ROCK SHELTER MONITORING PROGRAM

Mandalong Mine

148690
Mandalong
Rock Shelter Monitoring
Program
4.0
8 July 2021

rpsgroup.com

Document status

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1.0	Draft	Kate Morris	Ben Slack	Ben Slack	11 March 2021
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Approval for issue

Ben Slack  8 July 2021

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1 INTRODUCTION

RPS has been engaged by Centennial Mandalong to prepare a Rock Shelter Monitoring Program in accordance with the requirements of SSD-5144, Schedule 4 Condition 11:

> *The Applicant must implement a **monitoring program of subsidence effects** at rock shelter sites 45-3-1228 and 45-3-1233 in the Extraction Plan for Longwalls 30-33 or, if access to these sites is not granted by the landowner, other rock shelter sites as agreed to in writing with the Secretary. This monitoring must be: undertaken by a suitably qualified archaeologist, whose appointment has been approved by the Secretary, undertaken in consultation with Heritage NSW and RAPS, and used to inform impact management of rock shelter sites under future Extraction Plans required under this consent to the satisfaction of the Secretary.*

The monitoring program will include 14 rock shelter sites in the Longwall 30-31 Extraction Plan area of Mandalong Mine, including AHIMS 45-3-1228 as specified in Condition 11. AHIMS 45-3-1233 is not included as it is not within the LW30-31 Extraction Plan Area due to re-orientation (Mod 9 Approval). This program was generated in accordance with Centennial's Northern Holdings Aboriginal Cultural Heritage Management Plan (2016) (ACHMP), specifically section 4.5.1, and the Mandalong Mine LW30-31 Extraction Plan Heritage Management Plan (2021) (HMP).

The monitoring program will record direct and indirect impacts of subsidence effects on rock shelter structural integrity and rock art (protected as Aboriginal Objects under the National Parks and Wildlife Act 1974 Section 83). Direct and indirect impacts may be from access, dust, or vibrations.

1.1 Study area

The Mandalong Mine is an underground longwall coal mining operation located approximately 35 kilometres south-west of Newcastle in NSW. The monitoring program will include all 15 rock shelter sites located in the Longwall 30-31 Extraction Plan area at Centennial Mandalong Mine (**Figure 1**). The sites are listed below (**Table 1**).

Table 1: Sites in the Longwall 30-31 Extraction Plan Area subject to monitoring

AHIMS Sites	Unregistered Sites
• 45-3-3594	• MS9-OH-1
• 45-3-3513	
• 45-3-3595	
• 45-3-3514	
• 45-3-1228	
• 45-3-3586	
• 45-3-3639	
• 45-3-3642	
• 45-3-3641	
• 45-3-3640	
• 45-3-4547	
• 45-3-4546	
• 45-3-4544	

1.2 Background

As per the ACHMP (RPS, 2016) and HMP (Umwelt, 2021), the aim of the monitoring program is to identify any direct or indirect impacts to Aboriginal rock shelter sites as a result of mining activities, monitor any changes, and identify appropriate mitigation strategies, if required. All sites in the wider area have been assessed by Ditton Geotechnical Services (DgS) regarding likelihoods of cracking and erosional damage from the Longwalls 30 and 31. However, regardless of likelihood ranking, all 15 rock shelter sites located within the Longwall 30-31 Extraction Plan area will be monitored.

This monitoring program has been developed in accordance with the principles of due diligence as defined by the NP&W Regulation 2009. While the broad principles of the *Due Diligence Code of Practice for the protection of Aboriginal Objects in NSW* (DECCW 2010) and the *NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects* (Minerals Council 2010) have been adopted; additional (and more specific heritage) management protocols have been developed to manage the complexities of mining activities, the nature of the Aboriginal cultural heritage sites present and the assessment of harm (Umwelt, 2021).

1.2.1 Consultation

Consultation documents between Centennial, HNSW, and Registered Aboriginal Parties (RAPs) are provided in Appendix A and B. All RAPs were provided with this monitoring program in April 2021 for review, however, no feedback was received.

1.3 Information and privacy

1.3.1 Restricted Information

No restricted information is provided in this report.

1.3.2 Confidentiality

No confidential information is included in this report. However, it is noted that this monitoring program contains details relating to the locations of registered Aboriginal heritage sites within and near the Study Area that may be considered confidential information by Registered Aboriginal Parties (RAPs).

1.4 Authorship and acknowledgements

This report has been prepared by RPS Senior Heritage Consultant/Archaeologist Ben Slack (BA Arch) and RPS Graduate Heritage Consultant/Archaeologist Kate Morris (BA/BSc Arch *Hons*). GIS mapping was undertaken by RPS Senior Draftsperson, Natalie Wood. This report was reviewed and approved by RPS Senior Heritage Consultant/Archaeologist Ben Slack (BA Arch).

