

Mandalong Southern Extension Project Modification 10

Additional longwall

State Significant Development Modification Assessment (SSD 5144-MOD 10)

March 2022



NSW Department of Planning and Environment | dpie.nsw.gov.au

Published by the NSW Department of Planning and Environment

dpie.nsw.gov.au

Title: Mandalong Southern Extension Project Modification 10

Subtitle: Additional longwall

Cover image: *Habitation structure Aboriginal cultural heritage site RPS PS30 (Umwelt, 2021)*

© State of New South Wales through Department of Planning and Environment 2022. You may copy, distribute, display, download and otherwise freely deal with this publication for any purpose, provided that you attribute the Department of Planning and Environment as the owner. However, you must obtain permission if you wish to charge others for access to the publication (other than at cost); include the publication in advertising or a product for sale; modify the publication; or republish the publication on a website. You may freely link to the publication on a departmental website.

Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing March 2022 and may not be accurate, current or complete. The State of New South Wales (including the NSW Department of Planning and Environment), the author and the publisher take no responsibility, and will accept no liability, for the accuracy, currency, reliability or correctness of any information included in the document (including material provided by third parties). Readers should make their own inquiries and rely on their own advice when making decisions related to material contained in this publication.

Executive Summary

Centennial Mandalong Pty Ltd (Centennial) owns and operates the Mandalong Coal Mine (Mandalong) located near Morisset, approximately 35 kilometres (km) southwest of Newcastle in the Central Coast and Lake Macquarie local government areas.

The Mandalong Southern Extension Project (MSEP) (SSD 5144) was approved on 12 October 2015 and has been modified on nine occasions. Centennial is approved to extract up to 6.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal. Mining operations are approved to be carried out until 31 December 2040.

Centennial is seeking to modify the MSEP consent to add an additional longwall (LW34) to the approved mine plan. LW34 would align with adjacent longwalls within the existing approved area for secondary extraction. The main access headings to the east of LW34 would also be re-orientated further to the east. All other aspects of the mine plan would remain unchanged and no additional infrastructure or changes to approved operations would be required.

Centennial is also seeking to modify its existing commitments to introduce a risk assessment process to allow certain exploration drilling activities to be undertaken on total fire ban days and to allow annual contributions to be distributed to the community via the Mandalong Community Consultative Committee. Centennial also propose to remove the \$500,000 limit to community contributions and commit to an ongoing annual contribution for the life of the mine.

The Department publicly exhibited the proposed modification from 25 October to 8 November 2021. It received advice from 13 government agencies, none of which objected. While some agencies initially expressed concerns with information provided, all agencies subsequently considered that the impacts could be appropriately managed through existing and recommended conditions of consent.

There were a total of four submissions from members of the community and one submission from a special interest group. Of the five submissions, one was in support and four objected to the proposal.

The key issue of concern from community submissions was the potential for increased bushfire risk. The NSW Rural Fire Service and Resources Regulator were satisfied, and the Department agrees, that this risk could be appropriately managed through updated management plans and new conditions of consent.

The predicted subsidence effects for the proposed modification are generally within the range of the previously approved mine plan. The Department is satisfied that potential subsidence impacts to private residences, public infrastructure, slope stability and water resources would not differ significantly from the approved mine layout and can be managed through the Extraction Plan process under the existing conditions.

The proposed modification is predicted to slightly increase the likelihood of subsidence related impacts for a number of Aboriginal cultural heritage sites, however, these impacts have been partially offset by the avoidance of impacts associated with the removal of LW33 from the approved mine plan. The Department is satisfied these impacts are generally consistent with those of the previously assessed and approved mine layout and can continue to be managed through Centennial's Aboriginal Cultural Heritage Management Plan and existing conditions of consent.

The proposed modification has the potential to impact on less than 0.01 ha of native vegetation through subsidence-induced ponding. Centennial have committed to monitoring biodiversity impacts in accordance with the existing Biodiversity Management Plan (BMP) and satisfying any required biodiversity offsets if impacts are detected. The Department is satisfied that the potential biodiversity impacts of the proposed modification can be appropriately managed under the existing conditions of consent and an updated BMP.

Overall, the Department is satisfied that there are no significant additional environmental impacts when compared with the mine's current operations, and that any residual impacts can be managed under the conditions of consent, as modified.

The proposed modification would also provide an opportunity to contemporise the conditions of consent to accord with Centennial's mining lease conditions, which have been updated recently to reflect mine rehabilitation reforms made under amendments to the *Mining Act 1992*.

The proposed modification would allow Centennial to maximise resource recovery within the existing development consent boundary partially offsetting the loss of the coal resource associated with the reduction of LW30 and removal of LW33. It would also improve the continuity of exploration activities during total fire bans, preventing delays to the mine planning process. The proposed modification would provide social and economic benefits through the continuation of community contributions for the life of the mine, ongoing local employment and broader economic and social benefits to the people of NSW through the payment of an additional \$8.3 million in mining royalties to the State.

The Department therefore considers that on balance the proposed modification is in the public interest and should be approved subject to the recommended revised conditions of consent.

Contents

1	Introduction	1
1.1	Background	1
1.2	Approval history	1
2	Proposed modification	5
2.1	Modification application	5
2.2	Modification justification	7
3	Statutory context	9
3.1	Scope of modifications	9
3.2	Consent authority	9
3.3	Mandatory matters for consideration	9
3.4	Other Approvals	10
4	Engagement	12
4.1	Department's engagement	12
4.2	Summary of submissions	12
4.3	Government agency advice	12
4.4	Community submissions	12
4.5	Response to Submissions	14
5	Assessment	16
5.1	Subsidence	16
5.2	Aboriginal cultural heritage	20
5.3	Biodiversity	23
5.4	Water resources	28
5.5	Other issues	29
6	Evaluation	32
7	Recommendation	34
8	Determination	35
	Appendices	36
	Appendix A – Modification report	36
	Appendix B – Submissions	36
	Appendix C – Submissions report	36
	Appendix D – Notice of modification	36
	Appendix E – Consolidated Consent	36

1 Introduction

1.1 Background

Centennial Mandalong Pty Ltd (Centennial) owns and operates the Mandalong Southern Extension Project (MSEP), located near Morisset, approximately 35 kilometres (km) southwest of Newcastle in the Central Coast and Lake Macquarie local government areas (LGAs) (see **Figure 1**). The MSEP is an operating underground coal mine which produces thermal coal for both international and domestic markets.

The MSEP comprises underground workings and four surface infrastructure sites, as follows:

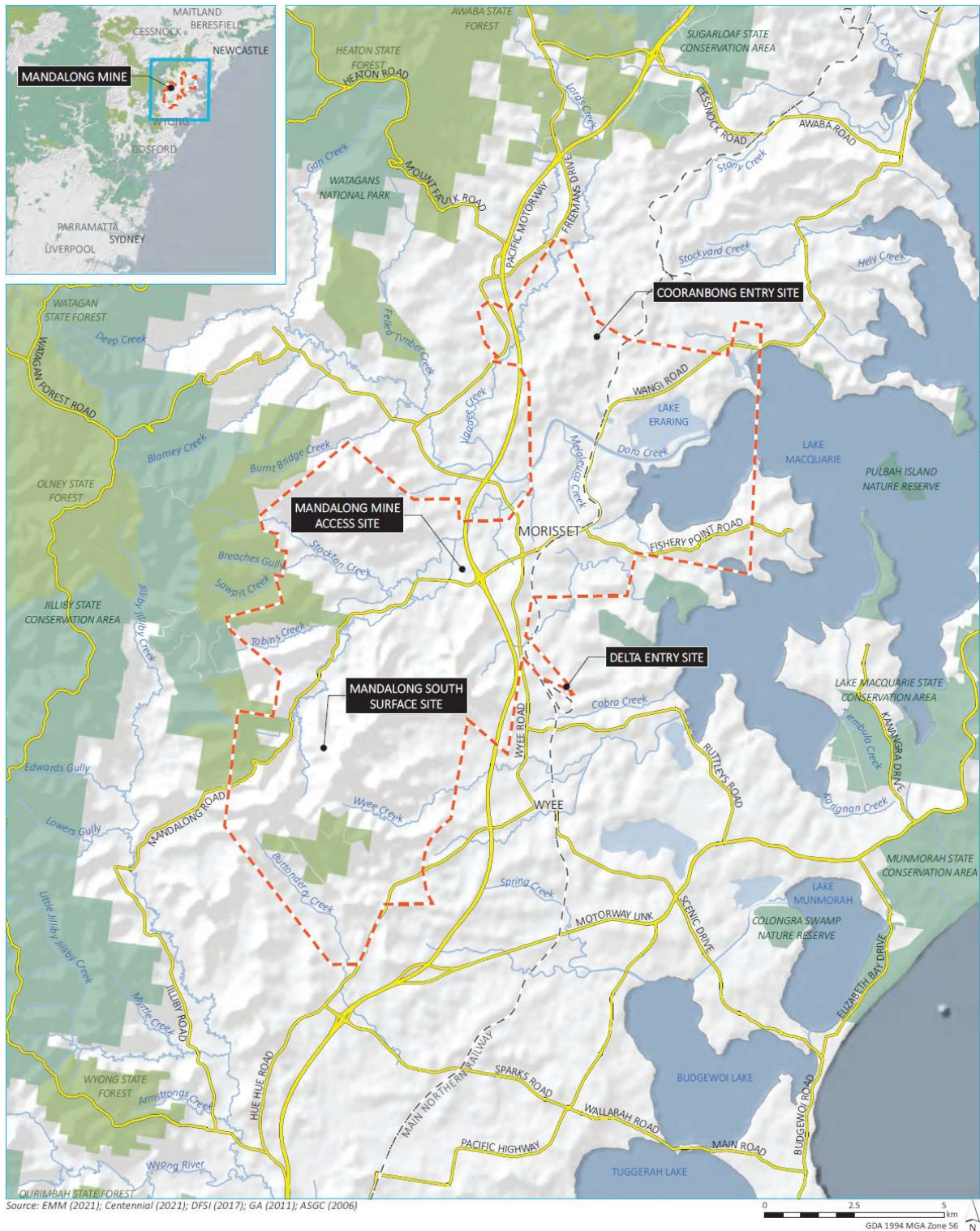
- Mandalong Mine Access Site (MMAS), located near Morisset and encompassing access to the underground mine workings, mine ventilation shafts and fans, gas drainage plant, workshops, administration buildings and mine personnel car parking;
- Cooranbong Entry Site (CES), where run-of-mine (ROM) coal is delivered to coal handling and processing facilities, approved under the Northern Coal Logistics Project development consent (SSD 5145);
- Delta Entry Site (DES), located at Wyee, delivers ROM coal to the Vales Point Rail Unloader Facility, approved under DA 35-2-2004; and
- Mandalong South Surface Site (MSSS), located 6 km southwest of the MMAS, provides ventilation shafts and fans, underground delivery boreholes and water management infrastructure.

