Wallarah 2
COAL PROJECT

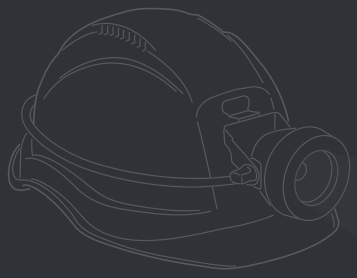
Wallarah 2 Coal Project

Environmental Impact Statement

April 2013

Appendix S

Aboriginal Cultural Heritage Assessment



Hansen Bailey
ENVIRONMENTAL CONSULTANTS

Landscape overlooking Wallarah Creek Open Site 2.

ABORIGINAL CULTURAL HERITAGE ASSESSMENT

Wallarah 2 Coal Project
Wyong, NSW

December 2012

Report Prepared by
OzArk Environmental and Heritage Management Pty Ltd
on behalf of Wallarah 2 Coal Project
For Hansen Bailey Pty Ltd

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EXECUTIVE SUMMARY

The Wyong Areas Coal Joint Venture (WACJV) seeks a Development Consent under Division 4.1 in Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Wallarah 2 Coal Project (the Project). This Aboriginal cultural heritage assessment has been undertaken as part of the 'Wallarah 2 Coal Project Environmental Impact Statement' (Wallarah 2 EIS) prepared by Hansen Bailey environmental consultants to support the application.

OzArk Environmental & Heritage Management Pty Ltd (OzArk) has been commissioned by Hansen Bailey Pty Ltd on behalf of Wyong Areas Coal Joint Venture to undertake an Aboriginal cultural heritage assessment within the Project Boundary. This study builds on several existing studies undertaken for the WACJV, the findings of investigations for other projects in the region, for which there is a considerable body of literature, as well as targeted field surveys. The Project has been divided into the following areas on the basis of potential impacts. Areas investigated within this report are listed within each impact category:

- Infrastructure Boundary:
    - Tooheys Road Site. This includes a rail loop and spur, stockpiles, water and gas management facilities, workshop and offices. Approximately 1.8km portion of the proposed rail loop is on Darkinjung Local Aboriginal Land Council land;
    - Buttonderry Site. This comprises land to be affected by direct surface impacts associated with the Project including main personnel access to the mine, main ventilation facilities, offices and employee amenities; and
    - Western Ventilation Shaft. This site is where the surface infrastructure for a proposed air ventilation shaft will be located within the Wyong State Forest.
- Subsidence Impact Limit:
    - Western forested hills (Wyong State Forest/Jilliby State Conservation Area (SCA)); and
    - Honeysuckle Park.
- Other WACJV owned land:
    - Hue Hue Road ecological offset investigation area. This study area is comprised of a number of rural/residential blocks between the F3 and Hue Hue Road.

As a result of several Aboriginal cultural heritage assessments within the Project Boundary that cover the years 2001–2011, eight Aboriginal sites have been recorded. In addition, three previously recorded sites are extant within the Project Boundary. **Table 1** summarises the location, type of sites and their cultural and scientific significance that are extant within the

Project Boundary (both recorded as part of this study and previously recorded) and whether project impacts will affect the site.

Table 1: Project Boundary and closely adjacent areas: Aboriginal sites recorded and degree of proposed impact.

Site Designation	Site Type	Project Area	Cultural significance	Scientific significance	Project impact?
WC-OS1 AHIMS # 45-3-3317	Open site	Other WACJV owned land	High	Low–Moderate	No
WC-OS2	Open site	Infrastructure Boundary: Tooheys Road Site	High	Low	Yes
WC-IF1 AHIMS # 45-3-3316	Isolated find	Other WACJV owned land	High	Low–Moderate	No
WC-ST1 AHIMS # 45-3-3315	Culturally modified tree	Other WACJV owned land	High	Low	No
WSF-AG1	Axe grinding groove site	Subsidence Impact Limit (JSCA)	High	Low–Moderate	No
WSF-AG2	Axe grinding groove site	Subsidence Impact Limit (JSCA)	High	Low–Moderate	No
WSF-AG3	Axe grinding groove site	Subsidence Impact Limit (JSCA)	High	Low–Moderate	Possible (indirect)
WSF-AG4	Axe grinding groove site	Subsidence Impact Limit (WSF)	High	Low–Moderate	Possible (indirect)
AHIMS # 45-3-3040	Axe grinding groove site	Subsidence Impact Limit (JSCA)	Prev. recording	Prev. recording	Yes (indirect)
AHIMS # 45-3-3041	Axe grinding groove site	Subsidence Impact Limit (JSCA)	Prev. recording	Prev. recording	Yes (indirect)
AHIMS # 45-3-3042	Axe grinding groove site	Subsidence Impact Limit (JSCA)	Prev. recording	Prev. recording	Yes (indirect)

As a result, one open site (WC-OS2) will be subject to direct impacts by the surface infrastructure development for the Project at the Tooheys Road site. Three axe grinding groove sites (AHIMS # 45-3-3040 to 45-3-3042) will be within the area affected by subsidence and may be indirectly impacted, and two axe grinding sites (WSF AG-3 and WSF AG4) are on the very edge of the predicted subsidence effect area although the possibility remains that they may be indirectly impacted.

In relation to management and mitigation of the proposed impacts it is noted that five of the recorded sites are outside the Infrastructure Boundary and Subsidence Impact Limit areas for the Project: WC-OS1, WC-IF1 and WC-ST1 (AHIMS # 45-3-3315 to 45-3-3317) as they are on land that will potentially be used for conservation purposes, and WSF AG-1 and WSF AG-2 as they are located outside the Project Boundary to the northwest.

In relation to the Aboriginal sites that will be impacted, the following management recommendations are made. It is understood that these recommendations may be included in the forthcoming *Aboriginal Cultural Heritage Management Plan* (ACHMP).

1. Tooheys Road Site: Location of WC-OS2. There is the possibility of impacting Aboriginal objects, principally artefacts, in areas adjacent to Wallarah Creek. Work in this area will be governed by inductions, management protocols and a minimisation of harm policy. These management recommendations are set out in **Section 8.4** of this report.
2. Wyong State Forest/Jilliby SCA: WSF-AG3 and WSF-AG4 are located near the edge of the Subsidence Impact Limit but should be further monitored as per recommendations listed in **Section 8.4**. WSF-AG1 and WSF-AG2 are located well beyond the edge of the Subsidence Impact Limit and will not be impacted by the Project. These sites should be further monitored to form a control as per recommendations listed in **Section 8.4**. The previously recorded sites on Myrtle Creek (AHIMS # 45-3-3040 to 45-3-3042) should be monitored as per recommendations listed in **Section 8.4**. It is also acknowledged that further sites (axe grinding grooves, small open sites) may be present in this area. Consequently, panel by panel pre-mining survey within the forested hills of the Wyong State Forest/Jilliby SCA should be undertaken under the auspices of an ACHMP.

Recommendations for the management of all recorded sites are contained within this report.

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

1.1 PROJECT BOUNDARY

The Project Boundary is located approximately 4.7 km north-west of Wyong on the Central Coast of NSW (**Figure 1**).

In the east, the Project Boundary comprises Jilliby Jilliby Creek and surrounding properties that occupy the floodplains and adjacent rises of Jilliby Jilliby Creek and its tributaries. The west the Project Boundary is occupied by the Wyong State Forest and Jilliby State Conservation Area (SCA) and comprises wooded hills that rise abruptly, albeit to a low relative altitude, from the floodplains of Jilliby Jilliby Creek.

1.2 BRIEF DESCRIPTION OF THE PROJECT

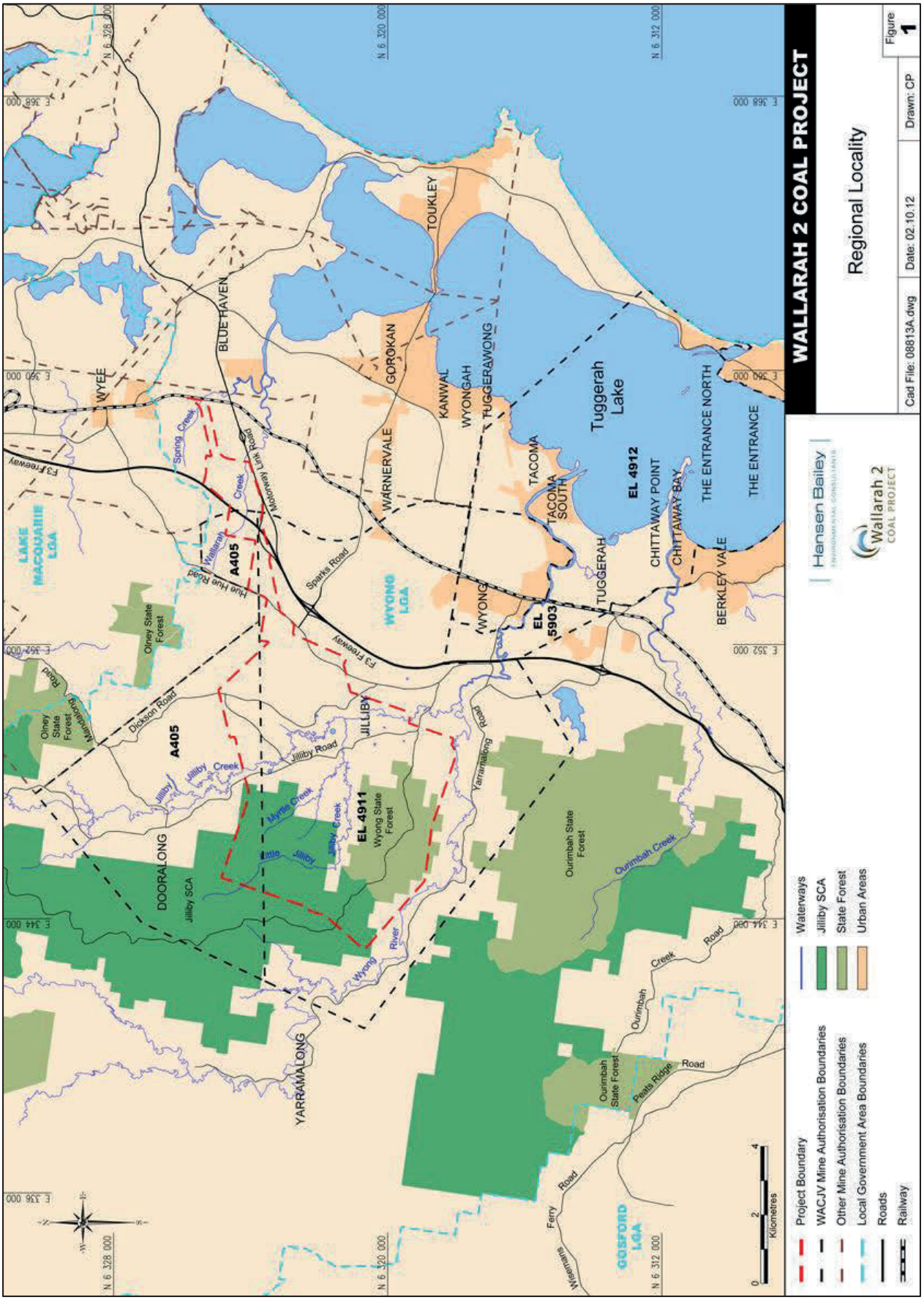
The Wyong Areas Coal Joint Venture (WACJV) seeks a Development Consent under Division 4.1 in Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Wallarah 2 Coal Project (the Project). This Aboriginal heritage assessment supports 'The 'Wallarah 2 Coal Project Environmental Impact Statement' (Wallarah 2 EIS) prepared by Hansen Bailey Environmental Consultants to support the application.

This Aboriginal heritage assessment has been prepared in accordance with the Director-General's Environmental Assessment Requirements (DGRs) for the Project issued 12 January 2012 in accordance with the requirements in Part 2 in Schedule 2 to the *Environmental Planning & Assessment Regulation 2000* (EP&A Regs).

OzArk Environmental & Heritage Management Pty Ltd (OzArk) has been commissioned by Hansen Bailey Pty Ltd on behalf of WACJV to undertake an Aboriginal heritage assessment within the Project Boundary. This study builds on several existing studies undertaken for the WACJV, the findings of investigations for other projects in the region, for which there is a considerable body of literature, as well as targeted field surveys.

Initial field assessment of the Infrastructure Boundary and other WACJV owned land by OzArk took place from 14–16 November 2006. A comprehensive test excavation programme was undertaken at the Tooheys Road Site (WC-OS2) on 9–15 March 2010. Survey of the Subsidence Impact Limit was conducted between 25–29 January 2010 and 26–30 September 2011 (**Figure 2**).

Figure 1: Location of Project Boundary.



1.3 THE PROJECT

Development Consent is sought to mine coal within the Extraction Area for a period of 28 years. The majority of this resource lies beneath the Wyong State Forest and surrounding ranges (including the Jilliby State Conservation Area (SCA)) while a proportion, to be extracted first, lies beneath a section of the Dooralong Valley and the Hue Hue area. The location of the Project is shown on **Figure 2**.

Key features of the Project include:

- The construction and operation of an underground mining operation extracting up to 5.0 Mtpa of export quality thermal coal by longwall methods at a depth of between 350 m and 690 m below the surface within the underground Extraction Area;
- Mining and related activities will occur 24 hours a day 7 days a week for a Project period of 28 years;
- Tooheys Road Site surface facilities on company owned and third party land (subject to a mining lease) between the Motorway Link Road and the F3 Freeway which will include (at least) a rail loop and spur, stockpiles, water and gas management facilities, workshop and offices;
- Buttonderry Site Surface Facilities on company owned land at Hue Hue Road between Sparks Road and the Wyong Shire Council's (WSC) Buttonderry Waste Management Facility. This facility will include (at least) the main personnel access to the mine, main ventilation facilities, offices and employee amenities;
- An inclined tunnel (or "drift") constructed from the coal seam beneath the Buttonderry Site to the surface at the Tooheys Road Site;
- Construction and use of various mining related infrastructure including water management structures, water treatment plant (reverse osmosis or similar), generator, second air intake ventilation shaft, boreholes, communications, water discharge point, powerlines, and easements to facilitate connection to the WSC (after July 2013, the Central Coast Water Corporation) water supply and sewerage system;
- Capture of methane for treatment initially involving flaring as practicable for greenhouse emission management and ultimately for beneficial use of methane such as electricity generation at the Tooheys Road Site;
- Transport of coal by rail to either the Newcastle port for export or to domestic power stations;

- A workforce of approximately 300 full-time company employees (plus an additional 30 contractors); and
- Rehabilitation and closure of the site at cessation of mining operations.

Areas assessed in this report have been categorised as Infrastructure (direct impact), Subsidence Impact Limit (indirect impact) and other land owned by WACJV at Hue Hue Road (no impact).

Areas assessed within these areas are:

- Infrastructure Boundary (**Figure 2** and **Figure 4**)
    - Tooheys Road Site. This includes the Tooheys Road surface infrastructure and rail loop;
    - Buttonderry Site. This comprises land to be affected by direct surface impacts associated with the Project; and
    - Western Ventilation Shaft. Location of surface infrastructure for a proposed air ventilation shaft.
- Subsidence Impact Limit: (**Figure 2** and **Figure 4**)
    - Western forested hills: Wyong State Forest/ Jilliby State Conservation Area (SCA). This land above the underground mine is located entirely within the Wyong State Forest/Jilliby SCA and is expected to be impacted by subsidence from the proposed longwall mining; and
    - Honeysuckle Park. This alluvial floodplain land is owned by the WACJV and is located adjacent to Jilliby Jilliby Creek near the confluence of Little Jilliby Jilliby Creek.
- Other WACJV owned land: (**Figure 2** and **Figure 3**)
    - This area is comprised of a number of lots between the F3 and Hue Hue Road as well as to the immediate north of the Buttonderry Site.

Figure 2: Conceptual Project layout.

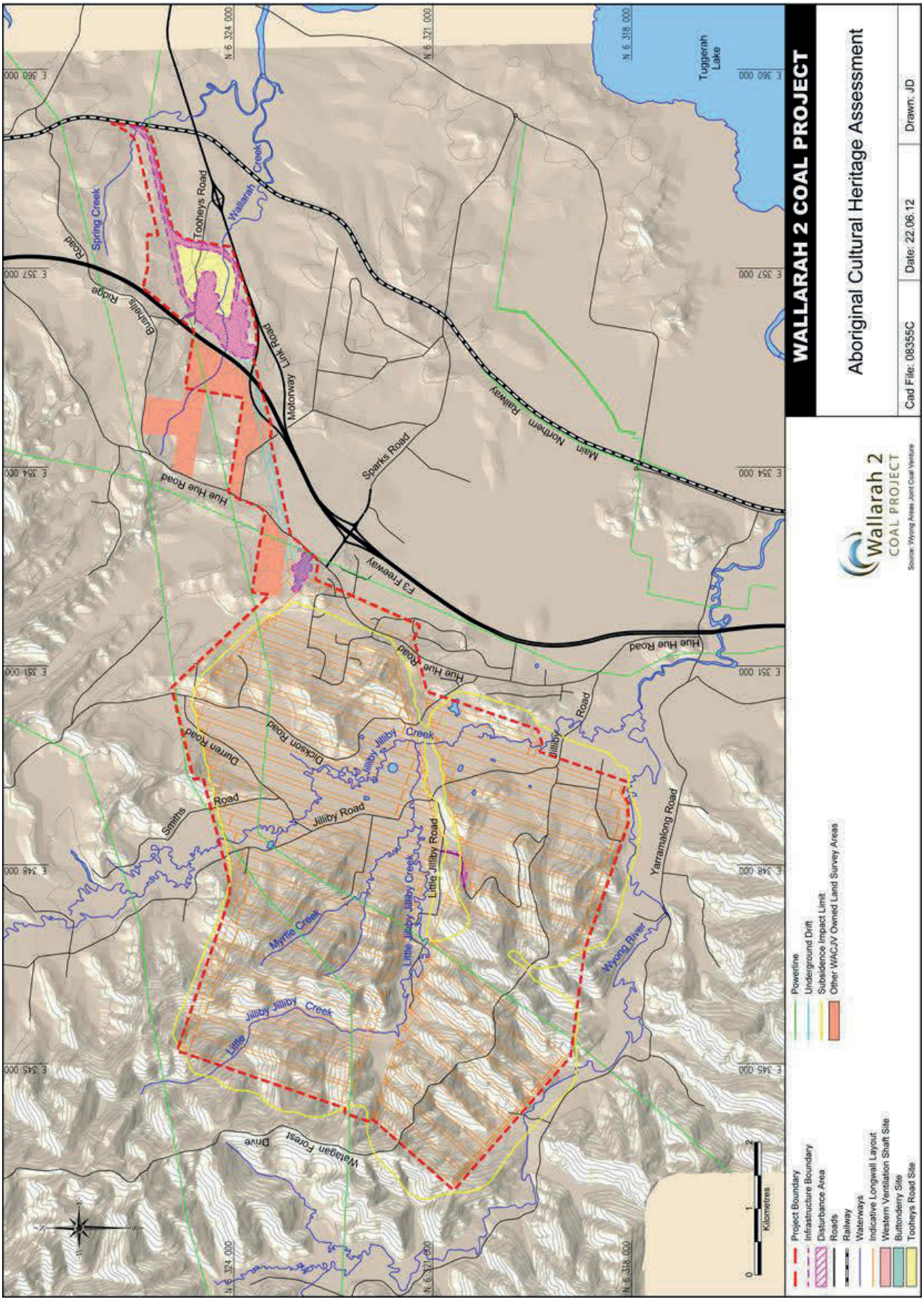


Figure 3: Conceptual Project layout: Tooheys Road Site, Buttonderry Site and Other WACJV owned land.

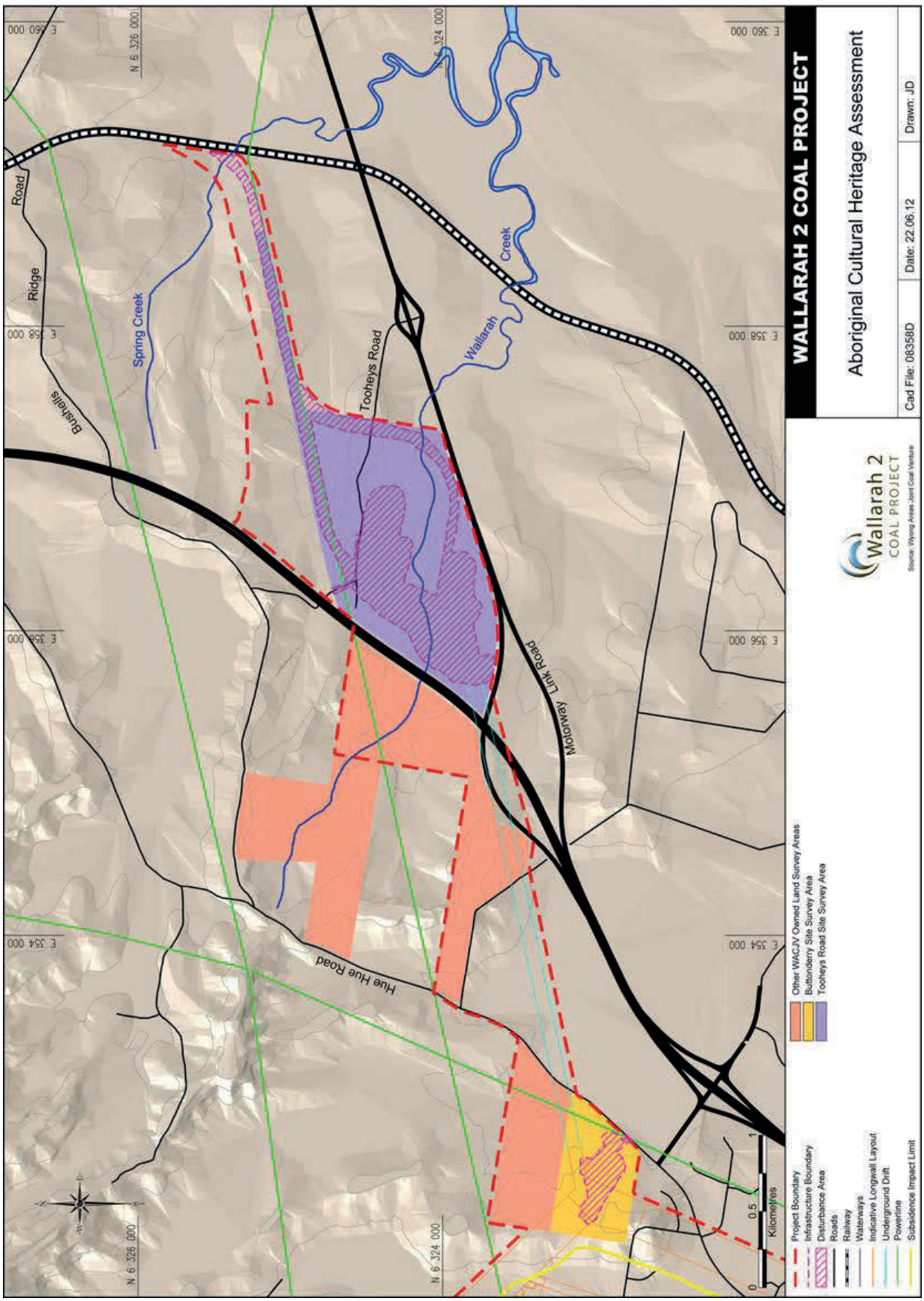
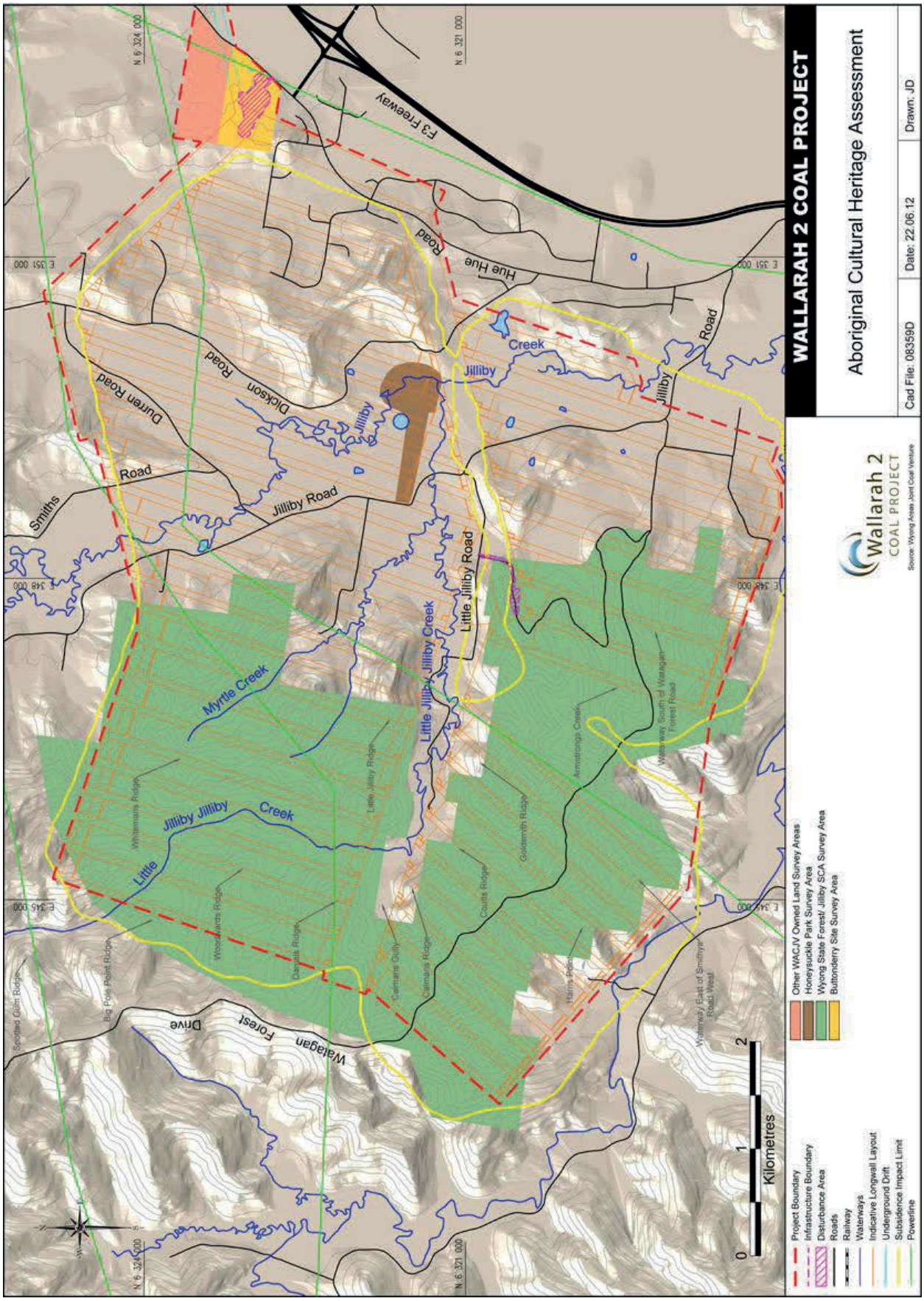


Figure 4: Conceptual Project layout: Western Ventilation Shaft and the Subsidence Impact Limit.



1.3.1 Infrastructure Boundary

The proposed works within the Infrastructure Boundary include potentially direct impacts associated with surface infrastructure at three locations (**Figure 2**).

1.3.1.1 Tooheys Road Site

The proposed infrastructure for the Tooheys Road Site is detailed in **Figure 5** and includes:

- Rail spur and loop with coal loader and two rail overbridges along Tooheys Road;
- Office facility, inclusive of administration offices, bathrooms, training facilities;
- Site access roads including at least partial relocation of Tooheys Road;
- Mine access drift and portal;
- Gas extraction and treatment plant;
- Coal stockpiles and conveyors;
- Car parking facilities; and
- Mine water and surface runoff settling ponds.

1.3.1.2 Buttonderry Site

The proposed infrastructure for the Buttonderry Site is shown in **Figure 6** and consists of:

- Upcast ventilation shaft and fan for mine ventilation;
- Downcast ventilation shaft for mine ventilation and man-riding;
- Main office facility, inclusive of administration offices and training rooms;
- Bathroom and showers; and
- Car parking facilities.

The Buttonderry Site will be accessed off Hue Hue Road via a sealed road.

1.3.1.3 Western Ventilation Shaft

A second (western) ventilation shaft site will be required around year 10 of mining. This will be located adjacent to Brothers Road (off Little Jilliby Road) within the Wyong State Forest as shown in **Figure 7**. This shaft facility will house a downcast shaft (for air intake) and related infrastructure.

Brothers Road will be upgraded prior to construction and the shaft site will be fenced on completion.

Figure 5: Conceptual proposed works at the Tooheys Road Site.

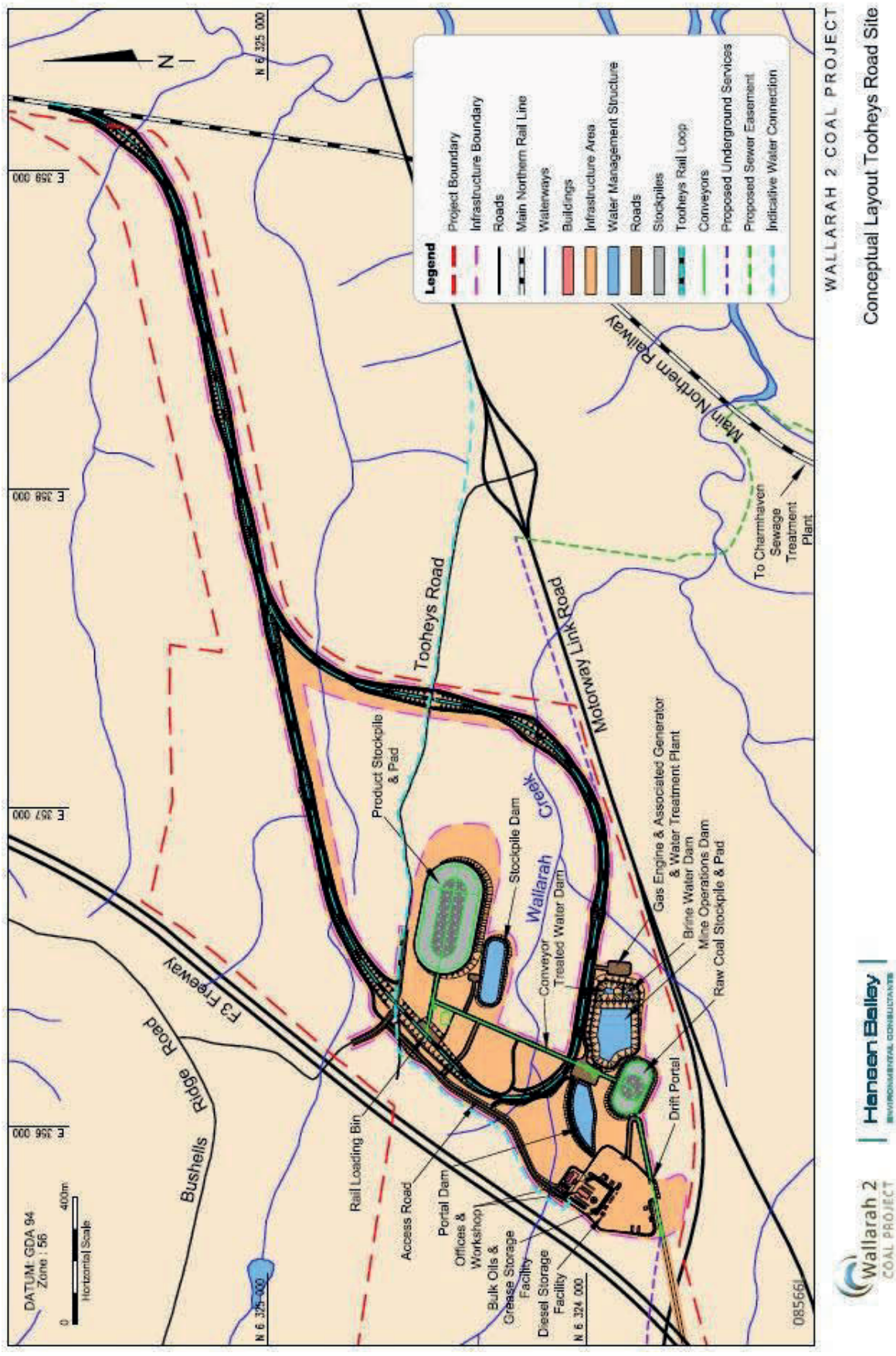


Figure 6: Conceptual proposed works at the Buttonderry Site.

