Preliminary Erosion and Sediment Control Plan

Miriam Vale Solar Farm

Prepared for:
Private Energy Partners Pty Ltd

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Document Information

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1.0 Introduction

1.1 Background

Attexo Group Pty Ltd (Attexo) has been engaged by Private Energy Partners to prepare a Preliminary Erosion and Sediment Control Plan (P-ESCP) for the Miriam Vale Solar Farm Project (the Project). The Project involves the development of a photovoltaic (PV) solar farm of up to 1 gigawatt (GW) generation capacity and associated infrastructure, including a substation.

The Miriam Vale Solar Farm Project is located within the Gladstone Regional Council (GRC) local government area and intersects 14 individual land parcels (the Project area). Construction is scheduled to commence in Q3 2025, subject to the receipt of requisite statutory approvals and the execution of the necessary commercial agreements. Construction is expected to extend for a period of 18 to 24 months with a peak construction workforce of up to 500 personnel who will reside offsite in existing accommodation in surrounding townships.

1.2 Purpose, Scope and Objectives

This P-ESCP has been developed to support the Development Application for the Miriam Vale Solar Farm Project under the GRC Planning Scheme, being:

- Development permit for Material Change of Use for Renewable Energy Facility (Solar Farm); and
- Development permit for Material Change of Use for a Substation.

This P-ESCP is intended to demonstrate that potential dust, erosion and sedimentation impacts associated with Project establishment can be effectively managed and to establish the baseline requirements for soil Erosion and Sediment Control (ESC) applicable to Project construction works. To achieve this, the following information is provided by this P-ESCP:

- A broad description of the Project site and construction works relevant to preliminary ESC planning.
- A description of the ESC standards relevant to the Project.
- An assessment of site environmental conditions as they relate to ESC constraints and potential threats.
- An assessment of the susceptibility of site soils to dust generation and associated management implications.
- An assessment of Project construction erosion risk.
- A description of the general approach to be applied to ESC throughout construction works.
- An outline of ESC monitoring and maintenance activities that will be undertaken during Project construction.

This P-ESCP is not intended for construction purposes and does not provide detailed information as to the design and placement of on-ground ESC controls. This level of planning requires a detailed knowledge of the construction method which will not be available until the construction contractor has been appointed. Project and site-specific construction Erosion and Sediment Control Plans (ESCPs) will be developed prior to the commencement of works and will be implemented throughout construction. Construction ESCPs will be developed to International Erosion Control Association (IECA) 2008 best practice standards and amended as required to meet discharge water quality objectives.

The overall objective of this P-ESCP, and all ESC for the Project, is as follows:

- *To take all reasonable and practicable measures to minimise short and long-term soil erosion and adverse effects of sediment transport* (IECA, 2008, p2.1).
- To minimise dust generation and associated impacts arising from Project construction.

2.0 Project Description

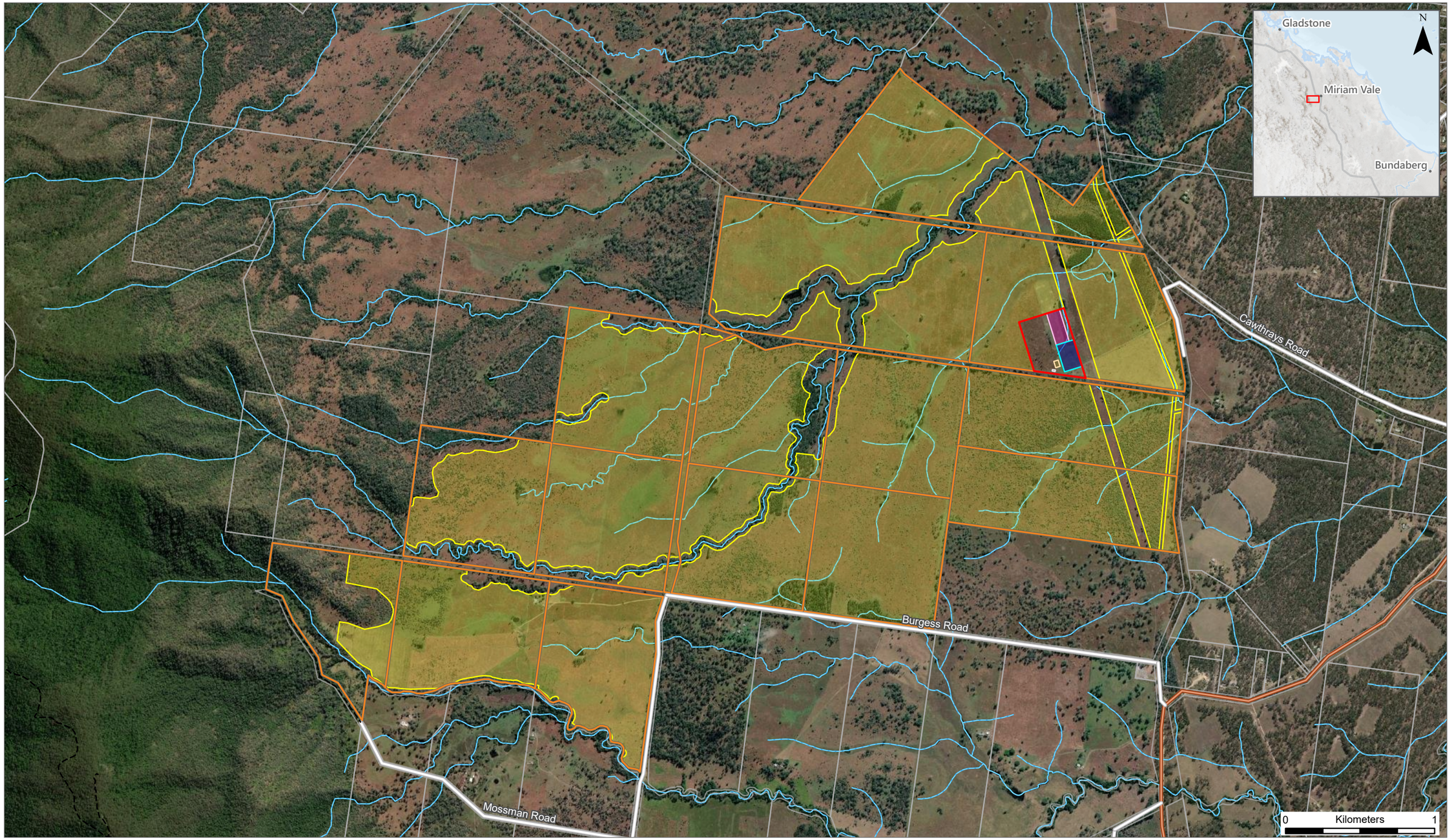
2.1 Site Overview

The Miriam Vale Project is located approximately 6 kilometres (km) west of Miriam Vale and 43 km west-southwest of Agnes Water, spanning 14 pastoral properties. The Project is described using the terms defined in **Table 2-1**.

Table 2-1 Project Area and Footprint Descriptions

Area	Definition	Size (hectares, ha)
Project area	Encompasses the entirety of the 14 land parcels intersected by the Project.	1,082.25 ha
Miriam Vale Solar Farm footprint	Comprises the maximum area to be disturbed by the Miriam Vale Solar Farm Project, equating to 85.2% of the Project area.	921.74 ha

A layout map showing the Project area and footprints as described in **Table 2-1** is provided in **Figure 2-1.**



Miriam Vale Solar Farm - Location

- Site Boundary
- Miriam Vale Solar Farm Development Footprint
- Proposed Substation and Switchyard Area
- Cadastral Boundary
- Proposed Substation Development Area
- Proposed Switchyard Development Area
- Proposed Laydown Area
- Proposed Maintenance and Storage Shed Area
- Watercourse line

Roads and tracks

- Connector
- Local
- Track

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FIGURE 2-1

2.2 Construction Works

Construction of the Project will occur concurrently and is expected to commence in Q3, 2025 and extend for a period of 18-24 months. A detailed construction methodology will be developed by the Project construction contractor upon award. A summary of those activities relevant to ESC planning is as follows:

General:

- Mobilisation: of machinery and equipment to site (staggered throughout the construction phase as needed).
- Site establishment: install temporary construction compounds, workshops, warehouses, amenities, laydown and stockpiling areas. Establish site entrance points sufficient for construction vehicles and plant.
- Vegetation clearing: removal of vegetation within the Project footprint where required via mechanical means, including approximately 34 ha of hardwood timber plantation (Tasmanian Blue Gum). Over 96% of the development footprint is non-derived grassland habitat.
- Machinery and equipment maintenance: includes general servicing and minor repairs such as oil and filter changes, hose replacements, refuelling and other top ups (i.e. hydraulic fluids, lubricants, coolant, etc.).
- Hot works: includes cutting, grinding, welding, soldering and other.
- Concreting: where pre-cast foundations are not used, wet mix will be transported to site in agitators, no onsite concrete batching is proposed.
- Site rehabilitation: groundcover reestablishment to be completed progressively as individual sites or Project sections are completed.