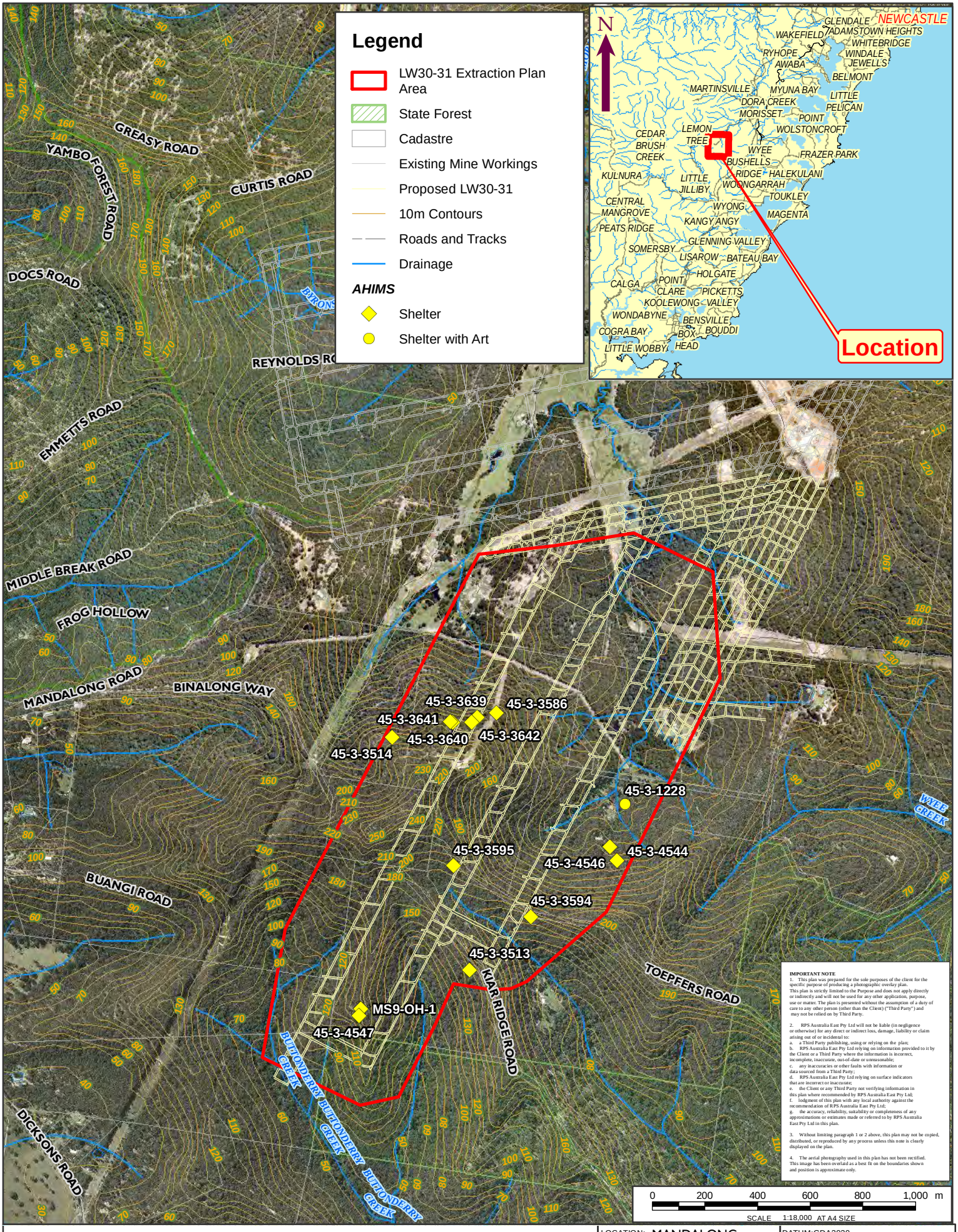

FIGURE 1: EXTRACTION PLAN AREA FOR LW30-31 WITH ROCKSHELTERS

LOCATION: MANDALONG LW30-31	DATUM:GDA2020 PROJECTION: GDA2020 MGA Zone 56
JOB NO.: **PR 148690** PURPOSE: HERITAGE Technician: Natalie.Wood Date: 12/07/2021	Data Sources: RPS, Client Nearmap 2017

CLIENT: CENTENNIAL

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
Unit 2A, 45 Fitzroy Street, Carrington, NSW, Australia, 2294 PO Box 120, Carrington, NSW, 2294
T: 02 4940 4200 F: 02 4940 4299 www.rpsgroup.com.au

Path: S:\Centennial\All Jobs\148690 Rock shelter monitoring program\10 - Drafting\Arcgis Map Documents\Arch\148690 Figure 1 Location with RS C A4 20210709.mxd

NEW_A4_Portrait 2019 Rev: B Produced:NW Reviewed: NW Date: 16/07/2019

2 SITE DESCRIPTIONS

DgS assessed the risk of cracking impacts at all sites in the wider area around Longwalls 30 and 31 and found that cracking damage was possible for 2 rock shelters (MS9-OH-1 and MS9-RS-1,) (Services, June 2021). Twelve (12) rock shelters were assessed as unlikely or very unlikely to be damaged by cracking, including 1 rock shelter with art and 4 with PADs assessed as very unlikely (Services, 2021).

Regardless of likelihood assessments of cracking, all 14 sites located within the Longwall 30-31 Extraction Plan area will be monitored.

The sites to be monitored are AHIMS 45-3-3514, 45-3-3594, 45-3-3513, 45-3-3595, 45-3-1228, 45-3-3586, 45-3-3639, 45-3-3642, 45-3-3641, and 45-3-3640, 45-3-4547, 45-3-4546, 45-3-4544 and currently unregistered site MS9-OH-1 (Table 1).

2.1 AHIMS 45-3-3514

AHIMS 45-3-3514 was recorded as a closed site on the upper slope of a steep ridgeline surrounded by open woodland. The rock shelter comprises a sandstone platform with an internal length of 10m, width of 20m, and height of 20m. The rock shelter has a sandy floor (exfoliated from the ceiling) and a steep downward decline from the shelter opening. The shelter appears to have been subject to wind erosion. Two areas nearby the site are frequented by the public for camping.

