

LAKE VERMONT MEADOWBROOK PROJECT INITIAL ADVICE STATEMENT

PREPARED FOR
BOWEN BASIN COAL PTY LTD

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LAKE VERMONT MEADOWBROOK PROJECT

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LIST OF ABBREVIATIONS

°C	degrees Celsius
%	percent
AARC	AARC Environmental Solutions Pty Ltd
ALA	Atlas of Living Australia
APCT	Abbot Point Coal Terminal
ARI	area of regional interest
ATP	Authority to Prospect
BBC	Bowen Basin Coal Pty Ltd
BMA	BHP Mitsubishi Alliance
BoM	Bureau of Meteorology
CCA	Conduct and Compensation Agreement
CHMP	Cultural Heritage Management Plan
CHPP	Coal Handling and Preparation Plant
DBCT	Dalrymple Bay Coal Terminal
DES	Department of Environment and Science
DNRME	Department of Natural Resources, Mines and Energy
DoEE	Department of the Environment and Energy
DSDMIP	Department of State Development, Manufacturing, Infrastructure and Planning
EA	Environmental Authority
EERS	Emissions and Energy Reporting System
EIS	Environmental Impact Statement
EO Act	<i>Environmental Offsets Act 2014</i>
EP Act	<i>Environmental Protection Act 1994</i>
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>

ERA	Environmentally Relevant Activity
ERC	Estimated Rehabilitation Cost
ERE	Endangered Regional Ecosystem
ESA	Environmentally Sensitive Area
EVNT	Endangered, Vulnerable or Near Threatened
FIFO	fly in, fly out
GDE	Groundwater Dependant Ecosystem
GHG	Greenhouse gas
ha	hectares
IAS	Initial Advice Statement
ILUA	Indigenous Land Use Agreement
IRC	Isaac Regional Council
Jellinbah	Jellinbah Group Pty Ltd
JV	Joint Venture
km	kilometre(s)
km ²	square kilometres
km/h	kilometres per hour
kV	kilovolt(s)
LGA	Local Government Area
LVR	Lake Vermont Resources Pty Ltd
m	metre(s)
mm	millimetre(s)
MAW	Mine Affected Water
MDL	Mineral Development License
MERCP Act	<i>Mineral and Energy Resources (Common Provisions) Act 2014</i>
MERFP Act	<i>Mineral and Energy Resources (Financial Provisioning) Act 2018</i>
MIA	Mine Infrastructure Area
ML	Mining Lease

MLA	Mining Lease Application
MNES	Matter of National Environmental Significance
MR Act	<i>Mineral Resources Act 1989</i>
Mtpa	million tonne(s) per annum
MVA	megavolt amperes
NC Act	<i>Nature Conservation Act 1992</i>
NGER Act	<i>National Greenhouse and Energy Reporting Act 2007</i>
NP	National Park
PCI	pulverised coal injection
PLA	Petroleum Lease Application
PMAV	Property Map of Assessable Vegetation
PMST	EPBC Act Protected Matters Search Tool
PRCP	Progressive Rehabilitation and Closure Plan
RE	Regional Ecosystem
QCMM	Lake Vermont Holdings Pty Ltd
Qld	Queensland
RIDA	Regional Impact Development Approval
RGTCT	RG Tanna Coal Terminal
ROM	run of mine
SCA	Strategic Cropping Area
SCL	Strategic Cropping Land
HSMS	Health and Safety Management System
SILO	Scientific Information for Land Owners
SIMP	Social Impact Management Plan
SSRC	<i>Strong and Sustainable Resource Communities Act 2017</i>
STP	Sewage Treatment Plant
TBD	to be determined
TEC	Threatened Ecological Community

TOR	Terms of Reference
the Project	Lake Vermont Meadowbrook Project
VM Act	<i>Vegetation Management Act 1999</i>
WPA	Wetland Protection Area
WQO	Water Quality Objectives

EXECUTIVE SUMMARY

Purpose of the IAS

This Initial Advice Statement for the 'Lake Vermont Meadowbrook Project' has been prepared by AARC Environmental Solutions Pty Ltd in support of Bowen Basin Coal Pty Ltd, for the key purpose of:

- providing the Department of Environment and Science with sufficient information to support an application for a voluntary Environmental Impact Statement, as per Chapter 3, Section 71 of the *Environmental Protection Act 1994* (Qld), and;
- providing sufficient detail to enable advisory agencies and other stakeholders to have effective input into establishing a Terms of Reference for an Environmental Impact Statement for the Project.

The Proponent

The Proponent for the Project is Bowen Basin Coal Pty Ltd (ACN 065 321 440) (BBC). BBC is a private company owned by the Lake Vermont Joint Venture, an unincorporated Australian joint venture operating in Queensland, whose participants and interests are identified as:

- QCMM (Lake Vermont Holdings Pty Ltd) (70%);
- Marubeni Coal Pty Ltd (10%);
- CHR Vermont Pty Ltd (10%); and
- Coranar (Australia) Pty Ltd (10%).

Lake Vermont Resources Pty Ltd manages the Lake Vermont Joint Venture operations, on behalf of the joint venture participants.

The Project

The 'Lake Vermont Meadowbrook Project' is an extension of the existing Lake Vermont Coal Mine, with BBC now proposing to commence the assessment and finalisation of environmental approvals for the Project. The Project is located approximately 30 kilometres northeast of Dysart and approximately 180 kilometres southwest of Mackay, within central Queensland.

The Meadowbrook Project proposes an underground, multi-seam, longwall coal mining development adjoining the north of the existing Lake Vermont open cut operations. The Project also includes three small-scale 'satellite' open-cut pits and supporting infrastructure.

The Project is planned to:

- supplement the scheduled future decline in coal output from the existing Lake Vermont Mine to maintain existing (approved) production levels across an extended life of mine;
- maximise the use of Bowen Basin Coal Pty Ltd owned land and existing infrastructure at the Lake Vermont Mine, so as to minimise the environmental impacts from additional infrastructure and to provide Project efficiencies; and

- design, construct and operate a Project that minimises adverse impacts on the social environment and complies with all relevant statutory obligations.

The key activities associated with the proposed Project will include:

1. underground longwall (plus bord and pillar) coal mining to recover the coal resource;
2. three small-scale 'satellite' open-cut pits to recover the coal resource;
3. development of a new infrastructure corridor linking the new mining area to the existing infrastructure of the Lake Vermont Mine;
4. development of a supporting mine infrastructure area (including run of mine stockpile, laydown area, ventilation shafts and supporting buildings); and
5. construction of drifts and shafts (to provide access to underground operations).

Project Benefits

The Project is expected to:

- contribute significantly to the State's economy and provide ongoing employment opportunities. The Project will directly employ up to 200 people during the peak construction phase and approximately 400 people during the peak operations phase. This will offset the future reduction in manning that will occur at the current Lake Vermont Mine as its output declines. The Project will further provide opportunities for local employment in construction, transport and the supply of goods and services;
- require significant capital investment and projected further expenditure for replacement capital over the life of the Project;
- provide continuity of coal sales and exports over the life of the Project, and associated revenue benefits for both the State and Commonwealth through coal royalties and other taxation;
- increase industrial activity in the region and generate wealth for many sectors of the local and regional economies. The Dysart and surrounding regional communities are likely to benefit significantly due to the economic benefits expected to arise as a result of the Project; and
- provide efficiencies by utilising existing infrastructure located at the Lake Vermont Mine. This includes:
 - utilising excess mine water at the Lake Vermont Open-cut Coal Mine during construction of the Project, and potentially to supplement supply during operation;
 - utilising the existing Coal Handling and Preparation Plant facilities at the Lake Vermont Mine; and
 - utilising the existing rail infrastructure to transport product coal to market.

Key Environmental and Social Aspects

The key environmental and social aspects of the Project are as follows:

- the Project has the potential to impact on threatened species and ecological communities; migratory species; and; a water resource (in relation to a large coal mining development) - as per the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999*. The Proponent has submitted a referral to the Department of the Environment and Energy, with the Project anticipated to be assessable under the Queensland-Commonwealth Bilateral Agreement for environmental assessment and approval;
- changes in topography and land-use due to subsidence and 'satellite' open-cut pits;
- ground preparation activities for mine infrastructure including a proposed Mine Infrastructure Area and a proposed infrastructure corridor;
- the management of surface water impacts relating to underground longwall operations and open-cut pit mining interactions;
- the management of groundwater during underground mine dewatering; gas drainage activities and disturbance to strata around mining areas;
- the need to manage the impact on ecological communities and species listed under nature conservation legislation, which may be disturbed as a result of subsidence, surface infrastructure, and 'satellite' open-cut pits;
- stabilising and rehabilitating disturbed land to a suitable post mine land use;
- influence on the region's demographics and population. The Project will increase regional employment directly and indirectly by increasing demand from suppliers; and
- potential changes to the socio-economic environment with respect to housing, employment, community values and the availability and development of public services.

Stakeholder Engagement

A Stakeholder Engagement and Communications Plan will be developed for the Project to proactively work with and respond to stakeholders, as well as to develop appropriate strategies to minimise impacts and enhance benefits associated with the Project. Jellinbah will undertake consultation with stakeholders as part of the EIS process; with the stakeholder engagement process to include:

- planning and implementing opportunities for stakeholders to comment on the potential impacts of the Project;
- obtaining, considering and responding to stakeholder comments and issues of concern; and
- building upon information and knowledge developed during the planning and assessment processes of the Project.

Project Timeline

The Project is currently in the early stages of a prefeasibility and supporting studies assessment program.

Construction of 'surface to seam' access infrastructure is targeted to commence in late 2022 and will be followed with first underground development coal to be mined by the end of 2024. Full underground mine production is targeted for late 2026; with the commencement of longwall operations.

Development timing of future 'satellite' open-cut pits will occur so that they come on-line to meet the longer-term future decline in production from the existing Lake Vermont Mine, thereby maintaining production levels to meet market demands.

In addition to the voluntary EIS for this Project, it is also acknowledged that an application for an amendment to the existing Lake Vermont Mine EA will be required. This EA amendment application will occur once a Mine Lease application has been made.

1.0 INTRODUCTION

This Initial Advice Statement (IAS) has been prepared by AARC Environmental Solutions Pty Ltd (AARC) at the request of Bowen Basin Coal Pty Ltd (BBC) to:

- support an application to undertake a voluntary Environmental Impact Statement (EIS) for the Lake Vermont Meadowbrook Project (the Project); and
- support the future Terms of Reference (TOR) development for the Project EIS.

The key objective of this IAS is to provide sufficient information to the Department of Environment and Science (DES) in relation to the proposed mining development, to enable appropriate and timely assessment processes to be established.

1.1 THE PROPONENT

The Proponent for the Project is BBC, a private company owned by Lake Vermont Joint Venture (JV), an unincorporated Australian JV operating in Queensland (Qld). The Lake Vermont JV participants and interests are outlined in Table 1. AARC is the agent acting on behalf of BBC to prepare this IAS.

Table 1 Bowen Basin Coal Pty Ltd Beneficial Ownership

Company	ACN	Holding (%)
QCMM (Lake Vermont Holdings Pty Ltd)	114 286 878	70
Marubeni Coal Pty Ltd	009 932 236	10
CHR Vermont Pty Ltd	127 093 520	10
Coranar (Australia) Pty Ltd	114 668 727	10

Lake Vermont Resources Pty Ltd (LVR) manages Lake Vermont operations on behalf of the JV. LVR is 100% owned by Jellinbah Group Pty Ltd (Jellinbah).

Jellinbah supplies high quality coking coal and pulverised coal injection (PCI) coals to international and domestic customers. Jellinbah is committed to the communities in which it operates and provides significant benefits to these local communities, as well as to the broader Central Qld region and to the Qld economy as a whole. Jellinbah is also committed to regularly reviewing environmental performance and publicly reporting on progress.

BBC is the registered entity proposing to carry out the Project, and all permits and licences are held and will be issued to that entity as detailed in Table 2.

Table 2 Permits and Licenses Holder

Name	Registered Address
Bowen Basin Coal Pty Ltd	Level 7, 12 Creek Street Brisbane, Queensland, 4000

1.2 PROJECT BACKGROUND

The Project is situated in the Bowen Basin of Central Qld, Australia, on tenure adjoining the northern boundary of the existing Lake Vermont Mine. The Lake Vermont Mine is an operation producing primarily hard coking coal and low volatile PCI coal. The Project lies approximately 30 kilometres (km) northeast of the township of Dysart, 180 km southwest of Mackay, and 240 km northwest of Rockhampton (Figure 1). The Project is located within the Isaac Regional Council (IRC) Local Government Area (LGA).

The Project is located close to existing towns, rail, road and power infrastructure and is approximately 320 km (by rail) from the Abbot Point Coal Terminal (APCT) north of Bowen and 430 km from the RG Tanna Coal Terminal (RGTCT) in Gladstone. The Project is also located 235 km (by rail) from the Dalrymple Bay Coal Terminal (DBCT) at the coal export port of Hay Point. Dysart is an established regional township servicing both mining and pastoral industries.

The Bowen Basin contains numerous mining operations (Figure 2), with a number directly bordering the Project site; including BHP Mitsubishi Alliance's (BMAs) Saraji Mine to the west; the recently approved Pembroke 'Olive Downs Coking Coal Project' to the north and east; Whitehaven Coal's 'Winchester South Project' and Aquilla Resources' 'Eagle Downs South Project' both to the north-east and the existing Lake Vermont Mine to the south.

BBC owns the Lake Vermont Mine on Mining Lease (ML) 70331, ML 70477 and ML 70528 under the approval of Environmental Authority (EA) Permit No. EPML00659513. The proposed Project lies on Mineral Development Licence (MDL) 303 and MDL 429.

The key objectives of the Project are to:

- extend the life of the existing Lake Vermont Mine, at existing (approved) production levels of up to 12 million tonnes per annum (Mtpa) of run of mine (ROM) coal, by supplementing the future decline in production from the existing open-cut with output from an adjoining underground operation and three small-scale 'satellite' open-cut pits;
- operate profitable mining operations which provide high-quality hard coking coal and PCI coal to the export and domestic market;
- design, construct and operate a Project that minimises adverse impacts on the social and natural environments;
- maximise recovery of economically mineable coal resources within the BBC tenements;
- maximise the use of BBC owned land and infrastructure at the Lake Vermont Mine (including the Coal Handling and Preparation Plant (CHPP) and rail infrastructure), o minimise the environmental impacts from additional infrastructure and to provide Project efficiencies; and
- comply with all relevant statutory obligations and continue to improve processes which enhance sound environmental management.



Figure 1 Project Locality

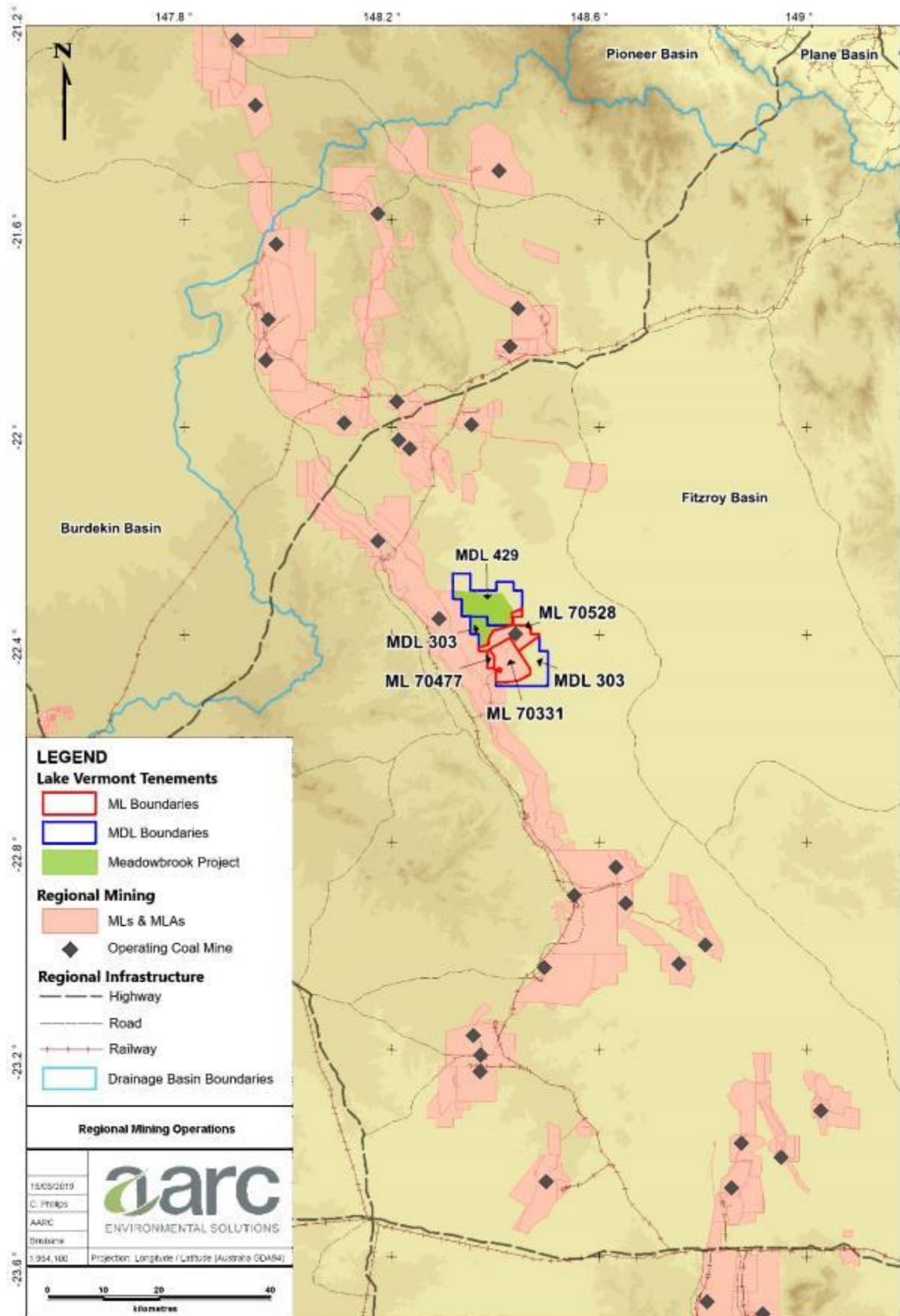


Figure 2 Regional Mining Operations

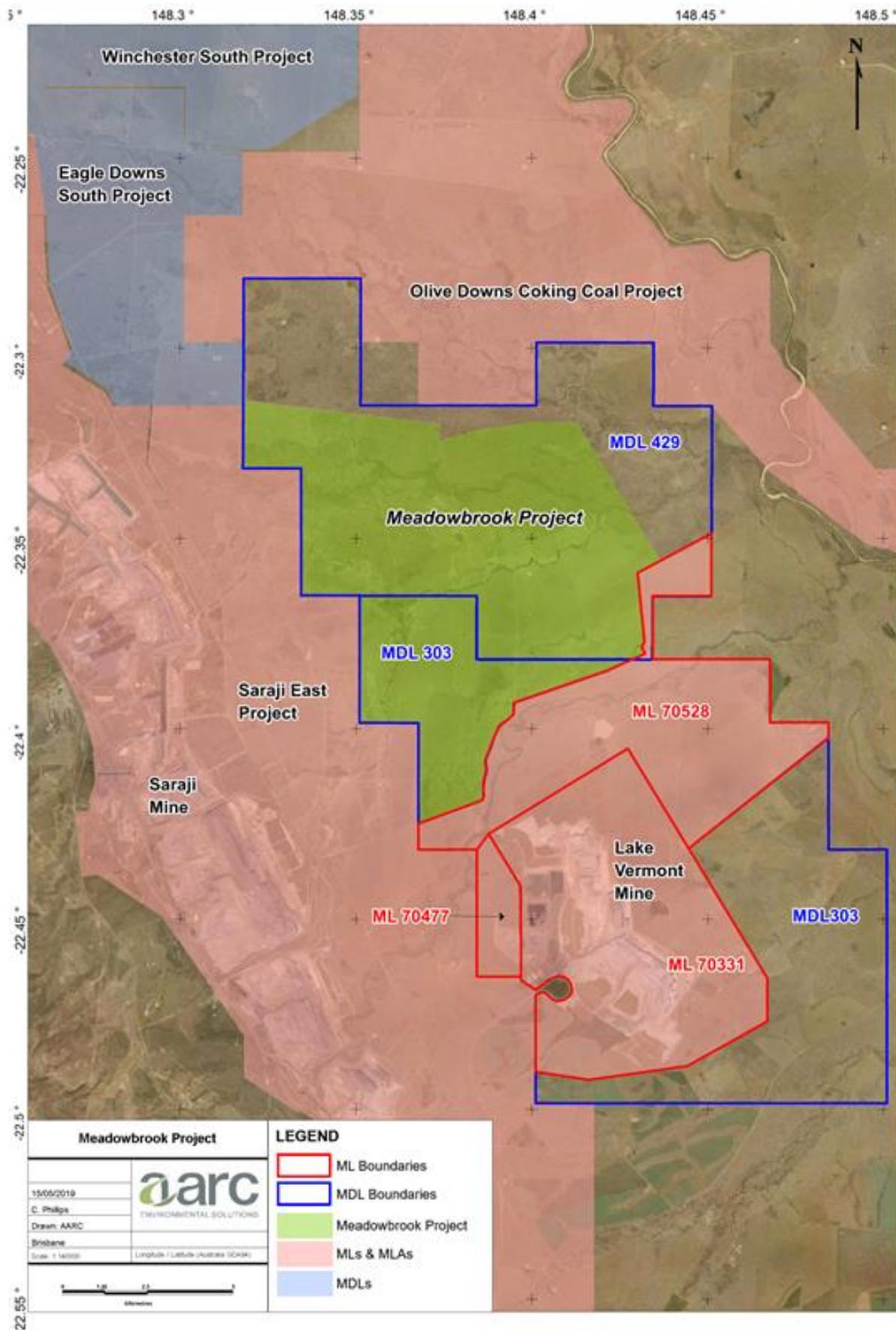


Figure 3 Meadowbrook and Surrounding Projects

1.3 PURPOSE OF THE INITIAL ADVICE STATEMENT

This IAS has been prepared to provide DES with relevant information in support of BBC's application to undertake a voluntary EIS under Chapter 3 Section 70 of the *Environmental Protection Act 1994* (EP Act). As per Section 71 of the EP Act, a voluntary EIS application must be:

- (a) in the approved form; and
- (b) supported by enough information to allow the chief executive to decide whether an EIS is appropriate for the project; and
- (c) supported by enough documents or information to establish that the applicant may enter land to which the project relates to carry out any necessary studies for the EIS; and
- (d) accompanied by:
 - (i) the documents that, under section 41(3), must accompany a submitted draft terms of reference for an EIS; and
 - (ii) the fee prescribed under a regulation.

This IAS is also intended to support BBC's submission of the draft Terms of Reference (TOR). Once an application for a voluntary EIS has been granted, the proponent can (at any time) provide a draft TOR to DES.

This IAS therefore provides a preliminary overview of the nature and extent of activities proposed for the Lake Vermont Meadowbrook Project, the existing environmental and cultural values of the site and the potential impacts of the proposed activities. To support the TOR process, this IAS also provides a description of the project and operational land, a list of interested and affected persons, a statement on how all such persons will be engaged, and a summary of any Commonwealth government requirements. Information provided in this IAS is preliminary and may be subject to change as Project development and the EIS process advances.

1.4 PROJECT BOUNDARIES

For the purpose of this IAS, 'the Project' is defined by the area of land within the northern portion of MDL 303 and southern portion of MDL 429 that overlaps with the property named 'Meadowbrook' (10/CNS93), as shown in Figure 3.

The Project does not include the southern portion of MDL 303 (south of Lake Vermont Mine), nor does it include the northern portion of MDL 429 that overlies the property called 'Vermont Park' (9/CNS98). Land tenure and ownership is further discussed in Section 3.

At the time of this IAS, the ML application area has yet to be finalised for the Project, however the area defined as 'the Project' will form the likely basis of the Mining Lease Application (MLA).

'The Project' is synonymous with the currently targeted study area, which delineates the likely location of the proposed activities within the MDLs. The final infrastructure layout and MLA area will be subject to values identified in the EIS process, further resource definition and advancement of engineering design.

1.5 PROJECT JUSTIFICATION

The Project will produce metallurgical coal for both export and domestic markets, generating employment and resulting in increased investments and royalties for Qld. Ongoing demand for coal products in Asia and other international markets, particularly for steel manufacturing, has created an opportunity for development of this Project. The Project will enable the current output from the Lake Vermont Mine to be maintained for an additional 20 to 25 years.

Coal is Qld's largest export commodity, with the Qld Government benefiting significantly from royalties paid by the mining industry each year. The Project will add to the royalties derived from mining activities in each year of operation.

In addition to these economic benefits, through its existing operations Jellinbah provides considerable employment and training, indirect employment, secondary support industries, and extensive support to community development, education, health, social and recreational programs.

The Project's EIS will consider various Project alternatives. These will include alternative mine infrastructure sites and alternative mining activities, as well as a "do nothing" case which will see a future marked decline output from the current Lake Vermont Mine. The EIS will also consider government priorities and objectives as outlined in relevant government policies and strategies.

1.6 PROJECT TIMING

The Project is currently in the early stages of a prefeasibility and supporting studies assessment program. It is estimated that the ongoing feasibility assessment program will be completed by late 2021.

Pending approvals, construction of surface and seam access infrastructure is scheduled to commence by the end of 2022, with first underground development coal to be mined by late 2024. Full underground mine production is scheduled for late 2026 with the commencement of longwall operations.

The development timing of future small-scale 'satellite' open-cut pits will occur so as to come online to meet the longer-term future decline in production from the existing Lake Vermont Mine, and thus maintaining production to meet market demands.

In addition to the anticipated EIS process for this Project, it is also acknowledged that an application for an amendment to the existing Lake Vermont Mine EA will be required. This will occur once a Mine Lease application has been made.

2.0 LEGISLATION APPROVALS

A preliminary review of legislative approvals has been undertaken to identify relevant processes that may be required to support the development of the Project. The Commonwealth (Section 2.1), State (Section 2.2) and Local Government approval requirements that may be relevant to the Project are identified and discussed through the following sections.

2.1 COMMONWEALTH LEGISLATION

The Commonwealth legislation and approval processes considered relevant to the Project are outlined in Table 3.

Table 3 Relevant Commonwealth Regulatory Processes

Legislation	Administering Authority	Approval Trigger	Relevance to Project	Approval Type
<i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i>	Department of the Environment and Energy (DoEE)	An action which has, or is likely to have, a significant impact on a Matter of National Environmental Significance (MNES) must be referred to DoEE.	<p>A referral to the DoEE will be required for the Lake Vermont Meadowbrook Project.</p> <p>This referral has been accounted for in Project planning timelines.</p>	EPBC Referral to DoEE.

2.2 STATE LEGISLATION

The Project is subject to an MLA process pursuant to Qld's *Mineral Resources Act 1989* (MR Act). The Project activities will also be authorised under an EA, pursuant to Qld's EP Act.

The State regulatory processes relevant to the Project are considered and discussed through Table 4.

Table 4 Relevant State Regulatory Processes

Legislation	Administering Authority	Approval Trigger	Relevance to Project	Approval Type
<i>Aboriginal Cultural Heritage Act 2003</i>	DES	Activity that has the potential to harm Aboriginal cultural heritage.	Proponent must comply with the cultural heritage 'duty of care' and take all reasonable and practicable measures to protect cultural heritage.	A Cultural Heritage Management Plan (CHMP) is in existence for the Lake Vermont Mine (with Barada Barna Kabalbara & Yetimarla People). This CHMP will be reviewed and updated if/as necessary, in respect of proposed Project activities.
<i>Biosecurity Act 2014</i>	Department of Agriculture and Fisheries	<p>This Act provides comprehensive biosecurity measures to safeguard our economy, agricultural and tourism industries, environment and way of life.</p> <p>All Queenslanders have a 'general biosecurity obligation' under the Act, including responsibility for managing risks that are:</p> <ul style="list-style-type: none"> • under their control; and • that they know about or should reasonably be expected to know about. 	<p>The management of the Project must:</p> <ul style="list-style-type: none"> • take all reasonable and practical steps to prevent or minimise each biosecurity risk; • minimise the likelihood of causing a 'biosecurity event', and limit the consequences if such an event is caused; and • prevent or minimise the harmful effects a risk could have, and not do anything that might make any harmful effects worse. 	Weed and Pest Management Plan(s).

Legislation	Administering Authority	Approval Trigger	Relevance to Project	Approval Type
<i>Electricity Act 1994</i>	Powerlink	Notice to authority if the Project would interfere with electricity entities works.	The Project will involve the extension of the existing Lake Vermont Mine 66 kilovolt (kV) powerline.	Notification of proposed activities affecting electricity entities work.
<i>Environmental Offsets Act 2014 (EO Act)</i>	DES	Significant residual impact to a prescribed environmental matter.	Prescribed environmental matters potentially impacted by the Project include: <ul style="list-style-type: none"> • threatened species; • threatened ecological communities; • migratory species; • a water resource; • regulated vegetation; • connectivity areas • wetlands and watercourses; and • protected wildlife habitat. 	Delivery of environmental offsets for significant residual impacts.
<i>Environmental Protection Act 1994 (EP Act)</i>	DES	<p>Conducting an Environmentally Relevant Activity (ERA) that is a resource activity or resource project.</p> <p>Triggers for an EIS level of assessment.</p>	<p>The Project will comprise a number of ERAs, including for the mining of black coal. All other ancillary ERAs supporting the Project will be confirmed during the EIS process (with these largely anticipated to be a continuation of existing ERA activities at Lake Vermont Mine; e.g. processing).</p> <p>The Project is proposing a change in the primary mining methodology (from open-cut to underground) with supporting 'satellite' open-cut pits. This change will give rise to future subsidence related impacts.</p>	<p>Application for a voluntary EIS.</p> <p>Major EA amendment (through an EIS level of assessment).</p>

Legislation	Administering Authority	Approval Trigger	Relevance to Project	Approval Type
<i>Local Government Act 2009</i>	Isaac Regional Council (IRC)	Carrying out activities regulated under local government planning schemes.	Local government planning schemes typically regulate building and construction activities, works on local roads and/or infrastructure, pest species and vegetation management.	Various permits under Local Laws (i.e. road excavation, road closures, etc. may be required to support Project activities).
<i>Mineral Resources Act 1989 (MR Act)</i>	Department of Natural Resources, Mines and Energy (DNRME)	Conducting larger-scale machine-mining in an area currently subject to an exploration tenement.	ML required over land in order to facilitate Project development.	Application for ML(s).
<i>Mineral and Energy Resources (Common Provisions) Act 2014 (MERC Act)</i>	DNRME	Various provisions relating to land access, such as Conduct and Compensation Agreements (CCAs) and overlapping coal and petroleum tenure.	<p>Provisions may influence:</p> <ul style="list-style-type: none"> • access to private and public land; • the negotiation of CCAs; and • potential co-development agreement(s) with petroleum tenure holders. <p>It is noted that BBC has an existing co-development agreement with BOW Energy (Arrow) in respect of the tenure related to this Project.</p>	<p>Potential short term CCAs pending property acquisition timings.</p> <p>Review and/or updating of existing co-development agreement with overlapping tenure holders.</p>

Legislation	Administering Authority	Approval Trigger	Relevance to Project	Approval Type
<p><i>Mineral and Energy Resources (Financial Provisioning) Act 2018 (MERFP Act)</i></p> <p><i>Mineral and Energy Resources (Financial Provisioning) Regulation 2019</i></p>	<p>Qld Treasury</p> <p>DNRME</p> <p>DES</p>	<p>EA holders for resource projects must:</p> <ul style="list-style-type: none"> establish a financial security; based on the project's 'Estimated Rehabilitation Cost' (ERC); and develop a Progressive Rehabilitation and Closure Plan (PRCP) (commencing September 2019). 	<p>The EA holder will be assessed in terms of their risk of leaving a potential rehabilitation liability to the State. Risk categories are very low, low, moderate and high.</p> <p>High risk holders will be required to establish 100 percent (%) of their ERC as a financial security for the operation. Very low to moderate categories will be required to make an annual financial payment (as a % of their ERC) relevant to their assigned level of risk.</p> <p>In regard to a PRCP, the Project will need to develop and have approved, a PRCP which details site rehabilitation plans through to final mine closure.</p>	<p>DES approval of ERC.</p> <p>Qld Treasury risk allocation decision.</p> <p>Financial Provisioning payment or security establishment.</p> <p>PRCP assessment, notification and approval.</p>
<p><i>Nature Conservation Act 1992 (NC Act)</i></p> <p><i>Nature Conservation (Wildlife) Regulation 1992</i></p>	<p>DES</p>	<p>Clearing of protected plants, including in high and non-high-risk areas on the Flora Survey Trigger Map.</p>	<p>No high-risk areas on Flora Survey Trigger Map are located within the Project.</p>	<p>A clearing permit is required for clearing in high risk areas, unless impacts can be avoided. If a person is, or becomes aware, that a threatened or near threatened plant is present, then a clearing permit will be required unless clearing of the plant (and within 100 metres (m) of the plant) can be avoided.</p>

Legislation	Administering Authority	Approval Trigger	Relevance to Project	Approval Type
<i>Nature Conservation Act 1992 (NC Act)</i> <i>Nature Conservation (Wildlife) Regulation 1992</i>	DES	Tampering with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring.	The removal or tampering of a breeding place is allowed if it is part of a species management plan for the same species or if a 'damage mitigation permit' for the animal is obtained and the permit authorises the removal or tampering.	Species Management Plan or Damage Mitigation Permit.
<i>Queensland Heritage Act 1992</i>	DES	Development that diminishes the heritage values of a Qld heritage place / artefact(s).	Potential for artefacts or features of heritage significance to exist on the Project.	Heritage agreement if artefacts or places of heritage significance are identified.
<i>Planning Act 2016</i>	Department of State Development IRC	Development of off-lease infrastructure and buildings. Construction of a building or other structure.	For any development located off-lease development permits will be required. Development permits for building works may be required within the MLAs. Applications for these works would be submitted to IRC, if required, following completion of the Project's detailed design.	Development Approval (if / as applicable).
<i>Plumbing and Drainage Act 2002</i>	Department of Housing and Public Works	Required for any onsite sewage treatment plant. Required regardless of whether the sewage treatment plant (STP) is an ERA under the EP Act.	A STP is planned as part of the Mine Infrastructure Area (MIA).	Approval for onsite sewage treatment plant.

