APPENDIX 1:

DIRECTOR-GENERAL'S REQUIREMENTS

Major Development Assessment
Mining & Industry Projects
Contact: Paul Freeman
Phone: 02 9228 6587
Fax: 02 9228 6466
Email: paul.freeman@planning.nsw.gov.au
Ref: S07/00659

Mr Doug Gordon
General Manager
Donaldson Coal
PO Box 2275
GREENHILLS NSW 2323

Dear Mr Gordon

Abel Coal Project
Section 75W Modification (05_0136 MOD 3)
Director-General's Requirements

The Department has received your application to modify the Abel Coal Project (05_0136 MOD 3) under section 75W of the *Environmental Planning and Assessment Act 1979*.

I have attached a copy of the Director General's environmental assessment requirements (DGRs) for the preparation of an Environmental Assessment (EA) for the proposed modification.

Please note that the Department may alter these requirements at any time. The Department will review the EA carefully before putting it on public exhibition, and will require you to submit an amended EA if it does not adequately address the DGRs.

These requirements have been prepared based on the information you have provided to date, and in consultation with the relevant government agencies and affected Councils. Their comments, which you should consider and address appropriately in preparing the EA, are also attached (see Attachment 2). Your proposal may require separate approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Department encourages you to confirm whether such an approval will be required as soon as possible. If an EPBC Act approval is required, I would appreciate it if you would advise the Department accordingly, as the Commonwealth approval process may be integrated into the NSW approval process, and supplementary DGRs may need to be issued.

I would appreciate it if you would contact the Department at least two weeks before you propose to submit the EA. This will enable the Department to:

- confirm the applicable fee (see Division 1A, Part 15 of the *Environmental Planning and Assessment Regulation 2000*); and
- determine the number of copies (hard-copy and CD-ROM) of the EA required for review.

If you have any enquiries about these requirements, please contact Paul Freeman.

Yours sincerely

Howard Reed 21·2·12

Howard Reed
A/Director
Mining & Industry Projects
As delegate for the Director-General

NSW Department of Planning, GPO Box 39, SYDNEY NSW 2001
www.planning.nsw.gov.au

Director-General's Requirements

Section 75F of the *Environmental Planning and Assessment Act 1979*

Application number	05_0136 MOD 3
Modification Description	Modifying the Abel Coal Project, which includes: • changing the approved mine layout to introduce longwall and shortwall mining methods; • extending the life of the mine to 2029; • increasing run-of-mine (ROM) coal production to 6.1 million tonnes per annum (Mtpa); • increasing the throughput of ROM coal at the Bloomfield Coal Handling and Preparation Plant (CHPP) to 8.9 Mtpa; • increasing the amount of ROM coal delivered to the CHPP from the Tasman Underground Mine; • increasing rail transport of product coal to the Port of Newcastle; • increasing the emplacement of reject material at Bloomfield Colliery; and • upgrading the CHPP, augmenting the integrated water management system for the Abel, Donaldson and Bloomfield mines, and constructing ancillary mine infrastructure.
Location	John Renshaw Drive, Buttai.
Proponent	Donaldson Coal Pty Limited.
Date of Issue	21 February 2012
General Requirements	The Environmental Assessment (EA) for the proposed modification must include a: • detailed description of the proposed modification, including: – need for the proposal; – justification for the proposed mine plan, including efficiency of resource recovery, mine safety, and environmental protection; – likely staging of the proposal - including construction, operational stage/s and rehabilitation; – likely interactions between the proposal and existing, approved and proposed mining operations in the vicinity of the site; – plans of any proposed building works; • consideration of all relevant environmental planning instruments, including Part 3 of the *Mining, Petroleum Production and Extractive Industry State Environmental Planning Policy 2007*, and identification and justification of any inconsistencies with these instruments; • risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment; • detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: – a description of the existing environment, using sufficient baseline data; – an assessment of the potential impacts of all stages of the proposal, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes; and – a description of the measures that would be implemented to avoid, minimise and if necessary, offset the potential impacts of the proposal, including proposals for adaptive management and/or contingency plans to manage any significant risks to the environment; and • consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EA.

Key Issues	
	• **Subsidence** – including a detailed quantitative and qualitative assessment of the potential conventional and non-conventional subsidence impacts of the proposal that includes: - the identification of the natural and built features (both surface and sub-surface) within the area that could be affected by subsidence, and an assessment of the respective values of these features using any relevant statutory or policy documents; - accurate predictions of the potential subsidence effects and impacts of the proposal, including a robust sensitivity analysis of these predictions; - a detailed assessment of the potential environmental consequences of these effects and impacts on both the natural and built environment, paying particular attention to those features that are considered to have significant economic, social, cultural or environmental values; and - a detailed description of the measures that would be implemented to avoid, minimise, remediate and/or offset subsidence impacts and environmental consequences (including adaptive management and proposed performance measures); • **Land Resources** – including a detailed assessment of the potential impacts on: - soils and land capability (including land contamination); - landforms and topography, including cliffs, rock formations, steep slopes, etc; and - land use, including agricultural, industrial, conservation and recreational uses; • **Water Resources** – including: - detailed assessment of potential impacts on the quality and quantity of existing surface and ground water resources, including: o detailed modelling of potential groundwater impacts; o impacts on affected licensed water users and basic landholder rights; and o impacts on riparian, ecological, geo-morphological and hydrological values of watercourses, including environmental flows; - a detailed site water balance, including a description of site water demands, water disposal methods (inclusive of volume and frequency of any water discharges), water supply infrastructure and water storage structures; - identification of any licensing requirements or other approvals under the *Water Act 1912* and/or *Water Management Act 2000*; - demonstration that water for the construction and operation of the proposed modification can be obtained from an appropriately authorised and reliable supply in accordance with the operating rules of any relevant Water Sharing Plan (WSP); - a description of the measures proposed to ensure the development can operate in accordance with the requirements of any relevant WSP or water source embargo; - a detailed description of the proposed water management system (including sewerage), water monitoring program and measures to mitigate surface and groundwater impacts; • **Biodiversity** – including: - measures taken to avoid, reduce or mitigate impacts on biodiversity; - accurate estimates of proposed vegetation clearing; - a detailed assessment of potential impacts of the proposal on any: o terrestrial or aquatic threatened species or populations and their habitats, endangered ecological communities and groundwater dependent ecosystems; and o regionally significant remnant vegetation, or vegetation corridors; and - an offset strategy to ensure the proposal maintains or improves the terrestrial and aquatic biodiversity values of the region in the medium

	to long term; • **Heritage** – including: - an Aboriginal cultural heritage assessment (including both cultural and archaeological significance) which must: o demonstrate effective consultation with Aboriginal communities in determining and assessing impacts, and developing and selecting mitigation options and measures; o outline any proposed impact mitigation and management measures (including an evaluation of the effectiveness and reliability of the measures); and - a Historic heritage assessment (including archaeology) which must: o include a statement of heritage impact (including significance assessment) for any State significant or locally significant historic heritage items; and, o outline any proposed mitigation and management measures (including an evaluation of the effectiveness and reliability of the measures); • **Air Quality** – including a quantitative assessment of potential: - construction and operational impacts, with a particular focus on dust emissions including $PM_{2.5}$ and PM_{10} emissions and dust generation from coal transport; - reasonable and feasible mitigation measures to minimise dust emissions, including evidence that there are no such measures available other than those proposed; and - monitoring and management measures, in particular real-time air quality monitoring; • **Greenhouse Gases** – including: - a quantitative assessment of potential Scope 1, 2 and 3 greenhouse gas emissions; - a qualitative assessment of the potential impacts of these emissions on the environment; and - an assessment of reasonable and feasible measures to minimise greenhouse gas emissions and ensure energy efficiency; • **Noise** – including a quantitative assessment of potential: - construction, operational and off-site transport noise impacts; - reasonable and feasible mitigation measures, including evidence that there are no such measures available other than those proposed; and - monitoring and management measures, in particular real-time and attended noise monitoring; • **Traffic & Transport** – including: - a detailed assessment of the proposal on the capacity, efficiency and safety of the road and rail networks; and - a description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road and rail networks over the life of the project; • **Visual** – including: - a detailed assessment of the: o changing landforms on site during the various stages of the proposed modification; o potential visual impacts of the proposal on private landowners in the surrounding area as well as from key vantage points in the public domain; and - a detailed description of the measures that would be implemented to minimise the visual impacts of the project; • **Waste** – including: - accurate estimates of the quantity and nature of the potential waste streams of the proposal, including tailings and coarse reject; - a tailings and coarse reject disposal strategy; and - a description of measures that would be implemented to minimise production of other waste, and ensure that that waste is appropriately managed;

	• **Hazards** – paying particular attention to public safety, including bushfires; • **Social & Economic** – including an assessment of the: - potential direct and indirect economic benefits of the proposal for local and regional communities and the State; - potential impacts on local and regional communities, including: o increased demand for local and regional infrastructure and services (such as housing, childcare, health, education and emergency services); and o impacts on social amenity; - a detailed description of the measures that would be implemented to minimise the adverse social and economic impacts of the proposed modification, including any infrastructure improvements or contributions and/or voluntary planning agreement or similar mechanism; and - a detailed assessment of the costs and benefits of the proposed modification as a whole, and whether it would result in a net benefit for the NSW community; and • **Rehabilitation** – including the proposed rehabilitation strategy for the site, having regard to the key principles in the Strategic Framework for Mine Closure, including: - rehabilitation objectives, methodology, monitoring programs, performance standards and proposed completion criteria; - nominated final land use, having regard to any relevant strategic land use planning or resource management plans or policies; and • the potential for integrating this strategy with any other rehabilitation and/or offset strategies in the region.
References	The environmental assessment of the key issues listed above must take into account relevant guidelines, policies, and plans. While not exhaustive, the following attachment contains a list of guidelines, policies and plans that may be relevant to the environmental assessment of this modification.
Consultation	During the preparation of the EA, you should consult with the relevant local, State or Commonwealth government authorities, service providers, community groups or affected landowners. The consultation process and the issues raised must be described in the EA. In particular you must consult with the: • Office of Environment and Heritage (including the Heritage Branch and Environment Protection Authority); • Division of Resources and Energy, within the Department of Trade and Investment, Regional Infrastructure and Services; • Department of Primary Industries (including the NSW Office of Water, Agriculture and Fisheries sections, Catchments and Lands (Crown Lands Division)); • NSW Health; • Transport for NSW (including the Centre for Transport Planning and Roads and Maritime Services); • Australian Rail Track Corporation, and downstream coal chain operators including Railcorp and Newcastle Ports Corporation; • Mine Subsidence Board; • Hunter Central Rivers Catchment Management Authority; • Cessnock City Council; • Newcastle City Council; • Maitland City Council; and • relevant Aboriginal groups. The EA must: • describe the consultation process used and demonstrate that effective consultation has occurred; • describe the issues raised by public authorities, service providers, community groups and landowners;