2.2 AHIMS 45-3-3594

AHIMS 45-3-3594 was recorded as a closed site on a mountainous upper slope surrounded by open woodland. The rock shelter cavity is characterised by a boulder formation. It is located along Toepfers Road, to the north of an unnamed first order tributary of Mannering creek.

Additional information on the site card appears to relate to a nearby artefact scatter site.

2.3 AHIMS 45-3-3513

AHIMS 45-3-3513 was recorded in 2011 as rock shelter located on a mountainous steeply inclined upper slope and surrounded by open woodland. The rock shelter cavity is characterised by a boulder formation and is part of an exposed sandstone shelf. The shelter is high enough to stand in and small shelved areas provide suitable ledges to sit on. A collection of rocks in a semi-circle formation may have once lined a fireplace but its antiquity cannot be determined.

AHIMS 45-3-3513 is just south west of AHIMS 45-3-3594.

2.4 AHIMS 45-3-3595

AHIMS 45-3-3595 was recorded in 2011 as a rock shelter characterised by a boulder formation and surrounded by open woodland. The shelter entrance is covered with vines, ferns, moss and a fallen tree. This rock shelter has two floor spaces. The first, comprises a small sloped platform which opens up into a relatively levelled area and small sandstone shelf. The second, has a relatively flat floor, but is narrower along the eastern wall and provides less protection from the elements. The most probable option for habitation would be A as it has a more level floor with small sandstone shelves and offers protection from climatic conditions. Both floors are sandy. The sand deposit is shallow (approximately 33mm) and does not constitute archaeological deposit (PAD). The ceiling and walls of the shelter have been affected by weathering which appears to have contributed to the sandy floor.

AHIMS 45-3-3595 is west of AHIMS 45-3-3594.

2.5 AHIMS 45-3-1228

AHIMS 45-3-1228 was first recorded in 1982 as a rock shelter site with two shelters in a series of sandstone outcrops. The largest shelter is 5m high at the entrance, and the smaller shelter, 4m from the large one, is 1.3m high. Outside of the smaller shelter were two chert flakes and one pink chalcedony flake. The rear wall of the smaller shelter has faded Aboriginal art.

The art consists of one white shield, one red-brown shield, a right hand stencil with no middle finger, a very indistinct white hand stencil, a white figure advised to be a goanna, and 8 other drawings. One of the other drawings is a zigzag 1.2m to the left of the white shield. The two shields are line drawings with no infill. The other figures are completely filled in with white pigment. Traces of white in between the drawings were suspected to be mineral deposit that also appears on nearby shelter ceilings and walls. The recorder suspected the re-brown shield was fresh and a fake due to its vibrancy and similarity in colour to mud used by wasps to make nests. They also concluded that red-brown lines on the ceilings were European as there are also initials drawn in charcoal and coloured chalk.

2.6 AHIMS 45-3-3586

AHIMS 45-3-3586 was recorded in 2011 as a rock shelter characterised by a boulder formation. The site is located on the upper slope of a mountainous landform in an electricity easement. Vegetation was predominantly cleared as a result of the disturbance, but there is a thick growth of ferns at the entrance to the shelters. An unnamed creek line is situated approximately 100 metres to the east with a Buttonderry Creek tributary about 400 metres to the south. The site is characterised by two smaller shelters (A & B) that are situated immediately adjacent to each other. Both shelters were likely used as temporary shelters. The sandstone of the shelters is dark and discoloured on the outside and on the inside was moderate to fine grained. The inside of the shelters have been subject to weathering which has resulted in loose sand at the base of the shelters. The depth of the sand is very shallow (<30mm) and not considered to contain deposit or potential archaeological deposit (PAD).

2.7 AHIMS 45-3-3639

AHIMS 45-3-3639 was recorded in 2011 as a rock shelter characterised by a sandstone platform to the west of a ridgeline. Two shelters are situated in an open forest with pockets of cleared areas. Both shelter openings that are not tall enough to stand in but can be sat in comfortably. Minor draining lines are nearby the shelter but there are no permanent water sources. The shelters are extensively weathered both inside and outside. The second shelter has evidence of internal rock collapse with a large, cracked square-shaped rock sitting in the entrance. The floors were sandy but <50mm in depth so were not considered to have a PAD. No art was noted.

In the absence of PAD or Art features this site has not been assessed to have archaeological value but has been registered at the request of the RAPs.

2.8 AHIMS 45-3-3642

AHIMS 45-3-3642 was recorded in 2011 as a rock shelter located on a mid to upper sloped landform along a sandstone shelf to the west of a ridgeline. The shelter is situated amongst open forest vegetation with pockets of gentle sloping cleared areas. The shelter has evidence of extensive weathering and has two openings. Neither space has a large enough internal area for standing but has comfortable sitting height. There is no nearby permanent water source though there are a few minor drainage lines in the vicinity. The second floor space had evidence of internal rock collapse with a large, cracked square-shaped rock sitting in the entrance. Weathering had also caused a layer of sand to form at the base of the shelter and its disturbance indicated possible animal use.

