

METROPOLITAN COAL LONGWALLS 301-303

HERITAGE MANAGEMENT PLAN



METROPOLITAN COAL

LONGWALLS 301-303

HERITAGE MANAGEMENT PLAN

Revision Status Register

Section/Page/ Annexure	Revision Number	Amendment/Addition	Distribution	DP&E Approval Date
All	HMP-R01-A	Original – Draft for Consultation	OEH, Aboriginal Stakeholders, DP&E	-
All	HMP-R01-B	Minor amendments to reflect comments received on Version A and revised Longwalls 302 and 303 layout	OEH, Aboriginal Stakeholders, DP&E	-
Figure 3	HMP-R01-C	Minor amendment to Figure 3	OEH, Aboriginal Stakeholders, DP&E	11 May 2017*
All	HMP-R01-D	Revised TARP and associated management plan amendments	OEH, Aboriginal Stakeholders, DP&E	-
Preface, 3.2 and 13	HMP-R01-E	Minor amendments	OEH (Regional Operations – Illawarra) & DP&E	-
Table 3	HMP-R01-F	Correction of AHIMS numbers for site FRC 28	OEH (Regional Operations – Illawarra) & DP&E	-
All	HMP-R01-G	Revised Longwalls 301-303 Extraction Plan	OEH (Regional Operations - Illawarra) & DP&E	-

* The approval allows for the extraction of Longwalls 301 and 302 only.

September 2018

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>	
1	INTRODUCTION	1
	1.1 PURPOSE AND SCOPE	1
	1.2 STRUCTURE OF THE HERITAGE MANAGEMENT PLAN	1
2	HERITAGE MANAGEMENT PLAN REVIEW AND UPDATE	5
	2.1 DISTRIBUTION REGISTER	5
3	STATUTORY REQUIREMENTS	6
	3.1 EP&A ACT APPROVAL	6
	3.2 LICENCES, PERMITS AND LEASES	8
	3.3 OTHER LEGISLATION	8
4	REVISED ASSESSMENT OF POTENTIAL ENVIRONMENTAL CONSEQUENCES	9
	4.1 LONGWALLS 301-303 EXTRACTION LAYOUT	9
	4.2 RELEVANT INFORMATION OBTAINED SINCE PROJECT APPROVAL	9
	4.3 ENVIRONMENTAL RISK ASSESSMENT	11
	4.4 ABORIGINAL HERITAGE SITES	13
	4.4.1 Revised Subsidence Predictions	16
	4.4.2 Revised Assessment of Potential Subsidence Impacts and Environmental Consequences	16
5	CONSULTATION PROTOCOL	19
	5.1 IDENTIFICATION OF ABORIGINAL STAKEHOLDERS	19
	5.2 ABORIGINAL STAKEHOLDER PARTICIPATION	19
	5.2.1 Involvement of Aboriginal Stakeholders in Fieldwork	20
	5.2.2 Ongoing Consultation with Aboriginal Stakeholders	20
	5.3 ABORIGINAL STAKEHOLDER ACCESS PROTOCOL	21
6	PERFORMANCE MEASURES AND INDICATORS	21
7	BASELINE DATA	22
8	SUPPLEMENTARY FIELDWORK AND PRE-CLEARANCE SURVEYS	24
	8.1 SUPPLEMENTARY FIELDWORK/INVESTIGATION	24
	8.2 PRE-CLEARANCE SURVEYS	24
	8.3 RECORDING AND REGISTERING NEW ABORIGINAL HERITAGE SITES	25
9	MONITORING	25
10	MANAGEMENT, REMEDIATION AND MITIGATION MEASURES	29
	10.1 MANAGEMENT AND REMEDIATION MEASURES	29
	10.2 MITIGATION MEASURES	30
	10.2.1 Mitigation Measure Consideration and Implementation Process	30
	10.2.2 Consideration of Mitigation Measures for Longwalls 301-303	31
	10.3 SURFACE DISTURBANCE PROTOCOL	32
	10.4 HUMAN SKELETAL MATERIAL PROTOCOL	32
	10.5 CULTURAL AWARENESS PROGRAM	33

TABLE OF CONTENTS (continued)

11	CONTINGENCY PLAN	33
12	FUTURE EXTRACTION PLANS	34
13	ANNUAL REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE	34
14	INCIDENTS	35
15	COMPLAINTS	35
16	NON-COMPLIANCES WITH STATUTORY REQUIREMENTS	36
17	REFERENCES	37

LIST OF TABLES

Table 1	Management Plan Requirements
Table 2	Provisional Extraction Schedule
Table 3	Aboriginal Heritage Sites within 600 m of Longwalls 301-303 Secondary Extraction
Table 4	Revised Subsidence Predictions for Longwalls 301-303 Aboriginal Heritage Sites
Table 5	Aboriginal Heritage Sites Subject to Previous Baseline Recording
Table 6	Aboriginal Heritage Sites Subject to Baseline Recording for Longwalls 301-303
Table 7	Monitoring Pro-forma
Table 8	Trigger Action Response Plan – Aboriginal Heritage Sites Monitoring
Table 9	Potential Management and Remediation Measures
Table 10	Potential Consequences and Mitigation Measures

LIST OF FIGURES

Figure 1	Longwalls 301-303 and Project Underground Mining Area
Figure 2	Known Aboriginal Heritage Sites within Underground Mining Area and Surrounds
Figure 3	Environmental Management Structure
Figure 4	Longwalls 301-303 Known Aboriginal Heritage Sites

LIST OF APPENDICES

Appendix 1	Longwalls 301-303 Baseline Record – Aboriginal Heritage Sites
Appendix 2	Heritage Management Plan – Subsidence Impact Register and Assessment Form
Appendix 3	Contingency Plan Check List

1 INTRODUCTION

Metropolitan Coal is a wholly owned subsidiary of Peabody Energy Australia Pty Ltd (Peabody). Metropolitan Coal was granted approval for the Metropolitan Coal Project (the Project) under section 75J of the New South Wales (NSW) *Environmental Planning and Assessment Act, 1979* (EP&A Act) on 22 June 2009. A copy of the Project Approval is available on the Peabody website (<http://www.peabodyenergy.com>).

The Project comprises the continuation, upgrade and extension of underground coal mining operations (Longwalls 20-27 and Longwalls 301-317) and surface facilities at Metropolitan Coal (Figure 1). Longwalls 301, 302 and 303 (herein referred to as Longwalls 301-303) are situated north of completed Longwalls 20-27 and define the next mining sub-domain within the Project underground mining area (Figures 1 and 2). Longwalls 304 on will be subject to future Extraction Plans.

1.1 PURPOSE AND SCOPE

In accordance with Condition 6, Schedule 3 of the Project Approval, this Heritage Management Plan (HMP) has been prepared as a component of the Metropolitan Coal Longwalls 301-303 Extraction Plan to manage the potential environmental consequences of the Extraction Plan on Aboriginal heritage sites or values.

The relationship of this HMP to the Metropolitan Coal Environmental Management Structure and to the Metropolitan Coal Longwalls 301-303 Extraction Plan is shown on Figure 3.

This HMP includes post-mining monitoring and management of the Aboriginal heritage sites subject to the two previously approved Metropolitan Coal Heritage Management Plans for Longwalls 20-22 and Longwalls 23-27. That is, the Metropolitan Coal Longwalls 20-22 and Longwalls 23-27 Heritage Management Plans will be superseded by this document following the completion of Longwall 27, consistent with the recommended approach in the NSW Department of Planning and Environment (DP&E) and NSW Division of Resources and Energy (DRE) (2015) *Guidelines for the Preparation of Extraction Plans*.

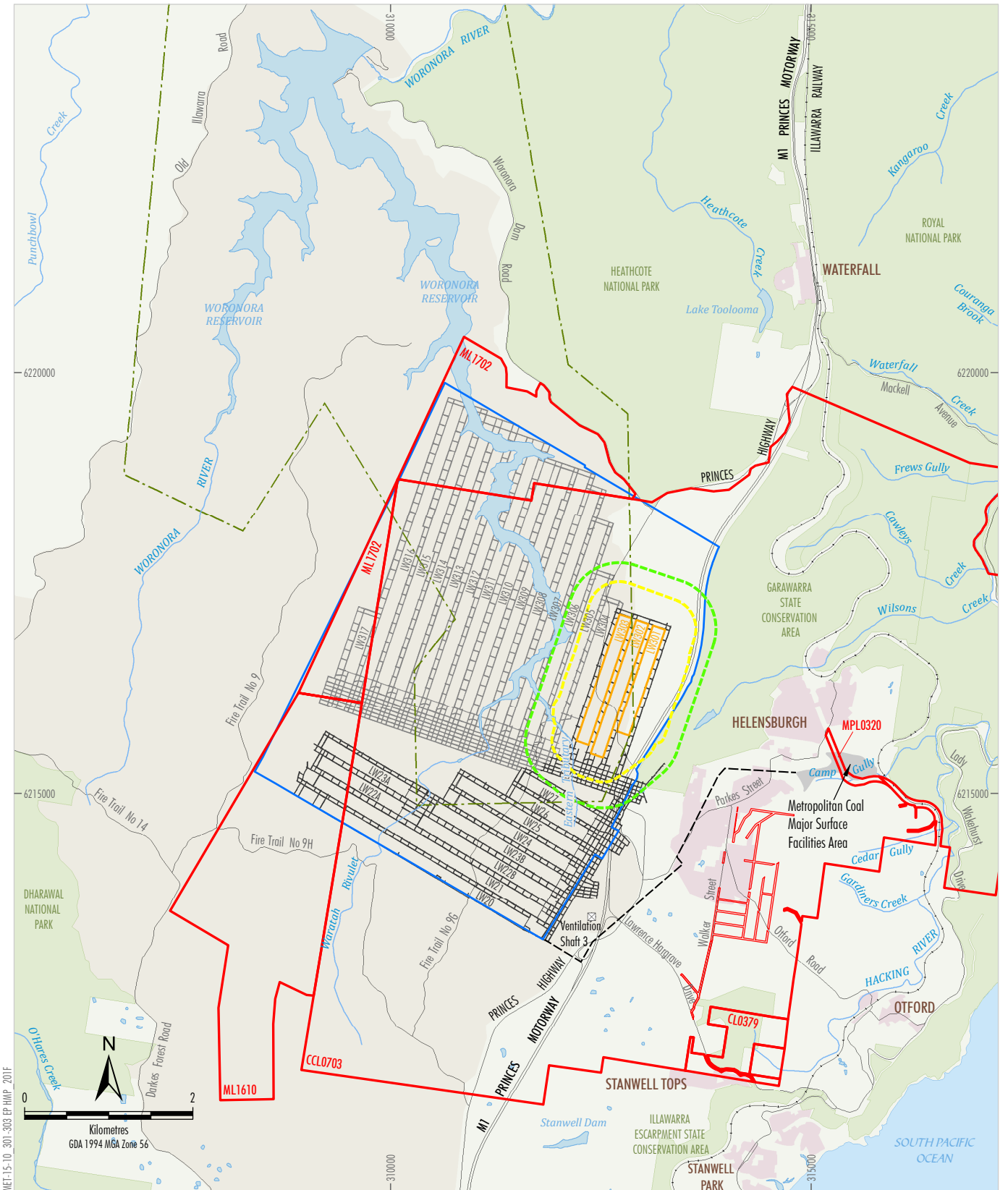
In accordance with Condition 6, Schedule 3 of the Project Approval, this HMP has been prepared by Metropolitan Coal and Niche Environment and Heritage, with assistance from Mine Subsidence Engineering Consultants (MSEC).

1.2 STRUCTURE OF THE HERITAGE MANAGEMENT PLAN

The remainder of the HMP is structured as follows:

- Section 2: Describes the review and update of the HMP.
- Section 3: Outlines the statutory requirements applicable to the HMP.
- Section 4: Provides a revised assessment of the potential subsidence impacts and environmental consequences for Longwalls 301-303.
- Section 5: Describes the consultation protocol.
- Section 6: Details the performance measures and indicators that will be used to assess the Project.
- Section 7: Outlines the baseline data for Aboriginal heritage sites.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 1
Document ID: Heritage Management Plan		