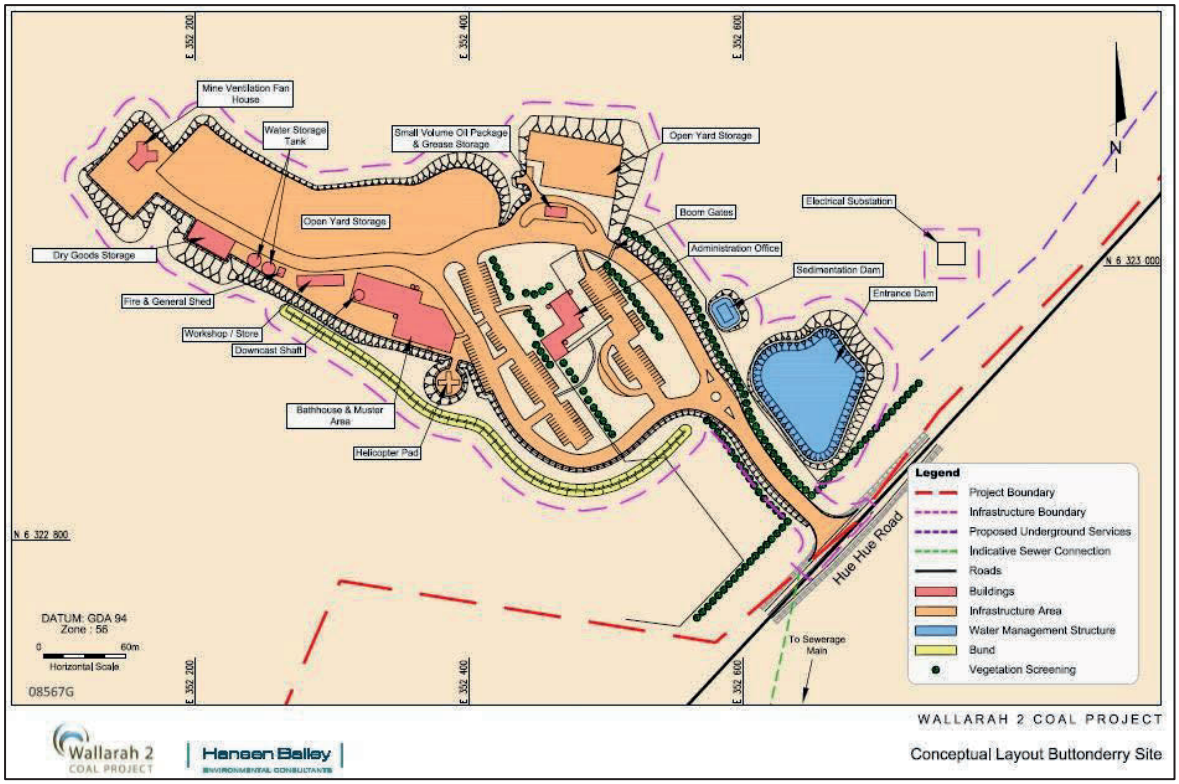
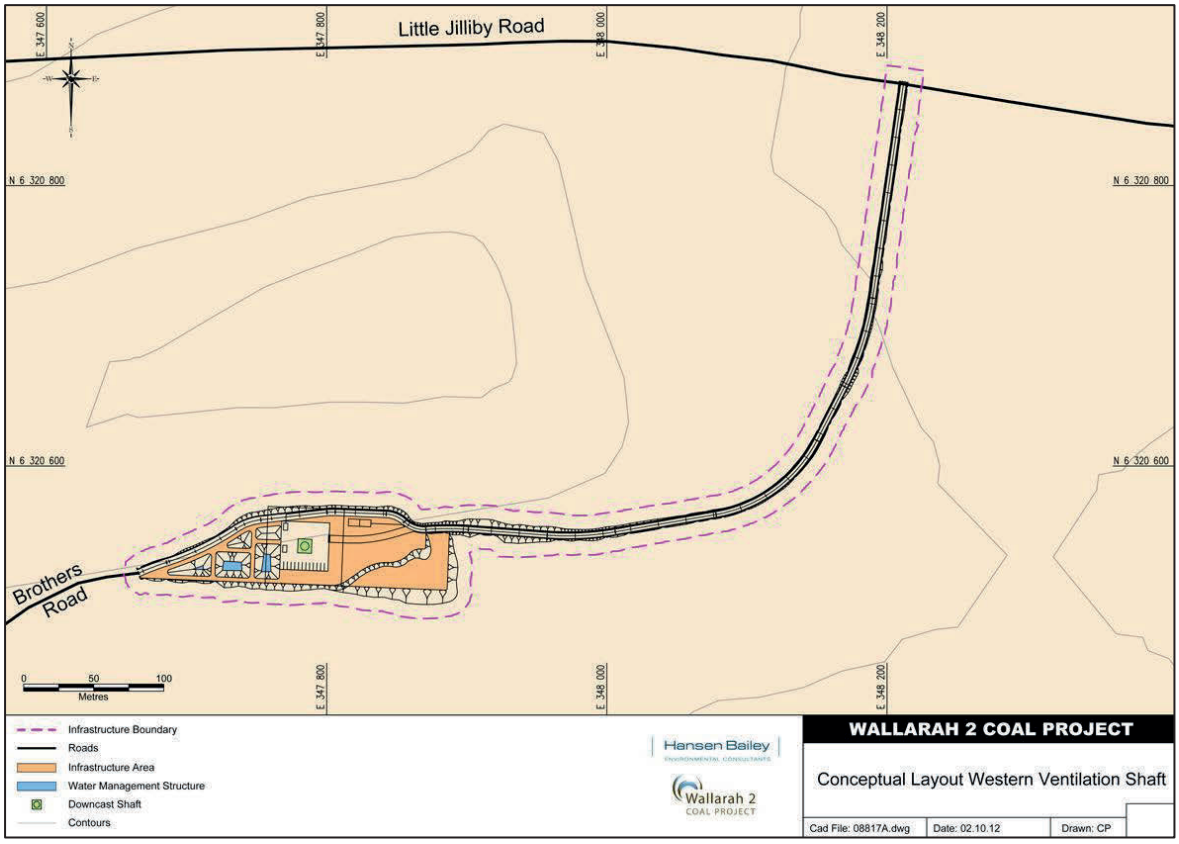


Figure 7: Conceptual proposed works at the Western Ventilation Shaft.



1.3.2 Subsidence Impact Limit

Survey within the Subsidence Impact Limit was restricted to areas that have public access (Wyong State Forest/Jilliby SCA: which comprises the largest proportion of the land above proposed mining area) or are owned by WACJV (Honeysuckle Park; see **Figure 4**). These accessible areas were subjected to a full Aboriginal heritage assessment to verify the predictive model for site location as set out in **Section 4.4.2**. The remainder of the Subsidence Impact Limit, being on private property and including largely cleared or disturbed rural properties, was not assessed in the field however was the subject of a desktop review presented in this assessment.

Proposed works in the Subsidence Impact Limit will consist of the mining of longwall panels for the proposed underground mine as shown on **Figure 2**.

1.3.3 Other WACJV owned land

Other WACJV owned land surveyed was located outside the Infrastructure Boundary (**Figure** 3). There is no proposed disturbance in this area.

1.4 HISTORICAL STUDIES

Over the past eleven years a number of desktop and field studies have examined much of the Project Boundary. This work is summarised in **Table 2** and presented in more detail in **Section 4.3** and **Section** 5.

It should be noted that the Buttonderry Site is also referred to as the Hue Hue Road site in some previous reports and the Tooheys Road Site is sometimes referred to as the Bushells Ridge site. The Western Area is a term also often used and relates to the western exploration licence areas which encompasses both the Buttonderry and Tooheys Road sites, as well as the area proposed for underground mining (Subsidence Impact Limit; **Figure 2**).

Table 2: Aboriginal Cultural Heritage studies by WACJV in the Project Boundary.

Company/Year Finalised	Title	Specialist components	Location
ERM 2001a	Indigenous Cultural Heritage Study – Western Area Study Methodology	Aboriginal Heritage Desk top review only.	Subsidence Impact Limit
ERM 2001b	Wyong Project – Indigenous Cultural Heritage Assessment – Preliminary Survey of the Bushells Ridge Site	Aboriginal heritage Preliminary field survey to identify visible archaeological evidence, areas of archaeological sensitivity and areas for further investigation.	Tooheys Road Site
OzArk 2006	OzArk 2009: Indigenous and non-Indigenous Heritage Assessment: Surface Facilities – Wallarah 2 Coal Project, Wyong NSW.	Aboriginal heritage Preliminary field survey to identify visible archaeological evidence, areas of archaeological sensitivity and areas for further investigation.	Tooheys Road Site Buttonderry Site Western Ventilation Shaft Other WACJV owned land

Company/Year Finalised	Title	Specialist components	Location
OzArk 2010	OzArk 2010a. Indigenous and Historic Heritage Assessment. Subsidence zone for the Wallarah 2 Coal Project	Aboriginal heritage Preliminary field survey to identify visible archaeological evidence, areas of archaeological sensitivity and areas for further investigation.	Subsidence Impact Limit
OzArk 2010b	OzArk 2010b. Test Excavation Programme. Wallarah Creek Sensitive Archaeological Landform	Archaeological test excavations at site WC-OS2.	Tooheys Road Site
OzArk 2012	This report: refer **Section 5**.	Aboriginal heritage Preliminary field survey to identify visible archaeological evidence, areas of archaeological sensitivity and areas for further investigation.	Subsidence Impact Limit

The OzArk investigations (2006–2012) included:

- A buffered search of the NSW Office of Environment and Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) covering the Project Boundary (most recent search dated 24 April 2012);
- Identification and pegging of surface disturbance areas as required within the Infrastructure Boundary;
- Field survey at the Tooheys Road Site to ensure the appropriate coverage of potential impact areas associated with proposed infrastructure. This survey focussed on all areas within the Infrastructure Boundary as well as targeting specific landforms to flesh out the predictive model as presented in ERM 2001a;
- Field survey of the Buttonderry Site and the Western Ventilation Shaft; and
- Targeted field survey of the Subsidence Impact Limit within the Wyong State Forest/Jilliby SCA and the WACJV owned floodplain property, Honeysuckle Park.
- Sample survey of various topographical units and sensitive archaeological landforms in other WACJV owned land to establish the general nature of the archaeological resource in the potential conservation area. This included targeting specific landforms to test the adequacy of the predictive model.

This report comprises results from survey by OzArk during three field assessments conducted in November 2006, January 2010 and September 2011. Additionally, an intensive test excavation programme within the Tooheys Road Site was conducted in March 2010.

2 ARCHAEOLOGICAL SURVEY

2.1 PURPOSE AND OBJECTIVES OF THE ARCHAEOLOGICAL INVESTIGATION

The purpose of this study is to survey the potential Aboriginal archaeological and cultural heritage impacts associated with the Project.

The objectives of this study are to:

Objective One: To create a regional archaeological framework in which this study is contained;

Objective Two: To locate and assess the significance of Aboriginal sites and/or objects within the Project Boundary; and

Objective Three: To provide management recommendations for any recorded Aboriginal cultural heritage within the Project Boundary.

2.2 DATES OF ARCHAEOLOGICAL INVESTIGATIONS

Excluding previous studies and site inspections by others prior to 2006, OzArk has completed multiple heritage surveys within the Project Boundary. They are:

- 12 October 2006: Survey of Darkinjung Local Aboriginal Land Council (DLALC) land adjacent to and within the Tooheys Road Site (OzArk 2009);
- 14–16 November 2006: Survey of Infrastructure Boundary and other WACJV owned land (OzArk 2009);
- 25–29 January 2010: Survey of accessible areas within the Subsidence Impact Limit (OzArk 2010a);
- 15–19 March 2010: Tooheys Road study area test excavation programme (OzArk 2010b); and
- 26–30 September 2011: Additional survey of accessible areas within the Subsidence Impact Limit (detailed in this report).

In addition to the above intensive survey periods, a reconnaissance site inspection of Myrtle Creek archaeological sites was undertaken on 20 October 2011 by an OzArk project manager (P. Cameron) in company with W2CP geological personnel.

2.3 ABORIGINAL COMMUNITY INVOLVEMENT IN ARCHAEOLOGICAL INVESTIGATION

Aboriginal community consultation for the Project was undertaken in two phases due to delays in the approval process and changes to the legislation and guidelines for heritage management and consultation.

The first phase was conducted according to the Department of Environment & Conservation (DEC 2004) *Interim Community Consultation Requirements* (ICCRs) as recommended in the

DEC 2005 *Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (for Part 3A assessments).

The revised Department of Environment, Climate Change & Water (DECCW) 2010 *Aboriginal Cultural Heritage Consultation Requirements* (ACHCRs) were followed for consultation carried out since 2011 (the second phase).

2.3.1 2006: Survey (Infrastructure Boundary, other WACJV owned land).

An advertisement appeared in the local print media on the 23rd August 2006 seeking expressions of interest from Indigenous groups and organisations in the Wyong area to participate in a Heritage Assessment for the proposed Wallarah No 2 Coal Project. Letters were also sent to Department of Environment & Climate Change (DECC), WSC and Native Title Service Corporation (NTSCORP) seeking knowledge of any indigenous stakeholder groups to contact for inclusion in the consultation process. The DLALC, Guringai Tribal Link Aboriginal Corporation (GTLAC) and Mur-Roo-Ma Inc, were advised of the Project and invited to express interest should they wish to be consulted. As a result of this initial consultation process, the following organisations formally registered interest:

- DLALC; and
- GTLAC.

Representatives from DLALC and GTLAC were invited to participate in the field assessment and sent details describing the proposed Aboriginal Archaeology and Cultural Heritage Assessment methodology. A request was extended for any specific cultural information (should any be available), as well as inviting comment / input on the methodology proposed.

The survey on DLALC land was undertaken on 13th October 2006 with David Pross (DLALC) accompanying OzArk Senior Archaeologist Ben Churcher during the assessment. This survey was confined to DLALC owned land and it was felt appropriate that only a DLALC representative attend this portion of the assessment.

Additional areas within the project site were surveyed in November 2006, representatives Sharon Hodgetts and Jason Taylor (DLALC) and Tracey-Lee Howie and Kevin Robinson (GTLAC) took part in the three day survey (14th November - 16th November) with Dr Jodie Benton and Phillip Cameron (OzArk). Discussions were held on-site during each survey regarding the findings of the field survey. The topics covered included cultural significance, management options and recommendations.

A copy of the draft report was issued to registered stakeholders in December 2009 and feedback was invited within the recommended fourteen (14) day time frame. It was noted in this correspondence that as per the recommendations in the draft report, the excavations at

Wallarah Creek were to be undertaken in 2010, in addition to assessment of subsidence areas. Responses were received from both DLALC and GTLAC. Both organisations were verbally supportive of the methodology proposed, however DLALC requested an extension on their feedback until after the additional survey in the western area potential subsidence district (**Appendix 1; items 1–3**).

2.3.2 2010: Survey (Subsidence Impact Limit).

The OzArk survey team was accompanied in the field during the survey of the Wyong State Forest/Jilliby SCA and Honeysuckle Park by representatives from both DLALC and GTLAC. The following site officers participated over the five (5) day period 25th – 29th January 2010:

DLALC:

- Ms Sharon Hodgetts
- Mr Darren Carney

GTLAC:

- Ms Tracey Howie
- Mr Kyle Howie
- Mr Warren Howie
- Mr David Pross

Subsequent to this survey, GTLAC submitted a report supporting the development of an Aboriginal Cultural Heritage Management Plan (ACHMP) which they recommended be prepared in partnership with the GTLAC and the DLALC[1]. The DLALC indicated they would submit a report following the test excavation of areas along Wallarah Creek scheduled for March 2010 (**Appendix 1; item 2**).

2.3.3 2010: Test excavation at site WC-OS2.

The test excavation program took place from 15th March – 19th March 2010. The following Aboriginal representatives assisted for the duration of the week's excavation:

DLALC:

- Ms Sharon Hodgetts
- Mr Darren Carney
- Norman Messina

GTLAC:

- Ms Tracey Howie

[1] As approval for the W2CP has not yet been obtained, an ACHMP has not yet been initiated.

- Mr Chevy Heath-Walker
- Mr Warren Howie
- Mr Kevin Robinson
- Ms Trudy Smith
- Ms Yvette Walker

Primarily, the community representatives were involved with the wet-sieving of deposits and in providing feedback on the excavation methodology. Discussions were held in the field at the location of excavation areas between archaeologists and the community to define the type and nature of each impact and assessed requirements for mitigation or management measures. The community was encouraged to bring forward any issues of concern and had full access to representatives of the client, the archaeologist and other communities for confidential or group discussions.

A copy of the draft test excavation report was issued to registered stakeholders on 31st August 2010 and feedback was invited within the recommended fourteen (14) day time frame. In response an email received from Tracey Howie (GTLAC) provided information relating to the traditional ownership of the Project Boundary and wider region. Correspondence received from the DLALC in response to review of the draft report noted one amendment in regards to traditional ownership, in addition to adding a reference to the DLALC in the recommendations of the report. Correspondence from DLALC, immediately following the test excavation in March 2010, expressed that their organisation was satisfied with the methodology and results of test sampling of the excavation program (**Appendix 1; item 2**).

2.3.4 2011: Survey (Subsidence impact Limit).

An additional site survey phase was undertaken in the Wyong State Forest/Jilliby SCA and Honeysuckle Park Study Areas in September 2011 (**Appendix 1; item 4**). Community consultation was continued under the existing arrangements and the methodology for the survey, and an invitation to participate, was extended to DLALC and GTLAC. Each stakeholder group was represented in the field, Sharon Hodgetts and Andrew Sweaton participated on behalf of DLALC whilst Tracey Howie represented GTLAC.

2.3.5 Consultation since: 2011

The second phase of consultation commenced in November 2011, undertaken according to the *Aboriginal Cultural Heritage Consultation Requirements 2010* (ACHCRs; DECCW 2010). Both DLALC and GTLAC were contacted and their previous input in the Project was acknowledged, each organisation was advised they would continue to be consulted as a Registered Aboriginal Party (RAP).

An expression of interest advertisement was placed in the Central Coast Express, to appear in the publication on 30th November, 2011 (**Appendix 1; item 5**). To establish a broad base of Aboriginal people or organisations who may hold cultural knowledge relevant to the Project and Project Boundary, contact details were sought from OEH, WSC, NTSCORP, Hunter Central Rivers CMA, National Native Title Tribunal, DLALC, GTLAC, and the Register of Aboriginal Owners.

Letters was sent to additional groups identified as a consequence of the agency contact (see **Appendix 1; items 6–10**). At the conclusion of the Stage 1 notification phase of this process, two new Aboriginal groups registered an interest (**Appendix 1; items 11–12**).

- Awabakal Traditional Owners Aboriginal Corporation (ATOAC); and
- Awabakal Descendants Traditional Owners Aboriginal Corporation (ADTOAC).

The Stage 2 / 3 letters presenting information about the sites recorded as part of the previous surveys were sent to all stakeholders (**Appendix 1; item 13**). This correspondence included an invitation to a potential meeting should RAPs wish to discuss the Project and share their views and cultural knowledge regarding the sites within and surrounding the Project Boundary. Both DLALC and GTLAC indicated they did not feel the need to attend the proposed session as they were aware of all aspects of the Project and had shared their substantial knowledge to this point.

Each of the new stakeholder groups expressed an interest in attending the Project briefing session and was interested to discuss their cultural knowledge in relation to the Project Boundary. Due to their close association both ADTOAC and ATOAC were satisfied to attend a joint meeting which was scheduled for Wednesday 16th May, 2012. Due to unexpected emergencies, neither organisation was able to attend on this day. Further meeting dates have attempted to be made; the most recent being on 30 August 2012 (**Table 3**). As a response from this final meeting request has not been followed up, OzArk assumes that a meeting is not required.

2.4 CONSULTATION ON THIS REPORT

This report (with this section incomplete) was sent to all RAPs for review and comment. The following groups received copies of this report:

- DLALC;
- GTLAC;
- ATOAC; and

- ADTOAC.

Responses have been received from:

- DLALC;
- ATOAC; and
- ADTOAC.

These responses are presented in **Appendix 2**.

The responses are wide ranging and the following points will be made concerning those RAP comments that focus either on the adequacy of this report as a cultural heritage assessment or the adequacy of the actual heritage survey.

It should be noted that this report will recommend that an *Aboriginal Cultural Heritage Management Plan* be formulated if approval for the Project is given (see **Section 8.2**). This plan would be done in consultation with all RAPs in order to inform the management of heritage sites within the Project Boundary. Concerns about the management of particular sites can be further enunciated in the *Aboriginal Cultural Heritage Management Plan* when the impact is certain and the timing of the impact will be known (for instance, sites in the Jilliby SCA will not be affected by undermining for at least another 15 years). It is a recommendation of this report that the sites in the Jilliby SCA are revisited when mining is more imminent to reassess management options in the light of the best practice of the day in accordance with the Subsidence Management Plan.

DLALC response

All DLALC recommendations have been accepted and incorporated into this report.

ATOAC response

The ATOAC became a RAP in 2011 after all fieldwork connected with this assessment had been completed.

The ATOAC include a statement of cultural significance of the area to the Awabakal Traditional Owners and this is included in the response in **Appendix 2**.

The ATOAC response states that the archaeological report should be an “appendix to an Aboriginal Cultural Heritage Assessment” (p. 3), however, this misrepresents the fact that Aboriginal cultural heritage significance, by current guidelines, is assessed equally between social, scientific, aesthetic and historic criteria with each criteria having equal weight.

The ATOAC state that there has been an absence of correct procedure relating to consultation concerning the Project (p. 2). From the Project’s inception, the appropriate consultation guidelines have been followed (see above) and the Project, at all times, has endeavoured to

obtain the advice and assistance of the local Aboriginal community in formulating the significance assessments in this report. From 2006 the GTLAC has been involved with the assessments associated with this Project and a 'Guringai voice' has been present for a long time.

This follows on to debates about who can speak for the Country of the Project Boundary, or who the Traditional Owners are of the area. However, it is not the place of this report to examine such issues but it is accepted that there is debate within some parts of the Aboriginal community on this issue.

The ATOAC response states that the social assessment component of this report is inadequate. In the six years that the assessment for the Project has been running, any cultural information that was shared with the OzArk team, if approved, was incorporated into the assessment of heritage significance.

The social/cultural significance of the sites recorded during the assessment was discussed at the time with Aboriginal representatives who were present at the assessment and their views are reflected in the assessment of heritage significance contained in this report.

In addition, for a report such as this, the assessment of social significance relates more closely to the actual sites within their immediate landscape rather than being an examination of regional cultural connections.

OzArk has attempted, on several occasions, to arrange a meeting with the ATOAC to allow a forum for the group to share any cultural knowledge they may have concerning the Project Boundary, but so far these efforts have been largely unsuccessful (see **Table 3**).

It is noted that the sites recorded during this assessment have been afforded high social significance in the report and that this level of significance has influenced the recommended management of these sites.

The views of the ATOAC can be read in full in **Appendix 2**.

ADTOAC response

The ADTOAC became a RAP in 2011 after all fieldwork connected with this assessment had been completed.

Some of the issues raised in the ADTOAC response, such as who can speak for Country, are similar to views set out in the ATOAC response and have been discussed above.

However, the ADTOAC response does touch on more issues to do with the archaeological methodology of the assessment that OzArk is more qualified to discuss.

The ADTOAC response (pages 1–3) comments on the survey coverage achieved during this assessment and the fact that low ground surface visibility can obscure sites.

The survey methodology appreciated that “100% survey” is not possible especially given the terrain in certain parts of the Project Boundary such as the Jilliby SCA. Instead the assessment made sure that all areas of higher archaeological potential were assessed such as along all major creek lines and along the ridges and escarpments of the Jilliby SCA. The assessments have occurred over four phases, with two phases concentrated in the Jilliby SCA. In the view of OzArk, the assessment cover is not only adequate, but in many areas, beyond adequate especially as it includes areas of very difficult surveying terrain.

Constraints such as ground surface visibility have been discussed in this report, but overall, this variable did not hinder the effective survey of the Project Boundary as there were sufficient exposures in the Infrastructure Boundary and topography such as open rock shelving for detecting axe grinding grooves in the creek systems of the Jilliby SCA. The methodology and recommendations accept that there is a possibility for further undetected sites to occur in the Jilliby SCA but it is likely that the majority of sites in this area have been recorded during this assessment.

The ADTOAC response on page 3 requests the monitoring of earth works in the Infrastructure Boundary due to the possibility of artefacts being present. OzArk does not recommend this type of monitoring due to health and safety issues, as well as the difficulty of detecting isolated artefacts in such a way. The Infrastructure Boundary has had extensive investigation by test excavation which showed that the area has a very low artefact density and monitoring in such a situation would be difficult to justify.

The ADTOAC response states that this report has no recommendations that would improve intergenerational equity. OzArk agrees that, in connection to Aboriginal cultural heritage, the Project does not add to intergenerational equity. However, it must be borne in mind that only a very low density artefact scatter (WC-OS2) is being directly impacted by the Project, and while indirect impacts may affect other sites, potential impact is assessed as a low risk and only partial damage would occur, rather than total destruction. While the loss or damage of any archaeological site is not to be taken lightly it does need to be remembered that the Jilliby SCA sites are not being removed from the landscape.

The issue of offsets raised by the ADTOAC response follows from the above observations as the degree of impact to Aboriginal sites with the Project Boundary is not sufficient to warrant a specific archaeological offset. The Project, however, has undertaken to conserve and maintain an ecological offset on Hue Hue Road (discussed in this report under: Other WACJV owned land) that contains three Aboriginal sites: an open site (WC-OS1), an isolated find (WC-IF1) and

a potential scared tree (WC-ST1). While this area will not be managed as an archaeological offset, the Project would undertake to also conserve these registered Aboriginal sites.

OzArk has attempted, on several occasions, to arrange a meeting with the ADTOAC to allow a forum for the group to share any cultural knowledge they may have concerning the Project Boundary, but so far these efforts have been unsuccessful (see **Table 3**).

The ADTOAC response ends with a statement of cultural significance that can be read in full in **Appendix 2**.

Table 3. Log of communication with the ATOAC and ADTOAC regarding the holding of a meeting.

Date	Correspondence and Communication
10 April 2012	Emailed correspondence and invited to arrange a meeting to discuss the Project and cultural knowledge, requested response by 13th April - Friday 2012.
11–12 April 2012	Replies from both ATOAC and ADTOAC agreeing to a meeting.
3 May 2012	Phoned both ATOAC and ADTOAC to follow up request for a meeting.
10 May 2012	Formal invitation for a meeting to be held at Wyong on Wednesday 16 May 2012.
14 May 2012	Phoned both ATOAC and ADTOAC to follow up request for a meeting. Learned that there was a death in the community and that the meeting could not be attended.
15 May 2012	Meeting cancelled due to ATOAC and ADTOAC being unable to attend.
17 July 2012	Phoned both ATOAC and ADTOAC and asked if a meeting could be rescheduled.
26 July 2012	Phoned both ATOAC and ADTOAC. ATOAC say they would be prepared to do a phone hook-up if a meeting could not be rescheduled. ADTOAC oppose phone hook-up but unavailable for face to face meeting at present.
8 August 2012	Email acknowledgement of receiving comments on the draft heritage report. Again state that OzArk are prepared to meet with ATOAC and ADTOAC if possible.
10 August 2012	Email response from ATOAC saying they will contact us with an appropriate time for OzArk to call. No follow up email has been received. The ADTOAC was given OzArk senior archaeologist's phone number to arrange a meeting. No call has been received.
30 August 2012	Email to ATOAC and ADTOAC saying we will finalise the process and to ask again if a meeting was required. No response has been received from ADTOAC to date (19 September 2012).
10 September 2012	ATOAC phoned Ben Churcher (OzArk) and expressed concern about two major issues: • That the report should investigate who the Traditional Owners are of the area • That the ACHMP should be written to accompany this report.

Responding directly to the comments made on 10 September 2012 (**Table 3**) by the ATOAC it was explained that it was beyond the scope for a report such as this to fully investigate issues surrounding the identity of Traditional Owners but that OzArk accepts that there are differing points of view within the community and that we have tried to be as inclusive in the consultation process as is possible. Regarding the formulation of an ACHMP, it was stated to the ATOAC that it is OzArk's recommendation that an ACHMP be formulated in consultation with all RAPs should the Project be approved and at a time when the precise nature and timing of works will be known.

2.5 OZARK INVOLVEMENT

The fieldwork component of the Project was undertaken on five main separate field surveys:

12 October 2006. Survey of DLALC land in the Infrastructure Boundary

- Fieldwork Director: Mr Ben Churcher (Senior Archaeologist, (BA [Hons] Dip.Ed.).

14–16 November 2006. Survey of Infrastructure Boundary and other WACJV owned land

- Fieldwork director: Dr Jodie Benton (BA (Hons) – University of Sydney; PhD – University of Sydney); and
- Fieldwork assistant: Mr Phil Cameron (Ecologist, BSc, Ass. Dip. App. Sci).

25–29 January 2010 Survey of Subsidence Study Areas

- Fieldwork director: Mr Ben Churcher; and
- Archaeologist: Ms Pauline Hams (Assistant Archaeologist, BA).

15–19 March 2010. WC-OS2 test excavation programme

- Fieldwork director: Dr. Jodie Benton;
- Archaeologist: Mr Ben Churcher;
- Assistant archaeologist: Mr Kim Tuovinen (BA (Hons) – University of Sydney, Grad Dip Ed – Charles Sturt University, Grad Dip Arch – Flinders University); and
- Operations manager: Mr Phil Cameron

26–30 September 2011 Survey of Subsidence Impact Limit

- Fieldwork director: Mr Ben Churcher; and
- Archaeologist: Mr Joshua Noyer (BA Anthropology/Archaeology – University of California, Santa Cruz).

2.5.1 Reporting

The reporting component of the Project was undertaken by:

- Report authors: Dr Jodie Benton, Mr Ben Churcher and Mr Josh Noyer; and
- Contributors: Mr Phil Cameron and Mr Kim Tuovinen.

2.6 DESKTOP DATABASE SEARCHES CONDUCTED

A desktop search was conducted of the following databases to identify any Aboriginal heritage sites or other relevant issues for consideration in this report. The results of this search are summarised in **Table 4**.

Table 4: Desktop database search results.

Name of database searched	Date of search	Type of search	Comment
Australian Heritage Database (AHD). http://www.environment.gov.au/heritage/ahdb/	28 March 2012	Wyong LGA.	1 Indigenous Place on the search is located at Norah Head which is 14km from the Project Boundary.
NSW Heritage Office State Heritage Register (SHR) and State Heritage Inventory (SHI). http://www.heritage.nsw.gov.au/	28 March 2012	Wyong LGA.	No Aboriginal sites are included in the search area.
National Native Title Claims Search http://www.nntt.gov.au/Applications-And-Determinations/Search-Applications/Pages/Search.aspx	27 May 2012	NSW	No Native Title Claims cover the Study Area.
Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) Protected Matters (EPBC Act) Database. http://www.environment.gov.au/arcgis-framework/apps/pmst/pmst-region.jsf	28 March 2012	Wyong LGA.	No World Heritage Properties or National Heritage Places are listed within the Wyong LGA.
OEH AHIMS	24 April 2012	18km x 10km centred on the Project Boundary	3 sites on OEH AHIMS Register: # 45-3-3040 thru 45-3-3042 are within the Project Boundary.
Local Environment Plan http://www.austlii.edu.au/au/legis/nsw/consol_reg/wlep1991305/sch1.html	28 March 2012	Wyong LEP of 1991.	No Aboriginal heritage places are listed within the Wyong LEP.

2.7 SURVEY COVERAGE AND CONSTRAINTS

Field survey focussed on areas of archaeological potential and areas where safe and unrestricted access allowed for productive survey activity and meaningful sampling within the various landforms across the Project Boundary. Significant coverage of the Project Boundary was achieved by:

- traversing tens of kilometres of ridgelines in the Wyong Sate Forest and Jilliby SCA;
- surveying significant lengths of various selected ephemeral and permanent streams in these areas;
- conducting a survey of land that is representative of the Jilliby Jilliby Creek floodplain and riparian areas within the cleared/disturbed rural lands;
- survey of the Hue Hue offset lands ('Other WACJV owned lands'); and
- detailed survey of the Tooheys Road, Buttonderry and Western Ventilation Shaft surface facilities sites, including a test excavation in the vicinity of Wallarah Creek and adjacent areas at Tooheys Road site.

Constraints such as access, difficult terrain and variable ground surface visibility did not allow for 100% surface survey coverage and as such the resulting survey should be considered a strategic targeted sampling. While a full pedestrian survey of the entire Project Boundary was not practical, OzArk relied on the sampling methodology discussed in **Section 5.1** to ensure that all areas adjacent to higher order waterways and a range of other landforms were surveyed

and assessed giving the surveyors confidence that a large and representative sample of all landforms in the Project Boundary were included in the surveys.

Given that all survey is a sample of a particular area (subject to ground surface visibility and distance between surveyors, for example) it is OzArk's opinion that the survey methodology adopted for this assessment ensured that all landforms likely to contain large and/or complex sites were assessed and that a good representative sample of other areas were also included in this assessment.

12 October 2006. Survey of DLALC land in Infrastructure Boundary

There were no constraints to the survey in this area over DLALC lands associated with the Tooheys Road Site. Exposure incidence was adequate and ground surface visibility was above 15%.

14–16 November 2006. Survey within Infrastructure Boundary and other WACJV owned land

The survey covered those areas that would be directly impacted by the proposed surface works at the Buttonderry site, Tooheys Road site and Western Ventilation Shaft site. As the impact areas were pegged in the field, the heritage surveyors were able to be certain that they were surveying the correct locations. Specifically, each area had the following characteristics:

Tooheys Road Site

There were no constraints to the survey of the Tooheys Road Site beyond obscured ground surface visibility from vegetation cover, particularly along Wallarah Creek. Overall ground surface visibility was fair with exposures allowing up to 10% of the ground surface to be exposed. Areas beyond the Infrastructure Boundary were not surveyed although the heritage survey did include a buffer area around each impact area to ensure that possible heritage items located just outside the impact corridors were assessed.

Buttonderry Site

Ground surface visibility at the Buttonderry Site was obscured by either grass cover or leaf litter and was generally low at around 5%. Exposures were not common although agricultural infrastructure such as fences, gates, dams and roads afforded some exposures.