Solar farm:

- Earthworks: cut and fill to establish required site profile and track gradients, trenching for subsurface cable installation, excavation for the installation of foundations and subsurface equipment. Establish compacted, unsealed tracks, laying and compaction of fill for temporary and permanent hardstand areas.
- Instream work: vehicle creek crossings will be established which will comprise either bed level or culvert types.
- Solar array: Install galvanised steel pole support structures – pile driving or screw in methods are proposed to minimise loss of pre-existing groundcover where practicable. Where soil depth is insufficient poles will be mounted onto concrete foundations. Install buried cable – excavate trench, install cable / conduit and backfill. If conduit is used, cable will be pulled through conduit post trench backfill as per the construction sequence. Install PV panels – lift panels into place via crane and attach to pole support structures.
- Substation: Pour concrete foundations for transformers and other equipment, erect buildings and enclosures (e.g. hut / control room, equipment housing etc.), install subsurface cabling and other buried infrastructure, install switchgear, earthing and protection systems, communications equipment and other as per design, install fencing and signage.
- Electrical works (OH and underground) general: cable joining, facility interconnection and grid connection.
- Site finishing: install site fencing, signage, bollards, gravel surfaces etc.

Commissioning

- Testing and commissioning of plant / equipment.

Demobilisation:

- Progressive disassembly and removal of all construction machinery, equipment and materials from site.
- Final site stabilisation and rehabilitation works.

2.3 Legislation and Standards

A summary of the legislation and standards relevant to ESC that apply to the Project is provided in **Table 2-2**.

Table 2-2 Legislation Standards

Standard	Application	Administrator
The Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018	Now an online platform, the guidelines establish a broad set of physical and chemical water quality standards stressing the need to develop locally relevant guidelines. Provides a basis for which local standards can be developed and a guideline which can be used in the absence of the former.	Australian and New Zealand Governments (ANZG)
Reef 2050 Water Quality Improvement Plan	Identifies management and monitoring requirements for land-based pollution to improve the quality of water discharged from Great Barrier Reef (GBR) catchments to the Reef. Establishes Water quality targets for each catchment that drains to the GBR.	Queensland and Australian Governments (partnership)
Environmental Protection Act 1994 (EP Act)	Environmental protection, establishes a General Environmental Duty (GED) and specifically addresses the release of water contaminants (S440ZG).	QLD Department of Environment, Science and Innovation (DESI)
Environmental Protection Regulation 2008	Prescribes various matters pertaining to the *Environmental Protection Act 1994*, e.g. water contaminants (Schedule 9) including sediment.	DESI
Environmental Protection (Water and Wetland Biodiversity) Policy 2019	Intended to achieve the object of the EP Act in relation to waters and wetlands. Identifies environmental values and management goals for waters, states water quality guidelines and objectives and provides a framework for decision making and monitoring and reporting on the condition of waters.	DESI
QLD State Planning Policy (SPP)	Establishes water quality as a matter of State interest and defines the Queensland Government's policies and assessment benchmarks about matters of state interest for land use planning and development.	Department of Housing, Local Government, Planning and Public Works (DHLGPPW)
The Planning Act 2016, subsidiary legislation, State Codes	Refer to the Project Planning Report for a detailed description these items.	DHLGPPW

Standard	Application	Administrator
Gladstone Regional Planning Scheme 2017, Version 2	Planning schemes identify strategic and specific outcomes relating to water quality protection applicable to developments which are assessable under the Planning scheme.	GRC
IECA Best Practice Erosion and Sediment Control Guidelines	Erosion and sediment control standard applicable to the development.	IECA

3.0 Site Environmental Characteristics

3.1 Soils

The soils in the Project area have been mapped in the 1:250,000 Land systems of the Miriam vale and Kolan Shires by Donnollan et al (2004). The associated report is titled *Land Resources of the Miriam Vale and Kolan Shires (Donnollan, Wetherall & Griffiths, 2004)*. This survey mapped approximately 6,153 square kilometres at 1:250,000 scale. Due to the survey scale individual soils are not explicitly mapped. Instead, the mapping units are land systems, or areas throughout which there is a recurring pattern of geology, topography, soils and vegetation. Within each land system, component land units were described in terms of soils, landform attributes and vegetation.

Four land systems are mapped across the Project area (**Table 3-1**) and are shown in **Figure 3-1**. The Project area is predominantly located on the Boondilla land system, host to a range of soil orders including sodic duplex soils (Sodosols and Kurosols) and heavy clay Vertosols. The site compound and substation are all mapped as the Miriam Vale 1 land system that may consist of a wide range of soil types from shallow Dermosols, to texture contrast soils such as Chromosols and Sodosols through to deep Vertosols. A soil site ~130 m away from the site compound is a Brown Sodosol. Sodosols are present in the area and will have a sodic clay subsoil that is highly likely to disperse.

Note: the information provided in **Table 3-1** is indicative and is intended for preliminary planning purposes only. Soil mapping data is limited by the scale of mapping; construction ESCPs should be informed by soil sampling data which is representative of soils present across the Project footprint. Additionally, the age of the report[1] results in an occasional lack of consistency with contemporary soil classifications and guidelines, such as the Australian Soil Classification (Isbell & NCST 2021).

There are no mapped acid sulfate soils mapped within the Project area.

[1] Refers to: *Land Resources of the Miriam Vale and Kolan Shires (Donnollan, Wetherall & Griffiths, 2004)*

Table 3-1 Land Systems Intersecting the Project Area[2]

Map code	Land system	Landform and geology	Dominant vegetation	Major soils	Area intersected by the Project [3](ha)
Alluvial Plains of Rivers and Creeks					
Bd	Boondilla	Alluvial plains and pediments and minor gently undulating rises on acid and intermediate intrusive rocks.	Open forest to woodland. Queensland blue gum, swamp mahogany, gum-topped box, cockatoo apple, bloodwoods and narrow-leaved iron bark.	Moderately deep to very deep, grey and brown sodic duplex soils (Sodosols and Kurosols), deep to very deep, black, cracking clays (Vertosols), black and grey, non-cracking clays and gradational soils (Dermosols) and coarse textured, uniform and gradational soils (Tenosols and Kandosols).	622.6
Acid to Intermediate Intrusive Rocks					
Mv1	Miriam Vale 1	Gently undulating rises to undulating rises on intermediate intrusive rocks.	Open forest to woodland. Narrow-leaved iron bark, bloodwoods, Moreton Bay ash, Queensland blue gum and silver-leaved iron bark.	Shallow to deep, brown and red, gradational soils (Dermosols) and non-sodic duplex soils (Chromosols), moderately deep to deep, brown, yellow and grey sodic and non-sodic duplex soils (Sodosols and Chromosols) and deep, black and grey, cracking clays (Vertosols).	300.8
Mv2	Miriam Vale 2	Gently undulating rises to undulating rises on acid intrusive rocks.	Open forest to woodland. Bloodwoods, Moreton Bay ash, yellow stringybark, narrow-leaved iron bark, Queensland blue gum, smooth barked apple and swamp mahogany often with an understorey of wattles, Melaleuca and Banksia species.	Moderately deep to deep, uniform, coarse textured soils (Tenosols) and deep, grey and yellow, non-sodic and sodic duplex soils (Chromosols, Sodosols and Kurosols).	2.5

[2] Data obtained from Queensland Globe, accessed online at: https://qldglobe.information.qld.gov.au/, 08.01.2024

[3] Refers to Miriam Vale Solar Farm Project area

Map code	Land system	Landform and geology	Dominant vegetation	Major soils	Area intersected by the Project [3](ha)
Cw	Castletower	Rolling hills to steep mountains on acid intrusive rocks.	Open forest to woodland. Spotted gum, narrow-leaved iron bark, bloodwoods, Moreton Bay ash, Queensland blue gum and swamp mahogany and minor areas of semi-evergreen vine forest.	Very shallow to shallow, uniform, coarse textured soils (Tenosols) and shallow to moderately deep, red, brown and yellow gradational soils (Dermosols and Kandosols) and non sodic duplex soils (Chromosols).	15.4