2.9 AHIMS 45-3-3641

AHIMS 45-3-3641 was recorded in 2011 as a rock shelter characterised by a boulder on a sandstone platform on a mid to upper sloped area. Surrounding vegetation consisted of open woodland. The shelter is not situated near to a permanent water source, with the closest being an unnamed tributary of Jilliby Jilliby Creek approximately 200-300 metres to the west. The opening of the shelter has a steep drop that opens into a gently sloped shelf. The ceiling has weathered and created a sandy deposit onto the floor. The sand floor was quite disturbed, which may indicate evidence of its use by animals, and was spilling out of the opening of the shelter. The ground floor surrounding the entrance to the shelter was very thickly covered by leaf litter and grasses.

AHIMS 45-3-3641 is immediately west of AHIMS 45-3-3640.

2.10 AHIMS 45-3-3640

AHIMS 45-3-3640 was recorded in 2011 as a rock shelter characterised by a boulder on a sandstone platform beneath a ridgeline on an upper slope. Surrounding vegetation consisted of open woodland. The shelter appears to undercut into the sandstone shelf and has approximately a 1m climb to get up into the shelter. The shelter does not have a comfortable sitting height but has room for lying down. The shelter is situated quite close to a drainage gully which is assumed to be a minor tributary line into Jilliby Jilliby Creek further to the west.

There is evidence of white chalk-like markings inside the opening of the shelter but they could not be determined to be of Aboriginal origin. The shelter had evidence of extensive weathering and discolouration patterning on the surface of the sandstone with the chalk-like figure superimposed over a number of weathered surfaces. The inside of the shelter has been affected by weathering and exfoliation and a very shallow layer of sand is lying on the floor. Pieces of leaf and bark were also seen on the floor including possible evidence of its use and disturbance by animals.

AHIMS 45-3-3640 is immediately east of AHIMS45-3-3641.

2.11 AHIMS 45-3-4547

MS9-RS-1 was recorded in 2020 as a rock shelter located on the other side of the small sandstone ridge that MS9-OH-1 is located on. The ground soil was loose and estimated to be 20cm in depth with the potential for subsurface deposits. One fractured shell piece, multiple bone fragments, and multiple charcoal fragments were noted. The height of the shelter is 218cm with a length of 460cm and a depth of 345cm.

2.12 AHIMS 45-3-4546

MS9-RS-2 was recorded in 2020 as a large rock shelter located on a mid-slope, south of an ephemeral creek. Nor artefactual or cultural material was noted, however, a small area of deposit within the shelter has the potential to contain evidence of Aboriginal occupation. The internal floor is gently sloping and the ceiling has some pitting. The height is approximately 7-8m, the entrance height is 464cm, the entrance length is 6.75m, and the depth is 6.7m.

2.13 AHIMS 45-3-4544

MS9-RS-3 was recorded in 2020 as a rock shelter located approximately 60m south of MS9-RS-2. The entrance is a small shallow opening with crawl space only. Two chert flakes were identified, potentially i*n situ*, and the fragmented long bone of a mammal or marsupial. One chert artefact is a broken flake with pot-lidding, and the other is a broken chert flake with 50% cortex. The shelter has an angular shelf on the southern wall and a shallow area of potential deposit. The height is 4.2m, the entrance height is 140cm, the entrance length is 5m, and the depth is 350cm.

2.14 MS9-OH-1

MS9-OH-1 was recorded in 2020 as a rock overhang at the top of a small sandstone ridge, upslope of a major creek line associated with a grinding groove. The width of the overhang is 170cm, the height is 105cm and the depth is 168cm. The site may have been used opportunistically. Surrounding vegetation growth is moderate contributing to poor ground visibility.

3 METHODOLOGY

As per the ACHMP and HMP, the aim of the monitoring program is to identify any risks of direct or indirect impacts to Aboriginal rock shelter sites as a result of mining activities, monitor any changes, and identify appropriate mitigation strategies, if required. Direct and indirect impacts may be from access, dust, or vibrations.

While natural processes such as water flow over sandstone structures can cause erosion, and surface exfoliation can occur due to the heat of bush fires; mining activities can also harm rock shelter sites. The risks associated with substantial subsidence/upsidence can lead to major surface cracking and even the collapse or sheering of rock shelter sites. Minor levels of subsidence can cause cracking and exfoliation of these structures. Secondary risks which will need to be considered include intensification of erosion and sheet wash over sandstone sites as a result of surface clearing and modification to drainage lines for the purpose of mining related activities (ACHMP 2016).

This monitoring program has been developed in accordance with the relevant Trigger Action Response Plan (TARP) and recommendations in the ACHMP.

The monitoring program records the condition of the site before mining (baseline survey and baseline check) and the condition of the site after mining (post mining initial condition and post mining secondary condition check) and thus has been separated into three phases.

- **Phase 1:** Baseline recording (prior to occurrence of undermining in vicinity of site) to record the condition of the site before mining.
- **Phase 2:** Post mining primary recording (immediately after undermining in vicinity of site) to evaluate whether there has been any change to the site and if any change is the result of subsidence impacts.
- **Phase 3:** Post mining secondary recording (approximately 8 months after undermining) to evaluate whether there has been any change to the site in the period since mining and to make an assessment on whether conditions have stabilised, If conditions have stabilised, no further monitoring is required. If subsidence has not stabilised, further monitoring will be required.

As per the ACHMP, Phase 1 baseline recording is to occur prior to the site being undermined. As per Section 11.1 of the HMP prepared by Umwelt, Centennial has committed that where the predicted level of subsidence for rock shelters is possible or higher, Centennial will engage a suitably qualified geotechnical expert to provide advice on ways in which subsidence impacts can be mitigated at the individual sites. A geotechnical assessment is to occur in the baseline monitoring inspections with the archaeologist and the RAPs.