MET-15-10-301-303 EP HMP 201F

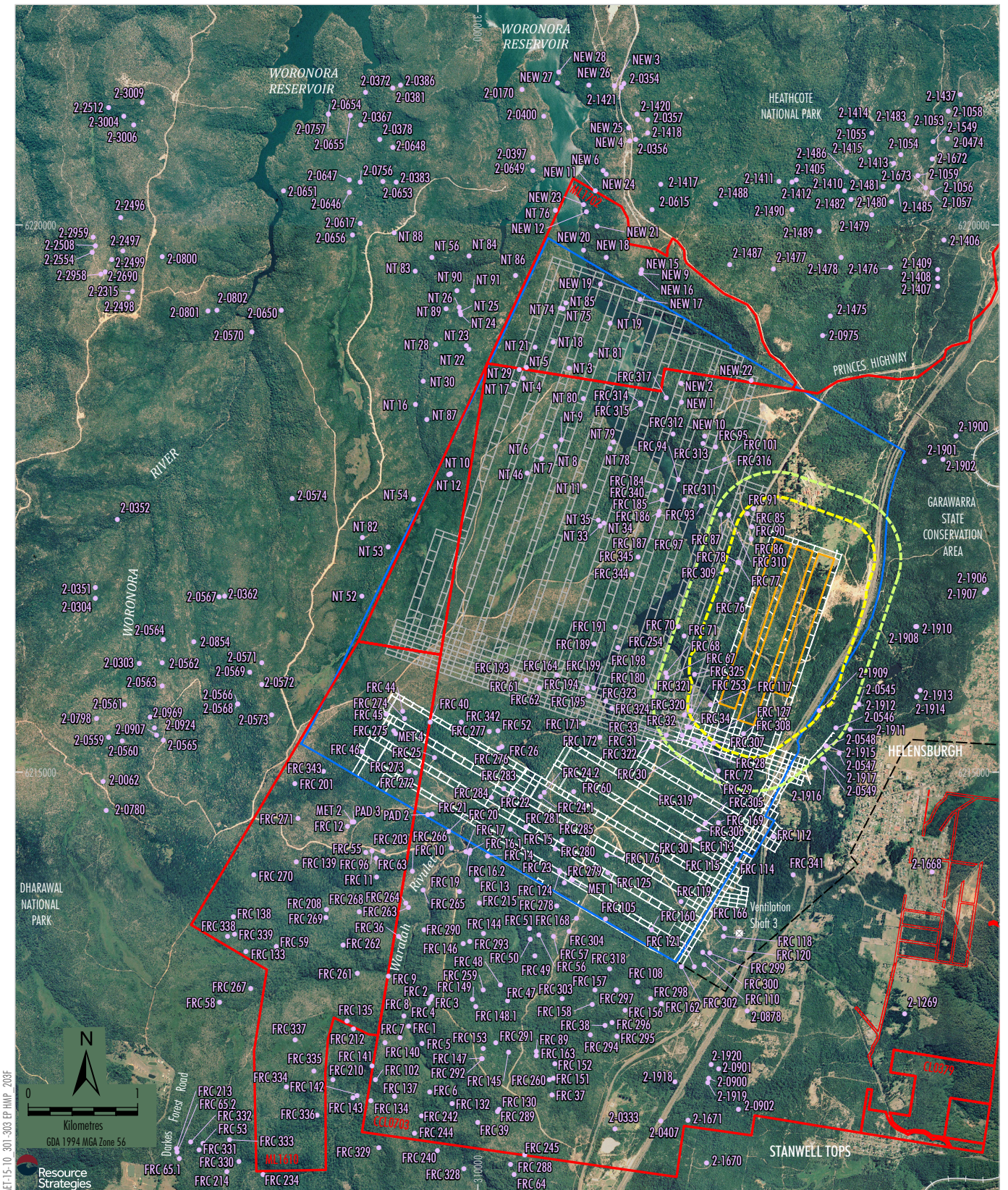
LEGEND

- Mining Lease Boundary
- Woronora Special Area
- Railway
- Project Underground Mining Area
Longwalls 20-27 and 301-317
- Longwalls 301-303 Secondary Extraction
- 35° Angle of Draw and/or Predicted
20 mm Subsidence Contour
- 600 m from Secondary Extraction of
Longwalls 301-303
- Woronora Notification Area
- Existing Underground Access Drive (Main Drift)

Source: Land and Property Information (2015); Department of Industry (2015);
Metropolitan Coal (2018); MSEC (2018)

Peabody
METROPOLITAN COAL
Longwalls 301 - 303 and
Project Underground Mining Area

Figure 1



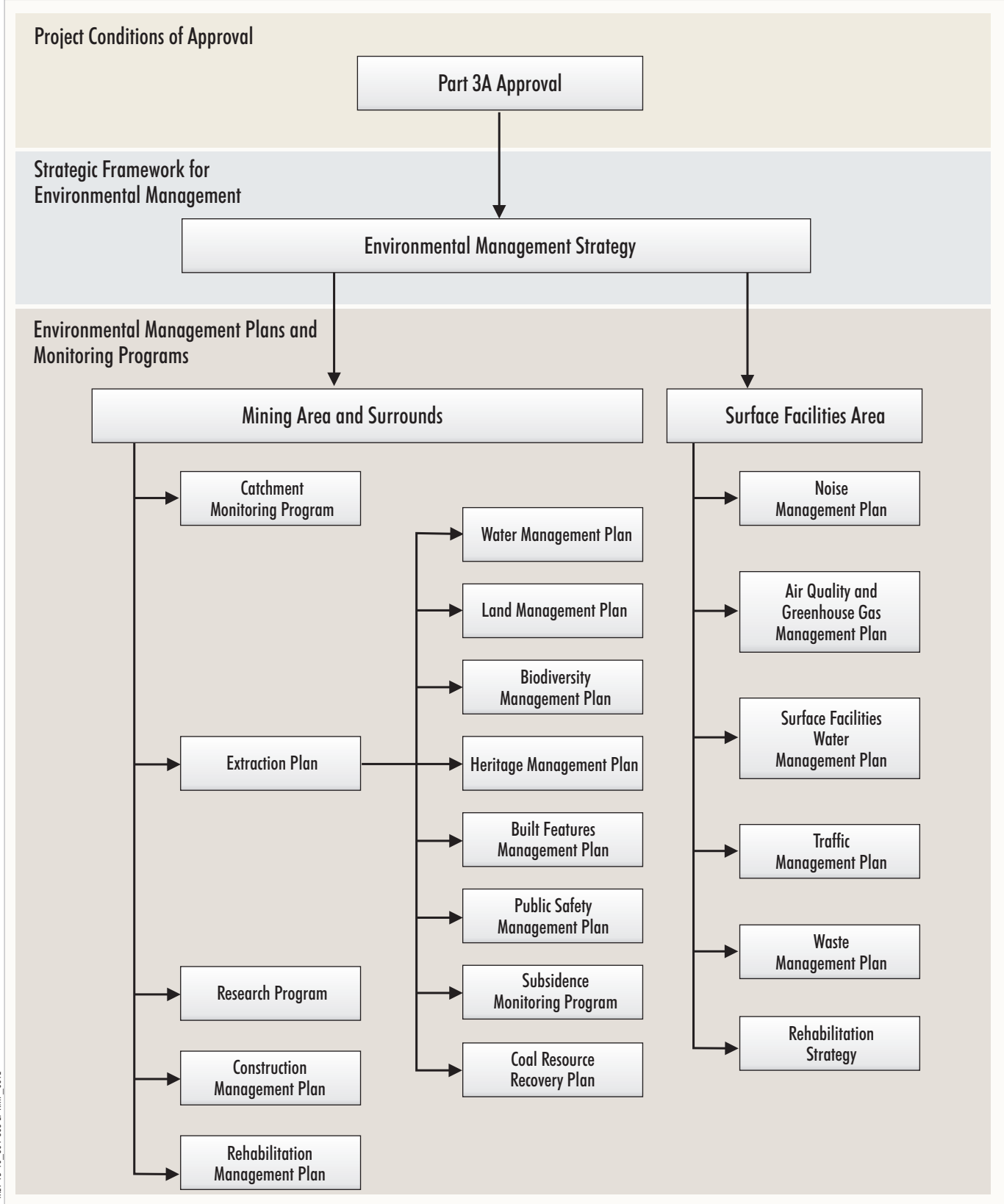
- LEGEND**
- Mining Lease Boundary
 - Railway
 - Project Underground Mining Area
Longwalls 20-27 and 301-317
 - Longwalls 301-303 Secondary Extraction
 - 35° Angle of Draw and/or Predicted
20 mm Subsidence Contour
 - 600 m from Secondary Extraction of
Longwalls 301-303
 - Existing Underground Access Drive (Main Drift)
 - Aboriginal Heritage Site

Source: Land and Property Information (2015); Date of Aerial Photography 1998;
 Department of Industry (2015); Metropolitan Coal (2018); MSEC (2018);
 Illawarra Prehistory Group (2007; 2008); AHIMS (2007); Kayandel
 Archaeological Services (2006; 2007; 2008); Niche Environment and
 Heritage (2013)

Peabody

METROPOLITAN COAL
 Known Aboriginal Heritage Sites
 Within Project Underground Mining Area
 and Surrounds

Figure 2



ME-15-10-301-303 BP HMP_001E

Figure 3

- Section 8: Describes supplementary fieldwork and pre-clearance surveys to be undertaken.
- Section 9: Describes the monitoring program and provides the detailed Trigger Action Response Plan.
- Section 10: Describes the management, remediation and mitigation measures that will be implemented to reduce potential impacts on Aboriginal heritage.
- Section 11: Provides a Contingency Plan to manage any unpredicted impacts and their consequences.
- Section 12: Describes the program to collect baseline data for future Extraction Plans.
- Section 13: Describes the annual review and improvement of environmental performance.
- Section 14: Outlines the management and reporting of incidents.
- Section 15: Outlines the management and reporting of complaints.
- Section 16: Outlines the management and reporting of non-compliances with statutory requirements.
- Section 17: Lists the references cited in this HMP.

2 HERITAGE MANAGEMENT PLAN REVIEW AND UPDATE

In accordance with Condition 4, Schedule 7 of the Project Approval, this HMP will be reviewed within three months of the submission of:

- an audit under Condition 8, Schedule 7;
- an incident report under Condition 6, Schedule 7;
- an annual review under Condition 3, Schedule 7; and

if necessary, revised to the satisfaction of the Director-General (now Secretary) of the DP&E to ensure the HMP is updated on a regular basis and to incorporate any recommended measures to improve environmental performance.

This HMP will also be reviewed within three months of approval of any Project modification and if necessary, revised to the satisfaction of the DP&E.

The revision status of this HMP is indicated on the title page of each copy. The distribution register for controlled copies of the HMP is described in Section 2.1.

2.1 DISTRIBUTION REGISTER

In accordance with Condition 10, Schedule 7 of the Project Approval, 'Access to Information', Metropolitan Coal will make the HMP publicly available on the Peabody website. A hard copy of the HMP will also be maintained at the Metropolitan Coal site.

Metropolitan Coal recognises that various regulators have different distribution requirements, both in relation to whom documents should be sent and in what format.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 5
Document ID: Heritage Management Plan		

An Environmental Management Plan and Monitoring Program Distribution Register has been established in consultation with the relevant agencies and infrastructure owners that indicates:

- to whom the Metropolitan Coal plans and programs, such as the HMP, will be distributed;
- the format (i.e. electronic or hard copy) of distribution; and
- the format of revision notification.

Metropolitan Coal will make the Distribution Register publicly available on the Peabody website.

Metropolitan Coal will be responsible for maintaining the Distribution Register and for ensuring that the notification of revisions is sent by email or post as appropriate.

In addition, Metropolitan Coal employees with local computer network access will be able to view the controlled electronic version of this HMP on the Metropolitan Coal local area network. Metropolitan Coal will not be responsible for maintaining uncontrolled copies beyond ensuring the most recent version is maintained on Metropolitan Coal’s computer system and the Peabody website.

3 STATUTORY REQUIREMENTS

Metropolitan Coal’s statutory obligations are contained in:

- (i) the conditions of the Project Approval;
- (ii) relevant licences and permits, including conditions attached to mining leases; and
- (iii) other relevant legislation.

These are described below.

3.1 EP&A ACT APPROVAL

Condition 6(f), Schedule 3 of the Project Approval requires the preparation of a HMP as a component of Extraction Plan(s) for second workings. Condition 6(f), Schedule 3 states:

SECOND WORKINGS

Extraction Plan

6. *The Proponent shall prepare and implement an Extraction Plan for all second workings in the mining area to the satisfaction of the Director-General. This plan must:*

...

(f) *include a:*

...

- *Heritage Management Plan, which has been prepared in consultation with OEH and the relevant Aboriginal groups, to manage the potential environmental consequences of the Extraction Plan on heritage sites or values;*

In addition, Condition 2, Schedule 7 and Condition 7, Schedule 3 of the Project Approval outline management plan requirements that are applicable to the preparation of the HMP. Table 1 indicates where each component of the conditions is addressed within this HMP.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 6
Document ID: Heritage Management Plan		

**Table 1
Management Plan Requirements**

Project Approval Condition	HMP Section
<p>Condition 2, Schedule 7</p> <p>2. The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:</p> <ul style="list-style-type: none"> a) detailed baseline data; b) a description of: <ul style="list-style-type: none"> • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; d) a program to monitor and report on the: <ul style="list-style-type: none"> • impacts and environmental performance of the project; • effectiveness of any management measures (see c above); e) a contingency plan to manage any unpredicted impacts and their consequences; f) a program to investigate and implement ways to improve the environmental performance of the project over time; g) a protocol for managing and reporting any; <ul style="list-style-type: none"> • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and h) a protocol for periodic review of the plan. 	<p>Section 7</p> <p>Section 3</p> <p>Section 6</p> <p>Section 6</p> <p>Sections 6, 9, 10 and 11</p> <p>Sections 9, 10 and 13</p> <p>Section 11</p> <p>Sections 9 and 13</p> <p>Section 14</p> <p>Section 15</p> <p>Section 16</p> <p>Sections 10, 11 and 16</p> <p>Sections 2 and 13</p>
<p>Condition 7, Schedule 3</p> <p>7. In addition to the standard requirements for management plans (see condition 2 of schedule 7), the Proponent shall ensure that the management plans required under condition 6(f) above include:</p> <ul style="list-style-type: none"> a) a program to collect sufficient baseline data for future Extraction Plans; b) a revised assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this approval; c) a detailed description of the measures that would be implemented to remediate predicted impacts; and d) a contingency plan that expressly provides for adaptive management. 	<p>Section 12</p> <p>Section 4</p> <p>Section 10</p> <p>Section 11</p>

3.2 LICENCES, PERMITS AND LEASES

In addition to the Project Approval, all activities at or in association with Metropolitan Coal will be undertaken in accordance with the following licences, permits and leases which have been issued or are pending issue:

- The conditions of mining leases issued by the DRG (Division of Resources and Geoscience, previously Division of Resources and Energy [DRE]) under the NSW *Mining Act, 1992* (e.g. Consolidated Coal Lease [CCL] 703, Mining Lease [ML] 1610, ML 1702, Coal Lease [CL] 379 and Mining Purpose Lease [MPL] 320).
- The *Metropolitan Coal Mining Operations Plan 1 October 2012 to 30 September 2019* approved by the DRG.
- The conditions of Environment Protection Licence (EPL) No. 767 issued by the NSW Environment Protection Authority (EPA) under the NSW *Protection of the Environment Operations Act, 1997*. Revision of the EPL will be required prior to the commencement of Metropolitan Coal activities that differ from those currently licensed.
- The prescribed conditions of specific surface access leases within CCL 703 for the installation of surface facilities as required.
- Water Access Licences (WALs) issued by the NSW Department of Primary Industries – Water (now the Department of Industry – Water) under the NSW *Water Management Act, 2000*, including WAL 36475 under the *Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011* and WAL 25410 under the *Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011*.
- Mining and workplace health and safety related approvals granted by the NSW Resources Regulator and WorkCover NSW.
- Supplementary approvals obtained from WaterNSW (previously the Sydney Catchment Authority [SCA]) for surface activities within the Woronora Special Area (e.g. fire road maintenance activities).