3.1.1 Soil Profile Sites

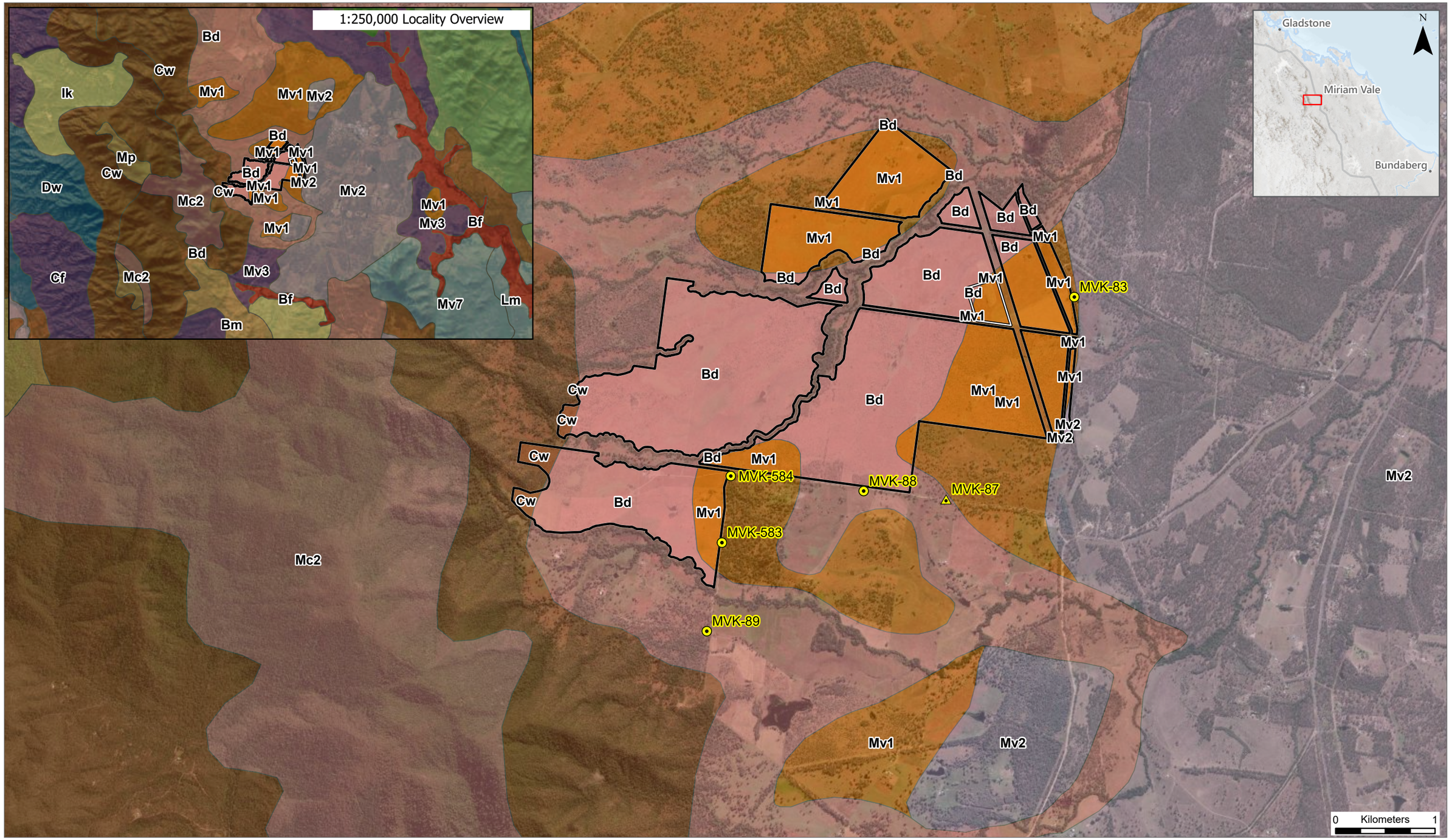
No soil sites were identified in SALI[4] occurring within the Project area, however six sites were identified in proximity to the Project to the south and east, one of which provided laboratory analysis data. Profile characteristics for these sites are described in **Table 3-2** with the corresponding locations shown in **Figure 3-1**.

Table 3-2 Soil Profile

Profile	Land system	Australian Soil Classification	Landform
MVK83	Miriam Vale 1	Hypercalcic, Subnatric, Brown Sodosol; medium, non-gravelly, clay loamy, clayey, shallow.	Hillcrest on Rises
MVK87	Boondilla	Vertic, Calcic, Brown Dermosol; medium, non-gravelly, clay loamy, clayey, moderate.	Hillslope on Rises
MVK88	Boondilla	Endocalcareous, Epipedal, Black Vertosol; —, non-gravelly, medium fine, medium fine, deep.	Valley-Flat on Rises
MVK89	Boondilla	Hypercalcic, Subnatric, Grey Sodosol; medium, non-gravelly, clay loamy, clayey, very deep.	Plain on Alluvial Plain
MVK583	Miriam Vale 1	Eutrophic, Subnatric, Grey Sodosol; medium, non-gravelly, clay loamy, clayey, very deep.	Plain on Alluvial Plain
MVK584	Miriam Vale 1	Bleached-Sodic, Eutrophic, Yellow Chromosol; thick, non-gravelly, clay loamy, clayey, moderate.	Hillcrest on Rises

Soil chemistry data is available for the MVK87 profile, which describes soils as being slightly acidic pH (6-7) to 40 cm depth, becoming moderately alkaline (8.5-9) below this depth, with no salinity or sodicity present. Cations indicate elevated magnesium presence, with calcium low (1-4) calcium:magnesium ratios and exchangeable magnesium percentages of 41–51%. In sufficient quantities, elevated magnesium can function like elevated sodicity, and result in the potential for dispersion.

[4] SALI is the State Soil and Land Information system that stores land resource data



Miriam Vale Solar Farm - Land Systems Mapping and Soil Profile Sites

Miriam Vale Solar Farm Development Footprint

Proposed Substation and Switchyard Area

Soil Site- Limited Chemistry

Soil Site- No Chemistry

Land systems (1:250,000 Scale)

- Aw1-Agnes Water 1
- Aw2-Agnes Water 2
- Aw3-Agnes Water 3
- Bd-Boondilla
- Bf-Baffle
- Bm-Blackman
- Bo-Boyne
- Cf-Clifton
- Cw-Castletower
- Dw-Dawes
- Ec1-Electra 1
- Ec2-Electra 2
- Ik-Inkerman
- Lm-Littlemere
- Lm-Lowmead
- Mc2-Muncon2
- Mp-Many Peaks
- Mv1-Miriam Vale 1
- Mv2-Miriam Vale 2
- Mv3-Miriam Vale 3
- Mv4-Miriam Vale 4
- Mv6-Miriam Vale 6
- Mv7-Miriam Vale 7
- Ng-Nagoorin

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FIGURE 3-1

3.1.2 Dust Risk Assessment

The susceptibility of soil materials to generate dust relates to a range of properties, including soil surface texture, aggregate size, soil structure and chemistry that indicates the potential for soil to be broken down into individual particles available to be entrained by wind. Typically, smaller particles, such as silt and fine sand, are more likely to form dust when disturbed than coarser sands and therefore soil textures such as sandy loams or sandy clay loams are often seen as high-risk dust materials. Soil structure, chemistry and surface condition also influence dust potential, with weakly structured or apedal (structureless) soils, sodic soils or hardsetting surfaces more prone to structural degradation from construction activity and trafficking.

An assessment of potential dust has been undertaken as a qualitative assessment of likely dust generation from soil characteristics, shown in **Table 3-3,** based on available land system soil texture information (**Section 3.1**).

Based on available information of potential soil textures present on site, there are soils with a likely high risk for dust generation. Given the variable nature of dust potential, construction ESCPs should consider site specific soil characteristics, wind exposure and likely trafficking volumes to further define areas with high potential for significant dust generation and associated management requirements.