As per the ACHMP, a Phase 2 post-mining inspection is to be undertaken within a reasonable timeframe after the completion of undermining, the condition of the site must be reinspected and compared to the last documented results. If the level of harm to the site becomes evident immediately post-mining, Centennial must endeavour to protect the site from further harm. The Centennial Environmental Team must notify and inform HNSW if there is a potential for harm to the site and follow the advice given by HNSW.

As per the ACHMP, the Phase 3 post mining secondary check will be undertaken approximately 8 months after the mining activity has finished. The inspection is required to make an assessment on whether there have been any changes to any identified impacts on the rock shelter sites. If conditions have stabilised and no changes to site condition are observed, then no further monitoring will be required. If noticeable changes in impacts are identified, Centennial's Environmental Team will notify and inform HNSW if there is a potential for harm to the site and follow the advice given by HNSW.

As per the HMP, the minimum information recorded will include the site location and GPS co-ordinates, provision of site plans where relevant, detailed digital photography, and field notes documenting general condition.

3.1 Phase 1 baseline recording

Baseline recording must include the following:

- Detailed archaeological recording,
  - observations of the rock morphology (surface) will be recorded
  - A 3D terrestrial scan of the rock shelter/grinding groove site(s) may also be considered if appropriate
- Archival-quality photos; and
  - archival-quality photographs will be taken in accordance with HNSW guidelines
- The designation of survey control points for monitoring.
  - A minimum of six (6) control points will be nominated on the rock shelter/grinding groove site(s). The recording of control points will be undertaken by a suitably qualified surveyor (appointed by Centennial or heritage consultant) in consultation with the heritage consultant using a total station or better equipment if available. The purpose of the control points is to provide points of reference on the rock shelter/grinding groove in order to later monitor the effects of subsidence. The location of these control points will, where practical, be tied to known surveyed points outside the zone of influence and/or other permanent points such as electricity transmission towers.
- A geotechnical assessment by a suitably qualified geotechnical expert.

3.2 Phase 2 monitoring

At the completion of undermining, Phase 2 monitoring must:

- Be reinspected with the same points and features photographed and recorded in such a way that they can be directly compared to the baseline documented results
  - Again, observations of the rock morphology (surface) will also be recorded, particularly if there is widening of existing cracks and/or development of new cracks. Signs of sheet erosion or exfoliation will also be recorded and archived. This data will be compared to recorded information in Phase 1.

3.3 Phase 3 monitoring

The Phase 3 monitoring will be undertaken approximately 8 months after undermining and must:

- Be reinspected with the same points and features photographed and recorded in such a way that they can be directly compared to the baseline documented results
  - Again, observations of the rock morphology (surface) will also be recorded, particularly if there is widening of existing cracks and/or development of new cracks. Signs of sheet erosion or exfoliation will also be recorded and archived. This data will be compared to recorded information in Phase 1.
  - If there is a discrepancy from the baseline recording and determined to be as a result of subsidence, Centennial will contact a suitably qualified cultural heritage consultant to assess the potential risk of harm to the site. The appropriate mitigation measures provided by the inspecting heritage consultant will be followed and implemented accordingly.

3.4 Additional monitoring

In instances where final subsidence is not achieved until after a number of longwall extractions have taken place, then additional inspections by registered Aboriginal parties and a suitably qualified archaeologist will be required to assess any further risks to Aboriginal sites. The same provisions for mitigation works as provided in Phase 2 will apply.

Should any noticeable changes in impacts be identified, Centennial's Environmental Team will notify and inform HNSW if there is a potential for harm to the site and follow the advice given by HNSW.

Additional inspections by a qualified cultural heritage consultant may be required to assess any further risks to Aboriginal cultural heritage sites.

3.5 Methods

In each inspection, a minimum of 6 control points will be recorded by a surveyor (to remain as points of reference throughout the monitoring program). The location of the control points will, where practical, be tied to known surveyed points outside the zone of influence and/or other permanent points such as electricity transmission towers.

Features will be observed, measured, described, photographed and documented using a total station and 3D scanning/photogrammetry. Features may include art, cracks, sheering, crumbling, erosion, weathering, fire damage, water damage, mineral damage and plant and animal impacts. In regard to any art, the colours, pigment intensity, and locations on the rock shelter will all be recorded for later comparison. The measurements and placements of cracks and surface damage will also be documented. By recording all rock shelters and features in detail with the use of a total station in addition to photography, scanning, description and drawing, the data can be accurately replicated for comparison.

If PADs and Aboriginal objects at the rock shelter sites are assessed to be at risk of harm during the phased monitoring, test excavations and surface salvage must be undertaken. As per Section 13, prior to the commencement of any activities that are predicted to result in possible subsidence at MS9-RS-1, baseline monitoring must occur and include assessment of whether additional works including test pit excavations and salvage will be required to mitigate subsidence impacts. As per Section 13, any proposed mitigation strategy, such as test excavations, will be subject to consultation with the Registered Aboriginal Parties (RAPs) and a suitably qualified archaeologist to ensure that it is appropriate to the nature and significance of the site. The agreed methodology for any test excavation and salvage works will be provided to Heritage NSW prior to implementation.

