WINCHESTER SOUTH PROJECT

ENVIRONMENTAL AUTHORITY APPLICATION

SUPPORTING INFORMATION

JUNE 2019
Project No. WHC-18-62
Document No. 00978634

1 INTRODUCTION

The Winchester South Project (the Project) is located approximately 200 kilometres (km) south west of Mackay and 30 km south east of Moranbah, within the Isaac Regional Council (IRC) Local Government Area (LGA) of the Bowen Basin, in central Queensland. Whitehaven WS Pty Ltd (Whitehaven WS), a subsidiary of Whitehaven Coal Limited, is the applicant and proponent for the Project.

The Project would be a greenfield development and would involve the development of an open cut coal mine (predominately metallurgical coal) and associated on-site and off-site infrastructure (e.g. electricity transmission line, water supply pipeline, access road etc.). It is estimated the Project would produce approximately 15 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal for approximately 30 years. As the mine design and project capital is optimised over the feasibility phase of the Project, the estimated output may be revised. The maximum tonnage output scenarios of between approximately 10 Mtpa and 20 Mtpa of ROM coal continue to be evaluated. Whitehaven WS plans to commence construction of the Project in approximately 2021 (or upon grant of all required approvals).

The Project presents an opportunity for development of a large scale, long-term mining operation that would generate significant employment and economic benefits to the local area, region and State.

The Coordinator-General, having considered the matters specified in section 27 of the Queensland *State Development and Public Works Organisation Act, 1971* (SDPWO Act), declared the Project a 'coordinated project for which an Environmental Impact Statement (EIS) is required', pursuant to section 26(1)(a)(b) of the SDPWO Act, on 17 April 2019.

1.1 PURPOSE AND STRUCTURE OF THIS DOCUMENT

This document has been prepared by Whitehaven WS to accompany a 'site-specific application for a new environmental authority for a resource activity' (site-specific application) to the Department of Environment and Science (DES) in consideration of sections 124, 125, 126 and 126A of the Queensland *Environmental Protection Act, 1994* (EP Act).

Section 2 provides a summary of the information requirements for the site-specific application, and in particular, addresses the items that requested additional information to be provided in an attachment. Where relevant, Section 2 of this document also references sections of the Initial Advice Statement (IAS) that was submitted to the Office of the Coordinator-General on 13 February 2019 as part of the application for declaration as a Coordinated Project. The IAS has been included as Attachment 1.

2 FURTHER INFORMATION

As described above, the site-specific application requires additional information to be provided in an attachment. Table 1 provides a reconciliation of the site-specific application and the additional information required.

Table 1
Reconciliation of Site-specific Application Requirements and Additional Information

<table>
<tr><th>Application Requirement</th><th>Additional Information</th></tr>
<tr><td>1 Applicant details</td><td>Refer to Application Form.</td></tr>
<tr><td>2 Registered suitable operator status</td><td>Refer to Application Form.</td></tr>
<tr><td>3 Details of the activity/activities being applied for</td><td>Resource activity name as it appears in Schedule 2A of the EP Reg
Refer to Application Form.
Ancillary activity as it appears in Schedule 2 of the EP Reg
<table>
<tr><th>Threshold</th><th>Name of ERA</th><th>Tenure Numbers</th></tr>
<tr><td>Storing more than 500 m^3 of chemicals of class C1 or C2 combustible liquids under AS1940 or dangerous goods class 3 under subsection (1)(c).</td><td>ERA 8 – Chemical Storage</td><td>MDL 183
MLA (TBC)</td></tr>
<tr><td>Extracting, other than by dredging, in a year, a total of more than 1,00,000 t of material.</td><td>ERA 16 – Extractive and Screening Activities</td><td>MDL 183
MLA (TBC)</td></tr>
<tr><td>Processing 1,000 t or more of coke in a year.</td><td rowspan="2">ERA 31 – Mineral Processing</td><td rowspan="2">MDL 183
MLA (TBC)</td></tr>
<tr><td>Processing 100,000 t or more of mineral products, other than coke, in a year.</td></tr>
<tr><td>Disposing of, in a year, more than 200,000 t of regulated waste and any, or any combination, of general waste, limited regulated waste, or untreated clinical waste.</td><td>ERA 60 – Waste Disposal</td><td>MDL 183
MLA (TBC)</td></tr>
<tr><td>More than 100 but not more than 1,500 EP, if treated effluent is discharged from the works to an infiltration trench or through an irrigation scheme.</td><td>ERA 63 – Sewage Treatment</td><td>MDL 183
MLA (TBC)</td></tr>
</table></td></tr>
</table>

Table 1 (continued)
Reconciliation of Site-specific Application Requirements and Additional Information

<table>
<tr><th>Application Requirement</th><th>Additional Information</th></tr>
<tr><td>4 Description of land where the activity/activities will be carried out</td><td>Please refer to the following sections of the IAS (Attachment 1) for additional information.

<table><tr><th>Land Characteristic</th><th>Relevant Sections of IAS</th></tr><tr><td>Environmental values</td><td>Section 5</td></tr><tr><td>Bioregions and regional ecosystems</td><td>Sections 5.1.4 and 5.1.5</td></tr><tr><td>Terrain</td><td>Section 5.1</td></tr><tr><td>Shallow groundwater systems</td><td>Section 5.1.2</td></tr><tr><td>Floodplains</td><td>Section 5.1.2.2</td></tr><tr><td>Soil descriptions</td><td>Section 5.1.1.3</td></tr></table>
Springs
A spring is a hydrogeological feature by which groundwater discharges naturally to the land or cave surface. This includes springs with permanent and non-permanent (i.e. intermittent or ephemeral) saturation regimes, dynamic or static geographic locations, and diffuse or point source geographic locations. The Queensland Springs Database provides a comprehensive catalogue of springs with a permanently saturated saturation regime that have fixed locations in Queensland and any associated surface expression groundwater dependent ecosystems. Review of the Queensland Springs Database indicates that no springs have been identified in the Project area, and no springs have been observed through surveys of the Project area.</td></tr>
</table>

Table 1 (continued)
Reconciliation of Site-specific Application Requirements and Additional Information

<table>
<tr><th>Application Requirement</th><th>Additional Information</th></tr>
<tr><td>4 Description of land where the activity/activities will be carried out (continued)</td><td>Tenements
Whitehaven WS is proposing to undertake the Project within three separate mining leases (MLA 1, MLA 2 and MLA 3), wholly located within the existing MDL 183 (see coordinates for MDL 183 boundary below).

<table>
<tr><th>Point</th><th>Easting</th><th>Northing</th><th>Point</th><th>Easting</th><th>Northing</th></tr>
<tr><td>1</td><td>628438.75</td><td>7552388.47</td><td>11</td><td>635577.01</td><td>7539180.74</td></tr>
<tr><td>2</td><td>630070.43</td><td>7553735.02</td><td>12</td><td>634115.50</td><td>7539403.50</td></tr>
<tr><td>3</td><td>630663.63</td><td>7553770.71</td><td>13</td><td>634131.14</td><td>7540999.53</td></tr>
<tr><td>4</td><td>631161.46</td><td>7552985.76</td><td>14</td><td>630094.07</td><td>7541039.92</td></tr>
<tr><td>5</td><td>631478.29</td><td>7552007.99</td><td>15</td><td>628993.85</td><td>7542691.03</td></tr>
<tr><td>6</td><td>632571.47</td><td>7551855.78</td><td>16</td><td>629014.02</td><td>7544741.33</td></tr>
<tr><td>7</td><td>639221.56</td><td>7544464.34</td><td>17</td><td>627865.73</td><td>7544752.55</td></tr>
<tr><td>8</td><td>639182.14</td><td>7540708.29</td><td>18</td><td>627304.72</td><td>7545757.79</td></tr>
<tr><td>9</td><td>636559.64</td><td>7539129.19</td><td>19</td><td>627376.03</td><td>7553168.25</td></tr>
<tr><td>10</td><td>636015.53</td><td>7539134.79</td><td>20</td><td>627898.97</td><td>7553471.37</td></tr>
</table></td></tr>
</table>

Table 1 (continued)
Reconciliation of Site-specific Application Requirements and Additional Information

Application Requirement	Additional Information
5 Details of contaminated land	Refer to Application Form.
6 Regional interests development approval	Refer to Application Form.
7 Environmental offsets	The Queensland *Environmental Offsets Act 2014* (EO Act) and EPBC Act and the following related policies are relevant to environmental offset proposals for mining projects: ■ Queensland Environmental Offsets Policy (Version 1.6); and ■ EPBC Act Environmental Offsets Policy (Department of Sustainability, Environment, Water, Population and Communities [SEWPaC], 2012) (and supporting EPBC Act Offsets Assessment Guide). As described in the Queensland Environmental Offsets Policy (Version 1.6), section 15 of the EO Act removes the ability for the State government to impose an offset condition in relation to a prescribed activity if a Commonwealth decision has already been made in relation to the same or substantially the same activity, matter and area of impact. It is possible that a Commonwealth decision for an offset would be made in relation to a number of matters associated with the area of impact which would negate the need for the State government to impose an offset condition on these matters (e.g. protected wildlife habitat). To address the residual significant adverse impacts (on MNES and MSES), an offset would be provided in accordance with the Queensland Environmental Offsets Policy (Version 1.6) and, if the Project is declared a 'controlled action', in accordance with the EPBC Act Environmental Offsets Policy (SEWPaC, 2012).
7.1 Notice of election	Refer to Application Form.

Table 1 (continued)
Reconciliation of Site-specific Application Requirements and Additional Information

Application Requirement	Additional Information
7.2 Staged environmental offsets	Land clearing is proposed to occur in multiple stages. If an offset is required, Whitehaven WS would propose a staged environmental offset in consideration of the staged land clearing. The offset (if required) for each stage of clearance would be provided before clearing the relevant stage. It is likely that the residual significant adverse impacts can be offset given the following: ■ The native vegetation communities/regional ecosystems to be cleared during the life of the Project (including those listed as 'Endangered' and 'Of Concern') all occur extensively in surrounding landscape and subregions. ■ The surrounding landscape contains large areas of non-remnant vegetation (required to offset the significant residual impact on 'Connectivity'). ■ The Ornamental Snake, Squatter Pigeon [southern], Greater Glider and Koala (and their habitats) are widely distributed in the surrounding landscape and region. ■ High Ecological Significance wetlands are mapped as occurring widely in the surrounding locality. In accordance with the Queensland Environmental Offsets Policy (Version 1.6), a notice of election would be provided to DES no less than 3 months before residual significant impacts on a relevant MSES. The notice of election would include a description of the: ■ offset delivery approach (land-based proponent-driven offset site(s), direct-benefit offset and/or a financial settlement offset); and ■ proposed staging details. A detailed assessment of the impact of each stage of the Project and the offset requirement for each stage would be conducted prior to providing the notice of election to DES for that stage. The offset would be provided before the commencement of each stage.

Table 1 (continued)
Reconciliation of Site-specific Application Requirements and Additional Information

Application Requirement	Additional Information
7.3 Nature conservation environmental offset	Refer to Application Form.
7.4 Marine parks environmental offset	Refer to Application Form.
8 Matters of national environmental significance	Refer to Application Form.
9 ANZSIC Code for the activity	Refer to Application Form.
10 Environmental impact statement under the State Development and Public Works Organisation Act 1971	Refer to Application Form.
11 EIS under the Environmental Protection Act 1994	Refer to Application Form.
12 EIS triggers	Refer to Application Form.
13 Assessment of the environmental impact	The existing environment, potential impacts and proposed environmental management and mitigation measures associated with the Project are outlined in Sections 5, 6 and 7 of the IAS (respectively). The IAS is provided as Attachment 1. Further detail will be provided in the Environmental Impact Statement (EIS) for the Project.

Table 1 (continued)
Reconciliation of Site-specific Application Requirements and Additional Information

Application Requirement	Additional Information
14 Details of waste management	The management of waste (non-mineral) at the Project would be governed by Queensland legislation, including: ■ EP Act; ■ EP Regulation; and ■ *Waste Reduction and Recycling Act, 2011* (Queensland) (WRR Act). Waste streams generated by the Project would comprise, but not be necessarily limited to: waste rock; CHPP rejects; recyclable and non-recyclable general wastes; sewage and wastewater; and other wastes from mining and workshop activities (e.g. used tyres, scrap metal, waste hydrocarbons and oil filters). The application of the waste management hierarchy is an underlying principle of all waste management in Queensland. The waste management hierarchy, as stipulated in the WRR Act, identifies the most preferred to the least preferred waste management option: avoid; reduce; reuse; recycle; recover; treat; and dispose. Whitehaven WS would manage the waste produced at the Project in accordance with the waste and resource management hierarchy. If waste must be disposed of, Whitehaven WS would do so in a way that prevents or minimises adverse effects on environmental values. All general domestic waste (e.g. general solid [putrescibles] waste and general solid [non-putrescible] waste) would be stored on-site in bins for regular transport off-site by a licensed waste transport contractor to a licensed landfill. An on-site landfill will be implemented for the disposal of certain waste streams generated on-site. Some waste streams, including hazardous wastes, would be removed from site by a licenced contractor and disposed of, or recycled, at appropriate off-site facilities. Waste tyres would be segregated and stored in a designated area with no grass or other flammable material. Tyres would be transported off-site to a supplier for retreading where practicable or disposed on-site in a designated tyre disposal area. Scrap metal would be placed in scrap metal skips for collection by a licensed contractor. Larger items would be left in an accessible location where specific collection arrangements could be made. Waste oils would be collected and stored in designated waste oil containers within a designated bunded area for transport by a licensed regulated waste contractor to a regulated waste receiver. Engine oil/fuel filters would be collected and stored in sealed oil filter disposal pods. Filters would be treated (solvent wash) by a licensed regulated waste contractor to recover oil.

Table 1 (continued)
Reconciliation of Site-specific Application Requirements and Additional Information

Application Requirement	Additional Information
15 Coal seam gas activities	Refer to Application Form.
16 Exercising underground water rights	Refer to Attachment 2.
17 Publication of application notice and documents	Refer to Application Form.
18 Payment of fees	Refer to Application Form.
19 Applicant declaration	Refer to Application Form.

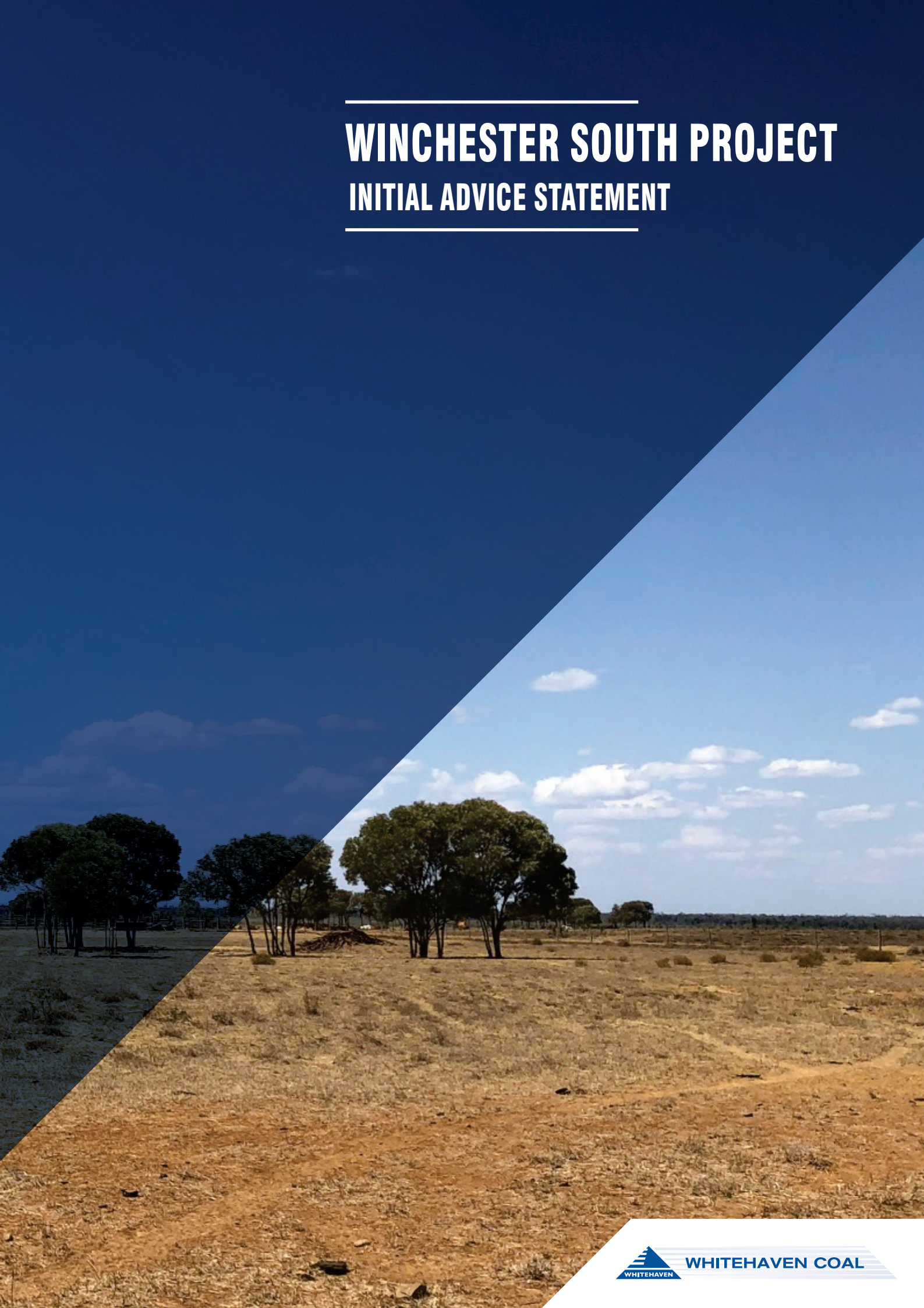
ATTACHMENT 1

WINCHESTER SOUTH PROJECT

INITIAL ADVICE STATEMENT

WINCHESTER SOUTH PROJECT

INITIAL ADVICE STATEMENT



WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

INITIAL ADVICE STATEMENT

FEBRUARY 2019
Project No. WHC-18-61
Document No. 00955794-006

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

EXECUTIVE SUMMARY

Whitehaven Coal Limited (Whitehaven) is Australia's largest independent listed coal producer, with six mines currently in operation in the Gunnedah Basin of north west New South Wales.

Whitehaven's current overall workforce is more than 2,000 personnel, with around 75 per cent of employees living in the local communities near the operations. Whitehaven has contributed over $1.5 billion in the last 5 years to the local economies around which it operates and works with over 350 local businesses.

Whitehaven is proposing to expand its operations to Queensland's Bowen Basin by developing the Winchester South Project (the Project), located approximately 30 kilometres south east of Moranbah. The Project would be a greenfield development and consist of a coal mine and associated infrastructure. It is estimated the Project would produce up to 15 million tonnes per annum of run-of-mine (ROM) coal for approximately 30 years.

The Bowen Basin contains high quality coal resources and an extensive existing mining industry serviced by extensive infrastructure. The development of a new mining operation would provide significant direct employment opportunities for approximately 500 construction personnel and approximately 450 operational personnel, and long-term flow-on social and economic benefits to regional communities.

