idemitsu

Boggabri Coal Mine

MODIFICATION 8 TO SSD 09_0182

for

Boggabri Coal Operations Pty Limited

July 2021

IDEMITSU BOGGABRI COAL

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

BOGGABRI COAL MINE

MODIFICATION 8 TO SSD 09_0182

MODIFICATION REPORT

Prepared by:

HANSEN BAILEY
6 / 127 – 129 John Street
SINGLETON NSW 2330

July 2021

For:

BOGGABRI COAL OPERATIONS PTY LIMITED
386 Leard Forest Road
BOGGABRI NSW 2382

EXECUTIVE SUMMARY

INTRODUCTION

Boggabri Coal Mine is owned by a joint venture between Idemitsu Australia Resources Pty Ltd via its subsidiary company, Boggabri Coal Pty Ltd (80%); Chugoku Electric Power Australia Resources Pty Ltd (10%); and NS Boggabri Pty Limited (10%).

The mine is located north-east of the township of Boggabri in the North West Region of New South Wales and is wholly within the Narrabri Local Government Area.

Boggabri Coal Operations Pty Limited (on behalf of Idemitsu Australia Resources Pty Ltd and its joint venture partners) lodged an application under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979* to modify State Significant Development Approval 09_0182, to allow for the proposed mine plan changes within the approved Mine Disturbance Boundary and to implement enhancements to the regional biodiversity corridor (MOD 8).

In February 2021, the Department of Planning, Industry and Environment confirmed that the appropriate approval pathway for MOD 8 would be via an application to modify State Significant Development Approval 09_0182 under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979*. On 28 May 2021, the Department of Agriculture Water and the Environment determined that MOD 8 was a Controlled Action requiring approval under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999*. It has been determined that the Controlled Action will be assessed by the NSW Government in accordance with the provisions of Schedule 1 of the bilateral agreement between the Commonwealth Government and the NSW Government.

Hansen Bailey has prepared this Modification Report on behalf of Boggabri Coal Operations Pty Limited in support of the application to modify State Significant Development Approval 09_0182 and to provide information to assist the NSW Government's assessment of MOD 8 under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999*.

MODIFICATION DESCRIPTION

MOD 8 seeks the following changes to the approved operations at Boggabri Coal Mine:

- Increasing the approved maximum depth of mining down to the Templemore Coal Seam to recover an additional 61.6 Million tonnes of Run of Mine coal within the currently approved Mine Disturbance Boundary. This will result in the extension of the mine life by six (6) years; and
- Construction of a specifically designed fauna movement crossing over the existing haul road between the Overburden Emplacement Area and the western side of a regional biodiversity corridor. The establishment of the fauna movement crossing is proposed to improve the movement of fauna from the Leard State Forest through the Southern Rehabilitation Area.

STAKEHOLDER CONSULTATION

The stakeholder consultation program for MOD 8 included engagement with the Boggabri Coal Mine Community Consultative Committee, Registered Aboriginal Parties, near neighbours and Broader Community, regulatory authorities (including local, state and Commonwealth government agencies), industry stakeholders and other interested stakeholders.

The purpose of the stakeholder consultation program was to inform stakeholders of the proposed changes to the Boggabri Coal Mine and to identify any key environmental, social and economic issues which need to be addressed within this Modification Report.

Boggabri Coal Operations Pty Limited will continue to consult with stakeholders throughout the Government review and assessment process for MOD 8.

IMPACTS, MANAGEMENT AND MITIGATION

This Modification Report includes an assessment of the potential environmental social and economic impacts of MOD 8 in accordance with applicable legislative requirements and relevant Government guidelines and policies.

Mine plan scenarios for Year 2024 and Year 2029 were selected as reasonable worst case representative years for the purpose of noise and air quality modelling, given the forecast production rates and equipment fleet requirements for these years.

The proposed changes to mining operations will remain within the currently approved Mine Disturbance Boundary at Boggabri Coal Mine.

Minor disturbance (less than 1.21 hectares) will be required to facilitate the construction of the fauna movement crossing on the western side of the approved disturbance area at Boggabri Coal Mine. Field assessments undertaken for the disturbance associated with the construction of this fauna movement crossing focussed on the land within the MOD 8 Survey Area, an area of approximately 110 hectares to the west of the approved disturbance area.

Where appropriate, the environmental assessments have identified management and mitigation measures to be implemented for MOD 8. These commitments generally align with those currently described within the existing Boggabri Coal Mine environmental management plans and programs.

The following provides a summary of the key findings from the environmental assessments undertaken for this Modification Report.

Noise

A Noise and Blasting Impact Assessment was undertaken by Global Acoustics in accordance with the *Noise Policy for Industry* (EPA, 2017).

Three private receivers are predicted to experience noise levels greater than the relevant noise criteria for the Year 2024 modelling scenario for the evening/night periods. One of these receivers has existing rights to acquisition under State Significant Development Approval 09_0182 and is predicted to experience a one decibel increase in noise for that previously assessed for the Boggabri Coal Mine.

The two remaining receivers are predicted to experience negligible noise impacts (that is, noise impacts which are not discernible to the average listener and therefore do not warrant receiver-based treatments or controls) for MOD 8 in accordance with the *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments* (DPIE, 2018).

There were no predicted exceedances of the relevant noise criteria for any privately owned receiver during the day period for Year 2024 or for any period for the Year 2029 modelling scenario.

The modelling predicted that MOD 8 will comply with the relevant criteria for sleep disturbance, cumulative noise and for land area assessment (that is, the assessment completed over 25% of land area). Further the proposed construction of the fauna movement crossing is unlikely to result in any noise exceedances.

Boggabri Coal Operations Pty Limited have committed to continue to manage noise impacts in accordance with its Noise Management Plan which will be reviewed and updated to reflect any changes for MOD 8.

Air Quality and Greenhouse Gas

An Air Quality and Greenhouse Gas Impact Assessment was undertaken by Jacobs Group (Australia) Pty Ltd in accordance with the "*Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW*" (EPA, 2016).

The Air Quality and Greenhouse Gas Impact Assessment included air quality dispersion modelling to predict the particulate matter concentrations for MOD 8 at privately owned receivers in the vicinity of the Boggabri Coal Mine. The predicted particulate matter concentrations were assessed against the criteria prescribed by EPA (2016) and DPIE (2018).

Dispersion modelling was undertaken to assess the air quality impacts of all operational activities at the Boggabri Coal Mine including the changes proposed by MOD 8. MOD 8 is predicted to generally comply with the relevant air quality criteria at privately owned receivers. Three private receivers (Receivers 140, 147 and 165) have been predicted to experience an exceedance of the 24-hour average PM_{10} criteria as a result of the cumulative emissions from all sources for one or more days of the modelled year. Despite the minor contribution to dust levels from Boggabri Coal Mine on these days, the background air quality levels on these days were leading towards or were in exceedance of the 24-hour average PM_{10} criterion.

The assessment of the limited construction activities associated with the establishment of the fauna movement crossing found that it would not result in significant impacts to regional air quality and can be managed by utilising standard dust management practices.

Boggabri Coal Operations Pty Limited will continue to manage its impacts to the regional air quality in accordance with its Air Quality and Greenhouse Gas Management Plan. This includes (but is not limited to) the implementation of mitigation and management measures such as watering of haul roads, utilisation of a Trigger Action Response Plan in conjunction with real-time air quality monitoring results to proactively manage operations and the advancement of progressive mine rehabilitation activities.

Scopes 1, 2 and 3 greenhouse gas emissions for MOD 8 were quantified within the Air Quality and Greenhouse Gas Impact Assessment completed by Jacobs. The assessment identified the annual Scope 1 and 2 emission rates for MOD 8 will be essentially equivalent to those generated from existing operations continuing for a further six years from 2033 to 2039.

The NSW Government's *Net Zero Plan Stage 1: 2020-2030* was released in March 2020 and sets out several initiatives to cut greenhouse gas emissions by 35% in 2030 compared with 2005 levels. This plan also states:

> "*Mining will continue to be an important part of the economy into the future and it is important that the State's action on climate change does not undermine those businesses and jobs and the communities they support*".

The Air Quality and Greenhouse Gas Assessment also quantified the Scope 3 emissions for MOD 8 (that is, for the end use of the product coal), noting that these emissions will ultimately be accounted for within the consumer countries greenhouse gas emission accounts.