Western Ventilation Shaft

Due to the smaller size of this area, and the guided nature of the inspection, the surveyors did not require the impact area to be pegged in the field. The area is densely vegetated and the only ground surface visibility was along an existing track. Ground surface visibility was around 5% overall.

Other WACJV owned land

For areas outside the Disturbance Area (**Figure 2**), survey focussed on any waterways, ridge tops and any areas of accessible ground surface visibility, particularly vehicle tracks and erosion scalds. Although these areas in the potential conservation offset lands generally lacked significant land or waterway features, these areas will be part of a biodiversity conservation offset and there will be no direct disturbance or clearing of these properties to cause impacts to any archaeological values. Consequently, these areas were not required to be as comprehensively assessed as those Disturbance Areas that will be subject to direct impact.

25–29 January 2010. Survey of Subsidence Impact Limit

Wyong State Forest/Jilliby SCA

The steep, forested hills of the Wyong State Forest/Jilliby SCA are challenging to access. They are currently densely vegetated and feature very steeply sloping terrain which is a significant impediment to close physical inspection and raises access safety considerations. Vegetation is very thick in places necessitating that detours around thick vine tangles be made. In other areas, typical rainforest vegetation on the valley floors made inspection of the ground surface almost impossible due to the dense mat of leaf litter. Nor were conditions for ground surface visibility any better in the more elevated parts of the Project Boundary as, again, dense leaf litter from the Sclerophyll forests obscured the ground surface (**Plate 1**).

Specific constraints encountered in the assessment of areas within the Wyong State Forest/Jilliby SCA were:

Waterways (**Figure 4**)

- **Calmans Gully**: access was reasonable once an entry point from the edge of the Wyong State Forest had been located. Vegetation was thick but did not impede survey along the creek bed.
- **Myrtle Creek**: The portion of Myrtle Creek within Jilliby SCA is thickly vegetated with coastal rainforest and consists of large sandstone boulders interspersed with areas of rock ledges. Access along the creek was possible but vine tangles and low light conditions made it difficult to inspect all rock surfaces.
- **Little Jilliby Jilliby Creek**: The headwaters of this system consist of thick rainforest with the waterway descending at steep gradients. It was extremely difficult going and many detours had to be made from the creek bed as thick vines blocked passage. Where Little Jilliby Jilliby Creek becomes a more mature watercourse, thick alluvium covers the valley floor and rock outcrops become more and more scarce. Survey down the creek was impossible at this point as the creek was full of water and thick vines blanketed the banks. Instead the remainder of this southern section was surveyed from an old forestry road that parallels the creek on its eastern bank.

- **Unnamed waterway to the east of Smithys Road West**: The creek was accessed from where the electricity easement crosses Smithys Road West. The headwaters of this creek were not assessed but the lower reaches were surveyed. The creek displayed the same attributes as others already surveyed: thick vegetation, moderate–steep gradients on the waterway and numerous large sandstone boulders interspersed with areas of rock ledges. Survey ceased when evidence of alluvium in the creek bed became more noticeable.

- **Unnamed waterway to the south of Watagan Forest Road**: This waterway was surveyed from its headwaters to where it leaves the Wyong State Forest. The gradient of the waterway was moderate but the creek lacked rock ledges although sandstone boulders were plentiful. The vegetation was rainforest but less dense than in other creek systems as the aspect of the area appeared to provide for a drier environment. Vine tangles were still an impediment to passage.

- **Armstrongs Creek**: This creek was accessed from Brothers Road where thick lantana stopped any meaningful survey of the creek. From what could be seen, Armstrongs Creek, in the vicinity of Brothers Road, is already mature with thick layers of alluvium present. The headwaters of this system were not surveyed.

A constraint present in all waterways in this area was that hand-held GPS units had difficulty in getting an accurate fix for mapping purposes. However topographic maps (including the aerial image) were invaluable as it allowed the surveyors to get a positional fix with the GPS units when clearings allowed and this could be related to the map. As a result, the survey team were able to accurately know their position in all but the narrowest valley systems. Over 8.5km of first and second order stream lengths in the Wyong State Forest/Jilliby SCA were successfully surveyed and characterised.

Ridgelines (**Figure 4**)

All key ridgelines in the Wyong State Forest/Jilliby SCA area were traversed ranging from good quality unsealed roads to minor and overgrown tracks in poor condition.

- **Whitemans Ridge**: Vegetation is Sclerophyll forest and apart from steep cliffs and slopes, there was no impediment to passage and the ridgeline was able to be fully assessed.

- **Other ridge systems**: The entire length of the ridge to the east of Little Jilliby Jilliby Creek was walked, as was the ridge to the northeast of Myrtle Creek and Little Jilliby Ridge. Sclerophyll forest predominated and areas of exposure were afforded by forestry tracks.

- **Watagan Forest Road ridge system**: This road was driven several times and spot checks made. These spot checks also included making detours down some of the forestry tracks that follow the smaller ridgelines off the Watagan Forest Road ridgeline. In character these ridge systems were identical to those surveyed in the east: if a rock cap was present, there were no habitable shelters and the landform primarily consisted of steep slopes coming to a relatively narrow ridgeline.

Honeysuckle Park

The OzArk survey team was not granted permission to enter private rural property. As the majority of the valley floor landforms and low hill slopes within the Subsidence Impact Limit are on private property which has been largely cleared or disturbed, detailed physical assessment of the majority of these private rural areas was not possible.

One valley floor property owned by WACJV was, however, able to be assessed and is considered to be representative of the valley floor landform unit, comprising additionally a portion of creek bank of Jilliby Jilliby Creek. Ground surface visibility was very low at around 3% due to the thick grass cover.

15–19 March 2010. Tooheys Road Site WC-OS2 test excavation programme

There were no constraints to the successful completion of the excavation programme. The weather was fine and all portions of the Tooheys Road Site were able to be accessed.

26–30 September 2011. Survey of Subsidence Impact Limit

Constraints were all consistent with those encountered in the previous survey of the Wyong State Forest presented above. Typical constraints included limited vehicle access, difficult pedestrian access due to very steep and rough terrain with vegetation overgrowth, and poor ground surface visibility.

3 LANDSCAPE CONTEXT

The Project Boundary lies within the Sydney Basin Bioregion (SBBR, also known as the Sydney–Bowen Basin) which is on the east coast of NSW and includes a significant proportion of the catchments of the Hawkesbury–Nepean, Hunter and Shoalhaven river systems, all of the smaller catchments of Lake Macquarie, Lake Illawarra, Hacking, Georges and Parramatta Rivers, and smaller portions of the headwaters of the Clyde and Macquarie rivers.

The Project Boundary includes the parts of the Dooralong and Yarramalong Valleys with the majority of the area located within the Wyong State Forest and parts of Jilliby SCA. The Project Boundary area also encompasses numerous mainly ephemeral waterways including small portions of Hue Hue Creek, Little Jilliby Jilliby Creek, Myrtle Creek and smaller and unnamed drainage lines associated with the Wyong River and Jilliby Jilliby Creek.

3.1 TOPOGRAPHY

3.1.1 Infrastructure Boundary

Tooheys Road Site

Topography within the Tooheys Road Site is characterised by gentle rises ranging in elevation from approximately 15m Australian Height Datum (AHD) along Wallarah Creek and a tributary to Spring Creek to around 40m AHD at both the ridge at the western end of Tooheys Road in the northern area of the Site and also in the extreme south-western portion of the Site (**Figure 5**).

Buttonderry Site

Topography within the Buttonderry Site is characterised by a gentle rise ranging in elevation from 22m AHD in the northeast of the site to Hue Hue Road and Buttonderry Creek to around 65m AHD in the south-western and most elevated portion of the Site and to approximately 50m AHD in the north-western corner of the Buttonderry Site (**Figure 6**).

Western Ventilation Shaft

Topography within the Western Ventilation Shaft site is generally hilly with adjacent steep slopes along an east-west orientated ridge. Areas to be upgraded on Brothers Road occupy a moderately graded slope (**Figure** 7).

3.1.2 Subsidence Impact Limit

The topography to the west beyond the Dooralong Valleys in the Wyong State Forest and Jilliby SCA is generally steep and rugged, consisting of steep to very steep slopes with narrow crests and ridges (**Figure** 4). The local relief for this major portion of the surface area in the Project

Boundary is generally between 50m to 220m AHD with slope gradients from 20–50%. Several smaller, steep-sided valleys are associated with tributaries into the Wyong River and Jilliby Jilliby Creek and these often intersect the steep high slopes, crests and ridges of the Wyong State Forest and Jilliby SCA. The Yarramalong and Dooralong Valleys are comprised of low slopes and floodplains consisting mainly of flat to gently sloping floodplain terraces and low slopes/toe slopes.

3.2 GEOLOGY AND SOILS

The Wyong area is located south of the Newcastle Coalfield on the north eastern margin of the Sydney Basin. The coal resources are contained within the upper part of the Permian Newcastle Coal Measures.

This sequence is overlain by the Triassic Narrabeen Group, which outcrops across the Project Boundary. Although Hawkesbury Sandstone, the uppermost and youngest geological unit present in the general region is commonly found on top of ridge tops within the Central Coast Valleys area further south, none is evident over the Subsidence Impact Limit. Instead, the Project Boundary comprises Narrabeen Group sandstone(s) including the Gosford (sandstone, siltstone) and Clifton (softer sandstone, claystone, and shales) Subgroups. Quaternary alluvium occurs along valley floors and floodplains of the Wyong River, Jilliby Jilliby and Little Jilliby Jilliby Creeks. The general geology of the mining area is shown in **Figure 8**.

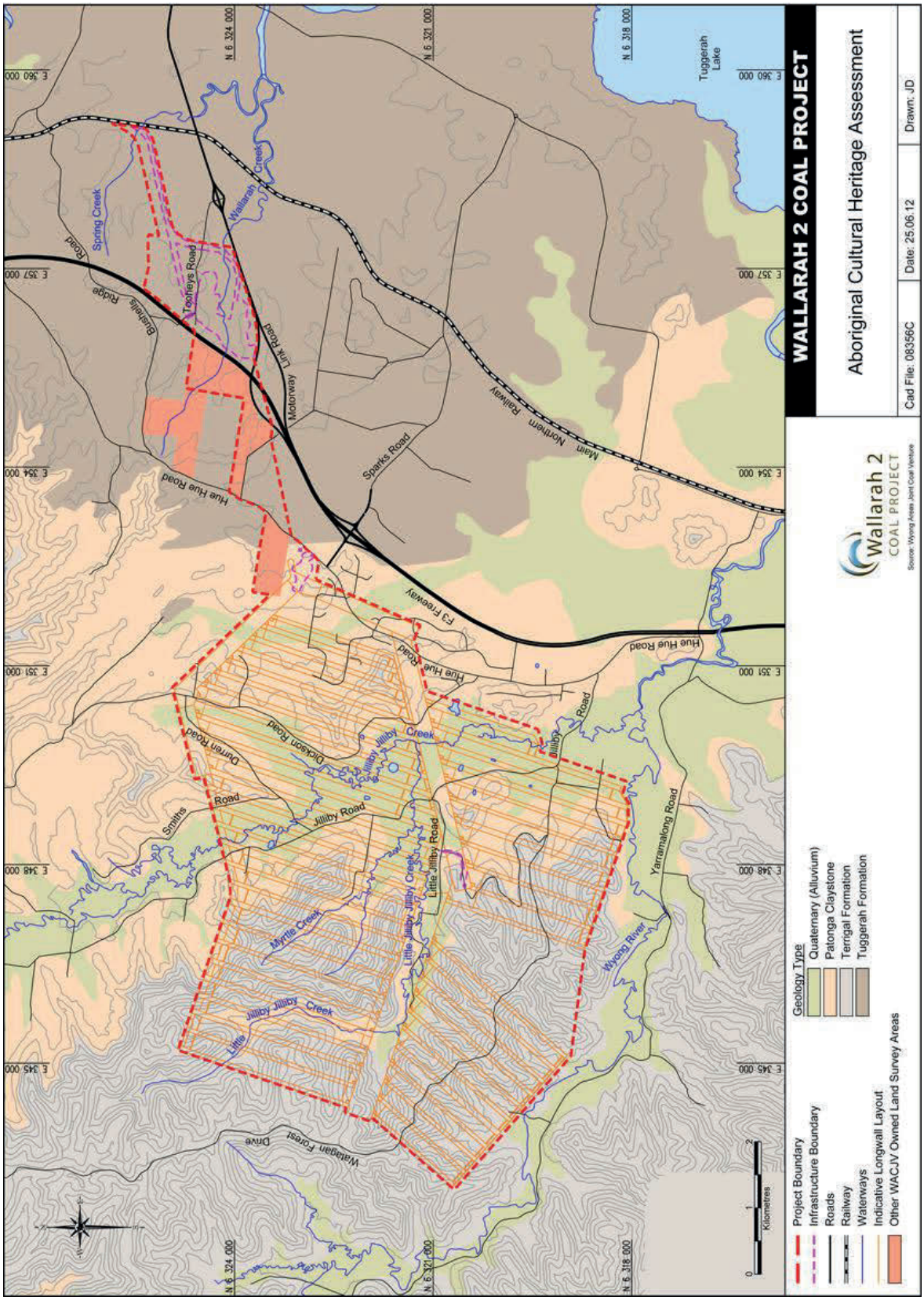
Regarding Aboriginal occupation of the area, as sandstone is the locally available stone, there were limited resources in terms of stone for flake production. For the production of items such as grinding stones or installations such as axe grinding grooves or stone arrangements, however, the local geology afforded ample resources in the available sandstone. In other areas of the region containing accessible Hawkesbury Sandstone, rock shelters and/or art sites are recorded. The Narrabeen Group of sandstones that characterise much of the Project Boundary tend not to contain habitable shelters and natural erosion of the more friable sandstone would slowly remove any evidence of art.

It is expected that the alluvial soils that exist within the valley floors within the Project Boundary would have been favoured locations for Aboriginal occupation in the past. However, much of this soil type is now on private land and the WACJV owned land at Honeysuckle Park was surveyed as a representative sample of the alluvial floodplain and riparian lands which have been cleared for agricultural/rural purposes and which is frequently inundated.

The Infrastructure Boundary, with the exception of the Western Ventilation Shaft, contains generally thin soils due to the erosion that followed the clearing of native vegetation for agricultural purposes. The Western Ventilation Shaft, although unaffected by agricultural uses, contains thin, sandstone derived soils. All soil types in these areas, even in the past, would

have been relatively poor and while less erosion would have been evident, they would have supported a relatively poor resource base available for exploitation by Aboriginal people.

Figure 8: Geological sequence underlying the Project Boundary.



3.3 VEGETATION

Vegetation across the Project Boundary is a mixture of coastal temperate rainforest remnants along creeks and drainage lines and sclerophyll forests further afield, particularly along ridge lines.

At present the vegetation is greatly altered from its native state either through the requirements of nearly two hundred years of agricultural use or use as a State Forest. All areas assessed as part of this study have been extensively exploited to the point where much of the Project Boundary contains cleared paddocks. Other areas, such as in the Wyong State Forest, have evidence of extensive timber harvesting over a long period of time that has removed almost all old growth trees apart from in a few surviving pockets.

The past vegetation communities that would have been of use to the local Aboriginal people can now only be extrapolated from other areas where the environment is more intact. On this basis it is assumed that the vegetation in the past would have still been thick; although not as entangled with vines as is found today. With the large canopy trees in place, a clearer understorey would have existed and this would have enabled freer movement than is the case today. Regardless, much of the Project Boundary would have been a temperate rainforest or dry sclerophyll forest and the resources available were those of the forest, rather than those of estuarine or coastal communities. This would have been a more-limited resource and it is unlikely that the area within the Project Boundary would have been conducive to long-term occupation (especially when compared to areas a little further east closer to the coast where estuarine and coastal communities intermingle). Further, the nature of temperate rainforest is that it becomes more impassable in narrow valleys and along waterways. This vegetation patterning would favour movement along areas of high ground, particularly in the Subsidence Impact Limit, where ridges containing dry sclerophyll forest would have allowed quicker movement through the country.

In terms of Aboriginal occupation, the vegetation originally existing within the Project Boundary would have been exploited but the immediate environs were not conducive to long term occupation. Ridge lines would have been used as pathways through the country and may contain low density artefact scatters indicating a transit camp. Other areas along creek lines were likely to have been heavily vegetated, and while hunting camps may exist in these areas, site manifestations are likely to be small with a low density of artefacts.

3.4 HYDROLOGY

3.4.1 Infrastructure Boundary

Tooheys Road Site

The Tooheys Road Site contains Spring and Wallarah Creeks with associated tributaries and one unnamed drainage line and headwater. All drainage lines drain east into Wallarah Creek offsite then eventually into the Budgewoi Lake (**Figure 1**).

More specifically, Spring Creek, a permanent source of water, is on land owned by the DLALC, north of Tooheys Road in the north-eastern section of the Project Boundary. Only a very small portion of this creek (c. 200m) is within the Tooheys Road site. This creek is fed by two main unnamed drainage lines from northwest and due west of an existing rail bridge, south of Bushells Ridge Road. According to the 2002 Dooralong 9131-1S map, no agricultural dams alter the natural hydrology of this waterway.

Wallarah Creek is located south of Tooheys Road and is a permanent source of water. The headwaters for this creek are 2km west, largely within the other WACJV owned land. Approximately 1.5km of this creek occurs within the Project Boundary, flowing east through the Tooheys Road Site. This creek has two main tributaries within the Project Boundary; one draining land to the north at the western boundary of the Project Boundary and one which is barely recognisable as a headwater, occurring in cleared, ploughed land adjoining the Sydney–Newcastle (F3) Freeway. The second tributary drains land south of the creek and is approximately 500m in length, of which 300m is within the Project Boundary. One large agricultural dam located on private property south of Bushells Ridge Road, and upstream of the Tooheys Road Site, alters the natural hydrology of this waterway (Dooralong 9131-1S 1:25k).

A smaller unnamed drainage feature is situated north of Tooheys Road, loosely paralleling it and then crossed by the TransGrid 330kV transmission line. Both headwaters for this feature are located on private property south of Bushells Ridge Road 1km west of the Sydney–Newcastle Freeway. Approximately 1.3km (or 1/3 of the entire length) of this feature is within the Project Boundary. This waterway is characterised by multi-channelled, shallow, separated, mostly permanent pools and waterlogged soils. Six agricultural dams located on private property south of Bushells Ridge Road alter the natural hydrology of this waterway.

Buttonderry Site

Surface water within the Buttonderry Site moves from the higher ground in the west toward Hue Hue Road and Buttonderry Creek. Once in the creek, the water flows southeast and only around 200m of this permanent waterway dissects the most north-eastern portion of the

WACJV owned property that is north of the proposed Buttonderry Site development area (**Figure 1**).

Only one agricultural dam, located on private property upstream of the Buttonderry Site (between Bloomfield and Kiar Ridge Roads) alters the natural hydrology of this waterway.

Western Ventilation Shaft Site

There are no drainage features within the Infrastructure Boundary at the Western Ventilation Shaft site. Surface water from the ridgeline drains south, off the slope, into a small east-west orientated valley containing the northern tributary (draining south) of Armstrongs Creek. This creek drains southeast for 3km before joining Jilliby Jilliby Creek, which then flows south into the Wyong River before eventually draining to Tuggerah Lake.

3.4.2 Subsidence Impact Limit

Six first and second order drainages are located in the Wyong State Forest/Jilliby SCA uplands within the Subsidence Impact Limit and are briefly described below (**Figure 4**):

- **Calmans Gully:** this creek system is alluvium filled for much of its length before it rises steeply as a typical 1st order waterway to its headwaters.
- **Myrtle Creek**: The portion of Myrtle Creek within Jilliby SCA is thickly vegetated with coastal rainforest and consists of large sandstone boulders interspersed with areas of rock ledges.
- **Little Jilliby Jilliby Creek** The headwaters of this system consist of thick rainforest with the waterway descending at steep gradients. When Little Jilliby Jilliby Creek becomes a more-mature watercourse, thick alluvium covers the valley floor and rock outcrops become more and more scarce.
- **Unnamed waterway to the east of Smithys Road West**: The creek contains thick vegetation, moderate–steep gradients on the waterway and numerous large sandstone boulders interspersed with areas of rock ledges.
- **Unnamed waterway to the south of Watagan Forest Road**: The waterway is in a steep V-shaped valley and, apart from some water held in pools; this system does not carry much water and is considered ephemeral in nature. The gradient of the waterway is moderate but the creek lacks rock ledges although sandstone boulders are plentiful.
- **Armstrongs Creek**: Armstrongs Creek, in the vicinity of Brothers Road, is a mature waterway with thick layers of alluvium present.
- **Jilliby Jilliby Creek**: Flows through the Subsidence Impact Limit as a mature stream. At present it has eroded steep banks on either side and agricultural land use is present almost to the edge of the banks.

Conclusion

There are a variety of hydrological resources that would have attracted Aboriginal occupation in the past throughout the Project Boundary. All areas assessed are within proximity to some sort of water source although the most reliable water would have been obtained in the higher order system of Jilliby Jilliby Creek that runs through the centre of the Project Boundary. While water resources in areas such as within the western Subsidence Impact Limit (Wyong State Forest/Jilliby SCA) would have been variable, the incidence of rock-pooling was reasonably frequent and water would have been available except in the driest seasons. The hydrology of Wallarah Creek would have also been variable as it has a limited catchment. However, during all assessments conducted for this study in the area, there were always pools of water in the creek. This would have allowed limited water based resources (both animal and vegetative) to exist in this area. This would have allowed low-level occupation: probably during good seasons.

The present nature of the waterways is also an issue in determining the likelihood of recording Aboriginal sites along them. Systems such as Jilliby Jilliby Creek flood frequently and in the process deposit alluvium and wash away evidence of Aboriginal occupation. This deposition/erosion phenomenon has accelerated during the past 200 years with the clearing of native vegetation and the area around Jilliby Jilliby Creek has probably lost any trace of the occupation that must have once occurred along its length. In other areas, such as the lower reaches of the creek systems in the Wyong State Forest/Jilliby SCA, the deposition of alluvium has also increased. The possibility is that any potential sites in these locations, such as axe grinding grooves, have become covered in sediment.

In the Infrastructure Boundary the hydrological system most of concern is not so much the location of the creek systems but the depletion of topsoils as these areas were clear-felled exposing the already thin soil to increased erosion. This would impact on any site in the vicinity by disturbing its context and very likely moving objects to new locations.

3.5 CLIMATE

The SBBR is dominated by a temperate climate characterised by warm summers with no dry season. A sub-humid climate occurs across significant areas in the northeast of the bioregion such as that experienced in the assessed Wyong area. Rainfall can occur throughout the year, but varies across the bioregion in relation to altitude and distance from the coast, with wetter areas being closer to the coast or in higher altitudes. Temperature varies across the bioregion, with areas of higher temperature occurring along the coast and in the Hunter Valley and areas of lower temperature on the higher plateaux and western edge.

More specifically, climate data from the Norah Head Bureau of Meteorology Automated Weather Station shows that the area has a maximum annual average temperature of 22.1°C

and minimum annual average of 15.1°C. The area has an annual average rainfall of 1,153.9mm (most monthly rainfall occurs in May with the least occurring in October).

Climate of this type would have allowed year-round occupation of the Project Boundary by Aboriginal people in the past. The climate would have also allowed relatively abundant vegetation to flourish, along with the accompanying food resources.

3.6 REGIONAL LAND USE HISTORY

As current land use and existing levels of disturbance are relevant to the determination of archaeological potential within the Project Boundary, a brief review of these factors is pertinent.

The Wyong area has been subject to a wide variety of documented land use practices since initial European settlement in the early 1820s. The timber industry has been a major influence in the Wyong area throughout the history of European occupation of the area.

The incidental impact of the timber harvesting was the opening up of the valleys, which attracted farmers, and settlers who cleared the river flats in the 1850s. These were mainly subsistence farmers growing fruit and vegetables and grazing stock. The height of the timber industry was reached in the early 1900s when exports boomed, however by the late 1920s much of the local timber had been felled and the area exhausted (ERM 2001b: 2.14).

Dairy farming became a major industry of the Wyong area in the 1930s, and by 1970 there were over 100 operational dairies in the area. Decline in this industry followed and by 1995/6 no dairy farms were operational in the Wyong area. Poultry farming remained a smaller industry, which peaked in the 1960s.

Residential development significantly increased once the Sydney Freeway was opened in 1987. This brought an influx of hobby farmers and rural residential development centred on the Yarramalong Valley. Traditional large acreage agriculture has given way in the last twenty years to smaller hobby farms running stud and beef cattle, rural weekend retreats, market gardens, orchards, nurseries, horse studs and turf farms (ERM 2001b: 2.14).

Transformation processes from the settlement and historic occupation of the area have no doubt been responsible for the modification/destruction of Aboriginal occupation sites in these valleys. Disturbances such as erosion and soil movement as a result of tree clearance and agriculture as well as the altered hydrological impacts of flooding, have undoubtedly contributed to the disturbance and / or redistribution of archaeological material.

3.7 EXISTING LEVELS OF DISTURBANCE

3.7.1 Infrastructure Boundary

Tooheys Road Site

The levels of existing disturbance across the Tooheys Road Site (**Figure 2**, **Figure 3** and **Figure 5**) were assessed as moderate to high. This disturbance was primarily due to the clearing of vegetation, agricultural use and subsequent erosion (**Plates 2–7**).

Environs of Spring and Wallarah Creeks

Spring Creek is largely unmodified and lined with large eucalyptus within the assessed area (**Plate 2**). The Disturbance Boundary adjoins an existing area of very heavy disturbance and waterway modification where a rail bridge has been constructed for the Main Northern Railway. There is evidence of surface impacts from vehicle tracks and ruts to the banks of the creek in discrete places (**Plates 3** and **4**).

Wallarah Creek has undergone heavy disturbance in places, evidenced by highly modified open channels, such as at the western end of the Tooheys Road Site at the location of recent public works associated with the construction of the Morisset to Warnervale water trunk main (Hunter Water Pipeline) and numerous other services and pipelines. Areas of intensive erosion occur resulting from land clearing practices and prior agriculture (**Plate 3**). In the western portion of the Tooheys Road Site (adjoining the F3 freeway) vegetation has been largely cleared within the past 50–80 years. Although some remnant trees remain and varying levels of soil disturbance have occurred, there has been some regeneration of native vegetation, particularly associated with the creek. It is within this regenerated and remnant vegetation of Wallarah Creek that the western most portion of the rail loop will cross.

Although the tributary of Wallarah Creek originating on the southern side of Motorway Link Road appears largely unmodified, the vegetation has in fact regenerated over the past 50 years, subsequent to clearing and grazing. The 4WD track shown on the topographic map crossing Wallarah Creek and running immediately west of the waterway is barely recognisable in the field and has been for the most part reclaimed by regrowth.

Within its central and eastern sections at the Tooheys Road Site, native vegetation along Wallarah Creek is unmodified between 50–100m either side of its existing banks. The presence of old growth eucalypts behind former agricultural fences indicates the creek has been recently excluded from both direct and indirect impacts (excluding the former vehicle crossing).

Area to the north of Tooheys Road

The area within DLALC land is 1800m x 60m (10.8ha). This land is not managed for any specific purpose by the DLALC. The only infrastructure present on the property (apart from agricultural fencing) is associated with a TransGrid 330kV powerline that occurs within a dedicated easement (**Plate 4**). The assessed area for the Project included 10–15m of the northern portion of the TransGrid easement (in the event that TransGrid would allow the rail alignment to be moved closer to the existing towers to minimise impacts to vegetation and possible heritage) and extended for 50m beyond the existing easement's northern limit. The alignment of the electrical towers does not occur within the assessed area.

Area to the southwest of Tooheys Road

Principally the zone covered in this section is Lot 124, which extends both to the north and the south of Wallarah Creek. This area has been heavily modified. Nearly all trees have been cleared, arable land ploughed and elevated lands suitable for Aboriginal occupation have been impacted by a residential house and farming infrastructure (former dairy shed). In 2006 large amounts of rubbish (car bodies, building materials and storage containers) were stacked in multiple piles toward and along the banks of Wallarah Creek. These materials, including potentially hazardous items (old pesticide containers and asbestos sheeting) have been subsequently responsibly removed by the Proponent. The western boundary of the property has been heavily altered by the Morisset to Warnervale water trunk main. Until recently, the western-most property of the Infrastructure Boundary, both north and south of Wallarah Creek, was used for grazing agriculture (goats) and has no significant understorey layer and very few trees.

Area to the southeast of Tooheys Road

The two blocks to the east adjoining Lot 124 have had similar, although less severe impacts to that noted above. North of Wallarah Creek these blocks have been cleared and, in the past, ploughed and grazed. Other impacts such as vehicle tracks and dams are also found in this area. To the south of Wallarah Creek, however, the land has been fallow for more than 30 years (estimation) as it has a mature understorey layer and moderate sized trees. It is likely that all blocks underwent tree clearing at some time in the past (**Plate 7**).

<u>Buttonderry Site</u>

Buttonderry Site is currently, and was formerly used, for grazing agriculture (**Figure 2**, **Figure 3** and **Figure 6**; **Plates 8–10**).

The Disturbance Area is primarily situated on lower, undifferentiated, northeast facing slopes which are currently predominantly treed, but have been subject to previous logging (only a few

isolated trees are mature: **Plate 8**). The south-eastern portion of the Disturbance Area comprises slightly more elevated land with minimal slope gradient (**Plate 9**).

This area has been completely cleared and shows evidence of having undergone ploughing or scarification for pasture improvement. A couple of stock dams have been excavated into deposits of the lower hill slope, which indicate that the remnant topsoil is very skeletal and directly overlies heavy clays of the 'B' horizon (**Plate 10**). Tracks that traverse the entire Buttonderry Site also provide limited disturbance.

Western Ventilation Shaft

The Western Ventilation Shaft is located within the Wyong State Forest (**Figure 2**, **Figure 4** and **Figure 7**; **Plate 11**). Disturbance in the immediate area is limited to the prior construction and ongoing maintenance of Brothers Road and selective logging in the past.

3.7.2 Subsidence Impact Limit

In the Wyong State Forest/Jilliby SCA portion of the Subsidence Impact Limit (**Figure 2** and **Figure 4**; **Plates 12–14**), the impact from farming is less while a long history of logging has drastically altered much of this Study Area (**Plate 12**). Much of the open woodland, particularly on ridgelines and slopes, is regrowth; with only a few residual, ancient trees present. As well as evidence of past logging there is also evidence of logging tracks, culverts and assembly areas that have all altered the ground surface. Vegetation clearing for 330kV transmission lines is also present in multiple sites in this area (**Plate 13**). Apart from logging activities, the ground surface in much of the area is undisturbed (**Plate 14**).

Within the privately owned land within the Subsidence Impact Limit (i.e. Honeysuckle Park: **Figure 4**) the land has been extensively cleared, probably ploughed and is intensively grazed (**Plate 15**). While some landform features, such as terraces, are evident, the majority of the privately owned land has been drastically altered by farming/timber clearing activities and flooding episodes. The effect of these disturbances would be to lower the integrity of any site had it existed, or potentially remove certain site types such as modified trees.

3.7.3 Other WACJV owned land

Previous impacts to these parcels of land are varied and are as follows:

- *DP 755245 Lot 118 (25ha)*
  This is the most northern block in the potential offset group of properties and fronts Bushells Ridge Road (**Figure 2** and **Figure 4**). It is currently used for grazingand has been similarly used throughout the past century. All drainage lines have been impacted by vegetation removal with one large dam having been constructed in one of the

headwaters to Wallarah Creek. The vast majority of vegetation on the block has been removed except on areas where there is steep topography (**Plate 16**).

- *DP 719762 Lot 1 (36 ha)*
  This portion of land fronts Hue Hue Road along its western boundary. It has suffered low levels of prior disturbance with only selective tree clearing having been undertaken (**Plate 17**).
- *DP 258692 Lot 31 (48 ha)*
  This portion of land abuts the F3 freeway. The flat areas have been cleared for grazing agriculture whilst the steeper slopes remain timbered only having undergone selective logging. In this block, generally, all land north of the tributary to Wallarah Creek has been cleared. However, the only clearing on the slopes is associated with the TransGrid 330kV electricity easement. There are several vehicle tracks that traverse this parcel of land.
- *DP 791157 Lot 2 (36 ha)*
  This is the southern-most of the potential offset group of properties and is bounded to the south by Kiar Ridge Road and the west by Hue Hue Road. The western 5ha contains a residence and has been heavily disturbed by residential infrastructure that has caused modification of the drainage line that runs parallel to Hue Hue Road. Similarly, as with all land in the vicinity, the flat areas were cleared for agricultural purposes and the steeper slopes have been selectively logged. One moderately sized farm dam is present on elevated land in the east of the property and several vehicle tracks exist.

3.7.4 Summary

Infrastructure Boundary

Given the high levels of disturbance to the ground surface, either from agricultural land uses or the resulting erosion, it is probable that Aboriginal sites in this area may have been disturbed during the process of erosion. The types of disturbances noted in this area are likely to disturb the context of artefacts.

Subsidence Impact Limit

Review of the past and present land use patterns within the Subsidence Impact Limit demonstrates that substantial parts of the landscape, especially along river flats and low slopes around the Yarramalong and Dooralong Valleys, have undergone significant physical modification as a result of historic settlement. These activities have potentially disturbed and/or destroyed Aboriginal sites that may have been located in the valleys in prehistory.

Disturbance in the western portions of the Subsidence Impact Limit are less severe although logging has encouraged localised erosion and ground surface disturbance, particularly in the form of tracks, assembly areas and from the removal of trees on steep slopes.