3.3 OTHER LEGISLATION

Metropolitan Coal will conduct the Project consistent with the Project Approval and any other legislation that is applicable to an approved Part 3A Project under the EP&A Act.

The following Acts may be applicable to the conduct of the Project (Helensburgh Coal Pty Ltd [HCPL], 2008):

- *Contaminated Land Management Act, 1997;*
- *Crown Lands Act, 1989;*
- *Dams Safety Act, 1978;*
- *Dangerous Goods (Road and Rail Transport) Act, 2008;*
- *Energy and Utilities Administration Act, 1987;*
- *Fisheries Management Act, 1994;*
- *Mining Act, 1992;*
- *Noxious Weeds Act, 1993;*
- *Protection of the Environment Operations Act, 1997;*

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 8
Document ID: Heritage Management Plan		

- *Rail Safety (Adoption of National Law) Act, 2012;*
- *Roads Act, 1993;*
- *Biodiversity Conservation Act, 2016;*
- *Water NSW Act, 2014;*
- *Water Act, 1912;*
- *Water Management Act, 2000;*
- *Work Health and Safety Act, 2011;* and
- *Work Health and Safety (Mines and Petroleum Sites) Act, 2013.*

Relevant licences or approvals required under these Acts will be obtained as required.

4 REVISED ASSESSMENT OF POTENTIAL ENVIRONMENTAL CONSEQUENCES

4.1 LONGWALLS 301-303 EXTRACTION LAYOUT

Longwalls 301-303 and the area of land within 600 metres (m) of Longwalls 301-303 secondary extraction are shown on Figures 1, 2 and 4. Longwall extraction will occur from north to south. The longwall layout includes 163 m panel widths (void) with 45 m pillars (solid).

The provisional extraction schedule for Longwalls 301-303 is provided in Table 2.

Table 2
Provisional Extraction Schedule

Longwall	Estimated Start Date	Estimated Duration	Estimated Completion Date
Longwall 301	28 June 2017	8 months	4 February 2018
Longwall 302	29 March 2018	8 months	October 2018
Longwall 303	November 2018	8 months	June 2019

Note the total cumulative predicted subsidence effects, subsidence impacts and/or environmental consequences at the completion of the Project are considered in the Metropolitan Coal Project Environmental Assessment (Project EA) (HCPL, 2008) and the Preferred Project Report (HCPL, 2009), and the cumulative subsidence effects, subsidence impacts and/or environmental consequences on Aboriginal heritage will be assessed in future Extraction Plans.

4.2 RELEVANT INFORMATION OBTAINED SINCE PROJECT APPROVAL

Aboriginal heritage monitoring programs have been implemented at Metropolitan Coal for Longwalls 20-22 (from 2010 to 2014; Round 1, 2 and 3 surveys) (Kayandel Archaeological Services, 2012; Niche Environment and Heritage, 2013, 2015) and Longwalls 23-27 (from 2015; Round 1, 2, 3, 4 and 5 surveys) (Niche Environment and Heritage, 2016a, 2016b, 2017a, 2017b, 2017c) to monitor the impacts and environmental consequences of Project related subsidence on Aboriginal heritage sites. The monitoring program has been undertaken by a suitably qualified archaeologist (with experience in rock art recording and management) and representatives of the Aboriginal stakeholders.

Metropolitan Coal acknowledges that all Aboriginal heritage sites are considered to be culturally significant to the Aboriginal people who have a traditional connection to Country. All Aboriginal heritage sites have been monitored for subsidence impacts by the observation and recording of any and all changes at the sites over the monitoring period.

Of the 52 Aboriginal heritage sites that have been subject to monitoring for Longwalls 20-22 and Longwalls 23-27, 12 have been determined to have changes due to mining induced subsidence.

Five Aboriginal heritage sites (FRC 15, FRC 281, FRC 283, FRC 284 and MET 1) have been determined to have changes due to mining induced subsidence from Longwalls 20-22 (Figure 2). The observed impacts at each site were as follows:

- Site FRC 15 – vertical cracking, not coincident with any art.
- Site FRC 281 – multiple cracks running either through or adjacent to the motifs (although the majority of art showed no damage or changes).
- Site FRC 283 – cracking of the rear wall of the shelter, not coincident with any art.
- Site FRC 284 – fracturing of the rear wall of the shelter and exfoliation, not coincident with any art.
- Site MET 1 – two vertical cracks along the rear wall and ceiling of the shelter, not coincident with any art.

Seven Aboriginal heritage sites (FRC 28, FRC 29, FRC 34, FRC 60, FRC 176, FRC 275 and FRC 301) have been determined to have changes due to mining induced subsidence from Longwalls 23-27 (Figure 2). The observed impacts at each site were as follows:

- Site FRC 28 – vertical cracking of the rear shelter wall, opening of horizontal planes/joints and movement of the rock shelf that is part of the shelter floor, not coincident with any art.
- Site FRC 29 – horizontal crack along the back wall and a joining vertical crack, not coincident with any art.
- Site FRC 34 – horizontal cracking along the roof of the shelter and cracking over the most southern hand stencil on the back panel.
- Site FRC 60 – three vertical cracks along the back wall of the shelter, no art recorded at this shelter, the artefacts could not be relocated.
- Site FRC 176 – where vertical cracking along the northern and southern ends of the shelter was observed, not coincident with art.
- Site FRC 275 – opening of horizontal bedding plane at rear of the shelter, five vertical hairline cracks along the back wall of the shelter, not coincident with any art.
- Site FRC 301 – surface cracking on the rock platform, not coincident with the grinding grooves.

The results of the monitoring program have been used to assess the Aboriginal heritage sites subsidence impact performance measure:

Less than 10% of Aboriginal heritage sites within the mining area are affected by subsidence impacts.

For the purpose of measuring performance against the Aboriginal heritage subsidence impact performance measure (Section 6), Aboriginal heritage sites are considered to be “affected by subsidence impacts” if they exhibit one or more of the following consequences that cannot be attributed to natural weathering or deterioration:

- overhang collapse;
- cracking of sandstone that coincides with Aboriginal art or grinding grooves; and/or
- rock fall that damages Aboriginal art.

Of the sites at which changes due to mining induced subsidence have occurred, only sites FRC 34 and FRC 281 have been affected by subsidence impacts as a result of cracking of sandstone that coincides with Aboriginal art. This means that less than 2% of sites within the mining area have been affected by subsidence impacts (Niche Environment and Heritage, 2017c) (Section 6).

In addition to the changes recorded as a result of mining induced subsidence, natural weathering processes can also result in changes/deterioration of Aboriginal heritage sites. For example, a large block fall was recorded at the southern end of site FRC 24.1 during the Round 2 monitoring for Longwalls 23-27. This change was observed to be due to natural water seepage and vegetation growth (including *Todea Barbara* and *Microsorium scandens*) along the bedding plane where it joins to the roof of the shelter (Niche Environment and Heritage, 2016b). Other examples of natural weathering include micro- and macro-vegetation growth, chemical erosion, fire damage and exfoliation of surfaces (Niche Environment and Heritage, 2016b).

The results of the monitoring to date are consistent with the potential subsidence impacts and environmental consequences predicted in the Project EA and the Preferred Project Report, where it was expected that the majority of identified Aboriginal heritage sites would experience no significant change, particularly when compared to natural weathering processes unrelated to mining and given the conservative nature of the subsidence predictions.

4.3 ENVIRONMENTAL RISK ASSESSMENT

An Environmental Risk Assessment (ERA) was conducted for four of the key component plans of the Metropolitan Coal Longwalls 301-303 Extraction Plan¹ viz. Water Management Plan, Land Management Plan, Biodiversity Management Plan and this HMP to give appropriate consideration to risk assessment and risk management in accordance with the DP&E and DRE (2015) *Guidelines for the Preparation of Extraction Plans*.

The suitably qualified and experienced experts endorsed by the Secretary of the DP&E for the preparation of the Metropolitan Coal Longwalls 301-303 Extraction Plan participated in the ERA². The ERA process involved the key steps described below.

¹ Individual risk assessments have been undertaken separately for the Metropolitan Coal Longwalls 301-303 Built Features Management Plan and the Metropolitan Coal Longwalls 301-303 Public Safety Management Plan, and are reported in their respective documents.

² Participants included Mr Peter DeBono (Mine Subsidence Engineering Consultants, Subsidence), Dr Noel Merrick (HydroSimulations, Groundwater), Mr Lindsay Gilbert (Hydro Engineering & Consulting, Surface Water), Dr David Goldney (Cenwest Environmental Services, Fauna), Dr Colin Bower (FloraSearch, Flora), Mr Jamie Reeves (Niche Environment and Heritage, Heritage), Mr Joshua Hunt (Resource Strategies, Land), Mr Jon Degotardi (Metropolitan Coal) and Mr Ryan Pascoe (Metropolitan Coal).

Review of Relevant Documentation

In preparation for the ERA workshop, the ERA participants reviewed a number of documents relevant to the risk assessment. This included (but was not limited to):

- The *Environmental Risk Analysis* (SP Solutions, 2008) conducted for the Project EA (Appendix O of the Project EA).
- The Preferred Project Report. During the NSW Government's assessment phase of the Project EA, and in recognition of concerns raised by key stakeholders during the formal Planning Assessment Commission (PAC) assessment process, HCPL considered it appropriate to reduce the proposed extent of the original Project longwall mining area (i.e. Longwalls 20-44).

This reduction in the extent of longwall mining resulted in a significant reduction to the extent of potential subsidence effects to the Waratah Rivulet and the Eastern Tributary and a reduction in the consequential potential environmental impacts.

- The revised subsidence predictions and assessments for the approved changes to the first workings layout for Longwalls 301-303 (Metropolitan Coal, 2016a).
 - Following further mine planning investigations, Metropolitan Coal identified that significant operational efficiencies and consequently a significant economic benefit would be achieved by rotating the first workings of Longwalls 301-317 to be square with the 300 Mains (a rotation of approximately six degrees). The Secretary of the DP&E approved the revised first workings in accordance with Condition 5, Schedule 3 of the Project Approval on 20 April 2015.
 - On 5 May 2016, Metropolitan Coal requested the approval of the Secretary of the DP&E to further amend the first workings layout for Longwalls 301-303. The proposed changes to the first workings layout for Longwalls 301-303 were as follows:
 - Longwall 301 – reduce the panel void length from 1,680 metres (m) to 1,428 m, with no change to the tailgate pillar dimensions.
 - Longwall 302 – reduce the panel void length from 2,637 m to 1,954 m, with a reduction in the tailgate pillar width by 25 m for approximately 608 m of the panel length.
 - Longwall 303 – reduce the panel void length from 2,760 m to 2,122 m, with a reduction in the tailgate pillar width by 25 m for approximately 728 m of the panel length.

The changes to the first workings layout for Longwalls 301-303 described above were approved by the Secretary of the DP&E on 16 June 2016.³

Risk Identification

The participants were asked to identify any additional (specific) issues/risks and/or changes to previously assessed levels of risk in preparation for the ERA workshop.

ERA Workshop

The ERA workshop for Longwalls 301-303 was conducted on 21 June 2016 via teleconference. The ERA workshop was facilitated by an independent specialist, Operational Risk Mentoring.

³ Note that subsequent to the completion of the Environmental Risk Assessment, Metropolitan Coal revised the lengths of Longwalls 301-303. The updated longwall layout is shown on the HMP figures.

While the general consensus of the workshop participants was the additional (specific) issues/risks were broadly assessed and ranked as part of the previous *Environmental Risk Analysis* (SP Solutions, 2008), it was considered warranted to assess some specific potential environmental issues (upland swamps and the Eastern Tributary) in further detail focusing on Longwalls 301-303, considering experience to date based on Longwalls 20-27 and other surrounding mines. These were assessed using the same probability, consequence and risk rankings tables as those used in the *Environmental Risk Analysis* (SP Solutions, 2008). The risk rankings undertaken during the ERA indicated that those ranked for Longwalls 301-303 were within the “low” range and the outcomes could continue to be integrated into the overall management systems so that they are effectively reviewed, implemented and monitored (Metropolitan Coal, 2016b).

The ERA indicated that there was no change in the previously assessed risk to Aboriginal heritage sites (Metropolitan Coal, 2016b).

ERA Report Review

All ERA participants were asked to review the draft report that was prepared to summarise the outcomes of the risk assessment workshop. Participants’ comments were incorporated into the final Metropolitan Coal (2016b) report.

This HMP has been prepared to provide for the effective management of subsidence risks.

4.4 ABORIGINAL HERITAGE SITES

The Aboriginal heritage sites identified within 600 m of Longwalls 301-303 secondary extraction are shown on Figure 4 and a summary is provided in Table 3⁴.

**Table 3
Aboriginal Heritage Sites within 600 m of Longwalls 301-303 Secondary Extraction**

AHIMS No.	Site Code	Site Type	Archaeological Significance Rating¹	Sites of Particular Cultural Significance²
52-2-0342* 52-2-0539*	FRC 28	Sandstone overhang with art, artefacts, deposit and/or grinding grooves	Moderate	-
52-2-0155 52-2-0193*	FRC 29	Sandstone overhang with art and PAD	Low	-
52-2-0200 52-2-0339*	FRC 30	Sandstone overhang with art and artefacts	Low	-
52-2-0722	FRC 31	Sandstone overhang with art, artefacts and deposit	Moderate	-

⁴ Site 2-0346 (AHIMS 52-2-0346) was described and assessed for potential subsidence impacts in the Project EA (HCPL, 2008; Kayandel Archaeological Services, 2008) and was reported as being located over Longwall 302. During the baseline recording for Longwalls 301-303, Niche Environment and Heritage undertook a detailed site inspection. Despite searches of all possible locations (based on descriptions in the AHIMS site card and previous assessment reports) and the surrounding area, the site was unable to be relocated in the area described by its previous recorded location. Niche Environment and Heritage has assessed the site record and determined that it refers to the same site as site FRC 93 and hence is located outside of 600 m of Longwalls 301-303 secondary extraction. This site is not considered further in this HMP.