The Project would include the following main components:

- an open cut coal mine which would primarily produce metallurgical coal for steel making;
- an access road;
- a rail loop and train load-out facility;
- an electricity transmission line;
- a raw water supply pipeline;
- mine infrastructure areas, including workshops, offices and an on-site coal handling and preparation plant to process ROM coal from the Project; and
- an on-site temporary accommodation camp.

The Norwich Park Branch Railway will be used as the connection into the broader Queensland rail network to transport the product coal by rail and export via the Abbott Point, Dalrymple Bay or Gladstone coal ports through the Newlands, Goonyella and Blackwater rail networks, respectively (subject to availability of rail and port allocation).

The mine plan for the Project is being designed to result in the creation of a final void outside the Isaac River floodplain. This would be achieved by backfilling the open cut voids within the Isaac River floodplain (as defined by the Queensland Floodplain Assessment Overlay [Department of Natural Resources, Mines and Energy, 2018]). While open cut mining is conducted within the Isaac River floodplain the active mining areas would be protected from flooding by levees (conceptual locations shown on Figure 2).

The Project would be progressively rehabilitated in accordance with leading practice measures and contemporary legislative requirements. The post-mining landform will be designed to be safe and structurally stable, to not cause environmental harm and be able to sustain post-mining land uses such as cattle grazing and woodland. It is expected that the post-mining landform would include final voids, however they would be located beyond the extent of the Isaac River 1:1,000 year average recurrence interval flood extent (to be defined as part of the Environmental Impact Statement).

Workforce accommodation options for the Project include self-accommodation (i.e. home ownership), rental accommodation and utilising existing accommodation villages in Moranbah, Dysart or Coppabella. In addition, the workforce may utilise an on-site temporary accommodation camp. The Project is located near established transport corridors, townships and accommodation facilities, minimising the need for extensive off-site infrastructure requirements.

Whitehaven considers the Project meets the requirements for declaration as a 'Coordinated Project' under the Queensland *State Development and Public Works Organisation Act 1971.* This document is an Initial Advice Statement which supports an application to the Coordinator-General for declaration of the Project as a Coordinated Project under Part 4 of the Queensland *State Development and Public Works Organisation Act 1971*. This Initial Advice Statement provides an overview of the Project to inform the preparation of the Terms of Reference for an Environmental Impact Statement for the Project.

1 INTRODUCTION

This document is an Initial Advice Statement (IAS) for the Winchester South Project (the Project). Winchester South Coal Operations Pty Ltd, a subsidiary of Whitehaven Coal Limited, is the applicant and proponent for the Project. The proponent (Section 2) will be referred to herein as Whitehaven.

The Project is located approximately 200 kilometres (km) south west of Mackay and 30 km south east of Moranbah, within the Isaac Regional Council (IRC) Local Government Area (LGA) of the Bowen Basin, in central Queensland (Figure 1). The Project would involve the development of an open cut coal mine (predominately metallurgical coal) and associated on-site and off-site infrastructure (e.g. electricity transmission line, water supply pipeline, access road etc.).

Considering the large scale of the Project, the scope of studies that will be undertaken and the complex approval requirements, Whitehaven considers that the Project should be declared as a 'Coordinated Project' requiring an Environmental Impact Statement (EIS).

1.1 BACKGROUND

The demand for high quality coal has remained strong due to industrial growth in Asia. The development of new coal resources is therefore considered to be necessary to achieve continuity of supply to this market.

Whitehaven is proposing to expand its operations to Queensland's Bowen Basin by developing the Project. The Project presents an opportunity for development of a large scale, long-term mining operation that would generate significant employment and economic benefits to the local area, region and State.

Whitehaven completed the 100% acquisition of the Project in June 2018. Whitehaven has since commissioned a Joint Ore Resources Committee Resource estimation and is developing a mine plan.

The Project would be a greenfield development and consist of a coal mine and associated infrastructure. It is estimated the Project would produce up to 15 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal for approximately 30 years. Whitehaven plans to commence construction of the Project in approximately 2021 (or upon grant of all required approvals).

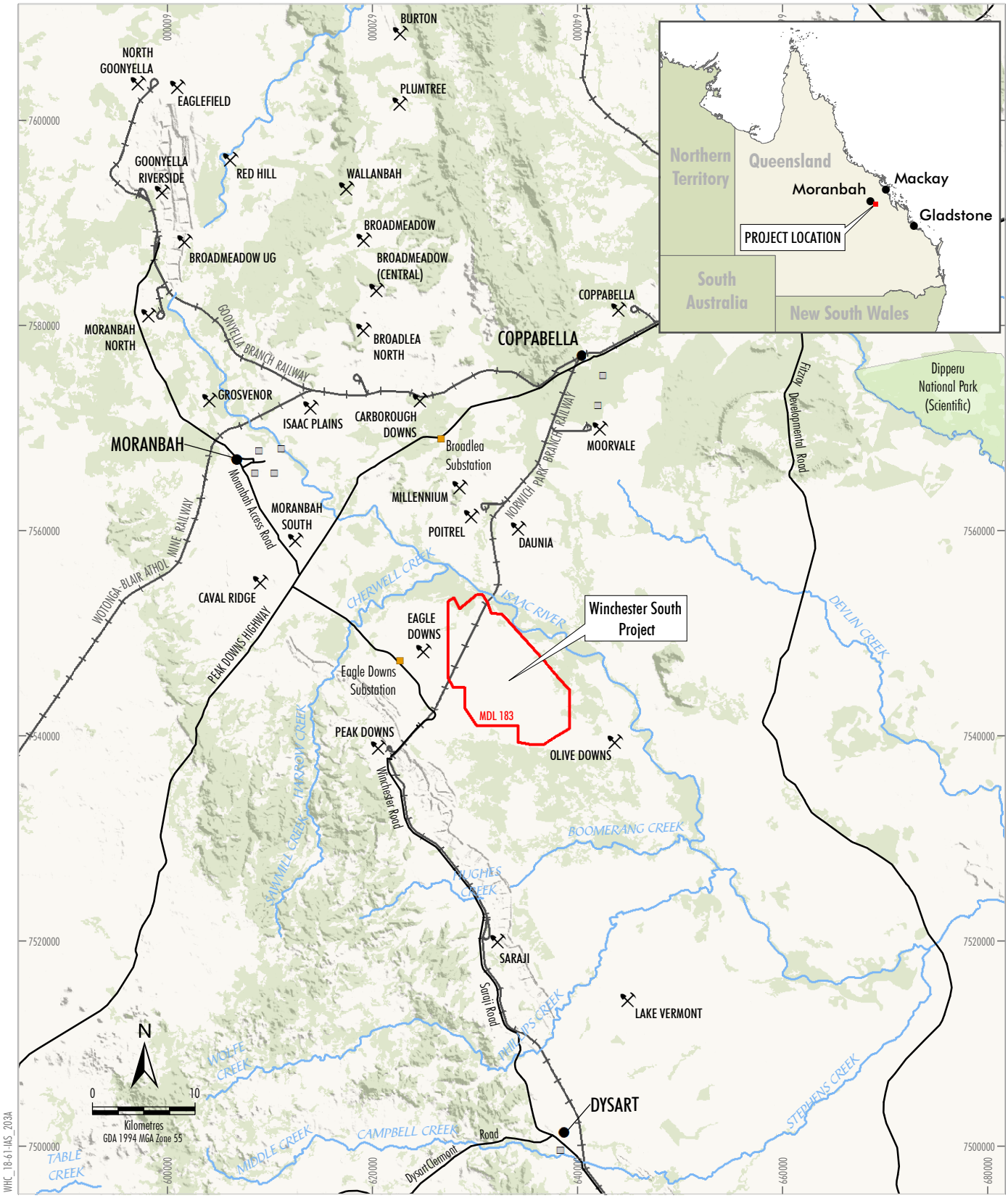
Section 3 provides a more detailed description of the Project and its components.

Whitehaven considers the Project meets the requirements for declaration as a 'Coordinated Project' under the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act) as it:

- would involve complex approval requirements, involving Local, State and Commonwealth governments;
- would require assessment of significant environmental effects;
- would have strategic significance to the local area, region and State, including infrastructure requirements, economic and social benefits, capital investment and employment opportunities; and
- would have significant infrastructure requirements associated with the rail loop, water supply pipeline, electricity transmission line, access road and an on-site temporary accommodation camp.

Whitehaven has commenced baseline environmental studies across the Project site and surrounds. Indicative conceptual mine plan and infrastructure designs have also been prepared to allow for commencement of environmental assessments, feasibility studies and detailed designs.

Whitehaven considers that, if declared a Coordinated Project, assessment via an EIS would be appropriate.



WHC_18-61-IAS_203A

LEGEND

- Winchester South Mineral Development Licence
- Accommodation Village
- Railways
- Roads

Source: Department of Natural Resources Mines and Energy (2018); Department of Natural Resources and Mines (2017) Geoscience Australia (2018)

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

Project Location

Figure 1

1.2 PURPOSE AND SCOPE OF THE IAS

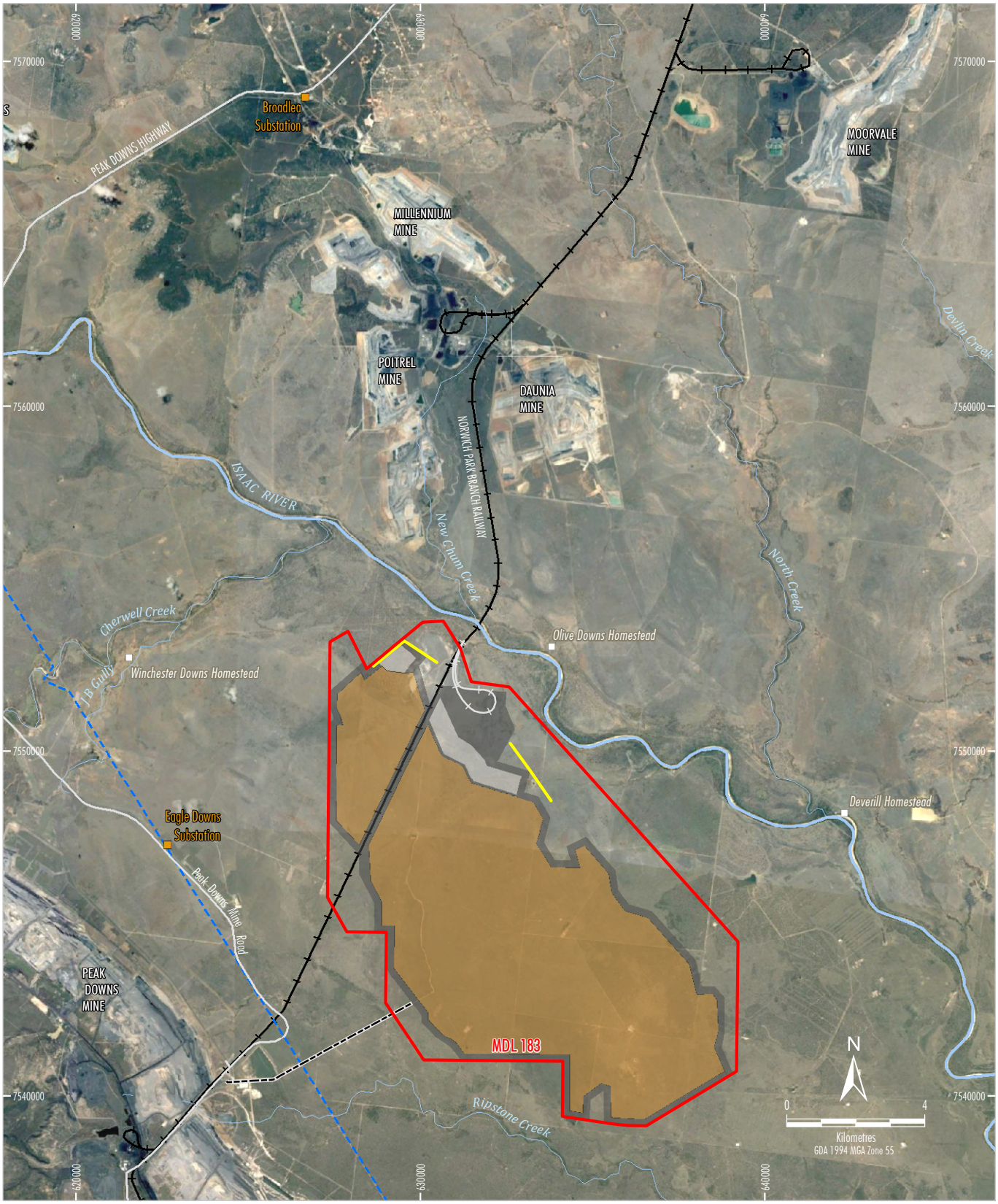
In accordance with the *Application Requirements for a 'Coordinated Project' Declaration* (Department of State Development, 2015), this IAS has been prepared to:

- assist the Coordinator-General in deciding whether to declare a project a Coordinated Project;
- enable stakeholders to determine the nature and relevance of the proposal to them;
- assist the Coordinator-General to determine whether an EIS or Impact Assessment Report process is appropriate; and
- subsequently assist the Coordinator-General to prepare draft Terms of Reference for the EIS.

This IAS includes the Project mining area located within Mineral Development Licence (MDL) 183, the rail loop, water supply pipeline, electricity transmission line, access road and any other required supporting infrastructure. MDL 183 and the initial conceptual locations of the key on-site Project components are shown on Figure 2.

Although numerous options exist, two of the preferred options for Project power supply is to connect, via an electricity transmission line, the site to either the Eagle Downs Substation, adjacent to the Peak Downs Mine Road, or the Broadlea Substation located adjacent to the Peak Downs Highway. These two substations are shown on Figure 2.

Section 3 provides a more detailed description of the Project.



WHC_18-61-IAS_2044A

LEGEND

- Winchester South Mineral Development Licence
- Roads
- Eungella Pipeline Southern Extension
- Railway

Indicative Key Project Infrastructure Component

- Infrastructure
- Open Cut Pit and Waste Rock Emplacement
- Waste Rock Emplacement
- Access Road
- Conceptual Flood Levee
- Rail Loop

Source: Department of Natural Resources, Mines and Energy (2018); Whitehaven (2018). Orthophoto: ESRI (2018)

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

Indicative General Arrangement

Figure 2

2 THE PROPONENT

The proponent for the Project is Winchester South Coal Operations Pty Ltd (a subsidiary of Whitehaven). The contact details for the Proponent are:

Winchester South Coal Operations Pty Ltd
Level 28, 259 George St
Sydney NSW 2000
Phone: (02) 8222 1100

As noted in Section 1, the Proponent is referred to in this IAS as Whitehaven.

Whitehaven Coal Mining Limited (now a wholly owned subsidiary of Whitehaven) was established in 1999 and began operations at its first mine (Canyon Mine) in 2000. Since then, Whitehaven has successfully grown through acquisitions and development of new mines, to become Australia's largest independent coal producer and the leading coal producer in north west New South Wales (NSW).

Whitehaven currently operates six mines in the Gunnedah Basin of north west NSW; five open cut mines at Maules Creek, Tarrawonga, Rocglen, Werris Creek and Sunnyside and one underground mine at Narrabri. These sites produce thermal and metallurgical coal primarily for export markets in North and South Asia. Whitehaven's overall workforce is more than 2,000 personnel, with approximately 75% of employees living in the local communities around operations.

Whitehaven also owns the Vickery Coal Mine, in the Gunnedah Basin, which is approved although not currently operating.

Whitehaven has contributed over $1.5 billion in the last 5 years to the local economies around which it operates and works with over 350 local businesses.

Whitehaven has undertaken numerous technical and complex environmental impact assessments and prepared EIS documentation for its existing operations and has the necessary experience and financial capacity to deliver a comprehensive EIS.

The EIS for the Project would be delivered with the assistance of a highly capable project team which also has extensive experience in Queensland based mining approvals. This will ensure the required reporting is delivered in a timely and professional manner, inclusive of all of the necessary details and supporting information.

3 NATURE OF THE PROPOSAL

3.1 SCOPE OF THE PROJECT

The Project would include, although not to be limited to, the following main components:

- an open cut coal mine which would primarily produce metallurgical coal for steel making (a secondary export quality thermal coal product would also be produced);
- an access road from the Peak Downs Mine Road via Winchester Road;
- a new rail loop and train load-out facility connecting to the Norwich Park Branch Railway;
- an electricity transmission line from the existing power network to the north or west;
- a raw water supply pipeline, for example from the existing Eungella pipeline network;
- mine infrastructure areas, including workshops, offices and an on-site coal handling and preparation plant (CHPP) to process ROM coal from the Project;
- an on-site landfill for the disposal of certain waste streams generated on-site; and
- an on-site temporary accommodation camp.

Up to 15 Mtpa of ROM coal would be extracted over the anticipated Project operational life of approximately 30 years.

Mine support infrastructure for the Project would include, for example, crib facilities, bathhouse, warehouse, re-fuelling facilities, powerlines, communication facilities and other associated amenities.

The main water demands for the Project would be for the CHPP and dust suppression. The water use would fluctuate with mining rate, area of disturbed land and climatic conditions.

Water would likely (subject to detailed design) be supplied through the following sources:

- open cut dewatering;
- processing water re-use and recycling;
- treated wastewater;
- flood harvesting;
- incident rainfall and runoff collection; and
- supplementary raw water supply from existing off-site water supply networks.

The mine plan for the Project is being designed to result in the creation of a final void outside the Isaac River floodplain. This would be achieved by backfilling the open cut voids within the Isaac River floodplain (as defined by the Queensland Floodplain Assessment Overlay [Department of Natural Resources, Mines and Energy {DNRME}, 2018]) (Figure 3).

While open cut mining is conducted within the Isaac River floodplain the active mining areas would be protected from flooding by levees (conceptual locations shown on Figure 2).

The Norwich Park Branch Railway will be used as the connection point into the broader Queensland rail network to transport the product coal by rail and export via, for example, Abbott Point, Dalrymple Bay, Gladstone coal ports through the Newlands, Goonyella and Blackwater rail networks, respectively (based on availability of rail and port allocation).

A construction workforce of approximately 500 personnel and an operational workforce of approximately 450 personnel is expected to be required.

3.2 LAND USE

The Project areas are generally consistent with the *identified coal reserves* in the *Mackay, Isaac and Whitsunday Regional Plan* (Queensland Government, 2012) and also overlap existing petroleum tenements.

As the Project is located in the centre of the Bowen Basin, mining and petroleum exploration activities have been conducted within the Project area and surrounds for several decades.

A number of existing and approved/proposed coal mines surround the Project, including Moorvale, Daunia, Poitrel, Millennium, Eagle Downs, Caval Ridge, Moranbah South, Peak Downs, Olive Downs and Saraji (Figure 1).

WHC_18-61-IAS_210C

LEGEND

- Winchester South Mineral Development Licence
- Cadastral Boundary
- Homestead
- Eungella Pipeline Southern Extension
- Railway
- Roads
- Queensland Floodplain Assessment Overlay

Source: Department of Natural Resources, Mines and Energy (2018).
Orthophoto: Whitehaven (2018)

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

Relevant Key Cadastral Boundaries and Queensland Floodplain Assessment Overlay

Figure 3

Land in the vicinity of the Project is predominantly owned by other mining companies. The land within MDL 183 is owned by mining companies (Iffley and Wynette) and private landholders (Winchester Downs) (Figure 3).