Table 3-3 Soil Dust Potential

Map code	Map code meaning	Dominant ASC[5]	Topsoil		Subsoil	
			Texture	Dust potential	Texture	Dust potential
Bd	Boondilla	Sodosol	Sandy loam	High	Light medium clay	Low
Bd	Boondilla	Vertosol	Light medium clay	Low	Light medium clay	Low
Mv1	Miriam Vale 1	Vertosol	Light clay	Moderate	Light medium clay	Low
Mv1	Miriam Vale 1	Sodosol	Sandy clay loam	High	Light medium clay	Low
Mv1	Miriam Vale 1	Dermosol	Clay loam	Moderate	Light medium clay	Low
Mv2	Miriam Vale 2	Kurosol	Sandy loam	High	Light medium clay	Low
Mv2	Miriam Vale 2	Tenosol	Coarse sand	Moderate	Sandy loam	High
Cw	Castetower	Tenosol	Sand	Moderate	Sand	Moderate
Cw	Castetower	Dermosol	Sandy loam	High	Sandy clay loam	High

3.2 Geology

The geology units intersected by the Project area are described in **Table 3-4**. In summary, surface geology comprises predominantly gabbro with areas of Quaternary Alluvium associated with drainage features.

[5] Australian Soil Classification (Isbell & NCST 2021)

Table 3-4 Surface Geology within the Project area[6]

Map Symbol	Rock Unit Name	Age	Lithological Summary	Dominant Rock
Pgja	Jackass Gabbro	Late permian	Dark grey, fine- to medium-grained, uneven-grained hornblende-clinopyroxene gabbro to diorite; locally with minor orthopyroxene, biotite, quartz; commonly partly altered; minor granodiorite	Gabbroid
PRg/b	PRg/b-YARROL/SCAG	Late permian - early triassic	Grey, fine to coarse-grained, equigranular to porphyritic gabbro, hornblende diorite and quartz diorite to biotite-hornblende quartz monzodiorite	Gabbroid
Qa	Qa-QLD	Quaternary	Clay, silt, sand and gravel; flood-plain alluvium	Alluvium

3.3 Topography

An assessment of site topography was undertaken using Queensland elevation data sourced from QTopo (DER 2024). All slope values described below are approximations based on this data and relative distances between selected key features.

The project area generally ranges between elevations of 80 m Australian Height Datum (AHD) to 60 m AHD in the central and northeast areas. The southwest project area has higher elevations, sloping from 130 m AHD to 80 m AHD at the junction of Mossman and Burgess Road. The Project area generally slopes to the east and northeast.

Slope within the Project area ranges from 1-6%, with increased slopes (3-6%) in proximity to foothills of the Castletower land system along the western boundary, but are generally 1-3% across the Project area, reflecting the gently undulating rises of the Boondilla and Miriam Vale land systems. There is a small east-west rise present approximately 300 m from the southern boundary which acts as a minor watershed, with slopes of 5% present to the south of this feature.

Topographic contours are shown in the Surface hydrology and topography map provided in **Figure 3-2**.

3.4 Vegetation

Most of the Project area had been substantially cleared of remnant vegetation by 1955, with all areas of the Project area either cleared or significantly thinned by 1981. Current regulated vegetation mapping reflects this clearing history, with no regulated vegetation located within the current Project footprint. A substantial proportion of the Project area was previously developed as a private hardwood plantation under a Managed Investment Scheme. The plantation areas have been harvested and are now generally maintained as pastoral land, with scatted patches of Tasmanian Blue Gum (*Eucalyptus globulus*) remaining.

[6] Data obtained from Queensland Globe, accessed online at: https://qldglobe.information.qld.gov.au/, 09.01.2024

3.5 Hydrology and Drainage

The Project area is situated entirely within the Baffle Creek sub catchment of the Baffle catchment. The Project area is mapped as including seven water features identified by the Department of Agriculture and Fisheries (DAF) under the Queensland waterways for waterway barrier works spatial data layer. These water features flow in a northeasterly direction, the most significant of which is an unnamed tributary to Skeleton Creek (stream order 2 to 3) with numerous associated unnamed tributaries (stream order 1). Several man-made damns occur throughout the Project area. A map showing the Project location with respect catchment boundaries and local waterways is provided in **Figure 3-2.**

An inspection of waterways, and all other potential water features occurring within the Project footprint, was undertaken by Attexo (2023) to verify the conditions of water features and aid in determining whether they met the requirements to be labelled a waterway or watercourse under the *Fisheries Act 1994* and *Water Act 2000* respectively. In addition to the seven mapped features, three additional features were identified within the Project footprint. Three features were determined to be "drainage features" in full or within the bounds of the Project area, with seven features determined as likely be considered a waterway under the *Fisheries Act 1994* (Attexo 2023).

There are no nationally or internationally important wetlands within the Project area, however Queensland wetlands mapping shows wetland areas adjacent to the southeast and eastern boundaries of the Project area, consisting of sub-dominant (1-50%) palustrine wetlands.

3.5.1 Great Barrier Reef

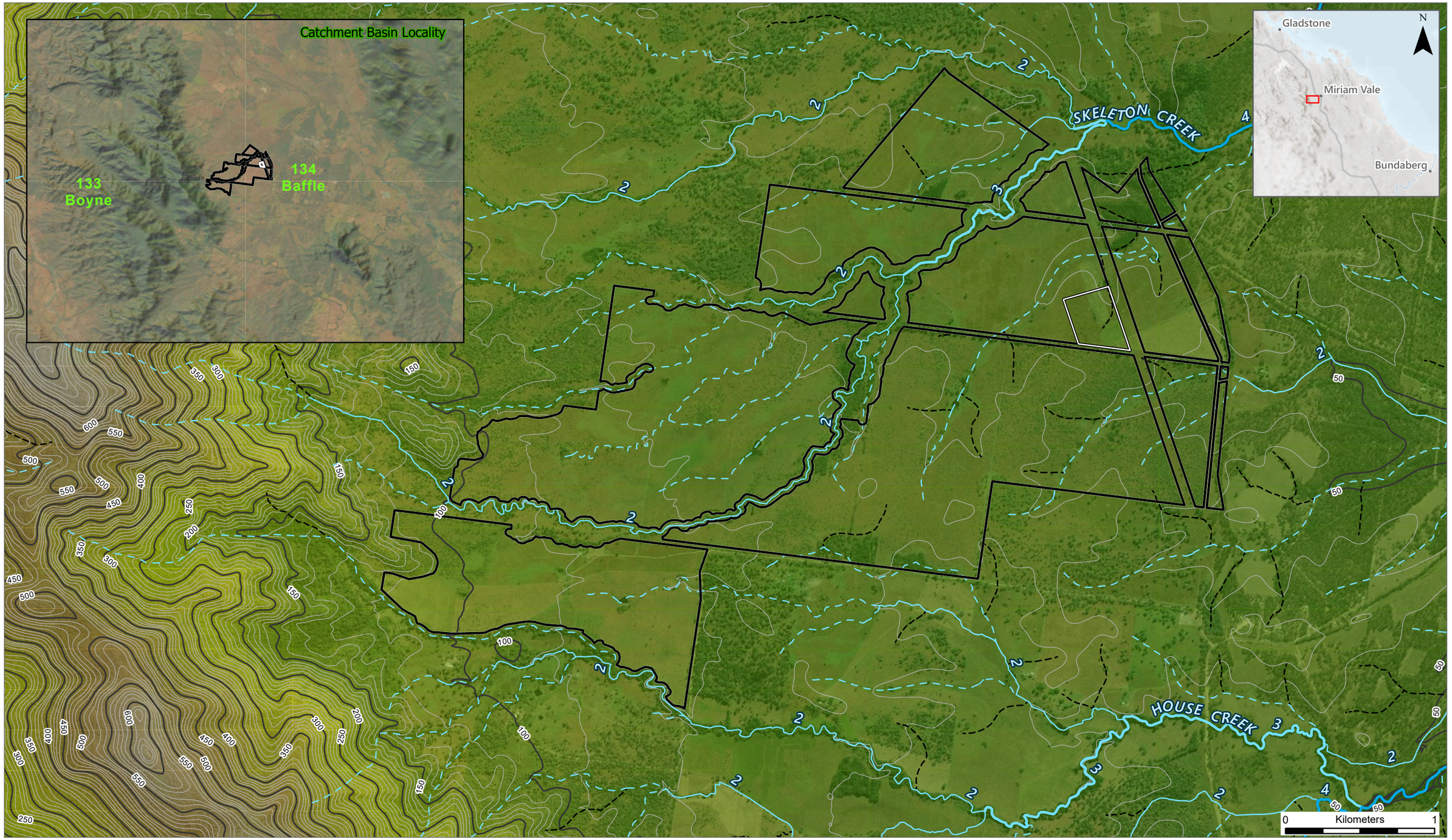
The Baffle Catchment is situated within the Great Barrier Reef Catchment Area (GBRCA), within the Burnett Mary Reef Region. Overland flows from the Baffle Catchment discharge to the GBR approximately 48 km north of Bundaberg.