	• identify where the design of the proposed modification has been amended in response to issues raised; and otherwise demonstrate that issues raised have been appropriately addressed in the assessment.
Deemed refusal period	60 days

ATTACHMENT 1
Technical and Policy Guidelines

The following guidelines may assist in the preparation of the EA. This list is not exhaustive and not all of these guidelines may be relevant to your proposal. Many of these documents can be found on the following websites:
http://www.planning.nsw.gov.au
http://www.bookshop.nsw.gov.au
http://www.publications.gov.au

Policies, Guidelines & Plans

Risk Assessment	
	AS/NZS 4360:2004 Risk Management (Standards Australia)
	HB 203: 203:2006 Environmental Risk Management – Principles & Process (Standards Australia)
Biodiversity	
	Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna – Amphibians (DECCW 2009)
	Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft (DECC 2004)
	BioBanking Assessment Methodology and Credit Calculator Operational Manual (DECCW 2008)
	The Threatened Species Assessment Guideline – The Assessment of Significance (DECC 2007)
	NSW State Groundwater Dependent Ecosystem Policy (DLWC)
	Policy & Guidelines - Aquatic Habitat Management and Fish Conservation (NSW Fisheries)
	State Environmental Planning Policy No. 44 – Koala Habitat Protection
Water Resources	
	National Water Quality Management Strategy: Australian Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Guidelines for Sewerage Systems – Effluent Management (ARMCANZ/ANZECC)
	National Water Quality Management Strategy: Guidelines for Sewerage Systems – Use of Reclaimed Water (ARMCANZ/ANZECC)
	Using the ANZECC Guideline and Water Quality Objectives in NSW (DEC)
	State Water Management Outcomes Plan
	Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009
Surface Water	NSW Government Water Quality and River Flow Objectives (DECC)
	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC)
	Managing Urban Stormwater: Soils & Construction (Landcom) and associated Volume 2E: Mines and Quarries.
	Managing Urban Stormwater: Treatment Techniques (DECC)
	Managing Urban Stormwater: Source Control (DECC)
	Floodplain Development Manual (DIPNR)
	Floodplain Risk Management Guideline (DECC)
	A Rehabilitation Manual for Australian Streams (LWRRDC and CRCCH)
	Technical Guidelines: Bunding & Spill Management (DECC)
	Environmental Guidelines: Use of Effluent by Irrigation (DECC)
Groundwater	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC)
	NSW State Groundwater Policy Framework Document (DLWC, 1997)
	NSW State Groundwater Quality Protection Policy (DLWC, 1998)

	NSW State Groundwater Quantity Management Policy (DLWC, 1998)
	Murray-Darling Basin Groundwater Quality. Sampling Guidelines. Technical Report No 3 (MDBC)
	Murray-Darling Basin Commission. Groundwater Flow Modelling Guideline (Aquaterra Consulting Pty Ltd)
	Guidelines for the Assessment & Management of Groundwater Contamination (DECC, 2007)
	Any relevant Water Sharing Plan for groundwater and surface water resources
Air Quality	
	Protection of the Environment Operations (Clean Air) Regulation 2002
	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC)
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC)
Noise	
	NSW Industrial Noise Policy (DECC)
	Environmental Noise Management – Assessing Vibration: a technical guide (DEC)
	NSW Road Noise Policy (DECCW)
	Interim Guidelines for the Assessment of Noise From Rail Infrastructure Projects (DECC)
Land Resources	
	Agfact AC25: Agricultural Land Classification (NSW Agriculture)
	State Environmental Planning Policy No. 55 – remediation of Land
	Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC)
Traffic & Transport	
	Guide to Traffic Generating Development (RTA)
Heritage	
Aboriginal	Draft Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation (DEC 2005)
	The Burra Charter (The Australia ICOMOS charter for places of cultural significance)
Historic	NSW Heritage Manual (NSW Heritage Office)
	The Burra Charter (The Australia ICOMOS charter for places of cultural significance)
Greenhouse Gases	
	National Greenhouse Accounts Factors (Australian Department of Climate Change (DCC))
	Guidelines for Energy Savings Action Plans (DEUS)
Waste	
	Waste Classification Guidelines (DECC)
Hazards	
	State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
	Hazardous and Offensive Development Application Guidelines - Applying SEPP 33
	Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis
Rehabilitation	
	Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth of Australia)
	Mine Closure and Completion – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth of Australia)
	Strategic Framework for Mine Closure (ANZMEC-MCA)
Socio-Economic	
	Draft Economic Evaluation in Environmental Impact Assessment (DoP)
	Techniques for Effective Social Impact Assessment: A Practical Guide (Office of Social Policy, NSW Government Social Policy Directorate)

APPENDIX 2:

ABORIGINAL HERITAGE SITE DESCRIPTIONS - PREVIOUSLY RECORDED SITES[1]

[1] From within the Modification investigation area only.

Previously recorded Aboriginal sites within the Abel Modification investigation area:

OEH Site #[1]	Site Name[2]	Site Type / Features[3]	MGA Eastings[4]	MGA Northings[4]	Locality Within Project Abel
38-4-341	Black Hill Quarry 1	open artefact site	369345	6364919	Underground Area (Modification 'Area B')
38-4-668	FMC6 Donaldson Mine[5]	open artefact site	368505	6366289	Underground Area (Modification 'Area A')
38-4-985	Abel 1[6]	open grinding groove site	367823	6364430	Underground Area (Modification 'Area C')
38-4-986	Abel 2[6]	open grinding groove site	367510	6364337	Underground Area (Modification 'Area C')

1. OEH Site # - site number as listed on the OEH AHIMS.
2. Site name of visible, spatially separate locations of heritage evidence/Aboriginal objects.
3. Standard archaeological site type description. Note - there are numerous errors and inaccuracies in the OEH AHIMS data with respect to site descriptions, these have been corrected where possible. 'Isolated artefacts' often comprise the only visible evidence of a larger artefact scatter, hence all 'isolated artefacts' and 'artefact scatters' are referred to as 'open artefact occurrences'.
4. MGA grid reference - The listed grid reference only refers to a single point within a site - often sites extend over broader areas of land. As noted above, there are numerous inaccuracies in the OEH AHIMS data and the accuracy of grid references not recorded by South East Archaeology has not necessarily been verified.
5. Umwelt (2002) map this site 3.5 kilometres east of the reported grid references. It is inferred that the OEH AHIMS grid references are incorrect with interchanging of the easting “6” and “8”. New grid references have been created for this site on the basis of previous mapping and reported site descriptions.
6. Site identified and recorded by Kuskie (2006).

Site # 38-4-341 (Black Hill Quarry 1)

[✓] New recording [ ] Additional Info

National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444

Standard Site Recording Form ~~xxxxxxxxx~~ Revised 12/92

1:250,000 map sheet: NEWCASTLE. NPWS Code 3,8

AMG Grid reference (Full reference - please include leading digits): 250K 369240 mE 25K; 250K 6364730 mN 5/8 25K

Scale of map used for grid reference (Please use largest scale available): [✓] 25K, 50K (preferred) [ ] 100K [ ] 250K

1:25K, 50K, 100K map name: BERESFIELD 9232-3-N

Site name: BLACK HILL QUARRY-1 Locality/property name: BLACK HILL QUARRY.

NPWS District: HUNTER. Region: CENTRAL.

HEAD OFFICE USE ONLY:
NPWS Site no: 38-4-341
Site types: Isolated Artefact
Accessioned by: [illegible] Date: [illegible]
Data entered by: [illegible] Date: 26 MAY 1994

Owner/Manager: MARK WOODBERRY.
Address: BLACK HILL QUARRY. BLACK HILL RD., BLACK HILL.

Reason for investigation
Survey for extensions to the existing quarry.

Portion no: (NOT MARKED ON 1:25000 MAP.
Parish: CESSNOCK. County: Northumberland.

Photos taken? Yes.
How many attached? Refer report.

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff. (Draw diagram on separate sheet.)
Proceed along Black Hill Rd & turn into the Black Hill Quarry (sign posted) continue past office to crusher plant, up the high wall & steep embankment.

Other sites in locality? Yes. Site Types include: Open campsites, isolated finds.
Are sites in NPWS Register? Yes. finds, axe grinding groove & [illegible]

Have artefacts been removed from site? NO. When? N/A.
By whom? N/A Deposited where? N/A.

Is site important to local Aborigines? Some significance.
Give contact(s) name(s) + address(es) Mr. G. Griffiths & Mr. S. Talbot.,
Contacted for this recording? Yes. P.O. Box 453,
(Attach additional information separately) If not, why not? Maitland. Mindaribba L.A.L.C.

Verbal/written reference sources (including full title of accompanying report).
C-2746 NPWS Report Catalogue #
Report of an archaeological survey of the proposed extensions to the Black Hill Gravel Quarry, Black Hill, NSW.

Checklist: surface visibility, damage/disturbance/ threat to site
Condition of site: Disturbed & unformed vehicular track.
Vis.: 90 %
Threat: Quarry extensions.

Recommendations for management & protection (attach separate sheet if necessary):
Consent to Destroy.

Site recorded by: J.M. L. RUIG. Date: 22. 11. 93.
Address/institution: 30 SIMPSON TCE., SINGLETON, 2330, N.S.W. Jim L. Ruig.

SITE POSITION & ENVIRONMENT

OFFICE USE ONLY: NPWS site no:

1. Landform a. beach/hill slope/ridge top, etc: Ridge top. b. site aspect: west. c. slope: [redacted] ~5°

d. mark on diagram provided or on your own sketch the position of the site: e. Describe briefly: (top of ridge - relatively flat).

f. Local rock type: Sedimentary. g. Land use/effect: Gravel Quarry.

2. Distance from drinking water: Source:

3. Resource Zone associated with site (estuarine, riverine, forest etc): Open Forest.

4. Vegetation: Eucalyptus spp., Kunzea ericoides, Macrozamia, Lomandra, Ferns, Acacia spp., Native Passionfruit.

5. Edible plants noted: Kunzea ericoides, Native Passionfruit, Macrozamia, Lomandra, Ferns.

6. Faunal resources (include shellfish): Avifauna noted.

7. Other exploitable resources (river pebbles, ochre, etc): None noted.

Site type: Isolated Artefact.