Under the *Mackay, Isaac and Whitsunday Regional Plan* (Queensland Government, 2012) the Project area is located within zones identified and mapped as Regional Landscape and Rural Production Area.

The Project mining area has been largely cleared through past agricultural practices, however some tracts of remnant (or regrowth) vegetation exist, particularly along the Isaac River. There is no Strategic Cropping Land mapped within MDL 183 or along the likely infrastructure corridors (Section 5.1.1.1). Currently, the main landuse within MDL 183 is cattle grazing.

3.3 PROJECT NEED, JUSTIFICATION AND ALTERNATIVES CONSIDERED

The development of new coal resources is considered necessary to meet demand for high quality coal due to industrial growth in Asia. Alternative assets, including existing operations with expansion opportunities, were investigated by Whitehaven during analysis of potential resources within Australia.

The Bowen Basin contains high quality coal resources and an extensive existing mining industry serviced by well established infrastructure.

The development of new mining operations such as the Project will provide significant direct employment opportunities for construction and operational workforces, and long-term flow-on social and economic benefits to regional communities.

Open cut methods would be used to extract the coal as the geology of the Project resource is not easily amendable to underground mining methods.

If the Project was not developed, the value that the coal resource would provide to State royalties and Commonwealth tax revenue would be foregone and contribution to Queensland's growing export industry would not be realised.

Whitehaven considers that the Project would achieve its objective of developing a high quality, long-term, metallurgical coal asset due to the location within the Bowen Basin mining region, greenfield nature of the asset, significant size of the coal resource and proximity to existing infrastructure.

The Project would also create social and community benefits, as well as significant employment opportunities.

Whitehaven is developing a preferred mine plan, infrastructure design and production and workforce profiles in consideration of environmental and planning constraints, logistics, community and external relations, marketing, and commercial and financial matters.

3.4 COMPONENTS, DEVELOPMENTS, ACTIVITIES AND INFRASTRUCTURE THAT CONSTITUTE THE PROJECT TO BE DECLARED COORDINATED

The main activities associated with the development of the Project would include:

- development and operation of an open cut coal mine within MDL 183;
- use of conventional open cut mining equipment to extract ROM coal up to 15 Mtpa for approximately 30 years;
- placement of waste rock (i.e. overburden and interburden) in out-of-pit waste rock emplacements and within the footprint of the open cut voids;
- on-site excavation of and production of waste rock and gravel construction fill materials for use in the Project rail loop, mine infrastructure area and road construction;
- drilling and blasting of competent overburden/waste rock material;
- progressive construction and use of soil stockpile areas;
- progressive development of sediment dams and storage dams, pumps, pipelines and other water management equipment and structures (including levees);

- construction and operation of mine infrastructure areas, including workshops, offices, an on-site temporary accommodation camp and an on-site CHPP to process ROM coal from the Project;
- mechanical dewatering and co-disposal of coal rejects on-site within the footprint of the open cut void and/or out-of-pit emplacement areas;
- construction and operation of ancillary infrastructure in support of mining including mine infrastructure areas, ROM pads, haul roads, electricity supply, consumable storage areas, light vehicle roads and access tracks;
- construction of an access road, for example from the Peak Downs Mine Road via Winchester Road;
- installation of a raw water supply pipeline, for example from the existing Eungella pipeline network;
- installation of an electricity transmission line from the existing power network;
- construction of a new rail loop and train load-out facility including product coal stockpiles for loading of product coal to trains for transport to coastal ports;
- an on-site landfill for the disposal of certain waste streams generated on-site;
- ongoing exploration activities; and
- other associated minor infrastructure, plant and activities.

As the mine design and project capital is optimised over the feasibility phase of the Project, the estimated output may be revised. The maximum tonnage output scenarios of between approximately 10 Mtpa and 20 Mtpa of ROM coal continue to be evaluated.

3.5 EXTERNAL INFRASTRUCTURE REQUIREMENTS

3.5.1 Fuel Supply

All required fuels would be transported (via road) to the Project by contractors.

3.5.2 Workforce Accommodation

Workforce accommodation options for the Project include self-accommodation (i.e. home ownership), rental accommodation and utilising existing accommodation villages in Moranbah, Dysart or Coppabella. Initial discussions with accommodation providers in these locations indicate that there is the ability to accommodate both the construction and operational workforce in these locations.

In addition, the workforce may utilise an on-site temporary accommodation camp.

3.5.3 Water Supply

As part of the Project, a raw water supply pipeline would be constructed to MDL 183 from the existing Eungella pipeline network. The alignment of the pipeline will be subject to relevant studies conducted during feasibility studies and the EIS.

Discussions with Sunwater indicate that water availability exists within the Eungella network to satisfy the water requirements for the Project. Sunwater has however indicated additional capital works may be required as part of this water solution. This will be scoped further during 2019.

Whitehaven is also investigating water supply options with neighboring mines in order to supplement the Project's raw water supply requirements.

3.5.4 Rail Transport and Port Operations

The Norwich Park Branch Railway runs through the western section of the Project (Figure 2). A new rail loop will be constructed (with product coal stockpiles adjacent to the train load-out facility) and connected to the Norwich Park Branch Railway. This would be used for loading of coal onto trains for transport by rail to existing port terminals for export.

The design and location of the rail infrastructure will be finalised as part of the feasibility studies and will be described in the EIS.

The existing railway network provides access to Abbott Point, Dalrymple Bay and Gladstone coal ports through the Newlands, Goonyella and Blackwater rail networks, respectively. Although Dalrymple Bay is the closest port to the Project, Whitehaven's port option will be based on availability of capacity and total logistics costs.

3.5.5 Electricity Supply

Permanent electricity supply for the Project would be provided from the existing regional power network via construction of a 132 kilovolt electricity transmission line to the Project from, for example the Broadlea Substation or Eagle Downs Substation (Figure 2).

The final alignment of the electricity transmission line will be subject to relevant studies conducted during feasibility studies and the EIS. Temporary power may be supplied (e.g. by diesel generator units) until a permanent supply is present.

3.5.6 Road Transport

Vehicle access for employees, contractors and deliveries would likely be from the Peak Downs Mine Road.

3.5.7 Telecommunications

The Project would include a connection to the existing fibre optic network (or other) currently available in the region.

3.6 TIMEFRAMES FOR THE PROJECT

Table 1 presents the approximate timeframes currently planned for the Project.

Early works may include construction of access road upgrades to the Project, construction of a raw water supply pipeline, and installation of an electricity transmission line.

Table 1
Approximate Project Timeframes

Approximate Timeframe*	Project Phase
2021-2023	Construction commences at the Project and external ancillary infrastructure requirements (e.g. water supply pipeline, access road, electricity transmission line, rail loop, an on-site temporary accommodation camp, etc.).
2021-2023	Construction of mine infrastructure areas, including workshops, offices and an on-site CHPP to process ROM coal from the Project.
2022-2023	First coal at the Project.
2024-2029	ROM coal extraction at the Project increases up to 13 Mtpa.
2030-2053	ROM coal extraction reaches and remains up to 15 Mtpa.
2053-2055	Final rehabilitation works.

* Dependent upon grant of all required approvals.

3.7 CONSTRUCTION AND OPERATIONAL PROCESSES

Construction activities would include, but not necessarily be limited to, the following key requirements:

- construction of sediment dams and storage dams, pumps, pipelines and other water management equipment and structures (including levees);
- construction and operation of mine infrastructure areas, including workshops, offices, an on-site temporary accommodation camp and an on-site CHPP to process ROM coal from the Project;
- construction and operation of ancillary infrastructure in support of mining including mine infrastructure areas, ROM pads, haul roads, electricity supply, consumable storage areas, light vehicle roads and access tracks;
- connection to the existing telecommunications network;
- construction of an access road, for example from the Peak Downs Mine Road via Winchester Road;
- construction of a raw water supply pipeline, for example from the existing Eungella pipeline network;
- installation of an electricity transmission line from the existing power network; and
- construction of a new rail loop and train load-out facility including product coal stockpiles for loading of product coal to trains for transport by rail.

3.8 WORKFORCE REQUIREMENTS DURING CONSTRUCTION AND OPERATION

A construction workforce of approximately 500 personnel and a full time operational workforce of approximately 450 personnel would be required for the Project.

The Project would operate up to 24 hours a day, seven days a week.

3.9 ECONOMIC INDICATORS

The estimated total capital cost for the development of the Project is approximately $1 billion.

Upon commencement of operations, the Project will contribute to State royalty payments and Commonwealth tax revenues.

The Project would include economic benefits through ongoing annual direct and indirect output, direct employment and household income contributions.

3.10 FINANCING REQUIREMENTS AND IMPLICATIONS

As described above, the capital cost over the life of the Project is estimated to be in the order of $1 billion. Initial capital to enable commencement of coal processing is estimated at approximately $600 million.

Whitehaven has a proven history of financing and developing similar scale coal mine developments in NSW, such as its Maules Creek and Narrabri operations. Funding for the Project will be sourced from a combination of cash flows generated from existing Whitehaven operations and/or available facilities.

4 LOCATION OF KEY PROJECT ELEMENTS

4.1 LOCATION

4.1.1 Local Context

The Project is bordered by the Isaac River to the north east, the Olive Downs Coking Coal Project to the east and south east, and the Peak Downs and Saraji mines approximately 10 km to the west.

The Project area landscape has average elevations of approximately 210 metres (m) Australian Height Datum (AHD) and is generally flat to slightly undulating. The Project area elevation ranges from approximately 185 m AHD in the north east of the Project to approximately 235 m AHD in the higher areas to the south west of the Project area (Geoscience Australia, 2018).

4.1.2 Regional Context

The Project is located approximately 30 km south east of Moranbah and approximately 50 km north of Dysart in the Bowen Basin region of central Queensland, within the Isaac Regional Council LGA (Figure 1). The closest city is Mackay which is located approximately 200 km north east of the Project.

The Project is located in a mining precinct comprising several existing nearby coal mining operations, including (Figure 1):

- Olive Downs – coordinated project (adjacent to the east and south east of the Project);
- Daunia (7.5 km north west of the Project);
- Poitrel (8 km north west of the Project);
- Peak Downs (8 km west of the Project);
- Millennium (10.5 km north west of the Project);
- Saraji East Mining Lease Project (11 km south of the Project);
- Isaac Plains Extension – coordinated project (18 km north west of the Project);
- Moorvale (19 km north of the Project);
- Saraji (19.5 km south west of the Project);
- Lake Vermont Northern Extension Project – coordinated project (23 km south east of the Project);
- Lake Vermont (26 km south of the Project); and
- Goonyella Riverside and Broadmeadow Mines – coordinated project (50 km north west of the Project).

The Project is located within the Barada Barna Country (QC2008/011) Native Title Determination Application Area registered with the National Native Title Tribunal (2018). The Project is also located in the Isaac Connors Groundwater Management Area (GMA) declared under the Queensland *Water Plan (Fitzroy Basin) 2011*.

4.2 TENURE

4.2.1 Tenements

The Project is located within tenement MDL 183 (Figure 4). Despite the mapping showing an overlap with Exploration Permit for Coal (EPC) 1949 and 1950, the land within the EPC is excluded where it appears to overlap with MDL 183.

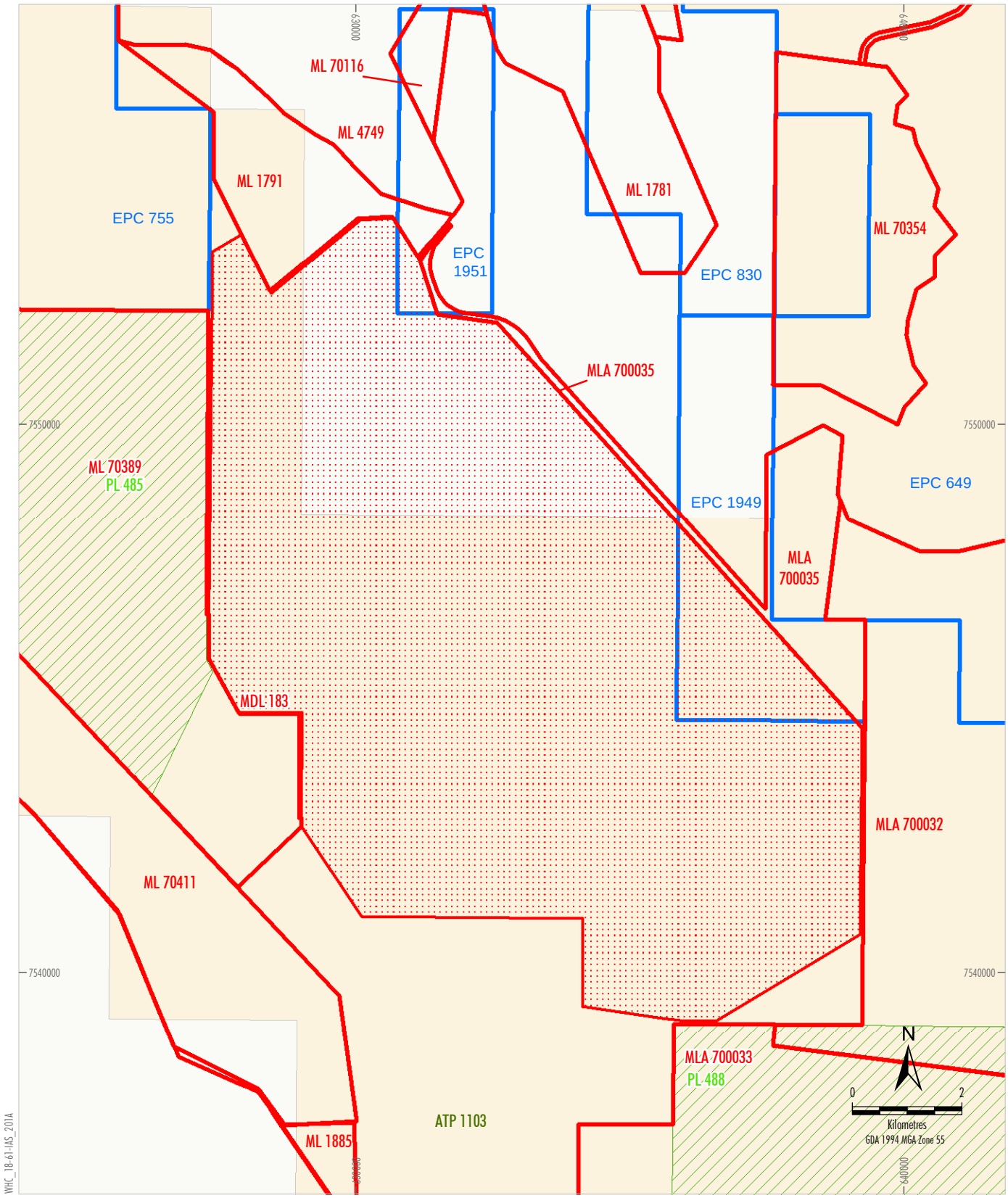
Whitehaven will be required to lodge a Mining Lease Application (MLA) for the Project with the Queensland Mining Registrar.

4.2.2 Land Ownership

The Project sits within the following lots:

- Iffley (11KL135);
- Wynette (4CNS15);
- Winchester Downs (5CNS90 and 8SP277384); and
- rail and road corridors (2CNS77 and ICNS78) (some parcels without lot numbers).

The associated external infrastructure for the Project (i.e. access road, electricity transmission line, and water supply pipeline) are currently conceptual only and therefore the specific lots to be impacted (and their ownership) are currently not known.



LEGEND

- Winchester South Mineral Development Licence
- Mining Lease
- Exploration Permits for Coal
- Petroleum Lease
- Exploration Permit for Petroleum

Source: Department of Natural Resources, Mines and Energy (2018);

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

Mining and Petroleum Tenements

Figure 4

4.2.3 Local Government Planning Scheme

The Project is in the local government area of Isaac Regional Council, which was formed from the Broadsound, Nebo and Belyando Shire Councils.

The Project is located partly within the former Belyando Shire Council and the Broadsound Shire Council areas.

Until the currently proposed Isaac Regional Planning Scheme is finalised, the below listed planning schemes would continue to apply:

- 2005 – Planning Scheme for Broadsound Shire;
- 2008 – Planning Scheme for the Shire of Nebo;
- 2009 – Planning Scheme for Belyando Shire; and
- 2011 – Moranbah Priority Development Area Development Scheme.

4.2.4 Regional Plan Designation

The *Mackay, Isaac and Whitsunday Regional Plan* (Queensland Government, 2012) recognises that coal mining is the major industry in the region and the largest employer. The *Mackay, Isaac and Whitsunday Regional Plan* also establishes a vision and direction for the region to 2031.

5 DESCRIPTION OF THE EXISTING ENVIRONMENT

5.1 NATURAL ENVIRONMENT

5.1.1 Land

5.1.1.1 Surrounding Mines

As described in Section 4.1, the region contains a number of currently operating and proposed coal mining activities, including mines to the immediate north, south and east of the Project (Figure 1).

5.1.1.2 Agricultural Land

There is no Strategic Cropping Land mapped within or adjacent to MDL 183.

There are two areas within the Project area mapped as *good quality agricultural land,* as identified in the *Mackay, Isaac and Whitsunday Regional Plan* (Queensland Government, 2012).

The majority of the Project area lies on C1 (sown pastures, and native pasture on high fertility soils) and C2 (Native Pastures) class agricultural lands (Queensland Government, 2018a). The land is suitable for pasture, however is not suitable for wide scale cropping (Department of Agriculture and Fisheries [DAF], 2018).

5.1.1.3 Geology and Soils

The Rewan and Rangal formations (including several faults) run through the middle of the Project area in a south easterly direction, bordered to the south west and north east by the Fair Hill formation (Figure 5).

Dominant soil types within the Project area include Vertosols and Sodosols (Queensland Government, 2018a).

5.1.1.4 Nature Conservation Areas

There are no nature conservation areas within or immediately surrounding the Project (Queensland Government, 2018a). The Dipperu National Park, located approximately 45 km to the north east of the Project is the closest National Park.

Bundoora State Forest is the closest State Forest and lies 70 km to the south west of the Project. Apsley and Blair Athol State Forests lie 95 km and 100 km to the south west of the Project, respectively.

There are no Ramsar protected wetland sites, nationally important wetland sites, or World Heritage areas within the Project area or vicinity (Appendix A; Department of the Environment and Energy [DEE], 2018a).

5.1.1.5 State Land

State land exists in the vicinity of the Project and may be traversed by external infrastructure, depending on final alignments. State Land with MDL 183 includes rail and road corridors.

5.1.2 Water

5.1.2.1 Surface Water

The Project lies within the Isaac River sub-catchment in the north of the Fitzroy River catchment (Queensland Government, 2018a). Under the Strahler classification system (Queensland Government, 2018a), the Isaac River in the vicinity of the Project is a 6th order stream.