Section 13 of the HMP prepared by Umwelt, concluded that subsidence impacts are predicted to exceed the original approved predictions at AHIMS 45-3-3642 and considered possible at MS9-RS-1. Section 13 also concluded that possible impacts may occur at MS9-OH-1, however, as this site is not associated with Aboriginal objects or PAD within the Project Area, the mitigation of any impacts was considered unnecessary.

As per Section 11.1 of the HMP, Centennial has committed that where the predicted level of subsidence for rock shelters is possible or higher, Centennial will engage a suitably qualified geotechnical expert to provide advice on ways in which subsidence impacts can be mitigated at the individual sites. A geotechnical assessment is to occur in the baseline monitoring inspections with the archaeologist and the RAPs.

These methods were generated in accordance with the ACHMP and MP.

Any potential impacts that cannot be mitigated based on geotechnical advice, will result in consultation with RAPs regarding test excavation and salvage methods which will aim to confirm the nature and extent of sub-surface deposits and, if required, salvage the deposit.

4 CONCLUSION AND IMPLEMENTATION

Subsidence impacts are predicted to exceed the original approved predictions at AHIMS 45-3-3642 and considered possible at MS9-RS-1. Possible impacts may occur at MS9-OH-1, however, as this site is not associated with Aboriginal objects or PAD within the Project Area, the mitigation of any impacts is considered unnecessary. Prior to the commencement of any activities that are predicted to result in possible subsidence at MS9-RS-1, baseline monitoring must occur and include assessment of whether additional works including test pit excavations and salvage will be required to mitigate subsidence impacts.

If PADs and Aboriginal objects at the rock shelter sites are assessed to be at risk of harm during the phased monitoring, test excavations and surface salvage must be undertaken.

If any conservation or management actions, including test excavations and salvage works, are required after the initial baseline survey, they must be considered by Centennial in consultation with the Registered Aboriginal Parties in order to minimise harm to the rock shelters and rock art, which are protected as Aboriginal Objects under the *National Parks and Wildlife Act 1974* Section 83.

This monitoring program was generated in accordance with the requirements of SSD-5144, Schedule 4 Condition 11, and guided by the ACHMP and MP. Monitoring will require a suitably qualified archaeologist, surveyor, and involvement of Registered Aboriginal Parties (RAPs).

This monitoring program is to be kept on record as compliance with Centennial's Northern Region Aboriginal Cultural Heritage Management Plan. The monitoring program is to be followed closely regarding the methodology specifications.

REFERENCES

RPS. (2016). *Centennial Coal Northern Holdings Aboriginal Cultural Heritage Management Plan*. Retrieved from RPS

Services, D. G. (June 2021). *Subsidence Predictions and Impact Assessment for Proposed LW30 and 31: for Centennial Mandalong Pty Ltd* (DGS Report No. MAN-005/2). Retrieved from unpublished for Centennial Mandalong Pty Ltd:

Umwelt. (June 2021). *Mandalong Mine LW 30-31 Extraction Plan Heritage Management Plan*. Retrieved from unpublished for Centennial Mandalong Pty Ltd

Appendix A
DPIE RPS Approval

Planning, Industry & Environment

Mr James Wearne
Group Approvals Manager
Centennial Mandalong Pty Limited
PO Box 1000
TORONTO NSW 2283

11/02/2021

Dear Mr Wearne

Mandalong Southern Extension Project (SSD-5144)
Appointment of a Suitably Qualified Archaeologist

I refer to your letter of 20 January 2021, requesting the Planning Secretary's approval of a suitably qualified archaeologist to undertake a monitoring program of subsidence effects at rock shelter sites in accordance with condition 11 of Schedule 4 of the Mandalong Southern Extension Project (SSD-5144) development consent.

The Department has reviewed the nominations and information you have provided and is satisfied that these experts are suitably qualified. Consequently, I can advise that the Planning Secretary approves the appointment of the following experts to prepare and undertake the Rock Shelter Monitoring Program, in accordance with the above conditions of consent:

- Mr Ben Slack, Senior Heritage Consultant, RPS Australia East Pty Ltd; to be assisted by
- Ms Kate Morris, Graduate Heritage Consultant, RPS Australia East Pty Ltd.

If you wish to discuss the matter further, please contact Melissa Anderson on 8275 1392.

Yours sincerely

Matthew Sprott
Director
Resource Assessments (Coal & Quarries)

As nominee of the Planning Secretary

Appendix B
Consultation Documents

22 April 2021

BY EMAIL

Mr. Peter Leven
Awabakal Descendants Traditional Owners Aboriginal Corporation
PO Box 137
Budgewoi NSW 2262

Dear Peter,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

In accordance with Condition 11(a) of Schedule 4 of SSD-5144, a copy of the Rock Shelter Monitoring Program has been enclosed for your review and comment.

Please provide any feedback or comments you may have on the Rock Shelter Monitoring Program by 5pm on **Friday 7 May 2021** to:

Jeffrey Dunwoodie
Centennial Mandalong
PO Box 1000
Toronto NSW 2283
Or

Email: Jeffrey.Dunwoodie@centennialcoal.com.au

If you have any questions or require any further information in regard to the Rock Shelter Monitoring Program, please contact me on 0448 490 023.

Yours sincerely

Jeffrey Dunwoodie

Environment & Community Coordinator

Enclosed

- Rock Shelter Monitoring Program (April 2021).