Discharges of land-based pollution to the GBR are managed via the Reef 2050 Water Quality Improvement Plan (WQIP) in a joint initiative by the Australian and Queensland Governments. Primary pollutants of concern to the GBR from mainland sources are identified as nutrients (nitrogen and phosphorus), fine sediments and pesticides which are largely attributed to agricultural sources.

Water quality targets set by the Reef 2050 WQIP for the Burnett Mary Region and Baffle catchment are outlined in **Table 3-5**.

Table 3-5 Reef 2050 WQIP Anthropogenic 2015 Water Quality Targets

Area	Dissolved Inorganic Nitrogen		Fine sediment		Particulate phosphorus		Particulate nitrogen		Pesticides
	tonnes	reduction	kilotonnes	reduction	tonnes	reduction	tonnes	reduction	target
Burnett Mary Region	470	55	240	20	210	20	590	20	-
Baffle Catchment	16	50	11	20	15	20	33	20	



Miriam Vale Solar Farm - Surface Hydrology and Topography

Miriam Vale Solar Farm Development Footprint

Proposed Substation and Switchyard Area

Contours (10m)

Index

Intermediate

Stream order

1

2

3

4

other

Elevation (m)

800
500
250
20

Drainage basins

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FIGURE 3-2

3.5.2 Groundwater

An analysis of Queensland Government groundwater bores present indicates five private water supply bores located within (3) or adjacent (2) to the south of Project area. These five private bores (RN 127892, 127893, 144394, 185401, 185438) record standing water level as generally 12-17 m, occasionally 6 m, below ground. The aquifers are all sub-artesian, with water quality from the two contemporary (2019) bores present in the Project area with conductivity from 1406-3940 µS/cm and pH of 7.1 to 8.1.

The status of geotechnical studies, site conditions and pile depths are to be confirmed. In the event that dewatering is required this is to be managed under a Dewatering Management Plan developed by the relevant construction contractor.

3.6 Rainfall and Erosion Risk

Rainfall data from the Bureau of Meteorology (BoM) Springs weather station (ID: 39255), was reviewed to inform this ESCP. This station is located approximately 18 km north-west of the Project area and is the closest station with an extended record of BoM rainfall data.

The monthly erosion risk has been determined based on mean monthly rainfall depth in accordance with IECA 2008 (Table 4.4.2) in **Table 3-6**. The monthly erosion risk ranges from low to high, with the latter corresponding to the highest rainfall months of December to March inclusive. The erosion risk ratings are used to determine the erosion control standard for the Project discussed in **Section 4.6.1** of this P-ESCP.

Table 3-6 Erosion Risk Rating based on Average Monthly Rainfall at the Springs Weather Station #39255 [7]

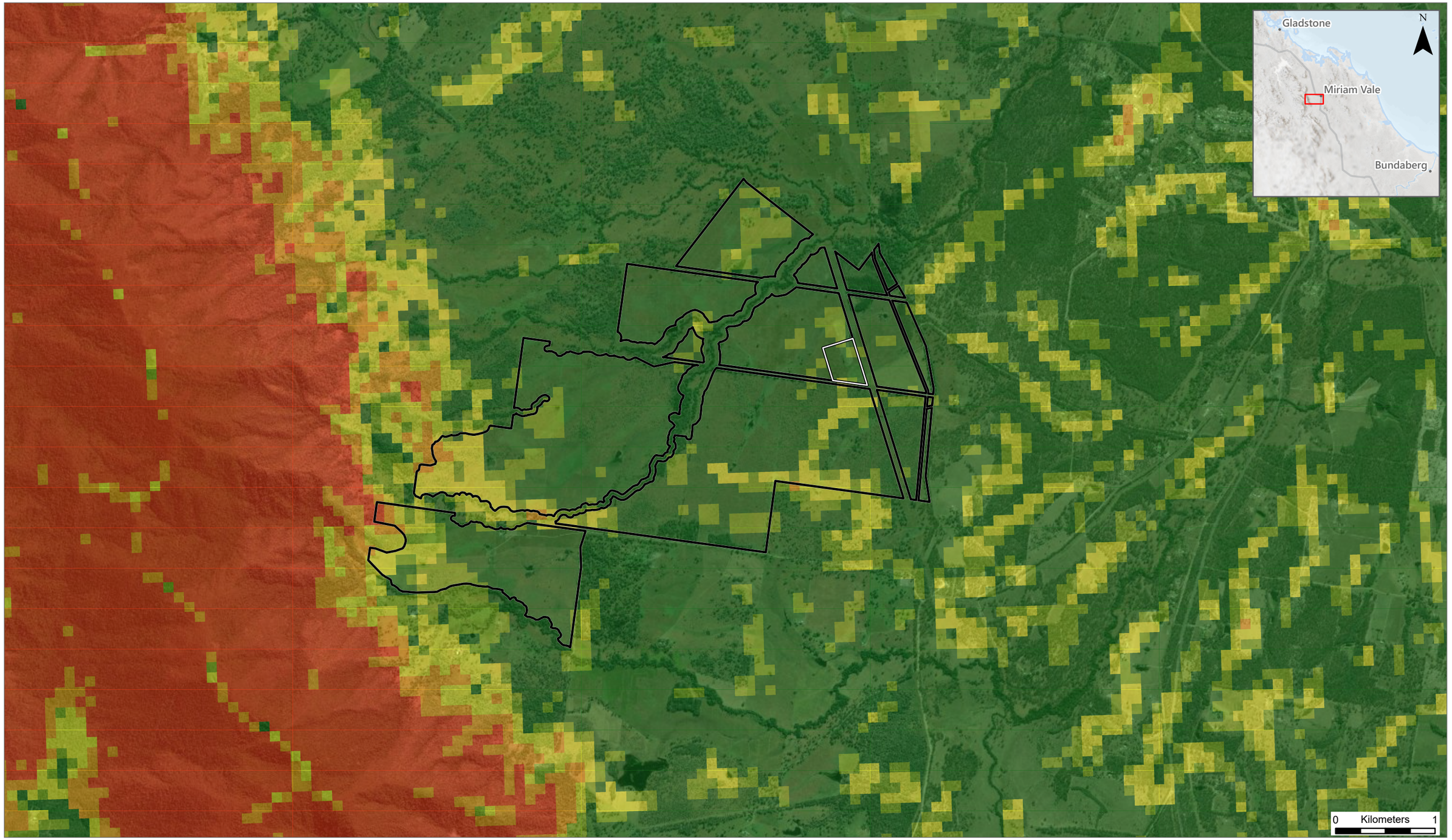
Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean rainfall depth (mm)	166.5	159	111.3	57.9	54.1	37.7	36.7	34.1	33.6	71.4	93.4	133.9	1001.8
Erosion risk rating	H	H	H	M	M	L	L	L	L	M	M	H	-

Key: H = High, M = Moderate, L = Low

Further to the above, an erosion hazard map derived using the DESI (DESI 2016) Revised Universal Soil Loss Equation (RUSLE) data series to calculate estimated annual soil loss, is provided in **Figure 3-3**. This information is intended to give a general indication of spatial variability of erosion hazard across the site, however, does not account for the seasonal variability captured by **Table 3-6**.

Spatial analysis of annual soil loss estimates found the erosion hazard to be fairly consistent across the site, increasing to the east as the surface terrain becomes more pronounced.

[7] BoM, accessed 11 January 2024



Miriam Vale Solar Farm - Erosion Hazard

Miriam Vale Solar Farm Development Footprint

Proposed Substation and Switchyard Area

Annual soil loss construction (t/ha/yr)

- 0 - 150 (Very Low risk)
- 150 - 225 (Low risk)
- 225 - 500 (Moderate risk)
- 500 - 1,500 (High risk)
- >1,500 (Extreme risk)

Attexo

REVIEWED: HS **DRAWN:** JT **SCALE (A3):** 1:37,500 **DATE:** 22/05/2024 **DWG No:** PRI-001-004[C]

FIGURE 3-3

3.7 Site Constraints

Project site constraints have been identified with reference to the IECA Best Practice Erosion and Sediment Control Manuals (Book 1, section 3.4) and are discussed in **Table 3-7**.