4 ABORIGINAL HERITAGE ASSESSMENT: BACKGROUND

4.1 ETHNO-HISTORIC SOURCES OF REGIONAL ABORIGINAL CULTURE

Although the exact position of traditional (pre-European) tribal boundaries is not clear, Norman B. Tindale's 1974 map (http://www.samuseum.sa.gov.au/archives/collections/tribes), with its obvious limitations, places the Project Boundary within Darkinjung Country although in an area in close proximity to the Awabakal (to the north) and the Daruk to the south[2].

The Darkinjung and their neighbours lived by fishing, gathering bush foods and hunting. The region was part of an extensive trade network and large ceremonies were held at times of the year when fish were plentiful. Ourimbah, in the middle of the Central Coast region, was a ceremonial ground in which boys were initiated (Vinnicombe 1980).

The Historic occupation of Australia started at Sydney in 1788 and its effects were soon felt in the Central Coast. Smallpox, measles and other exotic diseases quickly reduced the population (Stinson 1979: 11). It is also recorded that the Aboriginal occupants did not take too kindly to the invasion of white settlers to the area. According to the Town and Country Journal, 6th March 1875, Aboriginal men were "*ruthlessly slaughtered*" when reacting to the provocation of the stealing of land or women.

Before the invasion there may have been 1,500 Aborigines in 12 family groups living between the Hawkesbury River and Lake Macquarie. In six years, between 1821 and 1827, the local Aboriginal population was reduced from 200 to 65. A second smallpox epidemic in about 1828 almost completely destroyed the local population.

After the dispossession of Aboriginal people from their land, Aborigines and White Australians tended to live separately in space (Coombs 1994: 70), although there were a few people who may have been descendants of the original inhabitants living near Mangrove Mountain (Vinnicombe 1980). The Central Coast region grew rapidly as a centre of European population. By 1968 a local historian could comment that "*these friendly and worthy people... are no longer with us*[3]" (Bennett 1968: 3).

4.2 REGIONAL ARCHAEOLOGICAL CONTEXT

Although several broad archaeological studies have been conducted in the Wyong region over the last thirty years, there have been only a few, limited investigations that incorporate land

[2] Please note the comments of the ATOAC and ADTOAC in **Appendix 2** that dispute that the Project Boundary is solely within Darkinjung Country.

[3] OzArk recognises that the Darkinjung and other Aboriginal people continue to live in the Wyong area today and their small and segregated population in 1968 probably accounted for Bennett assuming that the Darkinjung "are no longer with us".

within the Subsidence Impact Limit. Studies from the broader region are therefore important to establish an overall picture of Aboriginal site distribution including the site types, frequencies and locational patterns. Review of these studies has been presented in considerable detail as much of this prior work will be extrapolated to predict the site types and frequencies that may be expected within the boundaries of the Subsidence Impact Limit.

The most relevant studies undertaken in the vicinity of Project Boundary are summarised below. Studies with direct physical relevance to the Project Boundary will be presented in the Local Archaeological Context: **Section 4.3**.

Approximately 270 Aboriginal sites have been recorded within the Wyong LGA and are listed on the NSW OEH AHIMS database. Sites are added to the list as further specific studies are completed (Wyong Shire Council 2004). The oldest date for the region (11,050 years Before Present) is based on evidence from Logger's Shelter at Mangrove Creek, recorded by Attenbrow (as cited in Vinnicombe 1980). Much of the following contextual review builds upon work previously undertaken for this Project, primarily ERM 2001a, with additional studies included where appropriate.

Vinnicombe (1980) Predilection and Prediction: A Study of Aboriginal Sites in the Gosford–Wyong Region

Patricia Vinnicombe undertook a major survey that sought to categorise and define Aboriginal heritage resources in the Gosford/Wyong area as a means to integrate cultural heritage into the early stages of development planning. The project comprised a thorough background research, detailed survey and analysis of results to produce a predictive model for the region that was relevant to her 1,560km^2 study area. Vinnicombe's study area finished 10km south of the current Project Boundary, but comprises landscapes similar to those incorporated within the current project scope. It is noteworthy, however, that the majority of similar landforms assessed by Vinnicombe were of the Hawkesbury Sandstone formations, not the Narrabeen Group formations that characterise the current Project Boundary.

As a result of this study, Vinnicombe identified various ecological zones within the study area and sought to determine the differences within and between these areas that might make Aboriginal site prediction more accurate. Three different environments were investigated, including open coastline and coastal estuary, riverine estuary and inland sclerophyll forest (the latter being most relevant to the current Project Boundary).

Vinnicombe conducted intensive 10km^2 surveys within each of these three zones, identifying an average of 11 sites/km^2 in coastal estuary areas, eight sites/km^2 in riverine estuary areas and six sites/km^2 in inland sclerophyll zones. Given the (then) current levels of development and the ecological make-up of the Gosford/Wyong area, Vinnicombe predicted that there could be an

overall total of 13,000 sites within the locality. Vinnicombe was also able to postulate that decreasing site densities are directly related to the distance from marine resources.

A total of 243 sites were recorded during intensive survey, as well as additional sites recorded in spot surveys and *ad hoc* inspections.

A total of 127 rock shelters with occupation evidence were located, along with another 469 shelters considered to be potentially habitable, thereby being the most common site type recorded during the survey. The following points synthesise the most relevant data regarding these sites (ERM 2001a: 2.17):

- Most were located on steep valley slopes associated with the Hawkesbury Sandstone although others were found in Narrabeen Group sandstone(s). These occurred to a lesser extent in the Gosford Formation subgroup (Terrigal Formation) and rarely in areas with combination claystone, sandstone and shale (Patonga Claystone).
- Occupation shelters were more common close to valley floors while those with art were said to be located below ridge tops;
- Shelters varied in size and there seemed to be a preference for north-westerly aspects in terms of occupied shelters;
- Proximity to permanent water sources did not appear to be a significant factor in occupation shelter selection, as they were most commonly found on high ridge tops, far from drainage lines. Water was still available, either from rock pools, seepage or aquifers;
- Archaeological deposits recorded in shelters varied in terms of content and density. More substantial deposits included stone artefacts, bone, shell and charcoal; and
- Art sites within shelters (67) occurred in both high ridge tops and on lower valley slopes. The size and aspect of the shelter did not seem to be a key factor in the location of art sites. Art included figurative and non-figurative work in wet pigment paintings (mostly red with some white and black), stencils (predominantly white, red, yellow and pink) and dry pigment drawings (most commonly black). Images were found on both ceilings and walls. Engravings within shelters were rare.

A total of 49 middens were recorded in sandy alluvium and Narrabeen Group landscapes, and these were most often observed near freshwater creeks/aquifers at the bottom of slopes towards the valley floor.

Artefact scatters were not commonly observed during survey. Five were located (only one is recorded as a separate site, the others as middens or shelter with deposit), all of which were either associated with middens or found on creek banks or a high plateau. It was noted, however, that there was a reasonable likelihood that vegetation and/or accumulated deposits may have covered archaeological sites causing them to be invisible in terms of survey.

A total of 54 grinding grooves were found, mostly in and along creek beds at the heads of valleys on Hawkesbury Sandstone. These were also found on Narrabeen Group sandstone(s) although not as often as in Hawkesbury Sandstone. They were usually located near the tops of waterfalls, near rock pools or close to aquifers on rock platforms. The numbers of grooves varied from 1–81 and the average groove size was 29 x 7.5 x 1 cm, making them likely to have been for spear/tool point sharpening rather than any sort of food preparation.

Engravings usually consisted of pecking, abrasion or both. Most motifs were human, fish or macropods, with birds and other animals, weapons and animal/human tracks also being observed. Of the 12 engravings recorded, they were usually found in Hawkesbury Sandstone on ridge tops and plateaus. Others were found on Narrabeen Group sandstone(s) at sea level.

As the Gosford-Wyong area has been heavily logged in the past, scarred trees were considered rare in the region and none were recorded during the Vinnicombe assessment.

The majority of the 1,000 registered sites listed on DECCW records for the Gosford-Wyong area at the time of the Vinnicombe study were engravings, axe-grinding grooves, rock shelters containing art and shelters with deposit. Shell middens, stone arrangements, open camp sites, burials and quarries were also recorded but in far fewer numbers. Vinnicombe argued that the bias in favour of engravings in the then NPWS register, largely reflected past survey strategies. In addition, the greater Gosford-Wyong area was dominated by Hawkesbury Sandstone ridges and as a result, the predominance of sandstone-derived sites recorded may have contributed to this trend.

The average site density within the Vinnicombe's study area was estimated at eight sites/km^2.

Attenbrow (2004a) Upper Mangrove Creek Investigations

Although over 20km west of the current Project Boundary, the archaeological investigations in the Upper Mangrove Creek sandstone hinterland area provides the largest systematic and best-published survey and excavation programme in the region, having taken place in the 1970s and the 1980s.

The project included the following components:

- Intensive survey of the Mangrove Creek dam storage area (1,215ha) which covered valley floors and low ridges underlain by the Narrabeen Group sandstone(s).
- Stratified random sampling of 10.1km^2 (or 10%) of the entire dam catchment, ensuring representation of the Hawkesbury Sandstone and underlying Narrabeen Group. This area was divided into three broad topographic zones: ridge tops to 10m below break of slope (separated into those dividing catchments from those within); valley bottoms (colluvial / alluvial) up to 40m up the low toe slopes (separated into minor and major)

and ridge sides of the Hawkesbury and Narrabeen sandstones (separated into those above major versus minor creek lines).

Attenbrow's findings generated the following predictive statements:

- That ridge tops between major catchments are likely to have a large number of sites including rock shelters with archaeological deposits and grinding areas. Density was predicted to be less than that for main creek valley bottoms and subsidiary creek sides, however. Ridge tops within catchments are likely to have few sites and the lowest density. If present, rock shelters will tend to be in cliff lines just below the flat ground of the ridge top.
- Main creek valley bottoms have a high density of sites, especially artefact sites with sub-surface deposits.
- Although ridge sides above main creeks have a high density of potentially habitable rockshelters or those with potential archaeological deposits (PAD), there will be an overall low density of sites while ridge sides above minor creeks have a relatively high density of sites and rock shelters with art will have the highest number of figures. Shelter archaeological deposits will be mainly small scale.

Attenbrow also investigated the Mangrove Creek alluvial flats from Wattle Creek to the site of the dam roughly 8.5km away. This investigation was conducted specifically to search for open artefact scatters and was undertaken in two stages, the first being an opportunistic approach followed by a more systematic survey after logging had occurred in the area, thus exposing sub surface archaeological deposits. Excavations also later formed part of this study to further investigate numerous sites.

As a result of both the survey and excavation programme, 179 sites were identified in the Upper Mangrove Creek, presented in **Table 5**.

Table 5: Site type frequencies in the Upper Mangrove Creek area.

Site Type	Number	Percentage of Total Site Types %
Grinding grooves in the open	41	23%
Rock shelters with deposit and art	33	18%
Rock shelter with deposit alone	30	17%
Isolated finds	28	16%
Open scatters of artefacts	25	14%
Rock shelter with art alone	15	8%
Rock engravings in the open	2	1.1%
Rock shelters with deposit, art and grinding groove	2	1.1%
Rock shelters with deposit, art and burial	1	0.6%
Rock shelter with deposit and grinding groove	1	0.6%

Site Type	Number	Percentage of Total Site Types %
Scarred trees	1	0.6%
Total	***179***	***100%***

In terms of the site location of the isolated finds, 82% were identified in the main creek valley bottoms, 11% on ridge lines above main creeks and 7% on ridge tops. It was noted that the discrepancy in distribution might be a result of more intensive survey in valley floors. Of the open artefact scatters, 84% were identified in main creek valley bottoms with the remainder identified on ridge tops. The overall density of archaeological features was determined as 5.8 per km^2.

A further noteworthy result of this project was the introduction of the concept of potential habitation (PH) shelters as it was realised that many rockshelters without any visible sign of Aboriginal use had deposits that looked as if they would contain archaeological materials. Important to future archaeological investigations, this work introduced the concept of Potential Archaeological Deposits (PADs) to Australia (Attenbrow 2004a).

Twenty-eight rockshelters with deposit were excavated during the salvage component of this project, along with many open artefact scatter sites. Of these, only 16 had been recorded as having archaeological deposit from the presence of surface artefacts sighted during the initial site survey. Of the twelve potential archaeological deposits in rockshelters that were test excavated, eight (67%) proved to contain sub-surface cultural materials. Additionally, this salvage program was among the first pieces of research aimed at the scientifically rigorous understanding of an environmentally defined area that was able to shed light on the processes of 'intensification' of Aboriginal occupation during the late Holocene around 4000 BP (Attenbrow 2004b).

Dyall (1981) Tuggerah–Sterland 330kV Transmission Line Assessment

Dyall conducted a survey for the then Electricity Commission of NSW on the route of the Tuggerah-Sterland 330kV transmission line located 10km south of the Project Boundary. A total area of 120km^2 was covered by this survey, encompassing a variety of landforms, including steep Narrabeen Group sandstone ridges and Gosford Sub-Group sandstone outcrops. Particularly the eastern portion of the survey covered similar landforms to those found in the current Project Boundary.

13 Aboriginal occupation sites were recorded during the survey. An 'art gallery' was identified at the head of Moran's Creek. Six rock shelters were located, one with a single drawing. Six sets of axe-grinding grooves were also identified, ranging from a single groove to a set of seventeen,

all located in minor creeks, at locations where the creeks flow over sandstone shelves, high on the ridges. Two isolated finds of stone flakes were also recorded.

Based on the results of the preliminary survey, Dyall hypothesised that while it was unlikely that more art would be found within the study area, a more detailed survey should reveal more Aboriginal material, especially around the swamp areas.

Koettig & Hughes (1983) The Hungry Creek Survey in Upper Wollombi Brook

This survey located 60km to the west of the Project Boundary covered an area of 300ha in very similar terrain to that found in the western portion of the Subsidence Impact Limit. The survey identified 17 sites, (average site density was 5.7 per km^2) of which 12 were rock shelters with associated traits such as art and/or deposits. It was noted that these 12 sites represented 24% of 51 potential habitation shelters. This added to the previous survey results of Vinnicombe and Attenbrow that of all the potential habitation shelters identified, 16% and 24% respectively had actually been utilised as activity or habitation sites. This indicates that on average one in four or five potential shelter sites will show evidence of occupation.

The difficulty in distinguishing between Hawkesbury Sandstone and Narrabeen Group sandstone(s) was also noted by Koettig and Hughes (1983).

Dallas (1986) Hue Hue Rd assessment

WSC commissioned an archaeological survey along Hue Hue Road as part of their Draft Local Environment Plan (LEP). The study area consisted of land abutting Hue Hue Road, to the west of the Sydney–Newcastle Freeway and in close proximity to the Project Boundary. The landforms that comprised this study are more akin to those in the valley bottoms and toe slopes within the Subsidence Impact Area than that of the sandstone country to the west.

Based on the limited previous archaeological work in the area and the environmental setting of the site, Dallas limited site prediction to open camp sites and modified trees.

A surface scatter of three artefacts was identified, on compact exposed clays and gravels, located on a slope overlooking a creek. The artefacts consisted of a yellow mudstone flake, a grey silcrete flake and a yellow chert flake. It was assessed as unlikely that any undisturbed subsurface deposits remained in the area.

The scatter was interpreted to represent sporadic use of the area. Its location may indicate use of the area by small foraging groups who would have exploited the resources of the nearby swamp. However, European land use practices are likely to have obliterated any traces of substantial significant occupation sites within Dallas' study area.

Kinhill (1995a) Morisset Forestry District EIS: An Assessment of Aboriginal Archaeological Sites

The Morisset Forestry District (MFD), located 20km north of the Subsidence Impact Limit, was assessed to describe the Aboriginal heritage and cultural values of the area the likely environmental impact of forestry operations on Aboriginal heritage sites. The study also endeavoured to establish the nature and distribution of stone artefact scatters across the landscape as it appeared that the database for sandstone sites was sufficiently large enough for predictive purposes.

The study area was approximately 1,160km^2, and was divided into 10 environmental zones based on geology and topography. The geographical nature of these zones was used to predict the frequency and distribution of different site types (ERM 2001a: 2.21). Written descriptions of these zones make them somewhat difficult to distinguish from one another but it is noteworthy that they are all fairly rugged and comprise no alluvial/valley components. Although descriptions of zones do note whether Narrabeen or Hawkesbury sandstones are present, zones sometime include both formations. Survey was limited to identify zones 4, 5, 6, 8 and 10, of which 4–6 and 8 comprise deeply dissected Hawkesbury Sandstone plateaus with steep valley sides, mainly on sandstones of the Narrabeen Group that is overlying Gosford Formation sandstone and shales; while zone 10 comprises low hills on Permian sedimentary rocks.

At the time of this study, approximately 200 sites had already been recorded within the study area and registered on the AHIMS. Most were sandstone rock shelters with art and axe grinding grooves on sandstone outcrops. In the wider region, (i.e. all forests in MFD) approximately 4,800 sites were listed with NPWS. Of these, 75 per cent were rock shelters with art and/or deposit, axe-grinding grooves and rock engravings. The area also yielded open campsites (artefact scatters) in the Hunter Valley region and shell middens on the coast. Very few open artefact scatter sites were recorded in the study area.

Based on previous archaeological research, it was assumed that sandstone sites were more likely to be found in areas with geology characterised by Hawkesbury Sandstone. It was also predicted that open artefact scatters were likely to be more prolific on ridge tops and valley floors.

Results of this study saw a total of 41 Aboriginal sites recorded, including open artefact scatters, axe grinding grooves and rock shelters. Of the 22 open artefact scatters, the majority were low density sites with an average of six artefacts per site, with largest bearing 34 artefacts. Most scatters were located on ridge tops or valley floors as predicted. Four axe grinding groove sites were recorded, three in creek beds and the final on top of a sandstone ridge next to water ‘potholes’. Five rock shelters with PAD of 25cm depth were also recorded, four of which overlooked a tributary of Deep Creek.

In summary, rock shelters were most commonly located on sandstone cliffs, ridges and dissected plateaus of Hawkesbury Sandstone, where outcropping was common. Rock shelters were likely to occur in similar topography in Narrabeen Group sandstone(s) and associated formations although they were less probable in Gosford Formation sandstone and shales and the Clifton Subgroup (Zones 4, 5 & 8; ERM 2001a: 2.22). It is important to note here that these extrapolations regarding sites and their relationship to the underlying geology are somewhat difficult to interpret. As the Narrabeen Group is comprised only of the Gosford Formation and the Clifton Subgroup (as well as a lower undifferentiated component), it is hard to see where the shelters were more likely to occur within the Narrabeen Group.

Open artefact scatters were most likely to occur on ridge tops and on the lower reaches of some of the creek lines in both Hawkesbury and Narrabeen Group sandstone(s). Of all the landscapes surveyed, those underlain by Gosford Formation with cappings of Hawkesbury Sandstone and Clifton Subgroup had the highest potential to yield artefact scatters as a result of the broader ridges associated with this geology. The scarcity of open artefact scatters was attributed to the long logging tradition in the area which had disturbed those areas where artefact scatters usually occur (ridge tops and valley floors), while the higher number of sandstone sites (rock shelters and engravings) was probably due to the fact that logging activities were concentrated away from sandstone outcrops.

Kinhill (1995b) Compartments 182, 183 and 184 of the McPherson State Forest, NSW

Assessment of 812ha proposed for timber harvesting was undertaken in the McPherson State Forest. McPherson State Forest is located around 40km west of the Project Boundary. This survey recorded Hawkesbury Sandstone on the plateaus, ridge tops and high slopes and underlying Narrabeen Group sandstone(s) on lower slopes and valley sides. No valley bottoms were assessed. Predictions for site type and location were made based on Attenbrow and Vinnicombe's work in the Upper Mangrove catchments and it was anticipated that most, if not all, of the sites identified during the survey would be sites associated with rock outcrops. The study area was divided into eleven sample survey areas and three transects, which together comprised 147.7ha (18%) of the total study area. Descriptions of all these areas indicate that Hawkesbury Sandstone was the predominant formation assessed.

A total of 12 sites were located and site density calculated at 8.2 per km^2. This is higher than reported for previous studies in the McPherson State Forest and the Upper Mangrove Creek area at 6.5 per km^2. Open artefact densities were calculated at 1 artefact/10,000m^2 on ridge tops and at 1 artefact/16,500m^2 on shelves on ridge sides.

Silcox (1996) Archaeological Survey and Assessment of Compartment 128, Ourimbah State Forest, Mangrove Mountain, NSW

An archaeological investigation in the Ourimbah State Forest, Mangrove Mountain near Gosford, NSW (approximately 5km to the southwest of the Subsidence Impact Limit) was conducted over 536ha in preparation for further forestry activities. Geologically the area is comprised of Hawkesbury Sandstone capping overlying Gosford Formation sandstone and shales of the Narrabeen Group. Topographically, the area comprised a deeply dissected plateau surface with ridge tops within and between major creek catchments.

On the basis of previous research and the area's geography, Silcox predicted that rock shelters (containing art and/or deposit) and axe grinding grooves were the most likely site types to occur in the region. As a result of survey, 59 new sites were recorded, including 40 axe grinding groove sites, 18 shelter sites and one boulder with art. Of the axe grinding sites, 50% were found on creek beds of major tributaries on valley floors, 32.5% on top of or on the side of ridge tops, 12.5% on the plateau surface, and 5% were found on the sloping sides of plateaus. The number of grooves in each site ranged from two to 131.

Of the shelters recorded, 72% were found along the ridge sides and ridge tops/cliff lines, 17% were found on the plateau surface, 5.5% were found on the side of the plateau, and 5.5% were found on the lower side of a valley. A total of 16 shelters (89%) contained Aboriginal art, including animal and human motifs, as well as hand stencils. Six shelters (33%) contained archaeological deposit consisting of stone artefacts, including mudstone, chert, quartz, silcrete and volcanic artefacts. Two isolated shells of the *Anadara trapezia* (Sydney cockle) species were also found. In addition, three shelters (17%) contained axe grinding grooves, recorded separately from the 40 axe grinding groove sites already mentioned. The boulder with art (a human motif) was found on the side of a ridge.

As predicted, shelters and axe grinding grooves were the most common sites found. Site density was calculated at 11 sites per km^2, higher than originally predicted at six sites per km^2.

Nexus (1998) Green Waste Processing Facility, Hue Hue Rd, Warnervale

Nexus Environmental Planning undertook an archaeological survey at the proposed Green Waste Processing Facility on Hue Hue Road, Warnervale, adjacent to the Buttonderry Site, as part of an Environmental Impact Statement in preparation for a development application.

The site had previously been used as a waste disposal area and therefore it had already been highly disturbed and striped of vegetation due to previous land use. Further, the new facility was to be built on landfill. No items of archaeological or heritage significance were found on the site.

It was also concluded that any items that may have previously existed were probably removed during the previous stage of site development.

Heritage Concepts (2005) Gas Turbine Facility Munmorah Power Station

In 2005, three isolated artefacts and two artefact scatters were recorded as a result of a survey for a proposed Gas Turbine Facility associated with Munmorah Power Station located 25km northeast of the Project Boundary (Heritage Concepts 2005). Part of this survey traversed close to the Tooheys Road Site (the mine Infrastructure Boundary to the east of the Subsidence Impact Area: OzArk 2009), particularly in the north where the Munmorah Power Station survey ran down the TransGrid easement. Of the three isolated finds recorded, two are located along the TransGrid easement within the Tooheys Road Site but are outside the direct impact corridor surveyed for the rail loop as part of the Project surface infrastructure study (OzArk 2009). Underneath TransGrid pylon 21TL16, the pylon closest to Spring Creek on its western bank, isolated artefact (IA2) was recorded. It consisted of a large flake of mudstone. The ground surface in this area also has been heavily disturbed from vehicle (mostly motocross) traffic.

The other isolated artefact (IA3), a single flake of indurated mudstone found sitting on the hard, eroded track surface, was located in a section of the TransGrid easement adjacent to the Tooheys Road Site.

4.3 LOCAL ARCHAEOLOGICAL CONTEXT

In 2001, Environmental Resources Management Australia Pty Ltd (ERM) was commissioned to prepare a methodology for the full assessment of the 'western area' (Wyong State Forest) and the then current mine plan (which has been significantly modified since that time). No field work was undertaken for the 2001 study, which was purely a desktop review.

An AHIMS search over a 540km^2 area was undertaken by ERM in 2001, including the current Subsidence Impact Limit.

This search returned 80 Aboriginal sites. Most of the sites recorded in the ERM search area are axe grinding grooves (30%) and shelters (27%). Open sites account for 25% of sites, while isolated finds are also quite well represented at 18% of sites. The majority of sites have been recorded in the context of archaeological assessments for development applications, several of which were discussed previously under the Regional Archaeological Context (**Section 4.2**). This is undoubtedly the key reason why many of the recorded sites occur in concentrations.

It is also worth noting that all known sites within the search area are above the 100 year flood line (i.e. outside the floodplains of the Yarramalong and Dooralong Valleys) where agricultural land practices have transformed the landscape. 60% of recorded sites are located on the Terrigal Formation geological unit / Watagan soil landscape, which comprises the steep hills

and outcropping sandstone that characterises much of Subsidence Impact Limit. Sites recorded in this unit/landscape include an even representation of shelters, axe grinding grooves, open sites and isolated finds. About 23% of recorded sites are on Patonga Claystone geology and the associated Mandalong soil landscape that occurs between the Terrigal Formation and the alluvials of the valley floor. Sites in this group are predominantly axe grinding grooves followed by shelters, with no artefact scatter sites being recorded.

In conjunction with this, a preliminary Aboriginal cultural heritage assessment of the proposed coal mine surface Infrastructure Boundary at the Bushells Ridge site (Infrastructure Boundary: Tooheys Road Site) was carried out by ERM (2001a) on behalf of Coal Operations Australia Limited for the WACJV. The assessment was undertaken to establish the likely possibilities and constraints to the development of the site in terms of Aboriginal archaeological potential.

This assessment comprised an initial desktop study that was undertaken to review the existing environmental and archaeological landscapes in and around the study area. From this review a predictive archaeological model for likely site types and their distribution across the landscape was developed.

The predictive model was then used to design a two-staged survey that targeted sampled within the main geological and topographic zones considered as having archaeological sensitivity and value. The result of this survey was that no visible evidence of Aboriginal cultural material was recorded. Consequently, an adaptive management approach was adopted whereby other environmental indicators were used to identify areas of archaeological potential. The landforms with greatest archaeological potential were identified at two places along the Wallarah Creek system.

4.3.1 AHIMS Database

A search of the OEH AHIMS[4] including the Project Boundary revealed six previously recorded Aboriginal sites within the Subsidence Impact Limit (**Table 6**). Three of these sites (WC-OS1, WC-IF1 and WC-ST1) were recorded as part of this assessment and are detailed in **Section 5.4**.

Figure 9 maps the recorded sites located in the then Wyong State Forest (now Jilliby SCA) portion of the Subsidence Impact Limit and those located in the Other WACJV owned land. These sites are discussed more fully in **Section 5.5**.

The three axe grinding groove sites in the Jilliby SCA are located along the base of the deeply incised Myrtle Creek, which is a tributary into Little Jilliby Jilliby Creek. These sites were

[4] Search date: 24.04.2012.

recorded by State Forests during a site recording exercise. Site #45-3-3040 is comprised of 14 grooves in three groups within a 15m to 20m area. The first group with two grooves, the second with nine grooves and the third with three grooves, all measuring between 16cm and 43cm in length, 5cm to 17cm wide and 1cm to 4cm deep. This groove area is located 10m west of the confluence of a minor tributary with Myrtle Creek.

Site #45-3-3041 is comprised of 30 grooves in two groups on a flat rock surface. The first group with 22 grooves, the second with eight grooves, all measuring between 11cm and 47cm in length, 3cm to 34cm wide and 0.5cm to 6cm deep. The variation in dimensions and shape indicates that the sharpening of different tools was taking place here and also possibly the preparation/grinding of particular foodstuffs, for example in a ground area measuring 42cm x 34cm x 3cm.

Site #45-3-3042 is comprised of five grooves in one group on a small rock surface 250m south east of site #45-3-3041.

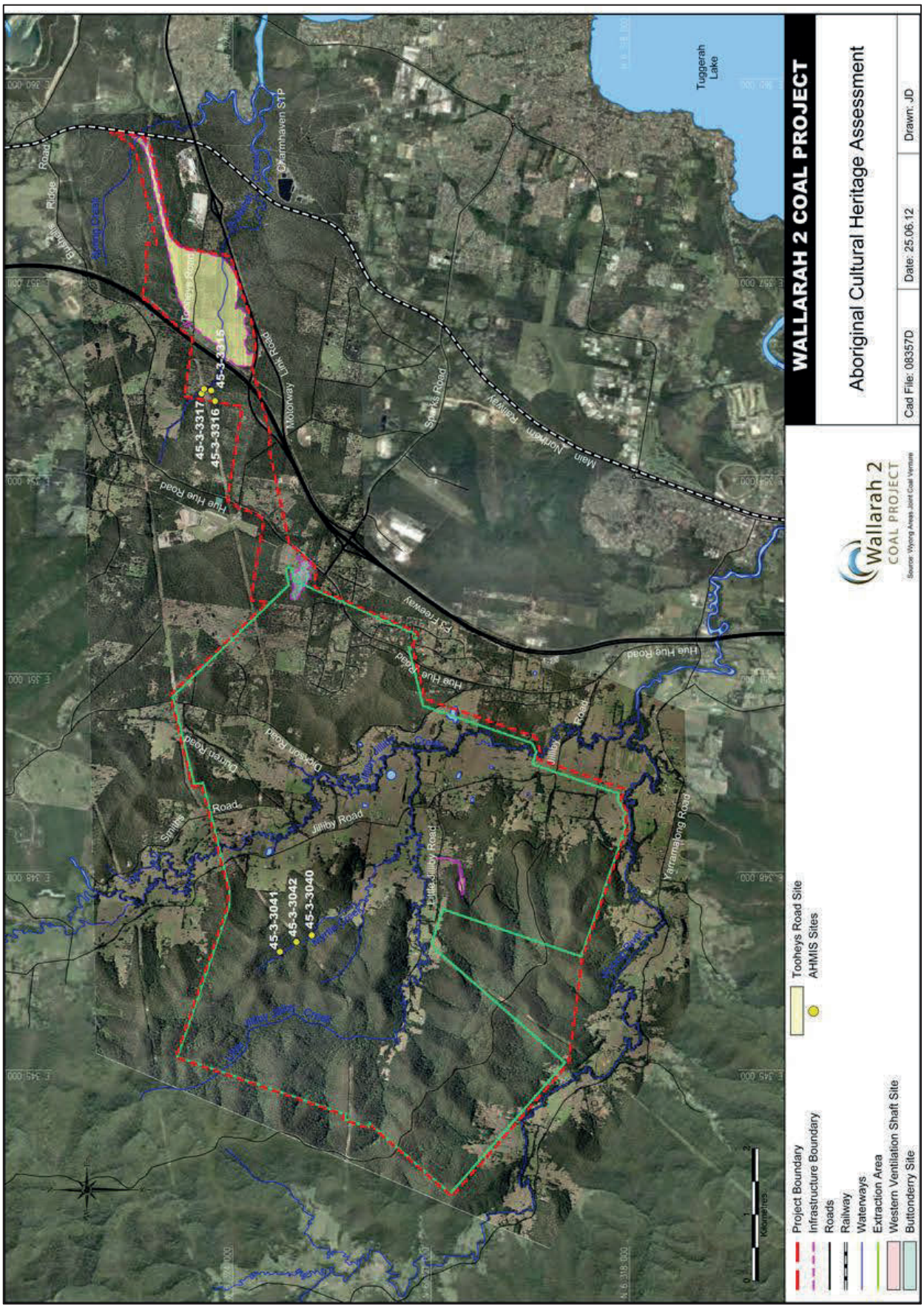
Plotting of these sites in terms of surface geology indicates that all three sites are located on boundary of the Terrigal Formation and the Patonga Claystones (refer to **Figure 8**).

It is noteworthy that axe grinding grooves are once again the predominant site type (as was the case within the broader search by ERM [2001a: see above]). The lack of modified (scarred) trees in the vicinity is undoubtedly reflective of the long and almost-complete logging throughout the Project Boundary.

Table 6: Previously recorded sites within the Project Boundary.

Site ID	Site Name	Easting Northing (GDA Zone 56)	Site Types	Recording
45-3-3040	Myrtle Creek/Maculata Road #3; Wyong State Forest	347040; 6322804	Axe grinding groove	Donovan, Welsh
45-3-3041	Myrtle Creek/Maculata Road #1;Wyong State Forest	346790; 6323285	Axe grinding groove	Donovan, Welsh
45-3-3042	Myrtle Creek/Maculata Road #2; Wyong State Forest	346940; 6323035	Axe grinding groove	Donovan, Welsh
45-3-3317	WC-OS1	355816–356256; 6324009–6324218	Open site	OzArk
45-3-3316	WC-IF1	355124; 6324266	Isolated find	OzArk
45-3-3315	WC-ST1	355284; 6324324	Culturally modified tree	OzArk

Figure 9: Aerial photograph showing the location of the previously recorded axe grinding sites along Myrtle Creek.



4.4 PREDICTIVE MODEL FOR SITE LOCATION

Proximity to a permanent water supply is the primary factor appearing to determine the location of Aboriginal campsites. In the Sydney region, stream ordering has been used to predict the potential for site occurrence, and further to indicate the possible nature of these sites in terms of their complexity. Results of an integrated series of studies including a serious excavation component suggest a high correlation between the permanence of a water source and the permanence and / or complexity of the areas' Aboriginal occupation. This was further reflected in the lithic assemblages from sites close to permanent water, which suggested that a greater range of activities was represented (e.g. tool use, manufacture and maintenance, food processing and quarrying). Sites near ephemeral water sources had evidence for one-off occupation (e.g. isolated knapping floors or tool discard), and creek junctions were also proven to be foci for site activity.