1.2 Approval history

The Mandalong Coal Mine (Mandalong) was originally approved in 1998 under development consent DA 97/800. In October 2015, consent was granted for the MSEP (SSD 5144) by the former NSW Planning Assessment Commission (PAC) under Part 4, Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The MSEP development consent (as modified) permits:

- extraction of up to 6.5 million tonnes per annum (Mtpa) of ROM coal via longwall (LW) and bord and pillar underground mining methods until 31 December 2040;
- continued operation of the MMAS;
- construction and operation of the MSSS;
- progressive rehabilitation of the MMAS and MSSS; and
- ongoing exploration activities within Centennial's mining leases and exploration licence areas.



- KEY**
- Development consent boundary
 - Rail line
 - Main road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - State forest

Regional context

Mandalong Mine Modification 10
Modification report
Figure 1.1



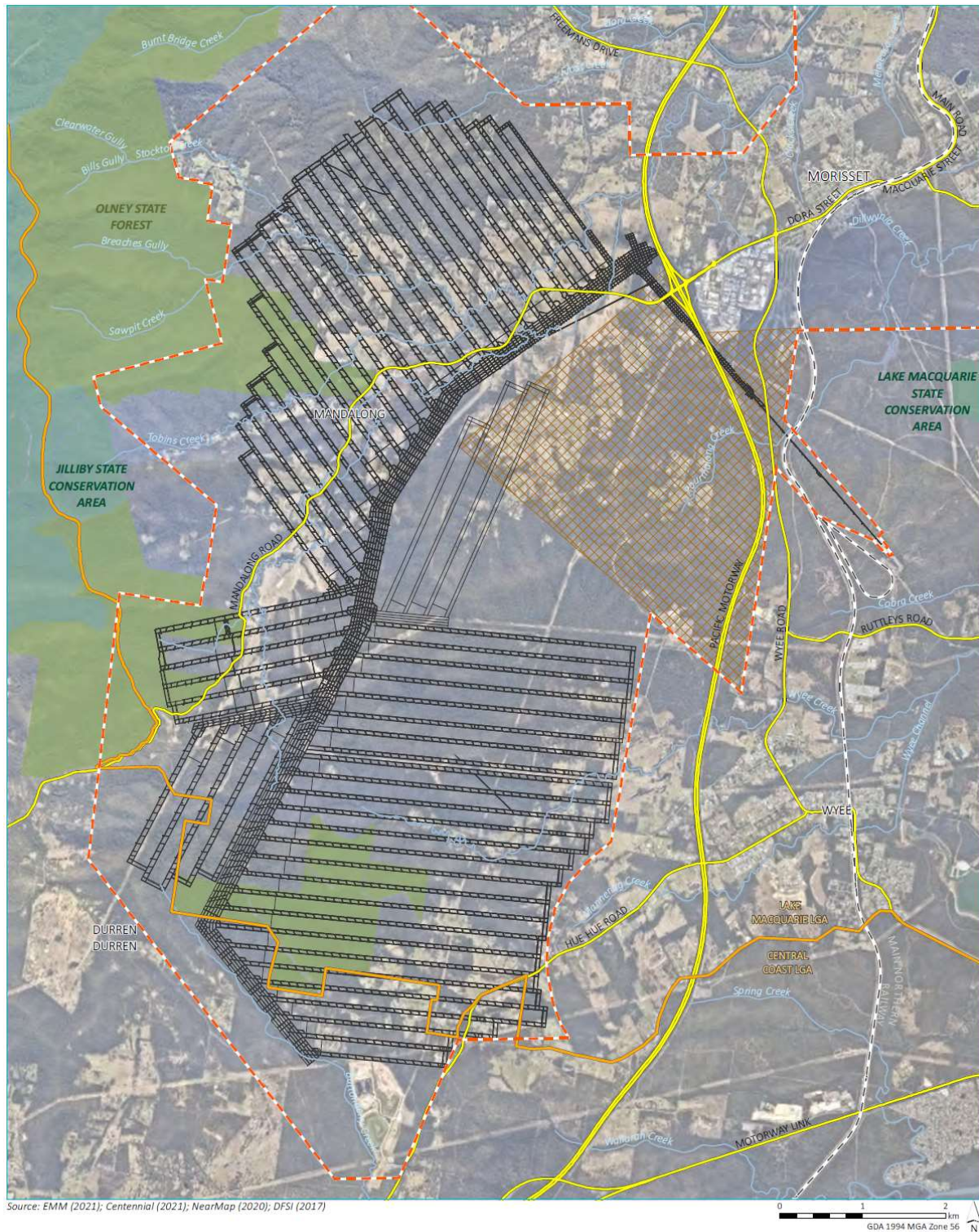
Figure 1 | Regional context map

The MSEP development consent has been modified on nine previous occasions (see **Table 1**)

Table 1 | Summary of approved modifications

Mod No.	Summary of Modifications	Approval Authority	Type	Approval Date
MOD 1	Relocation of a 2.4 km section of a TransGrid 330 kV transmission line	Minister's delegate	96 (2)	14 June 2016
MOD 2	Extension of first workings associated with LWs 22 and 23	Minister's delegate	96 (1A)	22 September 2016
MOD 3	Increased annual production limit from 6 to 6.5 Mtpa of ROM coal	Minister's delegate	96 (1A)	16 November 2016
MOD 4	Extension of LWs 22 and 23 and extraction of an additional 1.4 million tonnes of ROM coal	Minister's delegate	96 (2)	24 March 2017
MOD 5	Extension of LW 24, addition of LW 24A and extraction of an additional 3.71 million tonnes of ROM coal	Minister's delegate	96 (2)	1 August 2017
MOD 6	Controlled discharge of mine water from sediment dam	Minister's delegate	4.55 (2)	15 April 2019
MOD 7	Construction of a 33-kV powerline from the MMAS to the MSSS	Minister's delegate	4.55 (2)	25 July 2019
MOD 8	Increase to full-time equivalent employees (FTE), onsite car parking and upgrade an existing substation	Minister's delegate	4.55 (2)	17 January 2020
MOD 9	Reorientation of LWs 30 to 33	Minister's delegate	4.55 (2)	1 April 2021

The approved mine plan for the MSEP is shown on **Figure 2**.



KEY

- Development consent boundary
- Area 2: Bord and Pillar Extraction
- Approved mine plan
- Rail line
- Main road
- Named watercourse
- Local government area
- NPWS reserve
- State forest

Approved mine plan for the Mandalong
Southern Extension Area

Mandalong Mine Modification 10
Modification report
Figure 3.1



Figure 2 | Approved mine plan

2 Proposed modification

2.1 Modification application

On 8 October 2021, Centennial lodged an application to modify the MSEP (SSD 5144) under section 4.55(2) of the EP&A Act.

The proposed modification seeks to:

- add an additional longwall to the approved mine plan;
- allow greater flexibility to undertake exploration drilling activities on total fire ban days; and
- change the way annual contributions are distributed to the local community.

The proposed modification is summarised below, while a detailed description is provided in the Modification Report and associated supplementary information that accompanied the application (see **Appendix A**).

Additional longwall

The proposed modification seeks to amend the approved mine plan to include an additional longwall (LW34) as shown on **Figure 3**. LW34 would align with adjacent panels, maintaining the existing panel width of 200 metres (m). The main access headings to the east of LW34 would also be re-orientated further to the east. All other mining geometry aspects would remain unchanged. The secondary extraction of coal as part of the proposed modification would remain within the approved secondary extraction footprint. The proposed modification would not alter the approved production rate or delivery limits and would require no additional infrastructure or any other change to approved operations.

Exploration drilling

Centennial proposes to amend one of its existing development consent commitments to allow greater flexibility to undertake exploration drilling activities on total fire ban days following completion of a risk assessment process.

Centennial propose to amend the commitment that currently reads:

‘No drilling will be conducted on total fire ban days.’

The proposed amendment to this commitment would read as follows:

‘On total fire ban days, a structured assessment of the risk of either igniting or becoming impacted by a fire must be completed by all exploration workers prior to commencing work on that day. The findings of the risk assessment will identify the risk of working along with the required additional controls and mitigation actions.’