DESCRIPTION OF SITE & CONTENTS.

Note state of preservation of site & contents. Do NOT dig, disturb, damage site or contents.

1. Flake: 20 x 16 x 8 mm. Black silcrete, platform: broad (16 x 6 mm), tertiary + longitudinal ridge.

CHECKLIST TO HELP: length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock.

DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types.

ART: area of surface decorated, motifs, colours, wet, dry pigment, technique of engraving, no. of figures, sizes, patination.

BURIALS: number & condition of bone, position, age, sex, associated artefacts.

TREES: number, alive, dead, likely age, scar shape, position, size, patterns, axe marks, regrowth.

QUARRIES: rock type, debris, recognisable artefacts, percentage quarried.

OTHER SITES EG. structures (fish traps, stone arrangements, bora rings, *mia mias*), mythological sites, rock holes, engraved groove channels, contact sites (missions massacres cemeteries) as appropriate

Attach sketches etc. eg. plan & section of shelter, show relation between site contents, indicate north, show scale.

Attach annotated photos (stereo where useful) showing scale, particularly for art sites.

Site # 38-4-668 (FMC6 Donaldson Mine)

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220
Standard Site Recording Form

New Recording ☐ Additional information ☐

Site name	FMC6 – DONALDSON MINE	**NPWS Site Number**	38-4-0668
Owner/manager	*Donaldson Coal Pty Ltd*		
Owneraddress	Donaldson Coal Pty Ltd Po Box 2275 Green Hills NSW 2323		38-4-0668
Location	Donaldson Open Cut Coal Mine		
How to get to the site	South of John Renshaw Drive: 3.7km west of intersection with Weakleys Drive, track east of Four Mile Creek south and follow easch easterly tributary to a location approx. 160m north of Blackhill Drive and 100m east of Four Mile Creek tributary.		
1:250,000 map name	Newcastle	**NPWS map code**	
AMG Zone	56 **AMG Easting** 364800	**AMG Northing**	6366100
Method for grid reference	Topographic map **Map scale (if method = map)** 1: 25 000 **Map name**		Beresfield 9232-3-N
NPWS District Name (see map)	Coffs Harbour	**NPWS Zone (see map)**	Northern
Portion no.		**Parish**	Stockrington
Site type(s)	Artefact scatter	**Site type code (NPWS use only)**	
Description of site and contents CHECKLIST: eg. length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. ART: area of decorated surface, motifs, colours, wet./dry pigment, engraving technique, no. of figures, sizes, patination. BURIALS: number & condition of bone, position, age, sex, associated artefacts. TREES: number, alive, dead. likely age, scar shape, position, size, patterns, axe marks, regrowth. QUARRIES: rock type, debris, recognisable artefacts, percentage quarried	This site is located on a vehicle track, on a hillslope 100m to the east of Four Mile Creek. The artefacts consist of a broken chert flake, a silcrete flake, an acid volcanic core/tranchet flake, and an acid volcanic flaked piece. 100% visibility **Attach photographs and sketches, eg. plan & section of shelter.** **Do NOT dig, disturb or damage site or contents.**		

Version: July 2002 Data entered by: Umwelt (RWB) Date entered: 4/2/2003.

Report AHIMS # 98342

Aboriginal Sites Register of NSW

NPWS, PO Box 1967, Hurstville NSW 2220

Standard Site Recording Form

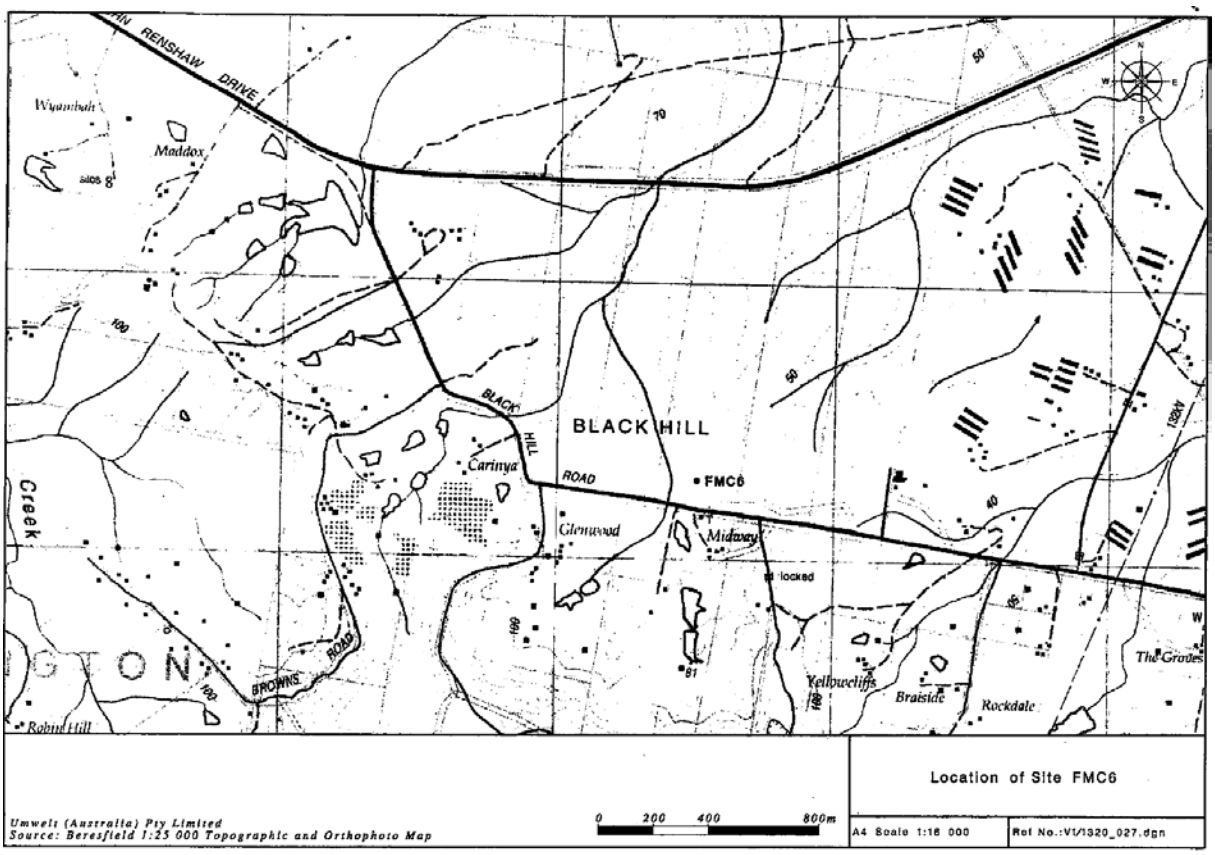
Land form	slope		**Aspect**	W	**Slope**	8-10%
Mark position of the site						
Local rock type	sedimentary		**Land use/effect**	Vehicle track		
Distance from drinking water	Approx. 100m		**Source**	Four Mile Creek tributary		
Resource zone (eg. estuarine, river, forest)	Forest / riparian		**Vegetation**	Spotted Gum / Iron Bark Forest		
Edible plants	None noted		**Faunal resources** (include shellfish)	Kangaroo, wallaby, echidna, goanna, snakes		
Other exploitable resources (eg. ochre)						
Are there other sites in the locality	Yes	**Are they in the Sites Register** Yes	**Other site types include**	Isolated finds, open scatters		

Site condition	Heavily disturbed	Artefacts could not be relocated during later surveys.	
Management recommendations	Leave as is. Located within conservation area.		
Have artefacts been removed from site	No	**When**	
By whom		**Deposited at**	
Consent applied for		**Consent issued**	
Date of issue		**Consent number**	

Reason for investigation			
Were local Aborigines contacted or present for the recording	Contacted and present	**Names and addresses**	Les Draper, Dave Matthews, Gordon Griffiths, Ron Griffiths Mindaribba Local Aboriginal Land Council Lot 457 Chelmsford Drive Metford NSW 2323
Is the site important to local Aborigines	yes		

Verbal/written reference sources	Effenberger, S. 1997 Donaldson Coal Project (west of Beresfield). Archaeological Sample Survey, Maitland, Newcastle, and Cessnock LGAs. Report to PPK Environment & Infrastructure Pty Ltd.	**ASR report number(s) (or title)**	C- C-
Photographs taken	No	**No. of Photos attached**	
Site recorded by	Sue Effenberger	**Date of recording**	16 September 1997
Address/institution			

Version: July 2002	Data entered by: Umwelt	Date entered:


RENSHAW DRIVE
Wyambah
Maddox
BLACK HILL
BLACK HILL ROAD
Carinya
FMC6
Glenwood
Midway
locked
Creek
BROWNS ROAD
Robin Hill
Yellowcliffs
Braeside
Rockdale
The Groves
Location of Site FMC6
Umwelt (Australia) Pty Limited
Source: Beresfield 1:25 000 Topographic and Orthophoto Map
0 200 400 800m
A4 Scale 1:16 000
Ref No.:V1/1320_027.dgn

Site # 38-4-985 (Abel 1)

National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 9585 6444

Standard Site Recording Form Revised 5/88

NPWS Code

1:250,000 map sheet: _____

AMG Grid reference (Full reference - please include leading digits): 250K 3 6 7 7 2 0 mE (25K); 250K 6 3 6 4 2 4 0 mN (5/6 25K)

Scale of map used for grid reference (Please use largest scale available): [x] 25K, ~~50K~~ (preferred) [ ] 100K [ ] 250K

1:25K, ~~50K, 100K~~ map name: Beresfield 9232-3N

HEAD OFFICE USE ONLY:

NPWS Site no: 38-4-985

Site types:

Accessioned by: _____ Date: _____

Data entered by: _____ Date: _____

Owner/Manager: Coal & Allied

Address: Lemington Road, Lemington NSW 2330

Site name: Abel 1

Locality/property name: Black Hill

NPWS District: Lower Hunter

Region: Northern

Reason for investigation

Archaeological assessment in relation to proposed Abel underground coal mine.

Portion no:

Parish:

Photos taken? Yes

How many attached? Nil

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff. (Draw diagram on separate sheet.)

The property is accessed from Black Hill Road approximately eight kilometres south of East Maitland.

Other sites in locality? Yes

Are sites in NPWS Register? Yes

Site Types include: Artefact scatters, grinding grooves

Have artefacts been removed from site? No

By whom?

When?

Deposited where?

Is site important to local Aborigines? Yes

Give contact(s) name(s) + address(es): Mindaribba Local Aboriginal Land Council, PO Box 401, East Maitland, NSW 2325

Contacted for this recording? Yes

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report)

NPWS Report Catalogue #

Appendix in Project Abel Part 3A Application.