Boggabri Coal Operations Pty Limited will continue to minimise its greenhouse gas emissions in accordance with the measures described within its Air Quality and Greenhouse Gas Management Plan. These include, improving operational efficiencies to minimise diesel usage, regular maintenance of plant and equipment, use of appropriate equipment in consideration of energy efficiency and the training of staff on continuous improvement strategies focussed on enhancing energy efficiencies of its operations.

Further to the above, Boggabri Coal Operations Pty Limited has committed to commissioning a Greenhouse Gas Minimisation Study to assess the existing measures and to identify any further reasonable and feasible measures to further minimise direct greenhouse gas emissions from the site. Boggabri Coal Operations Pty Limited will also continue to monitor and report on its direct greenhouse gas emissions and compare against the forecast emissions from the Air Quality and Greenhouse Gas Assessment. Where actual emissions are identified to be greater than the forecast emissions within this Modification Report, Boggabri Coal Operations Pty Limited will consult with Department of Planning, Industry and Environment in relation to the appropriate mechanism to offset these additional emissions.

In accordance with existing conditions of State Significant Development Approval 09_0182, Boggabri Coal Operations Pty Limited is currently undertaking the establishment and preservation of one of the largest regional biodiversity corridors in Australia. In addition to the significant biodiversity outcomes, the above project will result in a future carbon sink within the surrounding environment.

Groundwater

A Groundwater Impact Assessment was undertaken by Australasian Groundwater and Environmental Consultants to assess the incremental impacts of the mine plan changes associated with MOD 8 on the regional groundwater regime.

The assessment entailed the use of the recently updated 3D regional groundwater numerical model prepared for the Boggabri, Tarrawonga and Maules Creek mining complex. This groundwater numerical model has been subject to regular recalibration and review including independent reviews by State government.

The regional groundwater regime generally comprises four hydrological systems: the two quaternary alluvial groundwater systems associated with the Namoi River and its tributaries, the Permian groundwater system which is primarily associated with the coal seam aquifers and the basement Boggabri Volcanics.

Water quality within the Quaternary alluvial aquifers is highly variable. Fresh groundwater is generally limited to bores near surface water sources, including the Namoi River, Barbers Lagoon and Maules Creek. High extraction generally occurs in irrigation areas on the Namoi River floodplain. Groundwater within the Permian coal seams and interburden of the Maules Creek Formation is generally brackish to moderately saline. The quality, depth and yield of water from the Permian constrain the use of this water for agricultural or other beneficial uses.

The groundwater modelling for MOD 8 identified inflows to the Boggabri Coal Mine are variable throughout the mine life ranging from 213 Megalitres per year to 712 Megalitres per year. These groundwater inflows are directly from the Permian coal seam aquifers which is rarely used for agriculture or other beneficial uses.

Although MOD 8 is predicted to increase drawdown in all coal seams proposed to be mined, the model predicts negligible change to drawdown within the Quaternary alluvium. The drawdown within the surrounding coal seams is fundamentally equivalent to that predicted for the approved mining operations and the predicted drawdown in the alluvials attributable to MOD 8 alone does not result in any additional bores being significantly impacted when compared to the impacts from the currently approved operations.

Predicted water takes from all groundwater water sources remains within the entitlements provided in Water Access Licences held for the Boggabri Coal Mine and subsequently no additional water entitlements will be required to account for the predicted water takes for MOD 8.

The incremental impacts of MOD 8 on the surrounding water sources relative to approved mining at Boggabri Coal Mine, are minimal, while cumulative impacts are fundamentally equivalent to those for already approved mining activities. Accordingly, MOD 8 is predicted to result in minimal impacts to the hydrological characteristics of surrounding water sources.

Boggabri Coal Operations Pty Limited has committed to continue to manage the predicted impacts to groundwater in accordance with the Water Management Plan and associated Groundwater Management Plan.

The Water Management Plan and Groundwater Management Plan will be reviewed and updated to include additional measures specific to MOD 8. This will include the installation of additional monitoring bores to supplement the existing groundwater monitoring network (in consultation with relevant regulators) to facilitate the monitoring of impacts to the deeper strata to be mined and the continued monitoring of impacts from mining operations associated with MOD 8.

Surface Water

A Surface Water Impact Assessment was undertaken by Engeny Water Management to assess the potential impacts of MOD 8 on the existing Site Water Balance and surface water environment.

The proposed changes to the mine plan for MOD 8 will not result in an increase to the approved Mine Disturbance Boundary apart from the minor additional disturbance for a fauna movement crossing. Accordingly, MOD 8 will not result in appreciable changes to the surrounding catchment areas (including cumulative impacts), the final landform, flooding, downstream flow regimes and potential impacts to downstream water users.

The water balance modelling indicates that the total water inventory on site is primarily driven by groundwater inflows into the mining areas which are supplemented with imported makeup water from the groundwater borefield. Accordingly with the predicted increase in groundwater inflows predicted for MOD 8, the demand on the borefield and other external water supplies to meet site water demand will subsequently reduce.

The potential impacts of MOD 8 to surface water will continue to be managed in accordance with the Water Management Plan and associated Surface Water Management Plan.

Traffic

A Traffic Impact Assessment was undertaken by Cardno to assess the potential impacts to the regional road network resulting from the additional potential traffic volumes generated by MOD 8.

In light of the primary access to the Boggabri Coal Mine now being via the privately owned former coal haul road and the designated left turn intersections developed on the Kamilaroi Highway, potential impacts on the regional road network for MOD 8 are expected to be negligible with little to no effects on the road network performance.

Boggabri Coal Operations Pty Limited will prepare and implement a Construction Management Plan which will identify, mitigate and manage any potential traffic impacts during the construction program for the fauna movement crossing.

The measures detailed within the Traffic Management Plan will continue to be implemented during the operation of MOD 8 to minimise potential impacts on other road users.

Visual

A Visual Impact Assessment was undertaken by Hansen Bailey to assess the potential incremental impacts for MOD 8 within the contemporary landscape.

The visual impacts of the proposed changes to the approved Overburden Emplacement Area, including the increase to the overall height by five metres was assessed from available viewpoint locations, primarily to the south of the Boggabri Coal Mine. View locations to the North, East and West of the Boggabri Coal Mine will continue to not experience any visibility to the mining activities, due to screening from the Willow Tree Range. Accordingly, no visual impacts are anticipated from MOD 8 to receivers located within these view sectors.

Private view locations to the south east are generally more than seven kilometres from the Boggabri Coal Mine and/or are partially screened for views by the eastern portions of the Willow Tree Range.

Available views from the south east are anticipated to currently experience views of the southern faces of the developing Overburden Emplacement Area. These view locations are expected to experience moderate to low visual impacts as the southern faces (including the increased height) of the Overburden Emplacement Area are being developed and rehabilitated. Once rehabilitation has advanced and vegetation is established, the visual impacts to these view locations will reduce to low.

View locations from the south west of Boggabri Coal Mine will continue to experience views towards the developing Overburden Emplacement Area.

Given the advancement of current rehabilitation activities at Boggabri Coal Mine to the south western faces of the Overburden Emplacement Area, the mine plan changes sought by MOD 8 will only result in moderate to low impacts. More distant views from the south west (that is, more than 10 kilometres) will experience low visual impacts.

Given no material additional impacts are anticipated by MOD 8, no additional mitigation or management measures beyond those currently implemented at Boggabri Coal Mine are proposed.

The inclusion of the changes proposed by MOD 8 will not result in any noticeable lighting impacts to night lighting at the Boggabri Coal Mine. Operations at the Boggabri Coal Mine will continue to be managed in accordance with the relevant conditions of State Significant Development Approval 09_0182.

Rehabilitation & Soils

Landloch completed a Soils Assessment and a separate evaluation of the Conceptual Final Landform design for MOD 8 to determine any potential additional impacts which need to be managed.

The Soils Assessment indicated the small area of disturbance associated with the proposed fauna movement crossing (that is 1.21 hectares) falls on the boundary of the Blue Vale Footslopes and Brenty Soil Mapping Units, which are present across other areas of the Boggabri Coal Mine. In this regard, the mitigation and management strategies currently described within the relevant environmental management plans and protocols relating to erosion and sediment control at Boggabri Coal Mine remain appropriate for the disturbance and rehabilitation activities associated with MOD 8.

The landform evaluation found the primary change to the landform requires the top of the landform to be redesigned to a more undulating surface, with most runoff being managed on the top of the landform. Landloch has identified that the redesign will reduce the potential for uncontrolled discharges of water runoff onto outer batter slopes of the landform and minimise the potential for erosion of the outer slopes in the years that vegetation cover is established.