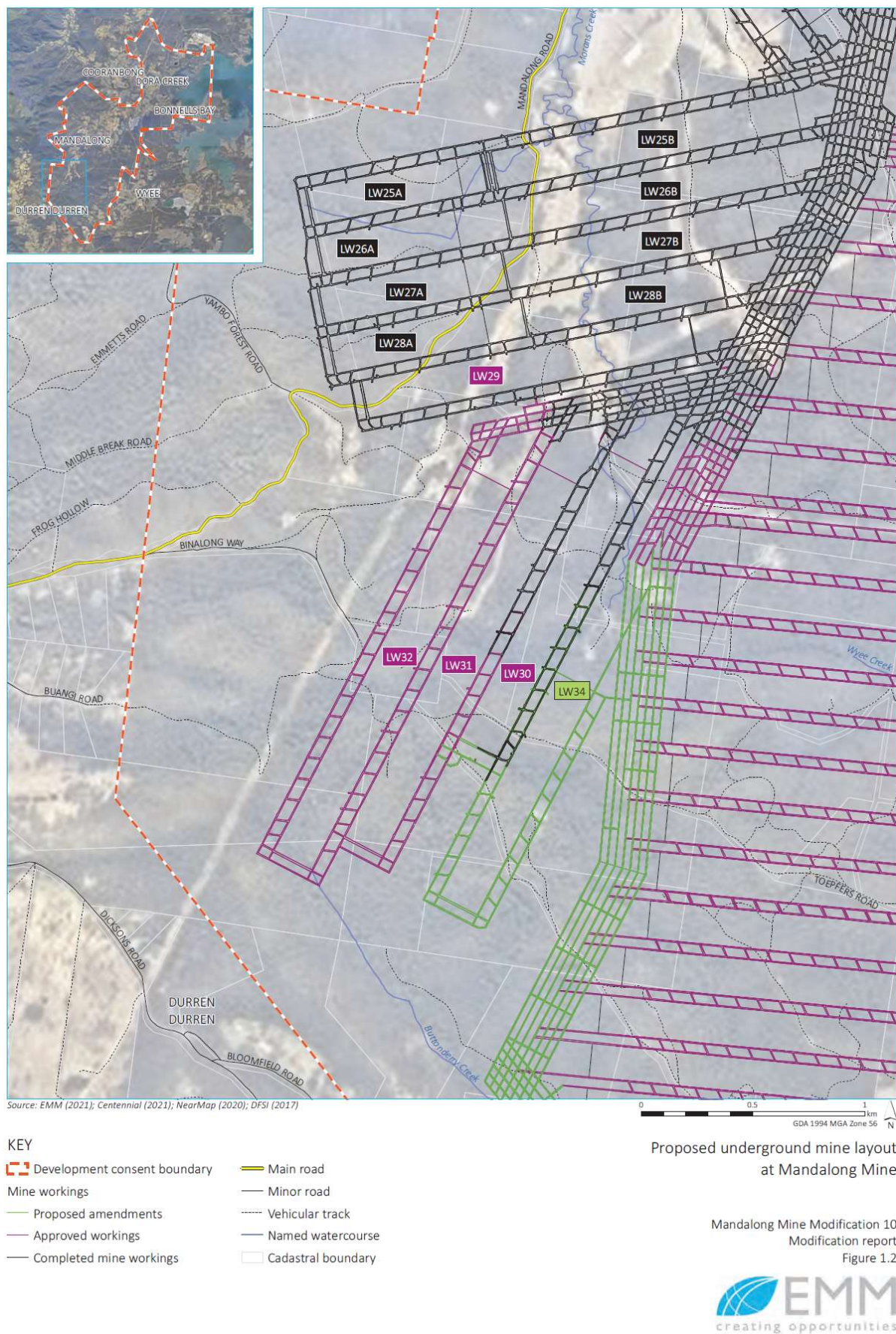


Figure 3 | Proposed mine plan – LW34

Annual contributions

Centennial propose to alter the way its annual contributions are distributed to the community by removing the Lake Macquarie Foundation as the administrator of the fund and instead distributing funds through the Mandalong Mine Community Consultative Committee (CCC).

Centennial also propose to remove the existing \$500,000 limit and commit to an ongoing annual contribution of \$50,000 for the productive life of the mine.

Centennial propose to amend the existing commitment to read:

'Centennial Mandalong will allocate \$50,000 annually (from the granting of the consent) until the cessation of mining toward a Mandalong Mine Community Fund. The allocation of these funds to the community will be determined annually by the Mandalong CCC in accordance with a Charter and Application process agreed by the CCC and Company.'

The Mandalong Mine Community Fund will invest in projects that improve community infrastructure and services and create vibrant neighbourhoods and public space in the communities of Morisset, Mandalong, Dora Creek and Wyee.

Note: Annual payments are subject to the Mandalong Mine operating and any annual payment otherwise due will be reduced proportionally to reflect any period during which the Mandalong Mine is not operating.'

2.2 Modification Justification

Additional longwall

Centennial advise that due to unfavorable geological conditions, the approved mine plan has been amended through the Extraction Plan process to remove LW33 and reduce the length of LW30. This has resulted in the loss of approximately 2 million tonnes (Mt) of coal recovery.

The addition of LW34 would maximise resource extraction within the West Wallarah Seam and the MSEP development consent boundary, partially offsetting the loss of coal recovery from the removal of LW33 and shortening of LW30. Without the proposed modification the coal within LW34, estimated at approximately 1.3 Mt, would not be extracted.

Centennial advise that the coal resource targeted by LW34 can be extracted efficiently using existing infrastructure and that the proposed modification would improve the continuity of coal extraction and employment at the MSEP.

Centennial also contend that, as the shortening of LW30 and removal of LW33 has reduced the potential environmental impacts of the previously approved mine plan, the proposed modification would not significantly alter the previously approved impacts of the MSEP.

Exploration drilling

Centennial is currently not permitted to undertake exploration drilling on total fire ban days. Centennial claim that this restriction results in delays to the exploration program and impacts the collection of geological information required for mine planning.

Centennial advise that several exploration activities do not involve the act of drilling itself and that these activities could continue safely and efficiently on total fire ban days without increasing bushfire risk. Such activities could include pulling out or installing drill casings, completing borehole sealing, packing or unpacking drilling equipment and other site preparation activities.

Centennial claim that greater flexibility around which exploration drilling activities are able to be undertaken on total fire ban days would improve the continuity of these activities during fire danger periods, preventing delays to the mine planning process.

Annual contributions

Centennial contend that the distribution of funds through the CCC, rather than the Lake Macquarie Foundation, would better ensure local priorities are reflected in the decision-making process and allocation of community funds.

If the existing limit on Centennial's community contributions is not removed, annual contributions would be capped at \$500,000, resulting in the cessation of funding that positively contributes to projects within the Morisset, Mandalong, Dora Creek and Wyee communities.

3 Statutory context

3.1 Scope of modifications

The Department has reviewed the scope of the modification application and considers that the application can be characterised as a modification as the proposal:

- would involve underground mining within an area previously approved for secondary extraction;
- would not involve an increase in annual production rate or intensity of mining operations;
- would not significantly increase the environmental impacts of the project as approved; and
- is substantially the same development as originally approved.

Therefore, the Department is satisfied the proposed modification is within the scope of section 4.55(2) of the EP&A Act and does not constitute a new development application. Accordingly, the Department considers that the application should be assessed and determined under section 4.55(2) of the EP&A Act rather than requiring a new development application to be lodged.

3.2 Consent authority

The Minister for Planning (Minister) is the consent authority for the application under Section 4.5(a) of the EP&A Act. However, as Centennial has not reported any political donations, there were fewer than 15 public objections and neither Lake Macquarie City Council or Central Coast Council objected to the modification, the Director, Resource Assessments may determine the application under the Minister's delegation dated 26 April 2021.

3.3 Mandatory matters for consideration

The Department conducted a comprehensive assessment of the project against the mandatory matters for consideration as part of the original assessment of SSD 5144. The Department considers this modification application does not result in significant changes that would alter the mandatory matters for consideration under section 4.15 of the EP&A Act and conclusions made as part of the original assessment.

Environmental Planning Instruments

A number of environmental planning instruments (EPI)s apply to the modification, including:

- *State Environmental Planning Policy (SEPP) (State and Regional Development) 2011;*
- *SEPP (Mining, Petroleum Production and Extractive Industries) 2007;*
- *SEPP (Infrastructure) 2007;*
- *SEPP No.33 – Hazardous and Offensive Development;*
- *SEPP No. 55 – Remediation of Land;*
- *Lake Macquarie Local Environmental Plan 2014; and*
- *Wyong Local Environmental Plan 2013.*

The Department has reviewed Centennial's consideration of the above EPIs as provided in its Modification Report and has also undertaken its own assessment of the EPIs. The Department considers that the proposed modification can be carried out in a manner that is generally consistent with the aims, objectives and provisions of these instruments.

Objects of the EP&A Act

The Minister or delegate must consider the objects of the EP&A Act when making decisions under the Act. The Department has assessed the proposed modification against the objects set out in section 1.3 of the Act. The objects of most relevance to the proposed modification are:

- (a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources;
- (b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment;
- (c) to promote the orderly and economic use and development of land;
- (e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats;
- (i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State;
- (j) to provide increased opportunity for community participation in environmental planning and assessment.

The Department considers the proposed modification encourages the proper management and development of resources (Object (a)) and promotion of the orderly and economic use of land (Object (c)). The Department has considered the principles of ecologically sustainable development (ESD, Object (b)) in its assessment of the proposed modification. The Department considers the proposal can be carried out in a manner that is consistent with the principles of ESD. The Department's assessment has sought to integrate all significant environmental, social and economic considerations.

Consideration of the protection of the environment (Object (e)) is provided in **Section 5** of this report. The Department considers the proposal has been designed to minimise potential environmental impacts.

The Department considers that consultation undertaken with key stakeholders satisfies the objectives to share responsibility between different levels of government (Objective (i)), while making the application publicly available on its website and seeking submissions satisfies the objectives of Object (j).

The reasons for granting consent for the original application

In accordance with section 4.55(3) of the EP&A Act, in determining this modification, the Department has taken into consideration the reasons for the PAC's decision on the MSEP (dated 12 October 2015). In determining the original MSEP, the PAC concluded that the benefits of the project outweighed the impacts, subject to the adherence to strict conditions. Consistent with this decision, the Department considers that the benefits of the modification outweigh the impacts, subject to the adherence to strict conditions.

3.4 Other Approvals

Mining Leases

The proposed modification is located within Centennial's existing approved Mining Leases (ML) 1722 and 1744, administered under the *Mining Act 1992*.

Centennial is considered to hold a relevant lease over the area covered by the proposed modification.

The proposed modification would also provide an opportunity to contemporise the conditions of consent to accord with Centennial's mining lease conditions, which have been updated recently to reflect mine rehabilitation reforms made under amendments to the *Mining Act 1992*.

Environment Protection Licences

Centennial holds Environment Protection Licence (EPL) 365 for MSEP, issued by the NSW Environment Protection Authority (EPA) in accordance with the *Protection of the Environment Operations Act 1997*. The EPL would not require variation for the proposed modification.