Centennial Mandalong Pty Limited
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Toronto NSW 2283
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www.centennialcoal.com.au

22 April 2021

BY EMAIL

Awabakal Traditional Owners Aboriginal Corporation
ATT: Kerrie Brauer
PO Box 122
Rutherford NSW 2230
Via email: kerrie@awabakal.com.au

Dear Kerrie,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

In accordance with Condition 11(a) of Schedule 4 of SSD-5144, a copy of the Rock Shelter Monitoring Program has been enclosed for your review and comment.

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Yours sincerely

Jeffrey Dunwoodie

Environment & Community Coordinator

Enclosed

- Rock Shelter Monitoring Program (April 2021).

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22 April 2021

BY EMAIL

Bahtabah Local Aboriginal Land Council
ATT: Mr Kentan Proctor
PO Box 3018
Blacksmiths NSW, 2281
Via Email: bahtabahkentan@hotmail.com

Dear Kentan,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

In accordance with Condition 11(a) of Schedule 4 of SSD-5144, a copy of the Rock Shelter Monitoring Program has been enclosed for your review and comment.

Please provide any feedback or comments you may have on the Rock Shelter Monitoring Program by 5pm on **Friday 7 May 2021** to:

Jeffrey Dunwoodie
Centennial Mandalong
PO Box 1000
Toronto NSW 2283
Or

Email: Jeffrey.Dunwoodie@centennialcoal.com.au

If you have any questions or require any further information in regard to the Rock Shelter Monitoring Program, please contact me on 0448 490 023.

Yours sincerely

Jeffrey Dunwoodie

Environment & Community Coordinator

Enclosed

- Rock Shelter Monitoring Program (April 2021).

Centennial Mandalong Pty Limited
ABN 74 101 508 892
PO Box 1000
Toronto NSW 2283
T. +61 02 4973 0900
E: info@centennialcoal.com.au
www.centennialcoal.com.au

22 April 2021

BY EMAIL

Biraban Local Aboriginal Land Council
PO Box 212
Toronto NSW, 2283
Via email: ceo@birabanlalc.com.au

Dear Chief Executive Officer,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

In accordance with Condition 11(a) of Schedule 4 of SSD-5144, a copy of the Rock Shelter Monitoring Program has been enclosed for your review and comment.

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22 April 2021

BY EMAIL

Cacatua Culture Consultants
ATT: Donna and George Sampson
22 Ibis Parade
Woodberry NSW, 2322
Via email: cacatua4service@tpg.com.au

Dear Mr and Mrs Sampson,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

In accordance with Condition 11(a) of Schedule 4 of SSD-5144, a copy of the Rock Shelter Monitoring Program has been enclosed for your review and comment.

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22 April 2021

BY EMAIL

Darkinjung Local Aboriginal Land Council
ATT: Barry Williams
PO Box 401
Wyong NSW 2259
Via email: barry.williams@dlalc.org.au

Dear Barry,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

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Yours sincerely

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Toronto NSW 2283
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E: info@centennialcoal.com.au
www.centennialcoal.com.au

22 April 2021

BY EMAIL

Guringai Tribal Link Aboriginal Corporation
ATT: Tracey Howie
PO Box 4061
Wyongah NSW, 2259
Via email: tracey@guringai.com.au

Dear Tracey,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

In accordance with Condition 11(a) of Schedule 4 of SSD-5144, a copy of the Rock Shelter Monitoring Program has been enclosed for your review and comment.

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Or

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Yours sincerely

Jeffrey Dunwoodie

Environment & Community Coordinator

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- Rock Shelter Monitoring Program (April 2021).

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E: info@centennialcoal.com.au
www.centennialcoal.com.au

22 April 2021

BY EMAIL

Wonn 1 Contracting
ATT: Arthur Fletcher
619 Main Road
Glendale NSW, 2285
Via email: arthur.c.fletcher@gmail.com

Dear Arthur,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

In accordance with Condition 11(a) of Schedule 4 of SSD-5144, a copy of the Rock Shelter Monitoring Program has been enclosed for your review and comment.

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Or

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Yours sincerely

Jeffrey Dunwoodie

Environment & Community Coordinator

Enclosed

- Rock Shelter Monitoring Program (April 2021).

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E: info@centennialcoal.com.au
www.centennialcoal.com.au

22 April 2021

BY EMAIL

Yula – Punaal Education and Healing Aboriginal Corporation
PO Box 491
Morisset NSW, 2264

Dear Sir / Madam,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

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Yours sincerely

Jeffrey Dunwoodie

Environment & Community Coordinator

Enclosed

- Rock Shelter Monitoring Program (April 2021).

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22 April 2021

BY EMAIL

Ms. Samantha Higgs
Senior Team Leader Aboriginal Cultural Heritage Regulation - North
Heritage NSW
Level 6, 10 Valentine Ave,
Parramatta NSW 2150

Dear Ms Higgs,

Centennial Mandalong – Rock Shelter Monitoring Program for Review

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www.centennialcoal.com.au

James McDonough
Team Leader
Energy, Industry & Compliance
Planning & Assessment

Your reference: Mandalong Rock Shelter Mitigation & Monitoring
Our reference: DOC21/312135-3

By email: james.mcdonough@dpie.nsw.gov.au

Dear Mr McDonough

Advice on Rock Shelter Mitigation Program Requirements – Post Approval SSD - Newly Identified Rock Shelters Aboriginal Cultural heritage - Mandalong SSD-5144

Thank you for your referral uploaded to the Major Projects Portal on 21 April 2021 requesting comment from Heritage NSW (HNSW) in relation to the proposed *Mandalong Mine Rock Shelter Monitoring Program* (RSMP) V2.0 prepared by RPS dated 14 April 2021. An RSMP is required for mitigation, monitoring and management of rock shelters located in the Mandalong South Extension Project (MSEP) SSD-5144. The study area for this RSMP (V2.0) has been limited to the current renumbered longwalls 30 to 31 (LW30-31) extraction plan (EP) area.