Erosion modelling for the Conceptual Final Landform for MOD 8 indicated there are no large differences in erosion compared with the currently approved landform.

Biodiversity

WSP prepared a Biodiversity Development Assessment Report for the disturbance of the 1.21 hectares anticipated for the construction of the fauna movement crossing.

The disturbance area comprises entirely the Plant Community Type 88 - Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion which does not conform to a listed ecological community under State or Commonwealth legislation. Although this vegetation community was identified to provide suitable habitat for the various threatened flora and fauna species known to occur within the locality, no threatened flora and fauna species were identified to occur within the disturbance area during targeted searches for MOD 8.

Assessments of significance have been prepared for the listed flora and fauna species in accordance with the relevant government guidelines for impacts on threatened species. These assessments concluded MOD 8 is not likely to have a significant impact on these threatened species.

Whilst up to 1.21 hectares of new disturbance is proposed within the MOD 8 Disturbance Footprint, overall, there will be a net decrease in total native vegetation disturbance of 2.06 hectares at the Boggabri Coal Mine as a result of MOD 8. This is the result of the surrendering of the existing approval to utilise a dragline in mining operations at Boggabri Coal Mine (and the 3.27 hectares disturbance assessed for the dragline erection pad and walk road) which was originally approved under State Significant Development Approval 09_0182.

The small residual impacts of MOD 8 to Plant Community Type 88 (that is, 0.25 hectares of additional disturbance) are anticipated to be appropriately compensated for by the total reduction in disturbance to other native vegetation communities (including 1.38 hectares of vegetation conforming to a Critically Endangered Ecological Community) which has previously been approved for disturbance and subject to compensation under the Boggabri Coal Mine Biodiversity Offset Strategy.

WSP also conducted an assessment of the potential impacts to Groundwater Dependent Ecosystems as a result of the changes to the mine plan proposed by MOD 8. The assessment relied on the raft of information available within the Project Boundary and the biodiversity offsets strategy and NSW Government regional vegetation mapping.

One vegetation community which has been conservatively assessed to conform to a Critically Endangered Ecological Community listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* was identified within an alluvial tongue to the south west of Boggabri Coal Mine which is predicted to be impacted by MOD 8. This vegetation community was identified to at least partially rely on groundwater as part of its water balance. An assessment of significance completed by WSP concluded that the predicted groundwater drawdown impacts as a result of MOD 8 alone is unlikely to result in significant impacts on this vegetation community.

The existing Groundwater Dependent Ecosystem monitoring program will be continued and supplemented by three additional monitoring locations within the predicted zone of alluvial drawdown to monitor the effects of drawdown on the potentially impacted terrestrial vegetation community and stygofauna community.

Aboriginal and Historic Heritage

An Aboriginal Cultural Heritage Due Diligence Assessment and a Heritage Assessment for the MOD 8 Survey Area was conducted by Insite Heritage.

Field work planning, implementation and the heritage assessments were undertaken in consultation and in conjunction with Registered Aboriginal Parties for the Boggabri Coal Mine.

No items of Aboriginal Cultural Heritage or Historic Heritage value were identified within the disturbance area anticipated for the fauna movement crossing and accordingly, no heritage constraints are present for MOD 8.

Management of heritage matters will continue to be managed in accordance with the Boggabri Coal Mine Cultural Heritage Management Plan.

Social

A Social Impact Assessment was conducted by Hansen Bailey to assess the potential incremental changes to the social impacts and benefits resulting from the proposed operational changes for MOD 8.

The Social Impact Assessment engagement program for MOD 8 occurred within January and February 2021 and entailed 13 telephone interviews/surveys with a total of 19 participants.

Socio-economic impacts of MOD 8 are generally associated with environmental impacts, including increased noise and dust emissions, changes in visual amenity and the potential impacts on available water. Socio-economic benefits of MOD 8 include increased employment opportunities for the construction and operational workforce, opportunities for local businesses during the additional six years of operations and additional contributions to the Narrabri Shire Council through the existing Voluntary Planning Agreement.

These impacts have been assessed to be low to moderate, noting minimal impacts to surrounding amenity and no predicted notable change to the social and economic profile of the community except for the potential for continued employment.

Economics

An Economic Impact Assessment of MOD 8 has been prepared by Gillespie Economics which entailed the completion of a Cost Benefit and Local Effects Analysis (with supplementation Input Output modelling analysis).

The Cost Benefit Analysis confirmed MOD 8 will have a global net production benefit of $513 Million (present value), with a minimum of $294 Million (present value) of these net production benefits accruing to Australia and $241 Million (present value) accruing to New South Wales.

These net production benefits are in the form of Company tax to the Commonwealth (and apportioned to the New South Wales Government) and New South Wales Government royalties.

The environmental and social costs which are not internalised into production costs include the opportunity costs of the existing Water Access Licences held by Boggabri Coal Operations Pty Limited (~$0.6 Million present value) and the additional Greenhouse Gas costs resulting from MOD 8 (~$0.1 Million present value). With consideration of the above external costs, MOD 8 is estimated to have net social benefits to both Australia and New South Wales of $293 Million (present value) and $240 Million (present value) respectively.

MOD 8 will provide direct economic activity, including jobs, to the local economy, and indirect economic activity to the local area via both wage and non-wage expenditure, while having no material adverse impacts. MOD 8 will result in incremental increases to the net income and net employment for the regional economy (relative to the base case), averaging at $8 Million in additional net income and a further 80 Full Time Equivalent jobs between 2022 and 2039.

EVALUATION OF MERITS

The approval of MOD 8 will increase Boggabri Coal Mine's coal reserve base within the approved Mine Disturbance Boundary and result in significant social and economic benefits.

MOD 8 is seeking changes to two aspects of the approved operations at Boggabri Coal Mine:

- the increase in approved mining depths; and
- the construction of a fauna movement crossing over the existing haul road.

The increase to the depth of mining will also result in a number of other changes to approved operations, including (but not limited to): mine life, Run of Mine coal production rates and equipment and workforce configurations. However, many aspects of the Boggabri Coal Mine will remain unchanged, including Project Boundary and approved Mine Disturbance Boundary, open cut mining methods, existing mine infrastructure and site access, product coal processing and transportation and rehabilitation objectives for the BCM.

Boggabri Coal Operations Pty Limited has consulted with relevant regulatory and community stakeholders over the Modification application and have considered all feedback when preparing this Modification Report.

The environmental assessments completed as part of this Modification Report have not identified any material additional environmental, social or economic impacts which will result from MOD 8 beyond those currently approved by State Significant Development Approval 09_0182 and therefore result in substantially the same impacts as those currently approved.

MOD 8 is expected to deliver net social benefits (that is, considering the social costs in relation to net production benefits) to both Australia and New South Wales of $293 Million (present value) and $240 Million (present value), respectively.

These net social benefits will generally be distributed as Royalties to the New South Wales Government ($216 Million, present value) and as Company tax ($78 Million, present value to Australian Government and $25 Million, present value apportioned to New South Wales) whilst also accounting for the opportunity costs of the existing Water Access Licences held by Boggabri Coal Operations Pty Limited (~$0.6 Million present value) and the additional Greenhouse Gas costs resulting from MOD 8 (~$0.1 Million present value). MOD 8 will continue to provide significant annual direct and indirect benefits to the local area.

MOD 8 will not result in material environmental impacts beyond those currently approved and will result in the delivery of very material direct and indirect economic activity to the local, State and National economies. Accordingly, MOD 8 is justified on environmental, social and economic grounds and is in the public interest.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

This section provides an overview of the Boggabri Coal Mine (BCM), the modifications proposed to the currently approved mine, introduces the proponent of this modification application and outlines the purpose and structure of this Modification Report.

1.1 BACKGROUND

Boggabri Coal Operations Pty Limited (BCOPL) operates the Boggabri Coal Mine (BCM) on behalf of Idemitsu Australia Resources Pty Ltd (IAR) and its joint venture partners. BCM is owned by the following joint venture partners:

- IAR via its subsidiary company, Boggabri Coal Pty Ltd (BCPL) – 80%;
- Chugoku Electric Power Australia Resources Pty Ltd – 10%; and
- NS Boggabri Pty Limited – 10%.