Works Approvals and Water Access Licences

Centennial currently holds Water Access Licence (WAL) 39767 and Works Approval 20WA218789 which allows for the extraction of up to 1,825 megalitres (ML) per year from the Sydney Basin North Coast groundwater source. No additional works approvals or WALs would be required for the proposed modification.

4 Engagement

4.1 Department's engagement

The Department publicly exhibited the modification application and Modification Report (see **Appendix A**) in accordance with clause 10 of Schedule 1 of the EP&A Act and clause 118 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) by:

- placing a public exhibition notice in a regional newspaper, the Newcastle Herald;
- publicly exhibiting the application and accompanying Modification Report, from Monday 25 October to Monday 8 November 2021 on the Departments' website; and
- directly notifying all previous submitters of the modification application and inviting them to make a submission.

The Department also requested advice from government agencies, including Lake Macquarie and Central Coast Councils.

In undertaking these processes, the Department considers that the notification process met the requirements of the EP&A Act and EP&A Regulation, and that the relevant statutory public participation obligations have been satisfied.

4.2 Summary of submissions

In response to the public exhibition of the proposed modification, the Department received advice from 13 government agencies, including Lake Macquarie City and Central Coast Councils, four submissions from members of the community and one submission from a special interest group. Of the five submissions, one was in support and four objected to the proposal.

4.3 Government agency advice

Mining, Exploration and Geoscience (MEG) within the Department of Regional NSW was satisfied that Centennial holds appropriate mining titles under the *Mining Act 1992*, both to make this modification application and to extract the coal resource.

MEG provided an economic and resource recovery analysis which indicated that the proposed modification would generate an additional \$8.3 million in State royalties and \$120 million in total revenue, in present day terms.

MEG was satisfied that the proposal would optimise resource recovery, be an efficient use of resources and support the continued employment of the existing workforce.

The **Resources Regulator** within the Department of Regional NSW recommended that Centennial implement additional risk assessment and controls to manage bushfire risk associated with exploration drilling on total fire ban days. Centennial committed to making the recommended updates to the bushfire management provisions within the Exploration Activities Management Plan.

NSW Rural Fire Service (RFS) recommended that a bush fire emergency management and operations plan be prepared in accordance with section 8.3.6 of *Planning for Bush Fire Protection*

(2019). In response, Centennial have committed to updating the bushfire management provisions within the Exploration Activities Management Plan to ensure consistency with RFS's recommendations.

Crown Lands within the Department noted that a works consent approval under s138 and or s71 of the *Roads Act 1993* would be required for any impacts to Toepfers Road and Kiar Ridge Road. Centennial acknowledged this requirement and committed to including it in the Public Roads Management Plan for LW34, which will be developed in consultation with Crown Lands as part of the Extraction Plan process.

Water Group (DPE Water) within the Department initially raised concerns that an independently reviewed numerical groundwater model had not been provided to confirm additional water take or groundwater interference. Centennial provided clarification in the Submissions Report (refer to **Section 4.5**) that the groundwater model had not required revision or recalibration since it was last independently verified in 2017. Centennial claimed that the groundwater model was therefore fit for purpose and did not require additional independent review.

DPE Water also requested clarification as to whether the proposed modification would result in any change to site water demand and demonstration that any required surface water entitlements could be obtained in accordance with the relevant Water Sharing Plan. In the Submissions Report, Centennial confirmed that there would be no change to site water demand due to the proposed modification, nor is there predicted to be any surface water take. Centennial nevertheless committed to obtaining any required water access licences from existing users on the water market prior to any predicted surface water take as a result of mining.

DPE Water reviewed Centennial's Submissions Report and advised that its concerns had been adequately addressed.

Biodiversity Conservation and Science Division (BCD) within the Department requested that the BDAR be revised to consider all native vegetation affected by ponding to be fully cleared rather than partially cleared. BCD also requested additional information to demonstrate how targeted flora and fauna surveys meet the relevant guidelines and further discussion of how Plant Community Types were identified. In response, Centennial provided a revised BDAR addressing BCD's comments. BCD reviewed the revised BDAR and advised it had no further comments.

Heritage NSW noted that the proposed modification would not impact any State heritage listed items and is unlikely to have additional impacts to historic heritage beyond those previously assessed. Heritage NSW recommended a condition addressing unexpected historic heritage finds. The Department notes that the existing conditions require a protocol to manage previously unidentified historic heritage items be included in a Heritage Management Plan, which is to be prepared in consultation with Heritage NSW. The Department therefore considers no additional conditions are necessary.

Heritage NSW initially raised concerns that the evidence of consultation with Registered Aboriginal Parties (RAPs) provided in the Aboriginal Cultural Heritage Assessment (ACHA) was incomplete. Centennial advised that all correspondence had been included in the ACHA, following which Heritage NSW advised that it was satisfied with the approach to managing Aboriginal cultural heritage impacts proposed in the ACHA.

Lake Macquarie City Council (LMCC) supported the proposed modification and were supportive of the recommendations made in the BDAR and ACHA.

LMCC recommended that BCD be identified as an approval authority for annual subsidence monitoring statements and any associated offset liability reports. Centennial responded to these recommendations in the Submissions Report (refer to **Section 4.5**), noting that due to the negligible biodiversity impacts predicted, the existing performance criteria in the consent are expected to be achieved. The Department notes that a Biodiversity Management Plan would be prepared in consultation with BCD as part of the Extraction Plan process along with a subsidence monitoring program. The Department considers the existing conditions appropriate to manage biodiversity impacts from the proposed modification.

LMCC also recommended a condition to indemnify LMCC in the event of any impacts to Olney State Forest. The Department notes that the existing conditions require Centennial to prepare a Land Management Plan in consultation with any affected public authorities, including LMCC, and considers that impacts to Olney State Forest can be appropriately managed through this process.

Central Coast Council requested that the potential subsidence impacts of the proposed modification be considered, including any impacts to Buttonderry Creek, Central Coast Council's road and drainage infrastructure and Buttonderry Waste Management Facility. The Department notes that Buttonderry Waste Management Facility is located over 2 km to the south east of the proposed LW34 and would not be impacted by the proposed modification. The Department has considered subsidence impacts in **Section 5**.

Central Coast Council also requested that biodiversity impacts be considered, including whether any impacts would differ significantly from the impacts of the originally approved mine layout. The Department has considered biodiversity impacts in **Section 5**.

Central Coast Council raised concern as to whether, given the project has been modified on nine previous occasions, the development as modified would be substantially the same as the development for which consent was originally granted. Centennial advised that the five modifications (including the proposed modification) relating to mine design have been necessary to adapt to geological conditions not known at the time of preparation of the original project Environmental Impact Statement (EIS). The Department has reviewed the proposed modification and (as discussed in **Section 3.1**) is satisfied that it is substantially the same as the development for which consent was originally granted.

Subsidence Advisory NSW (SA NSW), Environment Protection Authority (EPA) and Forestry Corporation of NSW did not raise any concerns regarding the proposed modification.

4.4 Community submissions

The four community submissions that objected to the proposed modification raised concerns over increased bushfire risk due to the proposal to allow exploration drilling activities on total fire ban days. Centennial responded to these concerns in the Submissions Report, claiming that a number of exploration activities that do not involve the act of drilling itself could be undertaken safely on total fire ban days. Centennial committed to updating the bushfire management provisions within the Exploration Activities Management Plan in accordance with advice from the Resources Regulator and RFS. This would include a risk assessment process for exploration drilling activities, which Centennial

contend would prevent any increase in the risk of bushfire resulting from the proposed exploration drilling activities on total fire ban days.

4.5 Response to submissions

On 9 December 2021, Centennial provided a detailed Submissions Report. The Submissions Report was subsequently made publicly available on the Department's website and was forwarded to relevant government agencies and Councils for comment.

The Submissions Report contained a revised Biodiversity Development Assessment Report (BDAR).

Copies of all submissions are included in **Appendix B**. A copy of the Submissions Report and associated additional information are included in **Appendix C**.

The Department has considered Centennial's Submissions Report and additional information including further expert advice from government agencies in completing its assessment of the proposed modification (as presented in **Section 5**) and in developing recommended conditions (see **Appendix E**).

5 Assessment

In assessing the merits of the proposed modification, the Department has considered the:

- modification application and supporting information;
- existing conditions of consent for the project;
- previous environmental assessments for the project;
- advice from government agencies and community submissions;
- relevant environmental planning instruments, policies and guidelines; and
- requirements of the EP&A Act.

The Department considers the key assessment issues relate to subsidence, biodiversity, Aboriginal cultural heritage and water resources. Consideration of these issues is provided below, with other issues discussed further in **Table 7**.

5.1 Subsidence

The Modification Report included a subsidence assessment undertaken by Ditton Geotechnical Services (DGS), which used empirical modelling based on mining geometry and the surrounding geology to predict subsidence effects on surface features above the proposed LW34. The subsidence assessment also included a comparison of predicted maximum subsidence effects between the approved and proposed longwall layouts as presented in **Table 2**.

Table 2 | Predicted maximum subsidence effects for the approved longwall layout and the proposed modification

Parameter	Unit	Approved layout (LW30 - LW33)	Proposed modification (LW34)
Final panel subsidence	m	0.92-1.33	0.49-1.39
Final maximum chain pillar subsidence	m	0.60-1.13	0.69-0.87
Maximum panel tilt*	mm/m	6-22	6-22
Maximum panel convex curvature*^	km ⁻¹	0.2-0.7	0.3-0.7
Maximum panel tensile strain*	mm/m	2-7	3-7
Maximum panel concave curvature*^	km ⁻¹	0.3-0.9	0.4-0.9
Maximum panel compressive strain*	mm/m	3-9	4-9

* mean and upper 95% confidence limit (U95%CL) values

^ - curvatures = 0.1 x strain

The predicted subsidence effects for the proposed LW34 are within the ranges of the previously approved mine plan for LW30 – LW33, with the exception of the predicted range of final panel subsidence, which is 0.06m greater than the approved maximum of 1.33m.