Table 3 (Continued)
Aboriginal Heritage Sites within 600 m of Longwalls 301-303 Secondary Extraction

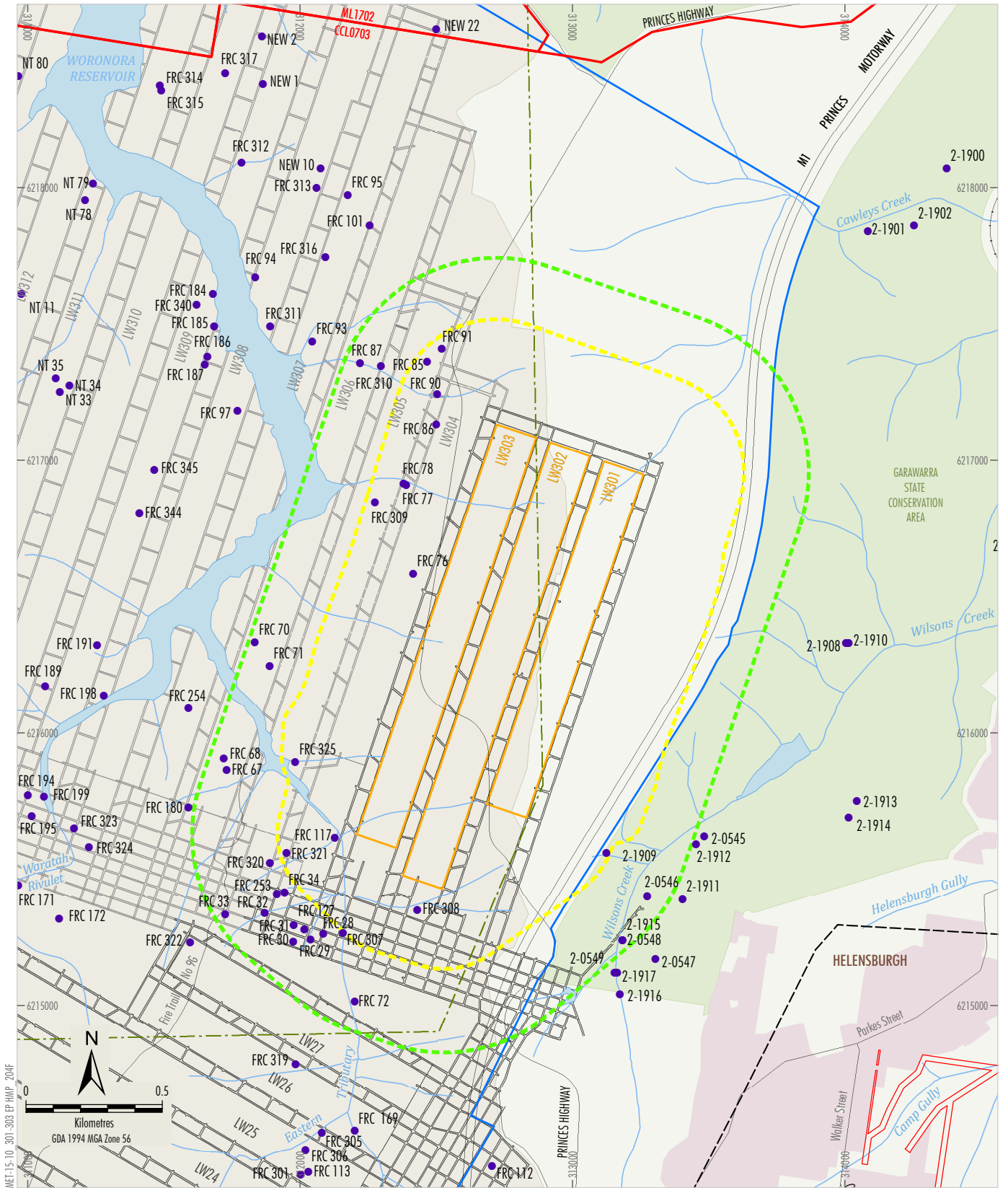
AHIMS No.	Site Code	Site Type	Archaeological Significance Rating ¹	Sites of Particular Cultural Significance ²
52-2-0194	FRC 32	Open site with grinding grooves only	High	-
52-2-0188 52-2-0325*	FRC 33	Open site with grinding grooves only	Low	-
52-2-0195	FRC 34	Sandstone overhang with art, artefacts and deposit	Low	-
52-2-0185	FRC 67	Sandstone overhang with artefacts and deposit	Low	-
52-2-0186 52-2-0326*	FRC 68	Sandstone overhang with art, artefacts and deposit	High	-
52-2-0192	FRC 70	Sandstone overhang with art, artefacts and deposit	Moderate	-
52-2-3510	FRC 71	Sandstone overhang with art only	Low	-
52-2-0199	FRC 72	Sandstone overhang with art, artefacts, deposit and/or grinding grooves	Moderate	-
52-2-0887	FRC 76	Sandstone overhang with art only	Low	-
52-2-0330 52-2-0886*	FRC 77	Sandstone overhang with art, artefacts and deposit	Low	-
52-2-0885	FRC 78	Sandstone overhang with art only	Low	-
52-2-0883	FRC 85	Sandstone overhang with art, artefacts and deposit	Moderate	-
52-2-0207 52-2-0898*	FRC 86	Sandstone overhang with art only	Low	-
52-2-0899	FRC 87	Sandstone overhang with art, artefacts and deposit	Low	-
52-2-0869	FRC 90	Sandstone overhang with artefacts and deposit	Low	-
52-2-0870	FRC 91	Sandstone overhang with art, artefacts and deposit	Low	-
52-2-0739	FRC 117	Sandstone overhang with art and PAD	Low	-
52-2-0203 52-2-0414*	FRC 127	Sandstone overhang with art only	Low	-
52-2-0828	FRC 180	Sandstone overhang with art only	Low	-
52-2-0738	FRC 253	Open site with grinding grooves only	Low	-
52-2-3498	FRC 307	Open site with grinding grooves only	Low	-
52-2-3499	FRC 308	Sandstone overhang with art only	Low	-
52-2-3501	FRC 309	Sandstone overhang with artefacts and deposit	Low	-
52-2-3500	FRC 310	Sandstone overhang with art only	Low	-
52-2-3451	FRC 320	Sandstone overhang with artefacts and deposit	Low	-
52-2-3452	FRC 321	Sandstone overhang with art, artefacts and deposit	Low	-
52-2-3466	FRC 325	Sandstone overhang with art only	Low	-
52-2-0546	2-0546	Sandstone overhang with deposit and art	-	-
52-2-0548	2-0548	Open artefact scatter	-	-
52-2-1909	2-1909	Overhang with art	-	-
52-2-1915	2-1915	Overhang with art	-	-

¹ Sources include: Kayandel Archaeological Services (2006; 2007; 2008) and information available on NSW Office of Environment and Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) Site Cards.

² As determined by the Aboriginal stakeholders as part of the Project Aboriginal Cultural Heritage Assessment (Kayandel Archaeological Services, 2008).

* Single Aboriginal heritage site registered more than once on the AHIMS database (Illawarra Prehistory Group, 2007).

PAD – Potential Archaeological Deposit.



MEF-15-10-301-303 EP HMP 204F

LEGEND

- Mining Lease Boundary
- Woronora Special Area
- Railway
- Project Underground Mining Area Longwalls 20-27 and 301-317
- Longwalls 301-303 Secondary Extraction
- 35° Angle of Draw and/or Predicted 20 mm Subsidence Contour
- 600 m from Secondary Extraction of Longwalls 301-303
- Existing Underground Access Drive (Main Drift)
- Woronora Notification Area
- Aboriginal Heritage Site

Source: Land and Property Information (2015); Department of Industry (2015); Metropolitan Coal (2018); MSEC (2018); Illawarra Prehistory Group (2007; 2008); AHIMS (2007); Kayandel Archaeological Services (2006; 2007; 2008); Niche Environmental and Heritage (2013)

Peabody
 METROPOLITAN COAL
 Longwalls 301 - 303
 Known Aboriginal Heritage Sites

Figure 4

4.4.1 Revised Subsidence Predictions

The subsidence predictions for Longwalls 301-303 in relation to Aboriginal heritage sites within the 35° angle of draw and/or predicted 20 mm subsidence contour have been prepared by MSEC (2018). Table 4 compares the revised subsidence predictions for the Longwalls 301-303 Extraction Plan with the subsidence predictions for the Preferred Project Layout (at the completion of Longwall 303).

There is a slight increase in the maximum predicted vertical subsidence at four of the Aboriginal heritage sites based on the Extraction Plan layout. There is an increase of 25 mm at site FRC 76 and of 10 mm at sites FRC 77, FRC 78, and FRC 309 (Table 4). The predicted tilt and curvatures based on the Extraction Plan layout are either the same or less than those based on the Preferred Project Layout (Table 4).

The grinding groove site (FRC 307) is located in the base of the Eastern Tributary and is likely to experience valley closure due to the extraction of Longwalls 301 to 303. The predicted total closure at this site is 130 mm, however the compressive strain due to valley closure is predicted to be less than 1.0 mm/m.

Based on the revised subsidence predictions, Section 4.4.2 provides a revised assessment of predicted subsidence impacts and environmental consequences on Aboriginal heritage sites.

4.4.2 Revised Assessment of Potential Subsidence Impacts and Environmental Consequences

The Project EA Subsidence Assessment (MSEC, 2008) provided a description of the general impacts on Aboriginal heritage sites (including open sites and sandstone overhang sites) in the Southern Coalfield as a consequence of longwall mining.

The maximum predicted subsidence parameters for the Aboriginal heritage sites, based on the Extraction Plan Layout, are similar to or slightly less than the maxima predicted based on the Preferred Project Layout. At some locations the predicted subsidence parameters are slightly higher than the parameters for the Preferred Project Layout, however the differences do not change the impact assessment provided in the Project EA or the Preferred Project Report.

The following provides a summary of potential impact mechanisms and any changes to the predicted subsidence impacts and environmental consequences due to the revised subsidence predictions for Longwalls 301-303.

Open Sites

One open site is located within the Longwalls 301-303 35° angle of draw and/or predicted 20 mm subsidence contour, namely site FRC 307 (an open site with grinding grooves). Open sites have the potential to be impacted by the cracking of sandstone resulting from mine subsidence.

Based on the predicted subsidence parameters described in Section 4.4.1, potential subsidence impacts to site FRC 307 are considered unlikely (MSEC, 2018).

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 16
Document ID: Heritage Management Plan		

Table 4
Revised Subsidence Predictions for Longwalls 301-303 Aboriginal Heritage Sites

Aboriginal Heritage Sites ¹	Maximum Predicted Subsidence ² (mm)		Maximum Predicted Tilt ³ (mm/m)		Maximum Predicted Hogging Curvature ⁴ (km ⁻¹)		Maximum Predicted Sagging Curvature ⁴ (km ⁻¹)		Maximum Predicted Conventional Tensile Strain ⁵ (mm/m)		Maximum Predicted Conventional Compressive Strain ⁵ (mm/m)	
	PPL (LW301-303) ⁶	Extraction Plan Layout (LW301-303) ⁷	PPL (LW301-303) ⁶	Extraction Plan Layout (LW301-303) ⁷	PPL (LW301-303) ⁶	Extraction Plan Layout (LW301-303) ⁷	PPL (LW301-303) ⁶	Extraction Plan Layout (LW301-303) ⁷	PPL (LW301-303) ⁶	Extraction Plan Layout (LW301-303) ⁷	PPL (LW301-303) ⁶	Extraction Plan Layout (LW301-303) ⁷
Open Sites												
FRC 307	20	<20	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
Sandstone Overhangs												
2-1909	<20	<20	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 76	100	125	1.0	0.5	0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 77	40	50	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 78	40	50	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 85	40	<20	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 86	60	40	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 90	60	<20	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 91	50	<20	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 117	200	20	2.0	<0.5	<0.01	<0.01	0.02	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 308	30	20	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 309	20	30	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 321	<20	<20	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5
FRC 325	30	30	<0.5	<0.5	<0.01	<0.01	<0.01	<0.01	<0.5	<0.5	<0.5	<0.5

Source: After MSEC (2018).

¹ Aboriginal heritage sites within the Longwalls 301-303 35° angle of draw and/or predicted 20 mm subsidence contour.

² Subsidence refers to vertical displacements of the ground.

³ Tilt is the change in the slope of the ground as a result of differential subsidence, and is calculated as the change in subsidence between two points divided by the distance between those points.

- 4 Curvature is the second derivative of subsidence, the rate of change of tilt, and is calculated as the change in tilt between two adjacent sections of the tilt profile divided by average length of those sections.
- 5 Conventional strain based on 15 times curvature. Strain is the relative differential horizontal movements of the ground. Tensile strains occur where the distance between two points increases and compressive strains occur when the distance between two points decreases.
- 6 PPL – after completion of Longwall 303 of the Preferred Project Layout.
- 7 Extraction Plan Layout – after completion of Longwall 303 of the Extraction Plan layout (Longwalls 301-303)

mm = millimetres

mm/m= millimetres per metre

km⁻¹ =1/kilometres

Sandstone Overhang Sites

There are 13 sandstone overhang sites located within the Longwalls 301-303 35° angle of draw and/or predicted 20 mm subsidence contour. Overhang sites can potentially be impacted by the cracking of sandstone. Where cracking is coincident with an overhang, it is possible there could be an isolated rock fall as the result of mining, or in extreme cases, collapse (MSEC, 2018).

Of the 13 sites with overhangs, six have art only and seven have art and/or artefacts and/or PAD. All of the overhang sites are located above solid coal. That is, none are located directly over Longwalls 301-303. Based on the very low magnitude of predicted subsidence parameters, impacts to these sites resulting from the extraction of Longwalls 301-303 are considered unlikely. Surface fracturing of the bedrock can occur outside the longwall layouts, however such fracturing is minor and isolated and the likelihood of fracturing impacting the Aboriginal heritage sites outside the longwall layouts is considered to be low (MSEC, 2018).