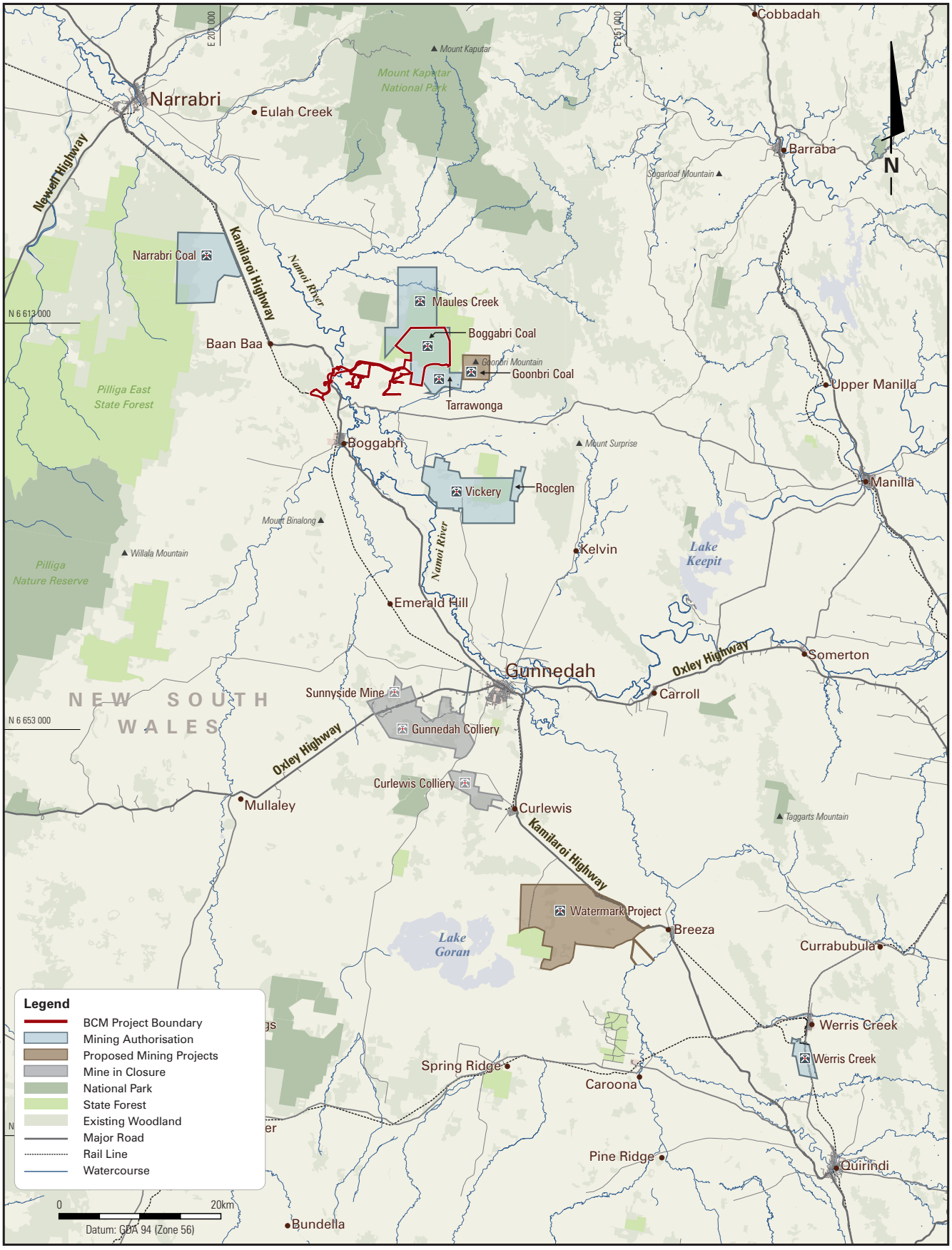
BCM is located approximately 15 km north-east of the township of Boggabri in the North West Region of New South Wales (NSW) and is located wholly within the Narrabri Local Government Area (LGA) (see **Figure 1**).

BCM is an open cut coal mining operation which has operated since 2006. BCM operates in accordance with State Significant Development Approval (SSD) 09_0182 which was originally granted under the former Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 18 July 2012. SSD 09_0182 permits the production up to 8.6 Million tonnes per annum (Mtpa) of Run of Mine (ROM) coal from site until the end of 2033.

BCM is part of the Boggabri, Tarrawonga, Maules Creek Coal Mining Complex (BTM Complex) and is immediately adjacent to the Tarrawonga Mine to the south and Maules Creek Mine to the north. Tarrawonga Mine is operated by Tarrawonga Coal Pty Limited (TCPL). Maules Creek Mine is operated by Maules Creek Coal Pty Limited (MCCPL). Both TCPL and MCCPL are subsidiaries of Whitehaven Coal Limited (Whitehaven Coal).

BCOPL is seeking a Modification to SSD 09_0182 under Section 4.55 of the EP&A Act to increase the depth of approved mining operations to recover an additional coal resource and to facilitate the construction of a fauna movement crossing across the existing haul road at BCM to encourage the movement of fauna from the Leard State Forest through the mine rehabilitation areas (MOD 8).

On 28 May 2021, the Commonwealth Department of Agriculture, Water and the Environment (DAWE) decided that MOD 8 was a controlled action requiring approval under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). It has been determined that the controlled action (as described within Referral EPBC 2021/8875) will be assessed by the NSW Government in accordance with the provisions of Schedule 1 of the bilateral agreement between the Commonwealth Government and the NSW Government.



HB BOGGABRI MOD8 EPBC Referral 1824 F1 Regional Locality 04 06 2019 Rev D

BOGGABRI COAL MINE

Regional Locality

FIGURE 1

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

IDEMITSU
BOGGABRI COAL

BCOPL has prepared this Modification Report to support an application to modify SSD 09_0182 and to provide information to assist the NSW Government's assessment of MOD 8 under the EPBC Act consistent with consultations with the NSW Department of Planning, Industry and Environment (DPIE) (see **Section 4.1.2**).

1.2 THE PROPONENT

SSD 09_0182 is held by BCPL, a wholly owned subsidiary of IAR which is the proponent for this application on behalf of its joint venture partners. The contact details of the proponent are:

Boggabri Coal Operations Pty Limited

PO Box 12
BOGGABRI NSW 2382
Phone: (02) 6749 6000
Email: boggabricoal@idemitsu.com.au

1.3 DOCUMENT PURPOSE

This Modification Report supports BCOPL's application for MOD 8 under Section 4.55(2) of the EP&A Act. It provides the information required to support the NSW Government's assessment of MOD 8 as a controlled action under the EPBC Act (EPBC 2021/8875). This Modification Report provides a description of MOD 8, assesses the potential environmental and social impacts and proposes any additional mitigation and management measures where required.

1.4 DOCUMENT STRUCTURE

This document has been prepared in consideration of the draft '*Guideline 8: Modifying an Approved Project*' (DPIE, 2017), *Exhibition Draft: Preparing a Modification Report State Significant Development Guide* (DPIE, 2020) and any directions received from the relevant regulatory authorities.

Section 2 describes the existing environment in the locality of MOD 8 and the approved mining operations at BCM;

Section 3 provides a description of MOD 8 activities;

Section 4 includes a brief discussion on the applicable regulatory framework;

Section 5 outlines the stakeholder consultation conducted;

Section 6 presents a summary of the scoping of environmental and socio-economic issues addressed within this Modification Report;

Section 7 provides a discussion on the environmental impacts from MOD 8 and identifies any required additional mitigation requirements;

Section 8 provides an evaluation of merits; and

Section 9 and **Section 10** each define the abbreviations used throughout this Modification Report and a list of relevant reference materials.

Appendix A to **Appendix U** provides copies of the detailed technical assessments and other supporting information which has been utilised in support of this Modification Report.

2 EXISTING ENVIRONMENT

This section provides a discussion on the existing approved BCM, the surrounding topography, natural features, land use and land ownership as relevant to MOD 8.

2.1 APPROVED BCM

BCOPL was originally granted DA 36/88 in 1989 to facilitate the production of 5 Mtpa of export quality product coal using open cut mining methods for a period of 21 years from the grant of the necessary mining lease (i.e. until 14 November 2011). Coal production at BCM did not commence until 2006. DA 38/88 was modified on three separate occasions to facilitate the development of additional water infrastructure, to increase the approved height of the Overburden Emplacement Area (OEA) and to extend the approval for a further 2 years (until December 2013) to enable mining operations to continue pending the determination of a new application.

BCOPL was granted Project Approval ((PA) now State Significant Development (SSD)) 09_0182 for the Continuation of Mining Project from the NSW Planning Assessment Commission (PAC) (now known as the Independent Planning Commission (IPC)) under Part 3A of the EP&A Act on 18 July 2012. SSD 09_0182 enables mining operations to be undertaken until the end of December 2033.