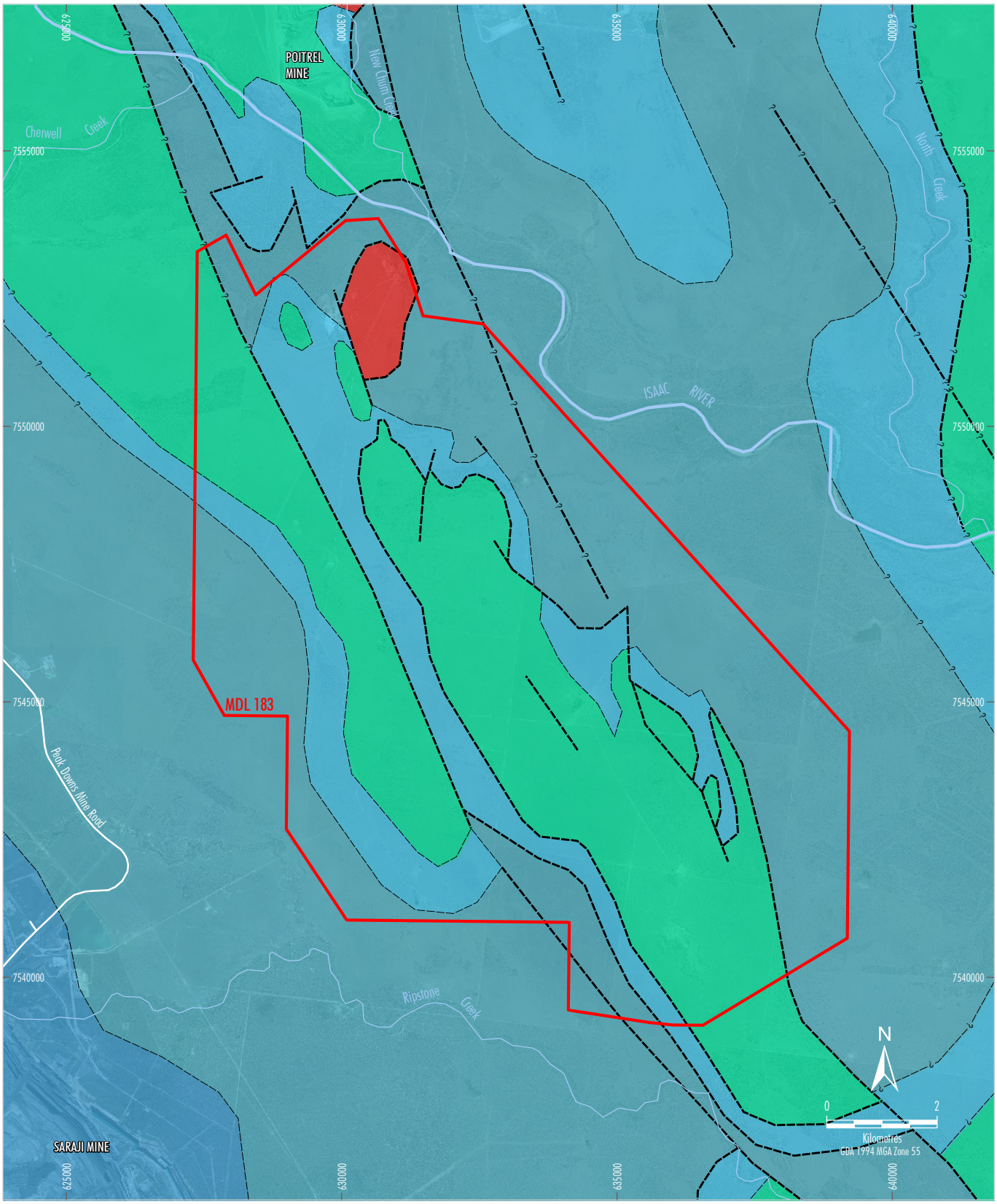
No diversions of the Isaac River are required for the Project.

Tributaries of the Isaac River in the vicinity of the Project (but beyond the MDL 183 extent) include (Figure 2):

- Ripstone Creek;
- New Chum Creek; and
- Cherwell Creek.

Unnamed 1st and 2nd order streams drain to the Isaac River from the Project area (Queensland Government, 2018a).

Flow duration data from the Queensland Government operated monitoring station on the Isaac River near the Deverill Homestead (Figure 2) indicates that the Isaac River is dry for most months of the year (between April and November), and subject to short period high flows in summer.



LEGEND

- Winchester South Mineral Development Licence
- Roads
- Watercourse

Rock Unit Name

- Fair Hill Formation,Fort Cooper Coal Measures (Pwt)
- Ki-CQ (Ki)
- Moranbah Coal Measures (Pwb)
- Rangal Coal Measures,Bandanna Formation,Baralaba Coal Measures (Pwj)
- Rewan Group (Rr)

Description

- Fault Approximate
- Fault Inferred
- Geological Boundary Approximate
- Geological Boundary Inferred

Source: Department of Natural Resources, Mines and Energy (2018); Deparment of Natural Resources, and Mines (2016)
Orthophoto: Whitehaven (2018)

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

Regional Geology

Figure 5

5.1.2.2 *Flooding*

The Queensland Floodplain Assessment Overlay was developed for use by local governments as a potential flood hazard area and it represents an estimate of areas potentially at threat of inundation by flooding (DNRME, 2018).

The mapping shows a portion of the Project area falls within the Isaac River floodplain (Figure 3).

5.1.2.3 *Groundwater*

It is expected that the Project coal resource is within a confined and semi-confined porous rock groundwater system within the Isaac Connors GMA. It is also expected that the Quaternary alluvial and unconsolidated Tertiary sediments associated with the Isaac River and its tributaries contain unconfined groundwater.

There are a number of groundwater bores within and immediately adjacent MDL 183. Bores classified as "existing" include (Queensland Globe, 2018):

- RN 162826.
- RN 162439.
- RN 141683.
- RN 162464.
- RN 162460.
- RN 141382.
- RN 165640.
- RN 141383.
- RN 162681.

A groundwater bore census was recently conducted on adjacent properties by HydroSimulations (2018) as part of the *Olive Downs Coking Coal Project Groundwater Assessment.* This bore census confirmed that groundwater use in the locality is limited, largely due to the limited extent of saturated alluvium (HydroSimulations, 2018).

The assessment also confirmed that water within the alluvium adjacent to MDL 183 generally exceeds guideline levels for drinking water and freshwater aquatic systems (HydroSimulations, 2018).

Potential impacts to bores would be considered in the Project EIS.

Raymond and McNeil (2011) indicate that the mapped groundwater zone in this region contains moderate to high salinities, dominated by Sodium and Chloride ions.

5.1.3 Air

5.1.3.1 *Regional Air Quality*

Regional air quality is expected to be influenced by emissions of dust from existing coal mining operations and agricultural activities.

Katestone Environmental (2018) recently reviewed the existing air quality in proximity to the Project as part of the *Olive Downs Coking Coal Project Air Quality and Greenhouse Gas Assessment*.

The review included analysis of long-term continuous PM_{10}[1] monitoring data available from the Department of Environment and Science (DES) monitoring station located in Moranbah, as well as dust deposition, total suspended particulate (TSP) and $PM_{2.5}$[2] data published in EISs for other mining operations in the region.

Based on the review, Katestone Environmental (2018) adopted the following background air quality levels, which are considered to also be representative of the Project site:

- Annual average TSP concentration of 27.5 micrograms per cubic metre (µg/m³).
- 24 hour average PM_{10} concentration of 27.2 µg/m³.
- Annual average $PM_{2.5}$ concentration of 3.6 µg/m³.
- 24 hour average $PM_{2.5}$ concentration of 4.3 µg/m³.
- Monthly average dust deposition level of 71 milligrams per square metre per day (mg/m²/day).

[1] PM_{10} refers to particulate matter 10 micrometres or less in diameter.

[2] $PM_{2.5}$ refers to particulate matter 2.5 micrometres or less in diameter.

5.1.3.2 *Prevailing Meteorology*

A review of the prevailing meteorology in the region was also conducted by Katestone Environmental (2018) as part of the *Olive Downs Coking Coal Project Air Quality and Greenhouse Gas Assessment*.

Data available from the Bureau of Meteorology monitoring station in Moranbah (Moranbah Airport) was used in The Air Pollution Model (TAPM) and CALMET to generate a three-dimensional meteorological dataset that Katestone Environmental (2018) considered representative of the region.

The meteorological file generated indicated winds are generally from the north east through to the south east. Winds from the north east are most frequent during spring, while winds from the south east are more frequent during autumn and winter. The strongest winds occur from the east and south east in summer and from the north east in spring (Katestone Environmental, 2018).

5.1.4 Ecosystems

Grazing land dominates the Project area with remnant and regrowth woodland vegetation present in some small patches. DES regional ecosystem (RE) mapping indicates nine REs occur within or intersect the Project area (DES, 2018a). Of these, the following two REs are classified as Endangered:

- 11.4.9 - *Acacia harpophylla* shrubby woodland with Terminalia oblongata on Cainozoic clay plains.
- 11.3.1 - *Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains.

These Endangered REs are mapped (collectively) on Figure 6.

An *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search (DEE, 2018a) was undertaken and identified the following three endangered ecological communities listed under the EPBC Act with potential to occur in the Project area and surrounds:

- Brigalow (*Acacia harpophylla* dominant and codominant).
- Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin.
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions.

Detailed vegetation mapping would be undertaken as part of the EIS to validate and ground truth the RE mapping.

5.1.5 Flora and Fauna

Database searches were undertaken to identify any Matters of National and/or State Environmental Significance with the potential to occur in the Project area and surrounds:

- Wildlife Online Database Search (DES, 2018b);
- EPBC Act Protected Matters Search (DEE, 2018a) (Appendix A); and
- Atlas of Living Australia (ALA) Database Search (ALA, 2018).

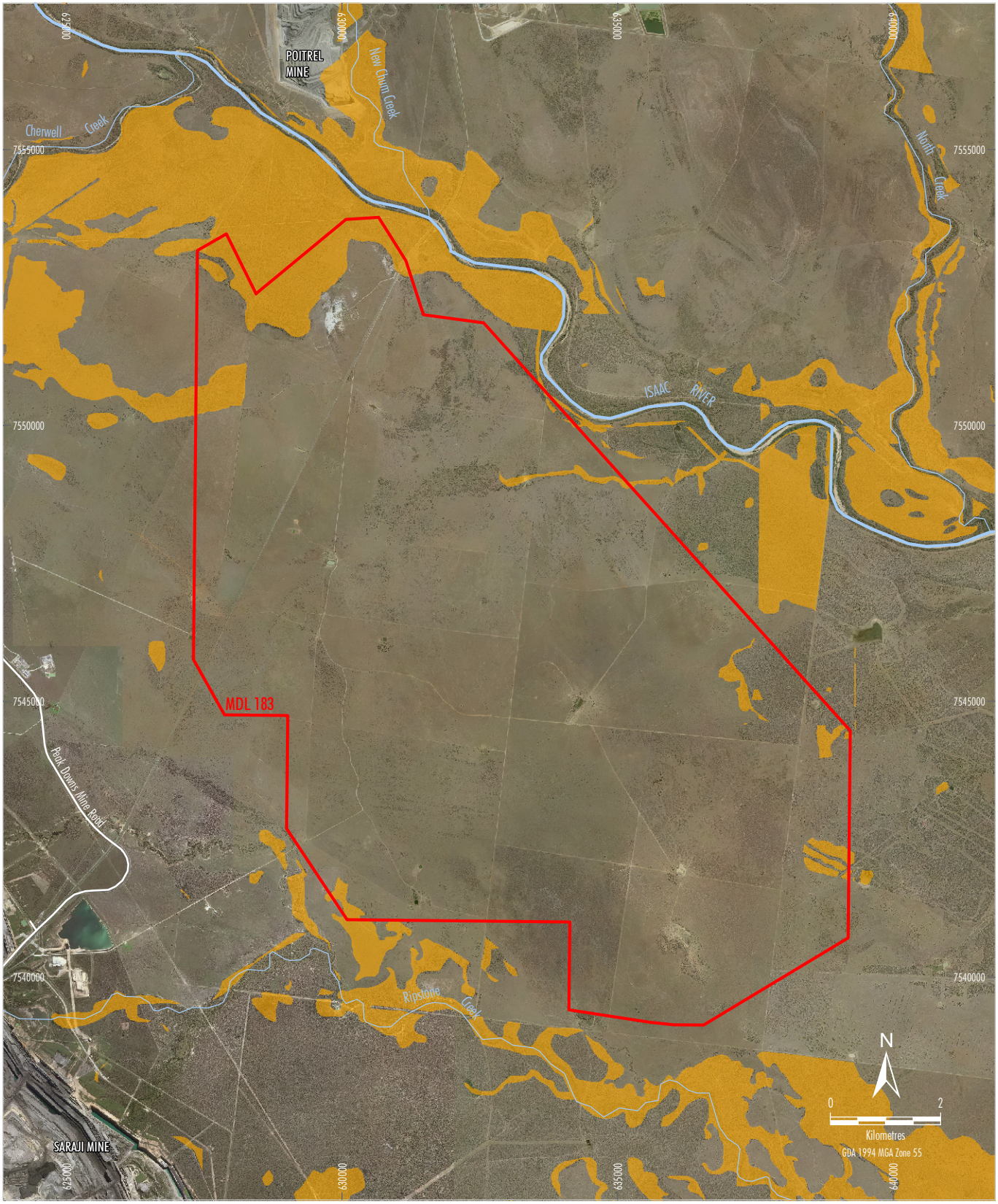
5.1.5.1 *Fauna*

The database searches identified fauna species listed as conservation significant or migratory under either the EPBC Act or *Nature Conservation Act 1992* (NC Act), relevant to the Project area and surrounds (Table 2).

5.1.5.2 *Flora*

The database searches identified three conservation significant species under either the EPBC Act or NC Act relevant to the Project area or surrounds (Table 3).

REs within the Project area that have been identified by the DES (2018a) regional mapping are described in Section 5.1.4.



WHC_18-61-IAS_206B

LEGEND

- Winchester South Mineral Development Licence
- Roads
- Watercourse
- Endangered Remnant Vegetation

Source: Department of Natural Resources Mines and Energy (2018); Deparment of Natural Resources and Mines (2016)
Orthophoto: Whitehaven (2018)

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

Endangered Regional Ecosystem Mapping

Figure 6

Table 2
Conservation Significant Fauna Species Potentially Occurring

Common Name	Scientific Name	Conservation Status[1]		Protected Matters Search	ALA	Wildlife Online
		EPBC Act	NC Act			
Bird						
Red Goshawk	*Erythrotriorchis radiatus*	V	E	Predicted	-	-
Squatter Pigeon (southern)	*Geophaps scripta*	V	V	Predicted	-	-
Painted Honeyeater	*Grantiella picta*	V	-	Predicted	-	-
Star Finch (eastern)	*Neochmia ruficauda*	E	E	Predicted	-	-
Australian Painted Snipe	*Rostratula australis*	E	V	Predicted	-	-
Fork-tailed Swift	*Apus pacificus*	M	SLC	Predicted	-	-
Oriental Cuckoo	*Cuculus optatus*	M	SLC	Predicted	-	-
Black-faced Monarch	*Monarcha melanopsis*	M	SLC	Predicted	-	-
Yellow Wagtail	*Motacilla flava*	M	SLC	Predicted	-	-
Common Sandpiper	*Actitis hypoleucos*	M	SLC	Predicted	-	-
Sharp-tailed Sandpiper	*Calidris acuminata*	M	SLC	Predicted	-	-
Curlew Sandpiper	*Calidris ferruginea*	M, CE	E	Predicted	-	-
Pectoral Sandpiper	*Calidris melanotos*	M	SLC	Predicted	-	-
Latham's Snipe	*Gallinago hardwickii*	M	SLC	Predicted	-	-
Osprey	*Pandion haliaetus*	M	SLC	Predicted	-	-
Common Greenshank	*Tringa nebularia*	M	SLC	Predicted	-	-
Fish						
Murray Cod	*Maccullochella peelii*	V	-	Predicted	-	-
Mammal						
Northern Quoll	*Dasyurus hallucatus*	E	LC	Predicted	-	-
Ghost Bat	*Macroderma gigas*	V	E	Predicted	-	-
Corbens Long-eared Bat	*Nyctophilus corbeni*	V	V	Predicted	-	-
Greater Glider	*Petauroides volans*	V	V	Predicted	-	Yes
Koala	*Phascolarctos cinereus*	V	V	Predicted	-	Yes
Reptile						
Southern Snapping Turtle	*Elseya albagula*	CE	E	Predicted	-	-
Fitzroy River Turtle	*Rheodytes leukops*	V	V	Predicted	-	-
Yakka Skink	*Egernia rugosa*	V	V	Predicted	-	-
Dunmall's Snake	*Furina dunmalli*	V	V	Predicted	-	-
Allan's Lerista	*Lerista allanae*	E	E	Predicted	-	-
Ornamental Snake	*Denisonia maculata*	V	V	Predicted	Yes	Yes

[1] Threatened species status under the EPBC Act and/ or the NC Act current as at November 2018.

CE = Critically Endangered, E = Endangered, V = Vulnerable, M = Migratory, SLC= Special Least Concern.

Table 3
Conservation Significant Flora Species Potentially Occurring

Scientific Name	Common Name	Conservation Status[1]		Protected Matters Search	ALA	Wildlife Online
		EPBC Act	NC Act			
Cycas ophiolitica	Marlborough Blue	E	E	Predicted	-	-
Dichanthium queenslandicum	King Blue-grass	E	V	Predicted	-	-
Samadera bidwillii	Quassia	V	V	Predicted	-	-

[1] Threatened species status under the EPBC Act and/ or the NC Act current as at November 2018.

E = Endangered and V = Vulnerable.

5.1.5.3 *Introduced Species*

Seventeen introduced species (including 11 fauna and six flora species) with the potential to occur within the Project area and surrounds, were identified by the EPBC Act Protected Matters Search (DEE, 2018a):

- House Sparrow (*Passer domesticus*);
- Spotted Turtle-dove (*Streptopelia chinensis*);
- Cane Toad (*Rhinella marina*);
- Domestic Dog (*Canis lupus familiaris*);
- Goat (*Capra hircus*);
- Cat (*Felis catus*);
- Feral Deer (*Cervus* sp.);
- House Mouse (*Mus musculus*);
- Rabbit (*Oryctolagus cuniculus*);
- Pig (*Sus scrofa*);
- Red Fox (*Vulpes vulpes*);
- Prickly Acacia (*Acacia nilotica* subsp. *Indica*);
- Cotton-leaved Physic Nut (*Jatropha gossypiifolia*);
- Lantana (*Lantana camara*);
- Parkinsonia (*Parkinsonia aculeata*);
- Block thorn (*Vachellia nilotrea*); and
- Parthenium Weed (*Parthenium hysterophorus*).

5.1.5.4 *Groundwater Dependent Ecosystems*

The National Atlas of Groundwater Dependent Ecosystems (GDEs) (Bureau of Meteorology, 2018) provides regional mapping of GDEs. This mapping shows:

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

Surveys would be undertaken of the Project area to validate this regional mapping.

It is considered unlikely that there would be significant stygofauna habitat in the underlying geology of the Project area. If present, stygofauna is most expected in unconfined sediments associated with major water courses.

5.2 SOCIAL AND ECONOMIC ENVIRONMENT

5.2.1 Isaac Region, Dysart and Moranbah

Key industries for the Isaac Regional Council LGA are coal mining and agriculture (IRC, 2018a). The Isaac Region is home to 27 currently operating coal mines, and four other resource operations. As of 2018, the region is responsible for 54% of Queensland's total saleable coal (IRC, 2018a). Agriculture is also a key contributor to the local economy.

It is expected that the townships of Dysart and Moranbah would provide a majority of the services needed by the Project workforce during its operation, considering the multitude of currently existing services which cater to mine workers in these townships.