Legislation	Administering Authority	Approval Trigger	Relevance to Project	Approval Type
<i>Regional Planning Interests Act 2014</i> <i>Mackay, Isaac and Whitsunday Regional Plan</i>	Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP)	Resource activities located in an area of regional interest (ARI) including: <ol style="list-style-type: none"> 1. a priority agricultural area 2. a priority living area 3. a strategic cropping area 4. a strategic environment area 	The Project does not currently impact on any ARIs. Updates to the Regional Plan and introduction of new ARIs will be monitored during the approval process.	A Regional Impact Development Approval (RIDA) is not anticipated to be required.
<i>Strong and Sustainable Resource Communities Act 2017 (SSRC Act)</i>	DSDMIP	Large resource Project (i.e. for which an EIS is required) planned to occur within nearby proximity (i.e. 125 km radius) of a regional community (i.e. population greater than 200 residents).	The Project is applying for a voluntary EIS and lies approximately 25 km from the town of Dysart, a regional community of approximately 3000 residents. It is noted that recent amendments to the SSRC Act establish: <ul style="list-style-type: none"> • prohibitions around 100% 'fly in, fly out' (FIFO) workforce arrangements; • anti-discrimination provisions against utilising local workers; and • requirement to undertake a social impact assessment. 	Social Impact Assessment. Adherence to SSRC Act requirements.
<i>Vegetation Management Act 1999 (VM Act)</i>	DNRME	Clearing of regulated vegetation.	Regulated vegetation present on the Project. The Act will apply to any activity requiring a development approval for clearing native vegetation.	Not applicable to approved activities on a ML.

Legislation	Administering Authority	Approval Trigger	Relevance to Project	Approval Type
<i>Water Act 2000</i>	DNRME	Taking or interfering with surface water, overland flow water, or groundwater.	<p>Potential for take of groundwater associated with mine dewatering and capturing or interfering with overland flow.</p> <p>Establishing 'make good agreements' with groundwater users potentially impacted by the proposed Project.</p>	<p>Water licence or permit.</p> <p>'Make good agreements' if/as necessary.</p>

3.0 PROJECT DESCRIPTION

3.1 PROJECT OVERVIEW

The Project is proposed to include the development of a double-seam underground longwall coal mine, along with three small-scale ‘satellite’ open-cut pits targeting coal resources to the north and adjacent to the existing Lake Vermont Mine.

To support the operation of the proposed underground development, a new ‘satellite’ surface MIA will be constructed on MDL 429 and MDL 303. A new infrastructure corridor will also be constructed on MDL 303, linking the new MIA to the existing infrastructure located at Lake Vermont Mine (on ML 70331). This infrastructure corridor will enable the delivery of power and water, provide personnel and materials access, as well as facilitate the clearance of ROM coal to the existing Coal Handling and Preparation Plant (CHPP). A conceptual Project layout is provided through Figure 4.

The Project is expected to produce up to seven Mtpa of metallurgical product coal (for the export and domestic market) over a life of 20 to 25 years. The output from the Project will supplement the scheduled decline in production from the existing open-cut operations, so that the total output from the Lake Vermont complex will be maintained within the existing EA limit of 12 Mtpa of ROM coal.

The proposed mine development will therefore be comprised of:

- a double seam underground longwall coal mine (supported by some bord and pillar mining development);
- three small-scale ‘satellite’ open-cut pits (on MDL 303 and MDL 429);
- incremental expansion of the existing accommodation facility at Dysart to support the construction and operational stages of the mine, noting that the expansion of the existing accommodation facility may consist of a temporary construction village as well as some limited expansion of the existing permanent village;
- a mine clean water dam as well as a dewatering dam (with locations and sizing to be determined as part of detailed technical studies);
- a new MIA located on MDL 303 and MDL 429;
- a surface ROM stockpile located within the new MIA;
- an overland conveyor system or truck haulage road to deliver ROM coal from the new MIA to the existing CHPP;
- an infrastructure corridor for the delivery of power and water as well as an access roadway for the movement of personnel and materials; and
- a network of gas drainage bores and associated surface infrastructure, including access tracks, across the underground mine footprint within MDL 303 and MDL 429.

3.2 ENVIRONMENTALLY RELEVANT ACTIVITIES

In addition to the anticipated EIS process for this Project, it is also acknowledged that an application for an amendment to the existing Lake Vermont Mine EA will be required. This will occur once a Mine Lease application has been made.

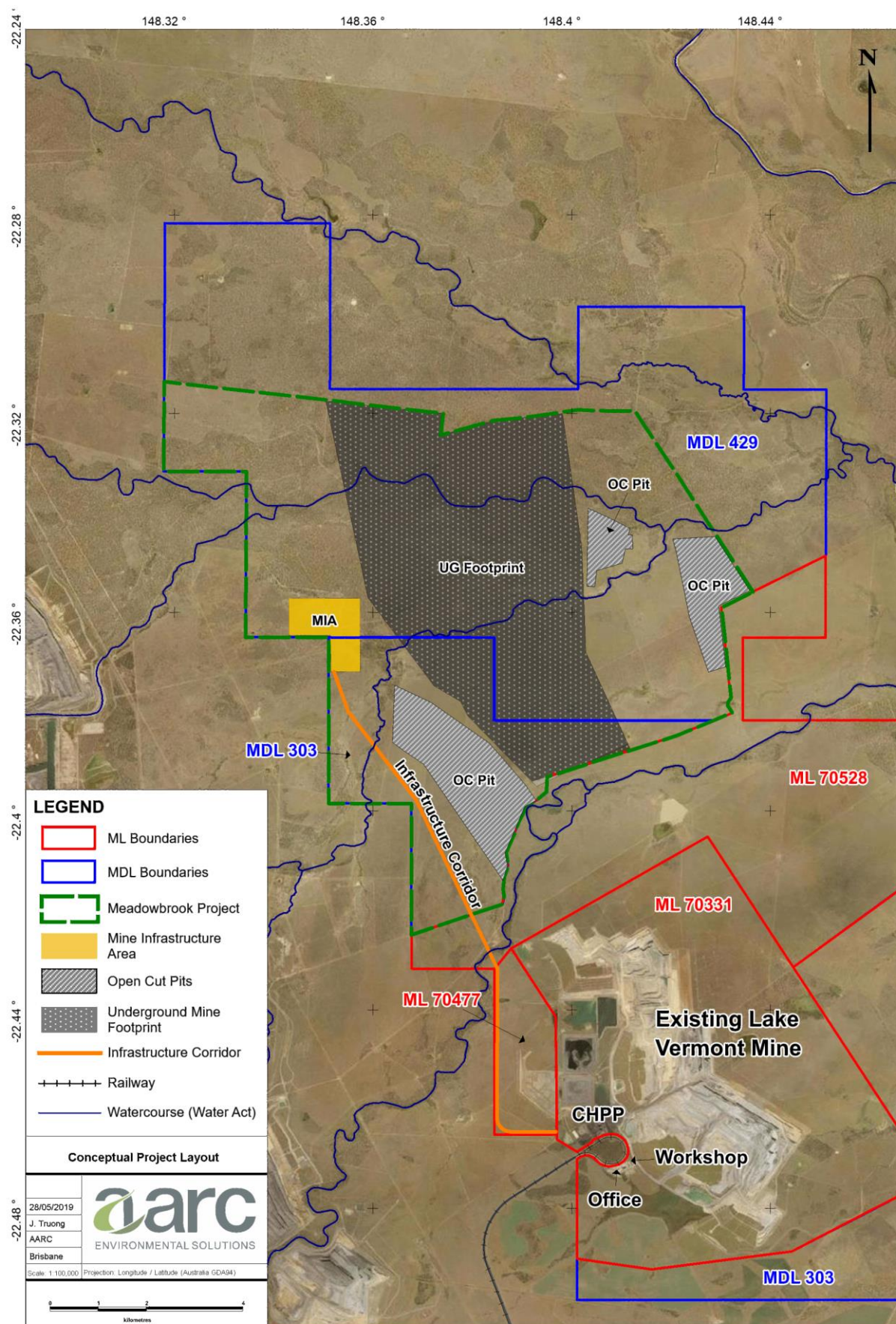


Figure 4 Conceptual Project Layout

In regard to amending the existing EA, it is acknowledged that all existing Environmentally Relevant Activities (ERAs) will be maintained. The locations of these ERAs will also remain as is, with the exception of a new fuel/chemical storage area within the proposed MIA. The Project is not however, expected to change existing ERA requirements or current thresholds.

Existing ERAs for Lake Vermont Mine are provided in Table 5.

Table 5 Proposed Project ERAs and aggregate environmental scores

Environmentally Relevant Activity	Aggregate Environmental Score
ERA 13 Mining black coal.	128
ERA 8 Chemical storage, Threshold 3 no more than 500m ³ of chemicals of Class C1 or C2 combustible liquids under AS 1940 or dangerous goods class 3 under subsection (1)(c).	85
ERA 16 Extractive, Threshold 1 dredging, in a year, the following quantities (b) more than 10,000 but not more than 100,000t. Threshold 3 screening, in a year, the following quantity of material – (a) 5000t to 100,000t.	25
ERA 31 Mineral processing, Threshold 2 processing, in a year, the following quantities of mineral products, other than coke – (b) more than 100,000t.	280
ERA 33 Crushing, milling, grinding or screening, more than 5,000t of material per year.	0
ERA 38 Surface coating, Threshold 2 coating, painting or powder coating, using in a year, more than 100t of surface coating materials.	7
ERA 56 Regulated waste storage, receiving and storing regulated waste.	ERA56 was deleted 01 July 2019. ERA 62 therefore added.
ERA 60 Waste disposal, Threshold 1(a) operating a facility for disposing of any combination of regulated waste (and <5t untreated clinical wastes if in a scheduled area): <50,000t.	65
ERA 62 (b) Operating, on a commercial basis or in the course of carrying on a commercial enterprise, a waste transfer station receiving >30m ³ or >30t of waste on any day	31
ERA 63 Sewage treatment, Threshold 1 operating sewage treatment works other than no-release works, with a total daily peak design capacity of (b) more than 100 but not more than 1500EP – (i) if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme.	27

3.2.1 Project Development Strategy

A definitive mine layout and development program has yet to be finalised for the Project, however the following key milestone dates have currently been targeted:

- drift and shaft plus surface construction to commence in Fiscal Year 2022;
- in-seam development to commence in Fiscal Year 2024; and
- longwall production to commence in Fiscal Year 2026.

Underground mining will likely initially focus on the shallower resources located in the southern portion of the Project area and progress to the deeper northern resources progressively over the life of mine.

The development timing of the 'satellite' open-cut pits will be staged so as to supplement the decline in production from the existing open-cut operation to maintain output from the overall Lake Vermont complex. A definitive development and mining schedule will be developed as part of the feasibility and planning works.

Based on the preliminary Project layout (Figure 4) the Project's disturbance footprint is currently calculated at approximately 1,272 hectares (ha), which is comprised of the elements outlined in Table 6. A further 3,212 ha of the tenure areas will be 'shadowed' by the underground mine development, although not subject to direct surface disturbance.

Table 6 Approximate Disturbance Footprints

Component	Area (ha)
MIA	171
'Satellite' Open-cut Pits	853
Infrastructure Corridor*	248
Haul Roads^ and other Site Access Roads/Tracks	TBD
Total Surface Disturbance Area	1,272
Underground Footprint†	3,212

Notes: * based on a nominal 100 m width

^ to service the 'satellite open-cut pits', all underground haulage will be via the MIA and infrastructure corridor

TBD – to be determined (during the EIS process)

† underground footprint does not equate to surface disturbance

3.3 TENURE

3.3.1 Mining and Petroleum Tenements

The Project is located directly north and adjoining the existing Lake Vermont Mine. The existing mine is comprised of three MLs; being ML 70331, ML 70477 and ML 70528. The proposed Project extension footprint lies within two MDLs, being MDL 303 and MDL 429. All of these tenements are held by BBC, with relevant details summarised in Table 7.

Table 7 Lake Vermont Tenure

Tenure	Project	Permit Name	Area (ha)	Associated Project Development
ML 70331	Lake Vermont Mine	Lake Vermont Mine	4,987	Road access; infrastructure corridor.
ML 70477		Lake Vermont West	453	Road access; infrastructure corridor.
ML 70528		Lake Vermont North	3,748	Road access; infrastructure corridor.
MDL 303	Lake Vermont Meadowbrook Project	Lake Vermont	2,226 (north)	Underground mining, gas drainage and vent shafts, open-cut mining and spoil dumps, road access, infrastructure corridor, surface mine infrastructure area.
			4,475 (south)	Nil.
MDL 429		Lake Vermont North	9,496	Underground mining, gas drainage and vent shafts, open-cut mining and spoil dumps, road access, infrastructure corridor, surface mine infrastructure area.

The Saraji Mine and associated Saraji East Project border the Project MDLs to the west, whilst the Olive Downs Coking Coal Project and the Eagle Downs South Project borders the Project MDLs to the north, north-east and north-west. The Olive Downs Coking Coal Project has recently had its EIS approved and is currently awaiting final commonwealth approval and grant of its associated MLs and EA. These surrounding coal mining Projects are detailed in Table 8 (below) as well as in Figure 3 of this IAS.

Table 8 Surrounding Mining Tenure

Tenure	Project	Entity	Status
Multiple	Saraji Mine	BMA	Active Mine
MLA 70383	Saraji East Project		Current EIS
MLA 700033	Olive Downs Coking Coal Project	Pembroke Resources	EIS Approved (May 2019)
MLA 700034			
MDL 519	Eagle Downs South Project	Aquila Resources	Exploration & Feasibility

Two Authority to Prospect (ATP) permits for petroleum and one Petroleum Lease Application (PLA) also overlap with the Project (as per Table 9 and Figure 5).

Table 9 Overlapping Petroleum Tenure

Tenure	Entity	Status
PLA 488	Arrow CSG (ATP 364) Pty Ltd	PLA lodged 23 November 2012.
ATP 814	Eureka Petroleum Pty Ltd	ATP expired; renewal lodged.
ATP 1031	Bow CSG Pty Ltd	ATP active.
ATP 1103	CH4 Pty Ltd	ATP expired; renewal lodged.

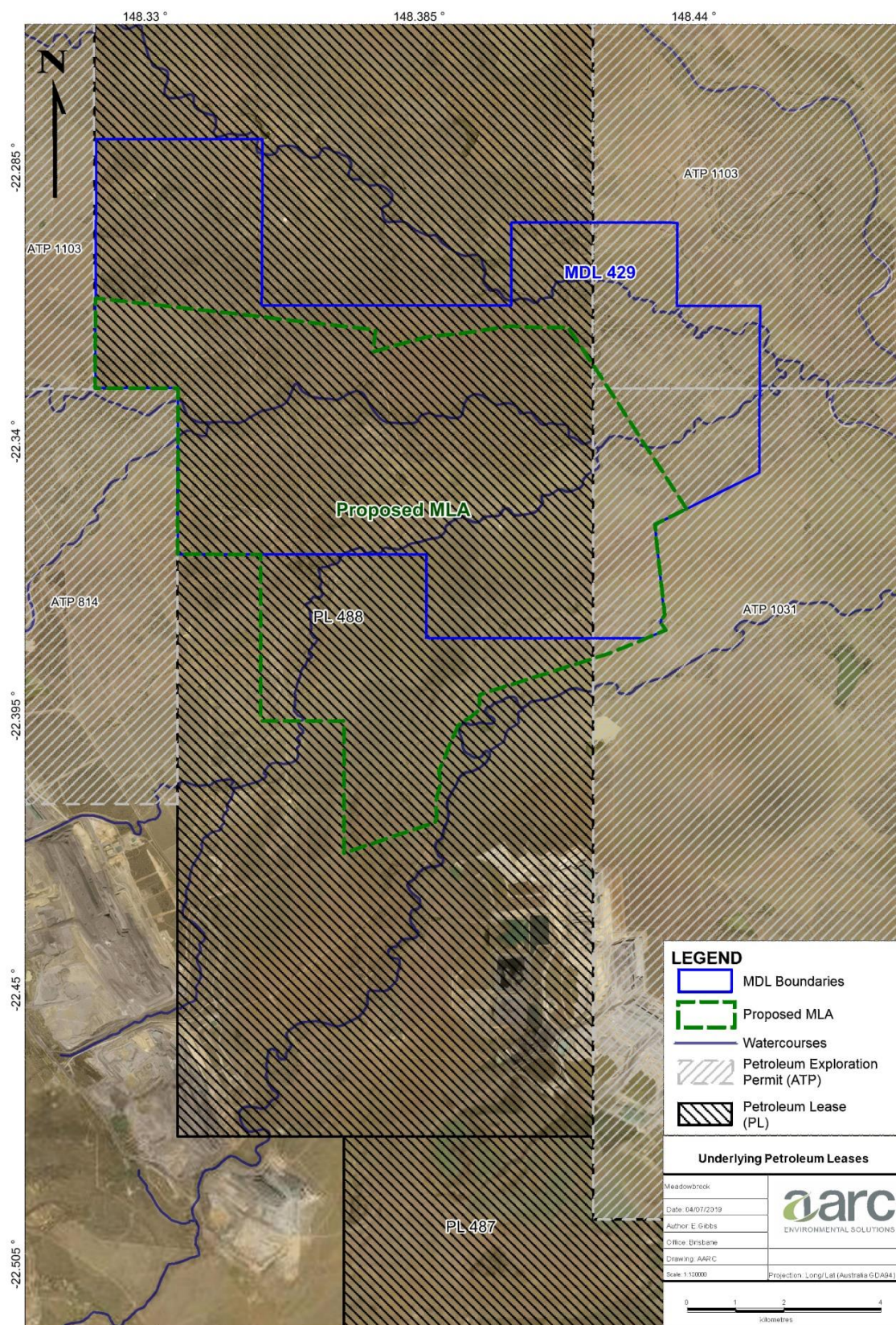


Figure 5 Overlapping and adjoining Petroleum Tenure

Mining and petroleum tenure holders are also identified in Section 11.4.11 (Affected and interested persons).

3.3.2 Land Tenure and Ownership

The Project occurs over one freehold land parcel, as detailed in Table 10 and presented in Figure 6.

Table 10 Land Tenure and Ownership

Lot / Plan	Tenure	Registered Owner	Property Name	Tenement
10 / CNS93	Freehold	BMA	Meadowbrook	MDL 429 & MDL 303

Beneficial interest holders of the Meadowbrook property (within the BMA entity identified above) are BHP Coal Pty Ltd, Umal Consolidated Pty Ltd, BHP Queensland Coal Investments Pty Ltd, Mitsubishi Development Pty Ltd, QCT Investment Pty Ltd, QCT Mining Pty Ltd, and QCT Resources Pty Ltd.

At the time of preparing this IAS, the Proponent was in the late stages of purchasing the portion of the Meadowbrook property that overlays the BBC MDLs. An application to subdivide this property has been approved by the local council, with BMA to retain the portion of the property underlying their Saraji East Project. It is envisaged that the sale will be finalised in coming months. Upon transfer of ownership, BBC will be the registered owner of all land overlying the Project site.

Other properties adjoining Meadowbrook (cadastral parcels) are identified through Figure 6. These properties are also discussed within Section 4.11.4 (Affected and interested persons).

3.3.3 Land Use

The Project site is currently used predominately for cattle grazing. Qld Land Use Mapping classifies the Project area as 'Grazing Native Vegetation'. Other dominant land uses in the nearby area are 'Mining' and 'Cropping'.

The Project is located within the IRC LGA, which consists of the former Nebo, Belyando and Broadsound Shire Council areas. Following the amalgamation of these LGAs the IRC began development of the IRC Planning Scheme on the 1st July 2018, which has yet to be finalised. Throughout the EIS process, the draft Planning Scheme will be consulted (until an updated or final version becomes available) in respect to assessing relevant land use impacts and planning aspects of the Project. The Mackay, Isaac and Whitsunday Regional Plan (2012) will also be considered in assessing the land use impacts of the Project.

There are no Protected Areas or Restricted Areas within, or adjacent to the Project. The Project tenements lie within the National Native Title Tribunal determination area for the Barada Barna People; however, does not overly any Native Title claim or applications. The Proponent does not have a voluntary Indigenous Land Use Agreement (ILUA) under the *Native Title Act 1993* over the existing mine.

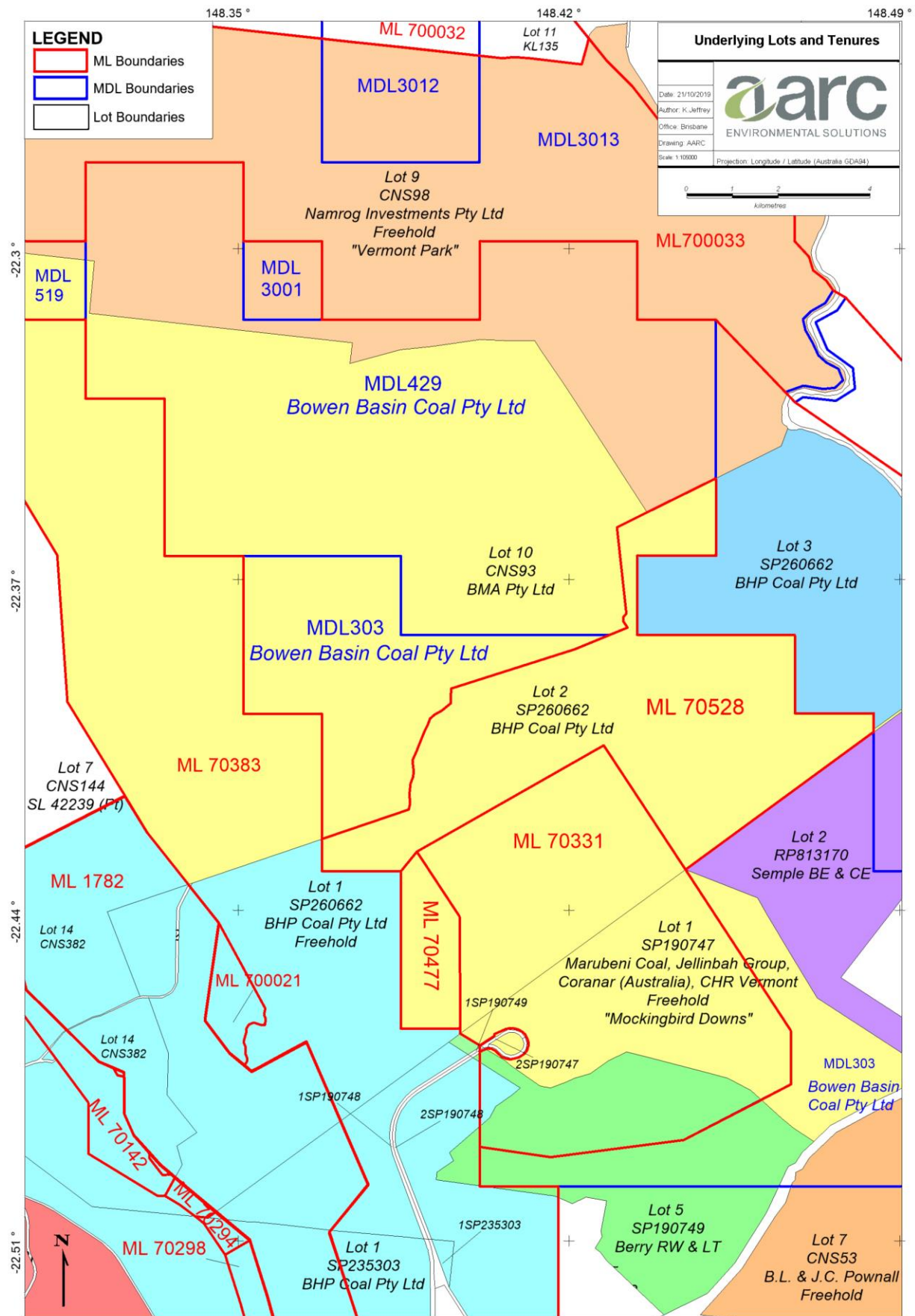


Figure 6 Project Tenements and Land Tenure

3.3.4 Land Access

BBC is currently finalising documentation with BMA, to acquire the area of the Meadowbrook property relevant to the Project site. Completion of this process will provide the necessary access (i.e. ownership) to complete all activities associated with future exploration, environmental studies and eventual mine operation.

It is noted that site environmental investigations completed to date, have been undertaken through the 'entry notice' process, as established through the MERC Act. Further use of this process is not anticipated to be required in advance of finalising the current land acquisition, however this mechanism is available should the land title transfer processes take longer than anticipated, or Project plans drive a short-term access need.

3.4 ACCOMMODATION AND WORKFORCE

LVR will manage and coordinate the construction and development of the Project by the engagement of a suitable construction contractor(s). The Project will employ up to 200 contract construction employees.

The operational workforce of the proposed underground mine will comprise a mix of owner-operator and contract employees and average approximately 350 to 400 employees. Operation of the proposed small-scale 'satellite' open-cut pits will likely be carried out by contract employees, as an extension to the existing open-cut operations.

As the Project moves into the operational phase, there will be a corresponding reduction in the size of the existing Lake Vermont open-cut operations. It is BBCs intention to provide opportunity where appropriate for many of these roles to transition from the slowing open-cut operations, to the ramping up of the Meadowbrook Project, thereby promoting workforce retention and job security for many employees and contractors. Overall, an incremental increase in the total operating workforce for Lake Vermont is expected, with this estimated to be in the order of 200 employees.

The existing Lake Vermont Accommodation Village at Dysart (located as shown through Figure 7) will be expanded to support the Project's construction and operational stages, as required. The extent of any required expansion to the existing accommodation village will be determined by workforce planning, labour market conditions and general market conditions during the pre-Project execution and development processes.

Negotiations are currently in progress to facilitate the appropriate land acquisition so that any required expansion of the existing accommodation village could proceed following required development permitting.

3.5 RESOURCE CHARACTERISATION

3.5.1.1 Regional Stratigraphy

The Project lies on the western limb of the Bowen Basin, a north to south trending retro-arc basin, that extends more than 250 km north to south and up to 200 km west to east. The basin sequence infilled a rift zone between stable Devonian to Carboniferous rocks of the Thomson Fold Belt to the west and a Devonian to Permian island arc system, the New England Fold Belt, to the east.

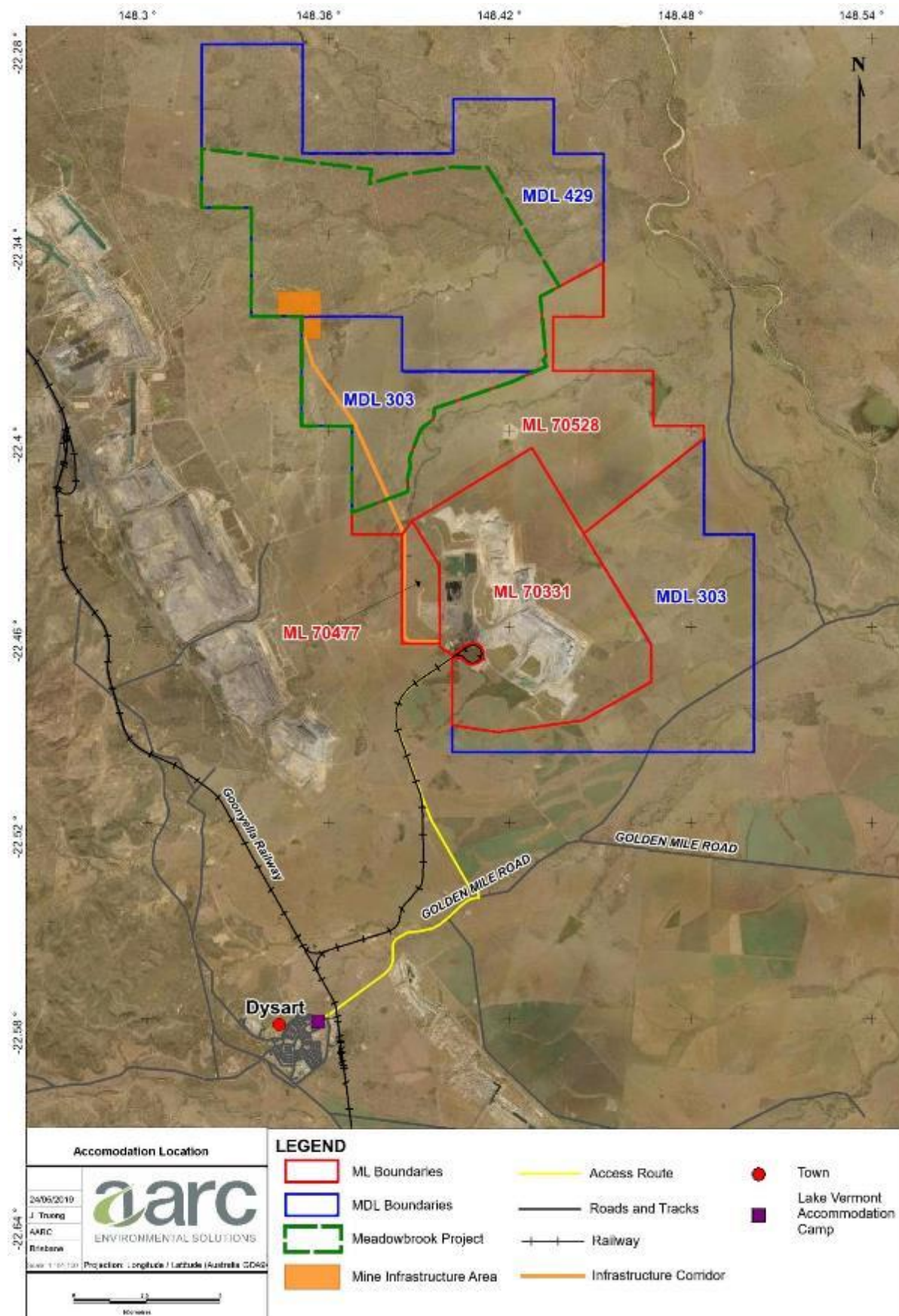


Figure 7 Location of Lake Vermont Accommodation Village

3.5.1.2 Stratigraphy of the Project Area

The Project is located adjacent to the boundary between the Collinsville Shelf and the Nebo Synclinorium. The regional Permo-Triassic stratigraphy comprises, in descending order:

- the Triassic Rewan Group; and
- the Late Permian, Blackwater Group, which can be subdivided into:
 - the Rangal Coal Measures;
 - the Fort Cooper Coal Measures; and
 - the Moranbah Coal Measures.