5 CONSULTATION PROTOCOL

5.1 IDENTIFICATION OF ABORIGINAL STAKEHOLDERS

For the purpose of this HMP, Aboriginal stakeholders are defined as being those Aboriginal groups/parties who have previously registered an interest in being consulted in relation to the Project or who have been involved on an ongoing basis at Metropolitan Coal. These Aboriginal stakeholders include the following:

- Cubbitch Barta Native Title Claimants;
- Illawarra Local Aboriginal Land Council;
- Korewal Elouera Jerrungurah Tribal Elders Corporation;
- Mr Gary Caines;
- La Perouse Botany Bay Aboriginal Corporation;
- Woronora Plateau Gundungara Elders Councils;
- Northern Illawarra Aboriginal Collective, including representatives from:
 - Wadi Wadi Coomaditchie Aboriginal Corporation;
- Tharawal Local Aboriginal Land Council; and
- Wodi Wodi Elders Corporation.

5.2 ABORIGINAL STAKEHOLDER PARTICIPATION

Metropolitan Coal is committed to maintaining ongoing consultation with Aboriginal stakeholders throughout the life of the Project; however, it is the responsibility of Aboriginal stakeholders to ensure that up-to-date contact details (full name, postal address, telephone number, and where possible, email address) are provided to Metropolitan Coal.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 19
Document ID: Heritage Management Plan		

5.2.1 Involvement of Aboriginal Stakeholders in Fieldwork

The number of participants in an effective field team is governed by a number of safety, logistic and access considerations, including:

- **Safety:** a large group can be difficult to keep together when moving through dense vegetation in steep terrain as is the case across the majority of the Project underground mining area. Large groups move slowly (especially through dense vegetation and in steep terrain) and can prevent a rapid response (i.e. evacuation) to imminent dangers that can often be encountered in the Project underground mining area (e.g. bush fire warnings and electrical storms).
- **Logistics:** Participant numbers are limited by vehicle availability and safety restrictions. The isolated nature of the area above the Project underground mining area requires the use of vehicles for efficient field work.
- **Access Restrictions:** Areas within the Project underground mining area are located within a WaterNSW Schedule One special area. Public access is controlled in this area to protect water quality and ecological integrity (WaterNSW and OEH, 2015). Excessive access into this area is not consistent with the WaterNSW's *Special Areas Strategic Plan of Management* (WaterNSW and OEH, 2015).

Aboriginal stakeholders will be invited to attend relevant scheduled fieldwork in consideration of the above.

Scheduled fieldwork to which Aboriginal stakeholders may be invited to attend includes:

- Aboriginal heritage monitoring (Section 9);
- supplementary fieldwork (Section 8); and
- the planning for and/or implementation of management and mitigation measures (Section 10).

Invitations to attend scheduled fieldwork will be provided in writing with at least 5 business days notice. Dates for undertaking fieldwork will be subject to consultation with Aboriginal stakeholders and archaeologists.

Prior to undertaking fieldwork, all participating Aboriginal stakeholders and archaeologists will be required to comply with Metropolitan Coal's workplace health and safety requirements. These requirements include the provision of copies of current relevant insurances (i.e. public liability and workers compensation) and appropriate personal protection equipment.

All Metropolitan Coal staff and contractors (including Aboriginal stakeholders and archaeologists) may be subject to random drug and alcohol testing. All Metropolitan Coal staff and contractors (including Aboriginal stakeholders and archaeologists) must be able bodied and fit to undertake the work required.

5.2.2 Ongoing Consultation with Aboriginal Stakeholders

Metropolitan Coal will maintain a consultation log to record all correspondence with Aboriginal stakeholders (e.g. emails, telephone calls, letters, meeting minutes, etc.).

Aboriginal stakeholders will be invited to comment on relevant draft documentation regarding the management of Aboriginal cultural heritage, if and when required.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 20
Document ID: Heritage Management Plan		

Aboriginal stakeholders will be notified of any material changes to the HMP. In the context of this HMP, a material change would include any change that affects the management of Aboriginal cultural heritage associated with Metropolitan Coal. Examples of a material change in the context of this HMP include:

- Any change to the monitoring program methodology (e.g. monitoring frequency or parameters).
- Any change to the available remediation or mitigation measures (e.g. proposed use of a new engineering technology to reduce potential consequences).
- Any change to the surface disturbance protocol.

5.3 ABORIGINAL STAKEHOLDER ACCESS PROTOCOL

In addition to scheduled field activities, Aboriginal stakeholders may apply to WaterNSW or other landholders for access to Aboriginal heritage sites within the larger Project area (e.g. for personal, spiritual or cultural reasons). Metropolitan Coal will endeavour to facilitate the requested access, consistent with personnel workplace health and safety requirements and associated landholder requirements.

6 PERFORMANCE MEASURES AND INDICATORS

The Project Approval requires Metropolitan Coal to achieve the Aboriginal heritage sites subsidence impact performance measure outlined in Table 1 of Condition 1, Schedule 3 of the Project Approval:

Less than 10% of Aboriginal heritage sites within the mining area are affected by subsidence impacts.

Metropolitan Coal will assess the Project against the following performance indicator to allow early recognition of mining impacts:

Less than 7% of Aboriginal heritage sites within the mining area are affected by subsidence impacts.

Aboriginal sites are subject to ongoing natural deteriorating processes unrelated to mining, including impacts from tree roots, natural weathering or deterioration, natural cracking of sandstone and inappropriate visitor behaviour (Lambert, 1989). Limited long term studies have been undertaken on subsidence impacts to overhangs in the NSW Southern Coalfields and as the internal structures of overhangs (e.g. existing bedding, cracking and seepage) are not always observable, not all risks to shelters from mining can be identified. This makes it problematic to clearly differentiate between subsidence impacts and natural impacts.

Section 9 describes the monitoring program and detailed Trigger Action Response Plan (TARP) that will be used to assess the Project against the Aboriginal heritage sites performance indicator and Aboriginal heritage sites subsidence impact performance measure. As described in Section 9, a Heritage Management Plan – Subsidence Impact Register (provided in Appendix 2) will be used to progressively monitor the cumulative number and percentage of Aboriginal heritage sites affected by subsidence impacts.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 21
Document ID: Heritage Management Plan		

For the purpose of measuring performance against the Aboriginal heritage sites performance indicator and subsidence impact performance measure, sites are considered to be “affected by subsidence impacts” if they exhibit one or more of the following consequences that cannot be attributed to natural weathering or deterioration:

- overhang collapse;
- cracking of sandstone that coincides with Aboriginal art or grinding grooves; and
- rock fall that damages Aboriginal art.

There are 143 Aboriginal heritage sites (142 sites identified in the Project EA and one new site [MET 4] identified during Round 2 monitoring for Longwalls 20-22) within the mining area. The mining area is defined by the Project Approval and is shown on Figure 1 of this HMP (labelled as Project Underground Mining Area Longwalls 20-27 and 301-317).

As described in Section 10, in the event that any subsidence impact is recorded, consideration would be given to implementing appropriate management, remediation and/or mitigation measures in consultation with the OEH and the Aboriginal stakeholders. In the event the Aboriginal heritage sites subsidence impact performance measure is exceeded, Metropolitan Coal will notify the DP&E, OEH and Aboriginal stakeholders as soon as practicable after Metropolitan Coal becomes aware of the exceedance and the Contingency Plan (Section 11) will be implemented.

As indicated in Section 4.2, Metropolitan Coal acknowledges that all Aboriginal heritage sites are considered to be culturally significant to the Aboriginal people who have a traditional connection to Country.

7 BASELINE DATA

Baseline recording of Aboriginal heritage sites for Longwalls 20-22 and Longwalls 23-27 has been conducted by Kayandel Archaeological Services or Niche Environment and Heritage. The sites that were subject to detailed baseline recording (where the sites were able to be relocated) are listed in Table 5.

A number of the Aboriginal heritage sites that have been subject to baseline recording for Longwalls 23-27 are located within 600 m of Longwalls 301-303 secondary extraction. These sites are shaded in Table 5.

Table 5
Aboriginal Heritage Sites Subject to Previous Baseline Recording

Sites Subject to Baseline Recording for Longwalls 20-22				
FRC 10	FRC 12	FRC 13	FRC 14	FRC 15
FRC 16.1	FRC 16.2	FRC 17	FRC 19	FRC 20
FRC 21	FRC 22	FRC 23	FRC 24.1	FRC 24.2
FRC 25	FRC 26	FRC 40	FRC 44	FRC 45
FRC 46	FRC 49	FRC 50	FRC 51	FRC 52
FRC 55	FRC 56	FRC 57**	FRC 60	FRC 63
FRC 96	FRC 105	FRC 108	FRC 110	FRC 113
FRC 114	FRC 115	FRC 118	FRC 119	FRC 120
FRC 121	FRC 124	FRC 125	FRC 156	FRC 157
FRC 160	FRC 162	FRC 166	FRC 168**	FRC 176
FRC 203	FRC 215	FRC 265	FRC 266	FRC 272
FRC 273	FRC 274	FRC 275	FRC 276	FRC 277
FRC 278	FRC 279	FRC 280	FRC 281	FRC 283
FRC 284	FRC 285	FRC 297	FRC 298	FRC 299
FRC 300	FRC 301	FRC 302	FRC 304	FRC 306**
FRC 318	FRC 342	FRC 343	MET 1	MET 2
PAD 2	PAD 3	MET 4*		
Sites Subject to Baseline Recording for Longwalls 23-27				
FRC 62	FRC 112	FRC 169	FRC 171	FRC 172
FRC 305	FRC 319	FRC 322	FRC 28	FRC 29
FRC 30	FRC 31	FRC 32	FRC 33	FRC 34
FRC 67	FRC 68	FRC 72**	FRC 117	FRC 127
FRC 180**	FRC 194	FRC 195	FRC 199	FRC 253
FRC 307	FRC 308	FRC 320	FRC 321	FRC 323
FRC 324				

Sites located within 600 m of Longwalls 301-303 secondary extraction.

* Site MET 4 was recorded during Round 2 monitoring for Longwalls 20-22. This site has been registered on AHIMS and has been subject to monitoring.

** Despite extensive searches, this site was unable to be relocated during baseline recording.

Baseline recording of 14 Aboriginal heritage sites (i.e. sites located within 600 m of Longwalls 301-303 secondary extraction not subject to baseline recording for Longwalls 23-27) has been conducted by Niche Environment and Heritage for Longwalls 301-303⁵. The sites subject to baseline recording for Longwalls 301-303 are listed in Table 6.

⁵ Detailed baseline recording of sites 2-0546, 2-0548, 2-1909 and 2-1915 was not completed for this HMP. Sites 2-0546, 2-0548 and 2-1915 are located outside of the 35° angle of draw and predicted 20 mm subsidence contour (Figure 4). Site 2-1909 is predicted to experience less than 20 mm of subsidence, less than 0.5 mm of tilt, and less than 1.01 km⁻¹ hogging and sagging curvature (MSEC, 2018). Notwithstanding, site cards have been completed and registered on the AHIMS database for all of these sites.

Table 6
Aboriginal Heritage Sites Subject to Baseline Recording for Longwalls 301-303

Sites Subject to Baseline Recording for Longwalls 301-303				
FRC 70	FRC 71	FRC 76	FRC 77	FRC 78
FRC 85	FRC 86	FRC 87	FRC 90	FRC 91
FRC 93*	FRC 309	FRC 310	FRC 325	

* As indicated in Table 4, this site is located outside of 600 m of Longwalls 301-303 secondary extraction. However, this site was subject to baseline recording following a detailed search for previously reported site 2-0346 (which has been confirmed to be a duplicate of FRC 93 with erroneous coordinates) and hence has been included in the baseline record in Appendix 1 for completeness.

The baseline record for the 14 Aboriginal heritage sites is provided in Appendix 1. The baseline record includes:

- a photographic record of each Aboriginal heritage site;
- detailed scaled plans of each site including physical characteristics and features; and
- detailed information regarding the dimensions, composition and features of the site.

8 SUPPLEMENTARY FIELDWORK AND PRE-CLEARANCE SURVEYS

8.1 SUPPLEMENTARY FIELDWORK/INVESTIGATION

Supplementary Aboriginal heritage fieldwork may be undertaken over the life of the Project to inform the management and monitoring of Aboriginal heritage sites.

8.2 PRE-CLEARANCE SURVEYS

Pre-clearance surveys may be required to be undertaken in the Project underground mining area to identify the most appropriate location for required Project infrastructure. Pre-clearance surveys will involve the following:

1. Developing an inventory of surface infrastructure required and conducting an initial desktop risk assessment based on the location of known sites.
2. Undertaking a pre-clearance survey (if required⁶) of the proposed site(s) for surface infrastructure by an appropriately qualified and experienced archaeologist.
3. Assessing potential impacts to nearby Aboriginal heritage site(s) based on the results of the pre-clearance surveys and determining the most appropriate location for required surface infrastructure.
4. Where practicable, surface infrastructure will be located so as to avoid or minimise impacts to Aboriginal heritage sites. If impacts cannot be avoided, appropriate management and/or mitigation measures will be undertaken (Section 10).

Where Aboriginal heritage sites are located close to required surface disturbance works, the surface disturbance protocol (described in Section 10.3) will be undertaken.

⁶ A pre-clearance survey would not be required if the area has been previously surveyed or if, in the opinion of an appropriately qualified archaeologist, contains limited archaeological potential.

8.3 RECORDING AND REGISTERING NEW ABORIGINAL HERITAGE SITES

Any previously unrecorded Aboriginal heritage sites identified during fieldwork (e.g. baseline recording, supplementary fieldwork, pre-clearance surveys, monitoring, follow-up inspections to assess the effectiveness of mitigation/management/remediation measures, etc.) would be recorded using the standard OEH site card. This information would be submitted to the OEH for registration on the AHIMS database. Any previously unrecorded sites would also be subject to archaeological and cultural significance assessment, in consultation with Aboriginal stakeholders. Any previously unrecorded sites would be managed in accordance with the requirements of this HMP.

