay Burnett Conservation Council
WHS Act	*Work Health and Safety Act 2011* (Qld)
WONS	Weeds of National Significance
WQO	Water Quality Objective
WRP	Water Resource Plan
WRR Act	*Waste Reduction and Recycling Act 2011* (Qld)

Glossary

Term	Definition
2-times base flow event	A post-winter flow year in which the days of flow twice base flow are not more than 4 days fewer than the days of flow twice base flow in the year for the pre-development flow pattern.
2-week lag event	A first post-winter flow event that starts within 2 weeks after the date the first post-winter flow event starts in the same year for the pre-development flow pattern.
4-week lag event	A first post-winter flow event that starts within 4 weeks after the date the first post-winter flow event starts in the same year for the pre-development flow pattern.
5-times base flow event	A post-winter flow year in which the days of flow 5-times base flow are not more than 4 days fewer than the days of flow 5-times base flow in the year for the pre-development flow pattern.
Average flow volume	The average of the volume ratios in the post-winter flow years in the simulation period.
Average peak	The average of the peak flow ratios for the post-winter flow years in the

Term	Definition
flow	simulation period.
Channel morphology statistic	The annual peak daily flow volume in the simulation period with an annual probability of exceedance of 50%.
Daily flow	The volume of water that flows past a node in a day.
Days of flow 5-times base flow	The number of days in a first post-winter flow event on which the daily flow is at least 5 times the seasonal base flow.
Days of flow twice base flow	The number of days in a first post-winter flow event on which the daily flow is at least twice the seasonal base flow.
dB	Decibel is the unit used for expressing the sound pressure level (SPL) or power level (SWL) in acoustics.
dB(A)	Frequency weighting filter used to measure 'A-weighted' sound pressure levels, which conforms approximately to the human ear response, as our hearing is less sensitive at very low and very high frequencies.
Event volume	The total daily flows for a first post-winter flow event. However, if the event volume calculated under paragraph 1 is greater than the volume of the estuary of the Fitzroy River, the event volume is the estuary volume.
First peak flow	The daily flow on the first day in a first post-winter flow event on which the flow reaches a peak. However, if the first peak flow calculated under paragraph 1 is greater than the daily flow for a flow with a depth of 3m (a 3-metre event), the first peak flow is the daily flow for a 3-metre event.
First post-winter flow event	The first flow in a year at a node that— a) starts between 15 September and 10 April in the year; and b) lasts for 21 days; and c) the chief executive is satisfied meets the following criteria— i. for a node other than node 0, the flow, within 6 days after its start, is greater than a flow with a depth of 1.5 m; ii. for node 0, the flow at its start is at least 5000 ML a day; iii. for a flow that starts in September, the water temperature is at least 23 °C; iv. the flow, for a node, for the duration of the event, is greater than the seasonal base flow mentioned for the node in part 1; v. for a node other than node 0, the first peak in the flow that is greater than a flow with a depth of 1.5 m happens within 6 days after the start of the event; vi. for node 0, the event has an event volume greater than half the volume of the estuary of the Fitzroy River. However, a *first post-winter flow event* does not include a flow that happens in a year in the simulation period for which a flow satisfying the requirements of paragraph 1 did not happen for the pre-development flow pattern.
Fish species diversity statistic	The annual proportional flow deviation which is a statistical measure of changes to both flow seasonality and volume as defined by the following formula when applied to the simulation period—

Term	Definition
	$$\mathbf{APFD} = \sum_{j=1}^{p} \frac{\sqrt{\sum_{i=1}^{12} \left\{ \frac{c_{ij} - n_{ij}}{\overline{n}_i} \right\}^2}}{p}$$ where— p = number of years in the simulation period c_{ij} = modelled existing flow for month i in year j n_{ij} = modelled natural flow for month i in year j $\tilde{n}_i$ = mean natural flow for month i across p years Σ = the sum of
Flood plain zone statistic	The number of flows in the simulation period which reach a level assessed as being required to inundate flood plain habitats.
Flow duration (2-times base flow)	The number of 2-times base flow events in the simulation period, expressed as a percentage of the number of post-winter flow years in the period.
Flow duration (5-times base flow)	The number of 5-times base flow events in the simulation period, expressed as a percentage of the number of post-winter flow years in the period.
In-channel riparian zone statistic	The number of flows in the simulation period which reach a level assessed as being required to inundate instream habitats to mid-channel levels.
$L_{A1(period)}$	The sound pressure level that is exceeded for 1% of the measurement period.
$L_{A1, adj\ (1hr)}$	Adjusted sound pressure level that is exceeded for 1% of the measurement period. The adjustment is made in accordance with AS1055.1 -1997 to account for tonal or impulsive characteristics of the subject noise.
$L_{A10(period)}$	The sound pressure level that is exceeded for 10% of the measurement period.
$L_{A10, adj\ (1hr)}$	Adjusted sound pressure level that is exceeded for 10% of the measurement period. The adjustment is made in accordance with AS1055.1 -1997 to account for tonal or impulsive characteristics of the subject noise.
$L_{A90(period)}$	The sound pressure level that is exceeded for 90% of the measurement period.
$L_{Aeq(period)}$	Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.
$L_{Aeq, adj\ (1hr)}$	Adjusted equivalent sound pressure level over 1 hour. The adjustment is made in accordance with AS1055.1 -1997 to account for tonal or impulsive characteristics of the subject noise.
L_{Amax}	The maximum sound level recorded during the measurement period.
Marine and	The total volume of flow at the Fitzroy Barrage during the months of January,