The subsidence assessment predicted impacts on surface features within the subsidence area of influence for the proposed LW34. This includes the 'angle of draw' (AOD) for the 20 mm subsidence contour, which is considered the practical limit within which measurable subsidence could occur. It also includes far-field subsidence effects, which can extend beyond the AOD.

Surface features that could be impacted by subsidence from the proposed modification include:

- steep slopes and rocky outcrops;
- tributaries of Morans Creek, Mannering Creek and Buttonderry Creek;
- two residential houses;
- Toepfers Road and Kiar Ridge Road;
- native vegetation and fauna habitat (discussed in **Section 5.3**); and
- Aboriginal cultural heritage sites (discussed in **Section 5.2**).

The location of these features is shown on **Figure 4**.

Steep slopes and rocky outcrops

A number of steep slopes (ranging between 18 and 30 degrees) with rocky outcrops are located above the proposed LW34. Surface cracks ranging from 150 mm to 320 mm in width are predicted to occur along these slopes, which is within the range of cracking for steep slopes predicted for the approved project.

The approved mine layout was assessed as unlikely to cause instability of slopes and the proposed LW34 is not predicted to significantly change this likelihood. Cracking along existing rock faces could result in release of boulders downslope, however this risk is already present due to the natural weathering process and the proposed LW34 is not predicted to increase the risk of property damage due to rock fall.

Slope stability would be monitored and managed in accordance with both the Subsidence Monitoring Program and the Land Management Plan within any Extraction Plan for LW34. Where necessary cracking would be repaired to limit further deterioration of slope stability.

Watercourses

First, second and third order tributaries of Mannering Creek and Morans Creek are located above the proposed LW34. The proposed modification is predicted to slightly change surface gradients along these creek beds, which would result in 'minor' to 'negligible' erosional impacts along the creeks. Minor cracking in creek beds could also result in some shallow sub-surface re-routing of flows. These potential impacts are generally consistent with those predicted for the approved mine plan.

Impacts to watercourses would continue to be managed through a Water Management Plan as part of the Extraction Plan process. Potential impacts to water resources are discussed further in **Section 5.4**.

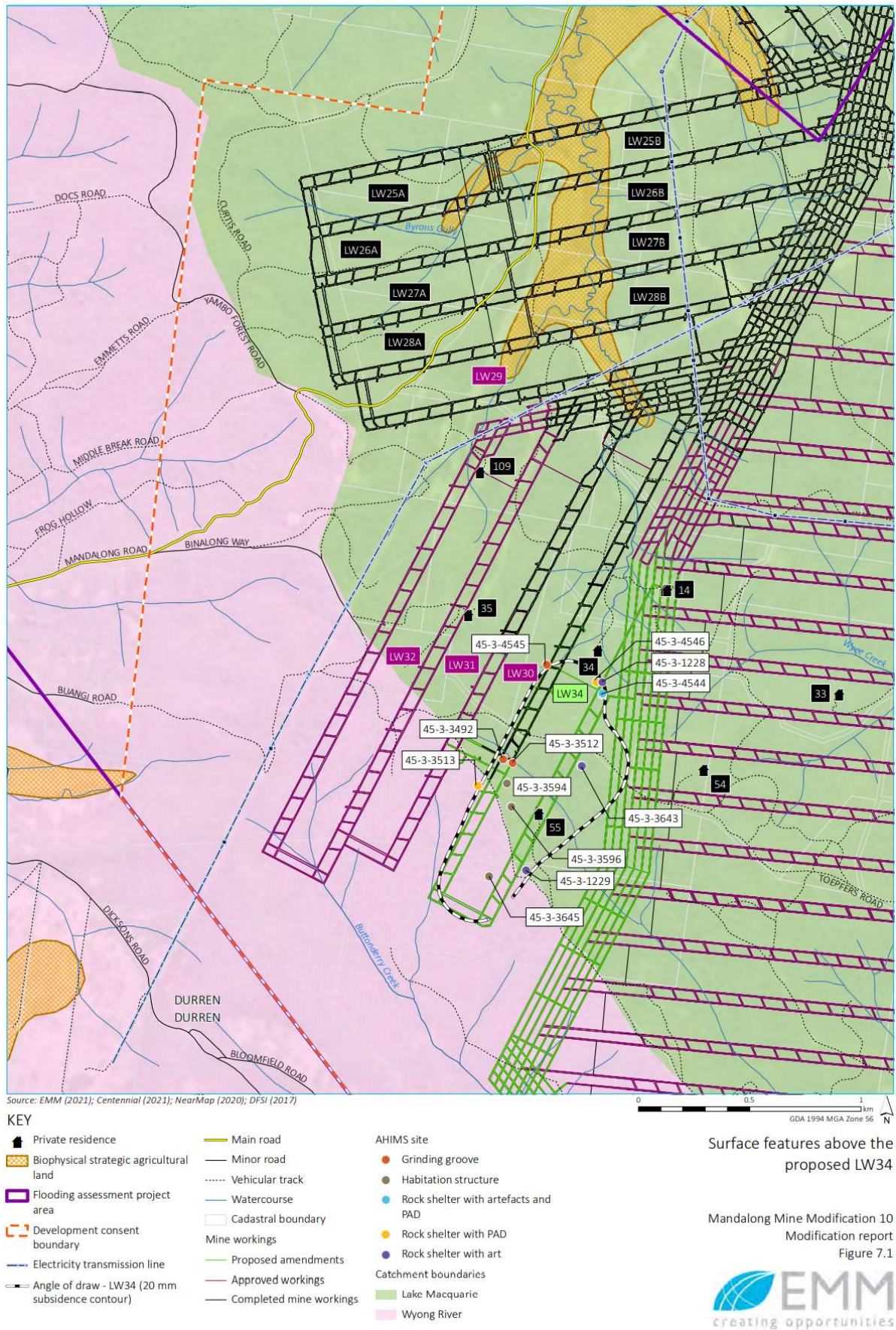


Figure 4 | Surface features above LW34

Residences

Two private residences are within the subsidence area of influence of the proposed LW34. The predicted subsidence impacts to these residences from the proposed modification are presented in **Table 3** along with a comparison to the predicted impacts of the approved mine layout.

Table 3 | Predicted subsidence impacts at residences

Residence ID	Cover depth (m)	Final subsidence (m)	Final Maximum tilt (mm/m)	Final maximum curvature (km-1)	Final maximum strain (mm/m)
Proposed modification					
34	312	0.09	0.5	0.01	0.1
55	387	0.18	6	0.15	1.5
Approved layout					
34	312	0.03-0.065	0	0	0
55	387	0.01-0.04	0	0	0

While these residences are predicted to experience increased subsidence impacts as a result of the proposed modification, the predicted effects remain within the 'safe, serviceable and repairable' limits and are unlikely to result in more than negligible damage.

The Department notes that the existing conditions require the development and implementation of a comprehensive subsidence monitoring program and an individual Property Subsidence Management Plan (PSMP) for each privately-owned property. PSMPs must be prepared in consultation with the landowner prior to mining occurring under the relevant property and include a detailed subsidence impact assessment. The PSMP must consider and set out appropriate measures, commitments and timeframes to mitigate, repair, replace or otherwise compensate for, impacts to the property.

The Department considers that the existing conditions of consent would ensure that all residences, including Residences 34 and 55, would be carefully monitored both before and after mining occurs, and that any identified impacts would be able to be adequately rectified in consultation with the landowner.

Roads

Two unsealed public roads (Toepfers Road and Kiar Ridge Road) are located above the proposed LW34. Impacts to these roads as a result of subsidence could include cracking, compressive humps and small changes to the slope of the road surface. These impacts are generally consistent with those of the approved mine layout. The Department considers that these impacts can be effectively managed through the existing conditions of consent, which include preparation of a Built Features Management Plan as part of the Extraction Plan process.

Conclusion

The Department has carefully considered the potential impacts of subsidence on natural and built features and is satisfied that these impacts would not be significantly greater than those of the approved mining layout.

The existing conditions of consent require Centennial to assess the potential subsidence impacts on natural and built features through the Extraction Plan process and manage them according to strict subsidence performance measures. The Department considers that the existing conditions and performance measures remain appropriate and provide adequate protection to all significant surface features in the modification area.

5.2 Aboriginal cultural heritage

The Modification Report included an ACHA prepared by Umwelt which assessed the potential impacts of the proposed modification on Aboriginal cultural heritage. The ACHA included an archaeological survey of the land above and surrounding LW34. This was undertaken in consultation with nine RAPs who raised no issues with the assessment methodology or recommendations made in the ACHA. While Heritage NSW initially raised concerns regarding the evidence of consultation provided in the Modification Report, following further clarification from Centennial, it ultimately confirmed its satisfaction with the ACHA.

Aboriginal heritage sites

The ACHA identified 12 previously recorded Aboriginal cultural heritage sites that could be impacted by subsidence from the proposed modification (see **Figure 5**). The field survey did not identify any new sites that could be impacted by the proposed modification.

Of the 12 sites identified in the ACHA, nine were rock shelters or habitation structures, while three were grinding grooves. The majority of these sites have been assessed in consultation with RAPs as having extremely high cultural significance and high scientific significance.

The most common Aboriginal cultural heritage site types identified across the broader MSEP project area in previous assessments are grinding grooves and rock shelters. The majority of these sites have been assessed as having very high to extremely high cultural significance and moderate to high scientific significance. The sites identified above the proposed modification are therefore generally comparable to the sites previously assessed across the broader approved project area.

Predicted impacts

Cracking of the rock surface due to stresses and strains is the primary potential cause of damage to such sites by subsidence. While erosion damage is considered a secondary impact relevant to sites exposed to concentrated water flows or that have been damaged by cracking. These potential impacts are expressed in terms of the likelihood of impact from cracking or erosion based on the predicted subsidence effects at each site. The likelihood of subsidence impacts for the identified Aboriginal cultural heritage sites is presented in **Table 4** along with a comparison with the previously assessed and approved impacts to these sites.