Table 3-7 Site Constraints

Constraint	Limitation	Description	Recommendations / Management
Soils	Sodosols	▪ Mapped as dominant within the Project area. ▪ Indicates presence of sodic (dispersive) soils in B horizon. ▪ Sodic soils are structurally unstable in water and susceptible to rilling and tunnel erosion. ▪ Sodic soils are readily dispersed by surface water flows and clay fraction does not settle out of water without the aid of a flocculant. ▪ Soil properties present challenges for vehicle access, load bearing and revegetation. ▪ Topsoils often prone to dust generation.	▪ Undertake soil sampling to confirm extent of sodic soils within Project footprint. ▪ Treatment of sodic soils to be addressed by the construction ESCP. ▪ Avoid earthworks during wet conditions in areas where sodic soils are present. ▪ Top dress dispersive soils with a layer of non-dispersive soil prior to installing scour protection (including vegetation). ▪ Undertake soil amelioration and careful plant selection for revegetation. ▪ Avoid direct revegetation into dispersive soils.
	Variation	▪ Area mapped as host to a range of soil orders with variable characteristics. ▪ Presence of texture contrast soils (Sodosols, Kurosols and Chromosols) with low-resilience topsoils and variable subsoil constraints (acidity and sodicity) ▪ Presence of heavy clay soil orders (Vertosols) which can be difficult to manage in wet or dry conditions.	▪ Undertake soil sampling to confirm extent and distribution of soils within Project footprint. ▪ Implement suitable soil management measures to preserve soil materials for rehabilitation and minimise potential land degradation.

Constraint	Limitation	Description	Recommendations / Management
	Dust	▪ Topsoil textures for many soils mapped as present on site present generally high potential for wind erodibility and dust. ▪ Dust generation impacts on air quality, visual amenity, community and the environment.	▪ Minimise unnecessary clearing to maintain groundcover as much and for as long as possible. ▪ Undertake soil sampling to confirm extent of high dust potential within the Project footprint. ▪ Implement and identify dust management measures in the construction ESCP, including air quality monitoring, traffic management, water sprays, dust suppression surfactants, wind breaks and revegetation.
Groundwater	Shallow water table	▪ Analysis of groundwater monitoring bores in proximity to the Project footprint has identified standing water levels at 6-17 m BGL. ▪ Surficial aquifers are sub-artesian with generally brackish water from 1406-3940 µS/cm.	▪ If required, dewatering will be in accordance with a dewatering procedure which: – Identifies prior to release treatment measures sufficient to prevent associated sediment transport to waterways. – Manages concentrated discharges to prevent scour / erosion. – Assesses potential salinity impacts and identifies management measures for the same.
Sensitive receptors	GBR	▪ Site is located within the GBR catchment and is subject to the *Reef 2020 Water Quality Improvement* Plan.	▪ IECA best practice standard for erosion and sediment control is to be applied to the Project. ▪ Discharge water quality objectives established for the Project are to consider sensitive receiving environments. ▪ Sensitive receptors are to be considered by Construction ESCPs.
	National Parks and Forest Reserves downstream and in proximity to the site.	▪ Bulburin East Forest Reserve abuts the western Project boundary. ▪ Mount Colosseum National Park, located approximately 7 km to the southeast of the Project area.	
	Waterways	▪ Various unnamed waterways of stream orders 1 to 3.	

3.8 Environmental Values and Threat Analysis

Detailed descriptions of the environmental values identified for the Project are provided within the Project Planning and Ecological Assessment Reports (Attexo, 2024). A summary of those potentially impacted by dust and / or sediment transport are identified in **Table 3-8**, along with the identified potential threats and impacts to these values. ESC practices to be adopted to prevent and / or mitigate impacts are discussed in **Section 4** of this P-ESCP. Specific on-ground controls to be implemented during construction works will be identified within construction ESCPs.

Table 3-8 Environmental Values and Threats Analysis

Environmental Value	Potential threats and impacts
Local surface waters including: ▪ Numerous higher order ephemeral streams which are tributaries to Skeleton Creek.	Threat: ▪ Sediment transport to natural surface waters Potential impacts: ▪ Increased opportunity for transport of pollutants via soil particles resulting in reduced water quality. – Subsequent impacts e.g. eutrophication, toxicity, changes to water chemistry etc. ▪ Death of / harm to aquatic organisms (flora and fauna) associated with: – Reduced overall water quality. – Reduced light penetration through water column impacting visibility for fauna and plant photosynthesis. – Smothering of plants and animals by sediment causing suffocation. ▪ Sediment deposits within watercourses introducing barriers to fauna movement or altered flow paths. ▪ Recreational impacts associated with loss of visual amenity and fishing opportunity.
Sensitive native flora and fauna located in proximity to the Project footprint.	Threat: ▪ Dust generation Potential impacts: ▪ Smothering of plants causing harm or death ▪ Loss of habitat due to the above. ▪ Respiratory impacts for fauna.
Surrounding agricultural land-use.	Threat: ▪ Soil erosion Potential impacts: ▪ Loss of productive topsoils resulting in reduction of agricultural productivity. ▪ Physical impacts associated with significant gully, tunnel and channel erosion such as loss of access to portions of land. ▪ Undermining of access tracks and other built infrastructure.

4.0 Erosion, Drainage and Sediment Controls

The sections to follow identify the principals, standards and strategies to be applied for erosion (including dust), drainage and sediment control throughout the Project construction phase. Specific controls are to be defined by construction ESCPs in accordance with all relevant guidelines established by this plan.

4.1 ESC Guiding Principles.

IECA 2008 identifies ten (10) key principles for effective ESC. A discussion as to how these principles have, or will be, applied by the Project is provided in **Table 4-1**.

Table 4-1 ESC Principles

Principle	Project Response
1. Appropriately integrate the development into the site.	▪ Utilise existing topography to minimise the need for extensive land reshaping and surface modifications where practicable. ▪ Consider site constraints including soil, water, vegetation and topography during site design and construction. ▪ Minimise trenching perpendicular to topographical contours.
2. Integrate erosion and sediment control issues into site and construction planning.	▪ Project infrastructure and temporary construction areas are sited to minimise reprofiling requirements where practicable. ▪ Access routes have been selected to minimise watercourse crossings and instream works. ▪ Where practical, the timing of ground disturbing activities will be prioritised to occur during lower rainfall periods. ▪ ESC standards to be applied during construction are established during the Project planning phase and included within construction tender packs and procurement contracts (i.e. this P-ESCP).
3. Develop effective and flexible ESCPs based on anticipated soil, weather and construction conditions.	▪ Construction ESCPs will be developed and implemented by those with control over construction works (supported by a suitably qualified ESC professional). ▪ Soil sampling will be undertaken, and soil characteristics considered as part of the development of construction ESCPs. ▪ Weather monitoring and wet weather preparedness will be addressed by construction ESCPs. ▪ ESCs will be regularly monitored and modified as required to achieve water quality objectives.
4. Minimise the extent and duration of soil disturbance.	▪ Infrastructure footprints are co-located where practical to reduce the overall land disturbance, such as the colocation of access tracks, electricity and communications cables. ▪ To the extent practical, construction works will be staged such that Project sections are completed or sufficiently stabilised prior to moving into new undisturbed areas.

Principle	Project Response
5. Control water movement through the site.	▪ Drainage will be managed in line with the Project stormwater management plan and construction ESCPs. ▪ Drainage control standards will be applied in line with those identified by the Project stormwater management plan and IECA 2008 section 4.3.
6. Minimise soil erosion.	▪ To the extent practical, construction works will be staged to minimise the overall area of unprotected soils at any one time. ▪ ESCPs will prioritise erosion prevention by maintaining groundcover and effective drainage controls.
7. Promptly stabilise disturbed areas.	▪ To the extent practical, construction works will be staged to maximise opportunities for progressive rehabilitation. ▪ Progressive rehabilitation will be undertaken throughout the construction phase. ▪ Land clearing, rehabilitation and interim stabilisation will be undertaken in line with IECA 2008 Table 4.4.7.
8. Maximise sediment retention on the site.	▪ Sediment control techniques will be applied based on the standards defined by IECA 2008 for estimated soil loss or monthly erosivity. ▪ Sediment traps will be designed and positioned by a suitably qualified person.
9. Maintain all ESC measures in proper working order at all times.	▪ Installed erosion, sediment and drainage controls will be monitored for condition at least weekly and prior to anticipated runoff producing rainfall. ▪ Controls found to be in disrepair will be restored as a priority and as a minimum prior to anticipated runoff producing rainfall.
10. Monitor the site and adjust ESC practices to maintain the required performance standard.	▪ Installed erosion, sediment and drainage controls will be monitored for effectiveness during and after rainfall events. ▪ Controls identified as not meeting performance criteria will be improved or alternatives sought.