The size of the Project Boundary is such that a variety of landform features are present. These can be classified into two main groups:

- predominantly cleared valley floors / toe slopes on alluvial / colluvial deposits; and
- steep sided forested ridges to the west (e.g. Wyong State Forest/Jilliby SCA).

The majority of the valley floors have been cleared and used intensively for agriculture while the hills have been extensively logged. These land use impacts, as discussed in greater detail in previous chapters, have undoubtedly had a significant impact on Aboriginal site preservation and hence on the type of sites and their distribution that can be predicted within the Project Boundary.

The following summarises the landforms of each area and their potential:

4.4.1 Infrastructure Boundary

Regarding the landforms of the Infrastructure Boundary it could be summarised that:

- There are few areas of substantial rock outcropping;
- That there are two drainage lines providing potentially permanent water: Wallarah and Spring Creeks;
- The majority of the land is over 200m away from permanent water; and
- The majority of the land is flat to gently sloping.

An Aboriginal Resources Planning Study for the Wyong Shire Council by Dallas *et al* (1987) attempted to develop predictive models of Aboriginal settlement but was limited by a lack of data. Most of the sites recorded were rock shelters and art sites, which were located in the sandstone outcrops west of the Project Boundary and shell middens along the coast. These

would be the most obvious and easily detected sites. Sites were rare in alluvial deposits in landscape contexts similar to those located within the Project Boundary. This was thought to reflect the level of development and disturbance of these areas, lack of visibility and lack of archaeological survey work. Their predictive model is heavily influenced by Vinnecombe's earlier work in the region and is based on dividing the region into ecological zones (coastal, riverine, escarpment etc.) and modelling Aboriginal settlement for each of these zones. As was seen from Vinnecombe's survey (**Section 4.2**) sites are more numerous near the coast and near permanent waterways and swamps.

On the basis of the geology, topography, soils and previous archaeological research in the region, the Infrastructure Boundary has moderate archaeological potential.

In terms of rock shelters, there appears to be low potential of finding such sites in the Infrastructure Boundary as substantial sandstone outcropping is not present.

Open sandstone art sites and axe grinding grooves may also be evident in any landscape where rock outcropping is present. As the Infrastructure Boundary contains little sandstone outcropping, the potential for recording such site types would also be low.

Open artefact scatters and / or isolated finds are likely to exist on ridge tops and associated high slopes (approximately 10m down slope from the ridge top/ slope break), as well as on low gentle slopes and terraces surrounding creek lines. On the basis of topography, the potential of recording artefact scatters would be moderate across the Infrastructure Boundary. However, as much of the Infrastructure Boundary is prone to erosion and soil movement, there is also the possibility that scatters have been locally redistributed or buried and may be therefore not as evident in the landscape. Furthermore, freshwater middens, which commonly occur along creek lines, may be equally affected by both flooding, erosion and soil movement.

The possibility of recording scarred trees within the Infrastructure Boundary is low as most mature timber has been logged at some time in the past. It should also be noticed that there are very few scarred trees recorded in the general vicinity of the Project Boundary, probably for the same reason.

4.4.2 Subsidence Impact Limit

Hilly landforms (ridge caps) of Terrigal Formation sandstones and mid-hill slopes of the Patonga Claystones (**Figure 8**):

- A significant portion of the outcropping geology in the west of the Subsidence Impact Limit is comprised of these formations.
- Headwaters for many tributaries into Wyong River, Jilliby Jilliby Creek and Little Jilliby Jilliby Creek originate in Terrigal Formation landforms.

- The results of previous research indicate that Hawkesbury Sandstone formations are favoured over Narrabeen Group sandstones (including Terrigal Formation) in terms of rock shelter site location. However, as no Hawkesbury Sandstone is present within the Subsidence Impact Limit, a greater emphasis is likely to have been placed on the available shelters of the Terrigal Formation and the Patonga Claystone.

- Research as presented in **Section 4.3** covering an area greater than the Subsidence Impact Limit yet including it, shows that sites are most common (60%) in the Terrigal Formation / Watagan soil landscapes and that sites in these areas may be axe grinding grooves, artefacts sites or shelters. Sites recorded on Patonga Claystone comprise 23% of the total and only include shelters or axe grinding groove sites. This pattern is thought to reflect the fact that the Patonga Claystone tend to outcrop mid hill slope while the Terrigal Formation comprises ridge caps as well.

- Of previously recorded sites within the Subsidence Impact Limit, 33.3% are located on Patonga Claystone—one axe-grinding groove site (in a sandstone unit) —while 66.6% are situated on the Terrigal Formation, comprising two axe grinding groove sites. This combination of site type and geological formation is expected to be repeated in the Subsidence Impact Limit. If results were extrapolated from the broader region, one may expect to find more such sites in the Terrigal Formation than the Patonga Claystone in the Subsidence Impact Limit.

- It must be kept in mind that the results from previous assessment within the Subsidence Impact Limit are not the result of methodological survey but more the result of incidental recordings. Consequently, site distribution within this area can only be interpreted as a snapshot, not as the results of a meaningful test of surface geology in relation to site location.

Using this data, the following conjectures may be made about Aboriginal sites in the hilly Terrigal Formation and Patonga Claystone that characterise the western portion of the Subsidence Impact Limit:

- Further Aboriginal sites are to be expected this area;

- Site types are most likely to be rock shelter sites or axe grinding grooves. Shelters may have deposits including midden material, but art sites have not been previously recorded in this area, although this does not discount limited potential for their presence;

- There is some evidence that sites will be more frequent on ridges between major catchments than on ridges within major catchments, although the distinction of major versus minor is somewhat arbitrary. Nevertheless, within the relation to the Subsidence Impact Limit, all the ridges are within a major catchment and not between and hence if this model were adopted we may expect less sites per km^2 than further afield on major catchment dividing ridges;

- Some artefact sites (open sites or isolated finds) may be located at the foot of slopes where the Patonga Claystones are close to the valley alluvials or on ridge tops of the Terrigal Formation;

- Burial sites and ceremonial sites are considered unlikely as suitable landforms (sandy terraces) are absent from the Subsidence Impact Limit; and
- Modified (scarred) trees are considered extremely unlikely due to the intense clearing and logging the region has experienced.

Valley floor landforms (flood plains and alluvial terraces) of Quaternary alluvium; (**Figure 8**):

- Quaternary alluvium comprises the valley floors of the Yarramalong, Dooralong and Little Jilliby Jilliby Valleys (Honeysuckle Park is located on Jilliby Jilliby Creek);
- The waterways of the Wyong River, Jilliby Jilliby and Little Jilliby Jilliby Creeks are fourth order or higher and permanent waterways within this landform;
- The results of previous research over the broader region recorded only one site in this formation, and that was on the edge of the developed valley floor. None have been previously recorded within the Subsidence Impact Limit;
- As a result of both hydrological and natural erosion/sedimentation regimes coupled with intensive land use practices, intact Aboriginal sites are considered extremely unlikely in the valley floor landforms; and
- There may be small pockets of land remaining less disturbed than others, but the location of these is challenging to predict.

Using this data, the following predictions may be made about Aboriginal sites in the flat to gently sloping valley floor alluvial landforms within the Subsidence Impact Limit:

- Virtually no intact Aboriginal sites are to be expected in valley floor alluvial landforms due to natural and anthropomorphic impacts;
- If site material such as Aboriginal stone tools were found in these landforms it is likely they will be one-off, isolated items that are no longer *in situ*;
- There are no predictive tools for the location of such sites as isolated finds and nor is this type of evidence particularly meaningful on a scientific level.

4.4.3 Other WACJV owned land

The Hue Hue Road ecological offset investigation area can be characterised as lower land around Wallarah Creek with higher land away from the creeks, particularly in the west. Rock outcropping is low and the majority of the study area is flat to sloping land and ridge lines over 200m from permanent water. This area has been cleared at some point in the past and there are few trees of sufficient age to have been growing when the area was occupied or used by Aboriginal peoples.

5 RESULTS OF ABORIGINAL HERITAGE ASSESSMENT

5.1 SURVEY METHODOLOGY

5.1.1 2006 Survey: Infrastructure Boundary and other WACJV owned land

The area was divided into those areas where there will be direct impacts (Tooheys Road Site, Buttonderry Site and Western Ventilation Shaft) and those where there will be no impacts (other WACJV owned land).

- Infrastructure Boundary: The Infrastructure Boundary was traversed using pedestrian transects by three or more surveyors. The surveyors assessed all regions within the Infrastructure Boundary, as well as a buffer surrounding the impact zones. Thus, in the Infrastructure Boundary, the proposed development was the primary determiner of what land was surveyed.

- Other WACJV owned land: The Hue Hue Road ecological offset investigation area was traversed using pedestrian and vehicle transects by a survey team. The surveyors assessed all regions within the area where proximity to water and/or suitable landform appeared to suggest that heritage items might be retained. Thus, in this area, the surveyor's interpretation of the area's landforms was the primary determiner of what land was surveyed.

- Subsidence Impact Limit: A reconnaissance survey of the Wyong State Forrest/Jilliby SCA was also undertaken at this time but this survey was limited in its scope.

5.1.2 2010 Survey: Subsidence Impact Limit

Due to access issues, particularly as the survey team did not have access to private property within the Subsidence Impact Limit, only land within the Wyong State Forest/Jilliby SCA was assessed. The State Forest comprises a large portion of the western portion of the Subsidence Impact Limit and primarily comprises of hills, ridges and steep-sided valleys (**Figure 2**).

Access was therefore at the core of the survey methodology, as survey of the Subsidence Impact Limit required a degree of difficulty from the perspective of terrain, vegetation and poorly maintained fire trails. Additionally, for health and safety reasons alone, the survey could not hope to cover all areas within the Subsidence Impact Limit and a sampling plan had to be devised.

This methodology first identified areas of archaeological potential within the Subsidence Impact Limit. These were identified as being the 2nd order waterways and the ridge lines. These two landform features were targeted for the following reasons:

- The only previously recorded sites in the Subsidence Impact Limit are axe grinding grooves along a 2nd order waterway (Myrtle Creek);

- Sites such as axe grinding grooves and shelter sites are likely to be more significantly impacted should subsidence occur than other sites such as open sites or isolated finds. These 'at-risk' sites would be located in creek lines where suitable sandstone exists;
- Ridge lines are known to contain sites in the region and were often used as pathways for people moving through the country. Additionally, it is along the ridge lines where suitable shelters for occupation may be located; and
- Other landforms in the Subsidence Impact Limit were steep slopes – often with a slope of up to 50 degrees. These slopes are unlikely to contain, or retain, items of cultural heritage and were therefore not directly targeted (although enough were assessed as the survey team made their way to a particular creek).

A survey methodology was therefore devised to sample the most prominent 2nd order waterways and ridgelines where suitable rock exposure could exist to contain axe grinding or shelter sites.

In summary the following generally 2nd order waterways (as shown in **Figure 4**) were targeted for survey:

- Calmans Gully;
- Myrtle Creek;
- Little Jilliby Jilliby Creek;
- Armstrongs Creek; and
- Unnamed waterway to the east of Smithys Road West.

Other waterways in the Subsidence Impact Limit were either inaccessible, or were first order streams with a steep gradient that lacked the sandstone shelving necessary for axe grinding sites.

The key ridgelines relevant to this Aboriginal heritage assessment within the Subsidence Impact Limit were (as shown in **Figure 4**):

- Whitemans Ridge;
- Little Jilliby Ridge;
- Harris Point; and
- Additional ridgelines able to be accessed by vehicle (such as that followed by Watagan Forest Road).

It was decided to bias the investigation of ridgelines within the Subsidence Impact Limit to favour the ridges to the east of Little Jilliby Jilliby Creek as these displayed features that were likely to contain shelters should they exist.

Some areas of the lower flat portion of the Subsidence Impact Limit are owned by the WACJV (Honeysuckle Park; **Figure 4**) and consist of cleared paddocks; there were no access issues to constrain full pedestrian survey of the property. The methodology for this area was therefore to assess as much of the property as conditions (ground surface visibility most importantly) allowed.

5.1.3 2011 Survey: Subsidence Impact Limit

The second survey of the Subsidence Impact Limit in 2011 followed a targeted survey methodology similar to the 2010 survey methodology presented in **Section 5.1.2.** The 2010 survey focused on the drainage lines and ridges to the east of Little Jilliby Jilliby Creek. In 2011 the methodology was to more thoroughly examine the ridges and spurs to the west of Little Jilliby Jilliby Creek as well as perform a more systematic survey of Myrtle Creek where axe grinding groves were known to exist.

This methodology therefore focused on the following ridgelines: Spotted Gum Ridge, Woodwards Ridge, Pole Ridge, Big Pole Ridge, Daniels Ridge, Calmans Ridge, Coutts Ridge, Goldsmiths Ridge, Whitemans Ridge and Little Jilliby Ridge (**Figure 4**).

The following 2nd order waterways were targeted for survey: Myrtle Creek and Little Jilliby Jilliby Creek (**Figure 4**).

5.2 SURVEY COVERAGE

Two of the key factors influencing the effectiveness of archaeological survey are ground surface visibility (GSV) and exposure. These factors are quantified in order to ensure that the survey data provides adequate evidence for the evaluation of the archaeological materials across the landscape. For the purposes of the current study, these terms are used in accordance with the definitions provided in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales: Part 6 National Parks and Wildlife Act 1974* (DECCW 2010).

Ground surface visibility is defined as:

> *… the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. Things like vegetation, plant or lead litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals' (DECCW 2010: 39).*

Exposure is defined as:

> *… different to visibility because it estimates the area with a likelihood of revealing buried artefacts or deposits rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals' (DECCW 2010: 37).*

Overall, GSV was low, however all landforms displayed exposures that enabled the survey team to assess samples of the ground surface. The following sections provide a summary of the land forms and ground surface visibility of the areas surveyed as part of the current assessment.

5.2.1 Infrastructure Boundary

Tooheys Road Site

In general, the GSV in all areas was assessed as low (less than 8% of the ground surface was visible across the Tooheys Road Site). Although features such as farm tracks and areas of sheet erosion allowed good visibility in places, either grass cover or thick understorey vegetation prevented good visibility across the majority of the area (**Plate 3**).

Buttonderry Site

Figure 6 delineates the area surveyed portions of the Buttonderry Site and a buffer zone around this area was also surveyed. Overall, GSV was low at around 9% across the Buttonderry Site (**Plates 8–9**).

Western Ventilation Shaft

GSV at the Western Ventilation Shaft was only afforded by a single dirt track making the overall GSV less than 1% (**Plate 11**).

5.2.2 Subsidence Impact Limit

Wyong State Forest/Jilliby SCA

The Wyong State Forest/Jilliby SCA portion of the Subsidence Impact Limit was surveyed by OzArk in 2010 and 2011. Both surveys in the Wyong State Forest/Jilliby SCA focused on waterway and ridge landforms with some minimal survey of the steep hill slopes. The 2010 survey largely targeted the waterways, while the 2011 survey effort targeted ridgelines.

Figure 10 shows the combined survey effort from 2010 and 2011. These transects followed topographical features such as ridge lines or drainage lines rather than artificial transect lines due to the nature of the landforms.

In total, all of the major ridgelines in the Subsidence Impact Limit were assessed by pedestrian transects that inspected the ridge itself (often quite narrow in this area) and any associated escarpment areas adjoining the ridge where exposed rock shelving offered the possibility of shelter/art sites. As the majority of ridge lines in the Subsidence Impact Limit have a fire trail along the crest, access along the ridge was possible and a linear exposure (created by the fire trail) existed along all ridges.

Survey of the drainage lines was extensive in 2010 and more targeted in 2011. In 2010 the entire length of Little Jilliby Jilliby Creek was surveyed within the Subsidence Impact Limit. This assessment included the headwaters that consisted of steeply incised valleys with the creek following a steep gradient and having the form of a series of rock pools interspaced by exposed boulders and rock shelving. The assessment also included the sections of Little Jilliby Jilliby Creek where the gradient is less and sediment covers any basal rock shelving. This section of the creek is very overgrown with vine thickets and other understorey species and access was very difficult. However, in the case of Little Jilliby Jilliby Creek, an old logging track had been built parallel to the creek and this was used to gain access for the assessment of this creek system. Assessment of the creek ceased when it exits the Subsidence Impact Limit and enters private property. At this stage Little Jilliby Jilliby Creek is used extensively for agriculture and is characterised as a low gradient stream within a cleared and somewhat modified landscape.

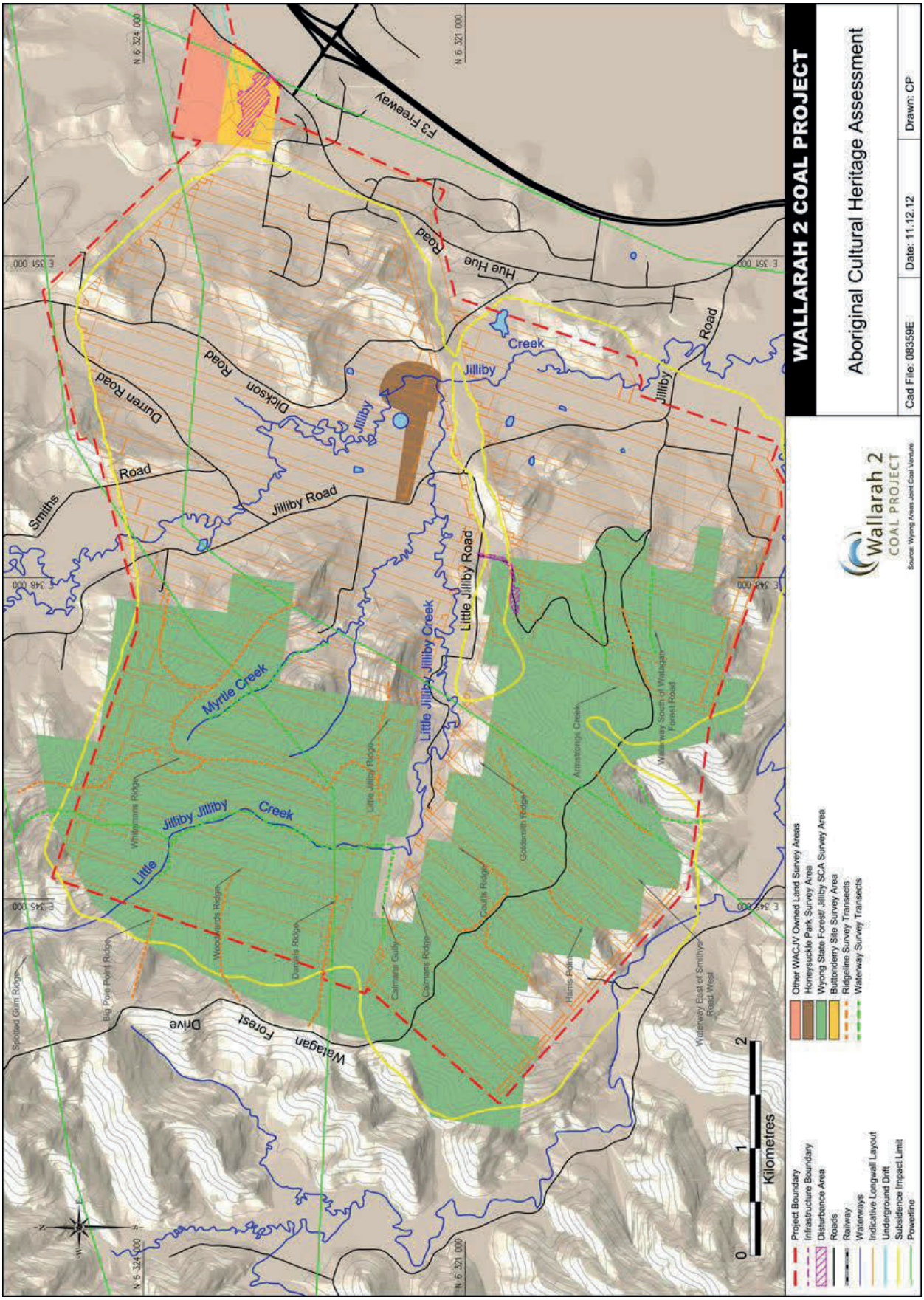
Other creek systems within the Subsidence Impact Limit, such as Calman's Gully were assessed, as were some other minor tributaries into Little Jilliby Jilliby Creek. A transect was also made from Big Pole Ridge down to Little Jilliby Jilliby Creek in 2011 to reinspect the northern extent of the creek system within the Subsidence Impact Limit.

Due to the previously recorded sites along it, Myrtle Creek was assessed in both 2010 and 2011 and the creek system within the Subsidence Impact Limit has been intensively inspected.

In addition to the ridge and drainage transects shown in Figure 10, several transects were made of the steep slopes between these two landforms. These transects were mostly made to access drainage lines and were uniformly very steep and largely devoid of rock shelving capable of containing shelter/art sites. At many locations when an inspection of a drainage line noted rock shelving further upslope, a detour was made and the shelving inspected for sites.

Overall, GSV across the Wyong State Forest/Jilliby SCA located within the Subsidence Impact Limit was low with leaf litter and vegetation obscuring most of the ground surface (**Plate 1**). Across the Wyong State Forest/Jilliby SCA the GSV was assessed at less than 5%.

Figure 10. Subsidence Impact Limit: survey transects.



Results for each unit assessed in the 2011 survey are indicated in **Table 7**. As can be seen, effective survey coverage was very low across the Wyong State Forest/Jilliby SCA as a combination of low GSV and lack of exposures provided little opportunity for inspection of the ground surface. **Plate 18** demonstrates typical GSV encountered during the 2011 survey. In reality, however, the survey was concentrating on locating shelter sites, axe grinding grooves and other more tangible manifestations that are not reliant on GSV (**Plate 19**). **Table 8** shows that large areas of the ridge lines were accessed during the survey of the Wyong State Forest/Jilliby SCA, followed by drainage lines with the lest surveyed landform unit being the steep slopes of the region.

Table 7: Subsidence Impact Limit; Wyong State Forest/Jilliby SCA: survey coverage.

Survey Unit	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
SG	Ridge	52,500	5%	5%	131.25	0.25%
WWP	Ridge	108,000	5%	5%	270	0.25%
DPR	Ridge	88,000	10%	10%	880	1%
DPS	Slope	29,000	5%	5%	72.5	0.25%
DPD	Drainage	10,000	5%	5%	25	0.25%
CPR	Ridge	25,000	5%	5%	62.5	0.25%
CTPR	Ridge	56,500	5%	5%	141.25	0.25%
GPR	Ridge	70,000	5%	5%	175	0.25%
GPS	Slope	20,000	5%	10%	100	0.5%
LJR	Ridge	72,500	10%	10%	725	1%
LJS	Slope	24,000	5%	10%	120	0.5%
LJD	Drainage	16,000	5%	5%	40	0.25%
BPS	Slope	35,000	1%	1%	3.5	0.01%
BPD	Drainage	23,000	5%	1%	11.5	0.05%
MCD	Drainage	99,000	5%	10%	495	0.5%
WR	Ridge	57,000	10%	10%	570	1%

Table 8: Subsidence Impact Limit; Wyong State Forest/Jilliby SCA: Landform summary.

Landform	Landform area (sq m)	Area Effectively Surveyed (sq m) (= Effective Coverage Area)	% of Landform Effectively Surveyed (= Area Effectively Surveyed / Landform x 100)	Number of Sites Recorded	Number of Extant AHIMS Sites	Number of Artefacts or Features
Ridge	529,500	2,955	0.56%	0	0	0
Slope	108,000	296	0.27%	0	0	0
Drainage	148,000	571.5	0.39%	4	3	7

5.3 ABORIGINAL SITES RECORDED

A total of eight Aboriginal sites have been recorded across the Project Boundary as a result of the four investigation campaigns conducted by OzArk (2006, 2010, 2010 test excavation, 2011).

They are:

Open sites (artefact scatters): Wallarah Creek OS-1 (WC-OS1; AHIMS 45-3-3317); Wallarah Creek OS-2 (WC-OS2).

Isolated Find (isolated artefact): Wallarah Creek IF-1 (WC-IF1; AHIMS 45-3-3316).

Culturally modified tree (scarred tree): Wallarah Creek ST-1 (WC-ST1; AHIMS 45-3-3315).

Axe grinding grooves: Wyong State Forest AG-1 (WSF-AG1); Wyong State Forest AG-2 (WSF-AG2); Wyong State Forest AG-3 (WSF-AG3) and Wyong State Forest AG-4 (WSF-AG4). (Wyong State Forest is now Jilliby SCA)

Table 9 provides information concerning the location of these sites and further details concerning these recorded sites follow.

Table 9: Project Boundary and closely adjacent areas: Aboriginal sites recorded.

Site Designation	Site Type	GDA Zone 56 Easting	GDA Zone 56 Northing
WC-OS1 AHIMS # 45-3-3317	Open site	355307–355237	6324431–6324471
WC-OS2	Open site	355816–356256	6324009–6324218
WC-IF1 AHIMS # 45-3-3316	Isolated find	355124	6324266
WC-ST1 AHIMS # 45-3-3315	Culturally modified tree	355284	6324324
WSF-AG1	Axe grinding groove site	345580	6325095
WSF-AG2	Axe grinding groove site	345649	6325056
WSF-AG3	Axe grinding groove site	345744	6324833
WSF-AG4	Axe grinding groove site	345784	6318982

5.3.1 Infrastructure Boundary

Tooheys Road Site

2006 Survey

The initial 2006 survey did not record any Aboriginal sites or objects within the Tooheys Road Site.

Although no Aboriginal sites were recorded, it was assessed that two areas located along the banks of Wallarah and Spring Creeks within the Tooheys Road Site had archaeologically sensitive landforms (**Figure 11**). This determination was made on the observed relationship throughout the region between Aboriginal sites, particularly open sites, and the presence of permanent water. As GSV was limited in areas along the banks of the creeks, a determination of these areas as 'archaeologically sensitive' was a precautionary designation that implies that there is a low-moderate probability of artefacts or intact subsurface archaeological deposits being present. The designation also confirms a similar designation of Wallarah Creek following the ERM 2001 survey.

The southern archaeologically sensitive area is 75m north and south from the centre line of Wallarah Creek. This area stretches along the whole length of Wallarah Creek within the Disturbance Boundary within the Tooheys Road Site. This area is approximately 1.4km long (east–west) with a total area of around 21ha.

The northern archaeologically sensitive area extends for 50m along both banks of Spring Creek near the Main Northern Railway. This area of archaeological sensitivity is approximately 200m long (northwest–southeast) with a total area of around 2ha.

2010 Archaeological test excavation at site WC-OS2

As a result of the 2006 survey the original ERM 2001a recommendation that the banks of Wallarah Creek be zoned as archaeologically sensitive was confirmed (**Plate 20**). Although there were exposures along the banks of Wallarah Creek at the time of the 2006 survey, in many areas, the ground surface was obscured by grass cover. Due to the generally low GSV and in order to better understand the nature and integrity of archaeological deposits along Wallarah Creek, an archaeological test excavation program was undertaken during 2010 (OzArk 2010b).

In total, 60 test pits measuring 1m x 1m were excavated; predominantly on the southern bank of the creek, but also on the northern bank and at the location where the proposed rail loop crosses the creek (**Figure 11**).

A very low frequency of artefacts was recorded with no pit displaying evidence of an intact site, not even one of low complexity. While evidence of lithic manufacture was present, its distribution was not concentrated and suggests random tool re-sharpening and isolated events rather than an occupational camp. In total, the excavation programme recovered 14 artefacts from the 60 test pits excavated (**Plates 21–22**). While no pit contained multiple artefacts, the area containing these 14 artefacts is being treated as a single site designated WC-OS2 (**Table** 10).

Table 10: Infrastructure Boundary: Aboriginal sites recorded.

Site Designation	Site Type	GDA Zone 56 Easting	GDA Zone 56 Northing
WC-OS2	Open site	355816–356256	6324009–6324218

Buttonderry Site

No Aboriginal sites were located within the Infrastructure Boundary that will be disturbed at the Buttonderry Site. It is possible that factors of visibility influenced this outcome, however, the sloping nature of the landform, and the ongoing agricultural disturbance to the flatter lands closer to Buttonderry Creek, combine to make the presence of *in situ* Aboriginal sites unlikely. These factors will be discussed in greater detail in **Section 5.7**.

No specific zones of archaeological sensitivity were delineated within the Buttonderry Site.

Western Ventilation Shaft

No Aboriginal sites were recorded within the Disturbance Boundary at the Western Ventilation Shaft. The Western Ventilation Shaft is a small study area, has been fairly extensively disturbed in the past and provided limited GSV. However, the landform occupied by the Western Ventilation Shaft was assessed to have a low probability of containing further, undetected Aboriginal sites or objects.

5.3.2 Subsidence Impact Limit

Four Aboriginal axe grinding groove sites were recorded within Wyong State Forest/Jilliby SCA as part of the OzArk 2010 heritage assessment of the Subsidence Impact Limit. Three are clustered together on the one watercourse in the very north of the Subsidence Impact Limit (WSF-AG1–3), while WSF-AG4 is located in the southwest of the Subsidence Impact Limit (**Plates 23–26**).

Table 11 records the location of these sites, while descriptions of the sites follow. **Figure 13** shows the location of these sites.

Table 11: Within and Adjacent to Subsidence Impact Limit: Aboriginal sites recorded.

Site Designation	Site Type	GDA Zone 56 Easting	GDA Zone 56 Northing
WSF-AG1	Axe grinding groove site	345580	6325095
WSF-AG2	Axe grinding groove site	345649	6325056
WSF-AG3	Axe grinding groove site	345744	6324833
WSF-AG4	Axe grinding groove site	345784	6318982

5.3.3 Other WACJV owned land

Three Aboriginal sites, an open artefact scatter (WC-OS1; AHIMS 45-3-3317; **Plates 27–28**), an isolated find (WC-IF1; AHIMS 45-3-3316; **Plate 29**) and a scarred tree (WC-ST1; AHIMS 45-3-3315; **Plate 30**) were recorded along Wallarah Creek or its tributaries in the offset investigation area. The locations of these sites are shown in **Table 12** and **Figure 13** and details are presented below.

Table 12: Other WACJV owned land: Aboriginal sites recorded.

Site Designation	Site Type	GDA Zone 56 Easting	GDA Zone 56 Northing
WC-OS1 AHIMS # 45-3-3317	Open site	355307–355237	6324431–6324471
WC-IF1 AHIMS # 45-3-3316	Isolated find	355124	6324266
WC-ST1 AHIMS # 45-3-3315	Culturally modified tree	355284	6324324

In keeping with the results of the assessment of the Tooheys Road Site, and based on the results of survey within the ecological offset investigation area, a zone of archaeological sensitivity has been be delineated along Wallarah Creek and its more major tributaries (see **Figure 11**).

This determination was made on the observed relationship throughout the region between Aboriginal sites, particularly open sites, and the presence of permanent water. As GSV was limited in areas along the banks of the creek, a determination of these areas as 'archaeologically sensitive' was a precautionary designation that implies that there is a low-moderate probability of artefacts or intact subsurface archaeological deposits being present. The designation also continues a similar designation of Wallarah Creek further east.

Figure 11: Test excavation pit layout at WC-OS2.

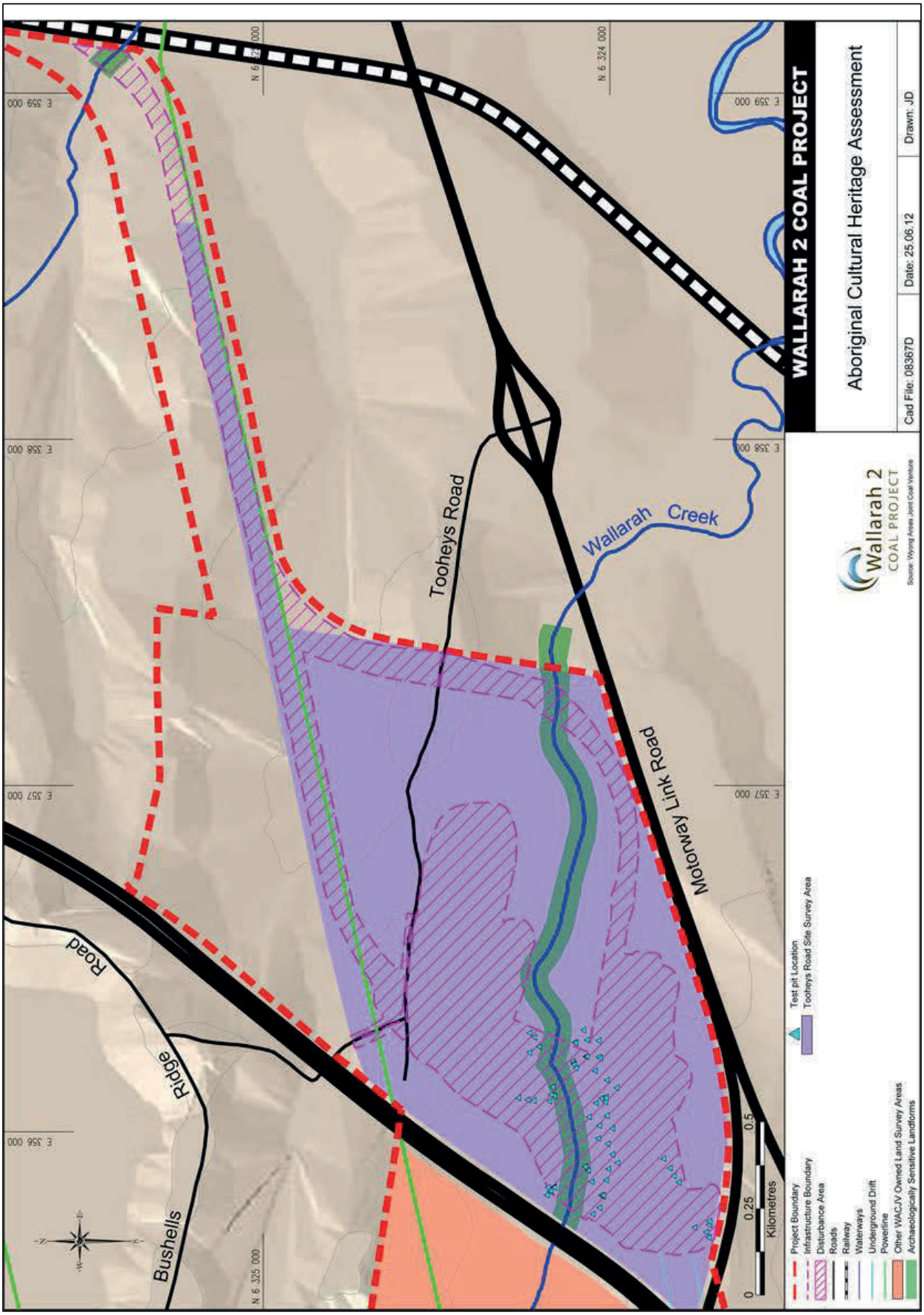


Figure 12: Subsidence Impact Limit and adjacent areas: location of recorded Aboriginal sites. AHIMS sites shown for comparison.