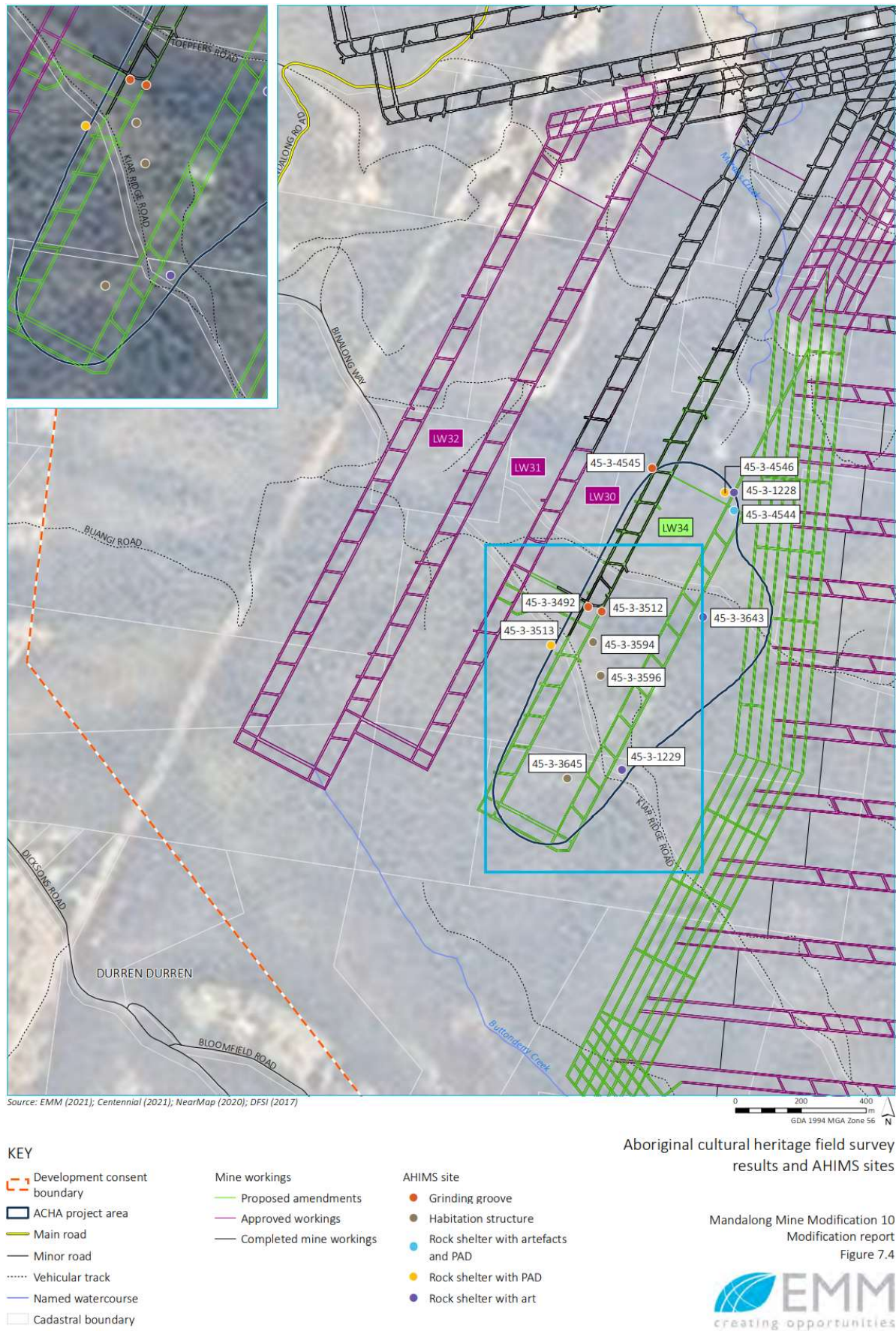


Figure 5 | Location of recorded Aboriginal cultural heritage sites

Table 4 | Summary of subsidence impacts for Aboriginal cultural heritage sites

Site Name (AHIMS number)	Site type	Previously approved likelihood of impact (cracking/erosion)	Cracking damage potential	Erosion damage potential
Morans Creek (45-3-1228)	Rock shelter with art	Very unlikely/ very unlikely	Unlikely	Unlikely
Olney (45-3-1229)	Rock shelter with art	Very unlikely/ very unlikely	Unlikely	Very unlikely
RPS CYL05 (45-3-3492)	Grinding groove	Unlikely / unlikely	Unlikely	Unlikely
RPS PS26 (45-3-3512)	Grinding groove	Unlikely / unlikely	Unlikely	Possible
RPS PS28 (45-3-3513)	Rock shelter with PAD	Very unlikely/ very unlikely	Unlikely	Very unlikely
RPS PS27 (45-3-3594)	Habitation structure (no PAD or objects)	Very unlikely/ very unlikely	Very unlikely	Unlikely
RPS PS30 (45-3-3596)	Habitation structure (no PAD or objects).	Very unlikely/ very unlikely	Possible	Very unlikely
RPS PS07 (45-3-3643)	Habitation structure (no PAD or objects).	Unlikely/ very unlikely	Unlikely	Very unlikely
RPS PS31 (45-3-3645)	Habitation structure (no PAD or objects).	Unlikely / unlikely	Possible	Unlikely
MS9-RS-3 (45-3-4544)	Rock shelter with artefacts and PAD	Very unlikely/ very unlikely	Unlikely	Unlikely
MS9-GG-3 (45-3-4545)	Grinding groove	Possible / possible	Possible	Possible
MS9-RS-2 (45-3-4546)	Rock shelter with PAD	Very unlikely/ very unlikely	Unlikely	Unlikely

Cracking damage is considered possible at two habitation structure sites, which represents an increase in potential impact from very unlikely and unlikely, respectively, compared with the approved mine layout. Cracking is also considered possible at one grinding groove site, which is consistent with the previously assessed and approved impacts at this site.

Cracking damage is considered unlikely or very unlikely at the remaining nine sites. Of these sites, the likelihood of impacts are slightly higher than those previously approved at five sites, where the predicted likelihood of cracking damage has increased from very unlikely to unlikely.

Although the proposed modification would marginally increase the likelihood of impacts to several Aboriginal cultural heritage sites, these potential impacts have been partially offset through the removal of LW33 from the approved mine plan, which has resulted in the avoidance of previously assessed and approved impacts to eight sites located above that longwall.

Mitigation and management

The existing conditions of consent require Centennial to prepare and implement an overarching Aboriginal Cultural Heritage Management Plan (ACHMP) for the project in consultation with RAPs and Heritage NSW. In addition, an ACHMP is one of the component plans of the Extraction Plan that must be prepared and approved prior to the commencement of second workings in LW34.

The ACHMP includes requirements to monitor all sites that could experience subsidence impacts. Management and mitigation of Aboriginal cultural heritage sites is undertaken on a site by site basis in consultation with the RAPs. Proactive or reactive management measures are based on consideration of site locality, site significance, risk of impact and potential impacts associated with implementing any mitigation measures.

Centennial would update the ACHMP to include the revised subsidence predictions for the proposed modification. The monitoring requirements of the ACHMP would be applied to the sites predicted to be impacted by the proposed modification and any required mitigation and management measures would be developed and implemented in consultation the RAPs and Heritage NSW. Advice from Heritage NSW confirmed it was satisfied with this approach to managing the potential Aboriginal cultural heritage impacts of the proposed modification.

Conclusion

The Department has carefully assessed the potential Aboriginal cultural heritage impacts associated with the proposed modification. While the likelihood of impacts to several Aboriginal cultural heritage sites would be marginally increased, these impacts have been partially offset by the avoidance of impacts associated with the removal of LW33 from the approved mine plan. Further, neither Heritage NSW nor the RAPs raised any issues with the proposed modification and both were supportive of the approach to managing the potential impacts proposed in the ACHA. Overall, the Department is satisfied the Aboriginal cultural heritage impacts of the proposed modification are generally consistent with those that were previously assessed and approved. The Department also considers that subsidence impacts can continue to be appropriately monitored and managed through the implementation of Centennial's ACHMP.

5.3 Biodiversity

The Modification Report included a BDAR prepared by RPS in accordance with the Biodiversity Assessment Method (BAM) to assess the potential biodiversity impacts of the proposed modification. BCD initially raised several concerns with the BDAR, including the methodology used to calculate offset requirements and the level of detail provided regarding flora and fauna survey methodologies. In response, Centennial provided a revised BDAR addressing BCD's comments, following which BCD confirmed its satisfaction with the revised BDAR.

Existing Environment

Vegetation surveys identified five plant community types (PCTs) and six vegetation zones within the area that could be impacted by subsidence from the proposed modification (see **Table 5**).

Table 5 | Plant community types with potential to be impacted by the proposed modification

Plant community type (PCT)	Conservation status	Total area (ha)	Area of potential impact (ha)
1528 - Jackwood - Lilly Pilly - Sassafras riparian warm temperate rainforest of the Central Coast	Endangered	0.04	-
1556 - Tallowood - Smooth-barked Apple – Blackbutt grass tall open forest of the Central and lower North Coast	N/A	25.1	0.000083
1568 - Blackbutt - Turpentine - Sydney Blue Gum mesic tall open forest on ranges of the Central Coast	N/A	7.2	0.00031
1573 - Sydney Blue Gum - Lilly Pilly mesic tall open forest of coastal ranges and tablelands escarpment	N/A	2.48	0.000078
1588 - Grey Ironbark - Broad-leaved Mahogany – Forest Red Gum shrubby open forest on Coastal Lowlands of the Central Coast	N/A	15.44	-
Disturbed/cleared	N/A	1.92	0.00022

One of these PCTs (PCT 1528) meets the criteria for the *Lowland Rainforest in NSW North Coast and Sydney Bioregions* threatened ecological community (TEC) under the *Biodiversity Conservation Act 2016* (BC Act). No other TECs were identified during the vegetation surveys.

One threatened flora species was detected during survey, being Scrub Turpentine (*Rhodamnia rubescens*), which is listed as 'critically endangered' under the BC Act.