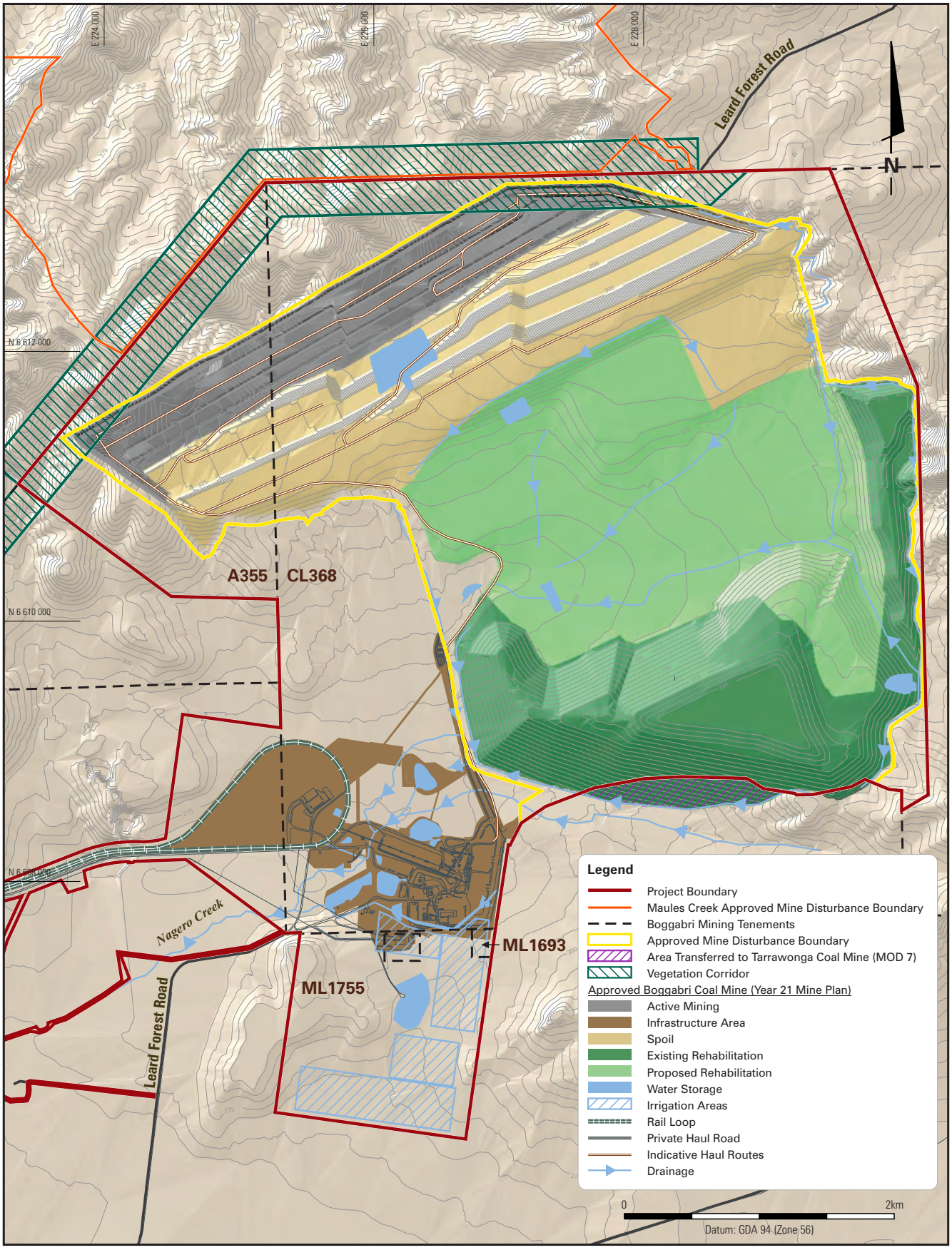
On 20 June 2019, a delegate of Minister declared PA 09_0182, as modified to be "*State Significant Development*" under Clause 6 of Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the EP&A Act. Accordingly, from 20 June 2019, PA 09_0182 has been referred to as SSD 09_0182.

The BCM currently operates under SSD 09_0182 (as modified) which is supported by the Boggabri EA and the documents from six approved modifications:

1. *Boggabri Coal Project Modification – Environmental Assessment* (Hansen Bailey, 2013a) (MOD 2);
2. *Boggabri Coal Mine Project Approval Modification EA* (Hansen Bailey, 2013b) (MOD 3);
3. *Boggabri Coal Mine – Project Approval Modification EA* (Parsons Brinckerhoff, 2014) (MOD 4);
4. *Boggabri Coal Mine – Project Approval Modification EA* (Parsons Brinckerhoff, 2015) (MOD 5);
5. *Boggabri Mine Project Approval 09_0182 – Minor Modification* (BCOPL, 2017) (MOD 6); and
6. *Boggabri Coal Mine – Project Approval Modification EA* (Umwelt, 2018) (MOD 7).

An initial modification (MOD 1) was made in December 2012 but was subsequently withdrawn.

Table 1 generally describes the currently approved activities under SSD 09_0182 whilst **Figure 2** provides a layout of these activities.



HB BOGGABRI 1824 MOD8 F2 Approved Operations 19 04 2021

BOGGABRI COAL MINE

Approved Operations

FIGURE 2

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

IDEMITSU
BOGGABRI COAL

Table 1
Key Components of the Approved BCM under SSD 09_0182

Aspect	Current Approval (as Modified)
Mine Life	Mining operations from 18 July 2012 until 31 December 2033.
Project Disturbance	2,056 ha (increased to include infrastructure built under other approvals or by other proponents).
Total Resource to be Recovered	145 Million tonne Mt of ROM coal. 135 Mt of product coal.
Mining Method	Open cut mining using either dragline, truck and shovel or truck and shovel operation.
Employment	Approximately 500 Full Time Equivalent (FTE) employees.
Depth of Mining	180 m.
Target Coal Seams	Basal seam - Merriown seam.
ROM Coal Production	ROM coal production of up to 8.6 Mtpa.
Overburden handling	Up to 59.9 Million bank cubic metres (Mbcm) of overburden to be handled in peak year.
Infrastructure Facilities Area	Construction and use of a CHPP, bypass crusher and associated auxiliary equipment. Creation of an equipment recycling yard. Construction of two access roads linking Kamilaroi Highway and the private haul road.
Coal Stockpiles	Extension of ROM and product coal stockpiles to accommodate coal from the Tarrawonga Mine (also available for use by BCM).
Coal Handling and Preparation Plant (CHPP)	Processing a combined total of 4.2 Mtpa ROM coal (up to 1.5 Mtpa from Tarrawonga Mine). Remaining ROM coal from BCM bypassed, including up to 3 Mtpa of Tarrawonga Mine.
Product Coal	Increase to 8.6 Mtpa of BCM product coal to be dispatched from the BCM. Up to 3 Mtpa of Tarrawonga Mine product coal to be dispatched.
Product Coal Transport	Increase to 8.6 Mtpa of product coal from BCM and 10 Mtpa overall via rail on the 17 km private rail spur from approximately May 2014 onwards. Additional rail movements associated with transporting up to 3 Mtpa of product coal from the Tarrawonga Mine, subject to commercial agreement (additional train movements).
Reject Material	Coarse rejects and tailings co-disposed with overburden or within in-pit tailings emplacement areas. Approximately 200,000 t of additional reject material throughout the life of the Project, associated with the processing of coal from the Tarrawonga Mine.
Overburden Emplacement Area	Extension of the existing Boggabri OEA (maximum height of 395 m AHD) Removal of a portion of the OEA from the BCM Project Boundary to facilitate Tarrawonga Mine's OEA which is now designed to integrate with the Boggabri OEA as per the Tarrawonga approval.
Water Management	On-site water management system comprising water management storages and collection drains, runoff diversions, sediment control and open cut dewatering. Licenced discharge of excess water stored on-site. Reduction in the overall catchment area of the BCM due to integration of waste rock emplacements with Tarrawonga Mine. Construction and operation of a borefield 5 km west of previous operations.
Mining Operation Hours	24 hours per day, seven days per week.