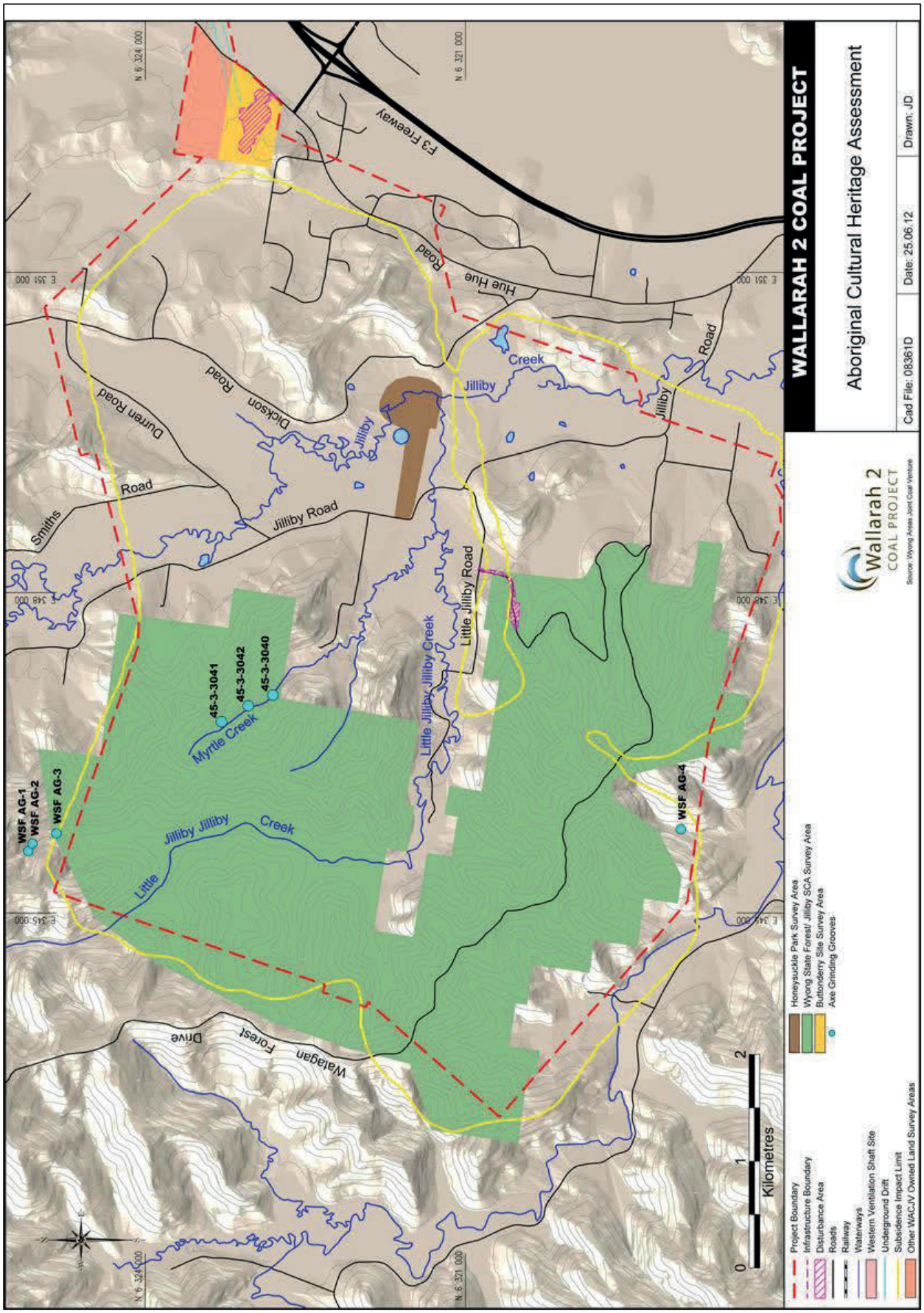
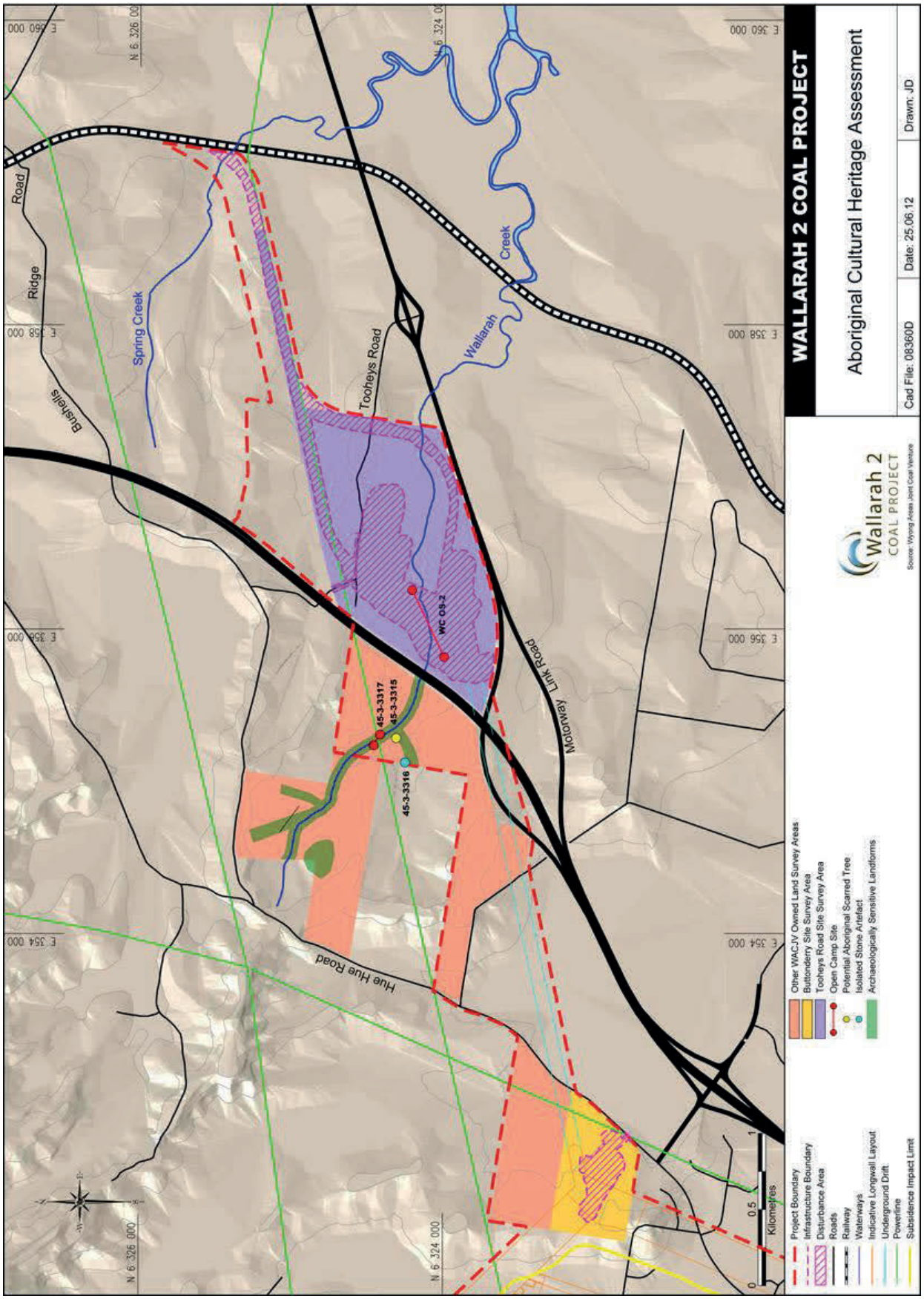


Figure 13: Other WACJV owned land: location of recorded Aboriginal sites. Tooheys Road Site WC-OS2 shown for comparison.



5.4 DETAILS OF ABORIGINAL SITES RECORDED

WC-OS1

Type of site: Open Site (artefact scatter). AHIMS # 45-3-3317.

Coordinates (GDA Zone 56): 355307–355237E; 6324431–6324471N

Location: Located on the banks of Wallarah Creek at an elevation of 20m AHD. The location of WC-OS1 is shown in **Figure 13**.

Report: OzArk 2009

Description: The open site is located within an alluvial landform, at the base of long, low gradient slopes stretching back from the drainage line (**Plate 27**). The confluence of a tributary into Wallarah Creek at this location is a common environmental setting for Aboriginal occupation during prehistory.

In general, GSV was low across the site and artefacts were recorded scattered across the area indicated by the coordinates above. In areas of better visibility, surface erosion was active potentially removing archaeological objects from the skeletal soils that characterise the lower slopes. The site is considered to extend (at a minimum) 150m along the western bank of Wallarah Creek. On the eastern bank the site extends (at minimum) beneath the electricity transmission line: although it is likely to extend further.

The artefacts were recorded in several exposures along a sandy vehicle track. The track is better established in the vicinity of the transmission line, allowing significantly better exposures in this location, coinciding with higher surface artefact visibility.

Artefacts included flakes and cores of a creamy, fine grained indurated mudstone/chert. Also present were artefacts manufactured from a fine-grained silcrete (**Table 13**, **Plate 28**).

It is considered that the nature of the landform, combined with low GSV, makes it likely that WC-OS1 extends beyond the locations at which surface manifestations were present. There is potential for sub-surface deposits in this area, although their condition may be questionable due to the effects of erosion.

Table 13: WC-OS1: details of artefacts recorded.

Artefact dimensions	Raw material	Comment
Exposure 1 - west side of creek.		
17 x 4.5 x 2.1mm	Cream (indurated mudstone/chert)	Complete flake, feather termination and 3 previous flake scars on dorsal surface.
7.9 x 3.5 x 1.7mm	Reddish green chert	Broken flake.
19.79 x 10.4 x 23mm	Cream (indurated mudstone/chert)	Core, bipolar.
Exposure 2 – east side of creek		

Artefact dimensions	Raw material	Comment
41 x 29.2 x 12.6mm	Yellow-red silcrete	Broken flake – transverse snap, distal portion missing. Evidence of core rotation and platform preparation (crushed).
16.8 x 12 x 2.7mm	Silcrete	Broken flake, proximal end missing, no cortex.
30.7 x 20.2 x 8.4mm	Cream (indurated mudstone/chert)	Broken flake, 2 previous flake scars on dorsal surface, small platform.
Southern exposure, west side of creek (adjacent to confluence)		
35.7 x 28.4 x 7mm	Cream siltstone	Flake (previous flake scars on dorsal surface).
8.2 x 4 x 0.2mm	As above	Broken flake.

WC-OS2

Type of site: Open Site (artefact scatter)

Coordinates (GDA Zone 56): 355816–356256E; 6324009–6324218N

Location: Located on the banks of Wallarah Creek at an elevation of 20m AHD.

Report: OzArk 2010b

Description: WC-OS2 was designated based on the findings of the 2010 test excavation programme within the Tooheys Road Site (**Figure 10**, **Figure 13**). The results of this programme revealed a very diffuse open site; almost better characterised as an area of isolated finds. There is no archaeological stratigraphy or other archaeological features present at WC-OS2.

In total, one tool was recorded, along with five un-retouched flakes and three broken, un-retouched flakes (**Table 14**). There was, however, evidence of lithic manufacture in the area with one core-trimming element and four flakes identified as debitage recorded (**Plates 21**–**22**).

A total of 14 artefacts (tool, flakes and debitage) were recorded across the site.

Table 14: WC-OS2: details of artefacts recorded at site.

Provenance	Artefact type	Raw Material	# Negative Flake scars	Cortex %	Dimensions
TS South 3; spit 2	Flake	Cream/Pink Quartzite	3	0	21.2 x 12.4 x 1.9
TS South 3; spit 3	Broken Flake	Cream Quartzite, fine-grained	?	0	13.6 x 5.9 x 1.4
TS South 3; spit 3	Flake	Cream Quartzite	0	0	4.7 x 3.9 x 1.4
TS South 14; spit 2	Broken Flake	Pale orange mudstone	2	0	28.5 x 15.4 x 8
TS South 19; spit 4	Broken Flake	Milk Quartz	2	0	15.6 x 14.5 x 6.3
TS South 18; spit 3	Chip	Milk Quartz	0	0	6.7 X 7.1 X 1.8
TS South 21; spit 3	Flake	Grey Quartzite, fine-grained	2	0	13 x 20 x 3.7
TS South 12; spit 3	Flake	Mudstone	0	0	6.7 x 4.6
TS South 20; spit 3	Retouched Flake	Light orange Quartzite	4	0	42.9 x 32.9 x 11.2
TS South 14C; spit 2	Broken Flake	Orange mudstone	3	0	10 x 4.4 x 1.3
TS South 3A; spit 3	Chip	Pinkish Quartz	0	0	8.3 x 3.5 x 0.8

Provenance	Artefact type	Raw Material	# Negative Flake scars	Cortex %	Dimensions
TS North 36; spit 2	Flake	Dark mudstone	2	12.5	14 x 10.1 x 3.6
TS North 48; spit 2	Flake	Dark orange mudstone	0	50	15 x 9.8 x 2.3
TS North 48; spit 2	Core-trimming Element	Orange mudstone	2	0	25.9 x 7.3 x 6.6

WC-IF1

Type of site: Isolated find (isolated artefact). AHIMS # 45-3-3316.

Coordinates (GDA Zone 56): 355124E; 6324266N

Location: Located on the northern bank of a tributary into Wallarah Creek (**Figure 13**).

Report: OzArk 2009

Description: The artefact was recorded on a dirt track that is actively eroding. Surrounding areas are unlikely to have been ploughed but may have been grazed and the area has been selectively cleared. Visibility was good on the track, but poor elsewhere (**Plate 29**).

WC-IF1 is located on the same tributary that provides evidence of occupation at its confluence with Wallarah Creek several hundred metres to the east (the southern portion of WC-OS1). Although this isolated find has been presented as a separate site from WC-OS1, it is considered to be part of the same site complex. It is likely that visibility and erosion have influenced the appearance of the archaeological record in this area.

The artefact comprising WC-IF1 is a cream flake of indurated mudstone (**Table 15**). Given its proximity to other sites and suitable landform, it is likely to have at some point been associated with other artefacts, and there is potential for sub-surface deposits in this area, although their condition may be questionable due to the effects of erosion.

Table 15: WC-IF1: Artefact details.

Artefact dimensions	Raw material	Comment
14.5 x 12.9 x 4.1	Cream (indurated mudstone)	Flake (complete) with hinge termination, percussion point present.

WC-ST1

Type of site: Culturally modified tree (scarred tree). AHIMS # 45-3-3315.

GPS Coordinates (GDA Zone 56): 355284E; 6324324N

Location: Located on the southern bank of a tributary flowing into Wallarah Creek and within 50m of this confluence, at an elevation of AHD 25m (**Figure 13**). The tree is situated on a sandy creek bank landform on Lot 31 DP 258692.

Report: OzArk 2009

Description: This scarred tree is a Blackbutt (*E. pilularis*). The scarred tree is alive; 25m in height and 2.73m in circumference. The elongated, south-southeast facing scar has dimensions of 104cm x 13cm, with a depth of 15cm. The original dimensions, based on regrowth, may have been around 132cm x 43cm (**Plate 30**).

The scar on this tree is assessed as being of **possible** Aboriginal cultural origin, but it must be noted that the tree is adjacent to a vehicle track and could be the result of damage from a vehicle, or from previous natural processes that have affected the tree. Morphological characteristics of the scar, however, such as its alignment with the trunk, its elongate nature and more specifically the tapered appearance of both ends, lend themselves to an interpretation of the scar as anthropomorphic in origin. Further support for this contention comes from the presence of artefacts in direct association with the scarred tree (WC-OS1) as there is positive evidence for the Aboriginal use of the area in prehistory.

WSF-AG1

Type of site: Axe grinding groove site

GPS Coordinates (GDA Zone 56): 345580E; 6325095N

Location: Located on the creek bed of an unnamed tributary to Little Jilliby Jilliby Creek that runs east and parallel to the main branch of the creek near its headwaters. The location of WSF-AG1 is shown in **Figure 12**.

Report: OzArk 2010a

Description: WSF-AG1 is a cluster of five axe grinding grooves. They are located next to a natural rock pool on a slab of bedded sandstone at the confluence of a minor waterway into the larger tributary (**Plate 23**). The axe grooves range in size between 20–30cm and are about 7cm deep on average.

WSF-AG2

Type of site: Axe grinding groove site

GPS Coordinates (GDA Zone 56): 345649E; 6325056N

Location: Located on the creek bed of an unnamed tributary to Little Jilliby Jilliby Creek that runs east and parallel to the main branch of the creek near its headwaters. WSF-AG2 is about 50 m south of WSF-AG1 on the same creek. The location of WSF-AG2 is shown in **Figure 12**.

Report: OzArk 2010a

Description: WSF-AG2 is one axe groove of definite Aboriginal origin. It is located next to a small natural rock pool on a slab of bedded sandstone (**Plate 24**). The axe groove is 35cm long and is about 6cm deep in a shallow v-shaped groove.

WSF-AG3

Type of site: Axe grinding groove site

GPS Coordinates (GDA Zone 56): 345744E; 6324833N

Location: Located on the creek bed of an unnamed tributary to Little Jilliby Jilliby Creek that runs east and parallel to the main branch of the creek near its headwaters. WSF-AG 1 and WSF-AG2 are located on the same creek as WSF-AG3. The location of WSF-AG3 is shown in **Figure 12**.

Report: OzArk 2010a

Description: WSF-AG3 is two axe grooves of Aboriginal origin along with three shallower grooves of probable Aboriginal origin. They are located next to a natural rock pool on a slab of bedded sandstone in the middle of the creek (**Plate 25**). The axe grooves range in size between 25cm and 35cm and are about 7cm deep on average.

WSF-AG4

Type of site: Axe grinding groove site

GPS Coordinates (GDA Zone 56): 345784E, 6318982N

Location: Located on the creek bed of an unnamed tributary to Wyong Creek that runs roughly north–south to the east of Smithys Road West. See **Figure 12** for the location of WSF-AG4.

Report: OzArk 2010a

Description: WSF-AG4 is five axe grooves of definite Aboriginal origin in an area of rock pools in the middle of the creek. They are located on a slab of bedded sandstone (**Plate 26**). The axe grooves range in size between 20cm and 38cm and are about 5cm deep on average.

5.5 Aboriginal Sites Re-located

5.5.1 Introduction

Three axe grinding groove sites had been previously recorded by a State Forest training exercise within the area of the Wyong State Forest and the Subsidence Impact Limit. They are:

- Site # 45-3-3040 is comprised of 14 grooves in three groups within a 15m to 20m area. The first group with two grooves, the second with nine grooves and the third with three grooves, all measuring between 16cm and 43cm in length, 5cm and 17cm in width and

1cm and 4cm in depth. This groove area is located 10m west of the confluence of a minor tributary with Myrtle Creek;

- Site # 45-3-3041 is comprised of 30 grooves in two groups on a flat rock surface. The first group with 22 grooves, the second with eight grooves, all measuring between 11cm and 47cm in length, 3cm and 34cm in width and 0.5cm and 6cm in depth; and
- Site # 45-3-3042 is comprised of five grooves in one group on a small rock surface 250m southeast of site # 45-3-3041.

All are located within the Wyong State Forest near to or along Myrtle Creek (**Figure 9**).

These are the only previously recorded Aboriginal sites to have been recorded within the Project Boundary.

5.5.2 Re-location attempt: 2010 Survey

As part of the 2010 heritage assessment, an attempt was made to re-locate the previously recorded sites. As the valley of Myrtle Creek is so narrow and the vegetation thick, none of the GPS hand-held devices with the survey team could register an accurate position for the previously recorded sites. Therefore the relocation was a visual one only. With thick leaf litter covering the rock platforms within Myrtle Creek it was difficult to relocate all sites. However, one set of grinding grooves was located that matched original site description for #45-3-3041: but not at the location given by AHIMS (see below; **Plate 31**).

The other site within Myrtle Creek (site #45-3-3040) was not able to be located on the day of the heritage assessment and no attempt was made to relocate site #45-3-3042 as it would have proved fruitless to search for it without the aid of detailed coordinates from the hand-held GPS devices.

However, given that one of the three previously recorded sites was re-located and that its description matched the site's site card (although it is located further along the creek than the AHIMS coordinates have it), there was no reason at the time to doubt that the other sites existed as well.

Further, the integrity of site #45-3-3041 is good with no sign of damage since its recording. Given the rugged nature and inaccessibility of the area in which the sites are located, it is assumed that the other sites also maintain their integrity as people would rarely visit the area.

5.5.3 Re-location attempt: 2011 survey

As part of the 2011 heritage assessment an additional attempt was made to re-locate AHIMS sites #45-3-3040, #45-3-3041 and #45-3-3042 by surveying along Myrtle Creek in the vicinity of the sites. Again GPS hand-held devices struggled with providing the survey team with accurate

positions of the previously recorded sites so it was decided to use a combination of maps, GPS fixes where possible and a detailed survey to ascertain the integrity of the sites along the creek.

At least five separate sets of grinding grooves were identified in the vicinity of two of the previously recorded AHIMS sites and appear to be sites #45-3-3040 (**Figure 14**; **Plates 32–33**) and #45-3-3041 (**Figure 14**; **Plates 34–36**). At three of the grinding groove locations multiple grinding grooves were identified (probably 45-3-3041), while the remaining two locations provided only solo groove examples (probably 45-3-3040).

Figure 14 shows the location of the grinding groove sites as accurately as the survey team were able to locate them. It is believed these locations are more accurate than the coordinates given in AHIMS.

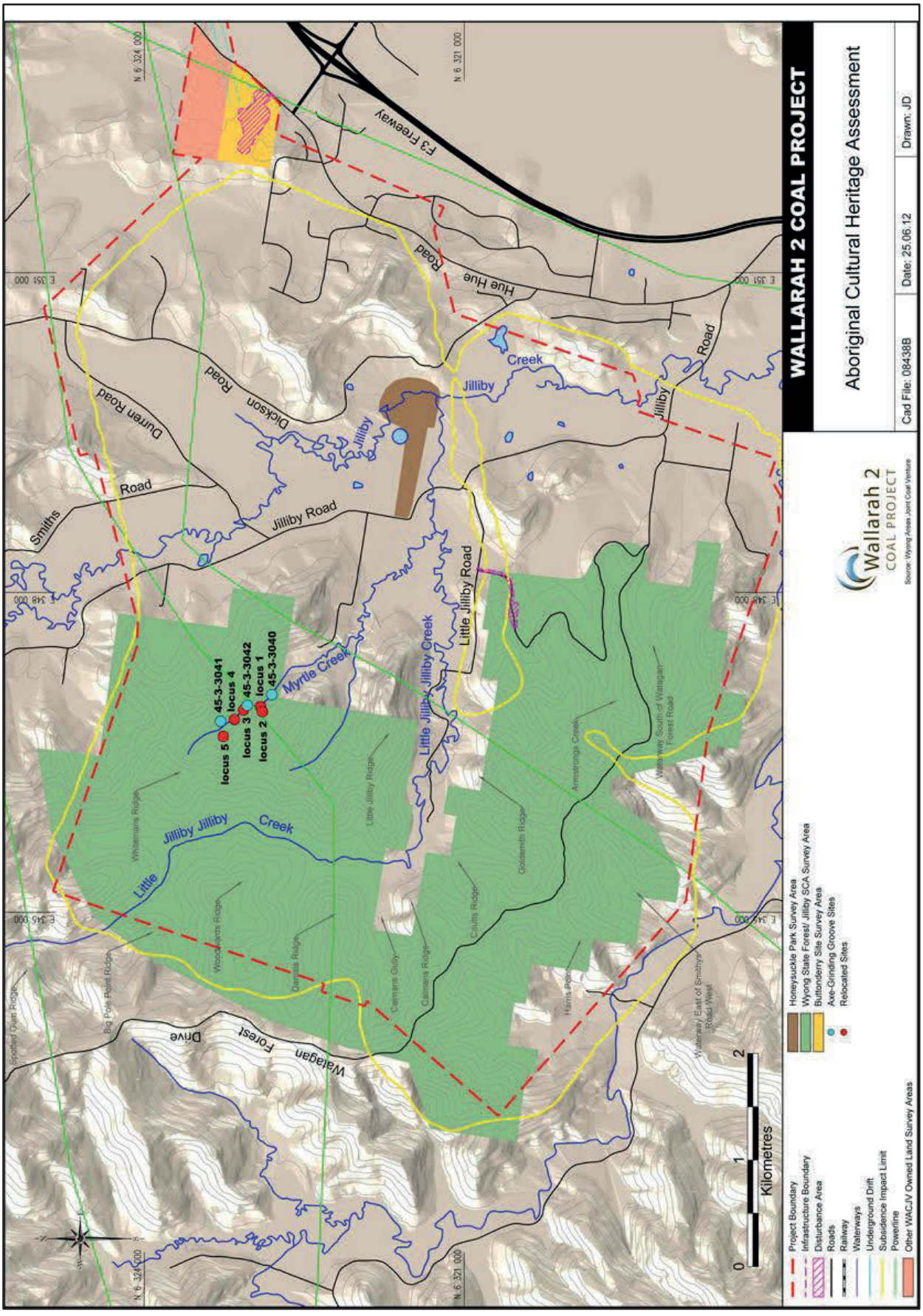
The area surrounding site #45-3-3040, using the coordinates given in AHIMS, was intensively investigated; however, no trace of axe grinding grooves could be located: even though the rock surfaces were reasonably free of leaf litter and silt.

It is felt that the AHIMS coordinates are probably wrong for these sites and that the axe grinding grooves are located further north along Myrtle Creek: with the major concentration in the southern three clusters (loci 1–3), while the northern two clusters (loci 4–5) display single axe grinding grooves. The confusion over the exact location of sites in such terrain is understandable but it is felt that Myrtle Creek has been systematically surveyed in 2011 and reconnoitred in 2010 and that the sites are located at the locations shown in **Figure 14**.

Given the difficulty of relocating such sites accurately, no attempt was made to relocate 45-3-3042 that is described as being only a few grooves on a minor tributary. However, it is likely further grooves, as observed by the surveyors of 45-3-3042, exist in the tributaries to Myrtle Creek.

These Myrtle Creek sites were later revisited on 20 October 2011 by an OzArk representative in company with W2CP personnel to determine the geological context of the sites. This assessment showed that the larger concentrations of grooves are located on large slabs that, although large, are reasonably disjointed from the underlying strata.

Figure 14: Subsidence Impact Limit: AHIMS sites (blue circle) and re-locations recorded during the 2010 and 2011 surveys (red circle).



5.6 ABORIGINAL COMMUNITY INPUT

No places within the Project Boundary were identified by the registered stakeholders as holding specific cultural significance. Nevertheless, as noted and discussed in more detail below (**Section 6.2.1**), the Aboriginal community regarded all archaeological sites as holding a degree of cultural significance.

5.7 DISCUSSION

5.7.1 Infrastructure Boundary

The findings of the assessment within the Infrastructure Boundary conform to the predictive model established in **Section 4.4.1** for those areas. The model predicted the low likelihood of shelter sites and axe grinding grooves (as there were no areas of substantial rock outcrops in the Disturbance Boundary) and scarred trees (as so few are recorded in the vicinity due to the extensive nature of land clearing and logging). The model also predicted that other site types, such as artefact scatters and isolated finds, could be present, as were, potentially, site types such as burials and ceremonial places: however, given the topography and land use history the likelihood of burials and ceremonial places being present was assessed as low as supported by the results of the assessment.

Further, the predictive model suggested that sites would be recorded close to permanent water on flat to gently sloping sandy soil.

Given the high levels of disturbance to the ground surface throughout the Infrastructure Boundary (either from clearing and ploughing/grazing or from erosion), the findings confirmed that recordings of artefact scatters would be in disturbed contexts.

Landscapes such as that around Wallarah Creek and Spring Creek would not have supported large, permanent populations and so the sites remaining tend to be of transit camps, rather than large base camps. Transit camps have lower densities of lithic discard and their more ephemeral nature can be removed from the landscape altogether if disturbed by ground surface alteration and/or erosion.

Ground surface visibility was also low (around 8%) and this would have also hampered the detection of sites across the Infrastructure Boundary.

<u>Tooheys Road Site</u>

The findings within the Tooheys Road Site support the predictive model in **Section 4.4.1** as the archaeological test excavations confirmed that the area along Wallarah Creek did hold potential for past Aboriginal use. However, also as predicted, the results for site WC-OS2 show a very diffuse artefact scatter in an area devoid of archaeological stratigraphy or other archaeological

features. The artefact density recorded across WC-OS2 was very low and is more indicative of a general use of the area in the past rather than the product of one defined site area.

Further, the archaeological test excavation methodology sampled widely and then concentrated around the find spot of an artefact by excavating further excavation pits in close proximity. This methodology was successful in demonstrating that the artefacts recorded were not part of a larger concentration.

The very low artefact frequency established that no discrete Aboriginal site exists within the excavation area of WC-OS2. Further, inspection of the soil profiles showed disturbed soil horizons and thin top soils, and with knowledge of past land use disturbances, it was assessed that there is a very low probability of an Aboriginal site of any structural integrity remaining undetected within the excavation area.

The test excavation along Wallarah Creek programme confirmed that:

- There is very low archaeological potential within the area investigated. While items of Aboriginal heritage (i.e. artefacts) are present, the distribution and nature of these items suggest a random 'background' scatter, rather than the nearby presence of a site that would display intactness and complexity; and
- The location was recorded as an Aboriginal site (WC-OS2) due to a technicality: whilst most artefacts were distant to each other, some occurred within 50m of each other, hence the designation of the area as a 'site' is more consistent with OEH requirements than as 14 isolated artefacts.

Buttonderry Site

The findings within this Site support the predictive model in **Section 4.4.1** as no Aboriginal sites were recorded in this area. The model predicted a probable lack of sites given the sloping nature of the landform, the distance to water, the lack of rock outcropping and the few old growth trees of sufficient age to have been culturally modified. It is possible that factors of visibility influenced this outcome; however, it is assessed that there is a low probability for further, undetected, Aboriginal sites or objects at the Buttonderry Site.

Western Ventilation Shaft

No Aboriginal sites were recorded within the area of the direct impact at the Western Ventilation Shaft. The Western Ventilation Shaft conformed to the predictive model in **Section 4.4.1** and the lack of Aboriginal sites is a product of its relatively small area that is reasonably disturbed.

The area has been cleared at some point in the past and there are few trees of sufficient age to have been growing when the area was occupied or used by Aboriginal people. Rock outcropping is not present and the majority of the area is flat to sloping land over 200m from permanent water.

The landform at the Western Ventilation Shaft, as well as the results of the assessment, indicate that there is a low probability of locating further, undetected Aboriginal sites within the Disturbance Boundary.

5.7.2 Subsidence Impact Limit

Wyong State Forest/Jilliby SCA

The findings of the assessment within the Subsidence Impact Limit confirm the predictive model established in **Section 4.4.2**. All sites recorded were axe grinding groove sites; a conclusion of the predictive model that, based on previous studies in the area, noted that as axe grinding grooves are a reasonably common site type in the region in similar topographic areas (see **Section 4.2**) that they were likely to exist in the Wyong State Forest/Jilliby SCA.

Four axe grinding sites (WSF-AG1–4) were recorded on Terrigal Formation landforms: a common feature noticed elsewhere in the region (**Section 4.3**). When the previously recorded sites are taken into account, these sites are probably wrongly coordinated in AHIMS and are located further north along Myrtle Creek: also in Terrigal Formation landforms or on the boundary with the Patonga Claystones. Axe grinding groove sites are the only site type to have been recorded within the Subsidence Impact Limit.