Checklist: surface visibility, damage/disturbance/ threat to site

Condition of site:

Low levels of ground disturbance primarily in relation to water run-off/erosion

Recommendations for management & protection (attach separate sheet if necessary).

Potential for impact requires clarification. Refer to Part 3A Statement of Commitments.

Site recorded by: Peter Kuskie

Address/institution: South East Archaeology Pty Ltd, 24 Bamford Street, Hughes ACT 2605

Date: 11/04/06

SITE POSITION & ENVIRONMENT | **OFFICE USE ONLY: NPWS site no:**

1. **Land form a. beach/hill slope/ridge top, etc:** drainage depression **b. site aspect:** open **c. slope:** moderate

d. **mark on diagram provided *or* on your own sketch the position of the site:** **e. Describe briefly:**

f. **Local rock type:** sandstone **g. Land use/effect:** Previously cleared, vehicle tracks

2. **Distance from drinking water:** <50 metres **Source:** 2nd order tributary of Long Gully

3. **Resource Zone associated with site (estuarine, riverine, forest etc):** Forest, drainage.

4. **Vegetation:** forest

5. **Edible plants noted:** nil

6. **Faunal resources (include shellfish):** typical forest species

7. **Other exploitable resources (river pebbles, ochre, etc):**

Site type:
Grinding Groove

CHECKLIST TO HELP: length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock.

DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types.

ART: area of surface decorated, motifs, colours, wet, dry pigment, technique of engraving, no. of figures, sizes, patination.

BURIALS: number & condition of bone, position, age, sex, associated artefacts.

TREES: number, alive, dead, likely age, scar shape, position, size, patterns, axe marks, regrowth

QUARRIES. rock type, debris, recognisable artefacts, percentage quarried.

OTHER SITES EG. structures (fish traps, stone arrangements, bora rings, mia mias), mythological sites, rock holes, engraved groove channels, contact sites (massacres cemeteries) as appropriate

DESCRIPTION OF SITE & CONTENTS.
Note state of preservation of site & contents. Do NOT dig, disturb, damage site or contents.

At least five visible grinding grooves although there may be many more under moss/leaf cover.

Site also comprises a circular depression where grinding has occurred just above a waterfall.

Levels of disturbance to site is low.

Attach sketches etc. eg. plan & section of shelter, show relation between site contents, indicate north, show scale.
Attach annotated photos (stereo where useful) showing scale, particularly for art sites.

Abel 1: Photographs and groove descriptions.

Extent of Exposed Rock (metres)	Extent of Grooves (metres)	Rock Type	Rock Form	Surface Condition	Disturbance	Type of Disturbance	Groove #	Groove Length (mm)	Groove Width (mm)	Groove Depth (mm)	Comments
12x4	1x1	sandstone	open surface	stable	low		1	300	90	20	adjacent to small pool with stagnant water
12x4	1x1	sandstone	open surface	stable	low		2	370	80	20	
12x4	1x1	sandstone	open surface	stable	low		3	300	90	20	truncated by crack in slab

Site # 38-4-986 (Abel 2)

National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 9585 6444
Standard Site Recording Form Revised 5/88

NPWS Code

1:250,000 map sheet: _____

AMG Grid reference (Full reference - please include leading digits): 250K 3 6 7 4 0 0 mE (25K); 250K 6 3 6 4 1 4 0 mN (5/8 | 25K)

Scale of map used for grid reference (Please use largest scale available): [x] 25K, ~~50K~~ (preferred) [ ] 100K [ ] 250K

1:25K, ~~50K, 100K~~ map name: Beresfield 9232-3N

HEAD OFFICE USE ONLY:
NPWS Site no: 38-4-986
Site types:
Accessioned by: _____ Date: _____
Data entered by: _____ Date: _____

Owner/Manager: Coal & Allied
Address: Lemington Road, Lemington, NSW 2330

Site name: Abel 2
Locality/property name: Black Hill
NPWS District: Lower Hunter
Region: Northern

Reason for investigation

Archaeological assessment in relation to proposed Abel underground coal mine.

Portion no:
Parish:

Photos taken? Yes
How many attached? Nil

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff (Draw diagram on separate sheet.)

The property is accessed from Black Hill Road approximately eight kilometres south of East Maitland.

Other sites in locality? Yes
Are sites in NPWS Register? Yes
Site Types include: Artefact scatters, grinding grooves

Have artefacts been removed from site? No
By whom?
When?
Deposited where?

Is site important to local Aborigines? Yes
Give contact(s) name(s) + address(es): Mindaribba Local Aboriginal Land Council, PO Box 401, East Maitland, NSW 2325
Contacted for this recording? Yes
(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report)

Appendix in Project Abel Part 3A Application.

NPWS Report Catalogue #

Checklist: surface visibility, damage/disturbance/ threat to site

Condition of site:

Low levels of ground disturbance primarily in relation to water run-off/erosion

Recommendations for management & protection (attach separate sheet if necessary)

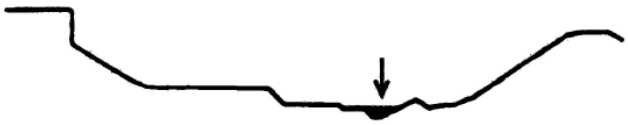
Potential for impact requires clarification. Refer to Part 3A Statement of Commitments.

Site recorded by: Peter Kuskie
Address/institution: South East Archaeology Pty Ltd, 24 Bamford Street, Hughes ACT 2605
Date: 11/04/06

SITE POSITION & ENVIRONMENT | **OFFICE USE ONLY: NPWS site no:**

1. Land form a. beach/hill slope/ridge top, etc: drainage depression b. site aspect: open c. slope: moderate

d. mark on diagram provided *or* on your own sketch the position of the site: e. Describe briefly:



f. Local rock type: sandstone g. Land use/effect: Previously cleared, vehicle tracks

2. Distance from drinking water: <50 metres Source: 1st order tributary of Long Gully

3. Resource Zone associated with site (estuarine, riverine, forest etc): Forsest, creek

4. Vegetation: forest

5. Edible plants noted: nil

6. Faunal resources (include shellfish): typical forest species

7. Other exploitable resources (river pebbles, ochre, etc):

Site type:
Grinding
Groove

DESCRIPTION OF SITE & CONTENTS.
Note state of preservation of site & contents. Do NOT dig, disturb, damage site or contents.

Four visible grinding grooves although there may be more under silt/leaf litter and moss cover.

Site is situated above a 10 metre drop/waterfall.

Levels of disturbance to site is low.

CHECKLIST TO HELP: length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock.
DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types.
ART: area of surface decorated, motifs, colours, wet, dry pigment, technique of engraving, no. of figures, sizes, patination.
BURIALS: number & condition of bone, position, age, sex, associated artefacts.
TREES: number, alive, dead, likely age, scar shape, position, size, patterns, axe marks, regrowth
QUARRIES: rock type, debris, recognisable artefacts, percentage quarried.
OTHER SITES EG. structures (fish traps, stone arrangements, bora rings, mia mias), mythological sites, rock holes, engraved groove channels, contact sites (missions massacres cemeteries) as appropriate

Attach sketches etc. eg. plan & section of shelter, show relation between site contents, indicate north, show scale.
Attach annotated photos (stereo where useful) showing scale, particularly for art sites.

Abel 2: Photographs and groove descriptions.

Extent of Exposed Rock (metres)	Extent of Grooves (metres)	Rock Type	Rock Form	Surface Condition	Disturbance	Type of Disturbance	Groove #	Groove Length (mm)	Groove Width (mm)	Groove Depth (mm)	Comments
10x5	1x1	sandstone	open surface	weathered	low	erosion	1	280	100	20	
10x5	1x1	sandstone	open surface	weathered	low	erosion	2	290	70	20	
10x5	1x1	sandstone	open surface	weathered	low	erosion	3	180	80	5	very shallow
10x5	1x1	sandstone	open surface	weathered	low	erosion	4	290	100	20	

APPENDIX 3:

ARCHAEOLOGICAL SURVEY COVERAGE DATABASE - CURRENT SURVEY

ABEL MODIFICATION 2012 - ARCHAEOLOGICAL SURVEY COVERAGE DATABASE

Survey Area	Landform Element	Slope	Distance to Water (metres)	Vegetation	Land Surface	Rock Outcrop Material	Rock Outcrop Form	Extent of Rock Outcrop (%)	Exposure Type (Horizon)	Erosion/Deposition	Total Sample Area (m^2)	Surface Visibility (%)	Detection Limiting Factors	Archaeological Visibility %	Ground Disturbance	Effective Survey Coverage (m^2)	# of Artefacts (open sites)	Artefact Density/m^2 of Effective Survey Coverage	Comments
AMA1	drainage depression	gentle	<50	1, 2	3, 4, 5	sandstone	outcrop	<10	A/B	E	13,440	2	1, 2, 3	2	low	268	0	-	access tracks; lantana thick from 368697:6366425 to south
AMA2	ridge crest	gentle	<50	2	4, 5	sandstone	outcrop	<10	A/B	E	7,200	20	1, 2	20	high	1440	10	0.007	three sites located along access tracks
AMA3	drainage depression	gentle	<50	1, 2	4, 5	sandstone	outcrop	<10	A/B	E	5280	2	1, 2, 3	2	low	105	0	-	logged in past; dense lantana; drilling area
AMA4	drainage depression	gentle	<50	2	2, 3, 4, 5	sandstone	outcrop	<10	A/B	E/D	5,600	2	1, 2, 3	2	low	112	0	-	sparse lantana north of Black Hill; open to south; drilling site
AMA5	simple slope	moderate	<50	2	4, 5	sandstone	outcrop	<10	A/B	E	2,800	2	1, 2	2	low	56	0	-	regrowth forest; dense lantana
AMA6	drainage depression	moderate	<50	2	4, 5	sandstone	outcrop	<10	A/B	E	1,260	2	1, 2, 3	2	low	25	0	-	difficult access due to dense lantana
AMA7	drainage depression	gentle	<50	2	3, 4, 5	sandstone	outcrop	<10	A/B	E/D	15,400	2	1, 2, 3	2	low	308	0	-	dense lantana south of Black Hill Road; sparse lantana towards two dams
AMB1	drainage depression	steep	<50	2	2, 4	sandstone	boulder, outcrop, open surface	10-50	A/B	E	2,560	2	1, 2, 3	2	low	51	0	-	difficult access, limited visibility due to dense lantana/vegetation in gully; sandstone outcrops covered in leaf litter/moss at 369237:6364774
AMB2	simple slope	moderate	>50	2	4, 5	sandstone	scarp, boulder, outcrop	10-50	A/B	E	2,400	2	1, 2	2	low	48	0	-	dense lantana, vegetation; adjacent to peak of Black Hill
AMB3	ridge crest	gentle	>50	1, 2	4, 5				A/B	E/D	2,000	2	1, 2	2	low-high	40	0	-	dense vegetation; peak of Black Hill and adjacent ridges; quarry adjacent
AMB4	simple slope	moderate	>50	2	4, 5	sandstone	scarp, boulder, outcrop	10-50	A/B	E	4,800	2	1, 2	2	low	96	0	-	dense lantana, vegetation; difficult access
AMB5	drainage depression	moderate	<50	1, 2	2, 3, 4, 5	sandstone	boulder, outcrop, open surface	10-50	A/B	E/D	5,600	2	1, 2, 3	2	low	112	0	-	dense lantana, vegetation
AMB6	drainage depression	gentle	<50	1, 2	2, 3, 4, 5			10-50	A/B	E/D	3,200	1	1, 2, 3	1	mod	32	0	-	regrowth; cleared; extensive dense lantana
AMC1	simple slope	moderate	>50	2	4, 5	sandstone	outcrop	<10	A/B	E	3,080	2	1, 2, 3	2	low	62	0	-	visibility limited by dense vegetation
AMC2	drainage depression	moderate	<50	2	2, 3, 4	sandstone	boulder, outcrop, open surface, scarp	<10	A/B	E	9,100	2	1, 2, 3	2	low	182	0	-	dense lantana in gullies; cliff/overhang/outcrop at 6367271:6364247
AMC3	simple slope	moderate	<50	2	2, 4	sandstone	boulder, outcrop	<10	A/B	E	1,600	2	1, 2	2	low	32	0	-	lantana; very small overhang
AMC4	simple slope	moderate	<50	2	4	sandstone	outcrop	<10	A/B	E	1,600	2	1, 2	2	low	32	0	-	visibility limited by dense vegetation
AMC5	simple slope	moderate	>50	2	4, 5	sandstone	scarp, boulder, outcrop	10-50	A/B	E	6,100	2	1, 2	2	low	122	0	-	logged; dense lantana/vegetation
AMC6	simple slope	moderate	>50	2	4	sandstone	outcrop	<10	A/B	E	2,080	2	1, 2,	2	low	42	0	-	regrowth forest; firetrail
AMC7	simple slope	moderate	>50	2	4	sandstone	outcrop	<10	A/B	E	3,680	2	1, 2	2	low	74	0	-	bush/regrowth; felled trees
AMC8	ridge crest	gentle	>50	2	4	sandstone	outcrop	<10	A/B	E	1,600	2-30	1, 2	2-30	low	320	0	-	bush/regrowth; firetrail
AMC9	drainage depression	moderate	<50	2	4	sandstone	outcrop	<10	A/B	E	2,000	2	1, 2	2	low	40	0	-	dense lantana; difficult access
AMC10	drainage depression	moderate	<50	2	4	sandstone	boulder, outcrop, open surface	10-50	A/B	E	8,160	2	1, 2, 3	2	low	163	0	-	sparse lantana

ABEL MODIFICATION 2012 - ARCHAEOLOGICAL SURVEY COVERAGE DATABASE

Survey Area	Landform Element	Slope	Distance to Water (metres)	Vegetation	Land Surface	Rock Outcrop Material	Rock Outcrop Form	Extent of Rock Outcrop (%)	Exposure Type (Horizon)	Erosion/Deposition	Total Sample Area (m^2)	Surface Visibility (%)	Detection Limiting Factors	Archaeological Visibility %	Ground Disturbance	Effective Survey Coverage (m^2)	# of Artefacts (open sites)	Artefact Density/m^2 of Effective Survey Coverage	Comments
AMC11	drainage depression	moderate	<50	2	4	sandstone	outcrop	<10	A/B	E	2,240	2	1, 2	2	low	45	0	-	
AMC12	simple slope	gentle	>50	2	4	sandstone	outcrop	<10	A/B	E	7,000	2	1, 2	2	low	140	0	-	
AMC13	simple slope	steep	<50	2	4, 5	sandstone	cliff, boulder	<10	A/B	E	1,600	2	1, 2	2	low	32	0	-	
AMC14	drainage depression	moderate	<50	2	2, 4	sandstone	boulder, outcrop, open surface	<10	A/B	E	6,240	2	1, 2, 3	2	low	124	0	-	overhang 367738:6362951; dense lantana
AMC15	simple slope	steep	<50	2	4, 5	sandstone	cliff, boulder	<10	A/B	E	7,500	2	1, 2	2	low	150	0	-	sparse lantana
AMC16	drainage depression	moderate	<50	2	3, 4	sandstone	boulder, outcrop, open surface	<10	A/B	E	10,800	2	1, 2, 3	2	low	216	0	-	
Vegetation - 1 = cleared/grass/crop; 2 = forest/bush/regrowth																			
Land Surface - 1 = sheet erosion; 2 = gully erosion; 3 = stream bank erosion; 4 = vegetated; 5 = modified																			
Erosion = E, Depositional = D, Uncertain = U																			
Detection Limiting Factors - 1 = vegetation; 2 = leaf litter/gravel; 3 = sediment deposition; 4 = other																			

APPENDIX 4.

ABORIGINAL HERITAGE SITE DESCRIPTIONS - SITES RECORDED DURING CURRENT SURVEY

Site Name	Survey Area	OEH AHIMS #	Site Type / Features	MGA Grid Reference Eastings	MGA Grid Reference Northings	Landform Type
AMA2/A	AMA2	pending	Open artefact site	368590	6366390	ridge crest
AMA2/B	AMA2	pending	Open artefact site	368703	6366603	ridge crest
AMA2/C	AMA2	pending	Open artefact site	368640	6366511	ridge crest
AMB1/A	AMB1	pending	Open grinding groove site	369242	6364779	drainage depression
AMC2/A	AMC2	pending	Open grinding groove site	367343	6364155	drainage depression
AMC2/B	AMC2	pending	Rock shelter with PAD	367340	6364645	drainage depression
AMC2/C	AMC2	pending	Open grinding groove site	367624	6364425	drainage depression
AMC2/D	AMC2	pending	Scarred tree (possible)	367346	6364645	drainage depression
AMC5/A	AMC5	pending	Open artefact site	367641	6364252	simple slope
AMC10/A	AMC10	pending	Open grinding groove site	366935	6363192	drainage depression
AMC12/A	AMC12	pending	Scarred tree (possible)	367576	6363045	simple slope
AMC16/A	AMC16	pending	Open grinding groove site	367903	6363467	drainage depression

SITE NAME: AMA2/A

Site Type:	*Open artefact site*	MGA Grid Reference:	*368590:6366390*
Date Recorded:	*2/4/12*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Ridge crest*	Vegetation:	*Regrowth forest*
Slope:	*Gentle*	Ground Disturbance:	*High*
Distance to Water:	*>50*		

Visible Extent of Surface Exposures: Length (m)	Visible Extent of Surface Exposures: Width (m)	Visible Extent of Evidence: Length (m)	Visible Extent of Evidence: Width (m)	Visible Locus Area (m^2)	Mean Surface Visibility of Locus (%)	Mean Arch. Visibility of Locus (%)	Effective Locus Area (m^2)	# of Artefacts	# of Artefacts per m^2 of Effective Locus Area	Sub-Surface Deposit
50+	2	40	2	80	90%	90%	72	6	0.083	possible

Lithic Items:

Artefact #	Colour	Stone Material	Lithic Item Type	Dimensions (mm)	Cortex (%)	Cortex Type	Comments
1	yellow/red	tuff	core	45x40x25	30%	peb	2+ scars, 1 platform
2	brown/red	tuff	lithic fragment	28x40x10	15%	peb	
3	red	silcrete	flake	20x12x3			
4	grey	chert	lithic fragment	25x19x15	25%	peb	
5	grey	silcrete	flake - proximal	45x30x20	40%	peb	
6	grey	chert	flake - proximal	20x11x5			margin damaged

Additional Comments:

- Artefacts located on vehicle track;
- High disturbance from vehicles.

Site Location: AMA2/A (100 metre MGA grid; 2 metre contours)

Photograph: AMA2/A

SITE NAME: AMA2/B

Site Type:	*Open artefact site*	MGA Grid Reference:	*368703:6366603*
Date Recorded:	*2/4/12*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Ridge crest*	Vegetation:	*Regrowth forest*
Slope:	*Gentle*	Ground Disturbance:	*High*
Distance to Water:	*<50*		

Visible Extent of Surface Exposures: Length (m)	Visible Extent of Surface Exposures: Width (m)	Visible Extent of Evidence: Length (m)	Visible Extent of Evidence: Width (m)	Visible Locus Area (m^2)	Mean Surface Visibility of Locus (%)	Mean Arch. Visibility of Locus (%)	Effective Locus Area (m^2)	# of Artefacts	# of Artefacts per m^2 of Effective Locus Area	Sub-Surface Deposit
50+	2	2	2	4	90%	90%	3.6	3	0.83	possible

Lithic Items:

Artefact #	Colour	Stone Material	Lithic Item Type	Dimensions (mm)	Cortex (%)	Cortex Type	Comments
1	red	silcrete	flake - proximal	30x25x15			
2	orange/red	silcrete	flake - proximal	55x27x15			
3	orange/red	silcrete	lithic fragment	17x16x2			

Additional Comments:

- Artefacts located on vehicle track;
- High disturbance from vehicles.

Site Location: AMA2/B (100 metre MGA grid; 2 metre contours)

Photograph: AMA2/B

SITE NAME: AMA2/C

Site Type:	*Open artefact site*	MGA Grid Reference:	*368640:6366511*
Date Recorded:	*2/4/12*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Ridge crest*	Vegetation:	*Regrowth forest*
Slope:	*Gentle*	Ground Disturbance:	*High*
Distance to Water:	*<50*		

Visible Extent of Surface Exposures: Length (m)	Visible Extent of Surface Exposures: Width (m)	Visible Extent of Evidence: Length (m)	Visible Extent of Evidence: Width (m)	Visible Locus Area (m^2)	Mean Surface Visibility of Locus (%)	Mean Arch. Visibility of Locus (%)	Effective Locus Area (m^2)	# of Artefacts	# of Artefacts per m^2 of Effective Locus Area	Sub-Surface Deposit
50+	2	1	1	1	90%	90%	0.9	1	1.11	possible

Lithic Items:

Artefact #	Colour	Stone Material	Lithic Item Type	Dimensions (mm)	Cortex (%)	Cortex Type	Comments
1	cream	tuff	flake	36x34x13			

Additional Comments:

- Artefact located on vehicle track;
- High disturbance from vehicles.