3.6 MINE STRATEGY

Coal occurs within all three units of the Blackwater Group but up to the present time has only been mined commercially from the Rangal Coal Measures. The depth to the Moranbah Coal Measures is considered too excessive within the Project, to be considered economically viable to mine.

The potential economic coal within the Project, therefore occurs within the Rangal Coal Measures. Persistent, thick coal horizons within the Rangal Coal Measures, in descending stratigraphic order are:

- the Leichhardt Seam and Leichhardt Lower Seam; and
- the Vermont Seam and Vermont Lower Seam.

One other thin, persistent seam, the Phillips Seam, is also present above the Leichhardt Seam, however it is of inferior quality and too thin to be considered economic.

3.6.1 Mining Alternatives

To determine the proposed mine strategy, an analysis of the mining alternatives has been undertaken. Initially an open cut economic margin analysis was carried out to define the economic pit limits for open cut mining assuming no constraints and a range of best case to worst case coal pricing and mining cost assumptions. Based on the physical deposit characteristics, the use of draglines, was eliminated in favour of truck and shovel methods in line with current mining practise at the Lake Vermont operation. Surface and environmental constraints were then considered, and the pit limits modified so as to minimise environmental impacts based on current and known future legislative requirements. Having defined the location and extents of future open cut mining pits, an underground footprint could be delineated.

Two economically viable underground target seams have been identified, being the Leichhardt Lower Seam and the Vermont Lower Seam. The Vermont Lower Seam extends across the entire Project, whereas the Leichhardt Lower Seam is only present across the northern half of the Project. As such the primary focus for the underground operation will be to target the Vermont Lower Seam with the Leichhardt Lower Seam considered as a potential later stage 'upside' opportunity. The proposed underground mine will operate at depths ranging between approximately 130 m to 500 m over the 20 to 25 year mine life.

Both longwall and bord and pillar mining options have been considered. Based on depth constraints, bord and pillar options will only be economically viable in the shallower areas within the defined underground footprint and so will not form a primary underground mining alternative. Based on the

currently known deposit characteristics longwall mining will provide the greatest resource recovery and economic outcome.

In addition to the proposed underground mining area, several small areas of economically viable open-cut resources exist within the Project. Opportunity exists to develop these small-scale open-cut pits to operate as 'satellite' pits to the existing open-cut mine. These will be utilised as an important means of supplementing production during various project development phases.

As well as these brownfield extension opportunities, a "do nothing" alternative will also be evaluated. This scenario will see a marked future decline in size and output from the existing Lake Vermont Mine beyond 2028 as the mine progressively exhausts its existing approved economic reserves.

3.6.2 Mining Method

The depth and thickness of the coal seams across the Project, is such that underground mining provides the most effective method of extraction. Two available underground mining methods are currently being considered as options for the Project. It is anticipated that longwall extraction will be the primary mining method, however it is possible that opportunities for bord-and-pillar mining will present themselves as ongoing exploration and feasibility planning progresses.

Both the Vermont Lower and Leichhardt Lower Seams range in thickness of between 2.5 m to 4.5 m across the Project which will enable the effective utilisation of conventional single pass continuous miner and single pass longwall mining machinery.

In the northern section of the Project where both the Leichhardt Lower and Vermont Lower Seams are present, the overlying Leichardt Seam will be mined out ahead of the underlying Vermont Lower Seam.

The small-scale 'satellite' open-cut pits will be operated using appropriately sized truck and shovel equipment. The pits will be designed and operated to minimise out-of-pit spoiling and disturbance areas, with the pits currently anticipated to be backfilled at completion, to affect an agreed post mining land use.

3.6.2.1 Coal Clearance

A ROM coal stockpile pad with a nominal capacity of approximately 200,000 tonnes will be constructed at the delivery head of the underground mine drift conveyor.

An infrastructure corridor will also be constructed to link the MIA of the proposed underground mine to the existing open-cut CHPP facilities. Within this corridor a coal haulage roadway will be constructed for the operation of road haulage style trucks. Should it prove economically viable, in addition to the coal haul road, an overland conveyor with a nominal capacity of approximately 1,200 tonnes per hour will also be constructed between the underground pit head / ROM stockpile and the existing Lake Vermont CHPP. Haul roads will be constructed linking the proposed small-scale 'satellite' open-cut pits to either the main trunk haul road or overland conveyor.

3.6.3 Underground Mine Layout

The underground mine will comprise of a network of development roadways for the purposes of access to, and ventilation of the longwall coal extraction panels. The development access panels typically comprise of multiple roadways each approximately 5.5 m wide, allowing for personnel and materials access, coal clearance conveyors and enabling adequate ventilation for the supply of fresh air, removal of dust, mine gases and heat.

Several conceptual mine layout alternatives have been determined at this early stage, sufficient to identify and delineate the overall life of mine footprint. A definitive finalised mine layout of the development roadways and longwall panels, however, has yet to be determined. This will be the focus of the ongoing feasibility planning process, to ensure the most suitable design option is selected. Once finalised, the selected mine layout will provide the basis of the environmental assessment for the EIS process.

3.6.4 Underground Mine Entry

Under coal mining regulations, an underground coal mine in Australia requires a minimum of three access points into the mine, all segregated from each other. These are:

1. a main intake travel way;
2. an egress (escape) intake travel way; and
3. a ventilation exhaust way.

Traditionally, shallow Australian underground mines have used two drifts for intakes and a shaft for ventilation, whereas deeper mines have used one drift and two shafts.

It is proposed that underground seam access for personnel, materials, and coal clearance conveyors will be via conventional inclined drifts. Vertical shafts will be used for exhaust ventilation. The surface portals will be located within the surface MIA, with ventilation shaft locations to be determined in conjunction with detailed mine plans.

3.6.5 Gas Drainage and Management

Early indications suggest that some mine gas will be encountered underground. The extent of mine gas drainage requirements however, along with associated surface infrastructure, is yet to be defined. An incidental mine gas hazard management strategy will ultimately be developed to reduce and mitigate any operational risks associated with in-seam gases. This may include:

- pre-drainage of coal measures prior to underground mining;
- dilution of seam gases via mine ventilation during the mining process; and
- post drainage of goaf areas after mining.

Co-development agreements are already in place with relevant overlapping tenement holders and allow for the granting of future mining leases.

3.7 MINE INFRASTRUCTURE AND FACILITIES

The Project is expected to require the following infrastructure to facilitate mining:

- a new surface MIA including:
 - a pit top ROM stockpile pad;
 - mine clean water and waste water dams;
 - workshops facilities;

- diesel refuelling tank(s) and oil storage area;
- emulsion farm (for storing longwall fluids);
- mine warehouse and stores yard;
- equipment washdown and laydown area;
- administrative and operational office facilities;
- bath house facilities; and
- potable water and waste water / sewage treatment plants;
- access drifts and shafts;
- access and infrastructure corridor connecting to the existing Lake Vermont Mine, including:
 - road access for personnel and materials;
 - extension of the high voltage power line and water delivery line from the existing Lake Vermont Mine;
 - a coal haulage road, and potentially an overland conveyor connecting the underground MIA to the existing Lake Vermont CHPP;
- a network of gas drainage bores and associated surface infrastructure consisting of gas and water collection networks and associated access tracks across the underground mine footprint; and
- expansion of the existing Lake Vermont Accommodation Village at Dysart.

Final infrastructure locations will remain subject to ongoing feasibility studies, with indicative locations currently presented in Figure 4.

3.7.1 Coal Handling and Preparation Plant

The Project will utilise much of the existing infrastructure located at the Lake Vermont Mine, including the CHPP and train load out facility. Coal will be transported from the underground ROM stockpile via a haul road (or an overland conveyor) to the existing CHPP for processing.

There is currently no CHPP upgrade or EA amendment proposed to increase the mining limit of the Lake Vermont Mine, with the current authorised limit of 12 Mtpa of ROM coal, believed to be sufficient to support the extended life of the operation.

3.8 PRODUCT COAL TRANSPORTATION

The Lake Vermont Complex is approximately 320 km by rail from the APCT in Bowen, 430 km from RGTCT in Gladstone and 235 km from the DBCT in Mackay, and. An existing rail loop connects the Lake Vermont Mine to the Aurizon heavy haul coal rail line, that will continue to provide connection to export ports from the Lake Vermont Mine.

Figure 8 shows the Bowen Basin rail and port networks that are accessible from the Lake Vermont complex.

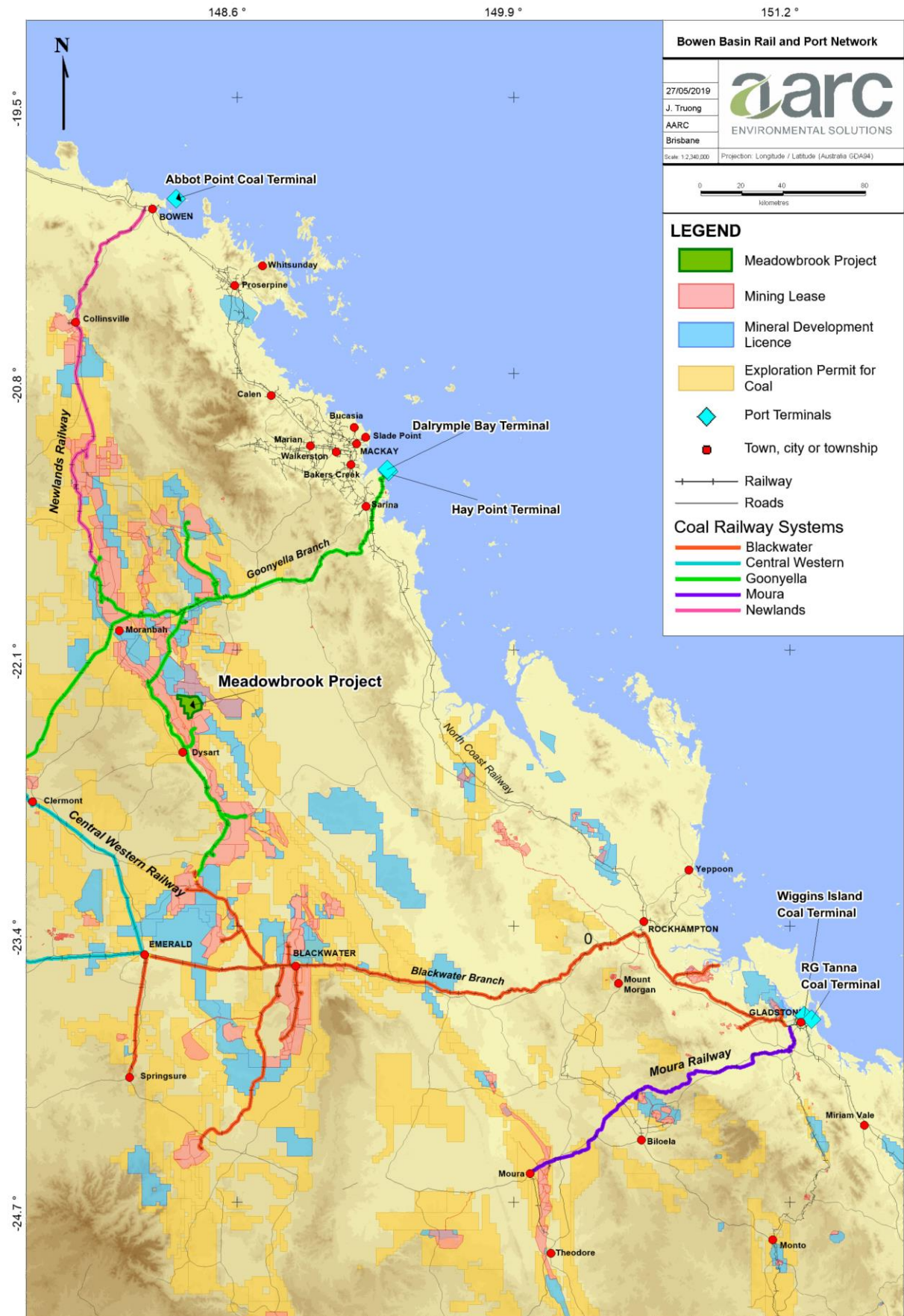


Figure 8 Bowen Basin Rail and Port Networks

The product coal shipped via the APCT and RGTCT will be within the approved port and shipping capacity and throughput limits, and therefore no additional impacts to the surrounding environment are expected. On occasions some coal has been shipped via DBCT where port capacity has been made available. Should adequate long-term capacity become available at DBCT and competitive contracts be negotiated, then transferring capacity from APCT to DBCT could be a possibility.

3.8.1 Rail Access

As per the current output from the Lake Vermont Mine, the product coal from the Project will be railed along the existing Lake Vermont spur line, to intersect with the existing Goonyella rail system, to head north to Abbot Point. Product coal is also railed south to intersect with the Blackwater rail system, for delivery to the port facilities at Gladstone. The volume of coal to be transported via the rail network will be within Aurizon's existing approval limits and therefore no impacts to the rail network are expected.

3.9 SITE ACCESS

The Lake Vermont Accommodation Village lies on the eastern edge of the nearby town of Dysart (refer Figure 7). The Golden Mile Road runs east from Dysart and intersects with the Lake Vermont access road that runs north alongside the Lake Vermont rail spur, providing direct access between the Lake Vermont Accommodation Village at Dysart and the existing Lake Vermont Mine. Both of these roads are sealed, two lane roadways and are under the jurisdiction of the IRC.

3.10 POWER SUPPLY

An initial power requirement estimate suggests that the Project will require approximately 27 megavolt amperes (MVA) of power capacity and that the Dysart Bulk Supply Substation has the capacity to supply this requirement. Additionally, the 66 kV line that supplies power from Dysart to the existing Lake Vermont Mine, will have the capacity to transmit the additional power without augmentation.

Consequently, it is proposed that a suitable switching and metering station be located at the existing Lake Vermont Mine substation and a 66 kV transmission line will be constructed along the proposed infrastructure corridor to connect to the new MIA. Existing electricity supply infrastructure is shown in Figure 9.

Within the Project MIA, there will be a main substation transforming the power from 66 kV to 11 kV, for reticulation to several smaller surface substations and for reticulation underground. Detailed power modelling will be carried out as part of ongoing feasibility mining studies, to confirm final power requirements and detailed infrastructure designs.

3.11 WATER SUPPLY

Water usage at the proposed Project will be primarily for the purposes of cooling mining (face) equipment and dust suppression. The likely volumes of mine dewatering from the underground operations has yet to be determined, however where appropriate, this mine water will be reused. Any shortfall in water needs will be supplemented by commercial raw water arrangements. At this early stage it is estimated that the incremental raw water supply requirements for the proposed underground mine could range between 200 to 400 megalitres per annum.

A current water supply agreement is in place between SunWater's Eungella Water Pipeline Pty Ltd and BBC for the supply of up to 1,500 megalitres of water per annum. Current annual water usage at the existing Lake Vermont Mine is approximately 970 megalitres (across both the operational and CHPP needs). Whilst, there may be capacity within the current supply agreement to cover the anticipated raw water supply requirements of the proposed underground mine, there will be insufficient allowance for

risk contingency. Consequently, some additional raw water supply will likely be required to augment the current supply contract. Future detailed water balance modelling will be undertaken to quantify any additional raw water requirements. The current water supply contract is due for renewal in December 2026. Existing water supply infrastructure is shown in Figure 9.

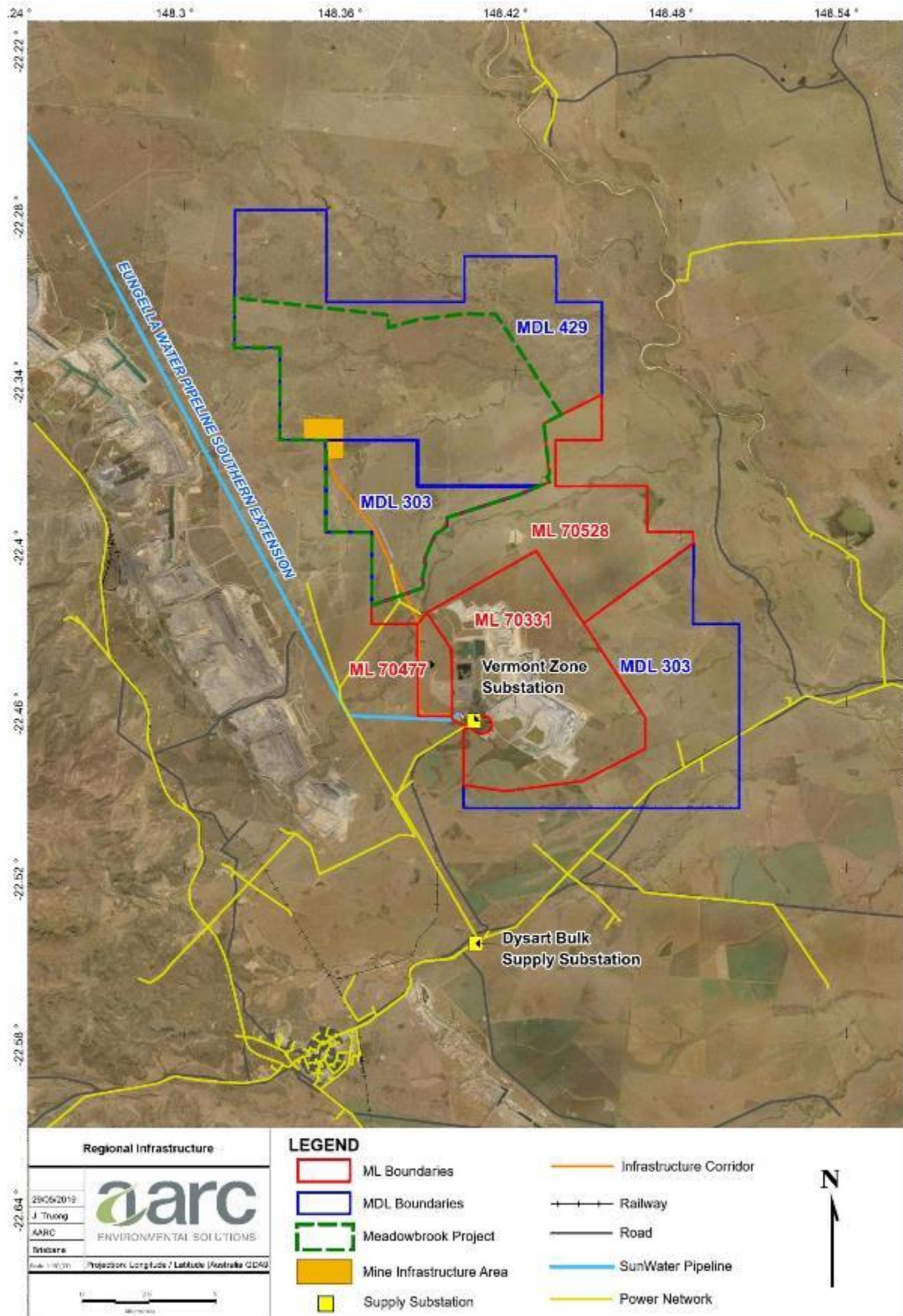


Figure 9 Regional Infrastructure Networks

3.12 WATER MANAGEMENT

3.12.1 System Overview

The site water management system at the Project will be designed in accordance with Qld regulatory requirements. The system will also be designed and operated in accordance with a number of key principles, including that:

- clean catchment water will be diverted around the mining works to the extent practicable;
- lesser quality water will be used in preference to higher quality water;
- use of mine affected water (MAW) will be maximised in preference to imported raw water (i.e. cease importation of raw water) or uncontaminated water;
- run-off 'sub-catchments' will be created to manage "clean", "spoil" and "mine affected" waters, including:
 - intercepting the MAW runoff and conveying it to designated dams for re-use;
 - Intercepting "spoil" runoff (using drains) to direct water into respective sediment dams for release, or later use onsite;
 - capturing or diverting "clean" runoff to ensure water does not unnecessarily enter the mine or infrastructure areas;
- the system be designed with flexibility where possible, such as to support the staged development of the mine;
- MAW will only be released from the site:
 - when the conditions set out in the EA are met;
 - after sufficient MAW exists to meet the ongoing operations requirements for the medium term, or if MAW storages are full or at risk of overtopping; and
 - such that the release of the MAW will not impact upon the values of the receiving environment or downstream users; and
- management of water storages and transfers within the site should:
 - maximise onsite storage to meet anticipated periods of wet and dry weather; and
 - minimise disruption to mining operations.

3.12.2 Potable Water Treatment

A potable Water Treatment Plant will be installed at the MIA to address the potable water demand for the Project.

Any waste water generated from the potable Water Treatment Plant will be managed via the existing MAW management system.

3.13 COMMUNICATIONS

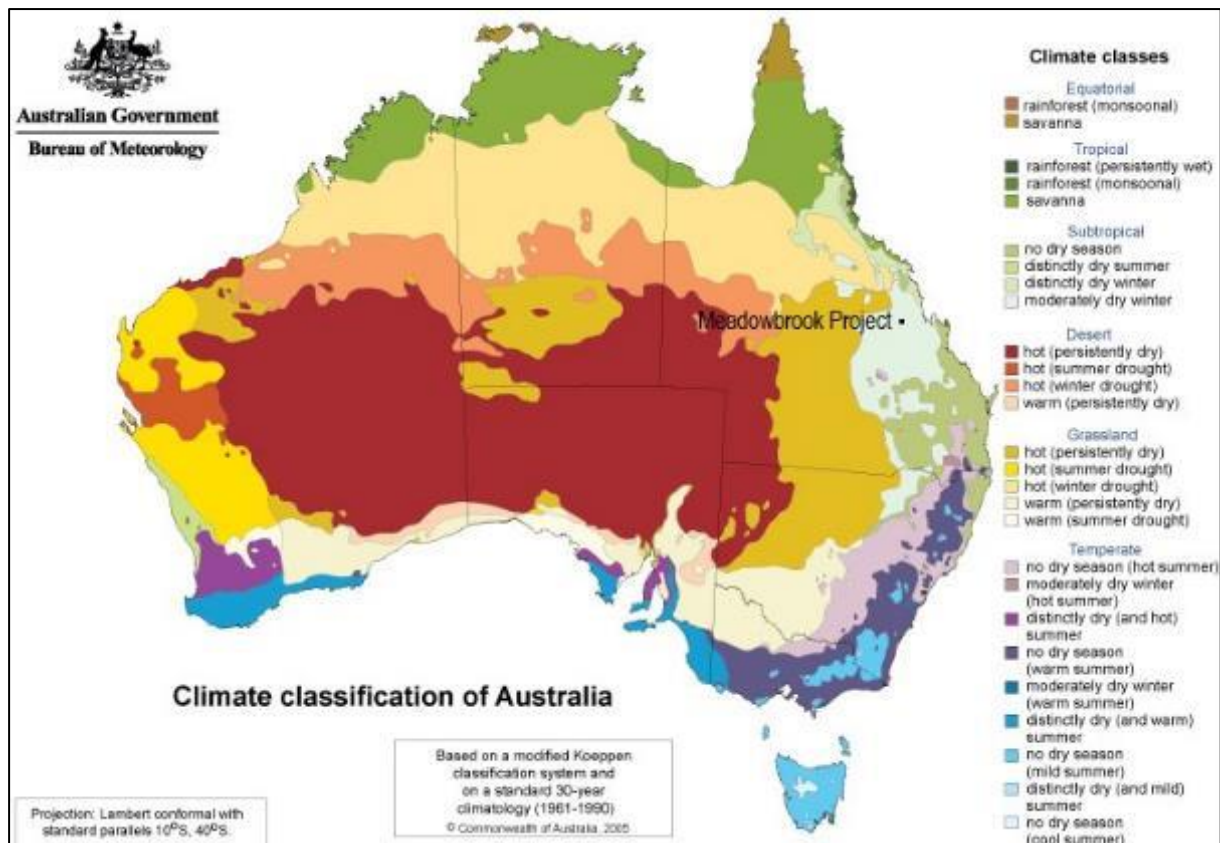
A telecommunications link to the Project site will be made by extending services from the existing Lake Vermont Mine through to the Project MIA, via the proposed infrastructure and services corridor. An underground phone and radio communication system will be controlled and monitored through the mine office control room.

4.0 EXISTING ENVIRONMENT AND POTENTIAL IMPACTS

The purpose of the following section is to overview the existing natural environment of the Project, while also beginning to consider the potential environmental impacts of the proposed Project activities.

4.1 CLIMATE

The Project area has a climate classification of Subtropical (moderately dry winter) using the Bureau of Meteorology's (BoM) modified Köppen Climate Classification System (refer Figure 10).



Source: Bureau of Meteorology (2018b)

Figure 10 Climate Classification of Australia

Meteorological data for the Project has been acquired from the Scientific Information for Land Owners (SILO) climate database (interpolated grid cell) (DES 2018a) and from two long-term BoM weather stations; situated at the Moranbah Water Treatment Plant and the Clermont Post Office (BoM 2018b). The locations of these weather stations and availability of datasets are provided in Table 11.

The data obtained from the SILO climate database and the weather stations has been used to collectively describe the historical climatic trends within the vicinity of the Project. Historical data is presented as an indicative representation of future climatic trends, patterns, cycles and extremes.

The SILO climate database grid cell data has been derived by either splining or kriging observational data from surrounding weather stations, and hence it is based solely on interpolation.

Table 11 Sources of Climate Data

Source	SILO Climate Database Grid Cell	Moranbah Water Treatment Plant	Clermont Post Office
Coordinates	-22.35 °S 148.40 °E	-21.99 °S 148.03 °E	-22.83 °S 147.64 °E
Locality	On Project	~ 55 km NW of Project	~ 95 km SW of Project
Data Availability			
Temperature	1968* – 2018	1986 – 2012	1910 – 2011
Rainfall	1968* – 2018	1972 – 2012	1870 – 2018
Humidity	N/A	1986 – 2010	1938 - 2010
Wind Speed & Direction	N/A	1986 – 2010	1962 – 2010

Note: * Older records available, however analysis was based on most recent 50 years of data only.

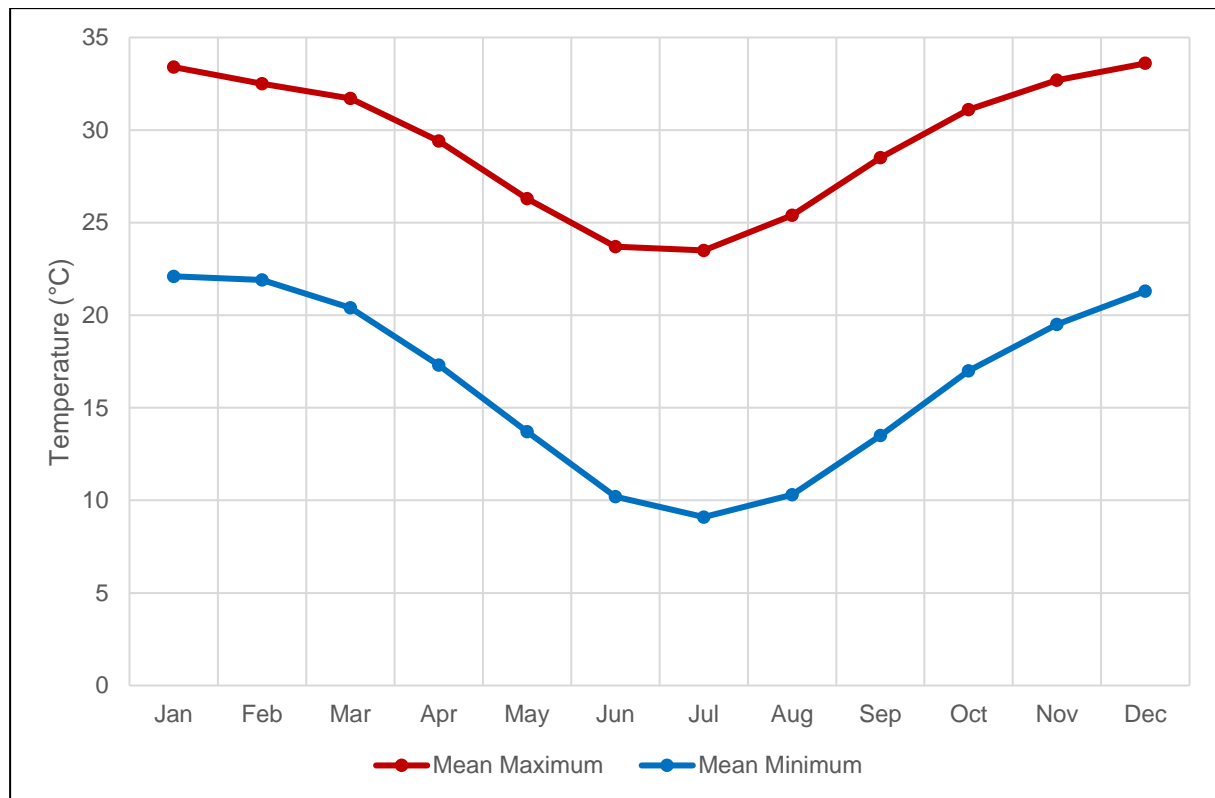
4.1.1 Temperature

Temperature data from the SILO climate database and BoM weather stations is presented in Table 12 and Figure 11 (SILO data only). The local monthly mean maximum temperatures indicate that the hottest months of the year in this region are typically November to February, with mean maximum temperatures ranging from 32.5 to 34.8 degrees Celsius (°C)). The local monthly mean minimum temperatures indicate that the coolest months of the year in this region are typically June to August with mean minimum temperatures ranging from 6.7 °C to 11.2 °C.

Table 12 Local Monthly Mean Temperature Records

Temperature Record	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
SILO Climate Database													
Mean Max. (°C)	33.4	32.5	31.7	29.4	26.3	23.7	23.5	25.4	28.5	31.1	32.7	33.6	29.3
Mean Min. (°C)	22.1	21.9	20.4	17.3	13.7	10.2	9.1	10.3	13.5	17.0	19.5	21.3	16.3
Moranbah Weather Station													
Mean Max. (°C)	33.8	33.1	32.1	29.5	26.5	23.7	23.7	25.5	29.2	32.3	33.1	34.0	29.7
Mean Min. (°C)	21.9	21.8	20.2	17.6	14.2	11.2	9.9	11.1	14.1	17.6	19.4	21.1	16.7
Clermont Weather Station													
Mean Max. (°C)	34.3	33.0	32.0	29.5	26.1	23.1	23.1	25.3	28.8	31.9	33.9	34.8	29.7
Mean Min. (°C)	21.6	21.1	19.4	15.7	11.4	8.1	6.7	8.3	12.1	16.3	19.0	20.8	15.0

Notes: XX = Maximum Value
XX = Minimum Value



Note: Based on SILO Climate Database data only.