9 MONITORING

A monitoring program will be implemented to monitor subsidence impacts and environmental consequences of Project related subsidence on Aboriginal heritage sites.

Monitoring of the Longwalls 20-27 Aboriginal heritage sites at which previous monitoring indicates continued change due to mining induced subsidence, will be monitored as a component of this HMP. The sites that show continued change due to mining induced subsidence has been determined by the Round 5 monitoring survey for Longwalls 23-27 (undertaken between 3 and 6 months following the completion of Longwall 27 in accordance with the Longwalls 23-27 HMP). The Aboriginal heritage sites that show continued change by the Round 5 monitoring survey are sites MET 1 and FRC 176. Sites FRC 28, FRC 29, FRC 34 and FRC 60 were observed to have shown change for the first time during the Round 5 survey (Niche Environment & Heritage, 2017c). These sites will be monitored within three months of the completion of Longwall 303.

All sites located within the Longwalls 301-303 35° angle of draw and/or predicted 20 mm subsidence contour, with the exception of sites FRC 76 and FRC 117, are predicted to experience maximum tilts, curvatures and strains that are less than typical magnitudes of subsidence survey accuracy (i.e. conventional tilt of less than 0.5 mm/m, conventional curvature of less than 0.01 km⁻¹ hogging and sagging). The maximum predicted subsidence at these sites at the completion of Longwall 303 extraction is 125 mm at site FRC 76, with predicted subsidence being 50 mm or less at all other sites (as detailed in Table 4 in Section 4.4.1). The majority of these Aboriginal heritage sites are located to the west of Longwall 303, overlying Longwalls 304 and 305 (Figure 4). Detailed baseline recording has been completed for these sites and is provided in Appendix 1. These sites will be monitored as a component of the next Extraction Plan.

Monitoring of the following Aboriginal heritage sites will be undertaken for Longwalls 301-303, within three months of the completion of Longwall 303 (Figure 4):

- FRC 76 (sandstone overhang with art only).
- FRC 117 (sandstone overhang with art and PAD).

Monitoring of sites FRC 76 and FRC 117 will also be undertaken as a component of the next Extraction Plan (i.e. Longwall 304 onwards).

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 25
Document ID: Heritage Management Plan		

The monitoring team will include a suitably qualified archaeologist (with experience in rock art recording and management) and representatives of the Aboriginal stakeholders (where available) (Section 5.1). Specific details that will be recorded during the monitoring program include (but are not limited to):

- the date of monitoring;
- the location of longwall extraction (i.e. the longwall chainage) at the time of monitoring;
- comparison of the physical characteristics of the site at the time of monitoring against the previous monitoring and the baseline record (detail/quantify any changes observed);
- inspections of rock surfaces for cracking and/or exfoliation and/or blockfall since the previous monitoring and against the baseline record;
- inspection of art motifs for damage or deterioration since the previous monitoring and against the baseline record;
- identification of any natural weathering processes that may result in deterioration (e.g. fire, vegetation growth and water seepage);
- detailed description and quantification of any changes noted during the completion of the above tasks;
- a photographic record of any changes noted during monitoring (taken at the same position and distance as baseline record to allow comparison over time);
- whether any follow-up actions are required to be considered (e.g. implementation of management or initiation of the Contingency Plan, etc.); and
- any other relevant information.

An example monitoring *pro forma* detailing the minimum recording requirements during monitoring is provided as Table 7.

A summary of the information collected during monitoring will be recorded in the Heritage Management Plan – Subsidence Impact Register (provided in Appendix 2) and reported in accordance with the Project Approval conditions. At the completion of monitoring, a report will be prepared and distributed to the OEH and each of the Aboriginal stakeholders. The report will include the following:

- a map of the area and the location of Aboriginal heritage sites monitored;
- a table outlining the dates on which each site was monitored and which Aboriginal stakeholders were present;
- a table outlining sites at which change has been noted and the nature and degree of change;
- a summary of comments made by Aboriginal stakeholders present during monitoring regarding:
 - the degree and nature of change to sites; and
 - proposed recommendations;
- general observations made during the monitoring; and
- recommendations for future monitoring.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 26
Document ID: Heritage Management Plan		

**Table 7
Monitoring Pro-forma**

Site Details						
Site Name			AHIMS Site Number			
Site Type						
GPS Details (GDA94)	Easting		Northing			
Recording Details						
Baseline Recording			Date/time			
Previous Monitoring			Date/time			
Current Monitoring			Date/time			
Archaeological Features						
Previously Identified						
Re-recorded						
Additional Located	(attach recording form)					
Site Condition						
Overall						
Rock surfaces						
Archaeological Feature/s						
Change in vegetation, erosion, soil level or hydrological features						
Observed Change						
Change Type	(e.g. cracking, collapse, exfoliation, segmented detachment, step cracking, platform separation, increased moisture flow)					
Location	(map location of damage within site)					
Dimensions (mm)	Length		Width		Depth/Height	
Comments	(e.g. has the archaeological feature been affected? is the damage new? has damage increased since previous monitoring?)					
Observed Natural Disturbance Processes						
Insects			Weathering			
Animals			Water-wash			
Vegetation			Exfoliation			
Microvegetals			Salts			
Siltation						
Comments						
Recommendations						
Further Monitoring						
Management						
Attach photographs and drawings of changes in site condition, subsidence damage, natural damage and any additional archaeological features. Photos should be taken from the same position and distance as the baseline record to allow comparison over time.						

The monitoring results will be used to assess the Project against the Aboriginal heritage sites performance indicator and subsidence impact performance measure (described in Section 6) in accordance with the detailed TARP provided in Table 8. The Heritage Management Plan – Subsidence Impact Register (provided in Appendix 2) will be used to progressively monitor and document the total number and cumulative percentage of Aboriginal heritage sites against the Aboriginal heritage sites performance indicator and subsidence impact performance measure (Table 8 and Section 6).

Table 8
Trigger Action Response Plan – Aboriginal Heritage Sites Monitoring

Performance Measure	Performance Indicator	Monitoring Sites	Parameters	Frequency/ Sample Size	Analysis Methodology	Error Types	Baseline	Significance Levels/ Triggers	Action/Response	
Less than 10% of Aboriginal heritage sites within the mining area are affected by subsidence impacts	<i>Less than 7% of Aboriginal heritage sites within the mining area are affected by subsidence impacts¹.</i>	<ul style="list-style-type: none"> Monitoring of the Longwalls (LW) 20-22 and LW23-27 Aboriginal heritage sites at which Longwalls 23-27 Round 5 monitoring indicates continued change due to mining induced subsidence, namely sites MET 1, FRC 28, FRC 29, FRC 34, FRC 60 and FRC 176. Monitoring of Aboriginal heritage sites FRC 76 (sandstone overhang with art only) and FRC 117 (sandstone overhang with art and PAD). 	<ul style="list-style-type: none"> Cracking of sandstone at open sites. Cracking and/or exfoliation of sandstone, blockfall, displacement, breakage and/or collapse of sandstone overhang sites. Damage or deterioration of art motifs. 	Survey of Aboriginal heritage sites within three months of the completion of LW303.	<ul style="list-style-type: none"> Visual inspection. The Heritage Management Plan – Subsidence Impact Register will be used to progressively monitor the cumulative number and percentage of Aboriginal heritage sites affected by subsidence impacts. 	<ul style="list-style-type: none"> Natural weathering processes that may result in deterioration (e.g. fire, vegetation growth and water seepage) attributed to subsidence. 	<ul style="list-style-type: none"> Aboriginal heritage sites in variable condition, and in states of constant natural change. Some sites exhibit varying degrees of natural cracking, erosion, seepage, weathering etc. Two sites, FRC 281 (over LW20-22) and FRC 34 (to the north of LW27) have been affected by subsidence impacts. Baseline record for sites listed in Section 7 and documented in reports for LW20-22, LW23-27 and/or LW301-303^{2, 3, 4}. 	Level 1	Monitoring results indicate sites FRC 281 and FRC 34 have been affected by subsidence impacts.	Continue monitoring. Six monthly reporting.
								Level 2	Monitoring results indicate less than 7% of Aboriginal heritage sites within the mining area are affected by subsidence impacts.	Consider the implementation of appropriate management, remediation and/or mitigation measures in consultation with the OEH and Aboriginal stakeholders. Six monthly reporting.
								Level 3	Monitoring results indicate greater than 7% of Aboriginal heritage sites within the mining area are affected by subsidence impacts.	Assess against the performance measure. Consider the implementation of appropriate management, remediation and/or mitigation measures in consultation with the OEH and Aboriginal stakeholders.

¹ Sites are considered to be “affected by subsidence impacts” if they exhibit one or more of the following consequences that cannot be attributed to natural weathering or deterioration: overhang collapse; cracking of sandstone that coincides with Aboriginal art or grinding grooves; and rock fall that damages Aboriginal art. There are 143 Aboriginal heritage sites (142 sites identified in the Project EA and one new site [MET 4] identified during Round 2 monitoring for Longwalls 20-22) within the mining area. The mining area is defined by the Project Approval and is shown on Figure 1 of this HMP (labelled as Project Underground Mining Area Longwalls 20-27 and 301-317). Metropolitan Coal acknowledges that all Aboriginal heritage sites are considered to be culturally significant to the Aboriginal people who have a traditional connection to Country.

² Kayandel Archaeological Services (2010) *Longwalls 20-22 – Heritage Management Plan Baseline Record - Aboriginal Heritage Sites*. Report prepared for Metropolitan Coal.

³ Niche Environment & Heritage (2013; 2016) *Longwalls 23-27 Metropolitan Colliery - Baseline Recording*. Report prepared for Metropolitan Coal.

⁴ Niche Environment & Heritage (2016) *Longwalls 301-303 Metropolitan Colliery - Baseline Recording*. Report prepared for Metropolitan Coal.

As described in Section 10, in the event that any subsidence impact is recorded during monitoring, consideration will be given to implementing appropriate management, remediation and/or mitigation measures in consultation with the OEH and the Aboriginal stakeholders. In the event the subsidence impact performance measure is exceeded, the Contingency Plan outlined in Section 11 will be implemented.

10 MANAGEMENT, REMEDIATION AND MITIGATION MEASURES

10.1 MANAGEMENT AND REMEDIATION MEASURES

Following completion of monitoring (Section 9), Metropolitan Coal will assess the need for implementation of appropriate management and/or remediation measures.

Examples of potential management and remediation measures are provided in Table 9. Development and implementation of these measures will be assessed on a case-by-case basis and will acknowledge that whilst the measures may reduce the risk of impact and consequence, they can also have the potential to cause substantial damage to Aboriginal heritage sites and their settings.

Table 9
Potential Management and Remediation Measures

Consequence	Potential Management and Remediation Measures	
	Measure	Description
Increased seepage with the potential to impact art.	Seepage control techniques.	<ul style="list-style-type: none"> Installation of an artificial dripline (e.g. silicone dripline) to direct increased moisture/water seepage away from art panels.
Reduction in the stability of a sandstone overhang due to substantial cracking or block fall.	Stabilisation techniques.	<ul style="list-style-type: none"> Installation of artificial rock support (e.g. rock bolts, cable bolts, cement sprays [e.g. shotcrete], injection of a binding agent [PUR or similar]). Installation of standing supports (e.g. timber props, timber cogs, sandbags and metal [hydraulic] props). Scaling/dislodgement/removal of remaining loose rock.
	Salvage.	<ul style="list-style-type: none"> Salvage of artefacts for safekeeping and storage and/or display at a suitable location in consultation with the Aboriginal community.
Impacts on aesthetic values due to cracking.	Restoration of aesthetic values.	<ul style="list-style-type: none"> Use of cosmetic treatments (e.g. in the form of coloured grout or similar) to restore aesthetic values.
Cracking of sandstone at open sites, threatening grinding grooves or engraved art.	Strain reduction techniques.	<ul style="list-style-type: none"> Installation of a stress relief slot or stress focus notch.

The development of management and/or remediation measures will be determined in consultation with the OEH and the Aboriginal stakeholders and with regard to the specific circumstances of the subsidence impact (e.g. the location, nature and extent of the impact) and the assessment of consequences.

If proposed, the implementation of any invasive techniques (e.g. stabilisation, stress relief/focus slots, use of material for aesthetic restoration, etc.) will also be developed in consultation with WaterNSW or other relevant landowners.

Follow-up inspections will be conducted to assess the effectiveness of implemented management and/or remediation measures and the requirement for any additional measures. The specific timing and nature of follow-up inspections/additional monitoring will be dependent on the nature of the management and/or remediation measures implemented. Any management and/or remediation measures implemented will be reported in the Annual Review (Section 13).

10.2 MITIGATION MEASURES

10.2.1 Mitigation Measure Consideration and Implementation Process

As part of the development of Extraction Plans (and on an ongoing basis during mining), Metropolitan Coal will consider the requirement for development and implementation of Aboriginal heritage mitigation measures. The aim of the mitigation measures is to reduce the potential for substantial impacts and consequences to Aboriginal heritage sites of high archaeological significance and/or particular cultural significance.

Previous monitoring, studies and experience from the Woronora Plateau and greater Southern Coalfield have identified several site characteristics/features as being most relevant when assessing the risk of environmental consequence to an Aboriginal heritage site from subsidence impacts. These characteristics include (Sefton, 2000 and 2004; Biosis Research 2007 and 2009; MSEC, 2007 and 2008):

- overhang volume – >50 cubic metres (m³) increases the risk of negative consequence;
- presence of existing water seepage – damage to art from water is more likely if existing seepage is present;
- location in relation to a drainage line – sites located in valley bottoms can experience valley closure mechanisms and increased risk of cracking;
- location in relation to goaf – location of sites relative to the goaf influences the level of subsidence impacts experienced;
- overhang formation process – block-fall type overhangs are more likely to have roof or rear wall damage due to subsidence impacts;
- depth of cover – increased depth of cover reduces subsidence impacts and consequences; and
- presence of existing joints and bedding planes – subsidence movements may be dissipated through existing joints and bedding planes rather than the creation of new cracks.