Considering the proposed Project mine life of approximately 30 years, and given that the Project is anticipated to require the employment of a significant number of workers who would reside and work in the region, the Project is anticipated to incur long-lasting economic growth to the region, especially within Dysart and Moranbah.

Situated approximately 50 km to the south of the Project, Dysart was established in 1973 to service surrounding coal mines in the region (IRC, 2018c).

Dysart hosts a number of recreational facilities, including an Olympic swimming pool, a nine hole golf course, as well as a number of sporting fields. In addition, the town houses a hospital, dental surgery, and medical centre, as well as a variety of accommodation options, including multiple hotels and several accommodation villages. The town is also home to a kindergarten, a primary and secondary school and an airport approximately 2 km to the south east.

Situated approximately 30 km to the north west of the Project, Moranbah was established for the purpose of housing mine workers (IRC, 2018b). The town provides a similar range of services to Dysart for mine workers in the region, albeit on a larger scale.

Moranbah holds numerous education facilities, including two day-care facilities, two primary schools and a high school. Additionally, Moranbah offers a number of health services, including a hospital, as well as a number of dental and general medical centres.

A range of recreational and accommodation services are also located in the town, including a number of hotels, a supermarket, multiple sporting fields and clubs, and a range of small stores and businesses (IRC, 2018b).

5.2.2 Accommodation and Housing

Substantial temporary and permanent accommodation options are available within Moranbah and Dysart. A significant proportion of the workers required for the Project are anticipated to require temporary or permanent accommodation.

Moranbah and Dysart contain a number of accommodation villages, including:

- the Morris accommodation centre in Moranbah;
- the Buffel Park accommodation village;
- the Leichardt accommodation village;
- the Ausco Dysart accommodation village;
- the Civeo accommodation villages in Moranbah, Coppabella and Dysart; and
- the Dysart Staff accommodation village commissioned by the BHP Billiton Mitsubishi Alliance.

In addition, the townships contain a number of hotels for temporary accommodation.

The Civeo accommodation village in Moranbah holds over 1,200 rooms (Civeo, 2018a), the Coppabella Civeo village holds over 3,000 rooms (Civeo, 2018b) and the Dysart Civeo village holds over 1,700 rooms (Civeo, 2018c). The Buffel Park accommodation village, approximately 20 km to the south of Moranbah, services a large portion of the workers from the Caval Ridge mine, with a capacity of 1,945 rooms (RPS, 2018).

5.2.3 Cultural Heritage

In accordance with the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act), a Project specific Cultural Heritage Management Plan (CHMP) would be developed in consultation with the Barada Barna People, the native title holders for the Project Area and 'Aboriginal Party' for the purposes of the ACH Act.

The Queensland Heritage Register (November 2018) includes no culturally significant sites in the general vicinity of the Project (Queensland Government, 2018c). The closest significant site was located in Nebo, 65 km to the north east of the Project boundary.

The National Heritage List, which identifies nationally significant cultural sites, also showed no sites within the Project area or its surrounds (DEE, 2018b).

5.3 BUILT ENVIRONMENT, TRAFFIC AND TRANSPORT

The majority of the existing, health, education and accommodation infrastructure within the region are located within the townships of Moranbah and Dysart (Figure 1).

Major road transport routes in the vicinity of the Project are the Peak Downs Highway, located approximately 20 km to the north west of the Project, and the Fitzroy Developmental Road, 25 km east of the Project (Figure 1).

The Peak Downs Mine Road, which becomes Saraji Road when it intersects the Saraji mine, is approximately 5 km to the west of the Project (Figure 2).

A number of private unsealed roads and tracks are located within the Project area.

The Norwich Park Branch Railway runs through the Project area and services the local region. This railway forms part of the Goonyella Railway line which transports coal from the Bowen Basin to Hay Point and the Dalrymple Bay Coal Terminal south east of Mackay.

Several existing mines in the region have rail spurs and loops, branching off the Norwich Park Branch Railway (Figure 1). The Norwich Park Branch Railway also services several railway stations within the vicinity of the Project.

A rail loop is proposed to be developed as part of the adjacent Olive Downs Project, which is proposed to run along the north eastern boundary of the Project area.

5.4 LAND USE AND TENURES

The Project area is located on MDL 183 held by Whitehaven (Figures 2 and 4).

The rural properties in the vicinity of the Project as shown on Figure 3, namely, the Winchester Downs, Iffley, and Wynette properties. Winchester Downs is privately owned, Wynette is owned by Whitehaven and Iffley is owned by Pembroke Resources.

Figure 4 shows the mining tenements in the vicinity of the Project. This includes MLAs, EPCs, Authorities to Prospect (ATPs), Mining Leases and Petroleum Leases.

5.4.1 Key Local and Regional Land Uses

As described in Section 5.1.1.4, the Project is surrounded by a number of currently operating coal mines.

The existing landuse for properties in the Project area is predominantly grazing. There are no nature conservation areas, including National or State Parks, in the Project area or immediate surrounds.

5.4.2 Key Local and Regional Land Tenure

A significant block of leasehold land exists to the west of the Project, corresponding with the Saraji and Peak Downs mines. Additionally, a large area of leasehold land to the north west of the Project corresponds with the Poitrel and Millennium mines.

Land within the Project area and to the east and south is made up of freehold land.

5.4.3 Native Title

The Barada Barna People are the native title holders for the general Project region (Queensland Globe, 2018). Preliminary investigations indicate that native title has been extinguished over the Project Area.

5.5 PLANNING INSTRUMENTS, GOVERNMENT POLICIES

A new Planning Scheme is currently being developed for the Isaac Regional Council LGA.

Until the new Planning Scheme is in place, development will be regulated under the existing Broadsound, Belyando and Nebo Shire Planning Schemes, and Moranbah Priority Area Development Scheme (Section 4.2.3).

The following State and Regional plans, strategies and policies are relevant to the Project:

- *Environmental Protection (Air) Policy 2008* (EPP [Air]).
- *Environmental Protection (Noise) Policy 2008* (EPP [Noise]).
- *Environmental Protection (Water) Policy 2008*.
- *Mackay, Isaac and Whitsunday Regional Plan* (Queensland Government, 2012).
- *Queensland Environmental Offsets Policy*.
- *Queensland Waste Avoidance and Resource Productivity Strategy (2014-2024)* (Department of Environment and Heritage Protection, 2014).
- *State Planning Policy* (Department of Infrastructure, Local Government and Planning, 2017).

The following Commonwealth policies and guidelines are relevant to the Project:

- *EPBC Act Environmental Offsets Policy* (Commonwealth of Australia, 2012).
- *Information Guidelines for proponents preparing coal seam gas and large coal mining development proposals* (Commonwealth of Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development, 2018).

6 POTENTIAL PROJECT IMPACTS

6.1 NATURAL ENVIRONMENT

6.1.1 Land

The Project has the potential to impact the land resources and uses within the Project area, for example:

- temporary landuse change to open cut mining (and associated activities) until the land is rehabilitated;
- alteration of landforms through the formation of final voids and waste rock emplacements; and
- changes to the agricultural capacity of the land.

The temporary change to land during mining operations would be managed through progressive rehabilitation to meet final landuse objectives, to be developed in consultation with relevant stakeholders.

6.1.2 Water

The Project has the potential to impact surface water and groundwater resources through direct disturbance associated with open cut mining, diversion of drainage features, creation of new temporary and permanent landforms that affect flood waters and (if required) through release of water to the surrounding environment.

Potential impacts to surface water resources may include:

- Changes to catchment areas and flow characteristics due to the construction of (for example) water storage dams, mine infrastructure areas, waste rock emplacements, flood levees, open cut pits, upstream diversions and final voids.
- Increased potential for erosion and sedimentation due to the increased area of land disturbance.
- Impacts to other water users in the region.
- Potential extraction and/or discharge of water as part of the on-site water management system.

Potential impacts to groundwater resources may include:

- Potential drawdown of groundwater aquifers, alteration of groundwater flow directions and decrease in baseflow to surface water systems.
- Localised effects on groundwater quality.
- Long-term changes to groundwater levels, flow direction and quality in the vicinity of final voids.

6.1.3 Ecosystems, Flora and Fauna

Clearance associated with the Project has the potential to directly disturb terrestrial and aquatic vegetation and habitat. This may also include impacts on the following biodiversity values:

- areas of RE;
- conservation significant species listed under the NC Act and EPBC Act;
- Environmentally Sensitive Areas;
- wetlands; and
- GDEs.

Increased activities in the area also have the potential to introduce additional weeds and feral animals to the Project area.

These potential impacts may require the development of a biodiversity offset.

6.2 AMENITY, INCLUDING NOISE, AIR QUALITY, VIBRATION, LIGHTING, URBAN DESIGN AND VISUAL AESTHETICS

6.2.1 Noise and Vibration

The key sources of potential noise and vibration impacts from the Project include, for example:

- Construction activities such as earthmoving, mobile equipment and blasting.
- Operational activities including mining fleet, crushing, conveyors, train load out, rail and road transport movements.

- Blast overpressure and ground vibration impacts due to blasting.

A range of legislation, policy, guidelines and standards are relevant to identifying values and managing impacts for noise and vibration at the Project including the *Environmental Protection Act 1994* (EP Act), EPP (Noise) and Ecoaccess Guidelines.

The EIS would include identification of relevant noise sensitive receptors. The closest receptor is located approximately 2 km from the Project (Figure 2).

The level of noise at a given receptor would vary depending on the distance from the noise source, the meteorological conditions, intervening topography and the type of noise source.

The EPP (Noise) details Acoustic Quality Objectives for sensitive receptors. The objectives aim to protect the qualities of the acoustic environment that are conducive to human health and wellbeing for individuals to sleep, study or learn, be involved in recreation, including relaxation and conversation and protecting the amenity of the community.

6.2.2 Air Quality and Greenhouse Gas

Potential air quality impacts from the Project would primarily be associated with dust generation from land disturbance, blasting, excavation, hauling and handling of waste rock, ROM coal and product coal and greenhouse gas emissions.

Application Requirements for Activities with Impacts to Air (DES, 2018c) states that a dust deposition limit of 120 milligrams per square metre per day (i.e. 0.12 grams per square metre per day) averaged over one month is frequently used in Queensland. Such an air quality objective is a benchmark set to protect the general health and amenity of the community in relation to air quality.

Additional potential air quality impacts include emissions of other air pollutants from diesel powered equipment and on-site blasting.

Electricity consumption and the transport of product coal would also be considered for their indirect greenhouse gas emissions.

Air quality is managed under the EP Act, the *Environmental Protection Regulation 2008* (EP Regulation) and the EPP [Air].

The EIS would include an air quality and greenhouse gas assessment, considering the DES *Guideline Application Requirements for Activities with Impacts to Air* (DES, 2018c).

6.2.3 Visual Aesthetics

The following Project components are considered to potentially result in visual and lighting impacts:

- open cut pit excavation;
- clearance of vegetation;
- conveyors or other infrastructure items;
- placement of waste rock in out-of-pit emplacements;
- lighting associated with night-time mining and processing operations; and
- construction of levees.

Two of the key issues to consider in the assessment of visual and lighting impacts are the number of sensitive viewing locations and the level of change to the existing environment. The Project is located in a mining precinct and therefore the impacts are not expected to be significant for the general public. However, the most visually sensitive locations in the vicinity of the Project are the nearby privately owned rural residences which would be assessed in the EIS.

6.3 SOCIAL ENVIRONMENT – POTENTIAL BENEFICIAL AND ADVERSE IMPACTS

Direct engagement with potentially affected stakeholders would be used to assess potential impacts of the Project on social values.

Consultation would be conducted with the local community, affected landowners and other relevant stakeholders, including other advisory agencies/groups.

Positive and negative social impacts are expected to be aggregated with the Project. For example:

- employment of approximately 500 personnel during construction and approximately 450 personnel during operations;
- potential impacts on social cohesion;
- population decline upon decommissioning;
- landuse changes as a result of the Project;
- potential amenity impacts including air quality, noise and vibration;
- provision of training opportunities (including opportunities for the Indigenous community); and
- increased demand for permanent and temporary housing in the local and regional area.

The Coordinator-General's *Social Impact Assessment Guideline* (Department of State Development, Manufacturing, Infrastructure and Planning, 2018) would be considered as part of assessing potential social impacts.

6.4 ECONOMIC EFFECTS

The Project would result in significant economic benefits including:

- employment of approximately 500 personnel during construction and approximately 450 personnel during operations;
- flow on effects to the local and regional economies;
- potential for development of new businesses in the local area and surrounds; and
- payment of significant royalties to the State and other tax payments.

Indirect employment and business generation are likely to be associated with property services, mechanical repairs, machinery, materials handling and equipment manufacturing, research, technical and computer services, wholesale trade and retail trade.

6.5 BUILT ENVIRONMENT

The Project has the potential to result in increased delays at existing intersections due to the traffic generation. The Project may also impact road capacity, safety and condition.

Potential traffic impacts of the Project would be assessed in accordance with the Department of Transport and Main Roads (DTMR) (2017) *Guidelines: Guide to Traffic Impact Assessment*.

Based on a train total payload of 10,800 tonnes (t), an average of between four and six product coal trains would be loaded per day for the Project. However, a peak higher than the average is likely to be required on some days.

Coal produced at the Project would be transported by rail and exported via either Abbott Point, Dalrymple Bay or Gladstone coal ports through the Newlands, Goonyella and Blackwater rail networks, respectively, subject to availability of rail and port allocations.

6.6 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE UNDER THE EPBC ACT

Matters of National Environmental Significance (MNES) potentially relevant to the Project include:

- A water resource.
- Listed threatened species and ecological communities.
- Migratory species.

The Project is not a nuclear action and the following MNES do not occur within the Project area:

- National Heritage Place.
- Wetland of International Importance.
- World Heritage Property.
- Great Barrier Reef Marine Park.
- Commonwealth Marine Area.

Whitehaven will prepare and submit an EPBC Act Referral (or Referrals) for the DEE to determine whether the Project requires approval under the EPBC Act.

7 ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

7.1 NATURAL ENVIRONMENT

A range of environmental management and mitigation measures would be developed to minimise the potential impacts of the Project on the natural environment, including:

- Development of soil resource management practices (including the stripping and stockpiling of soil for use in rehabilitation).
- Surface disturbance protocols (including pre-clearance surveys and salvage of habitat features).
- Progressive rehabilitation of Project disturbance areas to achieve safe, stable, non-polluting landforms able to support the post-mining landuses.
- Consideration of agricultural land and native ecosystems in the final landuse design.
- Dust suppression (watering) of haul roads, ROM and product coal stockpiles and transfer points.
- Blast management measures including the alteration of blast designs to meet applicable criteria.
- Development of upslope diversions to minimise the catchment area reporting to mine storages.
- Management of water resources in accordance with the Environmental Authority issued for the Project under the EP Act.
- Preparation of water management plans and monitoring programs under the Environmental Authority issued for the Project under the EP Act.
- Investigations into beneficial use of site water.
- Licensed extraction of water resources in accordance with the Queensland *Water Act 2000.*
- Assessment of requirement for State and Commonwealth biodiversity offsets, in accordance with the Queensland *Environmental Offsets Policy* and the Commonwealth *EPBC Act Environmental Offsets Policy*.

Following detailed assessment of the Project, environmental management and mitigation measures would be developed, refined following consultation and described in detail in the EIS.

7.2 BUILT ENVIRONMENT

Requirements for new roads and any upgrades of existing roads would be developed in consultation with the Isaac Regional Council and DTMR.

The Project would, following final route selection and design of the access road, include various transport management measures.

Management measures associated with the rail transport of product coal (if any) would be developed as part of the EIS, in consultation with relevant stakeholders.

7.3 CULTURAL HERITAGE MANAGEMENT PLAN (INDIGENOUS)

Whitehaven is in the process of developing a CHMP in conjunction with the Barada Barna People. The CHMP will describe the assessment of the cultural heritage values within the proposed area of disturbance, and the development of appropriate management strategies.

7.4 NON-INDIGENOUS CULTURAL HERITAGE MANAGEMENT PLAN

There are no known non-indigenous significant values in the Project area. If non-indigenous significant values are identified during preparation of the EIS, appropriate management measures would be developed.

7.5 GREENHOUSE GAS MANAGEMENT PLAN

Measures to minimise the generation of greenhouse gas emissions would be developed and likely include monitoring the fuel efficiency of mobile equipment, minimising double-handling of materials and consideration of the use of alternative renewable energy sources.

Greenhouse gas emissions, energy production, energy consumption and any other information required under the Commonwealth *National Greenhouse and Energy Reporting Act 2007* would be reported annually.

7.6 WASTE MANAGEMENT

The following Queensland legislation would govern the management of waste at the Project:

- EP Act;
- EP Regulation;
- *Waste Reduction and Recycling Act 2011* (Queensland) (WRR Act); and
- *Waste Reduction and Recycling Regulation 2011.*

An underlying principle of all waste management in Queensland is the waste management hierarchy. The waste management hierarchy (the WRR Act), identifies the most to the least preferred management option, as follows; '*avoid, reduce, reuse, recycle, recover, treat, and dispose*'.

This hierarchy would be used to manage waste at the Project.

An on-site landfill will be implemented for the disposal of certain waste streams generated on-site. Some waste streams, including hazardous wastes, would be removed from site by a licenced contractor and disposed of, or recycled, at appropriate off-site facilities.

7.7 HAZARD, RISK, AND HEALTH AND SAFETY

Hazards and risks are required to be identified and managed to reduce potential harm to people and the environment, as well as property. The EIS would include an assessment of risk and Whitehaven would develop an appropriate safety management system to define appropriate mitigation measures and strategies.

The risk assessment would be undertaken in accordance with Australian Standard/New Zealand Standard International Standards Organisation (ISO) 31000:2009 *Risk Management – Principles and Guidelines* (ISO 31000:2009) and International Electrotechnical Commission/ISO 31010:2009 *Risk Management – Risk Assessment Techniques*.

Consideration would be given to both on-site and off-site risks.

In relation to flooding, all practicable measures would be taken to prevent flooding of the Project infrastructure areas. This includes flood levees and relevant waste rock emplacements being designed to provide appropriate flood immunity.

The *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures – Version 5.01* (DES, 2016) would be used to guide design, construction and management of water storage structures and facilities.

7.8 ENVIRONMENTAL MANAGEMENT

Whitehaven would develop an Environmental Management System (EMS) for the Project to guide the implementation of environmental management commitments and strategies. The EMS would also guide the monitoring and review process for its environmental management with the aim of continual improvement of its environmental performance.

Monitoring of compliance with environmental management requirements would be undertaken by a team of appropriately qualified practitioners.

8 APPROVALS REQUIRED FOR THE PROJECT

Table 4 provides a description of the potential approvals required for the Project. These approvals may be refined through the environmental impact and mine planning process.

If declared a Coordinated Project, an EIS will be prepared under Part 4 of the SDPWO Act. Project components will be evaluated through the EIS such that the Coordinator-General can consider the Project as a whole and recommend approval conditions accordingly.