Figure 11 Project Monthly Mean Temperature Trends

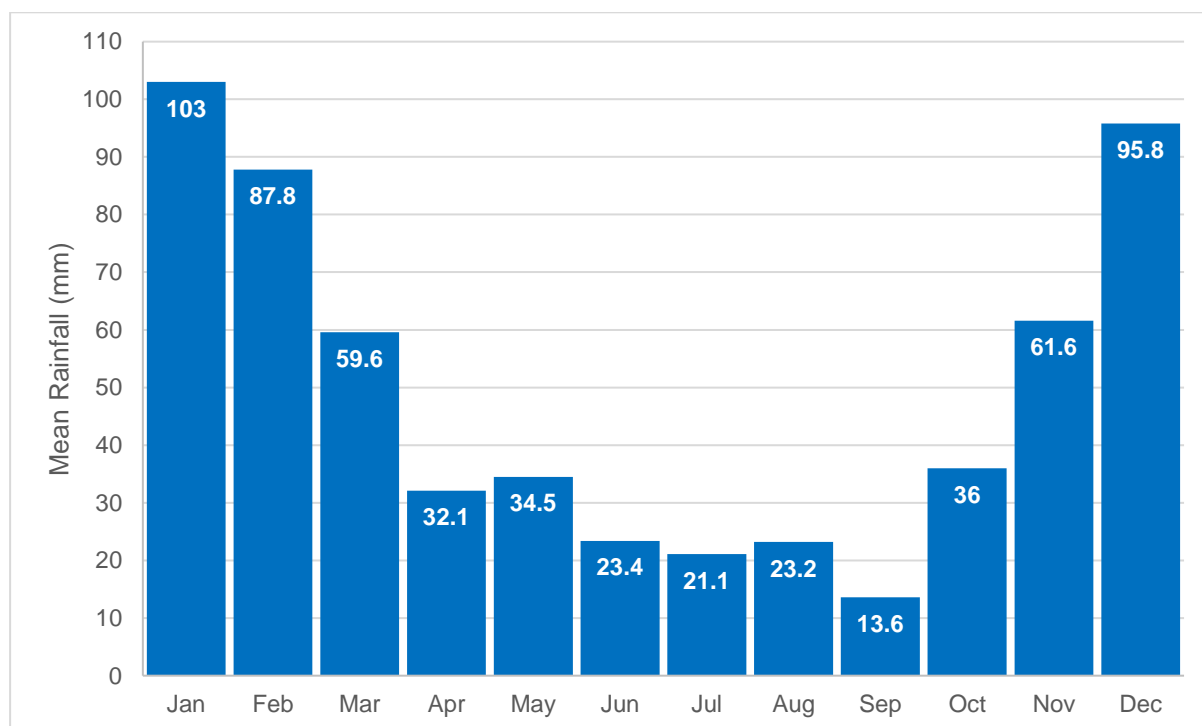
4.1.2 Rainfall

Rainfall data from the SILO climate database and the BoM weather stations is presented in Table 13 and Figure 12 (SILO data only). The mean annual rainfall for the Project region ranges from 591.8 millimetres (mm) to 665.6 mm. December to February is generally accepted as the 'wet season', with rainfall during this time accounting for approximately 50% of the region's total yearly rainfall. The 'dry season' usually occurs from June through to September with monthly rainfall totals below 25 mm consistently being recorded. The rainfall data for this region is consistent with the Köppen climate classification, which lists the region as Subtropical – Moderately Dry Winter.

Table 13 Local Monthly Mean Rainfall Records

Rainfall Record	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
SILO Climate Database													
Mean Rainfall (mm)	103.0	87.8	59.6	32.1	34.5	23.4	21.1	23.2	13.6	36.0	61.6	95.8	591.8
Moranbah Weather Station													
Mean Rainfall (mm)	103.8	100.7	55.4	36.4	34.5	22.1	18.0	25.0	9.1	35.7	69.3	103.9	614.5
Clermont Weather Station													
Mean Rainfall (mm)	117.0	114.4	74.6	38.4	34.1	33.5	25.3	18.7	20.1	35.2	57.0	91.5	665.6

Notes: XX = Maximum Value
XX = Minimum Value



Note: Based on SILO Climate Database data only.

Figure 12 Project Monthly Mean Rainfall Trends

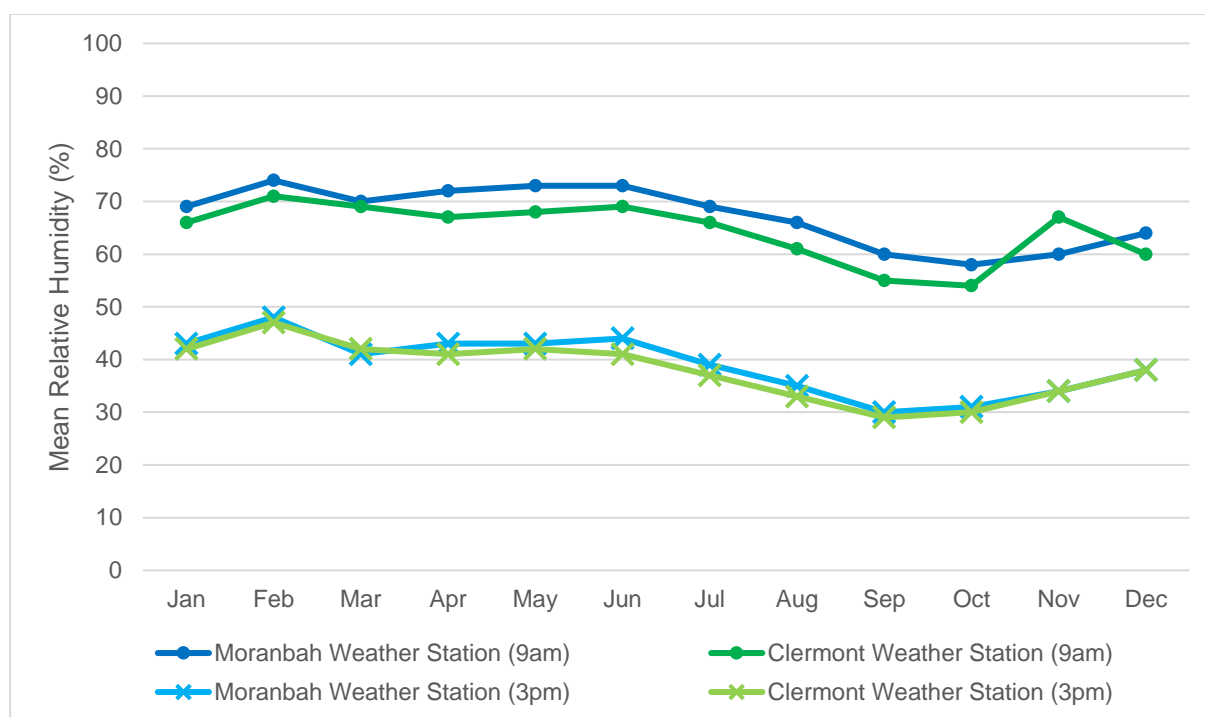
4.1.3 Humidity

Relative humidity data from the Moranbah and Clermont weather stations is presented in Table 14 and Figure 13. Local relative humidity typically increases during November to January (during the onset of the wet season) peaking in February, before gradually declining through to September / October. Relative humidity at 9 am is consistently higher than at 3 pm, which is a standard climatic observation of air moisture decreasing throughout the day, in response to increasing air temperature. No humidity data was available from the SILO climate database.

Table 14 Local Monthly Mean Relative Humidity Records

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Moranbah Weather Station													
Mean 9am Relative Humidity (%)	69	74	70	72	73	73	69	66	60	58	60	64	67
Mean 3pm Relative Humidity (%)	43	48	41	43	43	44	39	35	30	31	34	38	39
Clermont Weather Station													
Mean 9am Relative Humidity (%)	66	71	69	67	68	69	66	61	55	54	67	60	64
Mean 3pm Relative Humidity (%)	42	47	42	41	42	41	37	33	29	30	34	38	38

Notes: XX = Maximum Value
XX = Minimum Value



Note: Based on BoM weather station data only.

Figure 13 Local Monthly Mean Relative Humidity Trends

4.1.4 Wind

Wind speed data from the Moranbah and Clermont weather stations is presented in Table 15 and Figure 14. Within the local region, the windiest months typically occur during the shoulder seasons, with a small trough in the summer and the calmest period during the cooler months. Wind speeds are stronger in the afternoon at both local weather stations; however the Clermont weather station (approximately 95 km from the Project) consistently trends towards higher wind speeds than the Moranbah station (approximately 55 km from the Project).

No wind speed data was available from the SILO climate database.

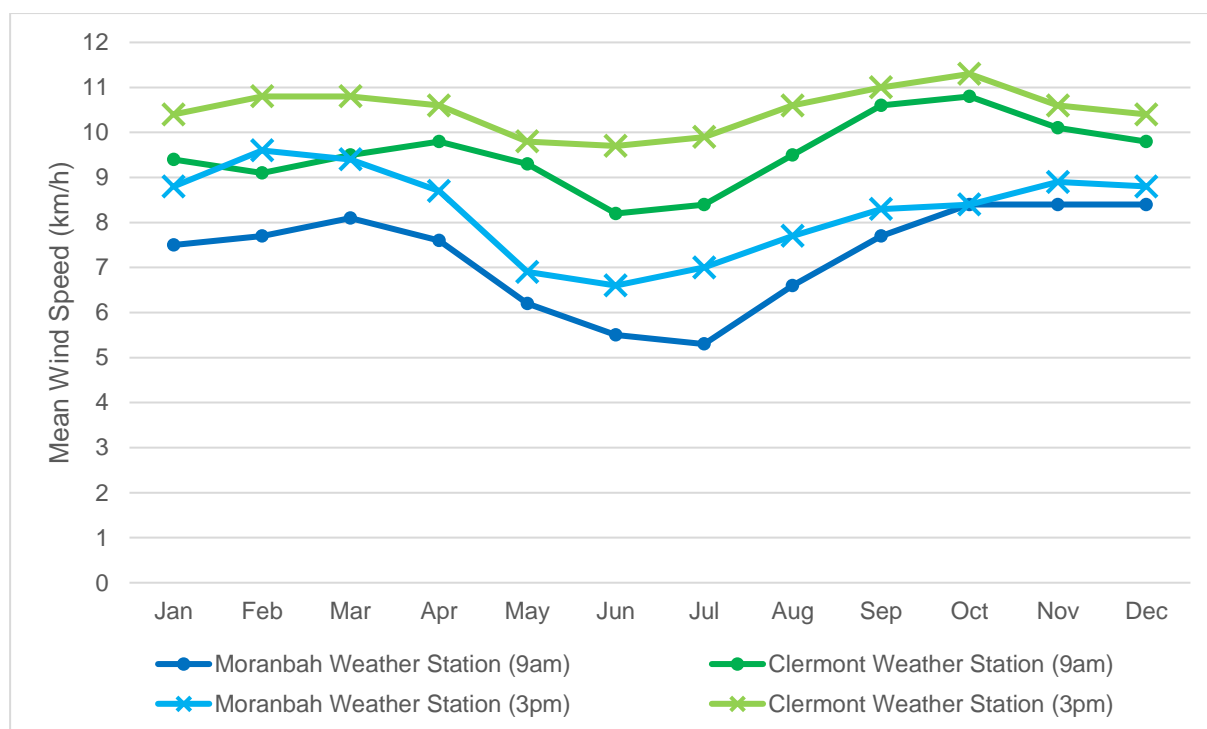
Table 15 Local Monthly Mean Wind Records

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Moranbah Weather Station													
Mean 9am Wind Speed (km/h)	7.5	7.7	8.1	7.6	6.2	5.5	5.3	6.6	7.7	8.4	8.4	8.4	7.3
Mean 3pm Wind Speed (km/h)	8.8	9.6	9.4	8.7	6.9	6.6	7.0	7.7	8.3	8.4	8.9	8.8	8.3
Clermont Weather Station													
Mean 9am Wind Speed (km/h)	9.4	9.1	9.5	9.8	9.3	8.2	8.4	9.5	10.6	10.8	10.1	9.8	9.5
Mean 3pm Wind Speed (km/h)	10.4	10.8	10.8	10.6	9.8	9.7	9.9	10.6	11.0	11.3	10.6	10.4	10.5

Notes: km/h = kilometres per hour

XX = Maximum Value

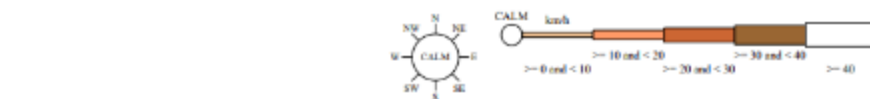
XX = Minimum Value



Note: Based on BoM weather station data only.

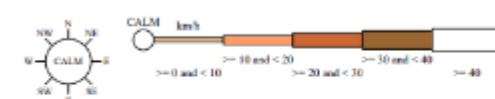
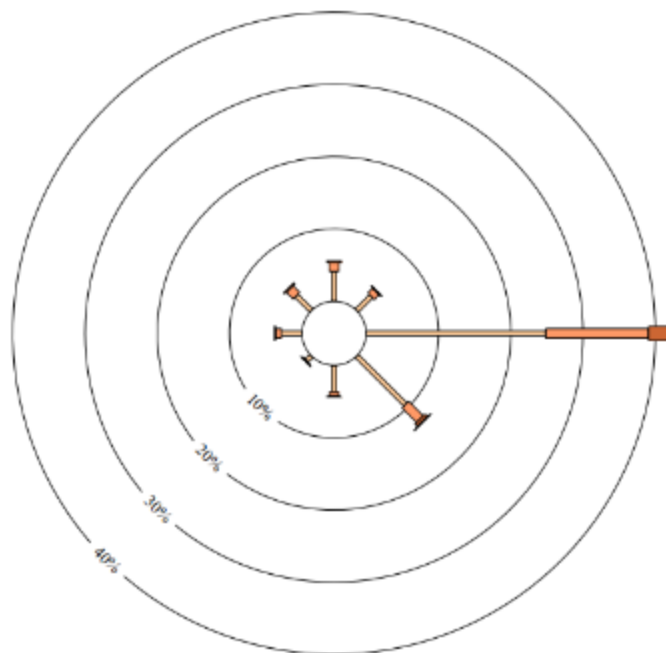
Figure 14 Local Monthly Mean Relative Humidity Trends

Wind roses are also used to demonstrate the annual mean wind direction. At Moranbah (Figure 15) the wind varies little and is predominantly from the east in both the morning and the afternoon. At Clermont (Figure 16) the wind is predominantly from the southeast in both the morning and the afternoon. Clermont, however, notably displays more variation than Moranbah, with more frequent records from both the south and the east.



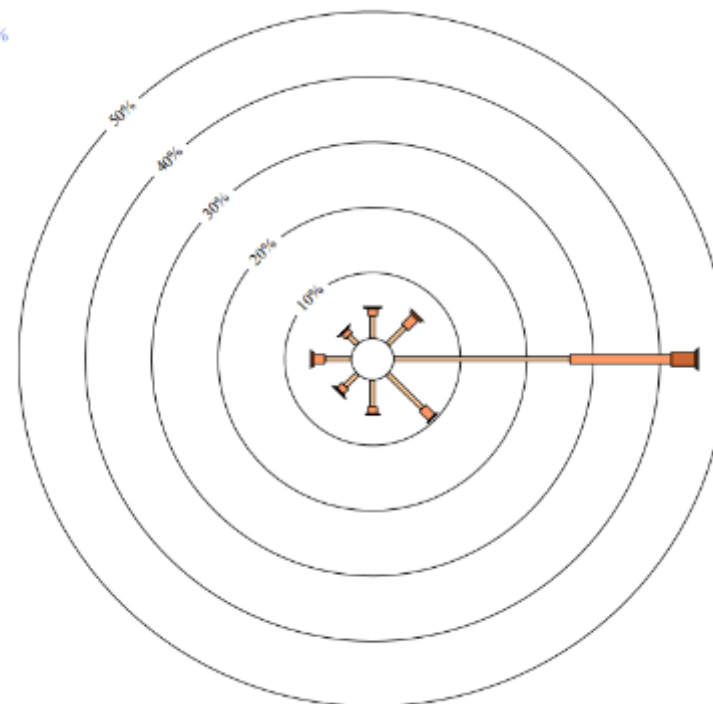
9 am
9141 Total Observations

Calm 22%



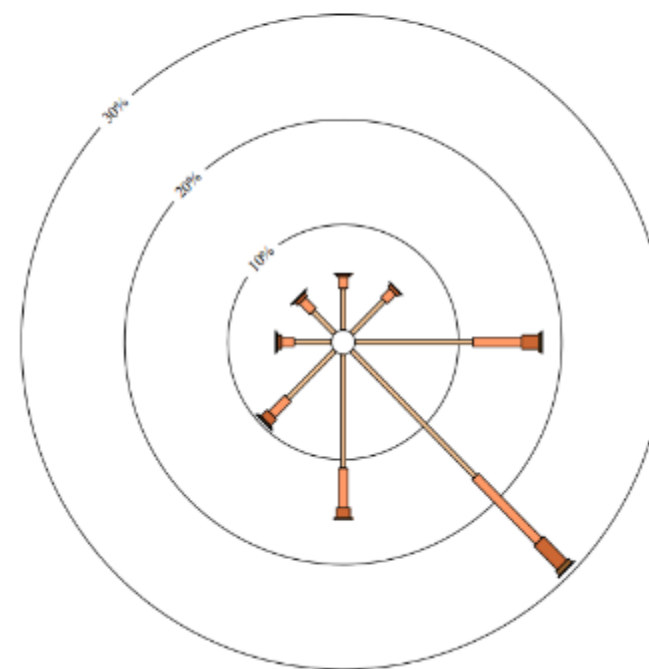
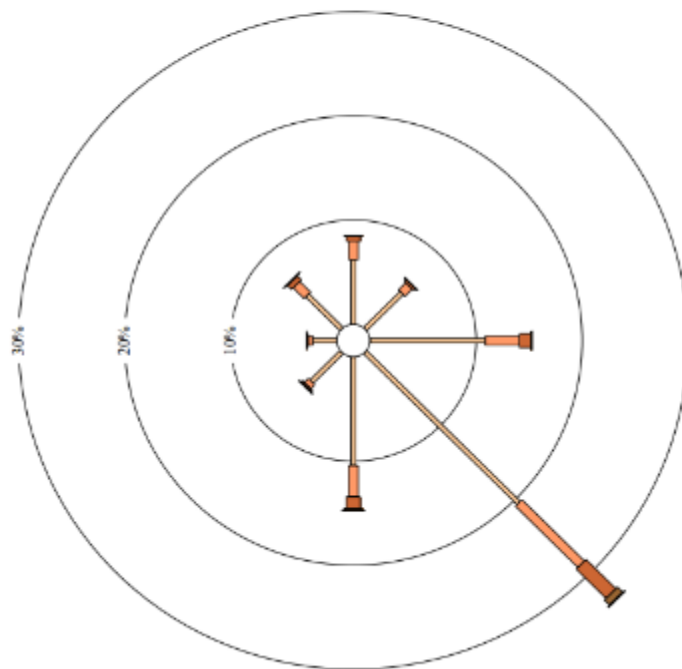
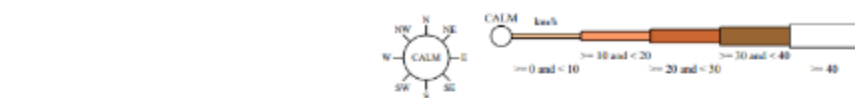
3 pm
8922 Total Observations

Calm 16%



Note: Based on BoM weather station data only.

Figure 15 Annual Wind Speed vs. Direction at Moranbah



Note: Based on BoM weather station data only.

Figure 16 Annual Wind Speed vs. Direction at Clermont

4.2 LAND

4.2.1 Topography and Landscape

The Project is situated within the Bowen Basin of Central Qld. Local topography is typically flat to undulating, sand or clay plains, with several defined alluvial flats. Desktop contour mapping shows the Project typically ranges between 170 m and 200 m in elevation, and there are no major ranges, mountains or valleys present. The western side of the Project is typically higher in elevation, with the Project generally draining west to east towards the Isaac River.

4.2.2 Geology and Geomorphology

The surface geology of the majority of the Project is Cainozoic and consists primarily of sand, silt, clay and minor gravel. The Project is dominated by the two major regional geological formations:

1. the Rewan Group – which is an early to mid-Triassic sandstone, mudstone, and conglomerate; and
2. the Fairhill Formation / Fort Cooper Coal Measures – which are Permian Age sandstones, conglomerates, mudstones, carbonaceous shales, coal, and cherty tuff.

The site is further characterised by linear tracts of the Rangal Coal Measures / Bandanna Formation / Baralaba Coal Measures, predominantly consisting of Permian sandstones, siltstones, mudstones, coal, tuff, and conglomerates.

The Project surface geological composition is described in Table 16 and illustrated in Figure 17.

Table 16 Geological Units of the Project

Period	Rock Unit Name (Map Symbol)	Lithological Summary	Dominant Rock
Late Tertiary - Quaternary	TQa-QLD (TQa)	Locally red-brown mottled, poorly consolidated sand, silt, clay, minor gravel; high-level alluvial deposits (generally related to present stream valleys but commonly dissected).	Alluvium
Quaternary	Qa-QLD (Qa)	Clay, silt, sand and gravel; flood-plain alluvium.	Alluvium

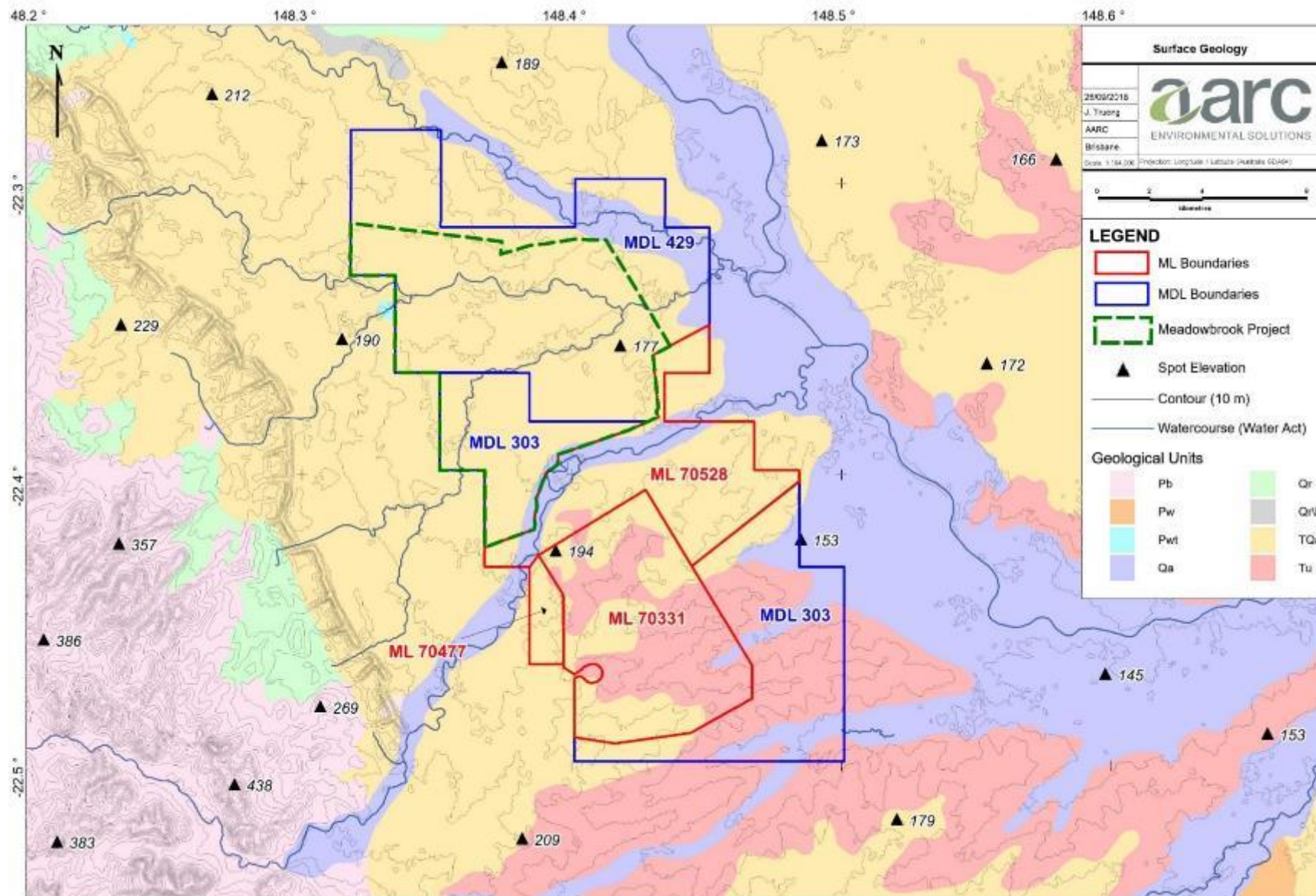


Figure 17 Surface Geology of the Project area

4.2.3 Soils

The Project consists of two major soil units (as per the Atlas of Australian Soils), with Va52 dominating the northern part of the Project and CC30 dominating the south. Va52 soils are hard pedal mottled-yellow duplex soils formed on undulating or gently undulating lands. CC30 soils are grey self-mulching cracking-clays on gently undulating or level plains. A final soil type, Rf8, occurs on the southern margin of the Project, in association with Phillips Creek. Rf8 soils are hard pedal brown duplex soils on alluvial plains, adjacent to major streams. Soils of the Project are described in Table 17 and shown in Figure 18.

Table 17 Soils of the Project

Code	Landform	Description	Soil Type
CC30	Gently undulating or level plains	Grey self-mulching cracking-clays	Uniform fine cracking, smooth faced peds, grey clay horizon underlain by grey/mottled clay.
Va52	Undulating or gently undulating lands	Hard pedal mottled-yellow duplex soils	Duplex yellow-grey, hard setting A horizon, A2 horizon conspic bleached, alk pedal mottled B horizon.
Rf8	Alluvial plains adjacent to major streams	Hard pedal brown duplex soils	Duplex brown, hard setting A horizon, no A2 horizon, alk pedal whole col B horizon.

4.2.4 Land Use Suitability

Agricultural land suitability can be broken down into four different classes (as per Table 18). The Project contains only non-agricultural land (Class D) and is not suitable for agricultural uses due to extreme limitations. Areas to the south, outside of the Project boundary, are suitable for pasture land (Class C) and a wide range of current and potential cropping (Class A) with nil to moderate limitation to production. Figure 19 illustrates the agricultural land suitability of the Project and immediate surrounds.

Table 18 Agricultural Land Suitability

Class	Type	Description
Class A	Crop Land	Land that is suitable for a wide range of current and potential crops with nil to moderate limitations to production.
Class B	Limited Crop Land	Land that is suitable for a narrow range of current and potential crops. Land that is marginal for current and potential crops due to severe limitations but is highly suitable for pastures.
Class C	Pasture Land	Land that is suitable only for improved or native pastures due to limitations which preclude continuous cultivation for crop production. Some areas may tolerate a short period of ground disturbance for pasture establishment.
Class D	Non-agricultural Land	Land not suitable for agricultural uses due to extreme limitations.

The Project does not lie within a Strategic Cropping Area (SCA), nor contain any Strategic Cropping Land (SCL). The closest SCA is located over 7 km to the south of the Project (as per Figure 20).