It is a condition of consent (Schedule 4 Condition 11) for the Mandalong SSD-5144 Project require that the proponent shall ensure that impacts from the development do not exceed the previously approved predicted impacts and subsidence performance measures. An appropriate method for monitoring and mitigation of rock shelter sites is required as numerous additional rock shelters that have been recorded in areas that had not been previously surveyed for the initial EIS, may now be impacted by cracking and erosion harm by longwall mining.

Aboriginal cultural heritage objects are currently managed by Mandalong Coal Mine under the *Centennial Northern Region Aboriginal Cultural Heritage Management Plan* (ACHMP) 2019. The RSMP, once approved, should be appended to the ACHMP. Consultation with the registered Aboriginal parties (RAPs) is required but there is no evidence that consultation was undertaken during the preparation of the RSMP. Consultation documentation with the RAPs has not been supplied.

RPS identified 15 AHIMS rock shelter sites within the LW30 to LW31 Extraction Plan second workings area:

- 45-3-1228 Moran's Creek Rock Shelter with Art
- 45-3-3513 RPS MAND STH PS28 Rock Shelter with PAD (boulder formation, possible fireplace)
- 45-3-3586 RPS MAND STH PS01 Habitation Structures: two adjacent Rock Overhang/ Boulder Formation
- 45-3-3594 RPS MAND STH PS27 Habitation Structure Rock Overhang
- 45-3-3595 RPS MAND STH PS29 Rock Shelter
- 45-3-3596 RPS MAND STH PS30 Rock Shelter
- 45-3-3639 RPS MAND STH PS02 Aboriginal Resource & Gathering Rock Overhang
- 45-3-3640 RPS MAND STH PS03 Rock Shelter
- 45-3-3641 RPS MAND STH PS04 Rock Shelter
- 45-3-3642 RPS MAND STH PS05 Aboriginal Resource & Gathering Rock Overhang
- 45-3-4544 MS9-RS-3 Rock Shelter with Artefacts, Deposit and Bone

- 45-3-3645 RPS MAND STH PS31 Rock Shelter
- 45-3-4546 MS9-RS-2 Rock Shelter with PAD
- 45-3-4547 MS9-RS-1 Rock Shelter with PAD (PAD 20cm, shell bone, charcoal)
- MS9-OH-1 Rock Overhang

One site within the LW30-31 EP area, Rock Overhang MS9_OH-1, has not been registered on the AHIMS database.

Impacts to Rock Shelter Sites in the LW30-31 Project Area (DGS 2021)

Two Rock Shelter with PAD sites identified by DGS (2021) that may be harmed by cracking within the LW30-31 Extraction Plan area are:

- AHIMS 45-3-3513 RPS MAND STH PS28 Rock Shelter with PAD (boulder formation, possible fireplace)
- AHIMS 45-3-4547 MS9-RS-1 Rock Shelter with PAD (PAD 20cm, shell bone, charcoal).

Five Rock Shelter Overhang sites identified by DGS (2021) that may also be harmed by cracking within the LW30-31 Extraction Plan area are:

- AHIMS 45-3-3639 RPS MAND STH PS02 Aboriginal Resource & Gathering Rock Overhang
- AHIMS 45-3-3642 RPS MAND STH PS05 Aboriginal Resource & Gathering Rock Overhang
- AHIMS 45-3-3586 RPS MAND STH PS01 Habitation Structure (two adjacent Rock Overhangs/ Boulder Formation)
- AHIMS 45-3-3594 RPS MAND STH PS27 Habitation Structure Rock Overhang
- MS9-OH-1 Rock Overhang

Management strategies to identify the risks of direct and indirect impacts to Aboriginal objects to Aboriginal rock shelter and habitation sites are outlined in the RSMP.

Pre-mining Mitigation, Baseline Recording, Monitoring and Post-mining Mitigation

The RSMP proposes phased management and mitigation for the LW30-31 area. Mitigation measures are required for the protection of Aboriginal cultural heritage and should include measures that will provide a greater understanding of how the area was used by Aboriginal people and improve cultural knowledge of these site types in the MSEP.

HNSW Recommendations

The following management measures must be included in the RSMP to ensure appropriate mitigation of any harm to rock shelter sites:

1. Consultation with the registered Aboriginal parties (RAPs) must be undertaken regarding the proposed RSMP protocols and provisions for management and mitigation of Aboriginal rock shelter/habitation structures at Mandalong Mine.
2. Appropriate methodologies for archaeological excavation, baseline recording and monitoring must be developed in consultation with the RAPs and included in the RSMP for management of rock shelters/habitation structures with associated art, deposit, presence of Aboriginal objects or PAD.
3. Detailed archaeological investigation, baseline recording and monitoring for any rock shelters must be conducted prior to subsidence occurring that might affect the integrity of the sites and to manage any potential risk from workplace health and safety issues.

If you have any questions, please contact Gillian Goode, Archaeologist, at Heritage NSW, on 0499 588 790 or gillian.goode@environment.nsw.gov.au.

Yours sincerely

Dr Samantha Higgs
Senior Team Leader
Aboriginal Heritage Regulation Branch - North
Heritage NSW

3 June 2021