Table 4
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
Commonwealth Government Approvals					
Environment Protection and Biodiversity Conservation Act 1999	EPBC Act referral and approval	Referral to the Commonwealth Minister of Environment is required if the Project may have a significant impact on MNES to determine if the Project is a 'controlled action' requiring approval under the EPBC Act.	If Whitehaven considers that the Project may have a significant impact on MNES, it must refer the Project to DEE to determine whether it is a Controlled Action. If the Project is determined to be a Controlled Action, approval from DEE will be required and it is expected that it will be assessed through a Bilateral Agreement between the Commonwealth and the State of Queensland under section 45 of the EPBC Act relating to Environmental Assessment.	DEE	Yes
State Government Approvals					
State Development and Public Works Organisation Act 1971	Coordinated Project declaration, Prescribed Project Declaration, Critical infrastructure designation	The Coordinator-General may declare that a Project is a Coordinated Project if it has: ■ complex approval requirements, involving Local, State and Federal governments; ■ significant environmental effects; ■ strategic significance to the locality, region or State, including any infrastructure, economic and social benefits, capital investment or employment opportunities it may provide; or ■ significant infrastructure requirements.	The IAS forms part of the application for the declaration of the Project as a Coordinated Project. The Coordinator-General will consider the application and determine whether the Project meets the requirements for declaration as a Coordinated Project. If declared a Coordinated Project, it is likely that it will be declared on the basis that an EIS is required for the Project which will be prepared in accordance with Part 4 of the SDPWO Act, allowing the Coordinator-General to coordinate the process, and ultimately providing some protection from third party review of the Coordinator-General's mandated conditions.	Department of State Development, Manufacturing, Infrastructure and Planning	Yes

Table 4 (Continued)
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
State Government Approvals (Continued)					
State Development and Public Works Organisation Act 1971 (Continued)	Coordinated Project declaration, Prescribed Project Declaration, Critical infrastructure designation (Continued)	A Prescribed Project is, among other things, one that the Minister considers to be of major economic or social significance to the State and provides a prescribed process for timely decision-making. A critical infrastructure designation is available for prescribed projects that the Minister considers to be critical or essential to the State for economic, environmental or social reasons.	The Coordinator-General may also, or separately, declare the Project to be a Prescribed Project. This allows the Coordinator-General to issue 'progression notices' (requiring other arms of Government to take steps in a prescribed time frame) and to step in and make decisions on behalf of other Government agencies. If the Project is declared to be a Prescribed Project, it may also be declared to be a Project for critical infrastructure.		
Aboriginal Cultural Heritage Act 2003 (ACH Act)	Cultural Heritage Management Plan (CHMP) or other form of agreement	Where an EIS is required, a CHMP must be in place and approved under Division 2 of Part 7 of the ACH Act as a pre-requisite to the grant of any lease, licence, permit, approval or other authority required under any Act for the Project. Where an EIS is not required, in practice, Whitehaven will need to enter an agreement with the Aboriginal parties in any event, to manage its duty of care under the ACH Act while alternative avenues are technically available, in practice, an agreement of some description is inevitable to properly manage Whitehaven's responsibilities).	An Exploration Agreement exists for MDL 183 and operates as a Voluntary Cultural Heritage Management Agreement with the 'Aboriginal Party' pursuant to section 23(3)(a)(iii) of the ACH Act. A CHMP or other form of agreement will replace the Exploration Agreement.	Department of Aboriginal and Torres Strait Islander Partnerships	No

Table 4 (Continued)
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
State Government Approvals (Continued)					
Environmental Protection Act 1994	Environmental Authority	A single, site specific Environmental Authority is required (section 124 of the EP Act) for the Project. The EA will authorise activities under the EP Act which includes the Environmental Relevant Activities (ERAs) that may be undertaken as part of the Project: ■ mining black coal; ■ Regulated Dams; ■ Environmental Offsets; ■ ERA 8 - Chemical Storage; ■ ERA 31 - Mineral Processing; and ■ ERA 63 - Sewage Treatment.	ERAs, including mining black coal, would be conducted as part of the Project. An environmental offset would be required if clearing is a 'prescribed environmental matter' (e.g. endangered RE) and any State offset will be conditioned under the EA. The EA will identify the size, shape and location of any residual voids for the Project. The site specific EA application is required to include detailed information regarding the proposed exercise of underground water rights (i.e. the taking or interference with associated water) including the aquifers to be affected, an assessment of the likely impacts on the quality of groundwater and other environmental values as well as strategies for avoiding, mitigating or managing the predicted impacts.	DES	Yes
	Notification of land – for notifiable activities	A proponent must notify DES of any activities listed in Schedule 3 of the EP Act that have the potential to cause land contamination. Notifiable activities on-site are likely to include: ■ abrasive blasting; ■ chemical storage (>10 t); ■ mine wastes; and ■ petroleum product or oil storage (>25,000 litres diesel).	Required one week prior to activity occurring.	DES	Yes

Table 4 (Continued)
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
State Government Approvals (Continued)					
Environmental Protection Act 1994 (Continued)	Progressive Rehabilitation and Closure Plan (PRCP)	The PRCP and its supporting schedule must be prepared and submitted and approved before Whitehaven may carry out any activities under the EA.	The PRCP and its supporting schedule must collectively set out: ■ the relevant activities and their duration; ■ a detailed description including maps of how and where the activities are to be carried out; ■ details of the consultation undertaken by Whitehaven in preparing the plan and to be carried out moving forward; ■ the extent to which the PRCP is consistent with local and State planning and the outcomes of consultations; ■ for each post-mining landuse, the proposed methods and techniques for rehabilitation to a stable condition (noting the rehabilitation milestones set out in the schedule to the PRCP); ■ the risk of not achieving a stable land condition – and how that risk is to be minimised; ■ the proposed management and rehabilitation plan for each non-use management area; and ■ detailed rehabilitation milestones to achieve the rehabilitation objectives of the PRCP.	DES	No

Table 4 (Continued)
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
State Government Approvals (Continued)					
Environmental Protection Act 1994 (Continued)	Registration as a suitable operator	Applicant must be registered as a suitable operator under section 318F of the EP Act prior to issue of the EA.	Required in order to undertake ERAs (including mining activities) in Queensland.	DES	No
Mineral Resources Act 1986	Mining Lease	Coal mining and production and associated activities including processing must be conducted within a mining lease.	Mining and associated activities to be conducted as part of the Project, within MDL 183 will require a mining lease.	DNRME	No
Environmental Offsets Act 2014	Biodiversity Offsets	Clearing of habitat areas would result in the need for biodiversity offsets.	Any applicable offsets will be conditioned as part of the EA and the EPBC Act approval.	DEE & DES	Yes
Nature Conservation (Wildlife) Regulation 2006	Species Management Program	Clearing of breeding habitat.	Will need to prepare a Species Management Program prior to tampering with animal breeding place.	DES	Yes
	Vegetation clearing permits	'Protected plant clearing permit' is required if: ■ the area is within a 'high risk area'; or ■ Whitehaven is aware of any endangered, vulnerable or near threatened (EVNT) species within the area to be cleared. Whether an area is 'high risk' determined by the 'protected plans flora survey trigger map' which allocates certain areas where EVNT species are known or likely to exist. If an area to be cleared is not identified on a flora survey trigger map as a high risk area, a flora survey is not required.	The Project may be required to obtain a clearing permit to authorise the clearing of EVNT species under the NC Act. Flora survey trigger maps for clearing protected plants obtained for the land underlying MDL 183 do not indicate that there are any high risk areas within MDL 183. As a result, provided that Whitehaven is not aware of any EVNT species within the area to be cleared and no flora surveys indicate the existence of EVNT species in the area, then no clearing permit or exempt clearing notification is required. The flora survey trigger map must be reviewed every 12 months and can be amended by DES at any time to add or remove a high risk area.	DES	Yes

Table 4 (Continued)
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
State Government Approvals (Continued)					
Nature Conservation (Wildlife) Regulation 2006 (Continued)	Vegetation clearing permits (Continued)	If clearing is proposed in an area that is not identified as a high risk area, however, Whitehaven becomes aware that there are plants that are EVNT species within the area to be cleared and the plants would be taken by the proposed clearing or there would be clearing within 100 m of the plants, then a protected plan clearing permit is required. However, an 'exempt clearing notification' must be submitted to the DES within one year of a flora survey being undertaken and at least one week prior to commencement of clearing where: ■ the clearing activities are to be carried out in a 'high risk area'; and ■ a flora survey has been carried out and did not identify any EVNT species within the area.	It is possible that the flora survey trigger map could be amended to add a high risk area affecting the Project area, however this is unlikely. In any event, under the *Nature Conservation (Wildlife) Regulation 2006,* a flora survey trigger map that is current at the time it is obtained for checking an area to be cleared is valid for 12 months from the day the person obtains a copy of the map either online or from the chief executive.		
Water Act 2000 and *Mineral Resources Act 1989*	Water allocation or water licence - Use and take of surface water or groundwater	Under the *Water Act 2000,* a person must not take, supply or interfere with water unless authorised.	The Project may involve taking or interfering with overland flow water, groundwater or water from the Isaac River. The Project is located within the Fitzroy River Catchment and is subject to the *Water Plan (Fitzroy Basin) 2011* and the Isaac Connors GMA.	DNRME	Yes

Table 4 (Continued)
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
State Government Approvals (Continued)					
Water Act 2000 and *Mineral Resources Act 1989* (Continued)	Water allocation or water licence - Use and take of surface water or groundwater (Continued)	In terms of water required for the Project development or operation, section 101 of the *Water Act 2000* provides that, subject to any alteration or limitation prescribed under a moratorium notice, water plan or a regulation under section 1046 of the *Water Act 2000*, a person may: ■ take overland flow water for any purpose; or ■ take or interfere with underground water for any purpose. Additionally, under section 334ZP of the *Mineral Resources Act 1989* the holder of an mining lease may take or interfere with underground water in the area of the mining lease if the taking or interference happens during the course of, or results from, the carrying out of an authorised activity for the mining lease (associated water).	The *Water Plan (Fitzroy Basin) 2011* regulates interfering with and taking overland flow water and groundwater from within the Fitzroy Water Plan Area, and states that: (a) the volume of overland flow water necessary to satisfy the requirements of an EA may be taken without a water licence; and (b) a person may only take or interfere with groundwater in a GMA (such as Isaac Connors) under a water permit, water licence or water allocation etc. Taking or interfering with associated water (e.g. to dewater the pit) will be authorised once the mining lease and EA are granted. If associated water is taken under the general authorisation under section 334ZP of the *Mineral Resources Act 1989*, Whitehaven is required to measure and report on the volume of associated water taken (including by evaporation if relevant).		
Water Act 2000	Riverine protection permits	A 'Riverine protection permit' may be required for activities that involve excavation or placing fill in a watercourse, lake or spring.	Exemption to this requirement applies where excavation or placing fill in watercourse, lake or spring is authorised under EA.	DNRME	Yes

Table 4 (Continued)
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
State Government Approvals (Continued)					
Mineral and Energy Resources (Common Provisions) Act 2014 (MERCP Act)	Provide notice of notifiable road use and obtain written consent or road compensation agreement or apply to Land Court for determination of compensation liability for notifiable road use (in absence of agreement/ consent)	Required if the Project proposes to use a public road for a 'notifiable road use', being: ■ use of a public road, within an authorised area for a resource authority, for transport relating to a seismic survey or drilling activity; or ■ use of a public road at more than the relevant haulage threshold rates, being 50,000 t per year on a State-controlled road or 10,000 t per year on another public road, if the haulage relates to transporting minerals that were mined released by mining or processed on land in an authorised area for a resource authority under the *Mineral Resources Act 1989*.	This may not be required given the availability of rail infrastructure within the Project area. The relevant public road authority is: ■ for a State-controlled road on which a notifiable road use is carried out – DTMR; and ■ for another road – the relevant local government with control of the relevant road.	DTMR and/or Isaac Regional Council depending on which roads (if any) are triggered for a notifiable road use	No
Local Government Approvals					
Planning Regulation 2017	Development Application	Development approvals pursuant to the *Planning Regulation 2017*, the Belyando Shire planning scheme may be required for operational works (such as excavation and filling, clearing of native vegetation and works that allow taking or interfering with water), material change of use, building works and reconfiguring a lot.	Project components located outside a mining lease.	Isaac Regional Council	Yes

Table 4 (Continued)
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
Other approvals and consents					
Mineral and Energy Resources (Common Provisions) Act 2014 (Qld)	Overlapping tenements	The interaction between MDL 183 and overlapping petroleum tenements is governed by MERCP Act Chapter 4.	MDL 183 is partially overlapped by ATP 1103, Potential Commercial Area (PCA) 143 (application) and PCA 144 (held by CH4 Pty Ltd). If the MLA area overlaps ATP 1103 (which is likely, since the ATP overlaps majority of MDL 183), and Whitehaven requires sole occupancy of the overlap area for its operations, an 'advance notice' must be given to the ATP holder within 10 business days after the MLA is lodged. Whitehaven must also give an '18 months notice' to the ATP holder at least 18 months prior to the date it requires sole occupancy of the relevant area of the overlap (i.e. to commence mining or to construct permanent infrastructure that requires sole occupancy). Should the ATP holder give notice of its intention to apply for a petroleum lease and should the petroleum lease be granted before a mining lease in the overlap area, the holders of the mining lease may be prevented from gaining sole occupancy of the overlap area for up to 11 years. In these circumstances, a joint development plan will be required between CH4 Pty Ltd and Whitehaven. The joint development plan would be a vehicle for the companies to negotiate an earlier mining commencement date for sole occupancy by Whitehaven.	DNRME	No

Table 4 (Continued)
Principal Required Statutory Approvals for the Project

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS scope
Other approvals and consents (Continued)					
Mineral Resources Act 1989 (Qld) and *Mineral and Energy Resources (Common Provisions) Act 2014* (Qld)	Restricted land consent	Where restricted land, including land within 50 m laterally of prescribed distances of artesian wells, bores, dams, stockyards or water storages and 200 m laterally of permanent buildings used as a residence or for business are identified as included within the boundaries of the proposed mining lease, consent will be required from: ■ any owners of the restricted land for the purposes of the MRA and MERCP Act to the inclusion of the restricted land areas in the surface area of the mining lease; and ■ relevant owners and occupiers of the restricted land areas before Whitehaven can enter the area of the restricted land to carry out activities authorised under the mining lease (however, recent amendments introduced under the *Mineral, Water and Other Legislation Amendment Act 2018* (Qld) may remove this requirement).	If restricted land is identified it will be relevant to the undertaking of the Project.	DNRME	No
Mineral Resources Act 1989 (Qld)	Land access – compensation agreements	A mining lease cannot be granted unless: ■ compensation has been determined (whether by agreement or by determination of the Land Court) between Whitehaven and each person who is the owner of land the surface of which is the subject of the MLA and of any surface access to the MLA; and ■ the condition of the agreement or determination have been or are being complied with by Whitehaven.	Compensation will be required to be agreed or determined with the underlying land owners for all areas where surface rights are sought for the MLA.	DNRME	No

[1] If declared a Coordinated Project, an EIS will be prepared under Part 4 of the SDPWO Act. Project components will be evaluated through the EIS such that the Coordinator-General can consider the Project as a whole and recommend approval conditions accordingly.

9 COSTS AND BENEFITS SUMMARY

9.1 LOCAL, STATE AND NATIONAL ECONOMIES

There continues to be a demand for high quality metallurgical and thermal coal, which will require the continued development of resources in the Bowen Basin. The development of new mining operations will provide significant direct employment opportunities for construction and operational workforces, and long-term flow-on social and economic benefits to regional communities.

Whitehaven would target a workforce of primarily local and regional personnel.

Employment and other opportunities expected to be generated by the Project include:

- a construction workforce in the order of 500 personnel; and
- a Project operational workforce in the order of 450 personnel, at full development.

Economic contributions would be considered in the EIS at the local, regional and national levels, and in accordance with the Coordinator General's *Economic Impact Assessment Guideline* (Department of State Development, 2017).

9.2 NATURAL AND SOCIAL ENVIRONMENTS

Potential impacts on the natural and social environments would be considered as part of the detail impact assessments in the EIS, including the cost-benefit analysis.

The Project EIS would include a cost-benefit analysis and would describe significant costs and benefits of the Project.

10 COMMUNITY AND STAKEHOLDER CONSULTATION

10.1 BACKGROUND

Coordinated stakeholder engagement is a key element of the assessment process for large developments such as the Winchester South Project and entails the inclusive and consultative interaction between a proponent and those organisations and individuals potentially impacted by a project.

As a leading Australian mining company with a strong track record of identifying and developing high quality coal assets, Whitehaven seeks to observe best practice stakeholder engagement approaches at all times. This means undertaking appropriate stakeholder identification, initiating meaningful and transparent dialogue, and listening to, and understanding, any concerns and issues as they arise.

In North West NSW, Whitehaven has invested significantly in efforts to measure and track community sentiment over time and has completed a total of four waves of qualitative and quantitative community research over the past five years as the company's local presence has grown. This has involved 1:1 stakeholder interviews, focus groups and quantitative surveys (n=600 participants per wave).

Through this community research process, Whitehaven has accumulated a comprehensive set of data to inform various project development decisions and local community engagement priorities, adopting a holistic or 'through-the-cycle' approach, and underscoring the importance the company assigns to testing community and stakeholder sentiment as an input to decision-making.

10.2 STAKEHOLDER ENGAGEMENT OBJECTIVES FOR WINCHESTER SOUTH

Stakeholder groups will have varying levels of interest, influence and information requirements in relation to a proposed development.

Consistent with the International Association for Public Participation (IAP2) Spectrum of Public Participation, which is acknowledged as an industry-leading stakeholder engagement framework, Whitehaven's focus at this stage of Project development is to 'inform' and 'consult'.

The key objectives of the program of stakeholder engagement for the Winchester South Project are to:

- identify key stakeholders to determine their level of interest and influence around the Project;
- initiate contact with stakeholders to inform them about the Project, including any aspects of special relevance and interest based on the above assessment;
- identify any issues and concerns in relation to the Project;
- work constructively with stakeholders to address or mitigate issues raised during the approvals period; and
- provide feedback, where appropriate, to stakeholders on their issues and how these have been addressed.

10.3 OUR ENGAGEMENT PRINCIPLES

Whitehaven is committed to establishing awareness, understanding, legitimacy and trust in the local communities where it operates.

Our community and social compact is to:

- identify, develop and operate world-class, long-life mining projects;
- promote local economic growth and sustainability through local job creation, local procurement and local business stimulus;
- build community capacity and viability through intergenerational investment in jobs, skills and infrastructure;
- instil community trust through responsible environmental stewardship; and
- leave a legacy that outlives mining operations.

Whitehaven seeks to deliver on its community and social compact by:

- communicating clearly with stakeholders about purpose and intent;
- listening and providing opportunities and channels for feedback;
- valuing timeliness and transparency in stakeholder interaction; and
- acting with honesty and integrity at all times.

10.4 STAKEHOLDER ENGAGEMENT STRATEGY

Whitehaven will adopt a scalable approach to engagement designed around the information requirements and the level of interest of the relevant individual or group. Accordingly, the frequency and type of communication will vary but, as has occurred with Whitehaven's other recent development projects in NSW, will involve a variety of potential consultation tools and approaches including:

- face-to-face meetings;
- roadshows;
- information sessions;
- newsletters;
- eDMs and e-mails;
- media releases;
- advertising;
- Project website;
- community information sessions;
- digital communications campaigns; and
- qualitative and quantitative research.

Consultation and engagement has commenced with an initial focus on State Government regulatory, consent and coordination authorities, local landowners, the Barada Barna Aboriginal Corporation (Traditional Owner Corporation), neighbouring mine owners and operators and relevant infrastructure and service providers.