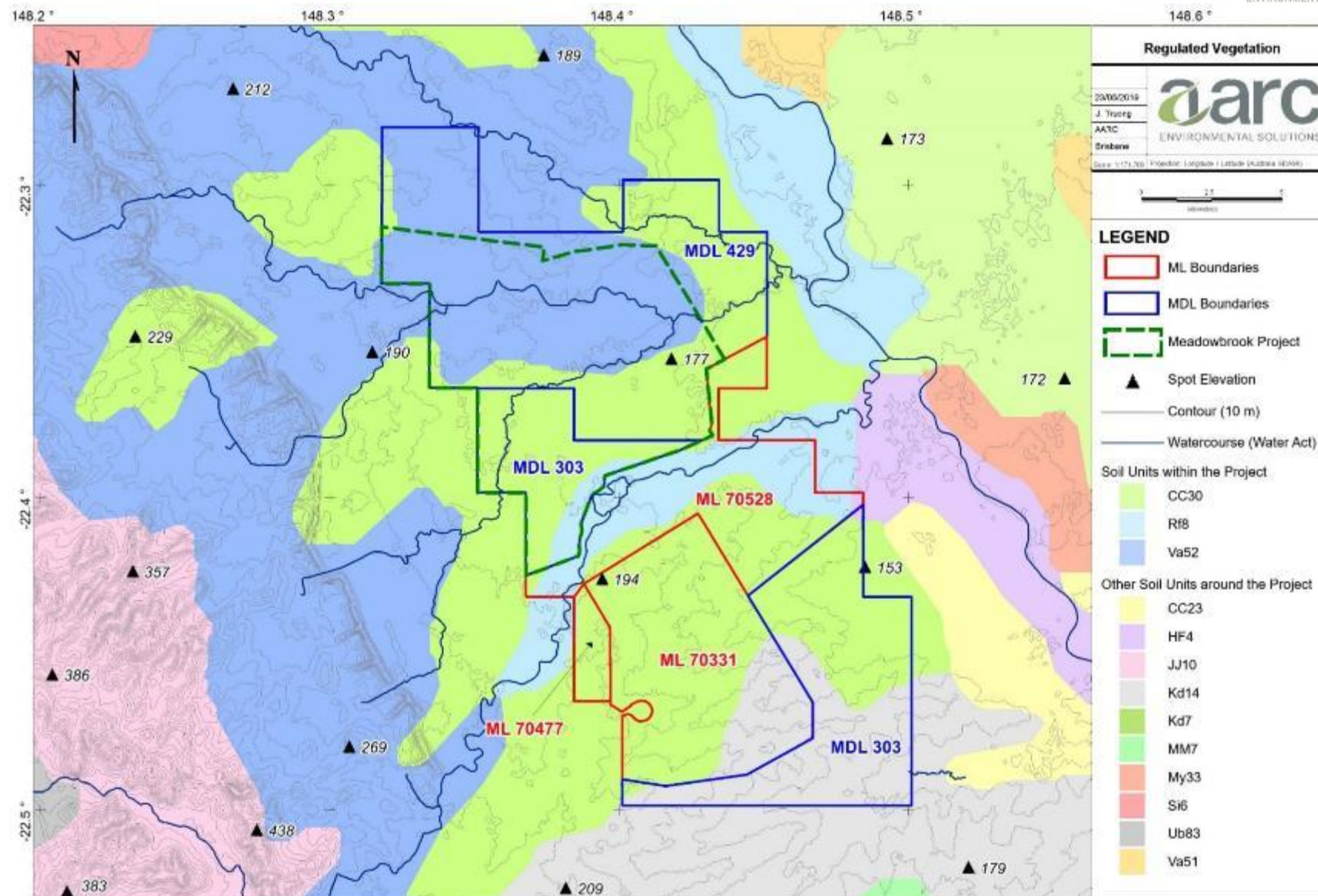


Figure 18 Soils of the Project

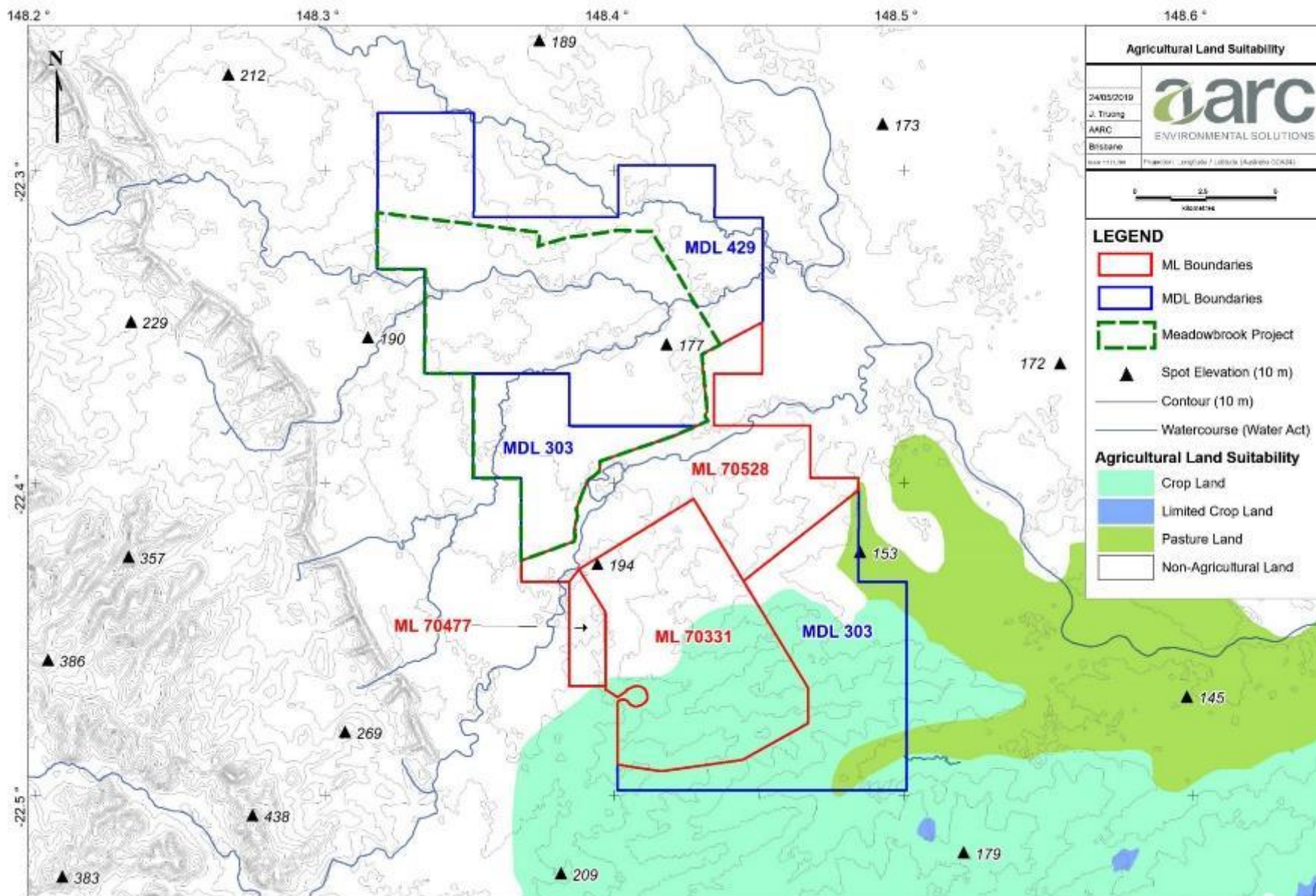


Figure 19 Agricultural Land Suitability

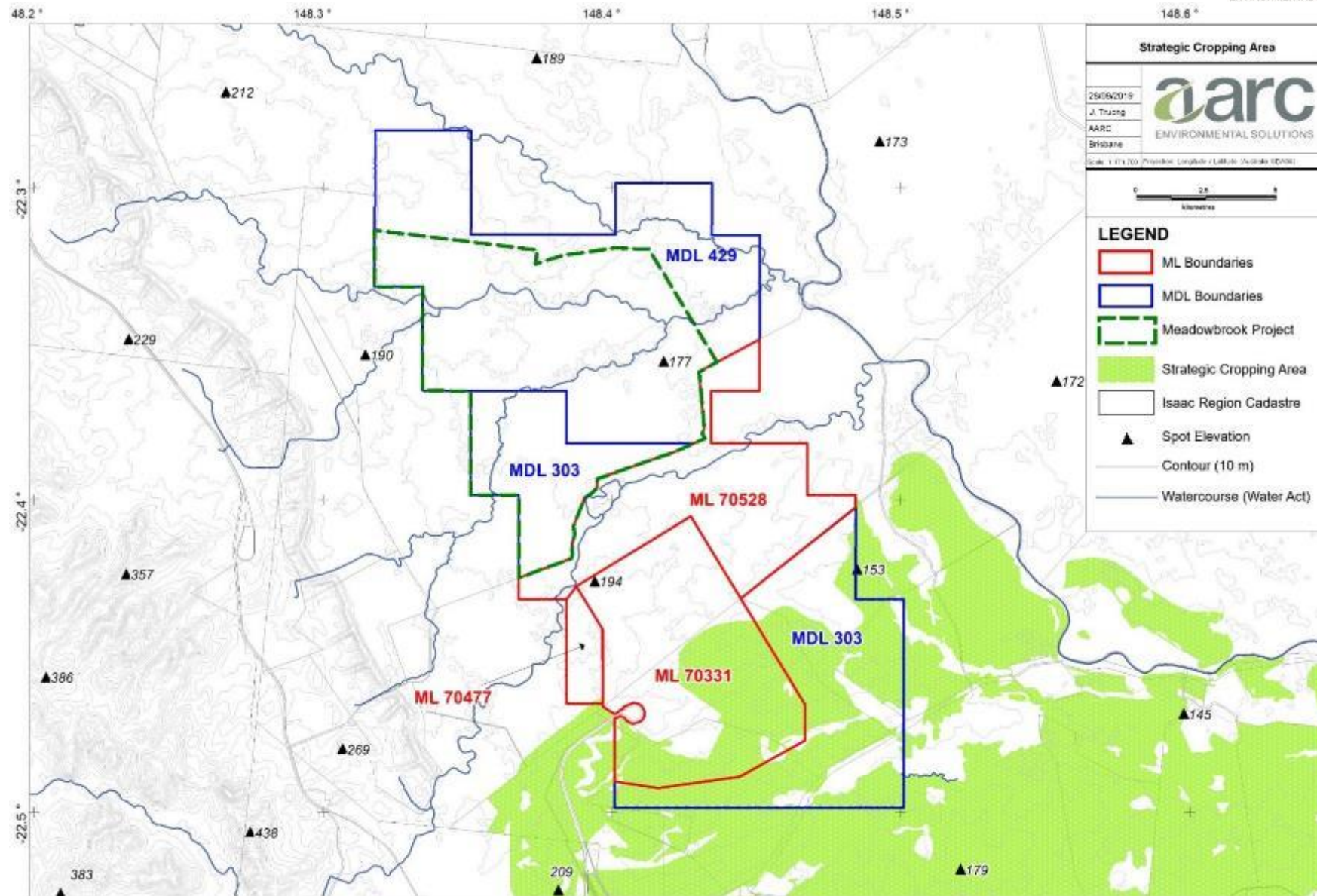


Figure 20 Strategic Cropping Area

4.2.5 Visual Amenity

The existing visual environment of the Project and surrounding area is considered typical of the Bowen Basin. There are a number of different landscape character types that provide a frequently changing visual environment. There are also a limited number of sensitive receivers in the vicinity of the Project site, due to its rural setting and predominate mining activities. The region has a long history of mining and as such, facilities and activities associated with this land use are visible throughout the existing environment.

The closest town to the Project is Dysart (25 km away). Vehicle access throughout the local area, is primarily composed of mining related traffic.

The location of the Project is approximately 7.5 km east of the Saraji Road. Lying between the proposed Project and the Saraji Road is the neighbouring BMA Saraji Mine, whose existing footprint is approximately five times the size of the proposed Meadowbrook Project, and approximately two and a half times the size of the entire Lake Vermont complex. The Fitzroy Development Road lies to the east of the Project, with approximately 12 km of existing pasture land separating the Project from the road. The Olive Downs Coking Coal Project, a recently approved open-cut coal mine, lies over this land, bordering the Lake Vermont Complex to both the east and the north. Golden Mile Road lies approximately 14 km to the south, with the existing Lake Vermont Mine lying in between the road and the proposed Project.

The Project is unlikely to be visible to the general public from surrounding roads and is completely surrounded by existing (or approved future) mining operations.

4.2.6 Potential Impacts to Land

Potential impacts to land are primarily associated with land clearing and subsidence associated with underground mining. The level of subsidence will be dependent on detailed mine design, with this to be subject to detailed modelling throughout the EIS process.

Minimal land clearing will occur during the initial phases of the Project, required only to enable site access via the proposed infrastructure corridor, roads and tracks within the Project, and construction of the MIA. Clearing may potentially destabilise soils, leading to erosion and sediment laden runoff if not properly managed. However, clearing for buildings and conveyor foundations will likely be small in area. The EIS process will determine suitable mitigation measures for management of erosion and runoff.

The Project does not lie within any acid sulphate soil mapping areas, and as such it is not anticipated that any clearing works will cause exposure. The EIS process will include an investigation into the likelihood of acid sulphate soil occurrence. If impacts are identified to potentially occur, mitigation strategies consistent with the *Queensland Acid Sulphate Soil Technical Manual – Soil Management Guidelines* (DES 2014) will be developed as part of this investigation.

As identified, the Proponent is in the final stages of purchasing the land subject to the Project. This land has historically been managed as a cattle property. Rehabilitation activities will aim to restore the pre-mining land uses post closure, to ensure continued beneficial land uses.

In regard to the proposed open-cut mining pits, it is noted that these areas will be designed to ensure compliance with the requirements of the MERFP Act. As such, detailed flood studies will be undertaken throughout the EIS process, to understand the extent of floodplains existing across the site. Where mining pits are proposed to be developed within defined floodplain areas, it is proposed that backfilling of these developments would occur. Further to this, a PRCP will be developed, to provide definition

around ongoing site rehabilitation plans. It is currently anticipated however, that no 'non-use management areas' would exist post mine closure.

In regard to underground mining areas, the potential for surface subsidence is acknowledged. Subsidence has the potential to impact surface infrastructure, land stability, surface water drainage and surface-groundwater interactions. A subsidence impact assessment will be conducted as part of the EIS.

It is noted however, that approximately half of the Project has historically been cleared for agricultural related activities, and minimal further clearing will be required for the construction of the Project. The Project's proposed use of the Lake Vermont Mine CHPP and rail infrastructure further reduce clearing requirements and the Project's overall disturbance footprint. As such, it is not anticipated that vegetation clearing will significantly contribute to environmental impacts. This will nonetheless be assessed through the EIS processes. Similarly, these processes will consider if there are new potential land impacts arising from the Project's use of Lake Vermont Mine's existing infrastructure and consider the use of alternatives.

4.3 WASTE MANAGEMENT

Activities of the Project will generate commercial and industrial waste products, which will comprise of, but not necessarily be limited to:

- vegetation clearing for infrastructural areas and 'satellite' open-cut pits;
- recyclable general waste (e.g. cans, paper and glass);
- non-recyclable general waste (e.g. food scraps and rags);
- regulated waste (e.g. batteries, detergents, hydrocarbon waste, solvents and tyres);
- scrap metal and off-cuts from maintenance activities and from the construction of supporting infrastructure (e.g. engine fuel/oil filters, waste oils); and
- sewage effluent, sludge and wastewater.

All general waste will be stored onsite in designated bins for transport offsite by a licensed waste transport contractor to a licensed landfill.

Regulated waste such as used tyres will be collected and stored in a designated area with no flammable material and be transported offsite to a supplier for re-manufacturing where practicable or disposed onsite in a designated tyre disposal area.

Scrap metal will be placed in a scrap metal skip bin and be collected by a licenced contractor.

Waste oils will be stored in designated waste oil containers within a designated bunded area for transport by a licenced regulated waste contractor to a regulated waste receiver. Engine fuel and oil filters will be collected and stored in sealed oil filter disposal pods, then be transported offsite and treated by licensed regulated waste contractor/s.

Treated effluent from sewage waste will be managed in accordance with legislative requirements and future EA conditions. Any waste water from the Water Treatment Plant onsite, will be managed via the existing MAW management system.

4.3.1 Potential Waste Impacts

Potential impacts to land resultant of inappropriate waste management practices may include ground and surface water contamination, land contamination, and impacts to adjacent sensitive receptors (e.g. odour, visual amenity).

A Waste Management Plan will be prepared for the Project, to ensure effective management of all waste streams generated by the construction and operational phases of the Project. The Waste Management Plan will include the development of strategies to minimise waste generation, promote the re-use and recycling of potential waste streams, and seek to minimise waste generation where waste is unavoidable.

4.4 TRANSPORT

Road Transport

The major road transport route closest to the Project is Saraji Road, which is located approximately 12 km west and intersects with Dysart Clermont Road immediately west of Dysart. Lake Vermont Road extends from Saraji Road, approximately 11 km southwest of the Project and runs northeast for 8 km.

Golden Mile Road runs eastward from Dysart and is located approximately 14 km south from the Project site. Golden Mile Road intersects with Carfax Road, which in turn intersects with the separate southern portion of MDL 303 (not included as part of the proposed Project). Golden Mile Road also intersects with the Lake Vermont access road which runs northward and into the Lake Vermont Mine.

Rail Transport

The main rail transportation in the vicinity of the Project is the Goonyella Railway which runs along the same track as Saraji Road for approximately 27 km to the west of the Project. The Lake Vermont rail spur branches from the Goonyella rail system and runs northward and alongside the Lake Vermont access road. This rail spur is designated for the transportation of product coal.

4.4.1 Potential Impacts to Transport

The traffic and transportation relating to the Project is not considered to have significant impacts to the surrounding area. Potential impacts would primarily be increased traffic during the construction phase of the Project caused by the increasing workforce on the existing road network.

A Transport Impact Assessment will be undertaken as part of the EIS to identify the impacts from transportation attributable to the Project and to determine mitigation strategies.

4.5 WATER

4.5.1 Surface Water

4.5.1.1 Catchment

The Project is located within the Isaac River catchment, which encompasses an area of 6,195 square kilometres (km²) within the Fitzroy River Basin (Figure 21). Relatively little water resource development has occurred along the Isaac River and the only significant water retaining structure is the Burton Gorge Dam, located at the headwaters of the Isaac River.

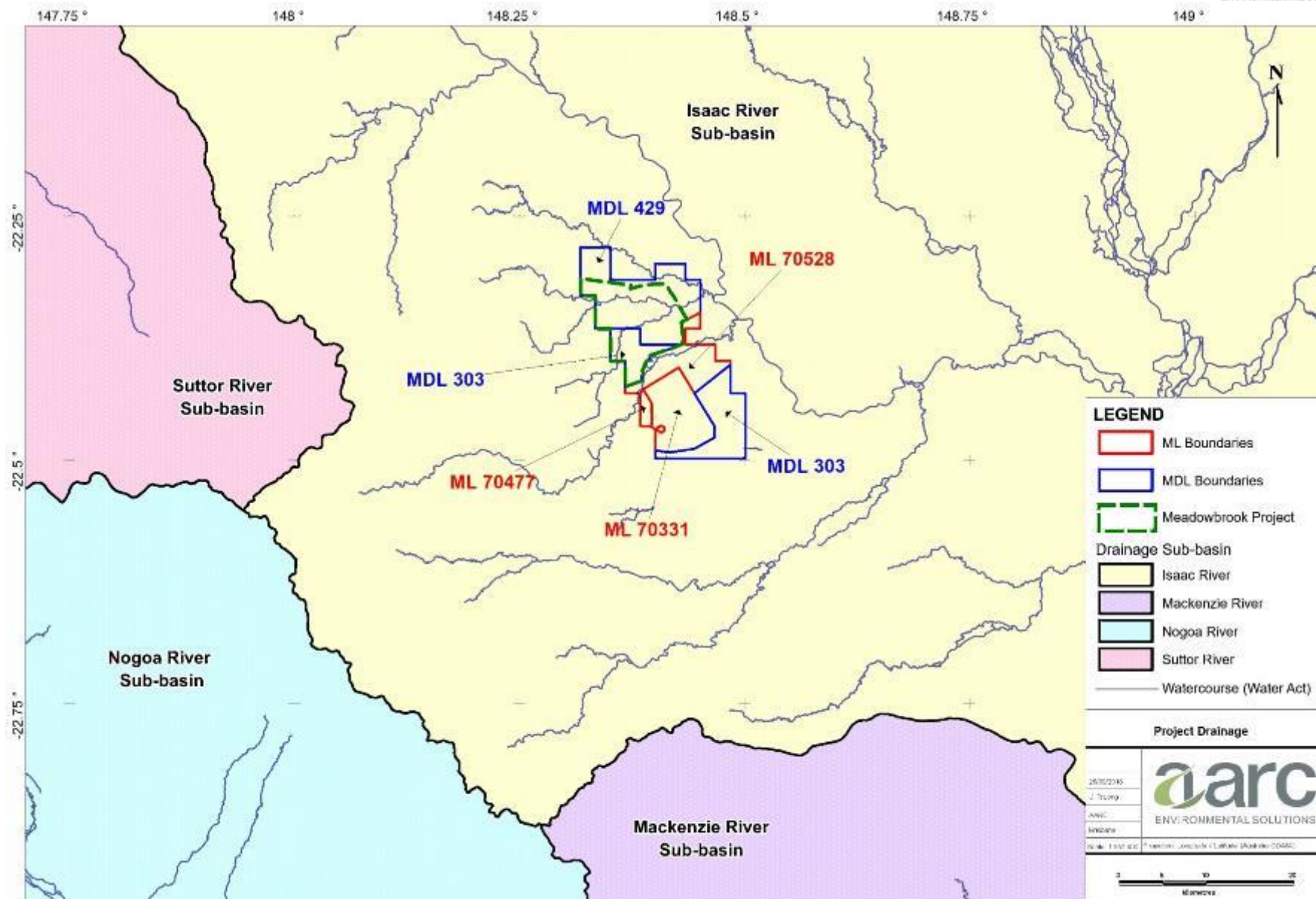


Figure 21 Project Drainage

Waters in the region are classed as slightly to moderately disturbed with existing impacts from broad-scale agriculture, grazing and other mining and resource developments. For example, Saraji Mine is located upstream of Lake Vermont and releases into the same receiving environment as the Lake Vermont Mine and the proposed Project.

4.5.1.2 Drainage

Three watercourses (under the *Water Act 2000*) traverse the Project (Figure 22) including Hughes Creek, Boomerang Creek, and One Mile Creek. Hughes Creek is a stream order 4 watercourse and flows directly into Boomerang Creek (stream order 5) shortly after crossing the western (upstream) boundary of the Project. Boomerang Creek flows due east for about 10 km before receiving the water from One Mile Creek (stream order 3) which flows southeast for approximately 10 km, before joining Boomerang Creek close to the Project's eastern boundary.

Boomerang Creek, One Mile Creek, and Hughes Creek flow through the neighbouring BMA leases (Saraji Mine, Saraji East Project) upstream of the Project. Thus, waters entering the Project may potentially be impacted by neighbouring mining operations.

North of the Project, crossing the northern sections of MDL 429, is Ripstone Creek and its tributaries. Ripstone Creek flows through both the BMA leases and the recently approved Olive Downs Coking Coal Project, before joining with Boomerang Creek and flowing into the Isaac River. To the south of the Project is Phillips Creek, which flows through both the BMA leases and other Lake Vermont Mine tenements.

The southern and south-eastern portion of the Project drains directly into the ephemeral Phillips Creek (located outside of the Project boundary). Phillips Creek joins the Isaac River approximately 8.5 km downstream of the Project. The catchment area of Phillips Creek is approximately 514 km² at the Isaac River confluence with both the Saraji Mine and Lake Vermont Mine within this drainage area.

All of the above-mentioned watercourses ultimately drain into the Isaac River (a stream order 6 watercourse under the *Water Act 2000*) located approximately 4 km to the east of the Project boundary.

A number of unnamed drainage features form upper tributaries of the above watercourses. Streamflow in the region is highly variable, with periods of flow (typically during December to April) interspersed with long dry spells.

4.5.1.3 Wetlands

No wetlands of international importance ('Ramsar' wetlands) or nationally important wetlands (as per the Directory of Important Wetlands) are located on or near the Project.

There are several small wetlands scattered across the Project that are listed as either High Ecological Significance wetlands (with an associated Wetland Protection Area (WPA) buffer zone) or wetlands shown on the Vegetation Management Wetlands Map (refer Figure 22).

There are also several more wetlands (of both categories) located downstream of the Project; occurring in association with the Isaac River. Regional Ecosystem (RE) mapping also indicates the presence of lacustrine, palustrine, and riverine waterbodies, and lacustrine and palustrine REs within the Project boundaries.

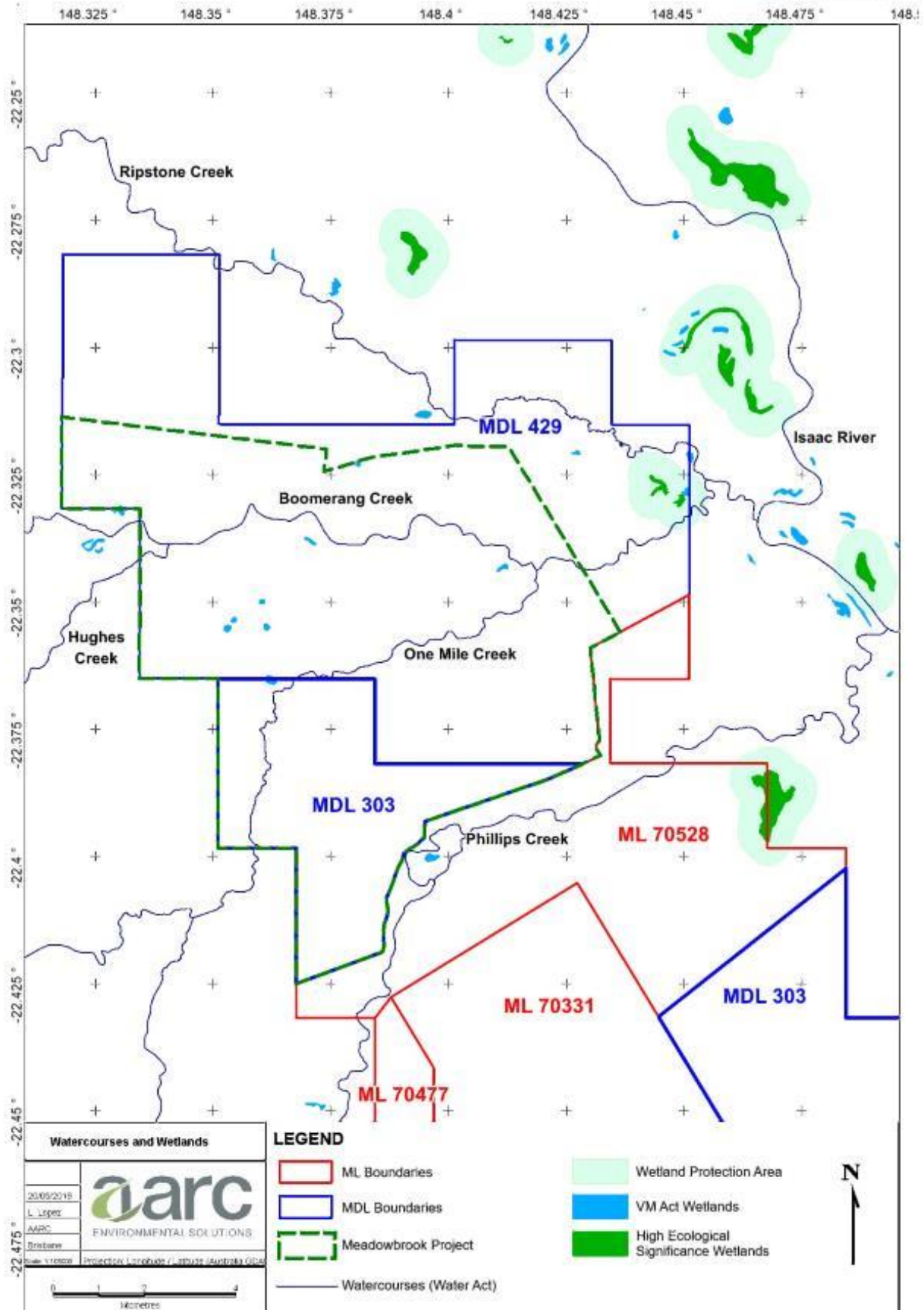


Figure 22 Waterways and Wetlands of the Project

4.5.1.4 Surface Water

During March 2019, a preliminary aquatic ecology assessment (AARC 2019) was undertaken. The results from the surface water quality analysis were compared to the regional Water Quality Objectives (WQOs) to develop a baseline assessment of local water quality.

Several factors, such as direct access of cattle to watercourses and mining activities upstream (Saraji Mine) were identified as likely influencing water quality across the Project. Nevertheless, water quality in the Project is considered typical of a slightly to moderately disturbed aquatic ecosystem in this region, with baseline elevations as follows:

- turbidity levels exceeded the WQOs for aquatic ecosystem values, which is likely attributed to high rainfall events and increased flow rates in the catchment in the days prior to and during the field survey. Deposition of fine sediments from runoff and overland flow is common following increased rainfall and sporadic rainfall events;
- ammonia levels were elevated at one site (compared to WQO for aquatic ecosystem values) which is potentially attributable to faecal deposition by grazing cattle;
- dissolved aluminium, copper, silver and zinc concentrations were elevated compared to guideline values for 95% protection (ANZECC & ARMCANZ 2018), which is likely resultant of upstream agricultural and operational mining influences; and
- total aluminium, lead and copper concentrations were elevated in comparison to guideline values for 95% protection (ANZECC & ARMCANZ 2018), which is likely resultant of upstream agricultural and operational mining influences.

4.5.1.5 Potential Impacts to Surface Water

The Project has the potential to impact on surface water resources in the following manner:

- altering flow paths, flow velocities and flood inundation areas;
- downstream water quality and quantity being impacted by MAW, or run-off from disturbed areas; and
- increased sediment loads due to erosion of disturbed land.

During the EIS process a variety of assessments will be undertaken to guide the development of surface water management plans and strategies. These include, but are not limited to:

- the modelling of surface water drainage to inform mine planning, location of infrastructure and effective site drainage design;
- a detailed flood and drainage impact assessment to identify and mitigate surface water impacts;
- a water balance model to simulate the performance of the mine water management system over the life of the Project and assess its ability maximise the re-use of water and minimise discharge of MAW; and
- a mine water management assessment to evaluate the performance of the proposed Site Water Management Plan.

Where impacts are identified, appropriate management and mitigation strategies will be designed and implemented. To minimise and manage impacts from the construction and operation of the mine and associated infrastructure, a water management system will be developed for the Project (as per Section 3.12). These strategies will be further developed as part of the EIS and may include engineering designs to provide conveyance of clean water flows downstream through areas of subsidence.

4.5.2 Groundwater

The Project is located within the Isaac Connors Groundwater Management Area, as defined under the *Water Resource (Fitzroy Basin) Plan 2011*, developed under the *Water Act 2000*. Groundwater assessment and modelling will be undertaken during the EIS process, to support assessment at both the State and Commonwealth level.

Groundwater investigations within the region have been undertaken to support existing mining activities and geotechnical investigations. Existing data has identified that sources of groundwater associated with the existing Lake Vermont Mine are limited. Geological and hydrogeological units within the area are as follows.

Quaternary Alluvial Aquifers

Quaternary alluvium of the area is typically of limited lateral extent, relatively thin and has not been observed during prior site investigations or geological exploration data, to contain groundwater. It is conceptualised it will not contain permanent groundwater as recharge to the alluvium via direct rainfall recharge or creek flow seeps downwards into the underlying Tertiary sediments. Review of data from groundwater databases indicates that bores have been drilled along watercourses; however, in many cases, the bores are shown to be constructed within units that underlay the alluvium, suggesting the alluvial deposits were initially targeted but found to be dry, and drilling continued until striking water at some depth below the alluvium. The alluvium, however, may be of importance as a source of groundwater recharge to underlying units which could explain the predominance of bores in areas beneath surface drainage lines.

Tertiary Sedimentary Units

Tertiary sediments nearby consist of a sub-horizontal blanket and have been previously observed from both exploration and groundwater drilling to be generally dry. However, the basal sand and gravel deposits have been noted to contain groundwater in some instances. The occurrence of these deposits is extremely sporadic, and the continuity of the deposits is not mappable.

Triassic Sedimentary Units

The Rewan Group occurs as a discrete lens that is fault-bound to the east by the Isaac Fault, and forms the recognised basal confining unit of the hydrogeological Great Artesian Basin and normally conceptualised as being a regional aquitard. The unit is known to contain structures or sandstone lenses that are capable of providing locally useable volumes of water for stock supply. However, in the surrounding region there are no registered bores constructed within Rewan Group sediments. This observation, combined with observations from prior drilling nearby, supports a conceptualisation of this unit as low permeability not forming significant regional groundwater units, and likely unimportant as a potential source of groundwater.

Permian Sedimentary Units

Within the Bowen Basin it is generally accepted that coal seams are more permeable relative to the Permian overburden and interburden material. Bores are often drilled dry until a water-bearing coal seam is encountered, with water rising up the borehole, indicating confined conditions within the coal

seam. Due to the low permeability of the coal measures, groundwater residence time is often long, resulting in occurrences of highly saline groundwater in some areas. It is often the case however, that the coal measures are the first unit where useable volumes of groundwater are encountered.

4.5.2.1 Groundwater Dependant Ecosystems

Due to the likely limited groundwater resources present around the Project, it is not anticipated that the Project will have an impact on Groundwater Dependant Ecosystems (GDE). However, during the EIS process an assessment will be undertaken to determine the presence of, and potential for, impact to GDEs. This will be based on a combined assessment inclusive of groundwater modelling, surface vegetation mapping and research into species rooting depths.

RE mapping of GDEs based on the National Atlas of GDEs (BoM 2018a) is illustrated in Figure 23 (aquatic GDEs) and Figure 24 (terrestrial GDEs) which identifies:

- large areas of land within the Project as having either no, or a low, potential for groundwater interaction;
- the Isaac River main channel as a GDE with a high potential for groundwater interaction, reliant on surface expression of groundwater;
- some areas immediately adjacent to the main channel as having a moderate potential for groundwater interaction, including vegetation reliant on subsurface groundwater;
- isolated areas immediately adjacent to Ripstone Creek as having a high potential for groundwater interaction, including vegetation reliant on subsurface groundwater;
- other isolated areas as having a moderate potential for groundwater interaction, including vegetation reliant on subsurface groundwater;
- wetlands on the Isaac River floodplain with moderate potential for groundwater interaction; including vegetation reliant on subsurface groundwater; and
- vegetated swamps in depressions beyond the Isaac River floodplain with moderate potential for groundwater interaction, mapped as GDEs reliant on surface expression of groundwater.