Threatened fauna detected during surveys included:

- Masked Owl (*Tyto novaehollandiae*)– listed as 'vulnerable' under the BC Act; and
- Glossy Black Cockatoo (*Calyptrorhynchus lathamii*) – listed as 'vulnerable' under the BC Act.

The presence of an additional 25 threatened species considered to have potential to occur was also assumed but could not be confirmed at the time of survey.

A number of habitat features were identified during surveys, including habitat trees, flowering shrubs, watercourses, caves, cliffs and rock crevices.

Habitat features and PCTs with potential to be impacted by the proposed modification are shown on **Figure 6**.

Predicted Impacts

The proposed modification would not require any clearing of native vegetation, however, subsidence predictions indicate that a potential increase in ponding could result in the loss of approximately 0.00047 hectares (ha) of native vegetation (see **Table 5**).

Subsidence effects could also impact rock-habitat features including caves, crevices and cliffs. This could disturb microbats and other cave associated species, such as the Sooty Owl (*Tyto tenebricosa*). However, given the minor extent of cracking predicted, any potential impacts are unlikely to be significant.

Hydrological changes to Morans Creek, Mannering Creek and Buttonderry Creek due to subsidence are not expected to materially change the watercourse stability impacts for these watercourses from the approved mine layout. Therefore, downstream ecological impacts due to the proposed modification are expected to be negligible.

Mitigation and management

Centennial would continue to manage biodiversity impacts through the Northern Region Biodiversity Management Plan and Mandalong Mine Biodiversity Management Plan (BMP). A BMP would also be prepared for the proposed LW34 as part of the Extraction Plan process.

Centennial have committed to include surveys and monitoring to evaluate the impacts of subsidence on habitat features for microbats and Sooty Owl in the BMP. A flora monitoring program would also be undertaken to determine any impacts to native vegetation, threatened flora species or threatened plant communities as a result of the proposed modification. The BMP would include an adaptive management strategy to mitigate any residual impacts to biodiversity.

Biodiversity Offsets

The potential area of impact from the proposed modification (0.00047 ha) is significantly less than the 0.01 ha threshold required to calculate offsets under the BAM. Centennial have committed to monitoring biodiversity impacts through the Extraction Plan process. If impacts of greater than 0.01 ha are detected as a result of the proposed modification, Centennial would satisfy ecosystem and species credit requirements in accordance with the NSW Biodiversity Offset Scheme through retiring credits where possible or through payment into the Biodiversity Conservation Fund. BCD has confirmed that it is satisfied with this approach. The Department notes that the existing conditions of consent specify 'negligible environmental consequences' as the performance measure for subsidence impacts to threatened species, threatened populations and endangered ecological communities. The existing conditions require Centennial to provide suitable offsets to compensate for any impact that exceeds this performance measure.

Should the impact threshold of 0.01 ha be exceeded, the biodiversity credits that would be required to be offset are identified in **Table 6**.

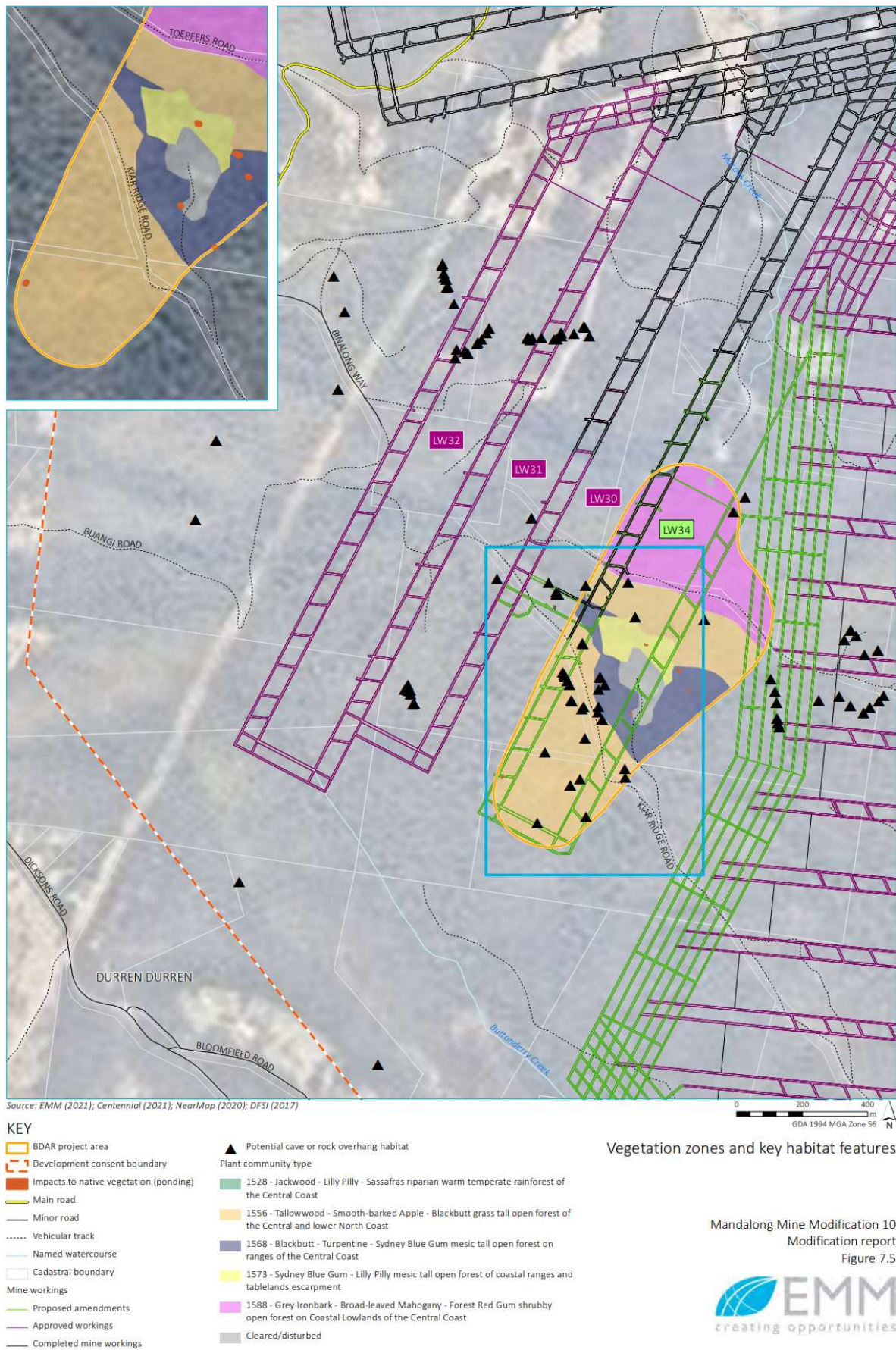


Figure 6 | Habitat features and PCTs above LW34

Table 6 | Biodiversity credits required to be offset if more than 0.01 ha is impacted

PCT / Species	Credits required
Ecosystem credits	
PCT 1556 - Tallowwood - Smooth-barked Apple – Blackbutt grass tall open forest of the Central and lower North Coast	1
PCT 1568 - Blackbutt - Turpentine - Sydney Blue Gum mesic tall open forest on ranges of the Central Coast	1
PCT 1573 - Sydney Blue Gum - Lilly Pilly mesic tall open forest of coastal ranges and tablelands escarpment	1
Species credits	
Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>)	1
Eastern Pygmy-possum (<i>Cercartetus nanus</i>)	1
Leafless Tongue Orchid (<i>Cryptostylis hunteriana</i>)	1
White-bellied Sea-Eagle (<i>Haliaeetus leucogaster</i>)	1
Pale-headed Snake (<i>Hoplocephalus bitorquatus</i>)	1
Stephens' Banded Snake (<i>Hoplocephalus stephensii</i>)	1
Green-thighed Frog (<i>Litoria brevipalmata</i>)	1
Little John's Tree Frog (<i>Litoria littlejohni</i>)	1
Square-tailed Kite (<i>Lophoictinia isura</i>)	1
Stuttering Frog (<i>Mixophyes balbus</i>)	1
Giant Barred Frog (<i>Mixophyes iteratus</i>)	1
Southern Myotis (<i>Myotis macropus</i>)	1
Barking Owl (<i>Ninox connivens</i>)	1
Powerful Owl (<i>Ninox strenua</i>)	1
Squirrel Glider (<i>Petaurus norfolcensis</i>)	1
Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>)	1
Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>)	1

PCT / Species	Credits required
Eastern Australian Underground Orchid (<i>Rhizanthella slateri</i>)	1
Black-eyed Susan (<i>Tetradlea juncea</i>)	1
Masked Owl (<i>Tyto novaehollandiae</i>)	1
Sooty Owl (<i>Tyto tenebriocosa</i>)	1

Conclusion

The Department has carefully assessed the potential biodiversity impacts associated with the modification. Overall, the Department considers these impacts can be suitably managed under the existing conditions of consent and an updated BMP.

5.4 Water resources

The Modification Report included a water resources impact assessment (WRIA) prepared by GHD to assess the impacts of the proposed modification on groundwater and surface water resources.

Groundwater

The existing hydrogeological model developed by GHD for the MSEP was updated to assess the potential incremental impacts of the proposed modification on the groundwater environment. Centennial advised that the hydrogeological model was previously recalibrated and independently verified in 2017 by HydroAlgorithmics as required by the conditions of consent. DPE Water ultimately advised that it was satisfied that the model was fit for purpose.

Groundwater sources in the vicinity of the proposed modification are predominantly characterised by shallow alluvium and weathered and/or fractured sandstone aquifers. They are generally low yielding and classified as 'less productive' in accordance with the *NSW Aquifer Interference Policy* (AIP).

The hydrogeological model predicted that the total groundwater inflows into the connected Cooranbong Colliery, Mandalong and Mandalong South workings would peak at approximately 2.0 megalitres per day (ML/day) (735 ML/year) in 2035 which is slightly lower than the previously approved peak of 2.1 ML/day. All groundwater take is predicted to be from the Sydney Basin North Coast Groundwater Source and would remain well below Centennial's existing entitlement under water access licence WAL 39767 to extract up to 1,825 ML/year from this groundwater source.