The stakeholder engagement effort for Winchester South will intensify over the coming months to include a broader cross-section of groups and individuals consistent with the stakeholder list above.

11 REFERENCES AND DATA SOURCES

Atlas of Living Australia (2018) *Atlas of Living Australia Database Search*.
Website: http://spatial.ala.org.au/
Date accessed: November 2018.

Bureau of Meteorology (2018) *Weather Station Directory*. Australian Government.
Website: http://www.bom.gov.au/climate/data/stations/
Date accessed: November 2018.

Civeo (2018a) *Moranbah Village.*
Website: http://civeo.com/lodges-villages/australia/moranbah-village/
Date accessed: December 2018.

Civeo (2018b) *Coppabella Village.*
Website: http://civeo.com/lodges-villages/australia/coppabella-village/
Date accessed: December 2018.

Civeo (2018c) *Dysart Village.*
Website: http://civeo.com/lodges-villages/australia/dysart-village/
Date accessed: December 2018.

Commonwealth of Australia (2012) *Environment and Biodiversity Conservation Act 1999 Environmental Offsets Policy.*

Commonwealth of Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Developments (2018) *Information Guidelines for proponents preparing coal seam gas and large coal mine development proposals.*

Department of Aboriginal and Torres Strait Islander Partnerships (2018) *Database search request tenement results.*
Website: https://culturalheritage.datsip.qld.gov.au/weave/report/persisted/EFEMEBEPEPECEPEPECKTEEECEEEPEEEFKTKCJGKAJZKCKF/Tenement Report.pdf
Date accessed: November 2018.

Department of Agriculture and Fisheries (2018) *Agricultural Land Classes*.
Website: https://www.daf.qld.gov.au/environment/ag-land-audit/guide-for-local-government/agricultural-land-classes
Date accessed: November 2018.

Department of Environment and Heritage (2014) *Queensland Waste Avoidance and Resource Productivity Strategy (2014-2024).*

Department of Environment and Science (2016) *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures – Version 5.01.*

Department of Environment and Science (2018a) *Regional Ecosystem Database*.
Website: https://data.qld.gov.au/dataset/regional-ecosystem-description-database
Date accessed: November 2018.

Department of Environment and Science (2018b) *Wildlife Online Database Search*.
Website: https://environment.ehp.qld.gov.au/report-request/species-list/
Date accessed: November 2018.

Department of Environment and Science (2018c) *Guideline Application Requirements for Activities with Impacts to Air.*

Department of Infrastructure, Local Government and Planning (2017) *State Planning Policy.*

Department of Natural Resources, Mines and Energy (2018) *Queensland Floodplain Assessment Overlay*. Queensland Government data.
Website: https://spp.dsdip.esriaustraliaonline.com.au/geoviewer/map/planmaking
Date accessed: November 2018.

Department of State Development (2015) *Application Requirements for a 'Coordinated Project' Declaration*.

Department of State Development (2017) *Economic Impact Assessment Guideline*.

Department of State Development, Manufacturing, Infrastructure and Planning (2018) *Social Impact Assessment Guideline*. State of Queensland.

Department of Transport and Main Roads (2017) *Guidelines: Guide to Traffic Impact Assessment*.

Department of the Environment and Energy (2018a) *Protected Matters Search within the following search area: -21.9804, 148.2271; -21.9626, 148.4839; -22.4685, 148.7586; -22.4673, 148.2450*. Data Received: November 2018.

Department of the Environment and Energy (2018b) *Australia's National Heritage List*. Website: https://www.environment.gov.au/heritage/places/national-heritage-list Date accessed: November 2018.

Geoscience Australia (2018) ELVIS (Elevation Information System). Website: http://elevation.fsdf.org.au/ Date accessed: November 2018.

Hansen Bailey (2013) *Moranbah South Project Environmental Impact Statement: Air Quality Assessment.*

HydroSimulations (2018) *Olive Downs Coking Coal Project Groundwater Assessment.*

Isaac Regional Council (2005) *Planning Scheme for Broadsound.*

Isaac Regional Council (2008) *Planning Scheme for the Shire of Nebo.*

Isaac Regional Council (2009) *Planning Scheme for Belyando Shire.*

Isaac Regional Council (2011) *Moranbah Urban Development Area Development Scheme.*

Isaac Regional Council (2018a) *Regional Overview*. Website: https://www.isaac.qld.gov.au/regional-overview Date accessed: December 2018.

Isaac Regional Council (2018b) *Moranbah*. Website: http://www.isaac.qld.gov.au/moranbah Date accessed: December 2018.

Isaac Regional Council (2018c) *Dysart*. Website: http://www.isaac.qld.gov.au/dysart Date accessed: December 2018.

JBT Consulting (2010) *Report on Grosvenor Coal Project Environment Impact Study Groundwater Impact Assessment*. September 2010.

Katestone Environmental (2018) *Olive Downs Coking Coal Project Air Quality and Greenhouse Gas Assessment.*

National Native Title Tribunal (2018) *Southern and Western Queensland Region*. Website: http://www.nntt.gov.au/Maps/QLD_Southern_and_Western_NTDA_Schedule.pdf Date accessed: November 2018.

Queensland Globe (2018) *Registered Groundwater Bores and Mine Monitoring Water Bores (DNRM and Private)*.

Queensland Government (2012) *Mackay, Isaac and Whitsunday Regional Plan.*

Queensland Government (2015) *Moranbah (Moranbah) 2015 hourly air quality and meteorological data*. Website: https://data.qld.gov.au/dataset/air-quality-monitoring-2015/resource/35cc93c7-c476-4a5c-b4a5-135af71b11dc Date accessed: November 2018.

Queensland Government (2018a) *Queensland Globe*. Accessed via Google Earth. Website: https://www.business.qld.gov.au/business/support-tools-grants/services/mapping-data-imagery/queensland-globe Date accessed: November 2018.

Queensland Government (2018b) *Water Monitoring Information Portal*. Station No. 130410A Website: https://water-monitoring.information.qld.gov.au/ Date accessed: November 2018.

Queensland Government (2018c) *Heritage Register Map*. Website: https://environment.ehp.qld.gov.au/heritage-register/map/ Date accessed: November 2018.

Raymond, M. A. A. and McNeil, V. H. (2011) *Regional Chemistry of the Fitzroy Basin Groundwater*. Brisbane: Department of Environment and Resource Management, Queensland Government.

RPS (2018) *Buffel Park Accommodation Village.* Website: https://www.rpsgroup.com/Australia-Asia-Pacific/Projects/Buffel-Park-Accommodation-Village,-Moranbah,-QLD.aspx Date accessed: December 2018

Sinclair Knight Merz (2009) *Isaac Connors Groundwater Project: Part A – Conceptual Model for Groundwater and Part B – Assessment of Groundwater Dependent Ecosystems*. Technical Reports for the Fitzroy Basin Water Resource Plan Amendment.

12 GLOSSARY, ACRONYMS AND ABBREVIATIONS

ACH Act	Queensland *Aboriginal Cultural Heritage Act 2003*
ALA	Atlas of Living Australia
AHD	Australian Height Datum
ATP	authority to prospect
CHMP	Cultural Heritage Management Plan
CHPP	coal handling and preparation plant
DEE	Department of the Environment and Energy
DES	Department of Environment and Science
DNRME	Department of Natural Resources, Mines and Energy
DTMR	Department of Transport and Main Roads
EIS	Environmental Impact Statement
EP Act	Queensland *Environmental Protection Act 1994*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPC	Exploration Permit for Coal
EPP (Air)	*Environmental Protection (Air) Policy 2008*
EPP (Noise)	*Environmental Protection (Noise) Policy 2008*
EP Regulation	Queensland *Environmental Protection Regulation 2008*
ERAs	Environmental Relevant Activities
EVNT	Endangered, vulnerable or near threatened
GDE	Groundwater Dependent Ecosystem
GMA	Groundwater Management Area
IAS	Initial Advice Statement
IRC	Isaac Regional Council
ISO	International Standards Organisation
LGA	Local Government Area
MDL	Mineral Development Licence
MERCP Act	Queensland *Mineral and Energy Resources (Common Provisions) Act 2014*
MNES	Matters of National Environmental Significance
MLA	Mining Lease Application
Mtpa	million tonnes per annum
NC Act	Queensland *Nature Conservation Act 1992*
$PM_{2.5}$	particulate matter 2.5 micrometres or less in diameter
PM_{10}	particulate matter 10 micrometres or less in diameter
PRCP	Progressive Rehabilitation and Closure Plan
RE	Regional Ecosystem
ROM	run-of-mine
SDPWO Act	Queensland *State Development and Public Works Organisation Act 1971*
TAPM	The Air Pollution Model
the Project	The Winchester South Project
TSP	Total Suspended Particulate
WRR Act	Queensland *Waste Reduction and Recycling Act 2011*
$\mu g/m^3$	micrograms per cubic metre

APPENDIX A
EPBC ACT PROTECTED MATTERS SEARCH RESULTS

Australian Government
Department of the Environment and Energy

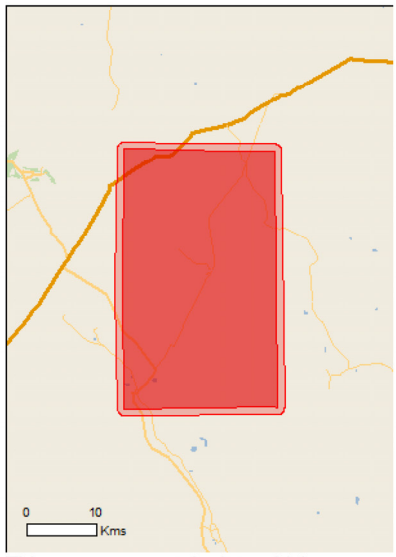
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

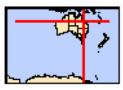
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 13/12/18 09:16:40



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 1.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	21
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Fish		
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Mammals		
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Nyctophilus corbeni		
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans		
Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Plants		
Cycas ophiolitica		
[55797]	Endangered	Species or species habitat likely to occur within area
Dichanthium queenslandicum		
King Blue-grass [5481]	Endangered	Species or species habitat likely to occur within area
Samadera bidwillii		
Quassia [29708]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Denisonia maculata		
Ornamental Snake [1193]	Vulnerable	Species or species habitat known to occur within area
Egernia rugosa		
Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Elseya albagula		
Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area
Furina dunmalli		
Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Lerista allanae		
Allan's Lerista, Retro Slider [1378]	Endangered	Species or species habitat may occur within area
Rheodytes leukops		
Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus		
Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Monarcha melanopsis		
Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Extra Information

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur

Name	Status	Type of Presence within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Vachellia nilotica Prickly Acacia, Blackthorn, Prickly Mimosa, Black Piquant, Babul [84351]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-22.27817 148.361196,-22.280076 148.167562,-22.136406 148.164816,-21.969667 148.166876,-21.970941 148.2479,-21.971578 148.278799,-21.971578 148.299398,-21.971578 148.302145,-21.971578 148.317251,-21.971578 148.330297,-21.971578 148.350897,-21.971578 148.355016,-21.971578 148.361196,-22.278805 148.365316,-22.278805 148.365316,-22.27817 148.361196

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

ATTACHMENT 2

WINCHESTER SOUTH PROJECT

UNDERGROUND WATER RIGHTS INFORMATION

Memorandum

To:	Brendan Dillon	**At:**	Whitehaven Coal
From:	Derwin Lyons	**At:**	SLR Consulting Australia Pty Ltd
Date:	14 June 2019	**Ref:**	620.13245-M01-v2.0.docx
Subject:	Winchester South Project Exercising Underground Water Rights EA Application		

1 Introduction

SLR Consulting Pty Ltd (SLR) has been engaged by Whitehaven Coal Limited (WHC) to provide technical assistance in satisfying EA Application underground water requirements for the Winchester South Project (the Project). The purpose of this memo is to provide the information required for documentation supporting the EA Application, to address the following specific issues with respect of underground water rights related to the Project:

- the areas in which underground water rights are proposed to be exercised;
- for each aquifer affected, or likely to be affected, by the exercise of underground water rights:
  - a description of the aquifer;
  - an analysis of the movement of underground water to and from the aquifer, including how the aquifer interacts with other aquifers and surface water; and
  - a description of the area of the aquifer where the water level is predicted to decline because of the exercise of underground water rights; and
  - the predicted quantities of water to be taken or interfered with because of the exercise of underground water rights during the period in which resource activities are carried out;
- the environmental values that will, or may, be affected by the exercise of underground water rights and the nature and extent of the impacts on the environmental values;
- any impacts on the quality of groundwater that will, or may, happen because of the exercise of underground water rights during or after the period in which resource activities are carried out; and
- strategies for avoiding, mitigating or managing the predicted impacts on the environmental values or the impacts on the quality of groundwater.

The information presented in this memorandum has been developed to satisfy the requirements outlined above. As information is not yet available on a local scale, publicly available information from surrounding project approvals documentation has been sourced; this principally takes the form of the documentation prepared for Pembroke Resources' Olive Downs Coking Coal Project (ODP) located on immediately adjacent tenure southeast of Winchester South (Pembroke Resources, 2018 and HydroSimulations, 2018).

Local scale information is expected to be derived during the Project's EIS studies, which for groundwater are scheduled to commence in earnest in Q3 2019.

2 The areas in which underground water rights are proposed to be exercised

The Winchester South Project is a proposed greenfield development consisting of an open cut metallurgical coal mine and associated infrastructure. The infrastructure is set to comprise access roads, a rail loop and train load-out facility, electricity transmission line, water supply pipeline, workshops, administrative offices and a coal handling and preparation plant. The Project is located on tenement MDL 183 (**Figure 1**) and is estimated to produce up to 15 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal for approximately 30 years.

The Project is located approximately 200km southwest of Mackay and 30 kilometres south east of Moranbah, central Queensland. The Project is located within the Isaac Regional Council (IRC) Local Government Area (LGA) of the Bowen Basin.

The Project is located in the Isaac Connors Groundwater Management Area (GMA) Zone 34 defined under the *Water Plan (Fitzroy Basin), 2011* made under the Queensland *Water Act, 2000* (Water Act). The Project is located within the Isaac Connors Groundwater Management Area (GMA) (Zone 34) of the Fitzroy Basin. Groundwater units of the GMA and related to the Study Area are classified as:

- Groundwater Unit 1 – (containing aquifers of the Quaternary alluvium); and
- Groundwater Unit 2 – (sub-artesian aquifers).

WHC are therefore proposing to exercise underground water rights as part of resource development operations for the Project that are likely to affect groundwater within the Isaac Connors GMA.

3 Aquifers likely to be affected by the exercise of underground water rights

As described above, publicly available information from surrounding project approvals documentation has been sourced for the memorandum; this principally takes the form of the EIS documentation prepared in 2018 for the ODP located on immediately adjacent tenure southeast of Winchester South. Local scale information specific to the Winchester South project area is expected to be derived during the Project's EIS studies, which for groundwater are scheduled to commence in earnest in Q3 2019.

3.1 Description of aquifers

The rock units with the potential to form aquifers within and in proximity to the Project site include:

- Surficial Cainozoic-aged regolith material including alluvium and colluvium; and
- Permo-Triassic aged rock units of the Bowen Basin that underly the surficial regolith material.

3.1.1 Cainozoic Units

3.1.1.1 Alluvium

Quaternary alluvium (Qa) associated with the Isaac River is present just outside the northern and northeastern edges of the Project site, and within a very small section of the Project site along the north-eastern boundary of MDL 183 (refer **Figure 1**). Studies undertaken for the ODP suggest that the extent and thickness of these unconsolidated sediments are generally less than 12 m thick but can be up to 30 m thick within a narrow corridor along the Isaac River, thinning out with distance from the river. Lithological logs for ODP bores indicate the alluvium comprises a heterogeneous distribution of fine to coarse grained sands interspersed with lenses of clays and gravels.

Geological logs from the ODP site indicate the alluvium is underlain by low permeability stratigraphy (i.e. claystone, siltstone and sandstone), which likely restricts the rate of downward leakage to underlying formations. Localised perched water tables within the alluvium are evident where waterbodies continue to hold water throughout the dry period (e.g. pools in the Isaac River and floodplain wetlands) occurring where clay layers slow the percolation of surface water.

The ODP EIS found that water within the Isaac River is largely fresh, while water within the alluvium is fresh to moderately saline with an average TDS of 1,458 mg/L, ranging between 201 mg/L and 3,430 mg/L.

3.1.1.2 Regolith

The surficial regolith material covering much of the Project site comprises Cainozoic (Quaternary to Tertiary) aged sediments, including alluvium and colluvium (**Figure 1**). Based on geological logs from the immediately adjacent ODP site, the regolith comprises a heterogeneous distribution of fine to coarse grained sand, clay, sandstone and claystone and is generally 15 m to 45 m thick. At the ODP site, the units are all recorded as being highly weathered, with the depth of weathering extending to around 50 m below surface, into the underlying Permian-aged coal measures.

Water within the regolith, where it is saturated, occurs at depths of around 8 m to 19 m below surface at the ODP site. Water within the regolith material at the ODP site was found to be generally highly saline, but can be brackish to moderately saline with an average TDS of 9,757 mg/L, ranging between 1,460 mg/L and 18,600 mg/L.

3.1.2 Permo-Triassic Units

Permo-Triassic aged rock units of the Bowen Basin underly the surficial regolith material that covers much of the Project site. The Permo-Triassic units include the Triassic-aged Rewan Group, and the Permian-aged Blackwater Group units (Rangal Coal Measures and Fort Cooper Coal Measures). The Permian coal-bearing strata of the Blackwater Group forms the main economic resource of the numerous mines in the area surrounding the Project, as well as at the Project. The Permo-Triassic aged rock units are orientated in a northwest-southeast trending syncline structure within the Project area (refer **Figure 1**), with the older Fort Cooper Coal Measures occurring at subcrop and minor outcrop on the southwestern and northeastern edges of the Project site.

3.1.2.1 Rewan Group

The Triassic-aged Rewan Group is up to approximately 300 m thick where it occurs at the adjacent ODP site. The Rewan Group strata includes two formations, the Rewan Formation that comprises green lithic sandstone, pebbly lithic sandstone, green to reddish brown mudstone and minor volcanolithic pebble conglomerate, and the underlying Sagittarius Sandstone unit that comprises lithic sandstone interbedded with mudstones and siltstones with scattered carbonaceous plant material.

The low permeability lithologies that comprise the Rewan Group mean that the Rewan Group is typically considered to form a significant regional aquitard, and where it exists the Rewan Group typically limits groundwater flow between the aquifer units of the Project area and surrounds.

3.1.2.2 Permian Coal Measures

The Rangal Coal Measures comprise light grey, cross-bedded, fine to medium grained labile and well cemented sandstones, grey siltstones, mudstones, shale and coal seams. The underlying Fort Cooper Coal Measures comprises tuffaceous sandstones, siltstones, mudstones and coal seams. The transition between the Rangal Coal Measures and the older Fort Cooper Coal Measures is marked by the 0.5 m to 1.5 m thick Yarrabee Tuff; a basin-wide marker bed comprised of weak, brown tuffaceous claystone. The non-coal portions of the sequence being predominantly sandstones, siltstones, mudstone and shales are referred to as interburden in the mining context.