Term	Definition
estuarine processes statistic	February, March and April in the simulation period divided by the number of years in the simulation period.
Mean annual flow	The total volume of flow in the simulation period divided by the number of years in the simulation period.
Median annual flow	The annual flow volume that is equalled or exceeded in 50% of years within the simulation period.
Noise sensitive receptor	An area or place potentially affected by noise which may include: • A residential dwelling • An educational institution, library, childcare centre or kindergarten • A hospital, surgery or other medical institution • An active (e.g. sports field, golf course) or passive (e.g. national park) recreational area • Commercial or industrial premises • A place of worship.
Number of first post-winter flows	The number of first post-winter flow events in the simulation period expressed as a percentage of the number of post-winter flow years in the period.
Number of flows within 2 weeks of the pre-development event	The number of 2-week lag events in the simulation period, expressed as a percentage of the number of 4-week lag events in the period.
Number of flows within 4 weeks of the pre-development event	The number of 4-week lag events in the simulation period, expressed as a percentage of the number of post-winter flow years in the period.
Peak flow ratio	The first peak flow for a year expressed as a percentage of the first peak flow for the year for the pre-development flow pattern.
Peak Particle Velocity (PPV)	Peak Particle Velocity, is the maximum vector sum of three orthogonal time-synchronized velocity components regardless of whether these component maxima occurred simultaneously.
Post-winter flow year	A year in the simulation period in which a first post-winter flow event happens for the pre-development flow pattern.
Rating Background Level	The overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period.
Upper riparian zone statistic	The number of flows in the simulation period which reach a level assessed as being required to inundate instream habitats to bank-full levels.
Vibration	The variation of the magnitude of a quantity which is descriptive of the motion or position of a mechanical system, when the magnitude is alternately greater and smaller than some average value or reference. Vibration can be measured in terms of its displacement, velocity or acceleration. The common units for velocity are millimetres per second (mm/s).
Volume ratio	The event volume for a year, expressed as a percentage of the event volume for the year for the pre-development flow pattern.

Symbols and units of measurement

Symbol / unit	Definition
≥	Equal to or great than
Al	Aluminium
^{0}C	Degrees Celsius
CO_2-e	CO_2-equivalent
Cu	Copper
dB	Decibel
EL	Elevation in metres above sea level
Fe	Iron
ha	Hectare
Hz	Hertz
kg/a	Kilograms per annum
km	Kilometre
km^2	Square kilometre
km/hr	Kilometres per hour
kt/a	Kilo tonnes per annum
kV	Kilovolt
kVA	Kilovolt-ampere
$L_{Aeq(period)}$	Equivalent sound pressure level over a specified period of time
m	Metre
m/s	Metres per second
m^3	Cubic metre
m^3/s	Cubic metres per second
Mg	Magnesium
mg/L	Milligrams per litre
mg/m^3	Milligrams per cubic metre
ML	Million litres or megalitre
ML/a	Mega litre per annum
ML/d	Mega litre per day
mm	Millimetres
MMI	Modified Mercalli Intensity
Mn	Manganese
Mt/y	Mega tonnes per year
N	Nitrates

Symbol / unit	Definition
P	Phosphates
Pb	Lead
PJ	Petajoules
$PM_{2.5}$ / PM_{10}	Particles of 2.5 µm and 10 µm equivalent aerodynamic diameter or less
µg/L	Micrograms per litre
µm	Micrometre
µS/cm	Micro Siemens per centimetre (measure of electrical conductivity in water)
NTU	Nephelometric Turbidity Units
RL	Reduced level
t/a	Tonnes per annum
t CO_2-e	Tonnes of CO_2-equivalent emissions
t/ha	Tonnes per hectare
Zn	Zinc