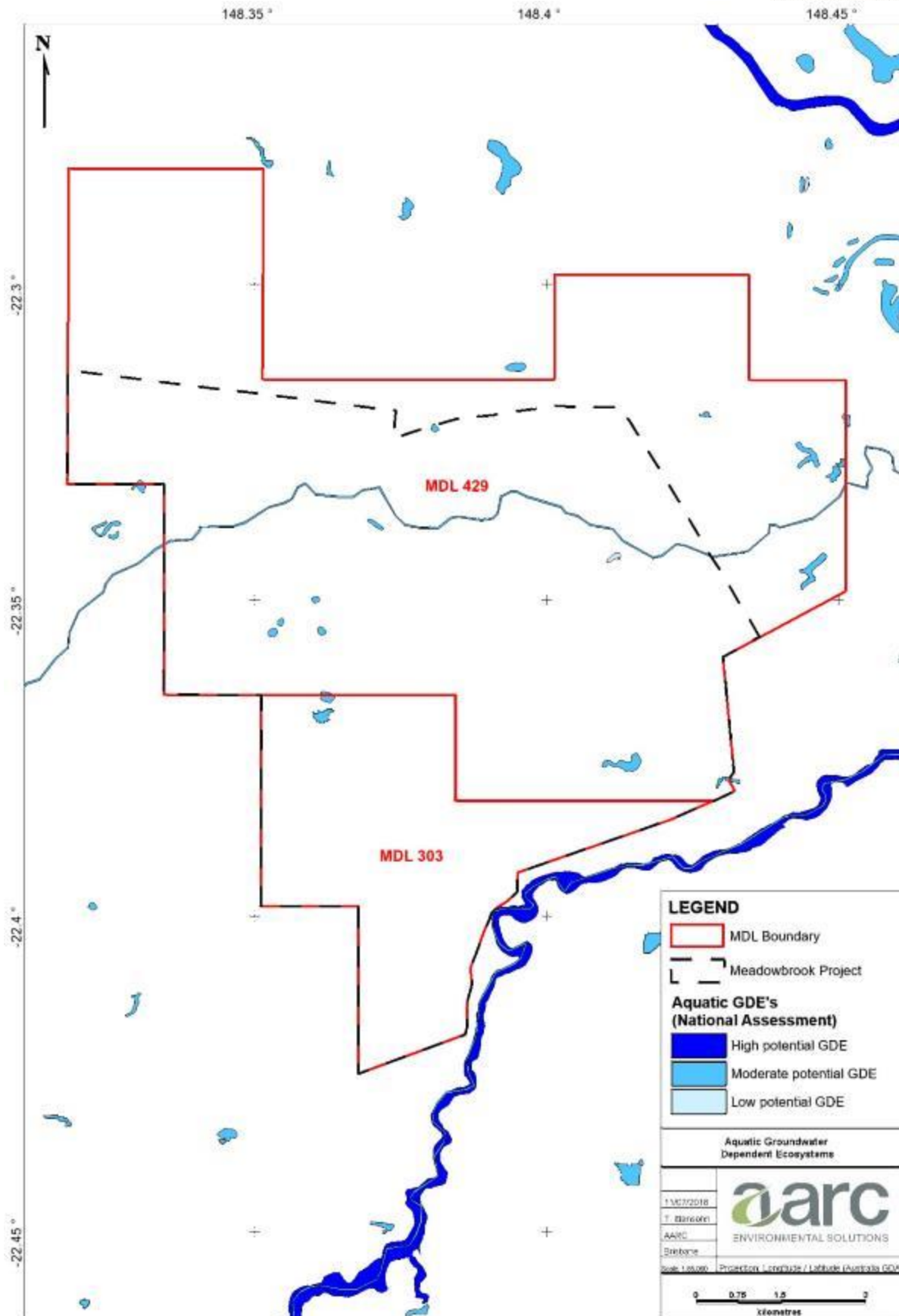


Figure 23 Potential for Presence of Aquatic GDEs

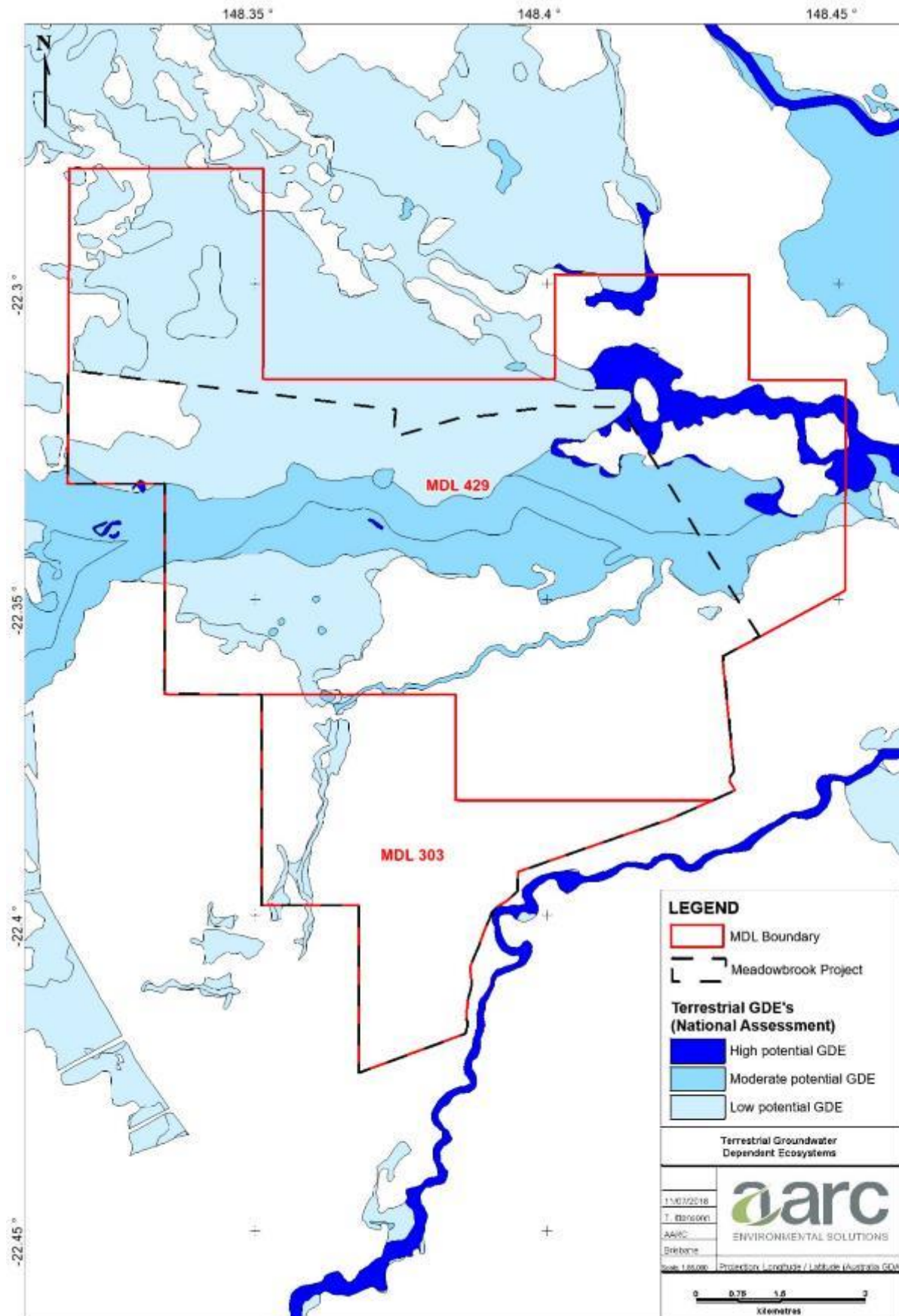


Figure 24 Potential for Presence of Terrestrial GDEs

24.1.1.1 Potential Impacts to Groundwater

Groundwater may be impacted by mining activities, such as through the depressurisation of aquifers and the release of contaminants impacting groundwater quality. Localised drawdown or depressurisation of groundwater is a likely result of underground mining activities. Additionally, underground longwall mining may cause subsidence resulting in surface cracking, another potential cause of depressurisation of overlying groundwater units. Subsidence cracking can also increase the potential for interaction between adjacent groundwater units and surface water.

Seepage from chemical stores, mine water dams, and waste storage facilities are also identified as potential sources of groundwater contamination. Consequently, storage facilities and dams will be designed to ensure they do not pose a risk of groundwater contamination due to seepage.

Studies conducted as part of the EIS process will assess all potential groundwater impacts related to the proposed development and provide mitigation measures for implementation. Studies will include a groundwater impact assessment (including consideration of potential GDE and stygofauna impacts), a surface water impact assessment and a Project flood study.

Registered bores and existing groundwater users within the area of potential impact will be identified, and where needed 'make good agreements' will be negotiated and implemented.

The Project will implement a Site Water Management Plan, Receiving Environment Monitoring Program and a Groundwater Monitoring Program to ensure effective water management during construction and operational mining phases.

4.6 AIR QUALITY

Air quality within and surrounding the Project is anticipated to be representative of the existing local environment. Current influences on existing air quality includes grazing activities, transportation activities, and regional mining activities.

As previously highlighted, the Project is bordered on two sides (west and south) by active open-cut coal mines. This land usage has the potential to affect baseline air quality, along with the current pastoral land use of the Project.

Current pastoral areas to the north and east of the Project also have approval to be developed into an open-cut coal mining operation in future, which may further influence the local air quality. Regional air quality is likely influenced by the extensive mining industry present throughout the Bowen Basin and central Qld.

4.6.1 Greenhouse Gases

Greenhouse gas (GHG) emissions, and other air pollutants, will also likely be generated from construction and operational activities relevant to the Project. Mining activities will generate GHG through fugitive coal seam gas emissions, combustion of diesel fuels in mining plant and equipment, and electricity usage.

Other activities onsite can also generate emissions such as the use of diesel-fuelled equipment and blasting. Emissions from the diesel-fuelled equipment generally comprises of carbon monoxide, nitrogen dioxide and other pollutants, such as sulphur dioxide. Emissions from onsite blasting are typically of nitrogen oxides.

4.6.2 Potential Impacts to Air Quality

Relevant to the Project; land clearing activities, open cut mining developments, internal haulage/transportation of coal materials, materials stockpiling and rail haulage; all have the potential to generate dust related impacts.

Sensitive receptors in the vicinity of the Project area have the potential to be affected through either direct or indirect air emissions. These sensitive receptors will be identified through EIS studies, however, may include farm sheds / working areas, rural residential dwellings, mine office buildings and broader farmland areas. Emissions and air pollutants may also have the potential to reach nearby towns (e.g. Dysart) which can lead to adverse impacts on human health and the natural environment. Such scenarios will be modelled through EIS studies.

An Air Quality and GHG Assessment will be undertaken as part of the EIS, to identify potential sensitive receptors and / or develop appropriate mitigation measures. The Proponent will also monitor the Project's GHG emissions through its participation in the Australian Government's Emissions and Energy Reporting System (EERS) under the Commonwealth's *National Greenhouse and Energy Reporting Act 2007* (NGER Act). It is required under the EERS to measure and report the GHG emissions and energy consumption on an annual basis.

4.7 NOISE AND VIBRATION

The noise environment within and surrounding the Project is typical of a rural environment with little human activity, however noise and vibration generated from exploration and mining activities is likely already present within the baseline noise environment. The Goonyella Railway passing near the Project is also likely to contribute to the acoustic environment, as may local road networks.

Noise sources from mining activities can often include blasting, crushing, processing, conveying, road and rail haulage and loading activities. Many of these sources relate to the operation of heavy machinery, while vibration can also be generated through construction and blasting activities and movement of heavy underground equipment.

4.7.1 Potential Noise and Vibration Impacts

Noise and vibration from construction and operational activities could potentially cause a disturbance to sensitive receptors and local environmental values.

The level of noise and vibration measured at a sensitive receptor will vary depending on distance from the source, prevailing meteorological conditions (e.g. wind direction and temperature), the intervening topography and the nature of the sensitive receptor being impacted.

A noise and vibration assessment will be undertaken as part of the EIS, including modelling of a range of different scenarios. This will assist in identifying potential sensitive receptors, quantifying potential impacts and to developing mitigation measures where required.

4.8 NATURE CONSERVATION

A desktop assessment of the natural values of the Project was undertaken on the 2nd to 3rd October 2018, to identify the values in the vicinity of the Project. All database searches were based on either the 'Meadowbrook' Lot/Plan, the Project MDLs, or the central Project coordinate point (-22.3503, 148.3908) - depending on the database search undertaken.

The following database searches were undertaken:

1. Environmental Reports Online (search based on MDL boundaries);
 - a. Biodiversity Planning Assessments and Aquatic Conservation Assessments;
 - b. Matters of State Environmental Significance;
 - c. Regional Ecosystems;
2. Environmentally Sensitive Area (ESA) Mapping (search based on MDL boundaries);
3. Protected Plants Flora Survey Trigger Map (search based on central coordinate point);
4. EPBC Act Protected Matters Search Tool (PMST) (two searches based on central coordinate point with 20 km and 50 km buffers);
5. Regulated Vegetation Management Report (search based on Lot/Plan);
6. Wildlife Online Species List Request (two searches based on central coordinate point with 20 km and 50 km buffers);
 - a. Rare and Threatened Species;
 - b. Introduced Species; and
7. WildNet Records Conservation Significant Species List (search based on circular area selected over the Project to best mimic a 'central point with buffer'; area selected was roughly equivalent to a 20 km buffer with a report area of greater than 285,000 ha).

Desktop assessment of the natural environment has established (through database searches) that none of the following occur on or adjacent to the Project:

- Heritage Places or Properties, or Commonwealth Land;
- Parks or Reserves of any kind;
- Protected, Refuge, Conservation, Fish Habitat or Marine Areas of any kind;
- Strategic Environmental Areas;
- Nationally or Internationally Important Wetlands;
- Legally Secured Offset Areas; or
- Protected Plants Flora Survey Trigger Area.

Additional resources that provide species records and related information, such as the Atlas of Living Australia (ALA), was also consulted where appropriate, to support the development of 'likelihood tables'.

Given the presence of surrounding mining activities; that have all undergone (or are currently undergoing) approval processes; a multitude of documentation (including ecological assessment reports) have also been reviewed to support an understanding of potential impacts.

During March 2019, preliminary terrestrial and aquatic ecological assessments (AARC 2019a; AARC 2019b) were also undertaken. Relevant field results have been included within this IAS where appropriate. Further ecological field studies are also still to be completed, with the next phase of assessment to occur this month (November 2019).

The following sections address items of nature conservation relevant to the Project, as identified through the desktop assessment and preliminary field investigations.

4.8.1 Regional Ecosystems

Current DES RE mapping identified ten REs as potentially occurring within the Project (refer Table 19 and Figure 25). A brief description of each RE is provided along with the conservation status under the VM Act and the DES Biodiversity Status. Of the ten REs identified, four are listed as Endangered and three are listed as Of Concern under both conservation status'. An additional two REs are listed as Of Concern under the DES Biodiversity Status only (and Least Concern under the VM Act), and one is listed as Least Concern / No Concern under their respective conservation status'.

Field verification of RE mapping has commenced but is not yet complete, with further field assessment currently being undertaken (Nov 2019). Thus far, seven of the ten REs have been confirmed on the Project (as per Table 19) and the DES RE Map has been confirmed as largely accurate. However, it is noted that some areas of the Project are yet to be assessed, to finalise boundaries and the presence of all REs within the Project.

Where possible, avoidance to impacts on REs of conservation significance will be undertaken through mine planning. If avoidance cannot be achieved, opportunities to minimise impacts will be investigated. Where this is not possible, and significant residual impact thresholds are expected to be exceeded, an Offset Strategy will be developed.

Regulated vegetation is mapped in Figure 26, which shows the Project contains Category B (remnant vegetation), Category C (high-value regrowth) and Category X (areas able to be cleared under a Property Map of Assessable Vegetation (PMAV)). Over half of the Project is mapped as Category X, with the majority of Category B (remnant vegetation) areas located in the north of the Project, in association with Boomerang Creek and adjacent floodplains.

Table 19 Regional Ecosystems mapped within the Project

RE	Description	Conservation Status		Presence on the Project	
		VM Act	DES Biodiversity	Desktop	Field
11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains.	E	E	Sub-dominant	Unconfirmed
11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains.	OC	OC	Dominant	Confirmed Dominant
11.3.2b	<i>Eucalyptus camaldulensis</i> (sometimes <i>E. populnea</i> and or <i>E. tereticornis</i>) woodland in drainage depressions (i.e. vegetated swamp).	OC	OC	Sub-dominant	Unconfirmed
11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines.	LC	OC	Sub-dominant	Confirmed Dominant
11.3.27b	Freshwater wetlands (i.e. billabongs, lakes). Vegetation ranges from open water +/- aquatic and emergent species.	LC	OC	Dominant	Confirmed Dominant
11.3.3	<i>Eucalyptus coolabah</i> woodland on alluvial plains.	OC	OC	Dominant	Unconfirmed
11.4.8	<i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains.	E	E	Dominant	Confirmed Dominant
11.4.9	<i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains.	E	E	Dominant	Confirmed Dominant
11.5.3	<i>Eucalyptus populnea</i> +/- <i>E. melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces.	LC	NC	Dominant	Confirmed Dominant
11.5.17	<i>Eucalyptus tereticornis</i> woodland in depressions on Cainozoic sand plains and remnant surfaces.	E	E	Dominant	Confirmed Dominant
Non-rem	Non-remnant vegetation (i.e. pasture, cropping, regrowth, etc.)	N/A	N/A	Dominant	Confirmed Dominant

Note: E = Endangered
 OC = Of Concern
 LC = Least Concern
 NC = No Concern at Present

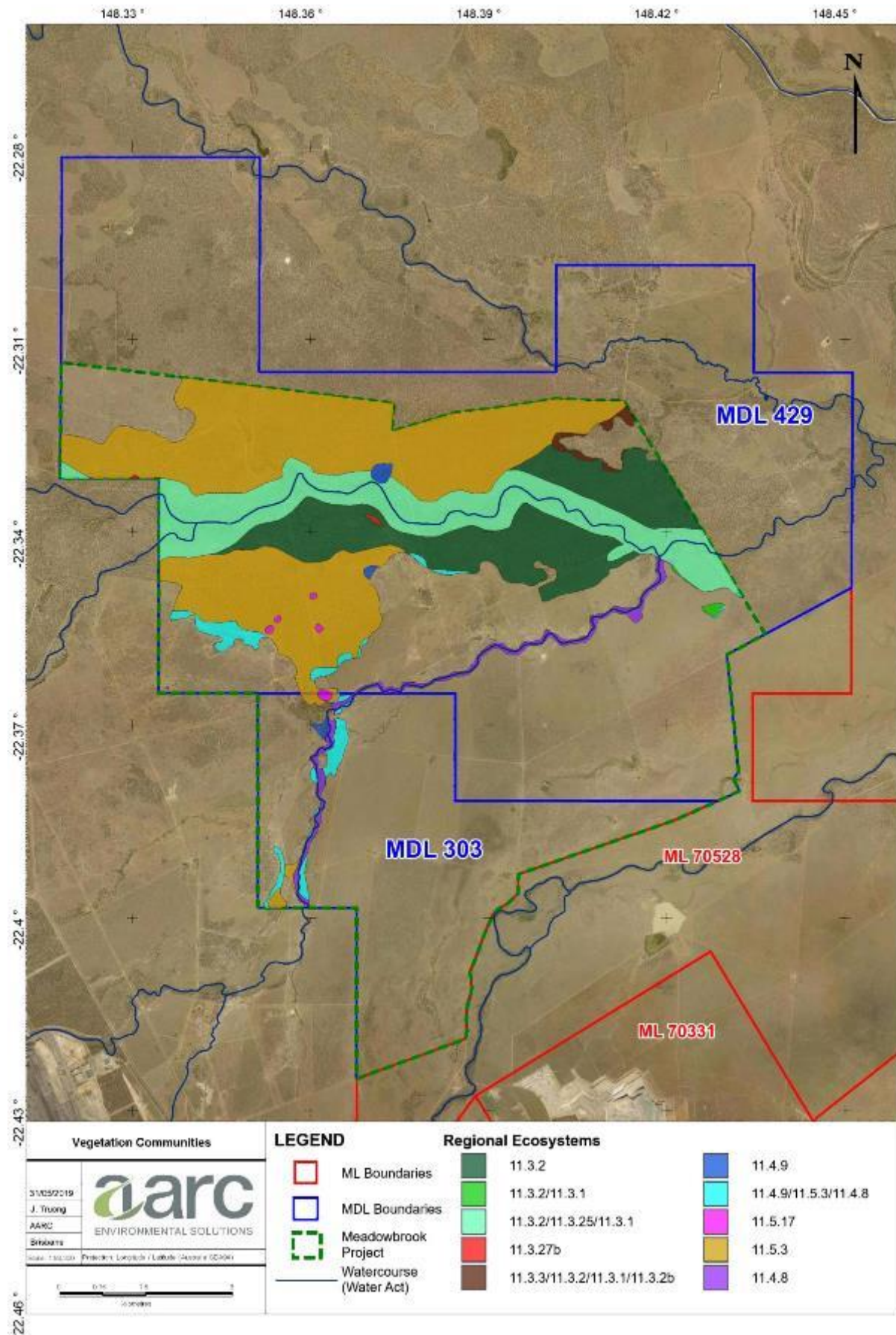


Figure 25 Regional Ecosystems mapped within the Project

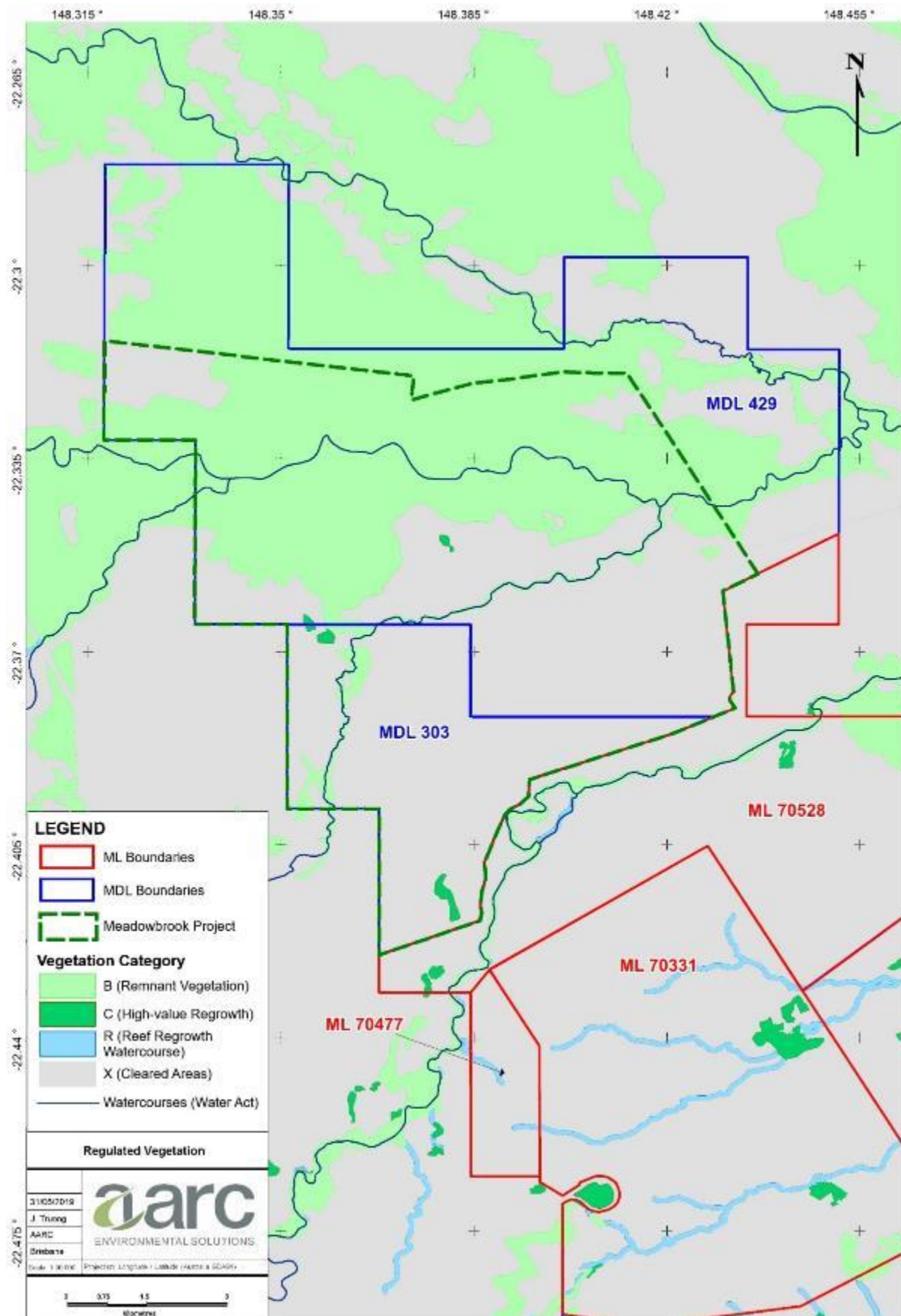


Figure 26 Regulated Vegetation (VM Act) associated with the Project

4.8.2 Environmentally Sensitive Areas

One ESA potentially present within the Project is a patchy representation of Endangered Regional Ecosystems (ERE). This mapping is based on DES RE mapping, showing vegetation with an endangered Biodiversity Status. The REs within the Project boundary triggering this is predominantly patches of *Brigalow* dominant vegetation (RE 11.3.1, RE 11.4.8, RE 11.4.9), and a few small patches of vegetated swampland in the south (RE 11.5.17 - *Eucalyptus tereticornis* woodland in depressions). With the exception of RE 11.3.1, these REs have been confirmed as present on the Project, however mapped distribution is yet to be finalised. The ESA Map database request is provided as Appendix A.

4.8.3 Threatened Ecological Communities

The PMST returned two Threatened Ecological Communities (TECs) as potentially occurring within a 0 to 20 km buffer zone of the Project central co-ordinate, and an additional two TECs potentially occurring within the 20 to 50 km buffer zone. Each TEC, its protection status and PMST type of presence is outlined in Table 20.

Table 20 Threatened Ecological Communities

Name	Status	PMST Presence
0 – 20 km Project Buffer Zone		
Brigalow (<i>Acacia harpophylla</i> dominant and codominant).	Endangered	Known to Occur
Natural Grasslands of the Qld Central Highlands and northern Fitzroy Basin.	Endangered	Likely to Occur
20 – 50 km Project Buffer Zone		
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions.	Endangered	Likely to Occur
Weeping Myall Woodlands.	Endangered	Likely to Occur

Field verified RE mapping will be used to finalise the presence of TECs within the Project. Likelihood of occurrence tables have been prepared for the TECs identified in the desktop assessment and further supported by preliminary field results (refer Table 21).

For TECs confirmed as present during the field verification of RE mapping, the boundaries will be mapped, and a vegetation assessment undertaken to determine whether the community meets the key diagnostic characteristics and condition thresholds of that TEC.

Table 21 Likelihood of TEC Occurrence

Name	Database Searches			Likelihood of Occurrence
	PMST	Presence on Surrounding Projects	Corresponding REs Mapped within Project	
Brigalow (<i>Acacia harpophylla</i> dominant and codominant)	Known to Occur (0-20 km)	Lake Vermont Mine Olive Downs Project Saraji East Project	11.3.1 11.4.8 11.4.9	<p><u>Desktop Assessment: Likely</u> Brigalow TEC is common throughout central QLD in small remnant patches. It is known to occur within a 20 km buffer of the Project, as well as having been previously identified on all of the surrounding Projects. Three REs that correspond to the TEC have been mapped by DES as occurring on the Project. It was considered likely that this TEC would be identified within the Project during RE mapping validation. TEC key diagnostic characteristics and condition threshold assessments will be undertaken as part of the EIS process to determine presence and potential for impacts.</p> <p><u>Field Verification: Highly Likely</u> RE 11.4.8 and RE 11.4.9 were confirmed as present on the Project, however RE 11.3.1 remains unconfirmed. Field verification that REs confirmed as present meet the key diagnostic characteristics and condition thresholds to be classed as Brigalow TEC has yet to be confirmed.</p>

Natural Grasslands of the Qld Central Highlands and northern Fitzroy Basin	Likely to Occur (0-20 km)	Saraji East Project	None	<p><u>Desktop Assessment: Unlikely</u> This TEC was identified as likely to occur within a 20 km buffer of the Project and has been previously identified on the Saraji East Project. 27 ha of RE 11.4.4 that corresponds to the TEC has been mapped by DES as occurring in the far southeast corner of the southern portion of MDL 303. MDL 303 is broken into northern and southern portions with the existing Lake Vermont Mine in the centre. The proposed Project only overlies the northern portion of MDL 303, and therefore it was considered unlikely that this TEC would be found within the proposed Project. No grassland REs (TEC or otherwise) have been mapped by DES within the Project.</p> <p><u>Field Verification: Unlikely</u> No grassland REs (TEC or otherwise) have been identified on the Project thus far. All grasslands currently confirmed within the Project are cleared pasture constituted of characteristic introduced pasture species.</p>
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Likely to Occur (20-50 km)	Not Identified	None	<p><u>Desktop Assessment: Unlikely</u> Vine thicket TEC is not known to occur within 20 km of the Project and is only considered likely to occur within a 20 – 50 km buffer of the Project. It has not been previously identified on any of the surrounding Projects. No REs that correspond to the TEC have been mapped by DES as occurring on the Project. It was considered unlikely that this TEC would occur on the Project.</p> <p><u>Field Verification: Unlikely</u> No vine thickets have been identified on the Project thus far.</p>

Weeping Myall Woodlands	Likely to Occur (20-50 km)	Not Identified	11.3.2 <i>(minor component of this RE)</i>	<p><u>Desktop Assessment: Unlikely</u> Weeping Myall TEC is uncommon and is only known to form minor components of two possible REs. It is not known to occur within 20 km of the Project and is only considered likely to occur within a 20 – 50 km buffer of the Project. It has not been previously identified on any of the surrounding Projects.</p> <p>One RE that has the potential to contain minor components corresponding to this TEC has been mapped by DES as occurring on the Project. No records of <i>Acacia pendula</i> (Weeping Myall) were returned in a 50 km search of the Project using Wildlife Online. It was considered unlikely that this TEC would occur on the Project.</p> <p><u>Field Verification: Unlikely</u> No Weeping Myall (<i>Acacia pendula</i>) have been identified on the Project thus far.</p>
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4.8.4 Essential Habitat

Vegetation Management mapping identifies that Essential Habitat for the ornamental snake (*Denisonia maculata*) exists within the Project (refer Figure 27). This is supported through Essential Habitat species records from adjacent Project studies.

Essential Habitat mapping covers much of the remnant vegetation within the Project. The ornamental snake has been previously identified on the Saraji East Project and Olive Down Coking Coal Project. Wildlife Online records show 16 records of the ornamental snake occur within a 20 km buffer, and an additional 26 records occur in the 20 – 50 km buffer zone. Thus far, the ornamental snake has not been identified on the Project, however it is acknowledged that suitable habitat does occur.

As a predominantly underground mine, land clearing will be minimised and the potential to impact Essential Habitat will be greatly reduced. Nonetheless, potential impacts to areas of Essential Habitat will be assessed in detail during the EIS process.

4.8.5 Threatened Flora

Desktop assessments identified that no Endangered, Vulnerable or Near Threatened (EVNT) flora species records occurred within 10 km of the Project, while six species were identified to potentially occur within the 10 – 20 km buffer zone of the Project. An additional eleven EVNT flora species were also identified to potentially occur within the 20 – 50 km buffer zone. Table 22 outlines these potential threatened species, their conservation status, database triggers, habitat preferences and likelihood of occurrence (based on desktop assessment and preliminary field verification completed to date).

Once again however, it is noted that EIS studies will assess the presence and potential impacts on these flora species of conservation significance.

4.8.6 Threatened Fauna

Desktop assessments identified two EVNT fauna records within 10 km of the Project, 18 species with the potential to occur within the 0 – 20 km buffer zone, and an additional eight EVNT fauna species with the potential to occur within the 20 – 50 km buffer zone. Table 23 outlines the potential threatened species, their conservation status, database triggers, habitat preferences and likelihood of occurrence (based on desktop assessment and preliminary field verification).

EIS studies will assess the presence and potential impacts on potential fauna species of conservation significance.

4.9 MARINE, MIGRATORY & SPECIAL LEAST CONCERN SPECIES

Desktop assessments identified 25 fauna species with Marine or Migratory significance under the EPBC Act, or Special Least Concern under the NC Act, with the potential to occur within 50 km of the Project site.

Table 24 outlines the potential marine, migratory (with the exception of *Numenius madagascariensis* which is covered in Table 23 as an EVNT species) and special least concern species, their conservation status, database triggers, habitat preferences and likelihood of occurrence (based on desktop assessment and preliminary field verification).

EIS studies will assess the presence and potential impacts on potential fauna species of conservation significance.