2.2 TOPOGRAPHY AND CATCHMENT

The topography surrounding BCM is dominated by the Willow Tree Range which wraps around the north, east and western sides of the mining area. The lower lying floodplains associated with the Namoi River and its tributaries are located to the south and south-west of the BCM. The Willow Tree Range includes steep slopes and crests (up to a maximum elevation of 430 m Australian Height Datum (AHD)) and forms a broad south-west facing basin. Goonbri Mountain (543 m AHD) is located approximately 3 km east of the BCM Project Boundary and is an isolated mountain located on the western extremity of the Nandewar Range. The Nandewar Range lies approximately 10 km to the north-east of the BCM Project Boundary.

The major watercourse in the region is the Namoi River. It has a catchment area of approximately 4,200,000 hectares (ha) and forms part of the Murray Darling Basin (MDB). The Namoi River catchment is bounded by the Great Dividing Range in the east, the Liverpool Ranges and Warrumbungle Ranges in the south and the Nandewar Ranges to the north. The catchment area upstream of the Boggabri township is approximately 2,200,000 ha and yields a mean annual streamflow of 906,470 Megalitres per year (ML/year).

The Namoi River is regulated by Keepit Dam on its main channel as well as Split Rock Dam on Manilla River (a tributary of the Namoi River). These dams facilitate the provision of flows for downstream water users.

BCM is located within the catchments of Nagero Creek and Bollol Creek, both of which are tributaries of the Namoi River.

2.3 LAND OWNERSHIP AND USE

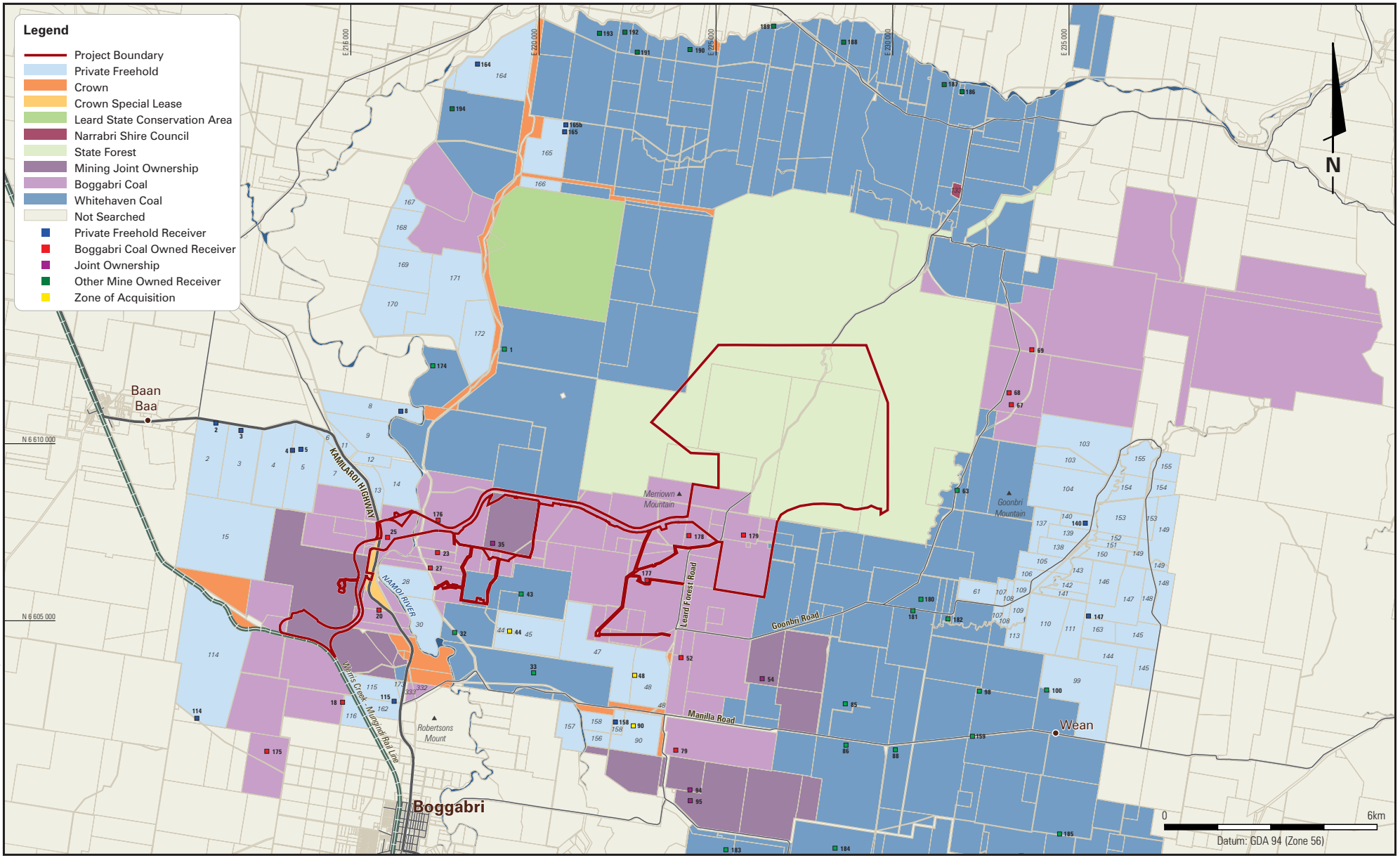
2.3.1 Land Ownership

The BCM is located within the Leard State Forest, which is Crown land. The land within the Leard State Forest is managed by the Forestry Corporation of NSW on behalf of the Crown.

BCOPL owns the land on which the Mine Infrastructure Area (MIA), Coal Handling and Preparation Plant (CHPP) and rail spur is located, apart from those parts of the rail spur which are located on land jointly owned with Whitehaven Coal and small parcels of Crown land and local roads.

Whitehaven Coal has significant landholdings to the north, west and south of the Leard State Forest. These landholdings are associated with Maules Creek Mine and Tarrawonga Mine. Due to the large landholdings of BCOPL and Whitehaven Coal, there is a significant buffer from the BCM mining operations to the nearest private freehold land.

The mining operations associated with BCM are generally undertaken on Crown land (Leard State Forest) and a small area of land owned by Whitehaven Coal. The ownership of land in the vicinity of BCM is illustrated in **Figure 3** and should be read in conjunction with **Appendix A** which provides an updated table of privately owned land within the locality.



HB BOGGABRI MOD8 1824 F3 Land Ownership 19 04 2021

BOGGABRI COAL MINE

Land Ownership

FIGURE 3

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

IDEMITSU
BOGGABRI COAL

There are currently three private residences provided acquisition rights under SSD 09_0182. These being location property identification numbers (ID) 44, 48 and 90. All other residences previously within the nominated Zone of Acquisition (ZOA) are either owned by BCOPL, Whitehaven Coal or jointly owned between BCOPL and Whitehaven Coal.

2.3.2 Land Use

The major land uses in the vicinity of BCM are agriculture, coal mining and forestry.

Agriculture is the dominant land use in the North West Region of NSW. Historically, agricultural enterprises in the region included grazing and dry land pasture improvement. The construction of Keepit Dam and Split Rock Dam ensured a more reliable water supply during prolonged dry periods. As a result, these dams facilitated the introduction of intensive cropping to the region.

The alluvial floodplain of the Namoi River supports highly productive agricultural land. The floodplain supports both dry land and irrigated cropping, as well as pasture establishment enterprises. The land surrounding the floodplain is primarily used for grazing, including sheep and cattle grazing.

Coal mining is a relatively recent land use in the Gunnedah Basin. BCM is adjacent to Maules Creek Mine to the north and Tarrawonga Mine to the south. The three mines are collectively referred to as the BTM Complex (or the Leard Forest Mining Precinct). A number of other small to medium sized coal mines are present in the region including Narrabri Mine, Rocglen Mine, Sunnyside Mine, Vickery Mine and Werris Creek Mine.

BCOPL has also formally operated the Forest View Quarry to the east of BCM which is accessed by Goonbri Road. BCOPL surrendered Environment Protection Licence (EPL) 20404 for this site in December 2018.

The Leard State Forest is approximately 8,134 ha in size and consists predominantly of native vegetation communities dominated by Ironbark, White Box, Blakely's Red Gum and White Cyprus Pine. Selective logging activities have been undertaken in the past, but the Leard State Forest remains in a generally forested state. The parts of the state forest that are not reserved for mining can be used for recreation purposes. In 2004, recreational hunting within the state forest was permitted to control pest species.

The Leard State Conservation Area is located approximately 5 km north-west of the Project Boundary and covers an area of 1,176 ha. In addition, Mt Kaputar National Park is located approximately 25 km to the north of the BCM Project Boundary. Mt Kaputar National Park covers an area of approximately 36,817 ha and possesses significant recreational value.