The development of mitigation measures will be determined with regard to the specific circumstances of individual sites, including accessibility, size and spatial extent, nature of predicted subsidence impacts and consequences, and level of damage or disturbance (to the site or its setting) associated with implementing the measure(s). The consideration of mitigation measures will acknowledge that while they may reduce the risk of consequence to the site, they also have the potential to cause substantial damage to the site and its settings (including impacts to cultural setting). Other potential environmental impacts associated with implementation of mitigation works (e.g. vegetation clearing) will also be considered.

Examples of potential mitigation measures currently available are provided in Table 10.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 30
Document ID: Heritage Management Plan		

Table 10
Potential Consequences and Mitigation Measures

Consequence	Potential Mitigation Measures	
	Measure	Description
Existing seepage with the potential to increase and threaten art due to subsidence movements.	Seepage control techniques.	<ul style="list-style-type: none"> Installation of an artificial dripline (e.g. silicone dripline) to direct increased moisture/water seepage away from art panels if it eventuates.
Reduction in the stability of an overhang due to substantial cracking or block fall.	Stabilisation techniques.	<ul style="list-style-type: none"> Installation of artificial rock support (e.g. rock bolts, cable bolts, cement sprays [e.g. shotcrete], injection of a binding agent [PUR or similar]). Installation of standing supports (e.g. timber props, timber cogs, sandbags and metal [hydraulic] props). Scaling/dislodgement/removal of remaining loose rock.
Potential cracking of sandstone associated with art or grinding grooves.	Strain reduction techniques.	<ul style="list-style-type: none"> Installation of a stress relief slot or stress focus notch.

Any proposed mitigation measures will be developed and implemented (if considered appropriate) in consultation with OEH, Aboriginal stakeholders and the relevant landowner (e.g. WaterNSW).

If mitigation measures are implemented, follow-up inspections will be conducted to assess the effectiveness of mitigation measures and to determine the requirement for any additional measures. The specific nature of follow-up inspections/additional measures will be dependent on the specific nature of the mitigation measure(s) implemented and their success.

A summary of the development process and success of implemented mitigation measures will be reported in the Annual Review (Section 13).

10.2.2 Consideration of Mitigation Measures for Longwalls 301-303

No Aboriginal heritage sites of high archaeological significance are located within the 35° angle of draw and/or predicted 20 mm subsidence contour of Longwalls 301-303 (Figure 4).

Metropolitan Coal acknowledges that all Aboriginal heritage sites are of cultural significance to the Aboriginal people who have a traditional connection to Country.

Consultation with representatives of the Aboriginal community regarding the cultural significance of the Project area and known Aboriginal heritage sites was undertaken during the surveys and inspections for the Project EA (Kayandel Archaeological Services, 2008). Aboriginal heritage sites that have previously been identified as being of special cultural interest or of particular cultural significance within the Project underground mining area are described in Appendix H of the Project EA. It is noted that at the time of the Project EA no sites or areas of particular cultural significance were identified within the area bound by the Longwalls 301-303 35° angle of draw and/or predicted 20 mm subsidence contour.

Based on the above, and in consideration of potential damage caused by the implementation of the above described techniques, mitigation measures are not proposed for Aboriginal heritage sites within the Longwalls 301-303 35° angle of draw and/or predicted 20 mm subsidence contour.

Future longwalls have the potential to result in additional subsidence movements at Aboriginal heritage sites associated with Longwalls 301-303 or the previous mining areas (i.e. Longwalls 23-27). As part of the development of the future Extraction Plans, Metropolitan Coal will review the potential impacts and environmental consequences to Aboriginal heritage sites and re-consider the development and implementation of mitigation measures if required.

As described above, the development and implementation of any mitigation measures will be undertaken in consultation with OEH, the Aboriginal stakeholders and relevant landowners (e.g. WaterNSW).

10.3 SURFACE DISTURBANCE PROTOCOL

The surface disturbance protocol aims to avoid accidental damage to Aboriginal heritage sites located in close proximity to surface disturbance works. As described in Section 8, pre-clearance surveys will be undertaken (as needed) to identify the most appropriate location for required Project infrastructure.

This protocol will apply to surface disturbance works (e.g. exploration works, installation/operation/maintenance of surface infrastructure, construction/maintenance of access tracks, monitoring and stream restoration) proposed to be located close to any known Aboriginal heritage site(s).

Surface disturbance works will be undertaken in consideration of the following:

1. Avoidance of impact to Aboriginal heritage sites will be the primary management measure, where practicable.
2. To avoid accidental damage to Aboriginal heritage sites located close to surface disturbance works, appropriate demarcation will be implemented (e.g. fencing, sign-posting or temporary flagging).
3. Where avoidance is not practicable, a comprehensive baseline record will be developed and consideration of salvage will be undertaken in consultation with Aboriginal stakeholders prior to disturbance.

10.4 HUMAN SKELETAL MATERIAL PROTOCOL

Burial sites can have high cultural significance to Aboriginal communities and culturally appropriate management of burial sites is a high priority for the Aboriginal community. "Aboriginal remains" are defined in the *National Parks and Wildlife Act, 1974* as:

... the body or the remains of the body of a deceased Aboriginal person, but does not include:

- (a) *a body or the remains of a body buried in a cemetery in which non-Aboriginal persons are also buried, or*
- (b) *a body or the remains of a body dealt with or to be dealt with in accordance with a law of the State relating to medical treatment or the examination, for forensic or other purposes, of the bodies of deceased persons.*

No burial or potential burial sites have been identified in the Project underground mining area. Nor are they considered likely to be identified in the future due to the shallow soil profiles present on the Woronora Plateau. Notwithstanding, the following steps will be carried out in the event that suspected Aboriginal human skeletal material is encountered within the Project underground mining area:

- surface works in the immediate vicinity of the skeletal material will cease;

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 32
Document ID: Heritage Management Plan		

- the DP&E, OEH, NSW Police and Aboriginal stakeholders will be informed as soon as practicable; and
- the identified skeletal remains will not be disturbed until the NSW Police and OEH have inspected the remains and authorised their disturbance.

10.5 CULTURAL AWARENESS PROGRAM

Metropolitan Coal will include a cultural awareness program as part of inductions aimed at minimising the potential for accidental damage to Aboriginal heritage. The cultural awareness program will provide:

- an overview of the cultural heritage management program;
- an overview of the consultation protocol (Section 5);
- an overview of the pre-clearance surveys (Section 8) and surface disturbance protocol (Section 10.3);
- an overview of mitigation, management and remediation measures (Section 10);
- simple criteria and procedures for artefact and human bone recognition;
- actions to follow if human skeletal material is encountered (Section 10.4); and
- personnel to contact for more information or assistance.

11 CONTINGENCY PLAN

In the event the Aboriginal heritage sites subsidence impact performance measure detailed in Section 6 of this HMP is considered to have been exceeded, Metropolitan Coal will implement the following Contingency Plan:

- The exceedance will be reported to the Manager – Technical Services and/or the Environment & Community Superintendent. within 24 hours.
- The exceedance will be recorded in the Heritage Management Plan – Subsidence Impact Register (provided in Appendix 2) consistent with the monitoring program described in Section 9 of this HMP.
- Metropolitan Coal will report the exceedance to the DP&E, OEH and Aboriginal stakeholders as soon as practicable after Metropolitan Coal becomes aware of the exceedance.
- Metropolitan Coal will conduct an investigation to evaluate the potential contributing factors. The investigation will:
 - compare and critically analyse measured versus predicted subsidence parameters;
 - review measured subsidence parameters against the observed impact; and
 - review the subsidence monitoring program and update the program where appropriate, in consultation with OEH and the Aboriginal stakeholders.
- Metropolitan Coal will identify an appropriate course of action with respect to the identified impact(s), in consultation with specialists, relevant agencies and Aboriginal stakeholders, as necessary. For example:
 - proposed management and/or mitigation measures (Section 10); and
 - a program to review the effectiveness of the management and/or mitigation measures.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 33
Document ID: Heritage Management Plan		

- Metropolitan Coal will submit the proposed course of action to the DP&E for approval.
- Metropolitan Coal will implement the approved course of action to the satisfaction of the DP&E.

In accordance with Condition 6, Schedule 6 of the Project Approval, Metropolitan Coal will provide a suitable offset to compensate for the impact to the satisfaction of the Secretary of DP&E if either the contingency measures implemented by Metropolitan Coal have failed to remediate the impact or the Secretary of the DP&E determines that it is not reasonable or feasible to remediate the impact.

A Contingency Plan Check List has been developed and is provided in Appendix 3.

12 FUTURE EXTRACTION PLANS

In accordance with Condition 7, Schedule 3 of the Project Approval, Metropolitan Coal will collect baseline data for future Extraction Plans. The collection of baseline data will include:

- photographic records;
- detailed scaled plans including physical characteristics and features; and
- detailed information regarding the dimensions, composition and features.

As described in Section 7, detailed baseline recording has been completed for a number of sites located to the west of Longwall 303, including sites FRC 70, FRC 71, FRC 76, FRC 77, FRC 78, FRC 85, FRC 86, FRC 87, FRC 90, FRC 91, FRC 93, FRC 309, FRC 310 and FRC 325. The baseline record for these sites is provided in Appendix 1.

Prior to the commencement of secondary extraction associated with the next Extraction Plan (i.e. Longwall 304 onwards), baseline data will be obtained for Aboriginal heritage sites located within the relevant 35° angle of draw and/or predicted 20 mm subsidence contour of the Extraction Plan longwall layout.

In addition to the baseline data collection, consideration of the environmental performance and management measures in accordance with the review(s) conducted as part of this HMP will inform the appropriate type and frequency of monitoring of the Aboriginal heritage sites relevant to the next Extraction Plan.

13 ANNUAL REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE

In accordance with Condition 3, Schedule 7 of the Project Approval, Metropolitan Coal will conduct an Annual Review of the environmental performance of the Project by the end of March each year.

The Annual Review will specifically address the environmental performance of the HMP and will:

- describe the works that were carried out in the past calendar year, and the works that are proposed to be carried out over the current calendar year;

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 34
Document ID: Heritage Management Plan		

- include a comprehensive review of the monitoring results and complaints records of the Project over the past year, including a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - monitoring results of previous years; and
 - relevant predictions in the Project EA, Preferred Project Report and Extraction Plan;
- identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the monitoring data over the life of the Project;
- identify any discrepancies between the predicted and actual impacts of the Project, and analyse the potential cause of any significant discrepancies; and
- describe what measures will be implemented over the next year to improve the environmental performance of the Project.

As described in Section 2, this HMP will be reviewed within three months of the submission of an Annual Review, and revised where appropriate.

The Annual Review will be made publicly available on the Peabody website in accordance with Condition 10, Schedule 7 of the Project Approval.

14 INCIDENTS

An incident is defined as a set of circumstances that causes or threatens to cause material harm to the environment, and/or breaches or exceeds the limits or performance measures/criteria in the Project Approval.

The reporting of incidents will be conducted in accordance with Condition 6, Schedule 7 of the Project Approval. Metropolitan Coal will notify the Secretary of the DP&E and any other relevant agencies of any incident associated with the Project as soon as practicable after Metropolitan Coal becomes aware of the incident. Within seven days of the date of the incident, Metropolitan Coal will provide the Secretary and any relevant agencies with a detailed report on the incident.

15 COMPLAINTS

A protocol for the managing and reporting of complaints has been developed as a component of Metropolitan Coal’s Environmental Management Strategy and is described below.

The Environment & Community Superintendent is responsible for maintaining a system for recording complaints.

Metropolitan Coal will maintain public signage advertising the telephone number on which environmental complaints can be made. The Environment & Community Superintendent is responsible for ensuring that the currency and effectiveness of the service is maintained. Notifications of complaints received are to be provided as quickly as practicable to the Environment & Community Superintendent.

Complaints and enquiries do not have to be received via the telephone line and may be received in any other form. Any complaint or enquiry relating to environmental management or performance is to be relayed to the Environment & Community Superintendent as soon as practicable. All employees are responsible for ensuring the prompt relaying of complaints. All complaints will be recorded in a complaints register.

For each complaint, the following information will be recorded in the complaints register:

- date and time of complaint;
- method by which the complaint was made;
- personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- nature of the complaint;
- the action(s) taken by Metropolitan Coal in relation to the complaint, including any follow-up contact with the complainant; and
- if no action was taken by Metropolitan Coal, the reason why no action was taken.

The Environment & Community Superintendent is responsible for ensuring that all complaints are appropriately investigated, actioned and that information is fed back to the complainant, unless requested to the contrary.

In accordance with Condition 10, Schedule 7 of the Project Approval, the complaints register will be made publicly available on the website and updated on a monthly basis. A summary of complaints received and actions taken will be presented to the Community Consultative Committee as part of the operational performance review.

16 NON-COMPLIANCES WITH STATUTORY REQUIREMENTS

A protocol for the managing and reporting of non-compliances with statutory requirements has been developed as a component of Metropolitan Coal’s Environmental Management Strategy and is described below.

Compliance with all approvals, plans and procedures will be the responsibility of all personnel (staff and contractors) employed on or in association with Metropolitan Coal, and will be developed through promotion of Metropolitan Coal ownership under the direction of the General Manager.

The Manager – Technical Services and/or Environment & Community Superintendent will undertake regular inspections, internal audits and initiate directions identifying any remediation/rectification work required, and areas of actual or potential non-compliance.

As described in Section 14, Metropolitan Coal will notify the Secretary of the DP&E and any other relevant agencies of any incident associated with Metropolitan Coal as soon as practicable after Metropolitan Coal becomes aware of the incident. Within seven days of the date of the incident, Metropolitan Coal will provide the Secretary of the DP&E and any relevant agencies with a detailed report on the incident.

A review of Metropolitan Coal’s compliance with all conditions of the Project Approval, mining leases and all other approvals and licences will be undertaken prior to (and included within) each Annual Review. The Annual Review will be made publicly available on the Peabody website.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 36
Document ID: Heritage Management Plan		

Additionally, in accordance with Condition 8, Schedule 7 of the Project Approval, an independent environmental audit will be undertaken by the end of December 2011, and a minimum of once every three years thereafter. A copy of the audit report will be submitted to the Secretary of the DP&E and made publicly available on the Peabody website. The independent audit will be undertaken by an appropriately qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary of the DP&E.