Although there was a low possibility of shelter sites being located within the Subsidence Impact Limit, it was noted that the Terrigal Formation is not suited to shelter formation and, as such, the incidence of shelters suitable for occupation would be rare. In one area of the Subsidence Impact Limit, there were shelters of sufficient size (to the south of where Whitemans Ridge Road becomes impassable: **Plate 19**), but sloping floors or inaccessible locations meant that none were considered to be suitable for occupation. Overhangs of generally small size characterised much of this area. Further, there was ample evidence of the very fragile nature of the Terrigal Formation sandstones. While this would not destroy evidence of occupation, roof collapses would destroy art sites and generally make the shelters poor long-term occupation choices.

While not all areas of the Subsidence Impact Limit were directly assessed, the results of this and previous assessments concludes that while there may be further axe grinding groove sites on other drainage systems (that were not visited as part of this assessment), within the Wyong State Forest/Jilliby SCA. Other site types, such as open sites, would be rare, and probably confined to ridge lines, given the nature of the watercourses and the steeply sloping land (**Plate 12**). Modified trees, as predicted, would be very rare given the amount of logging that has taken place.

Honeysuckle Park

The results from the eastern, flatter areas of the Subsidence Impact Limit also confirm the predictive model that these areas held a very low probability of locating sites or, if they were located, they would probably be out of context. The floodplains displayed high degrees of disturbance from farming / clearing activities and from periodic flooding (**Plate 15**). The assessment of this landform was that it would hold very low potential for the existence of undisturbed, subsurface deposits.

While the assessment cannot be extrapolated over the remainder of the eastern portion of the Subsidence Impact Limit, aerial photographs show similar land use and landforms over the majority of this area. Therefore, the conclusion of the predictive model still has validity in that it holds that undisturbed sites in this area will be very rare if present at all.

5.7.3 Other WAJVC owned land

The open site and isolated artefact recorded at the Hue Hue Road ecological offset investigation area (WC-OS1 and WC-IF1) are located near permanent water on flat to gently sloping, sandy soils. They occupy an equivalent landform to that occupied by WC-OS2 at Wallarah Creek within the Tooheys Road site. The associated (possible) scarred tree (WC-ST1) is in an area that has undergone less clearing in the past. The lack of recordings of any other site types across the Hue Hue Road ecological offset investigation area also confirms the predictive model.

6 ASSESSMENT OF ABORIGINAL HERITAGE SIGNIFICANCE

6.1 INTRODUCTION

The appropriate management of cultural heritage items is usually determined on the basis of their assessed significance as well as the likely impacts of any proposed developments. Social / cultural, archaeological, aesthetic and historic value are identified as baseline elements of significance assessment, and it is through the combination of these elements that the overall heritage values of a site, place or area are resolved.

Social or Cultural value

This area of assessment concerns the importance of a site or features to the relevant cultural group: in this case the Aboriginal community. Aspects of social value include assessment of sites, items, and landscapes that are traditionally significant or that have contemporary importance to the Aboriginal community. This importance involves both traditional links with specific areas, as well as an overall concern by Aboriginal people for their sites generally and the continued protection of these. This type of value may not be in accord with interpretations made by the archaeologist: a site may have low archaeological value but high social value, or vice versa.

Archaeological value

Assessing a site in this context involves placing it into a broader regional framework, as well as assessing the site's individual merits in view of current archaeological discourse. This type of value relates to the ability of a site to answer current research questions and is also based on a site's condition (integrity), content and representativeness.

The overriding aim of cultural heritage management is to preserve a representative sample of the archaeological resource. This will ensure that future research within the discipline can be based on a valid sample of the past. Establishing whether or not a site can contribute to current research also involves defining 'research potential' and 'representativeness'. Questions regularly asked when determining significance are: can this site contribute information that no other site can? Is this site representative of other sites in the region?

Aesthetic value

This refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with the social values. It may consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use (Australian ICOMOS 1988).

Historic value

Historic value refers to the associations of a place with a historically important person, event, phase or activity in an Aboriginal community. Historic places do not always have physical evidence of their historical importance (such as structures, planted vegetation or landscape modifications). They may have 'shared' historic values with other (non-Aboriginal) communities.

Places of post-contact Aboriginal history have generally been poorly recognized in investigations of Aboriginal heritage. Consequently the Aboriginal involvement and contribution to important regional historical themes is often missing from accepted historical narratives. This means it is often necessary to collect oral histories along with archival or documentary research to gain a sufficient understanding of historic values.

6.2 ASSESSED SIGNIFICANCE OF THE RECORDED SITES

6.2.1 Social or Cultural value

Conversations held with the representatives of the Registered Stakeholders determined that all site types are cultural value to the Aboriginal community because they provide physical evidence of Aboriginal occupation of the local area.

Artefact scatter sites WC-OS1, WC-OS2 and WC-IF1 were assessed as holding cultural value. The cultural value of the scarred tree WC-ST1 is more challenging for the community due to it being deemed a "possible" scarred tree, although this site type is generally held as having cultural value.

In the opinion of the Aboriginal representatives who accompanied the survey team, the recorded sites WSF-AG1–4 have cultural value as they had manifest attributes that could be connected by present-day Aboriginals with the past presence of their people.

Because these sites represent the ancestral footprint of today's Aboriginal people and because of their ability to help reconstruct the past settlement patterns and way of life, the archaeological sites recorded here are held in **high cultural value** by the local Aboriginal community.

6.2.2 Archaeological value

The archaeological value of artefact scatter sites, as described above, revolves around the known local context of this site type (i.e. are there many, some or no such features known locally?). Examining an 18km x 10km zone surrounding the Project Boundary[5], there are 15 artefact scatters (or 22.7% of total recorded sites) recorded on the OEH AHIMS database. This makes artefact scatters the most common site type in the vicinity of the Project Boundary.

[5] AHIMS site search 24.4.2012.

Sites WC-OS1 and IF1 are both assessed as comprising stone artefacts that are of Aboriginal origin. One is located on the flat and gently sloping banks of Wallarah Creek, while the other on the nearby banks of a tributary flowing into Wallarah Creek. The raw material, artefact density, site size and artefact type are all typical of previously recorded sites in the vicinity. The likelihood of there being associated, intact sub-surface deposits is considered moderate-low. As such the artefact scatter is assessed as having **low–moderate archaeological values**.

With regard to site WC-OS2, assessed during the 2010 test excavation programme (**Section 5.4**), the following assessment of archaeological value can be made:

- Due to the disturbed nature of the deposits such as the evidence of bioturbation within the pits and disturbed soil horizons from actions such as ploughing, the archaeological value is diminished;
- The low overall artefact density suggests a less-complex occupation by traditional Aboriginal groups, again diminishing the archaeological value; and
- No artefacts recorded during the excavations were unique or rare. As other examples of such types of sites exist throughout the immediate region the archaeological value is again diminished.

As a result, site WC-OS2 at the Tooheys Road Site is assessed as having **low archaeological values**.

Scarred tree WC-ST1 is assessed as being of probable Aboriginal origin. It is located on the gently sloping bank of the Wallarah Creek and the likelihood of there being associated, intact sub-surface deposits is considered moderate, as this tree is in association with recorded artefacts. Although scarred trees are a relatively rare site type in the region (see **Section 4.2**), there is only a probable chance that the scar was created by human agency, as such this site is assessed as having **low–moderate archaeological values.**

Recorded axe grinding groove sites WSF-AG1–4 are situated in undisturbed landscapes and exhibit no signs of previous anthropogenic impacts although natural joint movement and cracking in the host sandstone was observed in the vicinity of some groove sites.

The overall location of axe groove sites discovered during the current assessment conforms to the distribution pattern that has already been established throughout the broader region.

The axe grinding groove sites (WSF-AG1–4) are a common feature in the broader region and are representative of other sites that have previously been recorded within the Subsidence Impact Limit. The sites have good integrity and while natural erosion is a threat, there have been no artificial disturbances to the sites.

Axe grinding groove sites can provide information about past settlement patterns, tool manufacture and food processing, however, there is no chance of associated deposits

associated with the axe groove sites so archaeological research is limited. As such, the sites recorded as part of this assessment are assessed to have **low–moderate archaeological values**.

6.2.3 Aesthetic value

The recorded sites WC-OS1, WC-OS2, WC-IF1 and WC-ST1 are situated in highly modified landscapes, subject to vegetation removal and have been disturbed by agricultural activity. As such, the aesthetic characteristics of the sites are regarded as having been altered significantly. The sites are therefore assessed as having **low aesthetic values**.

Recorded axe grinding groove sites WSF-AG1–4 are situated in undisturbed landscapes and exhibit no signs of previous anthropogenic impacts. The sites are all situated in densely forested drainages that are difficult to access since they lack proper trails; however, these sites would be easily interpreted by laypersons with only minor aid. The visual appeal of axe grinding groove sites and undisturbed nature of the landscape, balanced with the difficulty of access, afford the sites **moderate aesthetic values**.

6.2.4 Historic value

The recorded sites WC-OS1, WC-OS2, WC-IF1, WC-ST1, and WSF-AG1–4 have no apparent relationship to known historical Aboriginal sites (such as missions or massacre sites), none of which are situated in the immediate vicinity. As such, they have been preliminarily assessed as having **low historic values**. A table of significance (**Table 16**) follows.

Table 16: Table of assessed significance.

Site name	Cultural significance	Scientific significance	Aesthetic significance	Historical significance
WC-OS1 AHIMS # 45-3-3317	High	Low–Moderate	Low	Low
WC-OS2	High	Low	Low	Low
WC-IF1 AHIMS # 45-3-3316	High	Low	Low	Low
WC-ST1 AHIMS # 45-3-3315	High	Low–Moderate	Low	Low
WSF-AG1	High	Low–Moderate	Moderate	Low
WSF-AG2	High	Low–Moderate	Moderate	Low
WSF-AG3	High	Low–Moderate	Moderate	Low
WSF-AG4	High	Low–Moderate	Moderate	Low

7 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROJECT

In terms of impacts, the assessment divided the Project Boundary into locations of direct impacts from surface infrastructure (Infrastructure Boundary), indirect impacts from subsidence (Subsidence Impact Limit), and other WACJV owned land.

Table 17 provides an indication of the potential impacts to all sites (AHIMS and recorded as part of the current assessment) identified. Refer to **Table 16** for assessments of significance for each site recorded as part of this study.

Table 17: Impact assessment for all recorded sites

Site Name/AHIMS Number	Type of Harm (Direct/Indirect / None)	Degree of Harm (Total/Partial/None)	Likelihood of Harm (Likely/Possible/Unlikely)	Consequence of Harm (Total/Partial/No loss of value)
WC-OS1 AHIMS # 45-3-3317	None	None	Unlikely	No loss
WC-OS2	Direct	Total	Likely	Total
WC-IF1 AHIMS # 45-3-3316	None	None	Unlikely	No loss
WC-ST1 AHIMS # 45-3-3315	None	None	Unlikely	No loss
WSF-AG1	None	None	Unlikely	No loss
WSF-AG2	None	None	Unlikely	No loss
WSF-AG3	Indirect	Partial	Possible	Partial
WSF-AG4	Indirect	Partial	Possible	Partial
45-3-3040	Indirect	Partial	Possible	Partial
45-3-3041	Indirect	Partial	Possible	Partial
45-3-3042	Indirect	Partial	Possible	Partial

7.1 INFRASTRUCTURE BOUNDARY

7.1.1 Tooheys Road Site

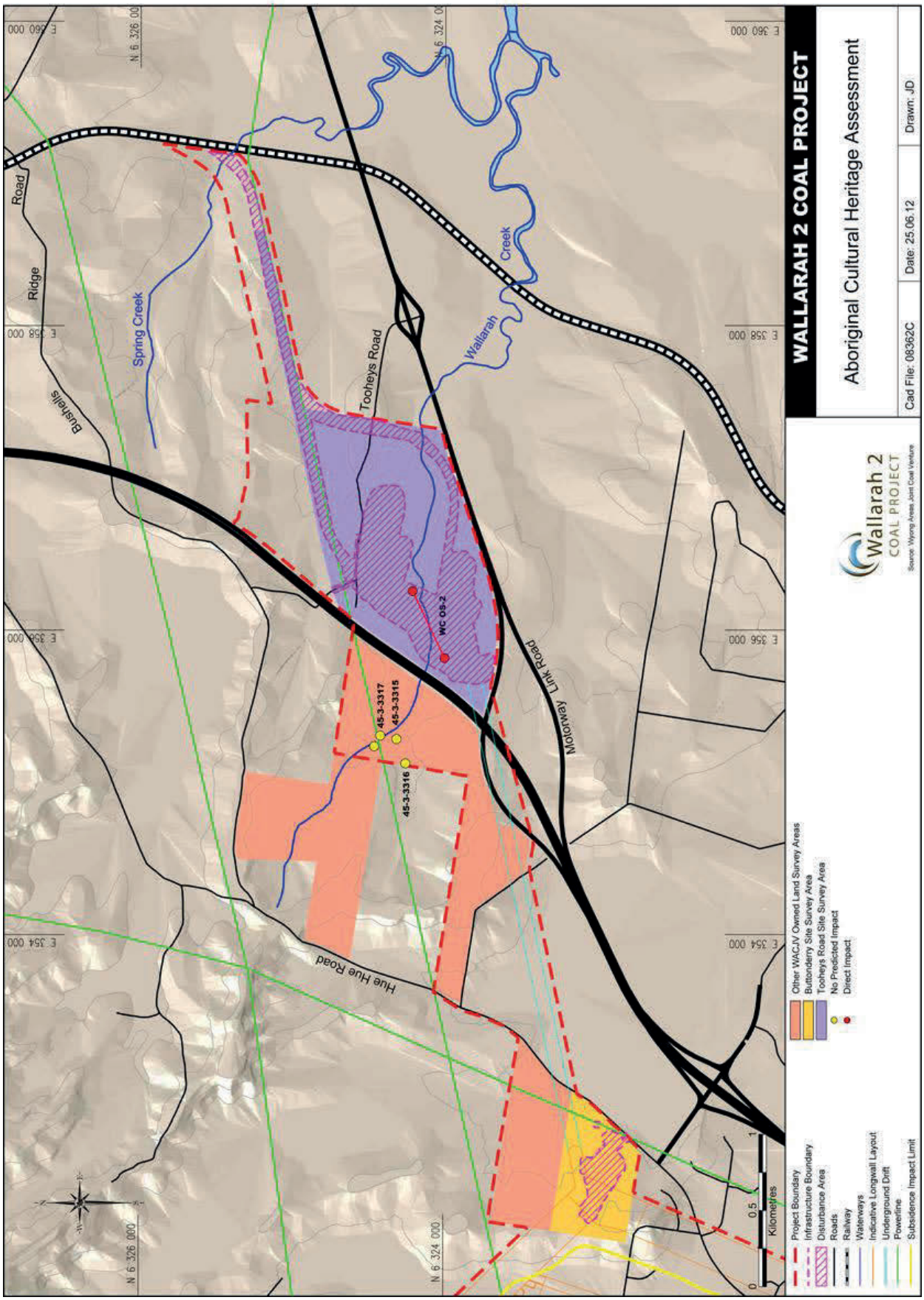
The proposed works will have an impact within specific areas with the Tooheys Road Site.

At WC-OS2 some artefacts were recorded within the Disturbance Area of the proposed works (**Figure 15**).

While the artefacts from the excavation have been removed to safety, there is a potential for further, undetected Aboriginal artefacts to be located within Disturbance Area, particularly on the southern bank of Wallarah Creek, although their frequency is likely to be low.

Any undetected artefacts are likely to be isolated finds and potentially consist of unmodified flakes. Whilst they have low scientific significance, they may hold cultural significance and therefore the recommendations listed in **Section 8.4** should be followed in relation to construction work along Wallarah Creek.

Figure 15: Possible impacts to Aboriginal sites at the Tooheys Road Site and other WACJV owned land.



7.2 SUBSIDENCE IMPACT LIMIT

7.2.1 Wyong State Forest/Jilliby SCA

Myrtle Creek

The previously recorded axe grinding groove sites (# 45-1-3040 to 45-1-3042) can potentially be impacted by fracturing of the bedrock within the Subsidence Impact Limit. The main mechanisms which could potentially result in impacts on grinding groove sites are the curvatures, strains and valley related upsidence and closure movements.

The maximum predicted curvatures. strains and valley closure movements are of sufficient magnitude to result in fracturing in the bedrock in the Subsidence Impact Limit. Experience in the NSW Coalfields indicates that fracturing of bedrock at depths of cover greater than 350 metres, such as the case within the Study Area, generally occurs in isolated locations and the likelihood that fracturing would be coincident with the grinding groove sites would be considered relatively low (MSEC 2012).

Definitive, physical impacts to these sites cannot be accurately predicted, only a risk-based consideration of likely impact levels. However, it is likely the low strain impacts may serve to preserve the sandstone on which the grooves are located from cracking. There is, however, potential for minor increased siltation along beds of Myrtle Creek if significant alteration to run off patterns occurs and if localised soil erosion develops. This possible siltation process may cover some of the grooves from view. It is noteworthy that this process occurs naturally, for example following bush fire, and is not an impact only generated as a result of longwall mining.

The axe grinding grooves are typically in well-jointed sandstone bedrock units although in geologically confined circumstances. Existing minor natural cracks and fissures also are also present in sandstone exposures. Although some of the axe grinding groove sites are outside the zone of influence of compressive or tensile strains, some may be affected by minor areas of vertical subsidence and tilt from the proposed mining activity. These effects are considered to present only a very low risk of damage to the site's integrity.

Based on their geological and landscape settings and the predicted range of subsidence effects, the individual axe grinding groove sites along Myrtle Creek are at a generally low level of risk of damage.

Axe grinding groove sites featuring scattered instances of individual rock grooves differ in their inherently lower risk of damage to their integrity arising from the proposed works when compared with other rock outcrop-based archaeology sites such as caves, significant shelter sites or rock art sites. There has been no evidence of such sites in the Subsidence Impact Limit.

Sites recorded for this study

All sites (WSF-AG1 to AG4) are predicted to be beyond the expected extent of compressive strain, as well as tilt. Two sites (WSF-AG3 and WSF-AG4), however, are on the very boundary of the Subsidence Impact Limit and there is a low probability that they could be significantly impacted (**Figure 16**).

Subsidence Impacts on potential Aboriginal sites in Wyong State Forest/Jilliby SCA Study Area

Although there are no other known Aboriginal sites or features within the Subsidence Impact Limit, there remains the potential for other sites to exist given the practical survey limitations such as poor ground visibility which could obscure archaeological evidence.

From the results of the current assessment, it is concluded that axe grinding groove sites would be the most likely type of site to be recorded in the Wyong State Forest/Jilliby SCA. While other site types are always possible, it is assessed that there will a low possibility of locating open sites and modified trees due to landform and disturbance patterns. It is also assessed that the topography does not allow suitable shelters that can be used for habitation.

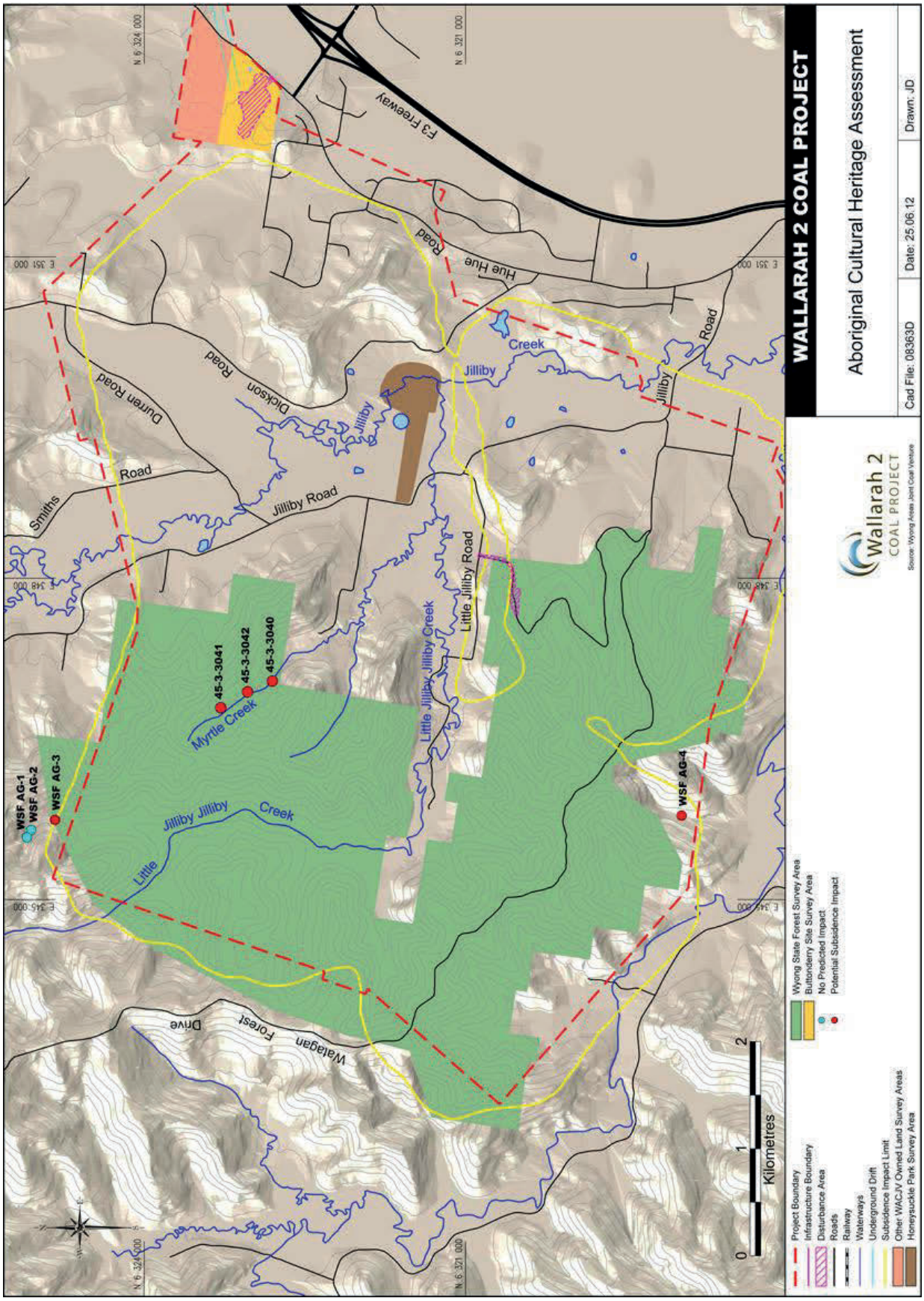
7.2.2 Honeysuckle Park

In terms of changes to inundation levels, the predicted alteration to overall flooding levels shows very minor areas that will be newly impacted both within the Dooralong and Yarramalong Valleys. No sites have been recorded within the valley floor landforms of the Subsidence Impact Limit and predictive modelling of site location (**Section 4.4**) suggests that site material of any integrity is unlikely in the valleys. Possible alteration to the paths of waterways and or erosion modification also has the potential to impact Aboriginal sites; however, the ability to predict either these factors or the location of Aboriginal sites in relation to them is low.

7.3 OTHER WACJV OWNED LAND

The recorded Aboriginal sites WC-OS1, WC-IF1 and WC-ST1 will not be impacted by the proposed works as they are located in a parcel of land that is being investigated as a potential ecological offset area (**Figure 16**).

Figure 16: Possible impacts to Aboriginal sites within or adjacent to the Subsidence Impact Limit.



8 MANAGEMENT AND MITIGATION

8.1 GENERAL PRINCIPLES

Appropriate management of cultural heritage items is primarily determined on the basis of their assessed significance as well as the likely impacts of the proposed development. **Section 6.2** and **Section** 7 describe, respectively, the significance / potential of the recorded sites and the likely impacts of the development. The following management options are general principles, in terms of best practice and desired outcomes, rather than mitigation measures against individual site disturbance.

- Avoid impact by altering the development proposal or in this case by avoiding impact to a recorded Aboriginal site. If this can be done, then a suitable curtilage around the site must be provided to ensure its protection both during the short-term construction phase of development and in the long-term use of the area. If plans are altered, care must be taken to ensure that impacts do not occur to areas not previously assessed.
- If impact is unavoidable then approval to disturb sites must be sought from the NSW Office of Environment and Heritage (OEH) and will depend on many factors including the site's assessed significance. Aboriginal community consultation will also need to occur following the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2011* (ACHCRs). If granted, the local Aboriginal communities may wish to collect or relocate any evidence of past Aboriginal occupation (Aboriginal object), whether temporarily or permanently, if necessary[6].

8.2 ABORIGINAL CULTURAL HERITAGE MANAGEMENT PLAN

An Aboriginal Cultural Heritage Management Plan (ACHMP) will be developed to the approval of the Department of Planning and Infrastructure (DP&I). The ACHMP will be guided by specific policies and procedures to manage Aboriginal archaeological sites within the Project Boundary. The ACHMP will be formulated and periodically reviewed in consultation with RAPs and OEH. The ACHMP will include, as a minimum, management and mitigation measures discussed in **Section 8.4** below.

8.3 LAND DISTURBANCE PROTOCOL

The Land Disturbance Protocol would include appropriate induction information for employees and/or contractors who are engaged in ground disturbing works. Particularly in the Infrastructure Boundary along the banks of Wallarah and Spring Creeks (within 100m of creeks' centre line), the Land Disturbance Protocol should include inductions to inform crews involved with the initial clearing and preparation of the site, including all crews involved with earth moving.

[6] The fate of all artefacts remains within the statutory control of OEH. A care and control permit may be issued to local Aboriginal groups or, with Aboriginal community consent, to other parties, for educational or display purposes.

These inductions could stipulate:

- That there may be isolated Aboriginal artefacts present in the landscape (a printed copy showing typical artefacts should be distributed: OzArk can arrange this if required); and
- That should any objects work crews suspect may be of Aboriginal origin be encountered, then work should cease in that area and OEH and the Darkinjung LALC consulted on how to best proceed.

8.4 MANAGEMENT AND MITIGATION OF RECORDED ABORIGINAL SITES

Appropriate management of cultural heritage items is primarily determined on the basis of their assessed significance, the likely impacts of the proposed development and the application of the relevant legislation.

The following management options are general principles, in terms of best practice and desired outcomes, rather than mitigation measures against individual site disturbance.

8.4.1 Infrastructure Boundary

1. Due to the results of previous surveys and subsequent test excavation programme at WC-OS2, management recommendations for the direct impact areas investigated are as follows:
    - All work crews should be inducted and made aware of the possibility of locating isolated Aboriginal objects within the Tooheys Road Site, particularly within 100m of the centre line for Wallarah and Spring Creeks (**Section 8.3**).
    - If the induction is undertaken, there is no constraint in this area to the proposed construction as outlined in this report on Aboriginal cultural heritage grounds.
2. Removed topsoil should be retained on site for revegetation after construction is complete such that any potential artefacts contained within the soil will remain in the general vicinity.
3. No Aboriginal sites were located at the other two locations of direct impact: the Buttonderry Site and the Western Ventilation Shaft. There is no constraint at these locations to the proposed construction as outlined in this report on Aboriginal cultural heritage grounds.
4. A contingency procedure should be devised for the discovery of previously unrecorded Aboriginal objects, including burials. Such a document should form part of the ACHMP.

8.4.2 Subsidence Impact Limit

5. All recorded sites are held to hold high cultural value, low-moderate archaeological value and moderate aesthetic value. Therefore any direct surface disturbance to the sites should be avoided by ground based activities. While the sites will not be harmed by the day-to-day activities of the Project through the construction phase, the locations of the sites should be

noted and any direct surface disturbance avoided should any future work need to take place within Wyong State Forest/Jilliby SCA.

6. Two identified sites (WSF-AG3 and WSF-AG4) are on the boundary of the Subsidence Impact Limit and are not predicted to be affected by subsidence from the Project when the closest mining in their vicinity would occur in approximately Year 22 and Year 37 respectively. Whilst axe grinding groove sites potentially can be harmed by vertical subsidence, it is the compression and tensile strains that have the greatest potential to affect the sites. To this end it is noted that these sites are beyond the effects of strain and tilting. As a precautionary measure a detailed record should be undertaken prior to longwall mining occurring within 500m of the site, and following longwall mining passing the site under the following plan:

    - All monitoring should include a photographic record, GPS location, remarks on silt deposition levels in Little Jilliby Jilliby Creek and any cracking of the bedrock / creek bed; and
    - Any monitoring activity should be undertaken with involvement of the Aboriginal community.

7. Two identified sites (WSF-AG1 and WSF AG2) are beyond all predicted impacts from the Project when the nearest mining would occur in about Year 39 (well beyond the duration of the Development Consent currently sought). These sites present no constraints to the proposed works; however, these sites should be included in any monitoring activity of nearby axe groove sites (WSF-AG3–4) and the Myrtle Creek AHIMS sites to provide a control in which to better assess the subsidence impacts in comparison with natural impacts.
8. Three axe groove sites identified on the AHIMS site register are located directly within the subsidence zone and are likely to be affected by over 2m of subsidence, around 4 mm/m tilt and c. 0.5 mm/m of strain. These three previously recorded axe-grinding sites along Myrtle Creek (AHIMS sites #45-3-3040, #45-3-3041 and #45-3-3042) have been assessed to be at a generally low level of risk of damage (MSEC 2012) from mining activity around Year 29 to Year 31 (likely to be beyond the duration of the Development Consent currently sought). As predicting subsidence related impacts is difficult, regular monitoring should be employed both pre-subsidence and post-subsidence to better understand the effect of subsidence and inform the Subsidence Management Plan (SMP) and ACHMP. Monitoring should be conducted under the following plan:

    - All monitoring should include a photographic record, GPS location, remarks on silt deposition levels in Myrtle Creek and any cracking of the bedrock / creek bed; and

- Any monitoring activity should be undertaken with involvement of the Aboriginal community.

9. As no sites or areas of sensitivity were recorded within Honeysuckle Park, no constraints have been identified for this area.
10. As multiple targeted surveys have been undertaken to test the predictive modelling assessment over portions of the Subsidence Impact Limit, no further archaeological survey prior to approval is required as the remaining unsurveyed landforms contain little potential for the existence of Aboriginal sites.
11. Further field assessment within the Subsidence Impact Limit (Wyong State Forest/Jilliby SCA portions only) may be considered appropriate to inform SMPs in the post-approval phase and prior to mining occurring these areas (minimum 15 years away), or for site specific management resulting from panel by panel pre-mining surveys.

8.4.3 Other WACJV owned land

12. Three Aboriginal sites were recorded (WC-OS1, WC-IF1, WC-ST1) and an area of archaeological sensitivity has been delineated along Wallarah Creek. No impacts are proposed for this area in the potential conservation offset lands and it is recommended that the high Aboriginal heritage values of this zone be managed through an appropriate ACHMP developed in consultation with the Aboriginal community.

9 RELEVANT LEGISLATION

A number of Acts of parliament provide for the protection of Aboriginal heritage at various levels of government[7].

- The three relevant statutes in New South Wales are the:
    - EP&A Act, amended by the Environmental Planning and Assessment Amendment (Infrastructure and Other Planning Reform) Act 2005 (EP&AA Act).
    - National Parks and Wildlife Act 1974 (NPW Act).
- While at Commonwealth level, the following statute is relevant:
    - *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) amended by the Environment and Heritage Legislation Amendment Act (no. 1) 2003.

9.1.1 State legislation

Environmental Planning and Assessment Act 1979 (EP&A Act)

The WACJV seeks a Development Consent under Division 4.1 in Part 4 of the EP&A Act for the Project.

On 1 October 2011, Part 3A of the EP&A Act was repealed and replaced by new provisions in the EP&A Act, which create an environmental assessment framework for two new categories of development: State significant development (SSD) and State significant infrastructure (SSI).

The classes of development that are SSD or SSI are set out in the State Environmental Planning Policy (State and Regional Development) 2011 which also commenced on 1 October 2011.

The procedures for SSD are set out in Division 4.1 of Part 4 of the EP&A Act.

The Minister for Planning is the consent authority for SSD – however this determination role has been delegated to the PAC or senior officers of the Department of Planning & Infrastructure in certain circumstances. A development application (DA) for SSD is to be accompanied by an EIS. Applicants for SSD will need to seek the Director-General's requirements (DGRs) for the EIS prior to lodging a DA.

Section 79C of the EP&A Act applies to SSD, therefore, all relevant planning controls contained in any environmental planning instruments will need to be considered, including local environmental plans. However, development control plans do not apply to SSD.

[7] NSW Heritage Office 1998: *Living with Aboriginal Culture*, p. 3.

Concurrence or subsequent approvals are not required in respect of SSD, including in relation to heritage, bushfire and threatened species. Input from relevant agencies will occur at DGR stage.

DAs for SSD must be exhibited for 30 days.

Under the EP&A Act 1979 - Sect 89J, following approval, an Aboriginal Heritage Impact Permit under section 90 of the *National Parks and Wildlife Act 1974* would not be required to impact an Aboriginal site or object.

National Parks and Wildlife Act 1974

Amended during 2010, the *National Parks and Wildlife Act 1974* provides for the protection of Aboriginal objects (sites, objects and cultural material) and Aboriginal places. Under the Act (S.5), an Aboriginal object is defined as: any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains.

An Aboriginal place is defined under the *National Parks and Wildlife Act 1974* as an area that has been declared by the Minister administering the Act as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.

As of 1 October 2010, it is an offence under Section 86 of the *National Parks and Wildlife Act 1974* to 'harm or desecrate an object the person knows is an Aboriginal object'. It is also a strict liability offence to 'harm an Aboriginal object' or to 'harm or desecrate an Aboriginal place', whether knowingly or unknowingly. Section 87 of the Act provides a series of defences against the offences listed in Section 86:

- The harm was authorised by and conducted in accordance with the requirements of an Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the Act;
- The defendant exercised 'due diligence' to determine whether the action would harm an Aboriginal object; or
- The harm to the Aboriginal object occurred during the undertaking of a 'low impact activity' (as defined in the regulations).