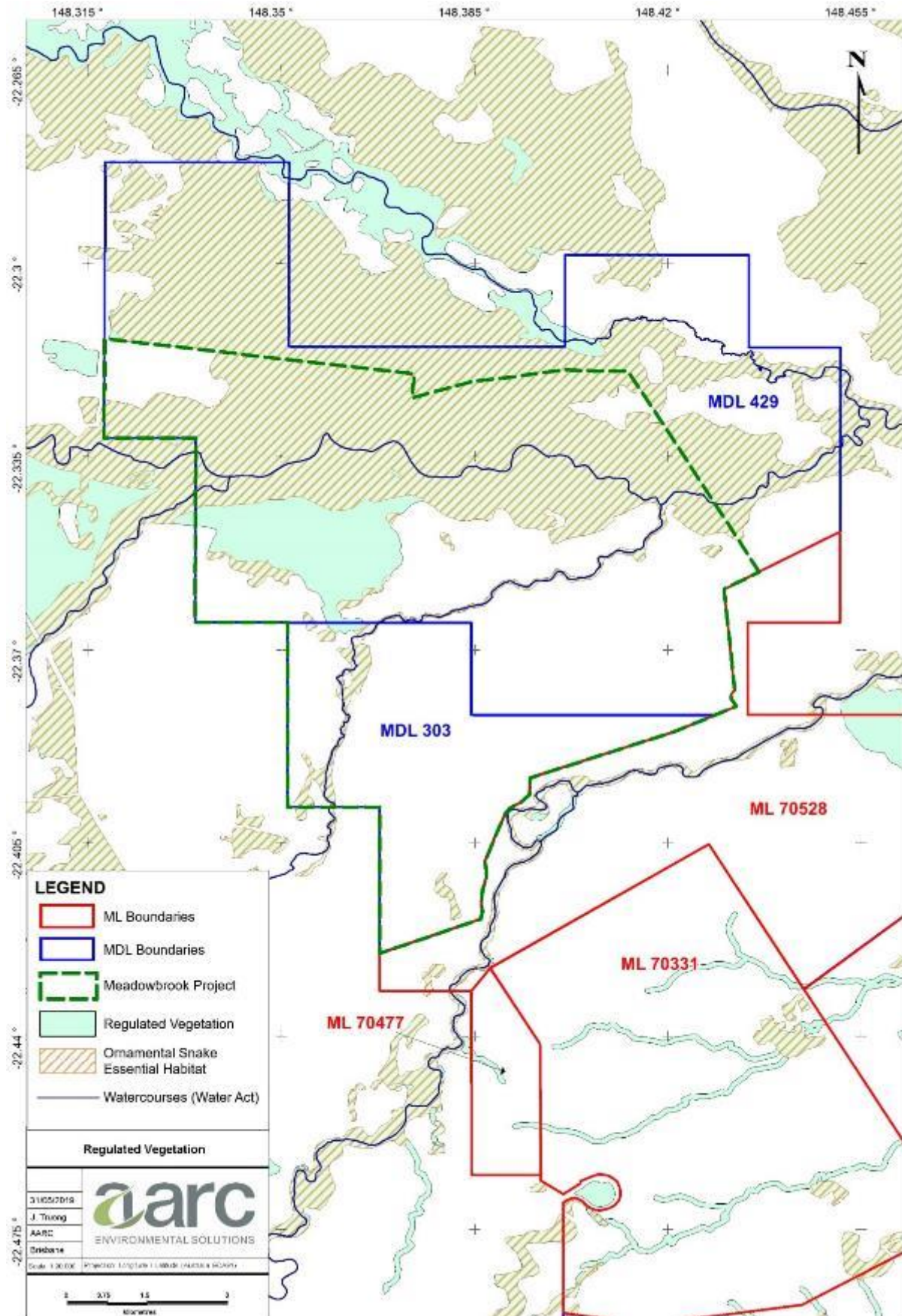


Figure 27 Essential Habitat associated with the Project

Table 22 Potential EVNT Flora Species and Likelihood of Occurrence

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
Acacia spania	-	NT	-	1 0 - 20 km 1 20 - 50 km 2 Total	Not Identified	Rocky sandstone ridges and hills in sandy to loamy soils in eucalypt or acacia dominated woodland. Also in vine thickets along scarp edges (DES 2018b). Grows in stands in the shrub layer of open Eucalyptus woodlands on shallow red soils (World Wide Wattle 2018).	Unlikely This species has not been recorded on the Project, or on any of the surrounding Projects, or within 10 km of the Project. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable landform and soil types.
Cerbera dumicola	-	NT	-	1 0 - 20 km 2 20 - 50 km 3 Total	Not Identified	Primarily found in Lancewood communities and semi-evergreen vine thickets in coastal and sub-coastal Central Qld (SGAP 2007).	Unlikely This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable vegetation communities.
Cycas ophiolitica Marlborough blue	E	E	Species or species habitat likely to occur within area (0 – 20 km)	No Records	Not Identified	Cycas ophiolitica inhabits eucalypt open forest and woodland communities with a grassy understorey. They occur on hill tops or steep slopes, at altitudes of 80-620 m above sea level. It grows on shallow, stony, red clay loams or sandy soils. (DES 2018b).	Unlikely This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable landform and soil types.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Dichanthium queenslandicum</i> King bluegrass	E	V	Species or species habitat may occur within area (0 – 20 km) Species or species habitat likely to occur within area (20 – 50 km)	5 20 - 50 km	Not Identified	This species occurs on black cracking-clay in tussock grasslands mainly in association with other species of Bluegrasses. It is mostly confined to the natural Bluegrass grasslands of central and southern Qld (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 10 km of the Project. Bluegrass TEC has not been identified on the Project nor any remnant natural grasslands. Cleared grasslands of introduced pasture species on cracking-clay presents the only marginally suitable habitat, however it is unlikely that the species would occur on this habitat and it is not considered a 'preferred habitat'.
<i>Dichanthium setosum</i> Bluegrass	E	-	Species or species habitat may occur within area (0 – 20 km) Species or species habitat likely to occur within area (20 – 50 km)	No Records	Not Identified	Occurs in grassy woodland and open forests in inland Australia. Associated with heavy basaltic black soils and stony red-brown hard-setting loam with clay subsoil and is found in moderately disturbed areas such as cleared woodland, grassy roadside remnants, grazed land and highly disturbed pasture (DOEE 2018).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 10 km of the Project. One WildNet record within 20 km of the Project exists. Potential habitat exists within the Project in the form of grassy woodlands, with further mapping and targeted searches to be undertaken.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Samadera bidwillii</i> Quassia	V	V	Species or species habitat may occur within area (0 – 20 km) Species or species habitat likely to occur within area (20 – 50 km)	No Records	Not Identified	Known only from coastal and near coastal areas of the eastern coast of Qld. Commonly found in rainforest but can also occur in open forest and woodland (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. The species is unlikely to occur within the Project as it lies outside of its known distribution. The only known records are from the eastern coast of Qld, with the nearest being from the St Lawrence area.
20 – 50 km buffer zone							
<i>Acacia arbiana</i>	-	NT	-	1 20 - 50 km	Not Identified	Confined to the summits of peaks of the Peak Range, east of Clermont, Qld. Recorded from trachyte outcrops in heath-like vegetation (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable landforms and vegetation communities.
<i>Aristida annua</i>	V	V	Species or species habitat known to occur within area (20 – 50 km)	1 20 - 50 km	Not Identified	This species is restricted to Eucalypt woodland on black clay and basalt soils (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable soil types.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
20 – 50 km buffer zone							
<i>Bertya pedicellata</i>	-	NT	-	13 20 - 50 km	Olive Downs	Restricted to central Qld on iron stone jump-ups and associated with communities dominated by <i>Corymbia trachyphloia</i> , <i>Acacia catenulata</i> , <i>A. curvinervia</i> and/or <i>A. shirleyi</i> (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km or the Project. This species has only been identified in the far north of the Olive Downs Project over 35 km from the nearest MDL boundary. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable land forms and vegetation communities.
<i>Cadellia pentastylis</i> Ooline	V	V	Species or species habitat may occur within area (20 – 50 km)	No Records	Not Identified	Occurs in a range of vegetation types including semi-evergreen vine thicket, Brigalow-Belah, Poplar Box and Bendee communities. Ooline often occurs on the edges of sandstone and basalt escarpments, 200 to 500 m above sea level. Ooline grows on the moderately fertile soils preferred for agriculture and pasture development (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat has yet to be identified on the Project and is unlikely to due to the Project lying outside of the known distribution of the species, unsuitable elevation, and absence of fertile soils.
<i>Capparis humistrata</i>	-	E	-	1 20 - 50 km	Not Identified	Grows in Eucalypt woodland with a shrubby understorey, on stony hard ridges and serpentinite soil. It also occurs on the margins of Brigalow forest on sandy soil (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km or the Project. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable land forms and vegetation communities.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
20 – 50 km buffer zone							
<i>Eucalyptus raveretiana</i> Black ironbox	V	-	Species or species habitat likely to occur within area (20 – 50 km)	No Records	Not Identified	Occurs on alluvial soils, loams, light clays or cracking-clays in open forests and woodlands along watercourses and occasionally on river flats (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Potentially suitable habitat in the form of riverine woodlands occurs on the Project however it is unlikely to be found due to the Project lying outside of the known distribution of coastal regions of eastern Qld.
<i>Macropteranthes leiocaulis</i> Smooth-barked bonewood	-	NT	-	4 20 - 50 km	Not Identified	Occurs in deciduous vine thickets, semi-evergreen vine thickets and araucarian microphyll vine forests on red ferrosols or sandstone talus (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable soil types and vegetation communities.
<i>Solanum adenophorum</i>	-	E	-	2 20 - 50 km	Not Identified	<i>Solanum adenophorum</i> occurs mostly in brigalow woodland and on very gently inclined slopes. It also occurs in gidgee (Acacia cambagei) scrub on deep cracking-clay soils (Bean 2012).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. However records exist within 20 – 50 km of the Project. Potentially suitable habitat exists within the Project in the form of Brigalow woodlands.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
20 – 50 km buffer zone							
<i>Solanum elaeagnifolium</i>	-	E	-	3 20 - 50 km	Not Identified	Grows on fertile cracking-clay soils in open forest of <i>Eucalyptus thozetiana</i> , <i>Acacia harpophylla</i> , with understorey of <i>Geijera parviflora</i> , <i>Casuarina cristata</i> , <i>Macropteranthes leichhardtii</i> , <i>Eucalyptus cambageana</i> , or woodland of <i>E. crebra</i> and <i>E. tenuipes</i> (DES 2018b).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km or the Project. However records exist within 20 – 50 km of the Project. Preferred habitat is extremely specific, however there is potential for some suitable habitat to exist within the Project in the form of Brigalow on cracking-clay soils.
<i>Trioncinia patens</i> Peak Downs daisy	-	E	-	2 20 - 50 km	Not Identified	Known only from three locations all on the toe slopes of peaks in and near the Peak Range National Park (NP) between Clermont and Dysart. Occurs in Eucalypt woodland on basalt-derived dark-grey to red-brown clays or clay-loams, often some surface gravel (Holland and Butler 2007).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km or the Project. This species is known only from the Peak Range NP. Suitable habitat has yet to be identified on the Project and is unlikely to due to the Project lying outside of the known distribution of the species.
<i>Trioncinia retroflexa</i> Belyando cobbles peg	-	E	-	No Records	Not Identified	Restricted to Bluegrass grasslands on basalt soils in central Qld (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km or the Project. However 1 WildNet record exists within 20 km of the Project. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable vegetation communities.

Table 23 Potential EVNT Fauna Species and Likelihood of Occurrence

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Acanthophis antarcticus</i> Common death adder	-	V	-	1 0 - 20 km 0 20 - 50 km 1 Total	Olive Downs as part of Arrow Basin 2011 survey	Found throughout Qld in a variety of habitats (Wilson & Swan 2017). Preferred microhabitat includes fallen timber and leaf litter and grass tussocks.	<u>Potential</u> This species has not been recorded on the Project and has no records within 10 km of the Project, however, has one record within 50 km on the Olive Downs Project in association with the Isaac River. Potentially suitable habitat exists within the Project due to broad macro-habitat preference, distribution across many areas of the country, however, individual records are often sparse, and the species has relatively low dispersion ability. Potentially suitable microhabitat features exists in varying availability across the Project and will continue to be targeted during further field assessments.
<i>Calidris ferruginea</i> Curlew sandpiper	CE Mi	SL	Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Occur on intertidal mudflats in sheltered coastal areas, around coastal non-tidal swamps, lakes and lagoons, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Potentially suitable habitat in the form of wetlands and dams occurs within the Project, however, it is unlikely to be found due to the Project lying outside of the known distribution of coastal regions of eastern Qld.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Dasyurus hallucatus</i> Northern quoll	E	-	Species or species habitat likely to occur within area (0 – 20 km)	No Records	Not Identified	The northern quoll is most abundant in rocky Eucalypt woodland. It occurs in a range of vegetation types, mostly within 200 km of coast (Menkhorst and Knight 2011).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable landforms.
<i>Denisonia maculata</i> Ornamental snake	V	V	Species or species habitat known to occur within area (0 – 20 km)	16 0 - 20 km 26 20 - 50 km 42 Total	Olive Downs Saraji East	Low-lying areas with cracking-clay soils (Wilson and Swan 2017).	<u>Likely</u> This species has yet to be recorded on the Project, however, has been recorded several times to the west and north of the Project along Boomerang, One Mile, and Ripstone Creeks or their tributaries. Suitable habitat exists within the Project, and this will be continued to be targeted during further field assessments.
<i>Egernia rugosa</i> Yakka skink	V	V	Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Dry open forests, woodlands and rocky areas in the Brigalow Belt, where it occurs in fallen timber, wood piles, uprooted trees, deep rock crevices, deeply eroded gullies or disused rabbit warrens (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Some marginally suitable habitat exists on the Project in the form of woodlands, however the Project lacks preferred rocky landforms and gullies.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Elseya albagula</i> Southern snapping turtle	CE	E	Species or species habitat likely to occur within area (0 – 20 km)	No Records	Not Identified	The white-throated snapping turtle is only found in the Burnett, Fitzroy, Raglan and Mary river drainages of southeast Queensland. It prefers permanent flowing water habitats where there are suitable shelters and refuges (e.g. fallen trees) (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of permanent flowing water.
<i>Erythroriorchis radiatus</i> Red goshawk	V	E	Species or species habitat likely to occur within area (0 – 20 km)	1 0 - 20 km 0 20 - 50 km 1 Total	Not Identified	Tall open forest, woodland, lightly treed savannah and the edge of rainforest, nesting within 1 km or permanent water (DES 2018b).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. However 1 record exists within 20 km of the Project. Suitable foraging habitat is potentially available on or around the Project, and the species has potential to utilise the Project as a part of its large home range. Breeding is unlikely to occur on the Project due to the lack of permanent water.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Furina dunmalli</i> Dunmall's snake	V	V	Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Inhabits forests and woodlands on black alluvial cracking-clay and clay loams dominated by Brigalow (<i>Acacia harpophylla</i>). Preferred microhabitat includes fallen timber and leaf litter and possibly cracks in clay soils (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat is available on the Project; however the Project lie outside of the known distribution with the closest records clustered around Clermont, or south of Rockhampton.
<i>Geohaps scripta scripta</i> Squatter pigeon (southern)	V	V	Species or species habitat known to occur within area (0 – 20 km)	4 0 - 20 km 38 20 - 50 km 42 Total	Lake Vermont Olive Downs Saraji East	Open grassy woodlands on sandy soils interspersed with low gravelly ridges, never far from water (Morcombe 2002).	<u>Likely</u> This species has yet to be recorded on the Project, however, has been recorded several times on surrounding projects. Suitable habitat exists within the Project. The species is typically locally abundant in areas where it is known from and not cryptic in nature.
<i>Grantiella picta</i> Painted honeyeater	V	V	Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Dry, open forests and woodlands, usually in areas with flowering and fruiting mistletoe and flowering eucalypts (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat likely to be found on the Project on a seasonal basis.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Lerista allanae</i> Allan’s lerista	E		Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Restricted to road verges and other small areas with friable soils, amid pastoral land dominated by heavy soils in the vicinity of Capella, Clermont and Logan Downs Station (Wilson and Swan 2017).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat is available on the Project; however the Project lies outside of the known distribution with the only records from Clermont and Capella.
<i>Maccullochella peelii</i> Murray cod	V	-	Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Utilises a range of habitats from clear rocky streams to slow-flowing, turbid rivers and billabongs. Frequently found in the main channels of rivers and larger tributaries. Preferred microhabitat consists of features such as large rocks, snags, overhanging banks and vegetation, tree stumps, logs, branches and other woody structures. Strongly associated with deep (>2.4 m) and slow water closer to the river bank (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of rocky habitat and ephemeral nature of waterways associated with the Project.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Macroderma gigas</i> Ghost bat	V	E	Species or species habitat likely to occur within area (0 – 20 km)	No Records	Not Identified	Spinifex hillsides, black soil grasslands, monsoon forest, open savannah woodland, tall open forest, deciduous vine forest and tropical rainforest. Influenced by the availability of caves and mines for roosting (Churchill 2008).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable roosting habitat has yet to be identified on the Project but may potentially occur in the local area. However the species is unlikely to due to the Project lying outside of the known distribution and the closest species records are near Mackay.
<i>Neochmia ruficauda ruficauda</i> Star finch	E	E	Species or species habitat likely to occur within area (0 – 20 km)	No Records	Not Identified	Inhabits tall grass and reed beds associated with swamps and watercourses in central Qld. It may also be found in grassy woodlands, open forests, mangroves, urban and cleared areas (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat can be found on the Project, however, there have no records in the wild since 1955.
<i>Nyctophilus corbeni</i> Corben's long-eared bat	V		Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Found across semi-arid southern Australia to southern Qld. Inhabits a range of dry woodland and shrubland communities in arid and semi-arid regions. Roosts mostly in tree hollows (Menkhorst & Knight 2011).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat can be found on the Project; however species records only exist from a latitude south of Bundaberg.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Petauroides volans</i> Greater glider	V	V	Species or species habitat likely to occur within area (0 – 20 km)	4 0 - 20 km 54 20 - 50 km 58 Total	Olive Downs Saraji East	Eucalypt dominated habitats, ranging from low, open forests on the coast to tall forests in the ranges and low woodland westwards of the Dividing Range (DES 2018b).	<u>Known</u> This species has been recorded on the Project and surrounding projects. Preferred habitat on site is confined to the Eucalypt woodlands along Boomerang Creek, where it was recorded during the field survey.
<i>Phascolarctos cinereus</i> Koala	V	V	Species or species habitat known to occur within area (0 – 20 km)	12 0 - 20 km 104 20 - 50 km 116 Total	Lake Vermont (<i>adjacent</i>) Olive Downs	Inhabits eucalypt forests and woodlands on the east coast of Australia (Curtis <i>et al.</i> 2012).	<u>Known</u> This species has been recorded on the Project and surrounding projects. Preferred habitat on site is confined to the Eucalypt woodlands along Boomerang Creek, where it was recorded during the field survey.
<i>Poephila cincta cincta</i> Southern black-throated finch	E	E	Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Inhabits grassy woodland dominated by eucalypts, paperbarks or acacias where there is accessibility to seeding grasses, with riparian habitat being particularly important (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat can be found on the Project; however the closest record is from 1985 on the coast south of Mackay.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
0 – 20 km buffer zone							
<i>Pteropus poliocephalus</i> Grey-headed flying-fox	V	-	Foraging, feeding or related behaviour likely to occur within area (0 – 20 km)	No Records	Not Identified	Roost in native vegetation near water, including mangrove, rainforest, melaleuca or casuarina (Churchill 2008). Typically commute within 15 km to feed on flowering and fruiting plants, including blossoms of various species of eucalypt, angophora, tea-tree and banksia (DES 2018b).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Seasonally suitable foraging habitat likely exists within the Project, however, no know records or roosts occur within 50 km.
<i>Rheodytes leukops</i> Fitzroy River turtle	V	V	Species or species habitat likely to occur within area (0 – 20 km)	No Records	Not Identified	Only found in the Fitzroy River and its tributaries, around Rockhampton in eastern central Qld. The species occurs within permanent freshwater riverine reaches and large, isolated permanent waterholes.	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of permanent flowing water or large isolated waterholes.
<i>Rostratula australis</i> Australian painted snipe	E	V	Species or species habitat may occur within area (0 – 20 km)	No Records	Olive Downs Saraji East	Shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DOEE 2018).	<u>Potential</u> This species has not been recorded on the Project, however, has been recorded on surrounding Projects and has records within 50 km. Seasonally suitable habitat exists within the Project in the form of seasonal wetlands and waterways.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
20 – 50 km buffer zone							
<i>Calyptorhynchus lathamii erebus</i> Glossy black--cockatoo (northern)	-	V	-	6 20 - 50 km	Not Identified	Woodlands dominated by Allocasuarina, or woodlands with a stratum of Allocasuarina beneath Eucalyptus, Corymbia or Angophora. The species has also been observed in mixed Allocasuarina, Casuarina, Callitris and <i>Acacia harpophylla</i> woodland assemblages (Glossy Black Conservancy 2010).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable vegetation communities.
<i>Chalinolobus dwyeri</i> Large-eared pied bat	V	V	-	6 20 - 50 km	Not Identified	Requires a combination of sandstone cliff/escarpment to provide roosting habitat that is adjacent to higher fertility sites, particularly box gum woodlands or river/rainforest corridors which are used for foraging. Available roosts are not evenly distributed throughout the landscape with Qld records from sandstone escarpments in the Carnarvon and Expedition Ranges and Blackdown Tablelands (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat has yet to be identified on the Project and is unlikely to due to the absence of suitable landforms.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
20 – 50 km buffer zone							
<i>Delma torquata</i> Collared delma	V	V	Species or species habitat may occur within area (20 – 50 km)	No Records	Not Identified	Inhabits eucalypt dominated woodland and open forest where it is associated with suitable micro-habitats (exposed rocky outcrops). Ground cover is predominantly native grasses such as Kangaroo grass (<i>Themeda triandra</i>), Barbed-wire grass (<i>Cymbopogon refractus</i>), Wiregrass (<i>Aristida</i> sp.) and Lomandra (<i>Lomandra</i> sp.) (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Potentially suitable habitat occurs within the Project; however, the Project is outside the species known distribution with closest records over 175 km away.
<i>Lasiiorhinus krefftii</i> Northern hairy-nosed wombat	CE	E	-	1 20 - 50 km	Not Identified	Known only from two locations. Epping Forest NP in central Qld which is characterised by Brigalow and Gidgee woodland on sandy soils with a native grass layer. A second translocated population has been reintroduced in the Richard Underwood Nature Refuge at Yarran Downs near St George (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. This species has an extremely restricted range which the Project lies outside of.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
20 – 50 km buffer zone							
<i>Numenius madagascariensis</i> Eastern curlew	CE Mi	E	Species or species habitat may occur within area (20 – 50 km)	No Records	Not Identified	Tidal mudflats, sand spits of estuaries, mangroves, lake shores and ocean beaches (Morcombe 2002).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. The closest records are near the coastline. Suitable habitat has yet to be identified on the Project and is unlikely to due to the Project lying outside suitable coastline environs, with only scattered records inland.
<i>Phaethon rubricauda</i> Red-tailed tropicbird	-	V	-	1 20 - 50 km	Not Identified	A marine species, in Qld it is only known from coastal environs and nests on coral islands (ALA 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. The closest records are near the coastline. Suitable habitat has yet to be identified on the Project and is unlikely to due to the Project lying outside suitable coastline environs.

Species Name Common Name	EVNT Listing		Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	EPBC Act	NC Act	PMST	Wildlife Online Records	Presence on Surrounding Projects		
20 – 50 km buffer zone							
<i>Taphozous australis</i> Coastal sheath-tail bat	-	NT	-	2 20 - 50 km	Not Identified	This species occurs along a very narrow coastal zone in Qld from Shoalwater Bay, through Cape York Peninsula, to Moa Island in the Torres Strait. It is dependent on coastal roosts, preferring sea caves and rocky clefts. Also known to roost in disused mines, boulder piles, rock fissures, concrete bunkers, and occasionally in buildings (Churchill 2008).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. However 2 records exist within 50 km of the Project. Suitable habitat has yet to be identified on the Project and is unlikely to due to the Project lying outside suitable coastline environs.
<i>Xeromys myoides</i> Water mouse	-	V	-	1 20 - 50 km	Not Identified	This species has been recorded in three distinct locations (Northern Territory, central south Qld, and south-east Qld) each location is characterised by specific habitat including mangroves and associated saltmarshes, sedge lands, clay pans, heathlands and freshwater wetlands (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. However 2 records exist within 50 km of the Project. Suitable habitat has yet to be identified on the Project and is unlikely to due to the Project lying outside of known distribution and absent of suitable aquatic environs.

Table 24 Potential Marine, Migratory and Special Least Concern Species

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	Ma	Migratory			SL	PMST	Wildlife Online Records	Presence on Surrounding Projects		
		M	W	T						
<i>Actitis hypoleucos</i> Common sandpiper	x		x		x	Species or species habitat may occur within area (0 – 20 km)	No records	Not Identified	Varied coastal and interior wetlands – narrow muddy edges of billabongs, river pools, mangroves, among rocks and snags, reefs or rocky beaches (Morcombe 2002).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Minimal amounts of marginal habitat is available to draw its presence.
<i>Anseranas semipalmata</i> Magpie goose	x					Species or species habitat may occur within area (0 – 20 km)	1 20 – 50 km	Not Identified	The Magpie Goose occupies large seasonal wetlands and well-vegetated dams with rushes and sedges; wet grasslands and floodplains (Pizzey & Knight 2007).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. One record exists within 50 km of the Project. Some seasonal habitat occurs on the Project, however preferred habitat is distributed on coastal margins.
<i>Apus pacificus</i> Fork-tailed swift	x	x			x	Species or species habitat may occur within area (0 – 20 km)	No records	Not Identified	Low to very high airspace over varied habitat, rainforest to semi-desert, most active just ahead of summer storm fronts (Morcombe 2002).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Minimal habitat is available on the Project; however occurrence is highly concentrated on coastal margins, and sporadic through inland Australia.

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	Ma	Migratory			SL	PMST	Wildlife Online Records	Presence on Surrounding Projects		
		M	W	T						
<i>Ardea alba</i> Great Egret	x					Species or species habitat known to occur within area (0 – 20 km)	6 0 - 20 km 15 20 - 50 km 21 Total	Not Identified	Common throughout Australia, with the exception of the most arid areas. Known to prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands (Morcombe 2002).	<u>Likely</u> This species has been recorded within 10 km of the Project. The species has yet to be detected on the Project, however seasonally suitable habitat is available on the Project and in the greater region.
<i>Ardea ibis</i> Cattle egret	x					Species or species habitat may occur within area (0 – 20 km)	No records	Olive Downs Lake Vermont	Widespread and common in north, north-eastern and south-eastern Australia. The species is found in grasslands, woodlands and wetlands, and is not common in arid areas. Utilises pastures and croplands, especially where drainage is poor. Will also forage in garbage dumps, and often associates with livestock (Morcombe 2002).	<u>Likely</u> This species has been recorded on surrounding Projects and within 10 km of the Project. The species has yet to be detected on the Project, however seasonally suitable habitat is available on the Project and in the greater region.
<i>Calidris acuminata</i> Sharp-tailed sandpiper	x		x		x	Species or species habitat may occur within area (0 – 20 km)	1 20 – 50 km	Not Identified	Fresh or salt wetlands – the muddy edges of wetlands and dams (Morcombe 2002). In Qld, they are recorded in most regions, being widespread along much of the coast and are very sparsely scattered inland, particularly in central and south-western regions (DOEE 2018).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. One record exists within 50 km of the Project. Species occurrence is concentrated on coastal margins, but still common throughout inland Australia where suitable habitat is available. The species has yet to be detected on the Project, however seasonally suitable habitat is available on the Project and in the greater region.

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	Ma	Migratory			SL	PMST	Wildlife Online Records	Presence on Surrounding Projects		
		M	W	T						
<i>Calidris ferruginea</i> Curlew sandpiper	x		x			Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Occur on intertidal mudflats in sheltered coastal areas, around coastal non-tidal swamps, lakes and lagoons, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. The species has yet to be detected on the Project and occurrence is highly concentrated on coastal margins, and sporadic through inland Australia; however minimal habitat is available on the Project.
<i>Calidris melanotos</i> Pectoral sandpiper	x		x		x	Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Usually coast wetlands, both fresh and saline, but also inland on permanent and temporary wetlands; utilises sites with mudflats, fringing vegetation, swamps with heavy overgrowth of vegetation (Morcombe 2002).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. The species has yet to be detected on the Project and occurrence is highly concentrated on coastal margins, and sporadic through inland Australia; however minimal habitat is available on the Project.

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence	
	Ma	Migratory				SL	PMST	Wildlife Online Records			Presence on Surrounding Projects
		M	W	T							
<i>Chrysococcyx osculans</i> Black-eared cuckoo	x					Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Open woodlands including stunted Mallee, mulga and riverine vegetation in open settings; also uses shrublands, especially saltbush and bluebush (Menkhorst <i>et al.</i> 2017).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. One record exists within 50 km of the Project. ALA records are located in the greater region over 30 km away. The species has yet to be detected on the Project, however potentially suitable habitat occurs within the Project in the form of wetlands and dams.	
<i>Cuculus optatus</i> Oriental Cuckoo				x	x	Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Rainforest margins, monsoon forest, vine scrubs, riverine thickets, wetter, densely canopied eucalypt forests, paperbark swamps and mangroves (Morcombe 2002).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Suitable habitat has yet to be identified on the Project and is unlikely to due to the Project absence of suitable vegetation communities.	

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	Ma	Migratory			SL	PMST	Wildlife Online Records	Presence on Surrounding Projects		
		M	W	T						
<i>Gallinago hardwickii</i> Latham's snipe	x		x		x	Species or species habitat may occur within area (0 – 20 km)	No Records	Olive Downs	Low vegetation around wetlands in shallows, sedges, reeds, heath, salt marsh, irrigated crops (Morcombe 2002). A non-breeding visitor that will readily move between locations as conditions become more or less favourable (DOEE 2018).	<u>Potential</u> This species has not been recorded on the Project; however it has been recorded on Olive Downs There are no records within 10 km of the Project however, the closest ALA record is near Middlemount, approx. 40 km away. The species has yet to be detected on the Project, however potentially suitable seasonal habitat occurs within the Project in the form of wetlands and dams.
<i>Gelochelidon nilotica</i> Gull-billed tern	x		x		x	-	1 20 – 50 km	Not Identified	An inland species, found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands (Birdlife Australia 2017).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. ALA records exists within 50 km of the Project with one record at Peak Downs Mine tailings dam, and a few records between Middlemount and Tieri. The species has yet to be detected on the Project, however potentially suitable seasonal habitat occurs within the Project in the form of wetlands and dams.

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	Ma	Migratory			SL	PMST	Wildlife Online Records	Presence on Surrounding Projects		
		M	W	T						
<i>Haliaeetus leucogaster</i> White-bellied sea-eagle	x					Species or species habitat likely to occur within area (0 – 20 km)	2 0 - 20 km 6 20 - 50 km 8 Total	Not Identified	Coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands. Habitat characterised by the presence of large areas of open water (larger rivers, swamps, lakes, the sea). Birds have been recorded in (or flying over) a variety of terrestrial habitats (DOEE 2018).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. Several records exist within 50 km of the Project. The species has yet to be detected on the Project, however potentially suitable seasonal habitat occurs within the Project in the form of wetlands and dams.
<i>Hydroprogne caspia</i> Caspian tern	x		x			-	No Records	Olive Downs	Mostly found in sheltered coastal embayments and those with sandy or muddy margins are preferred. They also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. They also use artificial wetlands, including reservoirs, sewage ponds and saltworks (DOEE 2018).	<u>Likely</u> This species has not been recorded on the Project and was not returned in any database search, however, has been identified on Olive Downs. ALA shows two records within 10 km of the Project. The species has yet to be detected on the Project, however potentially suitable seasonal habitat occurs within the Project in the form of wetlands and dams.
<i>Merops ornatus</i> Rainbow bee-eater	x					Species or species habitat may occur within area (0 – 20 km)	12 0 - 20 km 45 20 - 50 km 57 Total	Not Identified	Open forests and woodlands, shrublands, various cleared or semi-cleared habitats, including farmland and areas of human habitation. Open, cleared or lightly-timbered areas that are often located in close proximity to permanent water (DOEE 2018).	<u>Likely</u> This species has not been recorded on the Project or any of the surrounding Projects but has returned over 50 records within 50 km of the Project. The species has yet to be detected on the Project, however suitable habitat in the form of woodlands and other habitats is available on the Project.