The proposed modification is predicted to result in a reduction in the extent of groundwater drawdown compared to the approved mine plan, with the 2 m drawdown contour predicted to contract by around 700 m to the southwest compared with the approved mine layout.

The proposed modification is not predicted to result in changes to baseflows in ephemeral creeks or the quality of groundwater in the vicinity of the proposed modification. No private bores (other than Centennial owned monitoring bores) were identified within 2 km of the proposed LW34 and no high

priority groundwater dependent ecosystems (GDEs) are located within the vicinity of the proposed modification.

While the slight reduction in groundwater inflows as a result of the proposed modification would result in a minor decrease in the volume of water and mass of salt discharged from Mandalong's Licensed Discharge Point (LDP001), the change to the water and salt balance compared with the approved mine layout would be negligible.

Groundwater impacts attributable to the proposed modification were assessed as meeting the Level 1 minimal impact considerations under the AIP. The Department is therefore satisfied that potential groundwater impacts from the proposed modification would be minimal.

Surface water

The proposed modification is located beneath the upper reaches of Morans Creek, Mannering Creek and Buttonderry Creek including several unnamed tributaries. The creeks within the vicinity of the proposed modification are ephemeral, with periods of limited or no flow during low rainfall.

The subsidence assessment predicted that the proposed modification could result in slight changes to surface gradients and minor cracking within creek beds, however, these potential impacts are considered minor and would not differ significantly from the approved mine layout. The WRIA also notes that the watercourses above the proposed modification are headwater systems that consist of confined, bedrock-dominated channels, which are less susceptible to geomorphic impacts.

Catchment boundaries and watercourse stability of the creeks above the proposed modification are not predicted to change significantly compared with the approved mine layout. The proposed modification may cause a minor increase (less than one percent) in remnant ponding within existing flow paths along Buttonderry Creek compared with the approved mine layout. There would be negligible changes in remnant ponding along Mannering Creek and Morans Creek.

Baseline surface water quality monitoring has identified some elevated metal concentrations in Buttonderry Creek attributable to the geology of the catchment. Subsidence fracturing may expose previously unweathered near-surface rock, which can release additional metal concentrations into surface water or shallow groundwater, potentially impacting water quality downstream. These potential impacts would be consistent with the approved mine layout and are unlikely to be increased by the proposed modification.

Mitigation and management

The existing conditions of consent require Centennial to prepare an overall Water Management Plan (WMP) for the mine as well as a WMP as a component of the Extraction Plan prior to commencing secondary extraction of the proposed LW34. This would include a detailed groundwater monitoring program to monitor and report on groundwater inflows, changes to groundwater yields or quality, and potential impacts on groundwater users and GDEs.

The WMP would also include a program to monitor and report on stream morphology and flows, and surface water quality. Mechanisms would be developed to evaluate the effectiveness of Centennial's water management systems, and to respond to any exceedances of established performance criteria.

Conclusion

The Department is satisfied that the proposed modification would not significantly increase impacts on water resources compared with the approved mine layout. The Department considers that any incremental impacts associated with the proposed modification can be suitably managed and mitigated through the existing conditions of consent, an updated site WMP and the WMP component to the Extraction Plan for the proposed LW34.

5.5 Other issues

Other issues associated with the proposed modification include potential flooding, bushfire, greenhouse gas and socioeconomic impacts. The Department's assessment of these issues is summarised in **Table 7**.

Table 7 | Summary of other issues

Issue	Findings	Recommendations
Flooding	- The Modification Report included a flood impact assessment prepared by Umwelt. - The proposed modification is not predicted to materially change depth, velocity, extent, duration or hazard level of flood impacts from the approved mine layout. - The proposed modification would not increase potential flooding impacts on dwellings or roads and there would be no change to the 100 year average recurrence interval (ARI) flood level compared with the approved mine layout. - The existing conditions of consent require Centennial to monitor and manage flooding impacts through the Extraction Plan process. This would include monitoring and remediation requirements for any potential or actual impacts on watercourses, ponding, infrastructure and private residences from the proposed modification. - Overall, the Department considers that the predicted flooding impacts associated with the proposed modification would be similar to previously assessed and approved flooding impacts at the mine. The Department is satisfied that the existing conditions would continue to provide an effective framework for the management and mitigation of these impacts, and that no changes to these conditions are required.	No changes to existing conditions are recommended.

Issue	Findings	Recommendations
Bushfire	- Community submissions raised concerns about the potential for increased bushfire risk associated with the proposed modification. - Centennial has committed to implementing a risk assessment process and additional controls as part of the Exploration Activities Management Plan to manage bushfire risk when exploration drilling activities are undertaken on total fire ban days. - The Department sought advice from RFS and the Resources Regulator, neither of which objected to the proposed modification provided additional bushfire risk assessment and controls were implemented, consistent with RFS requirements. - The Department is satisfied that the bushfire risk associated with the proposed modification can be appropriately managed through bushfire management provisions within the Exploration Activities Management Plan.	- The Department has recommended a condition to require the Exploration Activities Management Plan to address the bushfire risk of the proposed modification. - The Department notes the existing conditions require Centennial to review and revise the approved Exploration Activities Management Plan to incorporate the modification.
Greenhouse gases	- The Modification Report included a detailed assessment of the potential greenhouse gas emission impacts of the proposed modification. - The shortening of LW30 and removal of LW33 has resulted in the loss of approximately 2.0 Mt of ROM coal from the previously approved mine plan. The proposed modification would include the extraction of 1.3 Mt of ROM coal, resulting in an overall decrease in ROM coal extracted compared with that approved under MOD 9. - The proposed modification would therefore not increase greenhouse gas emissions beyond those already assessed and approved.	No changes to existing conditions are recommended.
Socio-economic	The proposed modification would have local and regional benefits through: - ongoing employment for staff at Mandalong Mine and the associated economic and social benefits; - ensuring community contributions are ongoing for the life of the mine and that local priorities are reflected in the allocation of funds by distribution through the CCC; - the provision of approximately \$8.3 million in royalties to the State.	No changes to existing conditions are recommended.

6 Evaluation

The Department has assessed the merits of the proposed modification in accordance with the requirements of the EP&A Act and in consultation with relevant government agencies. None of the Government agencies objected to the proposal. While some agencies initially expressed concerns with information provided, all agencies subsequently considered that the impacts could be appropriately managed through existing and recommended conditions of consent.

The key issue of concern from community submissions was the potential for increased bushfire risk from the proposed modification. The RFS and Resources Regulator were satisfied, and the Department agrees, that this risk could be appropriately managed through additional measures incorporated into an updated management plan.

The Department's assessment has concluded that the impacts of the proposed modification can be appropriately managed under existing and new conditions of consent. In particular, the Department considers that mining-induced subsidence impacts on private residences, public infrastructure, slope stability and water resources can be mitigated, monitored and where necessary, remediated, in accordance with a comprehensive Extraction Plan and its various subplans.

The proposal has the potential to slightly increase impacts for a number of Aboriginal cultural heritage sites, however, these impacts have been partially offset by the avoidance of impacts to sites located above the approved LW33, which has been removed from the approved mine plan. Centennial's ACHMP would be revised in consultation with RAPs and Heritage NSW to reflect the proposed modification. This would include commitments to monitor all potentially impacted sites and to implement specific management actions, where required.

The proposal would also result in the loss of less than 0.01 ha of native vegetation through subsidence-induced ponding. Centennial have committed to satisfying any required biodiversity offsets in the event that actual impacts exceed predictions. The Department is satisfied that the potential biodiversity impacts of the proposed modification can be appropriately managed under the existing conditions of consent and an updated BMP.

The Department recognises that there are several benefits from the proposed modification. Firstly, the addition of LW34 would allow Centennial to maximise resource recovery within the existing development consent boundary, partially offsetting the loss of the coal resource associated with the reduction of LW30 and removal of LW33. This would be achieved efficiently using existing infrastructure and ensure the continuity of operations and employment at Mandalong.

The proposed modification would also provide Centennial with greater flexibility when undertaking exploration drilling activities, improving the continuity of these activities and preventing delays to the mine planning process.

The proposed modification would provide social and economic benefits through the continuation of community contributions for the life of the mine, ongoing local employment and broader economic and social benefits to the people of NSW through the payment of an additional \$8.3 million in mining royalties to the State. The Department considers these aspects of the proposed modification to be in the public interest and key reasons to recommend approval of the modification.

The Department concludes that the positive social and economic impacts created by the proposal would outweigh any negative environmental and social impacts, which are not predicted to be significant and can be manageable under existing and recommended conditions of consent. The Department is satisfied that the modification is in the public interest and should be approved.

7 Recommendation

It is recommended that the Director, Resource Assessments, as delegate of the Minister for Planning:

- **considers** the findings and recommendations of this report;
- **determines** that the application SSD 5144 MOD 10 falls within the scope of section 4.55(2) of the EP&A Act;
- **accepts and adopts** all of the findings and recommendations in this report as the reasons for making the decision to approve the modification;
- **modify** the consent SSD 5144; and
- **signs** the attached approval of the modification (**Appendix D**).

Recommended by:

3/3/2022



Jarrod Blane
Senior Planning Officer
Resource Assessments

Recommended by:

3/3/2022



James McDonough
Team Leader
Resource Assessments

8 Determination

The recommendation is **Adopted** by:

11/3/2022

A handwritten signature in black ink that reads "Jessie Evans". The signature is written in a cursive, flowing style.

Jessie Evans

Director

Resource Assessments

as delegate of the Minister for Planning

Appendices

Appendix A – Modification report

<https://www.planningportal.nsw.gov.au/major-projects/project/42336>

Appendix B – Submissions

<https://www.planningportal.nsw.gov.au/major-projects/project/42336>

Appendix C – Submissions report

<https://www.planningportal.nsw.gov.au/major-projects/project/42336>

Appendix D – Notice of modification

<https://www.planningportal.nsw.gov.au/major-projects/project/42336>

Appendix E – Consolidated Consent

<https://www.planningportal.nsw.gov.au/major-projects/project/42336>