17 REFERENCES

Biosis Research (2007) *Dendrobium Area Archaeological and Cultural Heritage Assessment*. Report for BHP Billiton.

Biosis Research (2009) *Bulli Seam Operations – Aboriginal Cultural Heritage Assessment*. Report prepared for BHP Billiton Illawarra Coal.

Department of Planning and Environment and NSW Trade & Investment – Division of Resources and Energy (2015) *Guidelines for the Preparation of Extraction Plans Required under Conditions of Development Consents, Project Approvals and Mining Lease Conditions for Underground Coal Mining*. Version 5. Draft.

Helensburgh Coal Pty Ltd (2008) *Metropolitan Coal Project Environmental Assessment*.

Helensburgh Coal Pty Ltd (2009) *Metropolitan Coal Project Preferred Project Report*.

Illawarra Prehistory Group (2007) *Information from an archaeological survey of parts of the Woronora Plateau to identify and record previously un-recorded Aboriginal heritage sites and to re-record previously recorded Aboriginal heritage sites*. Unpublished data provided to Helensburgh Coal Pty Ltd, January 2007.

Kayandel Archaeological Services (2006) *Longwalls 14-17 Metropolitan Colliery, Helensburgh, NSW, Supplement Report – Archaeological Significance Assessment*.

Kayandel Archaeological Services (2007) *Aboriginal Cultural Heritage Assessment for Longwalls 18-19A*.

Kayandel Archaeological Services (2008) *Aboriginal Cultural Heritage Assessment, Appendix H of the Metropolitan Coal Project Environmental Assessment*.

Kayandel Archaeological Services (2012) *Longwall Subsidence Impact Monitoring January & March 2012 Condition Monitoring Report*. Longwalls 20-22 Round 1 Monitoring Report. Report prepared for Metropolitan Coal Pty Ltd.

Lambert (1989) *Conserving Australian Rock Art: A Manual for Managers*.

Metropolitan Coal Pty Ltd (2016a) *Letter to the NSW Department of Planning and Environment, Re: Condition 5, Schedule 3 of the Metropolitan Coal Project Approval*. 5 May 2016.

Metropolitan Coal Pty Ltd (2016b) *Metropolitan Coal Longwalls 301-303 Environmental Risk Assessment Report*. June 2016.

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 37
Document ID: Heritage Management Plan		

- Mine Subsidence Engineering Consultants (2007) *Subsidence Assessment – The Prediction of Subsidence Parameters and the Assessment of Mine Subsidence Impacts on Natural Features and Surface Infrastructure Resulting from the Proposed Extraction of Proposed Longwalls 18 to 19A at Metropolitan Colliery in Support of an SMP Application.*
- Mine Subsidence Engineering Consultants (2008) *Metropolitan Colliery Longwalls 20-44 Subsidence Assessment Report (MSEC Report MSEC285 Revision C, August 2008), Appendix A in HCPL (2008) Metropolitan Coal Project Environmental Assessment.*
- Mine Subsidence Engineering Consultants (2018) *Metropolitan Mine – Longwalls 301 to 303 Subsidence Predictions and Impact Assessments for the Natural and Built Features in Support of the Extraction Plan (MSEC Report MSEC984).*
- Niche Environment and Heritage (2013) *Longwalls 20-22 Subsidence Impact Monitoring of Aboriginal Cultural Heritage Sites: Metropolitan Coal.* Longwalls 20-22 Round 2 Monitoring Report. Report prepared for Metropolitan Coal Pty Ltd, July 2013.
- Niche Environment and Heritage (2015) *Metropolitan Coal Longwall 22 Monitoring of Aboriginal Heritage Sites.* Longwalls 20-22 Round 3 Monitoring Report. Report prepared for Metropolitan Coal Pty Ltd.
- Niche Environment and Heritage (2016a) *Longwalls 23-27 Round 1 Monitoring of Aboriginal Heritage Sites.* Report prepared for Metropolitan Coal Pty Ltd. Longwalls 23-27 Round 1 Monitoring Report. April 2016.
- Niche Environment and Heritage (2016b) *Longwalls 23-27 Round 2 Monitoring of Aboriginal Heritage Sites.* Longwalls 23-27 Round 2 Monitoring Report. Report prepared for Metropolitan Coal Pty Ltd.
- Niche Environment and Heritage (2017a) *Longwalls 23-27 Round 3 Monitoring of Aboriginal Heritage Sites.* Longwalls 23-27 Round 3 Monitoring Report. Report prepared for Metropolitan Coal Pty Ltd.
- Niche Environment and Heritage (2017b) *Longwalls 23-27 Round 4 Monitoring of Aboriginal Heritage Sites.* Longwalls 23-27 Round 4 Monitoring Report. Report prepared for Metropolitan Coal Pty Ltd.
- Niche Environment and Heritage (2017c) *Longwalls 23-27 Round 5 Monitoring of Aboriginal Heritage Sites.* Longwalls 23-27 Round 5 Monitoring Report. Report prepared for Metropolitan Coal Pty Ltd.
- Sefton C.E. (2000) *Overview of the Monitoring of Sandstone Overhangs for the Effects of Mining Subsidence Illawarra Coal Measures.* Report for Collieries Division, BHP Coal.
- Sefton C.E. (2004) *Archaeological Investigation of Future Mining Extensions Including Longwalls 13-17 and 20-22.* Report prepared for Helensburgh Coal Pty Ltd.
- SP Solutions (2008) *Metropolitan Coal Project Environmental Risk Analysis.* Appendix O in HCPL (2008) *Metropolitan Coal Project Environmental Assessment.*
- WaterNSW and Office of Environment and Heritage (2015) *Special Areas Strategic Plan of Management 2015.*

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		Page 38
Document ID: Heritage Management Plan		

APPENDIX 1

LONGWALLS 301-303 BASELINE RECORD – ABORIGINAL HERITAGE SITES

AVAILABLE UPON REQUEST

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		
Document ID: Heritage Management Plan		

APPENDIX 2

HERITAGE MANAGEMENT PLAN
SUBSIDENCE IMPACT REGISTER AND ASSESSMENT FORM

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		
Document ID: Heritage Management Plan		

Heritage Management Plan - Subsidence Impact Register

Impact Register Number ¹	Aboriginal Heritage Site	Description of changes due to mine subsidence ²	Cumulative number of sites with changes due to mine subsidence ³	Has the site been affected by subsidence impacts? ⁴	Cumulative number of sites affected by subsidence impacts ⁵	Cumulative percentage of sites affected by subsidence impacts ^{6,9}	Management or Contingency Measures Implemented? ⁷ (Yes/No) ⁷	Were Measures Effective? (Yes/No) ⁸
1	FRC 281	Multiple cracks ranging from large, medium and small recorded in the shelter wall either running through or next to motifs (Longwalls 20-22 Round 1 Survey)	1	Yes	1	1/142 sites = <1%	No	N/A
2	FRC 284	Fractured corner or a buttress like formation on the rear wall (Longwalls 20-22 Round 1 Survey)	2	No	1	1/142 sites = <1%	No	N/A
3	FRC 284	Exfoliated section associated with the cracking has slumped (Longwalls 20-22 Round 2 Survey)	2	No	1	1/143 sites = <1%	No	N/A
4	FRC 15	Cracking of shelter wall (Longwalls 20-22 Round 2 Survey)	3	No	1	1/143 sites = <1%	No	N/A
5	FRC 15	Increased cracking of shelter wall (Longwalls 20-22 Round 3 Survey)	3	No	1	1/143 sites = <1%	No	N/A
6	MET 1	Cracking in roof of shelter and vertical cracking (Longwalls 20-22 Round 3 Survey)	4	No	1	1/143 sites = <1%	No	N/A
7	FRC 283	Opening of joints and silica forming over art panel (Longwalls 20-22 Round 3 Survey)	5	No	1	1/143 sites = <1%	No	N/A
8	FRC 176	Vertical cracking observed along the northern and southern ends of the shelter (Longwalls 23-27 Round 1 Survey)	6	No	1	1/143 sites= <1%	No	N/A
9	FRC 176	Widening (by 5 mm) of previously identified cracking located along the northern end of the shelter (Longwalls 23-27 Round 3 survey)	6	No	1	1/143 sites= <1%	No	N/A
10	FRC 275	Opening of the horizontal bedding plane and five vertical hair line cracks along the back wall of the shelter (Longwalls 23-27 Round 3 survey)	7	No	1	1/143 sites= <1%	No	N/A
11	FRC 301	A large surface crack was observed running east to west along the rock platform. Crack is approximately 3 m to the north of the grinding groove and is approximately 25m long and continues past the rock platform (Longwalls 23-27 Round 4 survey).	8	No	1	1/143 sites= <1%	No	N/A

Heritage Management Plan - Subsidence Impact Register (Continued)

Impact Register Number ¹	Aboriginal Heritage Site	Description of changes due to mine subsidence ²	Cumulative number of sites with changes due to mine subsidence ³	Has the site been affected by subsidence impacts? ⁴	Cumulative number of sites affected by subsidence impacts ⁵	Cumulative percentage of sites affected by subsidence impacts ^{6, 9}	Management or Contingency Measures Implemented? (Yes/No) ⁷	Were Measures Effective? (Yes/No) ⁸
12	FRC 28	Vertical cracking of the rear shelter wall, opening of horizontal planes/joints and movement of the rock shelf that is part of the shelter floor (Longwalls 23-27 Round 5 survey).	9	No	1	1/143 sites= <1%	No	N/A
13	FRC 29	Horizontal crack along the back wall of the shelter and a joining vertical crack (Longwalls 23-27 Round 5 survey).	10	No	1	1/143 sites= <1%	No	N/A
14	FRC 60	Three vertical cracks along the back wall of the shelter (Longwalls 23-27 Round 5 survey).	11	No	1	1/143 sites= <1%	No	N/A
15	FRC 34	Horizontal cracking along the roof of the shelter and cracking over the most southern hand stencil on the back panel (Longwalls 23-27 Round 5 survey).	12	Yes	2	2/143 sites= <2%	No	N/A

Notes:

- 1: Fill out all details in the Subsidence Impact Register Assessment Form and record the register number here.
- 2: Description of changes observed due to mine subsidence. (e.g. cracking of shelter wall, opening of joints).
- 3: Cumulative number of sites with changes due to mine subsidence.
- 4: Has the site been affected by subsidence impacts? Sites are considered to be 'affected by subsidence impacts' if they exhibit one or more of the following consequences that cannot be attributed to natural weathering or deterioration: overhang collapse; cracking of sandstone that coincides with Aboriginal art or grinding grooves; and rock fall that damages Aboriginal art).
- 5: Cumulative number of sites affected by subsidence impacts.
- 6: If the cumulative percentage of sites affected by subsidence impacts equals or exceeds 10%, notify General Manager. If less than 10%, notify the Technical Services Manager or Environment & Community Superintendent of the cumulative percentage.
- 7: Indicate whether management or contingency measures were implemented (yes or no).
- 8: Indicate whether the implemented management or contingency measures were considered to be effective (yes or no).
- 9: The total number of sites within the mining area (as defined by Appendix 3 of the Project Approval) changed from 142 sites to 143 sites due to the identification of a new site within the mining area during Round 2 monitoring (MET 4).

**Heritage Management Plan – Subsidence Impact Register
Assessment Form**

Date:

Observer (Name and position):

Register Number (i.e. Number 1, 2, etc.):

Longwall Number and Chainage:

Location of Observed Change Due to Mine Subsidence:

Description of Change Due to Mine Subsidence:

Description of Potential Consequences:

Examples:

- cracking through art or grinding groove;
- burial of artefacts and deposit; and
- complete loss of site due to collapse.

Attach photographs

Description of Photographs:

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		
Document ID: Heritage Management Plan		

Has the site been affected by subsidence impacts?

What is the cumulative percentage of sites affected by subsidence impacts?

Person Notified:	Environment & Community Superintendent	<input type="checkbox"/>
	Manager – Technical Services	<input type="checkbox"/>
	General Manager	<input type="checkbox"/>

Actions Required:	Management/Remediation Measures	<input type="checkbox"/>
	Contingency Plan Initiated	<input type="checkbox"/>
	Incident Notification	<input type="checkbox"/>
	Safety Measures/Public Safety	<input type="checkbox"/>
	Management Plan Requirements	<input type="checkbox"/>

Management/Remediation Measures Implemented:

Contingency Measures Implemented:

Effectiveness of Contingency or Management Measures:

APPENDIX 3
CONTINGENCY PLAN CHECK LIST

Metropolitan Coal – Heritage Management Plan		
Revision No. HMP-R01-G		
Document ID: Heritage Management Plan		

Contingency Plan Check List

Contingency Plan Component	Yes/No	Comment
Observation reported to the Manager – Technical Services Manager or the Environment & Community Superintendent (within 24 hours).		
Observation recorded in the Heritage Management Plan - Subsidence Impact Register.		
Reporting of any Aboriginal heritage performance measure exceedance to DP&E and OEH (as soon as practicable after Metropolitan Coal becomes aware of the exceedance).		
Conduct investigation to evaluate the potential contributing factors. Investigation to: <ul style="list-style-type: none"> • compare and critically analyse measured versus predicted subsidence parameters; • review measured subsidence parameters against the observed impact; and • review the Subsidence Monitoring Program and update the program where appropriate. 		
Identification of appropriate course of action with respect to the identified impact(s) in consultation with specialists, relevant agencies and Aboriginal stakeholders, as necessary. For example: <ul style="list-style-type: none"> • proposed management/mitigation measures; • a program to review the effectiveness of the management/mitigation measures. 		
Submission of the proposed course of action to the DP&E for approval.		
Implementation of the approved course of action to the satisfaction of the DP&E.		
Provision of a suitable offset - if either the contingency measures implemented by Metropolitan Coal have failed to remediate the impact or the Secretary of the DP&E determines that it is not reasonable or feasible to remediate the impact.		