4.2 Project Planning and Design

Project planning and design is a key component of effective management for the minimisation of erosion and sedimentation impacts. Project planning and design is to consider the following principals to minimise erosion risk in the first instance:

1. Design, situate and co-locate infrastructure to make best use of existing topography to aid drainage and minimise disturbance and erosion.

2. Ensure sufficient data is available (e.g. soil characteristics, rainfall and contour data etc.) to inform suitable ESC measures.

3. Consider local constraints (soils, topography and hydrology etc.) when determining the location of ESC measures and stockpiles.
4. Develop staged ESCPs to be effective during all construction phases.
5. Consider soil characteristics in the development of ESCPs, in particular the avoidance and / or treatment of dispersive soils and soils prone to dust generation.
6. Avoid the use of structures that pond water and can cause tunnel erosion.
7. Use back-push diversion banks in lieu of channels where practicable for temporary flow diversion.
8. Ameliorate dispersive soils, particularly in cable trenches and on fill embankments, where there is a high risk of tunnel erosion.
9. Position infrastructure to minimise watercourse crossings and instream works.

4.3 Erosion Control

4.3.1 Erosion Control Standard

The monthly erosion risk values for the site range between low and high (**Table 3-6**), the latter corresponding to the highest rainfall months of December to March inclusive. The construction schedule for the Project has not yet been determined; thus, it must be assumed that construction may take place at any time of the year, and all risk ratings must be considered.

Erosion control relies heavily on the maintenance and reestablishment of groundcover. The best practice land clearing and rehabilitation requirements identified for erosion risk rankings specified in IECA 2008, Table 4.4.7 pg. 4.16 will be applied during Project construction. IECA best practice land clearing and rehabilitation requirements for the risk values attributed to the Project in **Table 3-6** are reproduced in **Table 4-2** for ease of reference.

Table 4-2 Best Practice Land Clearing and Rehabilitation Requirements for Low, Moderate and High Erosion Risks.

Erosion Risk[8]	Best Practice Requirement
All Cases	▪ All reasonable and practicable steps will be taken to apply best practice erosion control measures to completed earthworks, or otherwise stabilise such works, prior to anticipated rainfall – including existing unstable, undisturbed, soil surfaces under management or control of the building / construction works.
Low	▪ Land clearing limited to a maximum 8 weeks of work.[9] ▪ Disturbed soil surfaces stabilised with a minimum 70% groundcover[10] within 30 days of completion of works within any area of a work site. ▪ Unfinished earthworks are suitably stabilised if rainfall is reasonably possible, and disturbance is expected to be suspended for a period exceeding 30 days.

[8] Erosion risk based on the average monthly rainfall depth shown in **Table 3-6** of this plan, with best practice requirements as seen in IECA 2008, Table 4.4.7, pg. 4.16.

[9] Refers to the amount of time ahead of the associated works.

[10] May be reduced if the natural cover present is less that the nominated value.

Erosion Risk[8]	Best Practice Requirement
Moderate	▪ Land clearing limited to a maximum 6 weeks of work.[9] ▪ Disturbed soil surfaces stabilised with a minimum 70% groundcover[10] within 20 days of completion of works within any area of a work site. ▪ Staged construction and stabilisation of earth batters (steeper than 6H:1V) in maximum 3 m vertical increments wherever reasonable and practicable. ▪ Unfinished earthworks are suitably stabilised if rainfall is reasonably possible, and disturbance is expected to be suspended for a period exceeding 20 days.
High	▪ Land clearing limited to a maximum 4 weeks of work.[9] ▪ Disturbed soil surfaces stabilised with a minimum 75% groundcover[10] within 10 days of completion of works within any area of a work site. ▪ Staged construction and stabilisation of earth batters (steeper than 6H:1V) in maximum 3 m vertical increments wherever reasonable and practicable. ▪ The use of turf to form grassed surfaces given appropriate consideration. ▪ Soil stockpiles and unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 10 days.

4.3.2 Erosion Control Strategy

Erosion controls are prioritised to minimise the area of soils exposed and therefore susceptible to sedimentation in the first instance. Strategies that will be used to prevent unnecessary disturbance, and minimise the length of time soils are left unprotected by groundcover include:

1. Staging of works so that:
   - **a.** Vegetation clearing and grubbing occurs as close as practicable prior to commencement of civil works within that area.
   - **b.** The overall area of soils exposed at any one time is minimised.
   - **c.** The stockpiling and double handling of soils is minimised.
   - **d.** Ground disturbance activities, particularly in high-risk areas, occur within lower rainfall periods.
   - **e.** Progressive site rehabilitation can take place throughout the construction period.
2. The establishment and demarcation of no-go zones, within which access or work is not permitted.
3. Protection of groundcover in temporary disturbance areas via their inclusion within the above no-go zones until works are to commence and then re-incorporating them back into the no-go zone as soon as work is complete, and the area is stabilised.
4. Remediation of temporary disturbance areas within the timeframes specified for best practice land clearing and rehabilitation in **Table 4-2**.
5. Utilisation of temporary groundcovers such as hydraulically applied soil binders, roll on blankets, mulch, gravel or other, to protect exposed soils not ready to be permanently stabilised.
6. Amelioration of soils in-situ prior to excavation where practicable, to minimise mixing requirements.

7. The establishment of groundcovers such as rock or gravel over site office, parking and laydown areas.
8. Dust control will be undertaken via the application of water or an appropriate soil binder where conditions require, and minimising trafficking as much as possible.

4.4 Drainage Controls

4.4.1 Drainage Control Standard

Temporary drainage controls will be required during construction to control surface flows around the site. Where not otherwise specified in Registered Professional Engineer of Queensland (RPEQ) approved stormwater management plans, temporary drainage controls used for ESC purposes will be designed as per IECA 2008 recommendations for temporary drainage structures in Queensland which are summarised as per Table 4.3.1 of IECA (2008):

- Design life <12 months: 1 in 2-year event.
- Design life 12-24 months: 1 in 5-year event.
- Design life >24 months: 1 in 10-year event.

Whilst the entire construction period is expected to extend for up to 18 to 24 months, works will be staged meaning standards for lesser design timeframes may be able to be applied.

The positioning and design of drainage controls requires an in-depth understanding of worked surface profiles and a detailed knowledge of the civil design and construction methodology. This level of planning is undertaken by construction contractors, hence temporary drainage controls for the purposes of ESC will be designed as part of the development of construction ESCPs.

4.4.2 Drainage Control Strategy

The following strategies / principals will be applied during the design and establishment of temporary drainage controls for construction ESC:

1. Prevent mixing of clean and dirty water where practicable.
2. Divert clean water away from work areas wherever practicable, where this cannot be achieved, control clean water flows through the site to avoid contamination (by sediment).
3. Divide unstable slopes using catch drains or flow diversion banks, at the intervals recommended by IECA 2008 Table 4.3.2 for slope length and steepness considering groundcover percentage.
4. Ensure that installed drainage features are suitable for the slope, appropriately sized and sufficiently lined to prevent scour. Utilise rock check dams (or equivalent) in suitable conditions (i.e. non-dispersive soils) to maintain flow velocity in line with channel and drain limitations (e.g. size and shape, lining type, etc.).
5. Allow water to shed from unsealed access tracks at regular intervals.
6. Utilise appropriate outlet structures at discharge points to prevent downstream scour.
7. Avoid structures that pond water at locations prone to tunnel erosion.
8. Avoid concentration of flow and maintain sheet flow conditions where practicable.

4.5 Sediment Controls

4.5.1 Sediment Control Standard

The sediment control standards to be applied across the various sub-catchment areas within the Project footprint will be determined during construction ESCP development when sufficient information is available to meaningfully apply the RUSLE (i.e. applying civil design for the determination of sub-catchments and locally derived soil erodibility [K] factors). At this time, the sediment control standard for each sub-catchment is to be applied as per the default criteria described in IECA, 2008 Table 4.5.1, and commensurate sediment control techniques selected in accordance with IECA 2008 Table 4.5.3.