3 MODIFICATION DESCRIPTION

This section describes in detail the modifications sought to SSD 09_0182, a justification for these changes and the alternatives considered.

3.1 OVERVIEW

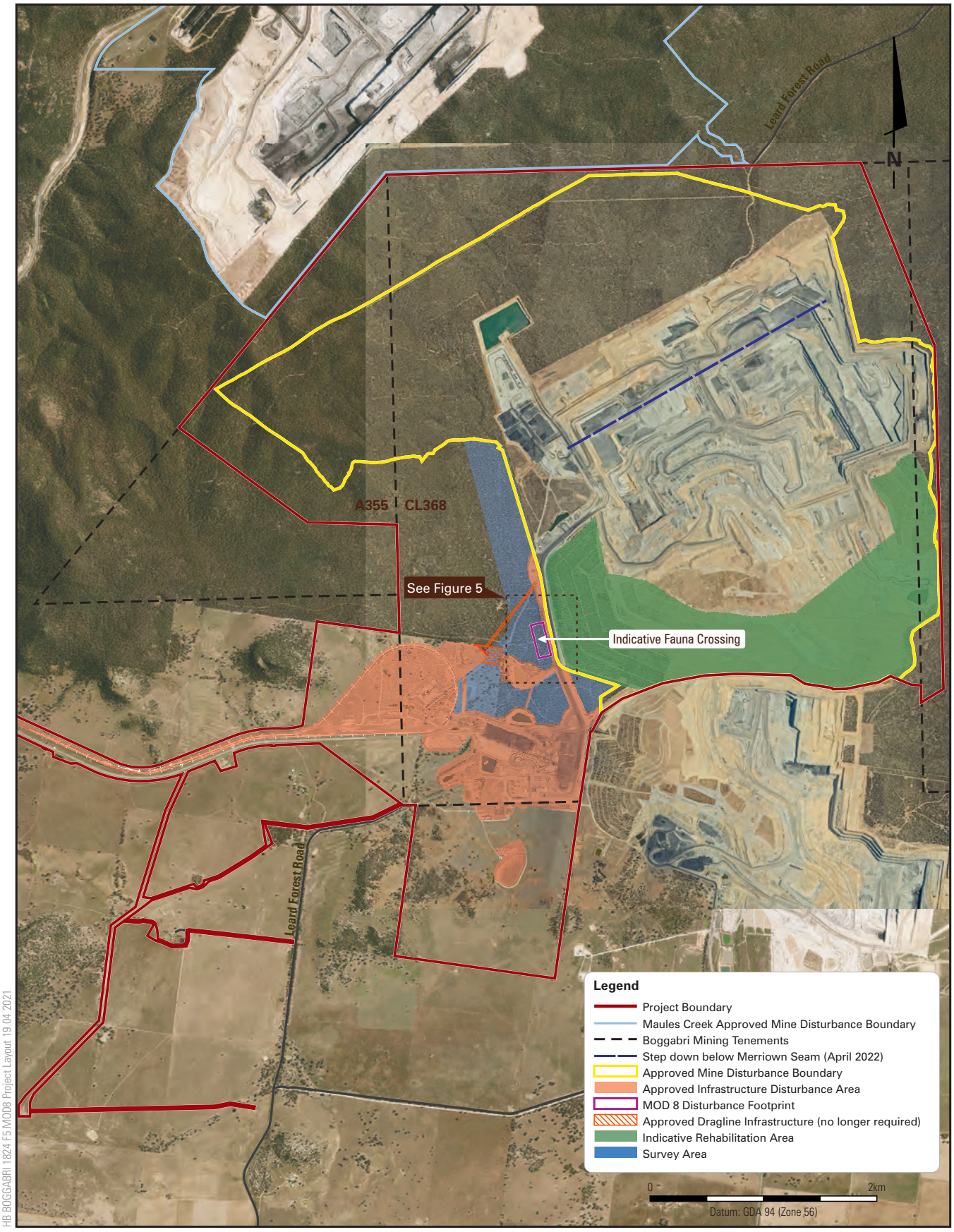
BCOPL is seeking a modification to SSD 09_0182 under Section 4.55(2) of the EP&A Act to increase the depth of approved mining operations, and to construct a fauna movement crossing over the existing haul road at BCM (MOD 8).

A conceptual layout of MOD 8 is shown on **Figure 4** and generally comprises the following:

- Increasing the approved maximum depth of mining down to the Templemore Coal Seam to recover an additional 61.6 Million tonnes (Mt) of ROM coal within the currently approved Mine Disturbance Boundary. It is expected that the additional ROM coal will be suitable for producing low ash, high energy thermal, semi-soft coking and pulverised coal injection (PCI) quality products for sale to the export market. This will result in the extension of the mine life by six (6) years; and
- Construction of a specifically designed fauna movement crossing over the existing haul road between the OEA and the western side of a regional biodiversity corridor. The establishment of the fauna movement crossing is proposed to improve the movement of fauna from the Leard State Forest through the Southern Rehabilitation Area (SRA) (**Figure 5**).

The current approved mining operations allow an annual ROM coal extraction rate of up to 8.6 Mtpa. Under MOD 8, ROM coal production will generally remain within this approved rate, however a minor increase in the currently approved maximum production rate to 9.1 Mtpa of ROM coal will be required in the maximum production year to accommodate the proposed mine plan schedule (see **Section 3.2.1**). MOD 8 does not seek to change the approved method of coal extraction or the approved rate of ROM coal processing and product railed from the BCM.

The proposed changes to mining operations will remain within the currently approved Mine Disturbance Boundary. Some very minor substitution of disturbance (i.e. less than 1.21 ha) will be required to facilitate the construction of the fauna movement crossing. The disturbance proposed as part of the fauna movement crossing will be immediately rehabilitated as part of the crossing construction program and overall, there will be a net decrease in disturbance area of the project of approximately 2.06 ha. This proposed substitution of the 1.21 ha will require no additional offsets due to an existing surplus of biodiversity offsets for the previously approved 3.27 ha.