Site Location: AMA2/B (100 metre MGA grid; 2 metre contours)

Photograph: AMA2/C

SITE NAME: AMB1/A

Site Type:	*Open grinding groove*	MGA Grid Reference:	*369242:6364779*
Date Recorded:	*11/04/2012*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Drainage depression*	Vegetation:	*Forest*
Slope:	*Steep*	Ground Disturbance:	*Low*
Distance to Water:	*<50*		

Extent of Exposed Rock:	*6 x 4 metres*
Extent of Grooves:	*1 x 1 metres*
Rock Type:	*Sandstone*
Rock Form:	*Open surface*
Surface Condition:	*Stable*
Disturbance:	*Low*
Type of Disturbance:	*Erosion, weathering*

Groove description:

Groove #	Groove Length (mm)	Groove Width (mm)	Groove Depth (mm)	Comments
1	460	70	5	u-shaped
2	300	80	8	u-shaped

Additional Comments:

- Erosion caused by water;
- Probably more grooves present under moss cover.

Site Location: AMB1/A (100 metre MGA grid; 2 metre contours)

Photograph: AMB1/A

SITE NAME: AMC2/A

Site Type:	*Open grinding groove*	MGA Grid Reference:	*367343:6364155*
Date Recorded:	*3/4/12*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Drainage depression*	Vegetation:	*Forest*
Slope:	*Moderate*	Ground Disturbance:	*Low*
Distance to Water:	*<50*		

Loci A - B:

Rock Type:	*Sandstone*
Rock Form:	*Open surface*
Surface Condition:	*Stable*
Disturbance:	*Low*
Type of Disturbance:	*Weathering*

Locus A:

Extent of Exposed Rock:	*6 x 4 metres*
Extent of Grooves:	*2 x 2 metres*

Locus B:

Extent of Exposed Rock:	*1 x 1 metres*
Extent of Grooves:	*1 x 1 metres*

Groove description:

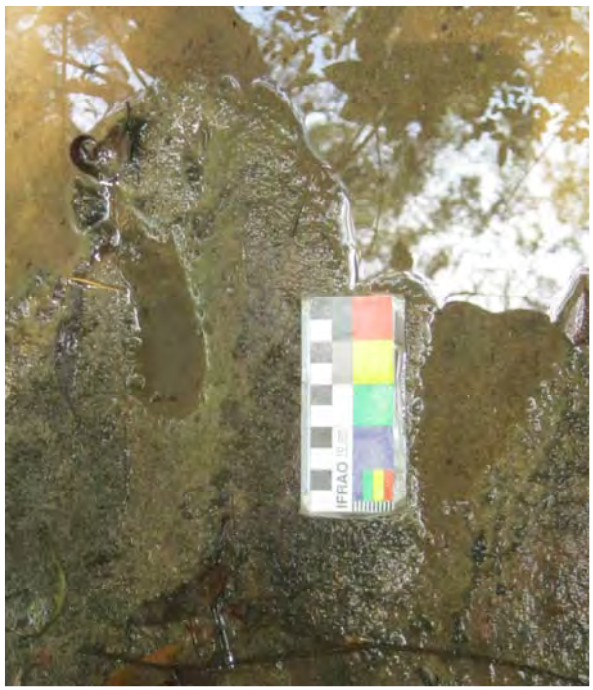
Groove #	Groove Length (mm)	Groove Width (mm)	Groove Depth (mm)	Comments
1	100	45	15	u-shaped
2	205	110	40	u-shaped
3	150	95	15	u-shaped
4	170	100	8	u-shaped
5	190	60	85	u-shaped
6	230	245	15	u-shaped
7	200	55	4	u-shaped
8	170	65	3	u-shaped
9	230	100	17	u-shaped, in locus B

Additional Comments:

- Recorded in two sub-loci, A - B, within 20 metres of each other;
- Grooves partially submerged, more likely to be present.

Site Location: AMC2/A (100 metre MGA grid; 2 metre contours)

Photograph: AMC2/A (below: grinding groove B1 - left and A1-8 - right)



SITE NAME: AMC2/B

Site Type:	*Rock shelter with PAD*	MGA Grid Reference:	*367340:6364645*
Date Recorded:	*12/4/12*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		

Landform Element:	*Drainage depression*	Vegetation:	*Forest*
Slope:	*Moderate*	Ground Disturbance:	*Low*
Distance to Water:	*<50*		

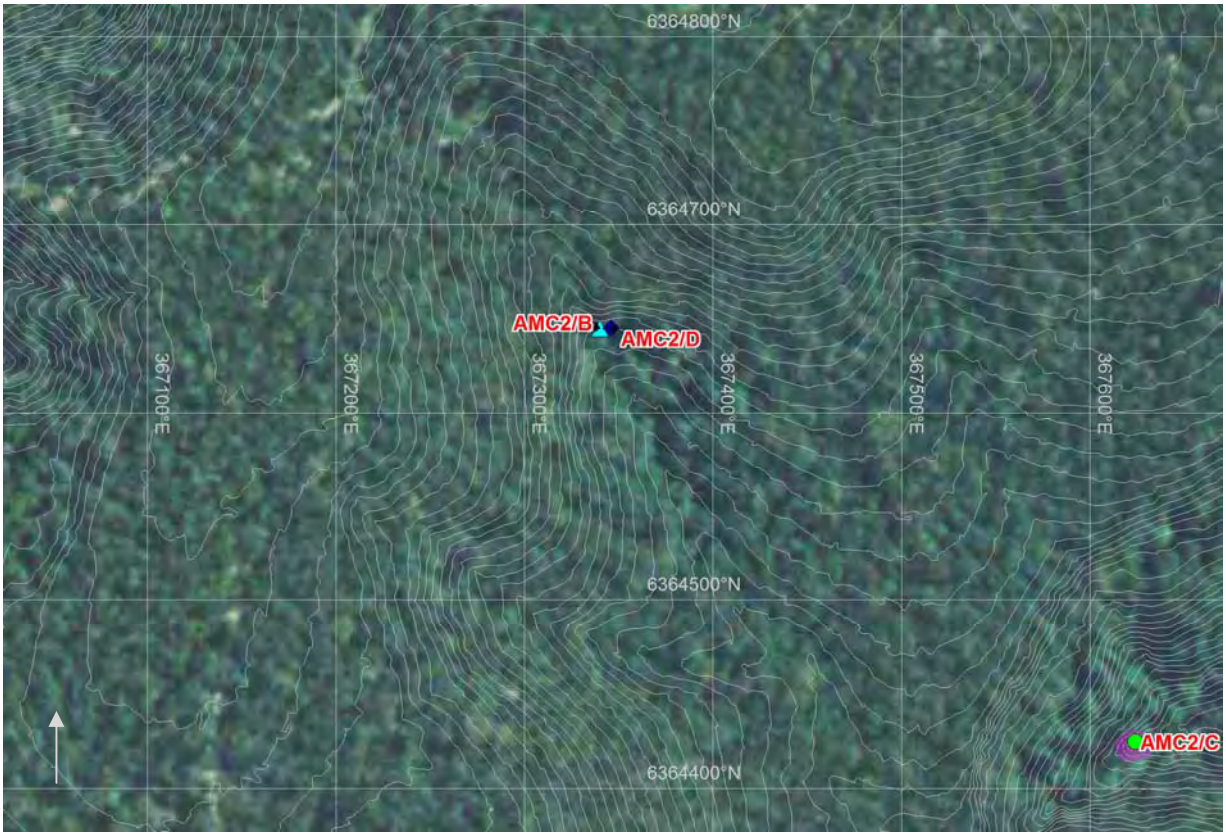
Rock Outcrop Material:	*Sandstone*
Outcrop Type:	*Rock shelter*
Outcrop Form:	*Boulder*
Aspect:	*South-west*
Erosion:	
Surface Condition:	*Stable*
Soil:	*Rocky, humic*
Disturbance to Deposit:	*Low*
Causes of Disturbance:	

Possible Extent of Potential Archaeological Deposit:	*2 x 2 metres*
Possible Depth of Potential Archaeological Deposit:	*>0.1 metres*
# of Artefacts:	*0*
Visible Extent of Artefacts:	*n/a*
Archaeological Visibility:	*2%*
Shelter Floor Area:	*2 x 2 metres*
Habitable Shelter Area (roof 1+ metres above floor):	*2 x 2 metres*

Additional Comments:

- Height in centre is 1.4 metres;
- Very low entrance;
- 15 metres from scarred tree (AMC2/D);
- Small PAD, very low research potential.

Site Location: AMC2/B (100 metre MGA grid; 2 metre contours)



Photograph: AMC2/B

SITE NAME: AMC2/C

Site Type:	*Open grinding groove*	MGA Grid Reference:	*367624:6364425*
Date Recorded:	*12/04/2012*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Drainage depression*	Vegetation:	*Forest*
Slope:	*Moderate*	Ground Disturbance:	*Low*
Distance to Water:	*<50*		

Extent of Exposed Rock:	*12 x 6 metres*
Extent of Grooves:	*1 x 1 metres*
Rock Type:	*Sandstone*
Rock Form:	*Open surface*
Surface Condition:	*Stable*
Disturbance:	*Low*
Type of Disturbance:	*Weathering*

Groove description:

Groove #	Groove Length (mm)	Groove Width (mm)	Groove Depth (mm)	Comments
1	270	80	5	u-shaped
2	280	90	10	u-shaped

Additional Comments:

- Weathering caused by water flow;
- Grooves submerged, probably more present.