Within the Permian units, as with most of the Bowen Basin groundwater is predominately found within the coal seams themselves, with the non-coal interburden typically having aquitard-like properties that confine the groundwater in the coal seams. The coal seams are dual porosity in nature with a primary matrix porosity and a secondary (dominant) porosity provided by fractures (joints and cleats). Hydraulic conductivity of the coal decreases with depth due to increasing overburden pressure reducing the aperture of fractures.

Broad hydrochemical mapping undertaken by the DERM for the Fitzroy Basin shows that groundwaters in the Project area fit into the 'Isaac-Dawson' groundwater zone, characterised by Sodic water types (Raymond and McNeil, 2011). Groundwater in this region was found to contain moderate to high salinities, dominated by Sodium and Chloride ions. Deep groundwater in the vicinity of the Project area exhibited high levels of electrical conductivity relative to other areas within the Fitzroy Basin (Raymond and McNeil, 2011). The ODP EIS found that this is consistent with anecdotal evidence which suggests that the groundwater extracted from historical bores in the Project area yield water that is unsuitable for stock and domestic purposes. The ODP EIS also found that:

- The regional assessment of groundwater quality (Raymond and McNeil, 2011) aligns with monitoring of groundwater quality at the Project monitoring sites and data obtained through the groundwater bore census.
- Water within the Permian coal measures can range between fresh and highly saline, but is generally saline within the coal seams, and brackish to moderately saline within the interburden units

3.2 Analysis of underground water movement

3.2.1 Cainozoic Units

3.2.1.1 Alluvium

The ODP EIS reported that groundwater occurs within the Isaac River alluvium at depths of around 10 to 20 metres below ground level (mbgl), and more than 4.5 m below the base of the Isaac River. This was taken to indicate that under current conditions the Isaac River is disconnected from the groundwater system. Regionally, groundwater flow within the alluvium is a subdued reflection of topography, with groundwater flowing in a south-easterly direction consistent with the alignment of the Isaac River. However, local groundwater levels within the alluvium are highest within 300 m of the river, indicating a potential local flow direction away from the river to the east and west. This also indicates potential losing conditions from the river to the underlying alluvium during flow periods.

Isaac River Alluvium groundwater elevations were reported in the ODP EIS to range from around 167 mAHD at the northern end of the ODS domain, down to 140 mAHD at the southeast.

Recharge to the alluvium is considered to be mostly from stream flow or flooding (losing streams), with direct infiltration of rainfall also occurring where there are no substantial clay barriers in the shallow sub-surface. Groundwater within the alluvium is likely discharged as evapotranspiration from riparian vegetation growing along the Isaac River, as well as potential baseflow contributions after significant rainfall and flood events.

3.2.1.2 Regolith

The groundwater flow processes for the regolith material were reported in the ODP EIS to be similar to those of the alluvium, however with groundwater fluxes expected to be significantly lower due to the dominance of clay within the Tertiary sediments. In areas near the Isaac River and creeks (i.e. Ripstone Creek), water has been detected within the regolith material at depths of around 8 to 19 mbgl. Outside of these areas the regolith material is largely unsaturated.

The regolith material comprises low permeability strata (i.e. clay and claystone), which likely restricts rainfall recharge. Groundwater discharge is likely to occur primarily via evapotranspiration, with some baseflow to streams from the regolith under wet climatic conditions. Vertical seepage through the regolith is likely to be limited by the underlying low permeability Rewan Group and other aquitards.

3.2.2 Permo-Triassic Units

3.2.2.1 Rewan Group

Groundwater monitoring conducted at the ODP included three Vibrating Wire Piezometers (VWP) with operational sensors targeting the Rewan Group. Confined groundwater conditions occur within the Rewan Group sediments. Groundwater elevations range from 163 mAHD at the northern end of ODS domain, down to 136 mAHD at the southeast, indicating a general south-easterly hydraulic gradient. However, it was reported that that the very low permeability strata that comprise the Rewan Group likely meant that groundwater transmission and flow within this unit is very limited.

3.2.2.2 Permian Coal Measures

The ODP EIS reported that vertical movement of groundwater (including recharge) within the Permian Coal Measures is limited by the confining interburden layers, meaning that groundwater flow is primarily horizontal through the seams. Regionally, groundwater within the Permian coal measures flows in a south-easterly direction, however flow paths are significantly altered at the local scale due to the extensive history of coal mining in the area. Permian groundwater elevations range from around 170 mAHD to the north of the ODP, down to 130 mAHD at the southeast of ODP. Recharge to the Permian coal measures occurs where the unit occurs at subcrop. Groundwater discharge dominantly occurs via evaporation and abstraction from active mine areas in the region.

3.3 Description of the area of the aquifer where water levels are predicted to decline

Generally speaking, the process of mining reduces water levels in surrounding groundwater units. The extent of the zone affected is dependent on the properties of the aquifers/aquitards and is referred to as the zone of depressurisation in a confined aquifer and zone of drawdown within the water table. Depressurisation and drawdown are greatest at the working coal-face, and gradually reduce with distance from the mine.

As described in **Section 1**, the groundwater study and impact assessment for the Project will be undertaken as part of the Project's EIS that is scheduled to commence in Q3 2019. The impact assessment will include numerical groundwater modelling to determine the predicted area of water level decline in the aquifers within and surrounding the Project area. However, for the purposes of the EA Application it is considered that the groundwater impact predictions provided in the ODP EIS are appropriate to provide contextual information for the likely impacts that may arise from the Project.

The numerical groundwater model developed for the ODP EIS was developed in part to simulate and predict the extent and area of influence of dewatering and the level and rate of drawdown at specific locations. The results of the ODP EIS model indicated:

- Maximum areal extent of drawdown within alluvium was predicted up to between 3 and 5 km from the proposed ODP pits.
- Maximum areal extent of drawdown within the regolith material (where saturated) was predicted up to between 6 and 11 km from the proposed ODP pits.
- Maximum areal extent of drawdown within the Leichhardt Seam of the Rangal Coal Measures was predicted up to between 5 and 8 km from the proposed ODP pits.
- Maximum areal extent of drawdown within the Vermont Seam of the Rangal Coal Measures was predicted up to between 5 and 11 km from the proposed ODP pits.
- Groundwater level drawdown within the mined coal seams is influenced by the geologic structure of the unit; drawdown is limited to where the coal is present (i.e. not sub-cropped or out-cropped) and extends furthest to the west of the ODP.

3.4 Quantities of water to be taken or interfered with

As described in **Section 1**, the groundwater study and impact assessment for the Project will be undertaken as part of the Project's EIS that is scheduled to commence in Q3 2019. The impact assessment will include numerical groundwater modelling to determine the quantities of groundwater to be taken or interfered with by the Project. However, for the purposes of the EA Application it is considered that the groundwater impact predictions provided in the ODP EIS are appropriate to provide contextual information for the volumetric quantities of water take that may arise from the Project.

The numerical groundwater model developed for the ODP EIS was developed in part to assess the groundwater inflow to the mine workings as a function of mine position and timing. This predicted total inflow volumes include water removed in rock material with mining, as well as water evaporated from the pit surface. It is therefore considered an over-estimate of water that could report to the site water balance. The combined inflows to the open cut operations were predicted to peak at approximately 4.5 ML/day (1,636 ML/year), while the average is expected to be about 1.7 ML/day (638 ML/year) over the duration of mining. The majority of water intercepted is sourced from Isaac Connors GMA Groundwater Unit 2 (i.e. non-Quaternary alluvium aquifers) at up to 1,199 ML/year, with up to 623 ML/year sourced from Groundwater Unit 1 (aquifers of the Quaternary alluvium).

4 Environmental values that may be affected by the exercise of underground water rights

The establishment of the Environmental Values of groundwater at and surrounding the Project will occur as part of the Project's EIS groundwater studies scheduled to commence in Q3 2019. For the purposes of the EA Application it is considered that the description of the groundwater Environmental Values provided in the ODP EIS remains appropriate to provide contextual information until that time. The following presents a summary of that information.

4.1 Groundwater Use

A groundwater bore census was conducted across the ODP area and surrounds in 2017 and 2018. The majority of the bores surveyed were located along the Isaac River and its tributaries. The bore census identified:

- 40 existing bores that were in use;
- 35 existing bores that were not in use;
- 7 bores that could not be accessed (and their usage status unknown); and
- 38 bores that were abandoned and destroyed.

For those bores in the census with water use information:

- 49 are used for stock water;
- 17 are used for groundwater monitoring; and
- 6 are used for domestic water supply.

For those bores in the census with available geological information:

- 22 intersect alluvium;
- 10 intersect regolith material; and
- 30 intersect Permian coal measures.

With the exception of the Quaternary alluvium aquifer, the moderate to high salinities observed in groundwater within the region (refer **Section 3.1**) likely precludes stock and domestic usage across most of the Project area and surrounds.

4.2 Groundwater Dependant Ecosystems

Regional scale broadbrush mapping of potential Groundwater Dependant Ecosystems (GDEs) is available the National Atlas of GDEs (Bureau of Meteorology, 2016). This mapping indicates that it is mainly the Isaac River floodplain and main channel that have the potential to contain GDEs, with the potential GDEs described in the Atlas as follows:

- The Isaac River main channel is a GDE with a high potential for groundwater interaction, reliant on surface expression of groundwater.
- Some areas immediately adjacent the Isaac River main channel have a moderate potential for groundwater interaction, including vegetation reliant on subsurface groundwater.
- Some isolated areas immediately adjacent tributaries to the Isaac River have a high potential for groundwater interaction, including vegetation reliant on subsurface groundwater.

- Wetlands on the Isaac River floodplain have a moderate potential for groundwater interaction, and are mapped as GDEs reliant on surface expression of groundwater.
- Vegetated swamps in depressions beyond the Isaac River floodplain have a moderate potential for groundwater interaction, and are mapped as GDEs reliant on surface expression of groundwater.

The wetlands of the Isaac River floodplain include a palaeochannel lake, ox-bow lakes and floodchannel wetlands. Field investigations conducted for the ODP failed to detect any fish within the palaeochannel lake waterbody, suggesting that it may be subject to complete drying and wetting cycles that limit the persistence of a diversity of aquatic biota. It was considered likely that the clay-rich substrates of this waterbody hold surface run-off for extended periods, but less likely that surface expressions of groundwater would make substantial contributions to wetted habitat at this location.

4.3 Stygofauna

A *Desktop Assessment: Likelihood of Stygofauna Occurrence in the Bowen Basin* (4T Consultants Pty Ltd, 2012) was prepared for the Bowen Gas Project EIS and identified areas of possible, likely and high likelihood of suitable stygofauna habitat in the vicinity of the Project. With the exception of areas associated with the Isaac River and tributaries located generally beyond the ODP tenements, almost all areas were identified as having limited stygofauna habitat (4T Consultants Pty Ltd, 2012). Given that it is unlikely groundwater discharges to surface water in the region surrounding the Project, therefore it can be concluded that it is likely that only groundwater associated with the Isaac River alluvium has potential to support an aquatic ecosystem Environmental Value.

5 Impacts on the quality of groundwater that may happen because of the exercise of underground water rights

As the mine progresses, waste rock material will be placed within out-of-pit and in-pit waste rock emplacement areas. Waste rock emplacement areas may produce seepage as a result of rainfall inundation, and waste rock analysis will be undertaken as part of the Project's EIS studies to determine the chemical composition of any such seepage. It may be expected that the results of this analysis would be similar to that conducted for the adjacent ODP EIS, given the very similar geological setting. The analysis undertaken for the ODP indicated that the waste rock material exhibited similar to improved water quality compared to water within regolith material. However, the waste rock material generally exhibited poorer water quality compared to the alluvium. Seepage from in-pit emplacements would not be expected to migrate to the alluvium as, consistent with the ODP, it is expected the groundwater level that would ultimately equilibrate within the in-pit waste rock emplacements would be below the base of the alluvium.

Water within any final voids associated with the Project would evaporate from the lake surface and draw in groundwater from the surrounding geological units. Evaporation from the lake surface would concentrate salts in the lake slowly over time. However, based on the results of the ODP EIS groundwater modelling, this gradually increasing salinity would not pose a risk to the surrounding groundwater regime as the final voids would most likely remain permanent sinks.

6 Strategies for avoiding, mitigating or managing the predicted impacts on the environmental values or the impacts on the quality of groundwater

6.1 Groundwater Monitoring Program

WHC would implement a number of environmental management and impact mitigation measures to minimise the potential impacts of the Project, which will be determined during the Project's EIS. For groundwater, these would include at a minimum a formalised Groundwater Monitoring Program that would contain the following components:

- Establishment of groundwater monitoring infrastructure to allow routine groundwater monitoring (levels and quality) in the aquifers likely to be affected by the Project, being alluvium, regolith and Permian coal measures.
- Establishment of monitoring criteria to monitor predicted impacts on both environmental values and predicted changes in groundwater quality.
- Automated groundwater level monitoring for at least 2 years prior to Project construction in order to establish a robust pre-mining baseline groundwater level dataset.
- Groundwater quality sampling for at least 2 years prior to Project construction in order to establish a robust pre-mining baseline groundwater quality dataset.
- Ongoing routine groundwater level and quality monitoring for the life of the Project.
- Establishment of groundwater quality trigger levels developed in accordance with the Department of Science, Information Technology and Innovation (DSITIA) guideline *Using monitoring data to assess groundwater quality and potential environmental impacts* (DSITI, 2017), once a suitable baseline dataset has been collected.
- An annual review of groundwater level and quality trends that will be conducted by a suitably qualified person and provided to the regulator. The review will assess the change in groundwater level and quality over the year, compared to historical trends and impact assessment predictions. The annual review will discuss any groundwater trigger exceedances or where trends show potential for environmental harm.
- Every five years the validity of the model predictions would be assessed and if the data indicates significant divergence from the model predictions, an updated groundwater model would be constructed for simulation of mining.

Monthly baseline groundwater monitoring commenced at the Project site in February 2019 from a network of 12 existing monitoring bores installed in the Permian coal measures (refer **Figure 1**). This includes automated groundwater level loggers set to record at four-hourly intervals. The baseline groundwater quality monitoring suite includes:

- Field parameters (EC, pH, temperature)
- Laboratory analysis:
    - pH, EC, TDS, SS, turbidity and SAR
    - Major cations
    - Major anions
    - Hardness and alkalinity
    - Metals (dissolved and total)

- Nutrients
- TPH, TRH and BTEXN

WHC currently has plans to expand the existing monitoring network further, supplementing the existing 12 monitoring bores at the Project site.

6.2 Third Party Bore Impacts

Should the Project's groundwater impact assessment presented in the future EIS show predicted impacts to third party groundwater users, WHC would engage with those third parties in accordance with its obligations under Chapter 3 of the Water Act and seek to establish make good agreements with those affected parties.

7 Closing

We trust the information contained within this memorandum meets your requirements. Please do not hesitate to contact Derwin Lyons with any further queries.

8 References

4T Consultants Pty Ltd, 2012. Desktop Assessment: Likelihood of Stygofauna Occurrence in the Bowen Basin.

Bureau of Meteorology, 2016. National Atlas of Groundwater Dependent Ecosystems.

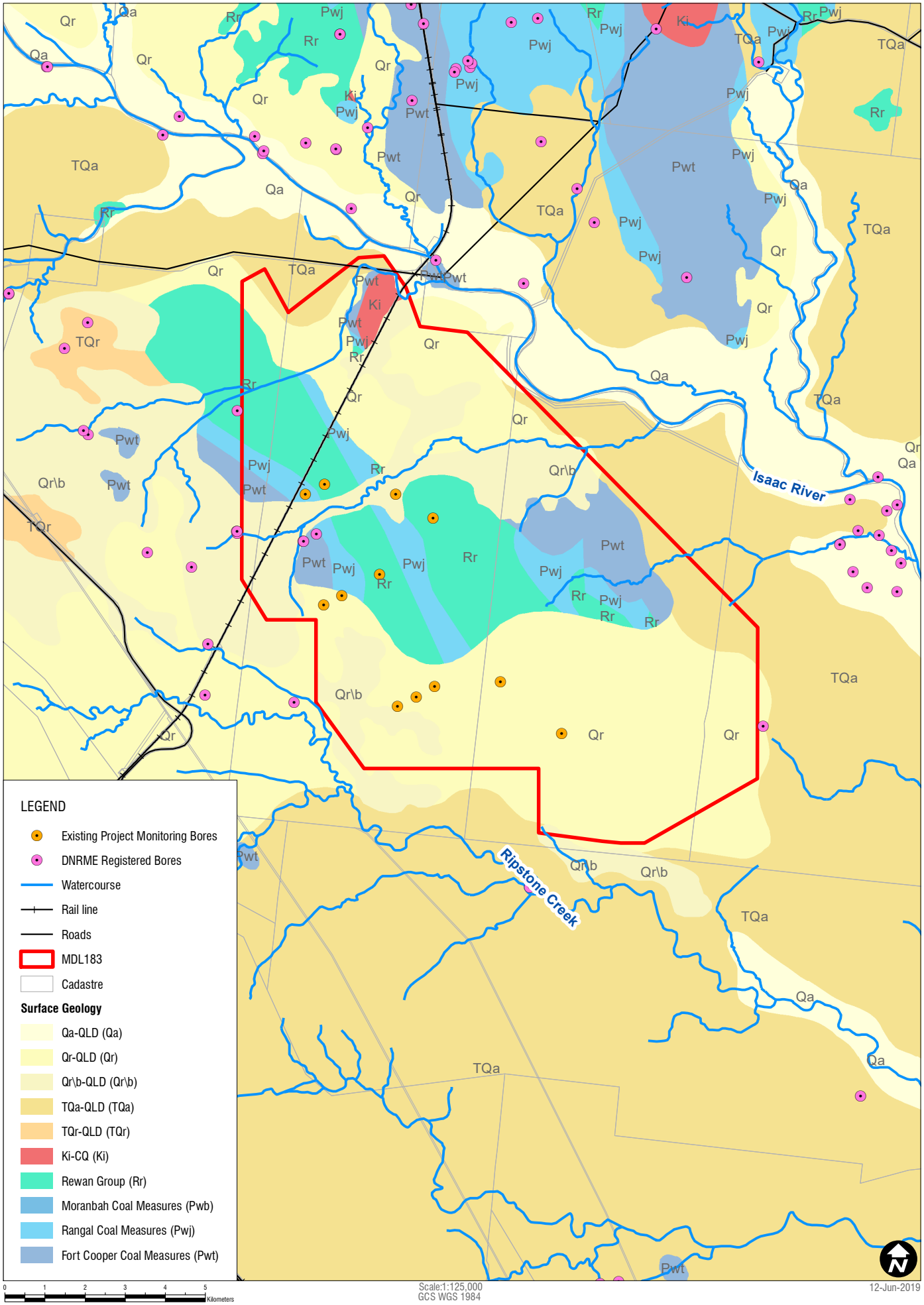
DSITI, 2017. Using monitoring data to assess groundwater quality and potential environmental impacts.

Raymond and McNeil, 2011. Regional chemistry of the Fitzroy basin groundwater.

Pembroke Resources, 2018. Olive Downs Project – Environmental Authority Application Supporting Information.

HydroSimulations, 2018. Olive Downs Project Groundwater Assessment.

Checked/
Authorised by: IE



Sheet Size : A4

SLR

www.slrconsultingaustralia.com.au PH: 61 7 3858 4800

LOCALITY PLAN

FIGURE 1