HB BOGGABRI 1824 F5 MOD8 Project Layout 19 04 2021

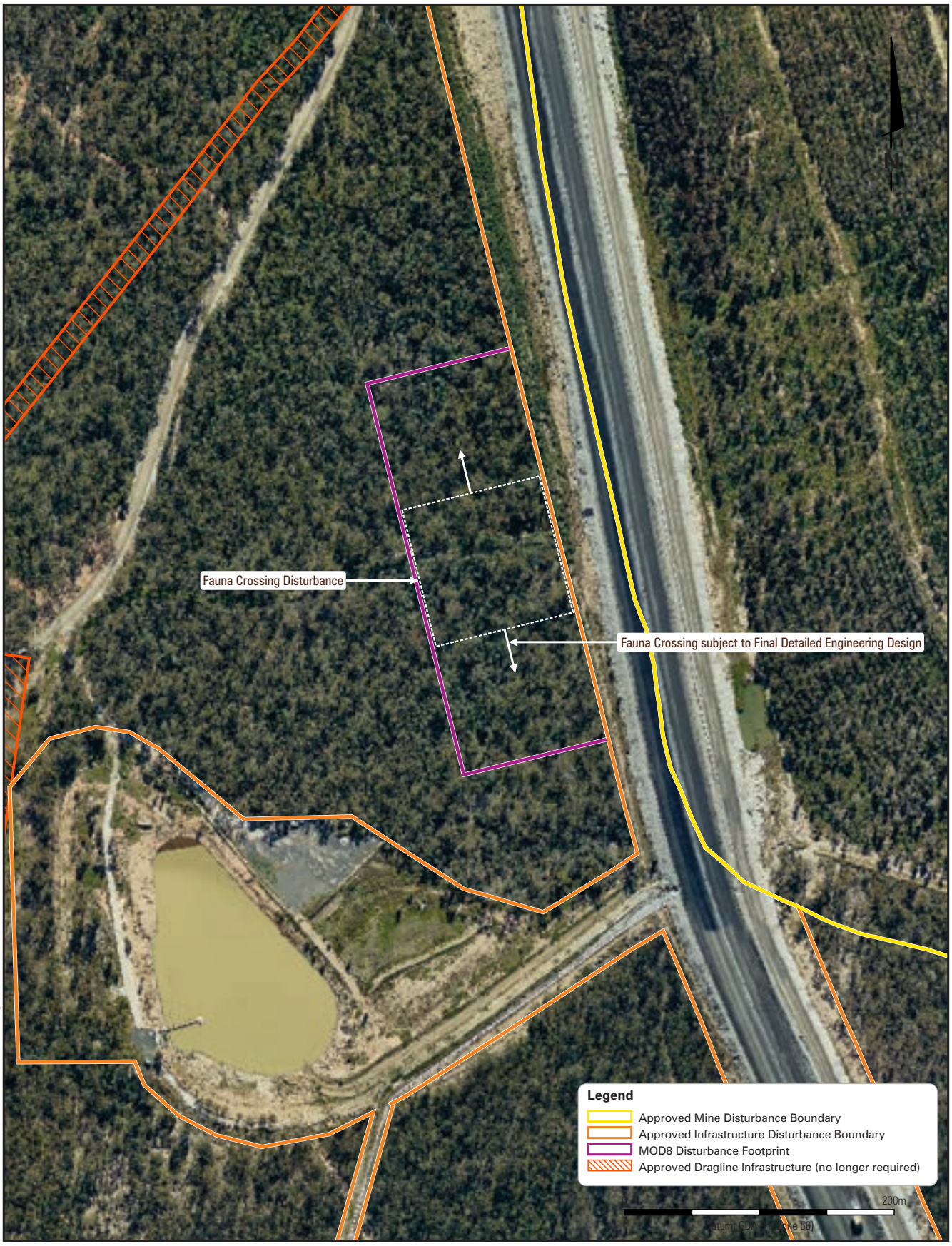
BOGGABRI COAL MINE

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

IDEMITSU
BOGGABRI COAL

MOD 8 Conceptual Project Layout

FIGURE 4



HB BOGGABRI 1824 MOD8 F3 Indicative Fauna Crossing 24 02 2021

BOGGABRI COAL MINE

Indicative Fauna Crossing

FIGURE 5

MOD 8 does not seek to make changes to various aspects of the BCM including (but not limited to): the approved Mine Disturbance Boundary, operational hours, mining methods, mining related infrastructure, water management system, coal handling, processing and transport methods and rates and access to the mine site. MOD 8 will facilitate the continued operations at BCM for a further six years, create additional direct and indirect employment and provide a further $216 Million (present value) in royalties to the State Government.

The following sections provide a detailed description of the components of MOD 8, the justification for MOD 8 and the alternatives considered.

3.2 MINING OPERATIONS

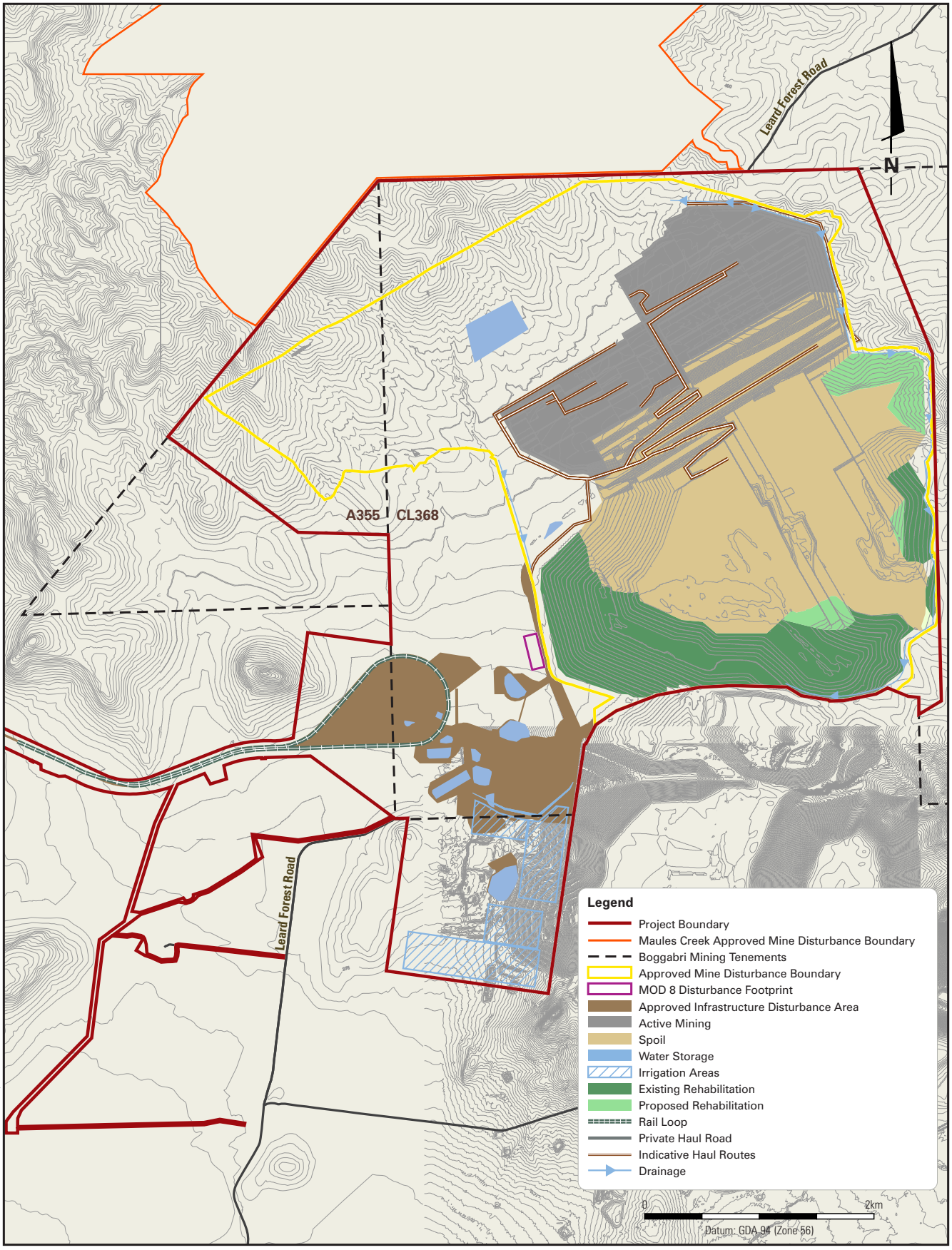
BCM currently mines coal from the Herndale coal seam to the Merriown coal seam within the Permian Maules Creek Formation. Exploration and mine planning investigations have identified the value of increasing the depth of approved mining operations to recover coal resources below the Merriown coal seam, like that undertaken by both adjacent mining operations. An increased depth of mining was considered within the 2010 Boggabri EA (i.e. Option 3), however this was not progressed at the time due to the limited understanding of the deeper geological strata along with no detailed mine planning for this option. Mining technologies and BCOPL's understanding of the coal resource within this area has substantially improved since the 2010 Boggabri EA was prepared.

MOD 8 seeks approval to recover up to an additional 61.6 Mt of ROM coal by mining the deeper seams within the currently approved Mine Disturbance Boundary. MOD 8 will facilitate the recovery of the known coal resources below the Merriown coal seam, down to the Templemore coal seam. The changes to the mine plan will result in an increase to the approved mine life by six years (to the end of 2039).

3.2.1 Mining Schedule and Methods

Currently approved mining operations at BCM are scheduled to continue towards the north-west until the end of December 2033. The mine plan changes resulting from MOD 8 are proposed to take place between 2022 and 2039 during which time approximately 143.1 Mt of ROM coal is proposed for extraction. This represents an additional 61.6 Mt of ROM coal from the coal seams below the Merriown coal seam. This ROM coal can be processed to produce thermal, semi-soft coking and PCI quality coal for the export market. Exploration activities indicate that the ROM coal from the deeper strata is expected to produce a lower ash higher energy thermal coal product than currently produced.

The increased ROM coal production leads to an increase in the volume of overburden materials to be moved. Whilst the annual overburden volume increases, the average overburden to coal stripping ratio remains generally consistent to that currently achieved at an average of 8.1 bank cubic metres (bcm) of overburden removed to each tonne of ROM coal recovered. **Figure 6** and **Figure 7** illustrate the conceptual arrangement and indicative progression of mining for MOD 8 for years 2024 and 2029, respectively.



HB BOGGABRI 1824 F6 MOD8 Conceptual Mine Plan 2024 29 04 2021

BOGGABRI COAL MINE

Hansen Bailey
ENVIRONMENTAL CONSULTANTS

IDEMITSU
BOGGABRI COAL

Conceptual Mine Plan 2024

FIGURE 6