Site Location: AMC2/C (100 metre MGA grid; 2 metre contours)

Photograph: AMC2/C

SITE NAME: AMC2/D

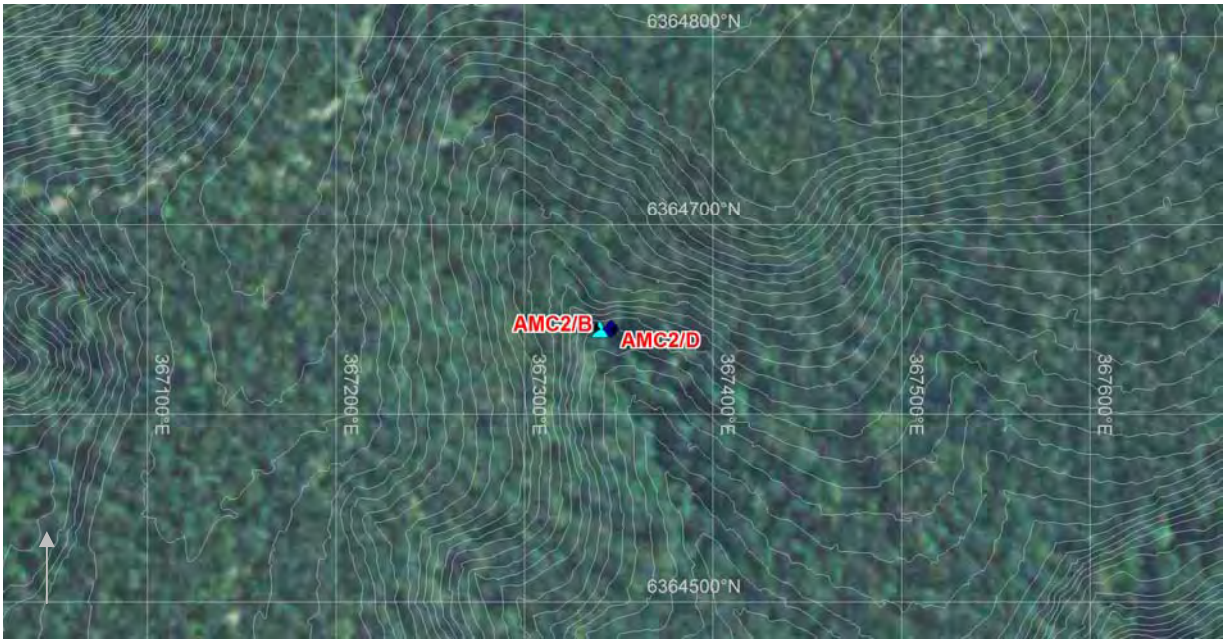
Site Type:	*Scarred tree (possible)*	MGA Grid Reference:	*367346:6364645*
Date Recorded:	*12/04/12*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Drainage depression*	Vegetation:	*Forest*
Slope:	*Moderate*	Ground Disturbance:	*Low*
Distance to Water:	*<50*		

Tree Species:	*Uncertain, possibly Coachwood or Mahogany*
Stand/Open:	*Stand of trees*
Tree Condition:	*Alive, healthy*
Tree Height:	*20+ metres*
Tree Circumference at Scar:	*2.6 metres*
Tree Diameter at Scar:	*c.0.7 metres*
Tree Age:	*Uncertain*
Disturbance:	*Possible white ants*
# Scars:	*One*
Scar Type:	
Scar Location:	*Trunk*
Scar Shape:	*Elongated oval*
Material Removed:	*Bark, wood*
Scar Condition:	*Poor - white ants*
Extent of scar (length):	*2 metres*
Extent of scar (width max):	*0.25 metres*
Extent of scar (depth max):	*0.18 metres*
Scar Height of Base Above Ground:	*2 metres*
Scar Overgrowth:	*0.12 metres*
Axe Marks:	
Scar Aspect:	*North-east*

Additional Comments:

- Located 15 metres from small rock shelter with PAD (AMC2/B);
- An Aboriginal origin for the scar cannot be discounted, but natural causes are more likely.

Site Location: AMC2/D (100 metre MGA grid; 2 metre contours)



Photograph: AMC2/D

Photograph: AMC2/D

SITE NAME: AMC5/A

Site Type:	*Open artefact site*	MGA Grid Reference:	*367641:6364252*
Date Recorded:	*12/4/12*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Simple slope*	Vegetation:	*Regrowth forest*
Slope:	*Moderate*	Ground Disturbance:	*High*
Distance to Water:	*<50*		

Visible Extent of Surface Exposures: Length (m)	Visible Extent of Surface Exposures: Width (m)	Visible Extent of Evidence: Length (m)	Visible Extent of Evidence: Width (m)	Visible Locus Area (m^2)	Mean Surface Visibility of Locus (%)	Mean Arch. Visibility of Locus (%)	Effective Locus Area (m^2)	# of Artefacts	# of Artefacts per m^2 of Effective Locus Area	Sub-Surface Deposit
50+	2	1	1	1	90%	90%	0.9	1	1.11	unlikely

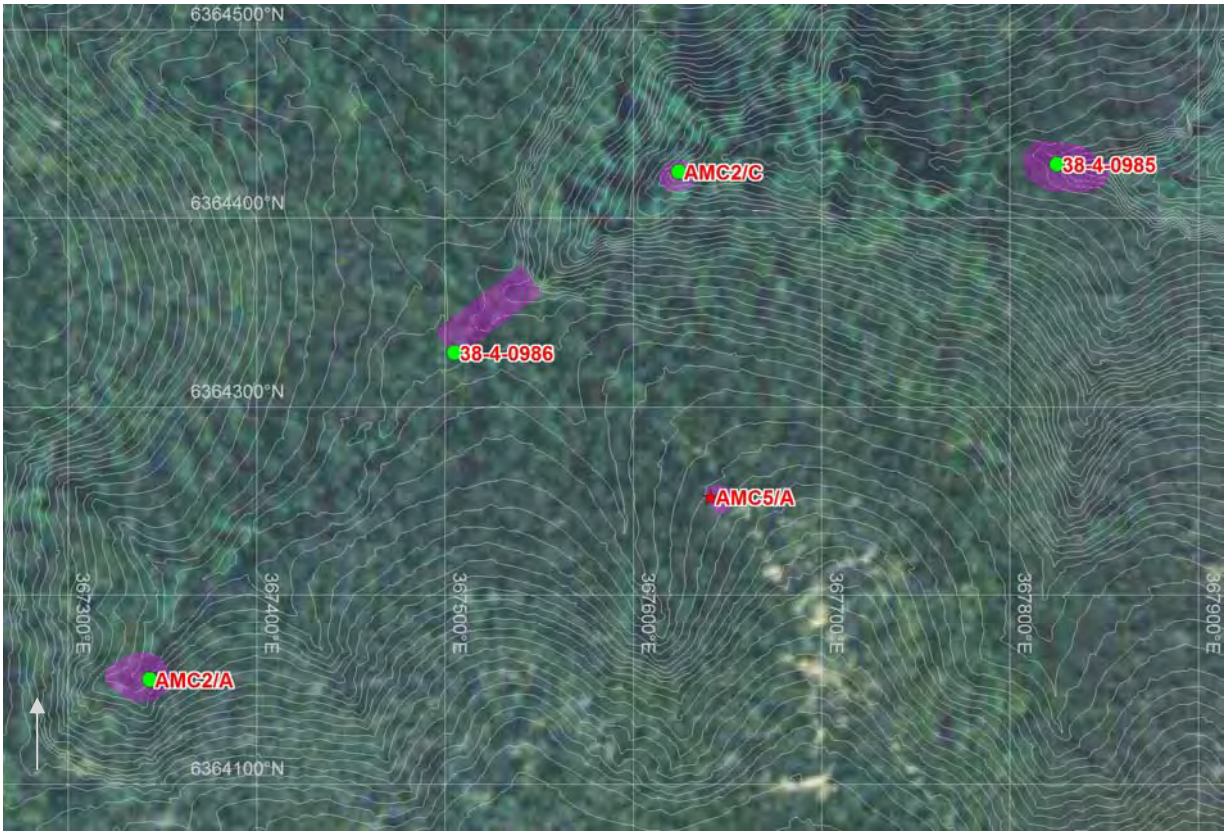
Lithic Items:

Artefact #	Colour	Stone Material	Lithic Item Type	Dimensions (mm)	Cortex (%)	Cortex Type	Comments
1	black	acidic volcanic	flake	33x39x12			

Additional Comments:

- Artefacts located on vehicle track;
- High disturbance from vehicles.

Site Location: AMC5/A (100 metre MGA grid; 2 metre contours)



Photograph: AMC5/A (inset - artefact)

SITE NAME: AMC10/A

Site Type:	*Open grinding groove*	MGA Grid Reference:	*366935:6363192*
Date Recorded:	*4/4/12*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Drainage depression*	Vegetation:	*Forest*
Slope:	*Moderate*	Ground Disturbance:	*Low*
Distance to Water:	*<50*		

Loci A - B:

Rock Type:	*Sandstone*
Rock Form:	*Open surface*
Surface Condition:	*Stable*
Disturbance:	*Low*
Type of Disturbance:	*Erosion, weathering*

Locus A:

MGA Grid Reference:	*366935:6363192*
Extent of Exposed Rock:	*6 x 4 metres*
Extent of Grooves:	*1 x 1 metres*

Locus B:

MGA Grid Reference:	*366940:6363163*
Extent of Exposed Rock:	*1 x 1 metres*
Extent of Grooves:	*1 x 1 metres*

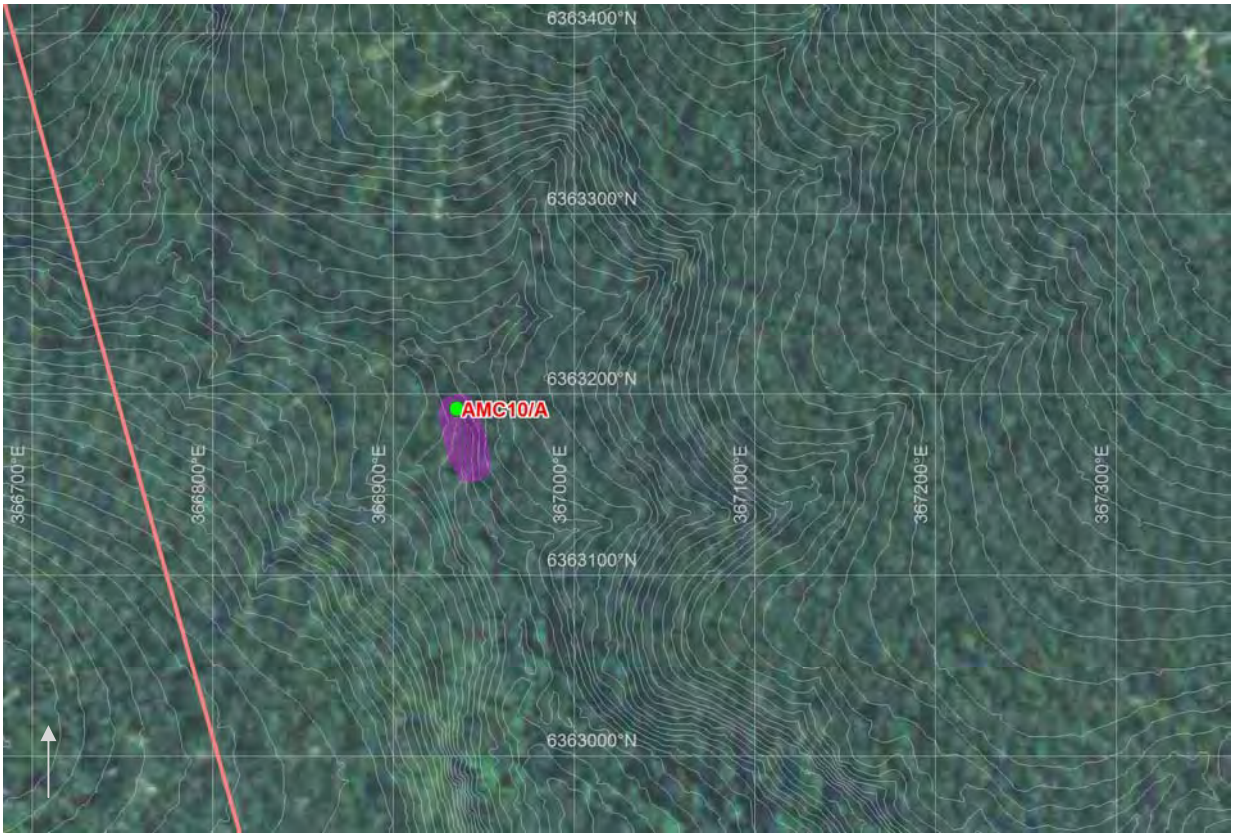
Groove description:

Groove #	Groove Length (mm)	Groove Width (mm)	Groove Depth (mm)	Comments
1	300	100	35	u-shaped
2	240	100	35	u-shaped
3	160	70	15	u-shaped
4	270	70	15	u-shaped
5	200	80	15	u-shaped
6	100	35	5	u-shaped
7	230	62	2	u-shaped
8	200	95	4	u-shaped
9	210	40	3	u-shaped; in sub-locus B
10	280	72	18	u-shaped; in sub-locus B

Additional Comments:

- Recorded in two sub-loci, A - B, within 30 metres of each other;
- More grooves likely to be present under moss cover.

Site Location: AMC10/A (100 metre MGA grid; 2 metre contours)



Photograph: AMC10/A (Locus A grooves)

Photograph: AMC10/A (Locus A)

SITE NAME: AMC12/A

Site Type:	*Scarred tree (possible)*	MGA Grid Reference:	*367576:6363045*
Date Recorded:	*4/04/12*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Jason Barr*		
Landform Element:	*Simple slope*	Vegetation:	*Forest*
Slope:	*Gentle*	Ground Disturbance:	*Low*
Distance to Water:	*>50*		

Tree Species:	*Uncertain, possibly Mahogany*
Stand/Open:	*Stand of trees*
Tree Condition:	*Alive, healthy*
Tree Height:	*15+ metres*
Tree Circumference at Scar:	*3.3 metres*
Tree Diameter at Scar:	*c.0.9 metres*
Tree Age:	*Uncertain*
Disturbance:	*Possible white ants*
# Scars:	*One*
Scar Type:	*Possible shield*
Scar Location:	*Trunk*
Scar Shape:	*Oval*
Material Removed:	*Bark*
Scar Condition:	*Good*
Extent of scar (length):	*1.83 metres*
Extent of scar (width max):	*0.23 metres*
Extent of scar (depth max):	*0.13 - 0.27 metres*
Scar Height of Base Above Ground:	*0.08 metres*
Scar Overgrowth:	*0.1 - 0.15 metres*
Axe Marks:	*Nil observed*
Scar Aspect:	*South-south west*

Additional Comments:

- Located adjacent to quarry haul road, about 30 metres from quarry buffer zone;
- Scar faces Mount Sugarloaf;
- An Aboriginal origin for the scar cannot be discounted, but natural causes or other non-indigenous impacts are more likely.

Site Location: AMC12/A (100 metre MGA grid; 2 metre contours)

Photograph: AMC12/A

Photograph: AMC12/A

SITE NAME: AMC16/A

Site Type:	*Open grinding groove*	MGA Grid Reference:	*367903:6363467*
Date Recorded:	*4/04/2012*	Topographic Map:	*Beresfield 9232-3N*
Recorder:	*Stephen Free*		
Landform Element:	*Drainage depression*	Vegetation:	*Forest*
Slope:	*Moderate*	Ground Disturbance:	*Low*
Distance to Water:	*<50*		

Extent of Exposed Rock:	*4 x 2 metres*
Extent of Grooves:	*1 x 1 metres*
Rock Type:	*Sandstone*
Rock Form:	*Open surface*
Surface Condition:	*Stable*
Disturbance:	*Low*
Type of Disturbance:	*Erosion, weathering*

Groove description:

Groove #	Groove Length (mm)	Groove Width (mm)	Groove Depth (mm)	Comments
1	300	100	35	u-shaped
2	240	100	35	u-shaped
3	160	70	15	u-shaped

Additional Comments:

- Weathering and erosion caused by water flow;
- Probable that more grooves are present under moss cover.

Site Location: AMC16/A (100 metre MGA grid; 2 metre contours)

Photograph: AMC16/A

APPENDIX 5:

PLATES

Plate 1: Modification Area A, view south of southern portion of survey area AMA4 (gentle drainage depression).

Plate 2: Modification Area A, view of dense regrowth vegetation in survey area AMA5 (moderate simple slope near Black Hill Quarry).

Plate 3: Modification Area A, Aboriginal stakeholders inspecting southern portion of survey area AMA7 (gentle drainage depression) south of Black Hill Road.

Plate 4: View south over southern portion of Modification Area A and 'Yellowcliffs' property to Black Hill Quarry and Black Hill (northern portion of Area B).

Plate 5: Modification Area B, straight-walled sandstone formation in survey area AMB4, adjacent to Black Hill Spur and Black Hill Quarry, with inaccessible cave.

Plate 6: Modification Area B, Aboriginal stakeholders inspected straight-walled sandstone formation in survey area AMB4, adjacent to Black Hill Spur and Black Hill Quarry.

Plate 7: Modification Area B, view north from Black Hill Quarry (survey area AMB3) to Donaldson Mine.

Plate 8: View west across Pambalong Nature Reserve to Modification Area B and Black Hill.

Plate 9: View north from Dog Hole Road along power easement bisecting eastern portion of Modification Area B, between Black Hill and Black Hill Spur.

Plate 10: View from Black Hill Quarry in Modification Area B south-west across Long Gully to rock formations in Area C, with Mount Sugarloaf, five kilometres south-west of the investigation area, in the rear.

Plate 11: Modification Area C, straight-walled rock formation in survey area AMC2 (moderate drainage depression).

Plate 12: Modification Area C, straight-walled rock formation in survey area AMC5.

Plate 13: Modification Area C, Aboriginal stakeholders inspecting straight-walled rock formation in survey area AMC5.

Plate 14: Modification Area C, Aboriginal stakeholder inspecting survey area AMC9 (moderate drainage depression).

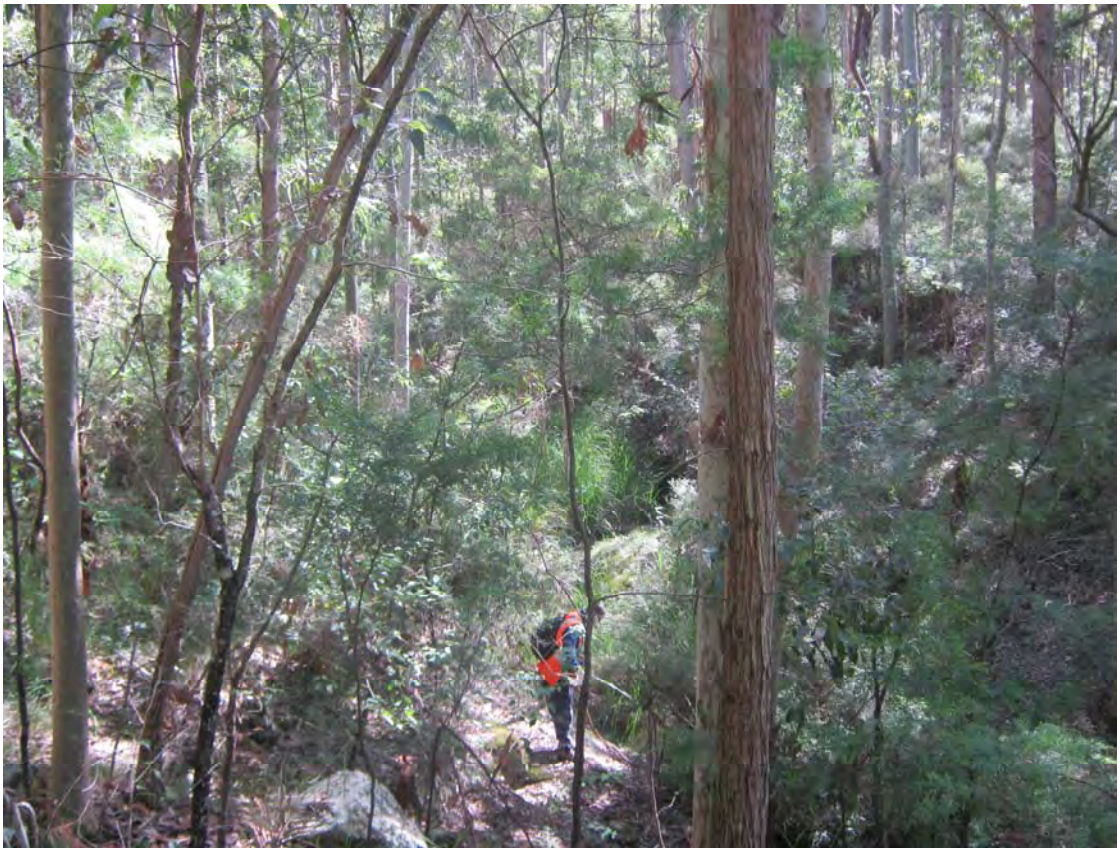


Plate 15: Modification Area C, Aboriginal stakeholder inspecting survey area AMC16 (moderate drainage depression).

Plate 16: View west from Dog Hole Road to eastern portion of Modification Area C (forested slopes and crests).

Plate 17: View south-west (above) and west (below) from Cedar Hill Drive across Pambalong Nature Reserve to Modification Area C (top left, with Mount Sugarloaf in rear, a further 5 kilometres south-west of the investigation area) and Area B (right, with Black Hill in centre-rear), the general location of the Doghole ceremonial area.