Given the size of the Project footprint, the monthly erosion risk ratings identified in **Table 3-6** and soil characteristics, it is expected that Type 1 sediment controls will be required in some cases.

4.5.2 Sediment Control Strategy

The following strategies will be applied for sediment control during Project construction:

1. All reasonable and practicable measures will be taken to prevent or minimise the release of sediment from the site.
2. Sediment traps will be designed and positioned by a suitably qualified person.
3. Sediment controls will be applied only after all reasonable and practicable measures to prevent erosion have been adopted.
4. Sediment laden runoff from construction areas will be directed to an appropriate sediment control device in accordance with the required treatment standard.
5. All reasonable measures will be taken to trap sediment as close to its source as practicable.
6. Stabilised site exits will be established to prevent the tracking of soils offsite by vehicles.
7. All sediment control measures will be designed, installed, operated and maintained in accordance with IECA, 2008.
8. All material removed from sediment traps during maintenance will be disposed of in a manner that does not cause ongoing soil erosion or environmental harm.

4.6 Stockpile Management

Best practice soil stockpile management comprises a mix of drainage, erosion and sediment controls. Soil stockpiles will be managed as follows:

- Topsoils are to be handled and stockpiled separately from subsoils for use in site rehabilitation (though this can be at the same location).
- Avoid any reduction in soil quantity or quality with regard to soil characteristics to maintain soil resources for rehabilitation.
- Stockpiles are to be located:
  - Within the sediment control envelope.

- Away from areas subjected to concentrated overland flow where practicable.
- As far as practicable from sensitive receiving environmental receptors such as waterways.

- Upslope overland flows are to be directed around stockpiles where the upslope catchment exceeds 1,500 m^2 and the average monthly rainfall exceeds 45 mm.
- Stormwater runoff originating from stockpiles is to be directed to a suitable sediment trap.
- Soil stockpiles are to be covered where the displacement of stockpiled materials has the potential to cause environmental harm.

4.7 Instream Works

Instream works will be required for the installation of approximately two creek vehicle crossings. Instream works will be undertaken in line with dedicated ESCPs developed to IECA 2008 standards which as a minimum:

- Consider scheduling of works to occur during periods of no or low flow where practicable.
- Establish measures to minimise channel and vegetation disturbance during works.
- Identify isolation requirements and techniques to prevent clean water entering the instream work areas.
- Identify requirements for the use of temporary groundcovers to protect disturbed areas during works.
- Identify flow diversion techniques which appropriately consider fish passage requirements.
- Identify management measures for dewatering activities which prevent sediment-laden water from entering the watercourse.
- Identify the erosion risk for the works based on either:
  - Expected channel flow conditions as described in IECA 2008 Table I9; or
  - Expected daily and average monthly rainfall as described in IECA 2008 Table I10.
- Establish channel clearing and stabilisation requirements for the work in line with the best practice channel clearing and stabilisation requirements identified in IECA 2008 Table I11.

4.8 Rainfall / Storm Preparedness

Weather monitoring and wet weather preparedness is to be addressed by construction ESCPs. Weather monitoring is to be undertaken on a daily basis during construction. The amount of rainfall required to generate surface water run-off at the site (i.e. the minimum run-off producing rainfall event) is to be determined onsite through monitoring and established as a trigger for site preparation and additional rainfall related monitoring. In the interim, if a single rainfall event in excess of 25 mm is forecast, the following is to be undertaken:

- A thorough inspection of all ESC control measures within 24 hours of the event.
- Maintenance and rectification of ESC controls to ensure that they are in proper working order prior to the rainfall occurring.

4.9 Dust Management

Specific measures for the management of dust during construction are to be determined by construction ESCPs and / or CEMPs developed by construction contractors and may include:

- Dust suppression techniques such as the use of water carts, soil binders and / or soil ameliorants.
- Minimising high dust generating activities during particularly dry and windy conditions where practicable.
- The implementation of speed limits on unsealed access tracks.
- The positioning and / or protection of soil stockpiles to minimise wind exposure.
- Covering of loads with the potential to generate dust whilst in transit.

5.0 ESC Monitoring, Maintenance and Reporting

The sections to follow identify the ESC monitoring, maintenance and reporting requirements applicable to the Project construction phase.

5.1 ESC Inspections

Documented ESC monitoring and maintenance programs will be developed by the construction contractors prior to commencement of works. This will include the development of inspection check sheets and other aids to facilitate thorough checks of all controls in place and discharge points. The minimum ESC monitoring requirements for the Project are summarised in **Table 5-1**.

Table 5-1 Minimum ESC Monitoring Requirements[11]

Frequency	Inspection requirement
Regular inspections	
Weekly site inspections	▪ Checks of all drainage, erosion and sediment control measures. ▪ Occurrence of excessive sediment deposition (whether on or off-site). ▪ Checks of all site discharge points (e.g. for scour or sediment deposition). ▪ Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements. ▪ Litter and waste receptors.
Monthly inspections	▪ Surface coverage of finished surfaces (both area and percentage cover). ▪ Health of recently established vegetation. ▪ Proposed staging of future land clearing, earthworks and site / soil stabilisation.
Rainfall related inspections	
Prior to anticipated runoff-producing rainfall (within 24 hours of rainfall occurring)	▪ Checks of all drainage, erosion and sediment control measures. ▪ Checks of all temporary flow diversion and drainage works.
Daily site inspections during runoff producing rainfall	▪ Checks of all drainage, erosion and sediment control measures. ▪ Occurrence of excessive sediment deposition (whether on or off-site). ▪ Checks of all site discharge points (e.g. for scour or sediment deposition).
Following run-off producing rainfall (within 18 hours)	▪ Treatment and dewatering requirements for sediment basins. ▪ Sediment deposition within sediment basins and the need for its removal. ▪ All drainage, erosion and sediment controls. ▪ Occurrences of excessive sediment deposition (whether on or offsite). ▪ Occurrences of construction materials, litter or sediment placed, deposited, washed, or blown from the sites, including deposition by vehicle movements.

[11] As per IECA, 2008 section 7.4

Frequency	Inspection requirement
	▪ Occurrences of excessive erosion, sedimentation or mud generation around the site office, car park and / or material storage areas.

5.2 Water Quality Monitoring

The frequency and locations of water quality monitoring will be determined by construction ESCPs. Water quality monitoring programs will consider:

- The location of sensitive environmental receptors and areas where the potential for soil erosion is high (e.g. due to soils present or the types of work being undertaken).
- The monitoring of water quality before, during and after the completion of construction to assess the effectiveness of controls.
- The monitoring of water quality during rainfall events where safe to do so, especially at points of concentrated discharge from the site.
- The monitoring of water quality both up and downstream of instream works.

5.3 Discharge Water Quality Standards

Locally derived discharge water quality objectives may be developed as part of construction ESCP development considering baseline conditions.

The default standard offered by IECA, 2008 of the 90th percentile suspended solids not exceeding 50 mg/L will be adopted as the water quality objective for discharges of treated water from sediment basins.

5.4 ESC Maintenance

ESC measures will be maintained as follows:

- As a minimum, ESCs will be maintained so that they are in proper working order prior to forecast rainfall events.
- To the extent practicable, controls will be maintained in proper working order to provide protection for unanticipated rainfall events.
- Sediment traps will be cleaned out and maintained in line with the operational standard for that device.
- The adequacy of controls will be reviewed considering water quality outcomes and ESCPs updated as required to achieve ESCP objectives.

5.5 Incidents, Corrective Actions and Reporting

ESC related incidents will be logged, responded to, and reported on in line with processes described by Project Construction Environmental Management Plans (CEMPs).

6.0 References

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Appendix A

Definitions

Table A- 1 Definitions

Term / Acronym	Meaning
AHD	Australian Height Datum
ANZG	Australia and New Zealand Governments
Attexo	Attexo Group Pty. Ltd.
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
DAF	QLD Department of Agriculture and Fisheries
DESI	QLD Department of Environment, Science and Innovation
DHLGPPW	QLD Department of Housing, Local Government, Planning and Public Works
EP Act	*Environmental Protection Act 1994*
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Control Plan
GBR	Great Barrier Reef
GBRCA	Great Barrier Reef Catchment Area
GRC	Gladstone Regional Council
IECA	International Erosion Control Association
MCU	Material Change of Use
P-ESCP	Preliminary Erosion and Sediment Control Plan
RUSLE	Revised Universal Soil Loss Equation
SALI	State Soil and Land Information system
SPP	State Planning Policy
WQIP	Water Quality Improvement Plan