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	Ma	Migratory			SL	PMST	Wildlife Online Records	Presence on Surrounding Projects		
		M	W	T						
<i>Monarcha melanopsis</i> Black-faced monarch	x			x	x	Species or species habitat known to occur within area (0 – 20 km)	1 20 – 50 km	Not Identified	Rainforests, mangroves, eucalypt forests and woodlands (Morcombe 2002).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km or the Project. However, records exist within 50 km of the Project. The species has yet to be detected on the Project, however some potentially suitable habitat occurs within the Project in the form of eucalypt forests and woodlands.
<i>Motacilla flava</i> Yellow wagtail	x			x	x	Species or species habitat may occur within area (0 – 20 km)	No Records	Not Identified	Open habitats, often near water; in Qld it is usually coastal (Morcombe 2002).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. The species has yet to be detected on the Project, which is outside of the known range, however, suitable open habitats occur within the Project.
<i>Myiagra cyanoleuca</i> Satin flycatcher	x			x	x	Species or species habitat may occur within area (0 – 20 km)	No Records	Olive Downs	Forests and woodlands, mangroves, coastal heath scrubs; in breeding season favours dense, wet gullies of heavy eucalypt forests (Morcombe 2002).	<u>Potential</u> This species has not been recorded on the Project or within 10 km or the Project. Records exist within 50 km of the Project and it has been recorded on Olive Downs. The species has yet to be detected on the Project, however some potentially suitable habitat occurs within the Project in the form of eucalypt forests and woodlands.

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	Ma	Migratory			SL	PMST	Wildlife Online Records	Presence on Surrounding Projects		
		M	W	T						
<i>Numenius madagascariensis</i> Eastern curlew			x			Species or species habitat may occur within area (20 – 50 km)	No Records	Not Identified	Tidal mudflats, sand spits of estuaries, mangroves, lake shores and ocean beaches (Morcombe 2002).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. The species has yet to be detected on the Project and occurrence is highly concentrated on coastal margins, and sporadic through inland Australia. Suitable habitat has not been identified on the Project.
<i>Pandion cristatus</i> Eastern osprey	x		x		x	-	1 20 – 50 km	Not Identified	Occurs in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. Require extensive areas of open fresh, brackish or saline water for foraging (DOEE 2018).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project, however records exists within 50 km of the Project. Adequate amounts of suitable habitat has yet to be detected on the Project to draw its presence.
<i>Pandion haliaetus</i> Osprey	x		x		x	Species or species habitat likely to occur within area (0 – 20 km)	No Records	Not Identified	Coastal waters and estuaries, beaches, islets and reefs; also follows major rivers and wetlands far inland from the coast to large river pools (Morcombe 2002).	<u>Unlikely</u> This species has not been recorded on the Project, any of the surrounding Projects, and has no records within 50 km of the Project on Wildlife Online, ALA, or WildNet. Adequate amounts of suitable habitat has yet to be detected on the Project to draw its presence.

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	Ma	Migratory			SL	PMST	Wildlife Online Records	Presence on Surrounding Projects		
		M	W	T						
<i>Plegadis falcinellus</i> Glossy ibis	x		x		x	-	1 0 - 20 km	Olive Downs	Fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. Occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons (Morcombe 2002).	<u>Likely</u> The species has not been recorded on the Project or any of the surrounding Projects, however, has over 50 records within 50 km of the Project. Seasonally suitable habitat is available on the Project.
<i>Rhipidura rufifrons</i> Rufous fantail	x				x	Species or species habitat may occur within area (20 – 50 km)	3 20 – 50 km	Saraji East	In east and southeast Australia, mainly inhabits wet sclerophyll forests. Also recorded from parks and gardens when on passage (DOEE 2018).	<u>Potential</u> The species has not been recorded on the Project but has been recorded there on Saraji East Project, and several records within 50 km. Minimal amounts of suitable habitat is available on the Project.
<i>Symposiachrus trivirgatus</i> Spectacled monarch	x			x	x	-	1 20 – 50 km	Not Identified	Prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves (Birdlife Australia 2017).	<u>Unlikely</u> The species has not been recorded on the Project or any of the surrounding Projects, has no records within 10 km and one record within 50 km of the Project. Suitable habitat is not available on the Project.

Scientific Name Common Name	EPBC Act				NC Act	Database Searches			Preferred Habitat	Desktop Likelihood of Occurrence
	Ma	Migratory			SL	PMST	Wildlife Online Records	Presence on Surrounding Projects		
		M	W	T						
<i>Tachyglossus aculeatus</i> Short-beaked echidna					x	-	1 0 - 20 km 20 20 - 50 km 21 Total	Not Identified	Found throughout Australia in forests and woodlands, heath, grasslands and arid environments (Australian Museum 2017).	<u>Likely</u> The species has not been recorded on the Project or on any of the surrounding Projects, however, is common throughout Australia. It has over 20 records within 50 km of the Project. The Project supports suitable habitat.
<i>Tringa nebularia</i> Common greenshank	x		x		x	Species or species habitat may occur within area (0 – 20 km)	1 20 – 50 km	Not Identified	Diverse inland and coastal areas; away from the coast uses both permanent and temporary wetlands – billabongs, swamps, lakes, floodplains, flooded irrigated crops, sewage farms and saltworks ponds; prefers wet and flooded mud and clay rather than sand (Morcombe 2002).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. A few records exist within 50 km of the Project. The species has yet to be detected on the Project, however minimal amounts of potentially suitable seasonal habitat occurs within the Project in the form of wetlands and dams.
<i>Tringa stagnatilis</i> Marsh sandpiper	x		x		x	-	1 0 - 20 km 2 20 - 50 km 3 Total	Not Identified	Found on coastal and inland wetlands throughout Australia, including permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks (DOEE 2018).	<u>Potential</u> This species has not been recorded on the Project, any of the surrounding Projects, or within 10 km of the Project. A few records exist within 50 km of the Project. The species has yet to be detected on the Project, however minimal amounts of potentially suitable seasonal habitat occurs within the Project in the form of wetlands and dams.

4.10 CULTURAL HERITAGE

There are no known Aboriginal or non-Aboriginal cultural heritage sites within the Lake Vermont complex tenements. The Lake Vermont complex tenements lie within the National Native Title Tribunal determination area for the Barada Barna People but does not overly with any Native Title claims or applications.

As part of the EIS, assessment of the Aboriginal cultural heritage values of the Project will be undertaken in consultation with the Barada Barna people. A CHMP between the Barada Barna Kabalbara & Yetimarla people and BBC is already in place and development of the Project will be managed in accordance with that plan.

The EIS will also survey and evaluate the significance of any European heritage sites that may be present within the Project.

4.11 SOCIAL ENVIRONMENT

4.11.1 Demographic

The Project is located in the IRC LGA, in central Qld. The closest community centres are Dysart (30 km southwest) and Moranbah (60 km northwest), with the closest major cities being Mackay (180 km northeast) and Rockhampton (240 km southeast).

The resident population of the IRC LGA is estimated to be approximately 20,940 people. However, the resource sector adds 11,580 workers to this number, giving the region a full-time equivalent population of 31,835 people (IRC 2018b). During the 2016 census, 2.95% of the steady population identified themselves as being of Aboriginal and/or Torres Strait Islander origin. The median age of the population during 2016 was 32 years (ABS 2016).

4.11.2 Recreation

Although the region has a lot to offer recreationally, the Project itself does not have any national parks or recreation areas within the surrounding area. The townships of Dysart and Moranbah were developed in the late 1900s in order to service the region's coal mines, and have since developed into significant townships, with diverse recreational and social settings (IRC 2018b).

Dysart is home to numerous sporting fields, an Olympic sized swimming pool and golf course, alongside a significant hospital, primary and secondary school. Moranbah is the larger of the two towns, due to the close proximity of several large coal mines. Two primary schools and one high school are located within the Moranbah township, which also houses multiple sporting areas, shopping centres and a commercial airport (IRC 2018b).

Traditional Owners have accessed the land of the IRC LGA land for thousands of years, for the purposes of hunting, fishing and social gatherings, and continue to do so across the council area (IRC 2018b).

4.11.3 Potential Social Impacts

As a part of the approvals process, BBC will undertake a Social Impact Assessment, including conducting a baseline analysis of the social climate of the Project and its nearby communities. The Project has the potential to affect local workforces, housing and accommodation, local business, industry, and community wellbeing. Affected (and interested) parties for the Project are discussed in Section 4.11.4 and Section 4.11.5.

The 2018 *'Economic Indicators Profile'* report (IRC 2018a) for the Isaac Regional Council area, identified the IRC LGA to have a full-time equivalent (resident and non-resident) population of 33,070 people, with 12,075 (37%) of those being non-resident workers.

It is acknowledged that the SSRC Act will be referenced in relation to establishing accommodation and workforce arrangements, and the undertaking of the social impact assessment for the Project. In this regard, it is noted that the SSRC Act establishes:

- prohibitions around 100% FIFO workforce arrangements;
- anti-discrimination provisions against utilising local workers; and
- a requirement to undertake a social impact assessment.

Completion of the Social Impact Assessment for the Project will include:

- engagement with the community and local government;
- an impact assessment of the Project on the community; and
- the development of a Social Impact Management Plan (SIMP).

When developed, the SIMP will require monitoring and updating throughout the life of the mine, to ensure that the presence of the Project is not negatively impacting the community, and that any negative impacts discovered are managed appropriately.

The social impact assessment will also identify how the Project may be positively impacting social factors within the region. Some of the positive impacts likely to be associated with the Project include:

- extensive support to community development, education, health, social and recreational programs;
- regional development and investment, with flow on effects for other industries;
- direct and indirect benefits for the local, regional and State economies; and
- ongoing direct and indirect employment opportunities.

4.11.4 Affected and interested persons

Section 41(3) of the Environmental Protection Act (1994) provides that an application to undertake a voluntary EIS must include:

(b) a list stating the name and address of each person the proponent proposes as an interested person for the project;

(c) a statement of how the proponent proposes to consult with the interested persons; and

(d) a list of the names and addresses of the affected persons for the project.

4.11.4.1 Affected Persons

In regards to who is considered an affected person for the Meadowbrook Project, section 38 of the EP Act provides that:

(1) A person is an **affected person** for a project if the person is—

(a) a person mentioned in subsection (2) for the operational land or any land joining it;
or

(b) any of the following under the Native Title Act 1993 (Cwlth) for the operational land or for an area that includes any of the land—

(i) a registered native title body corporate;

(ii) a registered native title claimant;

(iii) a representative Aboriginal/Torres Strait Islander

body; or

(c) a relevant local government for the operational land

(2) For subsection (1)(a), the persons are as follows—

(a) for freehold land—a registered proprietor;

(b) for land that is held from the State for an estate or interest less than fee simple and for which the interest is recorded in a register mentioned in the Land Act 1994 (Land Act), section 276—a person recorded in the register as the registered holder of the interest;

(c) for land subject to a mining claim, mineral development licence or mining lease—a holder of, or an applicant for, the mining tenure;

(d) for land subject to a relevant tenure for an environmental authority for a resource activity, other than a mining activity—the holder of the tenure;

(e) for land under the Land Act or the Nature Conservation Act 1992 (NCA) for which there are trustees—a trustee of the land;

(f) for Aboriginal land under the Aboriginal Land Act 1991 (ALA) that is taken to be a reserve because of section 202(2) or (4)(b) of that Act—the trustee of the land;

(g) for DOGIT land under the ALA or the Torres Strait Islander Land Act 1991—a trustee for the land;

(i) for Torres Strait Islander land under the Torres Strait Islander Land Act 1991 that is taken to be a reserve because of section 151(2) of that Act—the trustee of the land

(j) for land that, under the Aboriginal and Torres Strait Islander Land Holding Act 2013, is lease land for a 1985 Act granted lease or a new Act granted lease—the lessee;

(k) for land that is any of the following, the State—

(i) unallocated State land;

(ii) a reserve under the Land Act for which there is no trustee;

(iii) a national park (scientific), national park, national park (Aboriginal land), national park (Torres Strait Islander land) or forest reserve under the NCA;

(iv) a conservation park or resources reserve under the NCA for which there are no trustees;

(v) a State forest or timber reserve under the Forestry Act 1959;

(vi) a State-controlled road under the Transport Infrastructure Act 1994;

(vii) a fish habitat area under the Fisheries Act 1994;

(l) another person prescribed under a regulation.

The affected persons identified for the Project to date, include the individuals, groups and entities listed in Table 25 below.

Table 25 Affected Persons

Name of affected person or organisation	Relationship to Project	Contact details	Proposed contact method
Aquila Coal Pty Ltd	Adjoining tenure holder; of MDL 519	10 Eagle St, Brisbane, Queensland (4000)	Written correspondence.
Arrow CSG Pty Ltd	Overlapping petroleum tenure holder of Authority to Prospect (ATP) 1103 and Petroleum Lease (PL) application 488	GPO BOX 5262, Brisbane, Queensland (4001)	Written correspondence.
Barada Barna, Kabalbara and Yetimarla People	Cultural heritage parties of the existing CHMP for Lake Vermont Mine	Barada Barna Aboriginal Corporation 22 Walker St, Townsville QLD 4810	Written correspondence.
Berry RW & LT	Landowner of Lot 5 SP190749	'Lake Vermont' Dysart QLD 4745	Written correspondence.
BHP Coal Pty Ltd	Landowner of Lot 1, Lot 2 and Lot 3 of SP260662. Landowner of Lot 1 and Lot 4 of SP235303. Landowner of Lot 1 and Lot 2 of SP190748.	Tenure Management, 480 Queen Street, Brisbane Queensland 4000	Written correspondence.
BHP Mitsubishi Alliance (BMA)	Adjoining tenure holder of ML 70383 (Saraji East) incorporating Lot 14 CNS382	Tenure Management, 480 Queen Street, Brisbane Queensland 4000	Written correspondence.
BHP Mitsubishi Alliance (BMA)	Landowner of Lot 10, CNS 93 ('Meadowbrook')	Tenure Management, 480 Queen Street, Brisbane Queensland 4000	Written correspondence.
Bow Energy Pty Ltd	Overlapping petroleum tenure holder of ATP 1031	Level 5 60 Edward Street, Brisbane Queensland 4000	Written correspondence.

Ergon Energy	Queensland electricity infrastructure owner / supplier.	PO Box 1090, Townsville, Queensland	Written correspondence.
Eureka Petroleum Pty Ltd	Adjoining tenure holder; of ATP 814	Level 3, 410 Queen St, Brisbane 4000	Written correspondence.
Isaac Regional Council	Local Government Area	Corner Karmoo and Daintree Streets, Clermont, Queensland (4721)	Face to face Meetings. Written correspondence.
Namrog Investments Pty Ltd (overlapping MDL 429 – outside of project area)	Lot 9 CNS 98	Namrog Investments Pty Ltd c/- Level 14, 46 Edward St, Brisbane 4000	Written correspondence.
Pembroke Olive Downs Pty Ltd	Adjoining tenure holder; of MDL 3013 and ML 700033	Level 8, 444 Queen Street, Brisbane, Queensland (4000)	Written correspondence.
Semple BE & CE	Landowner of Lot 2 RP813170	1236 Golden Mile Road, Dysart QLD 4745	Written correspondence.

4.11.4.2 Interested Persons

In regards to who may be considered an interested person, section 41(3)(b) of the EP Act provides the following example:

an unincorporated community or environmental body with a financial or non-financial interest in the local government area that the operational land is in.

Interested persons for the Project have therefore been identified, as per Table 26 below.

Table 26 Interested Persons

Name of interested person or organisation	Relationship to Project	Contact details	Proposed contact method
Aurizon	Service Provider (Goonyella/Blackwater rail)	Aurizon GPO Box 456, Brisbane Queensland (4000)	Written correspondence. Face to face Meetings as required.
Department of Agriculture and Fisheries	Interest group for the Project	GPO Box 46, Brisbane, Queensland (4001)	Written correspondence.
Department of the Environment and Energy	Administering Authority for the EPBC Act.	John Gorton Building King Edward Terrace Parkes ACT (2600) GPO Box 787, Canberra, ACT (2601)	Post lodgement meeting (following EPBC referral submission). Ongoing meetings/phone discussions.

Department of Environment and Science	Administering Authority for the Project EIS and EA	99 Hospital Road, Emerald, Queensland (4720) Director General GPO Box 2454, Brisbane Queensland (4001)	Pre-lodgement 'face to face' meeting (completed). Ongoing meetings/ phone discussions. Written correspondence.
Department of Natural Resources, Mines and Energy	Administering Authority for the Project ML application and water related aspects/approvals	1 William St, Brisbane City Queensland (4000)	Pre-lodgement meeting (completed). Ongoing meetings/phone discussions. Written correspondence.
Department of Transport and Main Roads	Interest group for the Project Region	PO Box 673PO Box 673 Fortitude Valley, Queensland (4006)	Written correspondence. Face to face Meetings as required.
Gavin John Finger	Agistee of Lot 10 CNS 93	Meadowbrook, 829 Lake Vermont Rd, Dysart, Queensland	Face to face Meetings. Written correspondence.
Gladstone Ports Corporation	Service Provider	40 Goondoon St, Gladstone Central Queensland (4680)	Written correspondence. Face to face Meetings as required.
Isaac Regional Council	Local Government Area	Corner Karmoo and Daintree Streets, Clermont, Queensland (4721)	Face to face Meetings. Written correspondence.
North Queensland Bulk Ports Corporation	Service Provider	1/324 Queen St, Brisbane City, Queensland (4000)	Written correspondence. Face to face Meetings as required.
Powerlink Queensland	Service Provider (Dysart bulk supply substation)	33 Harold St, Virginia QLD 4014	Written correspondence. Face to face Meetings as required.
Queensland State Government	Service Provider (DBCT owner)	Waterfront Place, Level 15/1 Eagle St, Brisbane City Queensland (4000)	Written correspondence.

			Face to face Meetings as required.
SunWater	Service Provider	Green Square North, Level 9, 515 ST Pauls Terrace, Fortitude Valley, Queensland (4006)	Written correspondence. Face to face Meetings as required.
Thiess	Service Provider	Level 5, 179 Grey Street, South Bank, Queensland (4101)	Face to face Meetings as required.

4.12 ECONOMIC ENVIRONMENT

The IRC LGA unemployment rate has been falling since 2016, indicating healthy job growth and better business confidence throughout the region. All areas across the IRC LGA had a current unemployment rate of 2% or under, significantly less than the State and National figures of 6% and 5.5% respectively.

Approximately 39% of Isaac residents are employed within the mining industry. Agriculture, Forestry and Fishing are Isaac's second highest industry employing nearly 11% of residents. Employment diversity is low, with these key industries contributing 50% of overall employment within the region. Other employment sectors include construction, retail, and manufacturing. The mining industry supports many smaller industries in the region, through the supply of trade, and an increase in local populations through itinerant workforces.

4.12.1 Potential Economic Impacts

Continued stability, increased employment opportunities and wealth creation in the region; are key positive economic outcomes of the Project.

Project commencement is expected to contribute to further economic development of the IRC LGA. Key economic benefits resulting from Project development also include:

- an average of 350 – 400 full time operation jobs, with up to 200 peak contract employees during construction;
- royalties and taxes collected by State and Commonwealth Governments, including employee and Qld Payroll Tax; and
- increases in Australian export trade with direct exports to overseas markets.

A full Economic Impact Assessment will form a component of the EIS studies for the Project, to ensure that the benefits to the region are fully understood, and that any negative impacts can be appropriately mitigated and/or managed.

4.13 HEALTH, SAFETY, HAZARD AND RISK

There are a number of onsite and offsite hazards surrounding, or inherent to, the proposed Project activities. Mining (both underground and open-cut) is composed of many activities which present significant safety related risks to personnel. BBC considers the safety and health of its people as paramount to its business and will utilise existing processes to ensure all safety related risks are adequately managed.

Offsite hazards include, but are not limited to, natural events (altered flood characteristics and bushfire regimes) and adverse impacts on the water quality of the surrounding aquatic environment.

As part of the initial stage of mine planning, the Proponent has already begun to consider the following matters:

- health and safety;
- risks to the operation;
- resource recovery;
- potential impacts to the environment;
- community issues;
- geotechnical elements;
- mining methods and rates;
- infrastructure footprint and capacity;
- equipment requirements;
- development and operation timeframes; and
- capital and operating costs.

Risk assessment and analysis will be utilised throughout various stages of the Project design, decision-making and assessment processes.

4.13.1 Potential Health and Safety Impacts

The EIS will include a Hazard and Risk Assessment to identify and manage risks associated with the construction, operation and decommissioning stages of the Project and to develop appropriate mitigation measures and strategies. The Hazard and Risk Assessment will consider both onsite and surrounding offsite risks to people, properties and environmental values.

Procedures to reduce risks on health, safety and the environment will include, but are not limited to:

- the continued operation of a site Health and Safety Management System (HSMS);
- equipment and vehicle operators will be trained to safely operate the equipment and respond to emergency situations;
- the transport, storage and handling of dangerous goods, explosives, and hazardous substances will be undertaken in accordance with relevant legislation and guidelines;
- chemical substances will be managed in accordance with the relevant material safety data sheet;
- employees and contractors will be required to manage and remove all wastes according to the Waste Management Plan which will be prepared in accordance with relevant legislation and guidelines; and

- explosive magazines will be fenced, signed and maintained in accordance with Australian Standard 2187.2:2006.

BBC will also prepare an Emergency Response Plan, which will outline health and safety procedures and work in conjunction with emergency services (including the Isaac Local Disaster Management Group) to ensure the health and wellbeing of employees, contractors and the public is maintained.

Risk and hazard management plans developed for the project will build on and be in line with risk and hazard management plans currently developed and in place at the existing Lake Vermont Mine.

The Hazard and Risk Assessment will be in the form of a preliminary risk assessment in accordance with:

- AS ISO 31000: 2018 Risk Management – Guidelines, and
- IEC/ISO 31010: 2009 Risk Management – Risk Assessment Techniques.

Flooding Risk Management

The Isaac River, located northeast of the Project area, could potentially be prone to flooding and have an impact on construction and operation activities.

All water storage facilities and structures would be designed, constructed, and managed in accordance with *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures – ESR/2016/1933* (DES 2016).

Practicable measures will be undertaken to prevent flooding on Project infrastructure areas, which will include the design and construction of road elevations and flood levees where required.

Bushfire Risk Management

The Project is located in an area that could potentially be affected by seasonal bushfires and therefore, reasonable and practicable measures will be undertaken during construction and operation. This will include the construction and maintenance of fire breaks (where appropriate) and the provision of fire-fighting equipment. Training of staff is required for the proper use of the fire-fighting equipment.

5.0 MINE REHABILITATION

While the Project involves small open-cut operations, the vast majority of ‘mining’ is planned to occur underground. Open-cut developments will utilise existing tailings facilities, with spoil dump placements to be determined through detailed mine planning processes currently underway.

The principal rehabilitation activities for the proposed underground mine, will relate to the removal of buildings and infrastructure, ensuring access portals are sealed at mine closure, and effecting rehabilitation works of disturbed land to provide a suitable post mining land use.

The total footprint of buildings and structures on the Project is currently proposed to be relatively small. All buildings are expected to be demolished and rehabilitated, unless their retention for future use is specifically agreed to by the land holders.

5.1 MINE REHABILITATIONS REFORMS

In Qld, mine rehabilitation is required under the EP Act, which aims to attain ecologically sustainable development. The EP Act requires that all reasonable and practicable measures are taken to protect environmental values from all sources of environmental harm. The fundamental reasons for rehabilitation, are to reduce the apparent disturbance caused by authorised mining activities and to minimise the potential impacts for future environmental harm.

Recent mining rehabilitation reforms (late 2018) have introduced a new key piece of legislation; the MERFP Act, which includes provisions to:

1. replace the previous financial assurance arrangements for resource activities under the EP Act with a new financial provisioning scheme;
2. change how the ERC for a Project is calculated; and
3. amend the EP Act to introduce new requirements for the progressive rehabilitation and closure of mined land.

In response to this 3rd requirement, a PRCP will be required to support the Project EA application (including all activities carried out within the ML).

The PRCP will be subject to the same information request, public notification and decision-making process that apply to applications for an EA (under the EP Act) with the PRCP Schedule to attach to the Project EA once approved.

Rehabilitation of the Project will be designed to meet DES’ four general rehabilitation goals for land disturbed by mining, being to ensure that the final landform is:

- safe to humans and wildlife;
- non-polluting;
- stable; and
- able to sustain an agreed post-mining land use.

A new ERC calculator has recently been deployed by DES, while a new PRCP guideline is also currently being developed to support the new rehabilitation reforms introduced through the MERFP Act. The draft

guideline was open for a public comment period at the time of this application, and feedback during this period will be used to inform the finalisation of the guideline.

The following sub-sections outline a high-level proposal of the Project rehabilitation strategy as per the new PRCP requirements. This is subject to finalisation during the EIS process, and delivery of the final PRCP guideline. The EA application will be submitted with a complete PRCP as per the legislative and guideline requirements current at the time of submission.

5.2 PROGRESSIVE REHABILITATION AND CLOSURE PLAN

The PRCP will consist of two main parts:

1. rehabilitation planning; and
2. a PRCP Schedule.

The purpose of the rehabilitation planning component of the PRCP is to support and justify the development of the proposed PRCP schedule and will include the following information:

- Project information, including:
 - baseline information that elaborates on the preliminary overview of environmental and site values discussed in Section 4.0 of this IAS and will be defined in detail during the EIS process;
 - an options study detailing the decision making processes undertaken during the design and planning stages of the Project, showing how consideration of key environmental and site values guided the final design, to provide for optimal rehabilitation and closure success;
 - the final Project Description that elaborates on the preliminary overview discussed in Section 3.0 of this IAS and which will be defined in detail during the EIS process and options study;
- Rehabilitation planning and strategy including:
 - information about when the relevant activities on site will be conducted, including specification of the amount of disturbance and rehabilitation that will be undertaken each year for the life of mine;
 - spatial information detailing the location and maximum disturbance footprint of the mine, relevant sensitive receptors, and final land use/s of resource tenure (including options study for justification of chosen final land use/s);
 - proposed methodology and techniques to achieve rehabilitation goals for each final land use, as well as detail a monitoring and maintenance program that will be undertaken to demonstrate that milestones have been achieved;
 - details of stakeholder consultation undertaken to develop the PRCP and how ongoing consultation will be undertaken in relation to the rehabilitation to be carried out under the plan;
 - a risk assessment outlining the risks of not achieving a stable condition for final landform and a risk treatment plan outlining how these risks will be managed or minimised;

- PRCP Schedule containing:
 - a description of each area of the resource tenure in the context of its final land use;
 - the rehabilitation milestones for each area required to achieve a stable condition;
 - a timeline for when each rehabilitation milestone will be achieved; and
 - maps showing the location and designation of each final land use area and stage plans, for each area showing progression of rehabilitation milestones.

5.3 REHABILITATION OBJECTIVES

The development of site-specific rehabilitation goals, objectives, indicators and completion criteria will form part of the PRCP process for the Project. Rehabilitation activities will aim to restore the pre-mining land uses, to ensure the continued protection of land uses and the natural environment.

The overall rehabilitation objective is to return the Project to a stable landform capable of supporting similar land uses to pre-disturbance, in a manner which is consistent with the rehabilitation hierarchy.

The nominated post-mine land-uses across the resource tenure will likely include grazing on a mosaic of improved pasture and woodland habitat, as well as areas of native ecosystem.

For areas disturbed by the Project the following overarching objectives will apply:

- the mine site will be safe to humans and fauna;
- mining and rehabilitation will aim to create a landform that is stable and with similar land use capabilities and/or suitability that existed prior to the disturbance, unless other end uses are predetermined and agreed;
- mine wastes and disturbed land will be rehabilitated so that they are non-polluting and self-sustaining, or to a condition where the maintenance requirements are limited;
- surface water leaving the Project area will not be degraded compared to the condition prior to the commencement of mining operations. Current and future water quality will be maintained at levels that are acceptable for users downstream of the site and meet environmental needs;
- potential for acid mine drainage will be determined, and management measures implemented (e.g. encapsulation of sulphides or treatment systems), if required;
- vegetation cover will be established to reduce rates of erosion and sediment loss so that it is comparable to surrounding undisturbed landscapes; and
- soil suitability for use in rehabilitation will be assessed and soils will be ameliorated as required.

The PRCP will cover rehabilitation of all operational activities and associated infrastructure for the Project on the mine site; which covers the underground mining area, open-cut mining areas, the mine infrastructure area, and water storage areas.

5.4 POST-MINE LAND USE STRATEGY

The PRCP will aim for a sustainable post-mining land use of the proposed disturbance areas of the Project. Where possible the proposed post-mining land use strategy seeks to return the final landform

as close as possible to its original condition; that is, having a similar suitability and range of land use options as existed prior to mining.

There may be areas of the Project where rehabilitation to a similar condition as pre-mining is impractical, and other areas where land previously existed in a degraded condition or was subject to poor land management – that may be rehabilitated to an improved condition. Beneficial post-mining land use options will be identified through detailed rehabilitation planning works.

It is currently the aim of BBC to avoid non-use management areas in the final landform, aiming to return all disturbed lands to a post-mining land use. This will be subject to feasibility and options study that will form the basis of the rehabilitation planning part of the PRCP. No voids will be located within defined flood plain areas, with backfill being the current pre-feasibility objective.

It is noted that any infrastructure (including levee banks, roads, power lines and buildings) which will have a beneficial use, may be left in place, upon agreement with relevant landholders.

5.5 DECOMMISSIONING AND REHABILITATION

In consultation with relevant stakeholders, BBC will review all infrastructure assets (as part of PRCP works) to assess which structures will be retained, sold for recycling, relocated, or disposed of as general or regulated waste.

Progressive rehabilitation of disturbed land will proceed as soon as practicable following areas becoming available for rehabilitation. This will be outlined by milestones within the PRCP. In areas where it is not possible for complete rehabilitation to take place (such as due to integration into other active mining areas) temporary rehabilitation methods will be carried out, to provide the necessary short-term stabilisation of these areas.

6.0 STAKEHOLDER AND COMMUNITY CONSULTATION

As previously addressed, a social impact assessment and economic impact assessment will be undertaken to assess the potential impacts of the Project. As impacts are identified, solutions will be canvassed with the stakeholders through a consultation program.

The stakeholder consultation program will therefore include:

- identifying affected and interested stakeholders;
- development of a schedule of activities to inform the relevant stakeholders;
- development of appropriate communication and consultation model along with the selection of appropriate communication and consultation tools; and
- ongoing review and maintenance of relevant documentation to address any comments and/or issues of concern from the stakeholders and community.

Communication and consultation tools will be applied depending on the level of interests and convenience and may include the following options:

- face to face meetings;
- phone meetings;
- written notices and communications;
- local and/or regional newspaper notifications;
- newsletters; and
- media releases.

7.0 ENVIRONMENTAL MANAGEMENT

BBC is committed to operating in an environmentally and socially responsible manner during the design, approvals, construction, operation and closure of the Project.

Environmental matters will be managed by the following commitments:

- complying with legislative requirements;
- communicating effectively with stakeholders and governing departments; and
- committing to the reduction of environmental impacts.

BBC recognises that the above commitments are critical during the Project development stage and has developed a methodical plan to understand the potential environmental impacts of the Project and to meet all environment expectations.

The environmental impact assessment for each element of the Project will describe the measures that will be taken to prevent or mitigate any potential adverse environmental impacts on the environment. It will also address the potential for social impacts and present mitigation strategies to manage any potentially adverse impacts, if required.

Environmental management requirements for the operation will be stipulated in the regulatory documents that are produced as a result of the regulatory approvals processes (e.g. EA, PRCP, EPBC approval etc.). BBC will develop and implement an Environmental Management System for the Project to ensure that environmental and social management strategies are implemented, monitored and reviewed throughout the life of the operation.

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Appendix A ESA Database Search

Tenure type: Mineral development licences

Map requested: 17/12/2018 09:09:50

Centred on point position: Longitude: 148.3908 Latitude: -22.3503