Under Section 89A of the Act, it is a requirement to notify the OEH Chief Executive of the location of an Aboriginal object. Identified Aboriginal items and sites are registered with the OEH AHIMS.

9.1.2 Commonwealth Legislation

9.1.2.1 Environment Protection and Biodiversity Conservation Act 1999

Amendments in 2003 established the National Heritage List and the Commonwealth Heritage List, both administered by the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). Ministerial approval is required for proposals involving significant impacts to National/Commonwealth heritage places. Additionally, the Australian Heritage Council maintains the Register of the National Estate (RNE).

None of these heritage places exist within or close to the Project Boundary.

10 RECOMMENDATIONS

The following recommendations are made on the basis of:

- Legal requirements under the terms of the *National Parks and Wildlife Act 1974* (as amended) whereby it is illegal to damage, deface or destroy an Aboriginal relic / object without the prior written consent of the Director-General, OEH;
- The findings of the current investigations undertaken within the Project Boundary; and,
- The interests of the DLALC and other local Aboriginal and community groups.

Recommendations for the management of Aboriginal cultural items within the Project Boundary are as follows:

1. Tooheys Road Site: There is the possibility of impacting Aboriginal objects, principally artefacts, in areas adjacent to Wallarah Creek. Work in this area will be governed by inductions, management protocols to ensure harm minimisation. These management recommendations are set out in **Section 8.4**.
2. Buttonderry Site: No Aboriginal sites were recorded at this Site and there are no constraints to the proposed development on the grounds of cultural heritage so long as the nature and extent of the proposed impacts do not alter significantly from those assessed within the parameters of the current study.
3. Western Ventilation Shaft: No Aboriginal sites were recorded at this location and there are no constraints to the proposed development on the grounds of cultural heritage so long as the nature and extent of the proposed impacts do not alter significantly from those assessed within the parameters of the current study.
4. Wyong State Forest/Jilliby SCA: WSF-AG3 and WSF-AG4 are located on the edge of the Subsidence Impact Limit and should be further monitored as per recommendations listed in **Section 8.4**. WSF-AG1 and WSF-AG2 are located beyond the edge of the Subsidence Impact Limit and will not be impacted by the Project. These sites should be further monitored to form a control as per recommendations listed in **Section 8.4**. The previously recorded sites on Myrtle Creek should be monitored as per recommendations listed in **Section 8.4**. It is also acknowledged that further sites (axe grinding grooves, small open sites) may be present in this area. Consequently, panel by panel pre-mining survey within Wyong State Forest/Jilliby SCA should be undertaken under the auspices of an ACHMP.
5. Honeysuckle Park: No Aboriginal sites were recorded at this location and there are no constraints to the proposed development on the grounds of cultural heritage so long as the nature and extent of the proposed impacts do not alter significantly from those assessed within the parameters of the current study.

6. Other WACJV owned land: Three Aboriginal sites were recorded (WC-OS1, WC-IF1, WC-ST1) and an area of archaeological sensitivity has been delineated along Wallarah Creek in the potential conservation offsets properties (**Section 8.3** and **Section 5.3.3**). No impacts are proposed for this area although it is recommended that the high Aboriginal heritage values of this zone be recognised and managed through an ACHMP.
7. Ensure that all staff and contractors undertake induction that includes a cultural heritage awareness component. This should briefly cover general topics such as rudimentary site identification (e.g. some photos of stone tools, flakes, scarred trees and grinding grooves etc.) and an introduction to cultural values.
8. A contingency procedure should be devised for the discovery of previously unrecorded Aboriginal objects, including burials. Such a document should form part of an ACHMP.
9. The ACHMP should be developed in consultation with all RAPs. The ACHMP should include a methodology of site monitoring for the sites identified here (Points 4 and 6). This will be to determine the sites' condition pre-mining, immediately post-mining as well as annually for several years after mining has occurred.

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PLATES

Plate 1: Ground surface visibility: *Top*: an example of visibility in the ridge environments, *Bottom*: an example of visibility on valley floors. In both cases, leaf litter reduces visibility to zero.

Plate 2: The western bank of Spring Creek. The rail bridge can be seen in the background. This view shows one the tracks found in this area.

Plate 3: Wallarah Creek within the Disturbance Boundary at the Tooheys Road Site.

Plate 4: The TransGrid easement within the Tooheys Road Site. In this view, the rail loop would be located to the far left.

Plate 5: Southern bank of Wallarah Creek in the Infrastructure Boundary. This landform also contains WC-OS2.

Plate 6: Typical vegetation on the south bank of Wallarah Creek in Zone D of the Tooheys Road Site. The rail loop is travelling in the line of sight of this photo.

Plate 7: Tooheys Road Site overlooking Wallarah Creek that is located at the bottom of the hill beyond the cleared fields and dairy shed.

Plate 8: The Buttonderry Site showing the regrowth woodland, the slope and the poor ground surface visibility.

Plate 9: Cleared portion of land within the Buttonderry Site. Although cleared, grasses inhibit ground surface visibility.

Plate 10: View into sectioned deposits (dam excavation) at the Buttonderry Site. Note the thin 'A' soil horizon (approximately 10cm), overlaying heavy clays.

Plate 11: Western Ventilation Shaft: general view along the dirt road at the centre of area.

Plate 12: Wyong State Forest: typical view of the slopes below the ridgelines. Open woodland that had been logged characterised the vegetation.

Plate 13: Wyong State Forest: view from Maculata Rd towards Daniels Point across Little Jilliby Jilliby Creek.

Plate 14: Wyong State Forest: a typical view of 2nd order waterways in the area.

Plate 15: Honeysuckle Park: terracing from floods and the changing location of Jilliby Jilliby Creek can be seen.

Plate 16: Hue Hue Road ecological offset investigation area: view from the ridge-top in the northwest overlooking Lot 118, DP 755245.

Plate 17: Hue Hue Road ecological offset investigation area: view of the north western corner of Lot 1, DP719762. Note the steep slope and lack of visibility except on the track. Regrowth trees illustrate the impacts of selective, long term logging of the area.

Plate 18: Ground surface visibility obscured by thick vegetation during the 2011 survey of the Subsidence Impact Limit.

Plate 19: A large overhang is inspected in Subsidence Impact Limit. Overhangs as large as this were very rare.

Plate 20: View southwest across Wallarah Creek in the vicinity of WC-OS2.

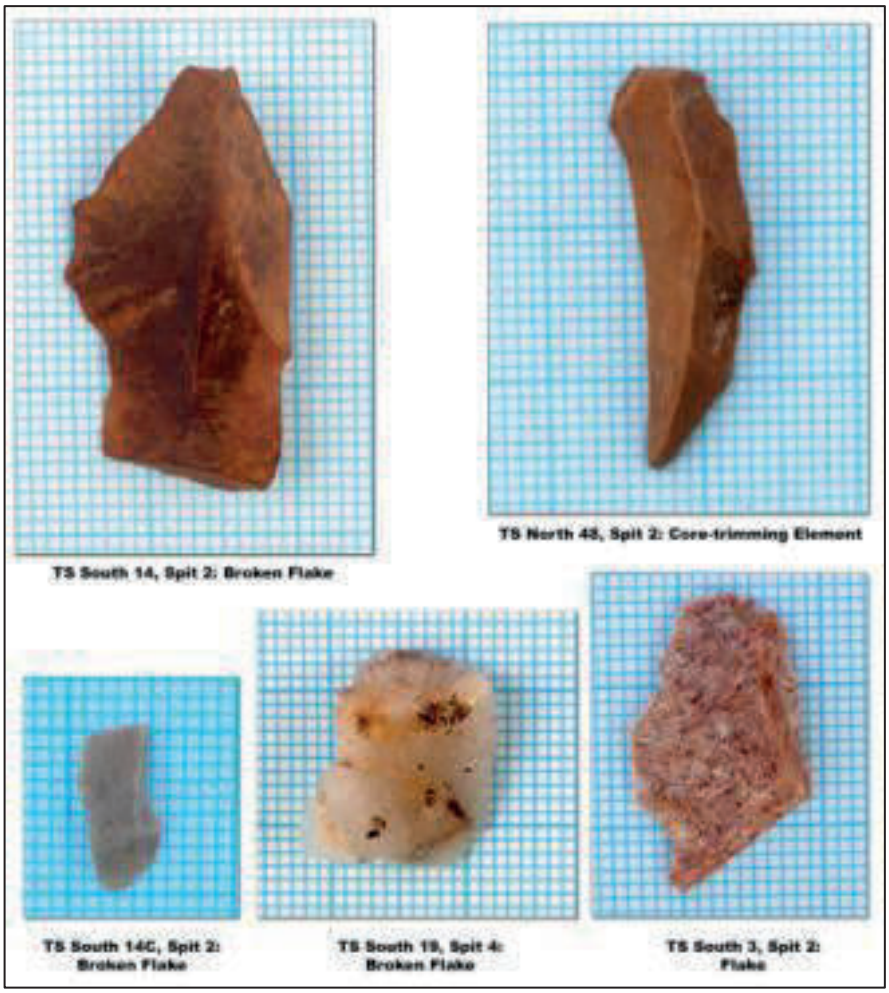

Plate 21: Artefacts recovered from test excavations at site WC-OS2.

Plate 22: Retouched silcrete flake artefact recovered from test excavations at site WC-OS2.

Plate 23: WSF-AG1: *Top*: general view of site; *bottom*: detail of two of the grooves.

Plate 24: WSF-AG2: *Top*: general view of site; *bottom*: detail of one groove.

Plate 25: WSF-AG3: *Top*: general view of site; *bottom*: detail of two of the grooves.

Plate 26: WSF-AG4: *Top*: general view of site; *bottom*: detail of the grooves.

Plate 27: View northwest along the track in the Potential Hue Hue Road Offset Area. This is the area that incorporates part of site WC-OS1.

Plate 28: Artefacts from site WC-OS1.

Plate 29: Location of isolated find WC-IF1, located on the banks of a tributary into Wallarah Creek.

Plate 30: Scarred tree WC-ST1.

Plate 31: A view of the relocated AHIMS site (#45-3-3041?) in Myrtle Creek, 2010 (Subsidence Impact Limit).

Plate 32: Northern most axe grinding groves recorded along Myrtle Creek, 2011 (Subsidence Impact Limit).

Plate 33: A group of axe grinding grooves is located on this rock shelf south of those depicted in **Plate 31** (Subsidence Impact Limit).

Plate 34: A view of the re-located AHIMS site #45-3-3041? in Myrtle Creek, 2011 (Subsidence Impact Limit). This view shows the same location as that in **Plate 31**.

Plate 35: A view of a possible extension of AHIMS site #45-3-3041? in Myrtle Creek, 2011 (Subsidence Impact Limit).

Plate 36: A view of a possible extension of AHIMS site #45-3-3041? (southern-most axe grinding grooves recorded) in Myrtle Creek, 2011 (Subsidence Impact Limit).

APPENDIX 1: COMMUNITY CORRESPONDENCE

1. Plain text copy of 7th January 2010 letter sent by OzArk to DLALC and GTLAC.

Dear [redacted],

Re: Aboriginal heritage assessment – Wallarah 2 Coal Project, Wyong, NSW.

You will recently have received the draft reports for the heritage assessments undertaken to date for the Wallarah 2 Coal Project, sent on Dec 18 2009. Also noted in that letter was the fact that we have additional work to do on this project in early 2010. This letter is to describe in greater detail the nature of this additional work and to seek your comments on the methods proposed. As we hope to be in the field the last week of January, we would appreciate any feedback ASAP. We can then consider these comments in finalising the methodologies.

1. Additional survey in the western area potential subsidence district

It has been determined that additional survey is required to sample some of the landforms of the what is known as the western area, being the zone within which subsidence from mining is anticipated in the future. The report on this area, as sent in December, is the one entitled Subsidence Area – Wallarah 2 Coal project.

The plan is to target landforms within this extremely large area (Report, Figure 1) to get a better understanding of the types of sites present and the landforms they occupy. Issues that will define the areas we can survey are primarily access. The majority of the valley floors are privately owned land that we cannot access, but these are also the most disturbed areas, having been impacted by agriculture for the past 150 years as well as being subject to significant flooding. The Wyong Coal project has purchased one property on the valley floor, adjacent to a creek, and this property will be surveyed by the team as an example of valley floor landform.

The remainder of the survey will be focused on the Jilliby State Conservation Area and the Wyong State Forest. These areas comprise thickly vegetated and often steep sloped ridges, cross cut by forest tracks. We will be aiming to access some for the creek lines through these gullies as well as attempting to access some outcropping sandstone areas to inspect for the presence of shelters and if present, to better understand their, size, accessibility and potential use in prehistory.

If [redacted] is aware of any specific locations that they believe require survey, we will include these in the programme.

This survey week is planned for January 25-29 inclusive (5 days) and we request [redacted] provide two representatives for this survey. We are aware that the Australia Day public holiday falls within this week, but we are keen to work on this day (due to the distances our team has to travel to get to Wyong) and if your representatives are willing to work also, that would be great.

2. Test excavations along Wallarah Creek.

The report relating to the surface facilities for the Wyong Coal Project, identified an area of sensitivity along Wallarah Creek and noted that prior to impacts from the project, the portions of the creek that were to be impacted by the project would need to be test excavated to determine if Aboriginal material is present and if so, to understand the nature extent and integrity of the archaeological deposits so that they can appropriately managed at the time of impact. Section 4.5.1 of the report presents the survey results for this area, Section 4.6.1 discusses these results and Section 4.9.1 then outlines a proposal and methods for testing these areas through archaeological excavation. I have attached section 4.9.1 to this letter in case the report is not at hand.

We are seeking any comment your organisation may have on this excavation proposal, which we plan to undertake from March 15 –19 2010.

In terms [redacted] involvement in the excavation project, we would like to have at minimum 2 but possibly 3 representatives to join the team.

Requirements for service provision in relation to the survey and test excavations

In selecting the groups / individuals to participate in the field assessments it is a requirement that your organisation / you are covered by valid workers compensation insurance, and that you forward this documentation i.e. your Certificate of Currency, to our office. Please be aware that without this documentation we will not be able to allow your sites officer to be involved in the field assessment (due to NSW OH&S legislation. Regardless of participation in the survey all Registered Stakeholders will remain involved in the project through this consultation process and be invited to review a draft report when it is available.

The dates as noted above are:

1. Western Area survey: Monday 25th – Friday 29th January 2010;

2. Wallarah Creek Test excavations: Monday 15th – Friday 19th March 2010. (We ask that representative be prepared to work on Saturday March 20, just in case we have not completed all the pits required due to bad weather or other unforeseen circumstances).

We aim to maintain these dates as set, however please be aware that if issues beyond our control arise, they may be changed. We will stay in touch regarding these dates.

If we do not receive any confirmation from your organisation by Monday 18th January 2010, we will presume that you do not wish to participate in the field assessment. However we will continue to consult with you during the duration of the project.

Fee Offer

The rate of pay is $[redacted] per day for a senior representative and $[redacted] per day for a junior, inclusive of all expenses, not including GST.

Appendix 1

Other requirements

Each participant's group is responsible for their Occupational Health and Safety (OH&S). Any participant must be assessed by their respective organisation as 'fit for field work'. OzArk reserves the right to send any participants home is we consider they pose a threat to their own health and safety, or that of others. The respective organisation will also ensure adequate Personal Protective clothing, boots, wide brimmed hat, long sleeve pants and shirt (high visibility) is provided. Participants must also ensure they have water and lunch for the duration of the field work.

In relation to the fee offer and scheduled dates we would appreciate confirmation of your representative's participation in the field assessment. Please also forward your documentation that confirms your organisation is covered by workers compensation insurance

Please do not hesitate to get in touch should you have any questions regarding the enclosed information. If you have any queries, please feel free to contact our office.

Kind regards

Jodie Benton, Director – OzArk EHM.

Appendix 1

2. Copy of 23rd March 2010 letter sent to OzArk by DLALC.

DARKINJUNG LOCAL ABORIGINAL LAND COUNCIL

168 PACIFIC HIGHWAY,
WATANOBBI NSW 2259
POSTAL ADDRESS:
P.O. BOX 401, WYONG NSW 2259

A.B.N. 99 583 297 167
TELEPHONE: (02) 4351 2930
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EMAIL: darkinjung@dlalc.org.au
www.darkinjung.com.au

OzArk Environmental & Heritage Management
145 Wingewarra St
DUBBO NSW 2830

23rd March 2010

Dear Cheryl

This letter confirms that as a representative of Darkinjung Local Aboriginal Land Council (DLALC), I was involved in the test excavation programme conducted from 15th to 19th March 2010 located at Wallarah Creek, south of Tooheys Road Bushells Ridge. This was carried out on behalf of OzArk Environmental & Heritage Management & Wallarah 2 Coal Project. Also involved from DLALC was Darren Carney on the 18th & 19th March 2010.

The method used for artefact retrieval required a number of 1 metre x 1 metre test excavation pits (in excess of 40) which were dug by an excavator over an area of approximately 600m². These were located in several zones on the northern and southern banks and terraces of the creek line and also approximately 400 metres further up the southern slope of the site, towards the sites boundary and the Motorway Link Road. The pits were divided into spits and from each spit 10 buckets of soil were retrieved as a representative sample (2-3 spits per pit), and then hand sieved using the wet sieving method.

Considering the area sampled, very few artefacts were retrieved. The artefacts found were a confirmation of Aboriginal people's occupation and use of the site in the past. The low density of finds was possibly because of the past use and disturbance of the site due to vegetation clearing and subsequent soil erosion.

Taking into account the methodology and results of the test sampling, DLALC was satisfied in the manner in which the testing was achieved.

Yours Sincerely

S. Hodgetts

Sharon Hodgetts
Consultant for DLALC

Suzanne Naden
Operations Manager

Appendix 1

3. Copy of 16th September 2010 letter sent to OzArk by DLALC.

DARKINJUNG LOCAL ABORIGINAL LAND COUNCIL
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Ms Cheryl Bourke
Ozark Environmental and Heritage P/L
PO Box 2069
DUBBO NSW 2830

16th September 2010

Dear Cheryl

RE: Aboriginal Heritage Assessment/Excavation Wallarah 2 Coal Project, Wyong.

Thank you for the opportunity to formally respond to the above draft report prepared for Wallarah 2 Coal Project.

Darkinjung LALC has now reviewed the above report which identified the following issues/concerns and key recommendations that we wish Ozark and Wallarah 2 Coal Project to consider.

Possible issues for impact:

- **Page 17**, comment by Bennett 1968, 'these friendly people are no longer with us', gives the impression that there are no living Darkinjung descendants left on the Coast, it should also include that there are descendants of the Darkinjung people living on the Central Coast today.
- **Page 60**, in regards to South bank of Wallarah Creek- from the F3 freeway to c.600m east. From the creek line to the Motor way Link Road c. 600m south,

1. ***Point C-*** *'should a noticeable concentration of items, work crews suspect may be Aboriginal in origin be encountered, then work should cease in that area and the DECCW consulted on how to best proceed'*
2. ***Point D-*** *'that should a suspected isolated Aboriginal artifact be noticed, it should be removed to a safe location and DECCW informed'*
3. **Points C and D** - should also include 'Darkinjung Local Aboriginal Land Council should be contacted'

Recommendations:

- Darkinjung LALC agrees with all recommendations, however strongly recommends the above issues be amended and included in the report.

If you wish to discuss these issues or recommendations please do not hesitate to contact me on the numbers listed above.

Thanking you

Suzanne Naden
Operations Manager

Appendix 1

4. Plain text copy of 12th September 2011 letter sent by OzArk to DLALC and GTLAC.

Dear [redacted],

Re: Aboriginal heritage assessment – Wallarah 2 Coal Project, Wyong, NSW.

Since project inception in 2006 [redacted], as a Registered Aboriginal Party, have been involved in the consultation process associated with the Wallarah 2 Coal Project.

As part of W2CP's environmental monitoring program and archaeological report updating, an additional site survey phase is required. Further field work is to be undertaken in the western area, being the zone within which subsidence from mining is anticipated in the future. This additional assessment will concentrate on the ridge / escarpment areas within the Wyong State Forest, in addition to any drainage systems with archaeological potential that may not have been subject to previous survey.

The following information states the proposed methodology for the cultural and archaeological assessment. As part of the consultation process we ask that [redacted] review this information and provide feedback. As the fieldwork is scheduled within the twenty eight (28) response time, should you wish to comment on the methodology and have your response included in the survey methods, we would appreciate your reply by Wednesday 21st September, 2011.

Methodology for the current investigation:

Provide registered stakeholders with maps of the proposed impact location and seek further comment of any known Indigenous cultural values. A map can be found accompanying this letter in Attachment 1.

To undertake physical survey of the Study Area. Physical assessment will include;

pedestrian survey of areas considered to have potential and / or good ground surface visibility (GSV).

vehicle transects of areas with poor GSV or areas of significant prior disturbance.

with agreement of Community and Archaeologists some areas may not be physically surveyed if considered to be too disturbed or to have very low likelihood of sites (ie. steep hillsides with no overhangs).

With respect to this the Proponent has elected to make two (2) positions each day over a five (5) day period available for representatives from the registered stakeholder groups of which there are two (2), to accompany the OzArk archaeologist during the fieldwork. This will ensure Indigenous involvement with the physical archaeological assessment of the study area. It is necessary for each organisation to have relevant workers compensation insurance, failure to provide a copy of a 'Certificate of Currency for Workers Compensation' will mean that the nominated representative will be unable to participate in the field survey component of the assessment.

Each stakeholder group is responsible for their Occupational Health and Safety (OH&S). It is not OzArk's responsibility to determine 'fitness for work' of your nominated site officer. Your organisation must accept full responsibility for your own risk management. If the senior OzArk representative chooses not to accept the risk associated with an individual's fitness for the specific work at hand, then OzArk expresses the right to exclude any site officer from participating in an OzArk managed project.

Discuss in the field, at the end of the field survey, any findings, identified cultural values, management of cultural heritage and culturally acceptable mitigation measures to be considered.

After survey, participating groups are asked to prepare a letter which clearly documents their understanding of the project, detail any associated cultural values of the study area and to provide any comment on proposed management and/or mitigation measures to be employed within the study area.

OzArk will prepare a draft report based on the field survey that will include letters from the stakeholder groups and their assessment of cultural significance for the area or recorded sites. Each group will be invited to review this draft report and provide comment within a given time frame and feedback will be included in report finalisation and provided as an appendix to the final report.

A copy of the final report, or advice of its availability, will be provided to each stakeholder group prior to the Proponent submitting it to the relevant authorities.

Field assessment: The survey team will comprise of an OzArk archaeologist, an archaeologist assistant and two (2) Indigenous Site Officers over five (5) days. OzArk would like to invite one member of [redacted] to participate in the survey, scheduled during the week commencing Monday 26th September to Friday 30th September, 2011. Representatives are to meet at the Wyong Train Station at 8.30 am. During the field assessment on site transport is provided. We aim to survey areas in the forested, western part of the project area delineated within the Project Boundary as defined by the yellow and green lines shown on Figure 1.

Requirements for service provision in relation to the survey.

In selecting the groups / individuals to participate in the field assessments it is a requirement that your organisation / you are covered by valid workers compensation insurance, and that you

forward this documentation i.e. your Certificate of Currency, to our office. Please be aware that without this documentation we will not be able to allow your sites officer to be involved in the field assessment (due to NSW OH&S legislation. Regardless of participation in the survey all Registered Stakeholders will remain involved in the project through this consultation process and be invited to review a draft report when it is available.

Fee offer: The Proponent is offering $[redacted] (excl.GST) per hour for participation in the field survey for an experienced, senior Sites Officer or Elder; this fee is all inclusive of travel, accommodation and meal expenses. Invoices are to be addressed to, [redacted].

This fee offer has been made to each Registered Aboriginal Party and when confirming involvement in the field survey you acknowledge your Site Officer's participation at this rate.

In relation to the fee offer and scheduled dates, we would appreciate confirmation of your organisation's wish to send a representative to participate in the field assessment and a copy of your current workers compensation insurance by the nominated date. To assist in the planning of the field work we also require the name and contact number of your nominated Site Officer and relevant experience and qualifications.

Please do not hesitate to get in touch should you have any questions regarding the enclosed information.

Kind regards

Cheryl Burke

Consultation Officer

Appendix 1

5. Copy of advertisement which appeared in the 30th November 2011 edition of the Central Coast Express.

Public Notice

Aboriginal Stakeholder Consultation Wallarah 2 Coal Project

Wyong Areas Coal Joint Venture is seeking to identify Aboriginal stakeholders who wish to be consulted in relation to the Aboriginal Heritage Impact Assessment over the area associated with the Wallarah 2 Coal Project located 4.7 km north-west of Wyong, NSW.

The purpose of community consultation with Aboriginal stakeholders is to assist Wyong Areas Coal Joint Venture in undertaking ongoing studies and reporting in relation to managing Aboriginal Cultural Heritage for the Project.

Interested stakeholders who hold knowledge relevant to determining the cultural significance of Aboriginal objects and / or places in the area of the Project are invited to register their interest in writing to:

Ms Cheryl Burke
OzArk EHM
PO Box 2069
DUBBO NSW 2830
Email: cheryl@ozarkehm.com.au
Tel: 02 6882 0118
Fax: 02 6882 0630

Expressions of Interest should include current contact details. The closing date for registration is close of business on **Wednesday 14th December 2011.**

Once Expressions of Interest have been received, a planning meeting will be held to discuss the program further.

Appendix 1

6. Plain text copy of 24th November 2011 letter sent by OzArk to Government Agencies.

Dear [redacted]

Re: Aboriginal heritage assessment – proposed Wallarah 2 Coal Project.

OzArk Environmental & Heritage Management P/L is seeking knowledge of any Aboriginal groups, stakeholders or traditional knowledge holders in the Wyong area with an interest in the management of Indigenous heritage matters.

We are currently undertaking Indigenous heritage consultation as per the OE&H "*Aboriginal cultural heritage consultation requirements for proponents 2010',* for the proposed Wallarah 2 Coal Project. A significant amount of assessment has already been completed for this project, however delays have seen legislation and guidelines for heritage management and consultation change and hence we are now seeking to update the consultation and assessment to be compliant with current regulations and in order to establish whether additional stakeholders wish to be involved.

The Wallarah 2 Coal Project is located 4.7 km north-west of central Wyong, NSW. The WACJV now seeks a Development Consent under Division 4.1 in Part 4 of the EP&A Act for the Project.

WACJV proposes to extract approximately 150 million tonnes (Mt) of coal from within the proposed 42 year total Extraction Area. The majority of this resource will be extracted within this Development Consent which is sought for a period of 28 years. The majority of this resource lies beneath the Wyong State Forest and surrounding ranges (including the Jilliby State Conservation Area (SCA)) while a proportion, to be extracted first, lies beneath a section of the Dooralong Valley and the Hue Hue area **(**see Conceptual Project Layout, attached **Figure 1**).

If [redacted] can recommend and provide contact details for any known Aboriginal groups with a cultural interest in this area we can then include them in the consultation process with regard to potential Indigenous heritage issues.

We would appreciate it if you could provide any feedback regarding these Indigenous stakeholder groups by **Monday 12th December, 2011.**

Yours truly

Cheryl Burke / Consultation Officer

7. Copy of 6th December 2011 letter sent to OzArk by OEH.

NSW EPA

Your reference: -
Our reference: DOC11/54824 & PIL11/1193-03
Contact: Rosalie Nave, Ph: (02) 6659 5221

COPY

Ms Cheryl Bourke
Consultation Officer
OzArk Environmental & Heritage Management P/L
PO Box 2069
DUBBO NSW 2830

Dear Ms Bourke

RE: ABORIGINAL HERITAGE ASSESSMENT – PROPOSED WALLARAH 2 COAL PROJECT

I refer to your correspondence, dated 24 November 2011, to the Environment Protection Authority (EPA) concerning the Aboriginal heritage assessment located within the Wyong LGA and described as the proposed Wallarah 2 Coal Project.

Please find enclosed a list of known Aboriginal parties that the EPA considers is likely to have an interest in your project. I note this is not necessarily an exhaustive list of all interested Aboriginal parties. Receipt of this list does not remove the requirement for a proponent/consultant to advertise the proposal in the local print media and contact other bodies and community groups seeking interested Aboriginal parties, in accordance with the '*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*' (CRs).

The EPA would also like to take this opportunity to remind the proponent or consultant of a number of key issues we have been encountering of late, and we'd ask your organisation to take note and ensure compliance please. These issues include:

- Please ensure the project documents the full consultation process in the Aboriginal cultural heritage assessment report or Aboriginal Heritage Impact Permit application and to include copies of all correspondence sent or received from all relevant stakeholders (including Aboriginal stakeholders and the agencies listed in section 4.1.2). Omission of these records in the final report may cause delays in approval or require parts of the consultation process to be repeated if the evidence provided to the EPA does not demonstrate that the consultation process has been fair, equitable and transparent.
- Unless the EPA is provided with evidence that reasonable attempts have been made to contact the relevant parties associated with the CRs, then the EPA will deem that the consultation process has not been complied with.
- The EPA considers evidence of reasonable efforts to contact relevant parties would include, but not be limited to, multiple forms of communication; faxes (with confirmation slips demonstrating successful transmission), an e-mail log, registered post details, copies of letters and a phone call log.

Locked Bag 914, Coffs Harbour NSW 2450
Federation House Level 7, 24 Moonee Street,
Coffs Harbour NSW 2450
Tel: (02) 6651 5946 Fax: (02) 6651 6187
ABN 30 841 387 271
www.environment.nsw.gov.au

Appendix 1

- Please note Appendix A of the CRs contains a map illustrating the region of the EPA to contact according to which local government area your project falls within. Full details of the consultation requirements and the relevant Fact Sheets can be located on our website at: http://www.environment.nsw.gov.au/licences/consultation.htm.
- If you encounter any changes to the contact details of interested Aboriginal parties, or become aware of additional parties, we encourage you to forward this information to the EPA so we can update our records.
- Consultation must be fair, equitable and transparent. If the Aboriginal parties express concern or are opposed to parts or your entire project, the EPA expects that evidence will be provided to demonstrate the efforts made to find common ground between the two perspectives.

If you have any further questions regarding this matter, please contact me on (02) 6659 8221.

Yours sincerely

6/12/11

ROSALIE NEVE
Aboriginal Heritage Planning Officer
Planning and Aboriginal Heritage Section – North East
Environment Protection Authority

Enclosure: Attachment A

Appendix 1

ATTACHMENT A – ABORIGINAL PARTIES IN THE AREA OF INTEREST

1. Guringai Tribal Link Aboriginal Corporation,
Tracey Howie
19 Coolabah Road
Wyongah NSW 2259
(02) 4392 8743
(02) 4396 3525
0404 182 049
guringai@kooee.com.au

2. Darkinjung Local Aboriginal Land Council,
Sean Gordon
PO Box 401
Wyong NSW 2259
(02) 4351 2930
(02) 4351 2946

s.gordon@dlalc.org.au

3. Kevin Duncan,
Kevin Duncan
95 Moala Parade
Charmhaven NSW 2263
(02) 43925426

0431 224099
kevin.duncan@bigpond.com

4. Daniella Chedzey, Jessica Wegener ,
Cultural Heritage Officer
7 Grant Street
Windermere Park NSW 2264

0431 373 751
daniellachedzey@yahoo.com.au

8. Copy of 28th November 2011 letter sent to OzArk by ORALRA.

OFFICE OF THE REGISTRAR
ABORIGINAL LAND RIGHTS ACT 1983 (NSW)

11-13 Mansfield Street
Glebe NSW 2037
PO Box 112, Glebe NSW 2037
P 02 9562 6327 F 02 9562 6350

Cheryl Burke
OZARK ENVIRONMENTAL MANAGEMENT
PO Box 2069
Dubbo NSW 2830

Dear Cheryl

Re: Request - Search for Registered Aboriginal Owners

I refer to your letter dated 24 November 2011 regarding an Aboriginal Stakeholders in Wyong area, NSW.

I have searched the Register of Aboriginal Owners and the project area described does not have Registered Aboriginal Owners pursuant to Division 3 of the *Aboriginal Land Rights Act* 1983 (NSW).

I suggest you contact the Darkinjung Local Aboriginal Land Council. They may also be able to assist you in identifying other Aboriginal stakeholders for this project.

Yours sincerely

Tabatha Dantoine
Administration Officer
Office of the Registrar, *Aboriginal Land Rights Act* (1983)

28 November 2011

Appendix 1

9. Copy of 6th December 2011 letter sent to OzArk by Wyong Shire Council.

Wyong Shire Council
CENTRAL COAST

CAF/C Ferry
F2006/01080
D02855296
6 December 2011

Cheryl Burke
OzArk Environmental and Heritage Management Pty Ltd
PO Box 2069
DUBBO NSW 2830

Dear Cheryl

Request for contact detail for Local Aboriginal Groups within Wyong Shire

I refer to your request for names of local Aboriginal Interest Groups for Archaeological Investigations for Wallarah No 2 Coal Project.

You are advised that Council does not provide information on local Aboriginal Groups as this information changes constantly. Please contact the Coffs Harbour branch of the Department of Premier and Cabinet - Office of Environment and Heritage (formerly DECCW - National Parks Section). They provide up to date lists of the local Aboriginal groups.

Regards,

Chris Ferry
Strategic Planner

Hely St / PO Box 20 Wyong NSW 2259 | P 02 4350 5555 | F 02 4351 2098 | E wsc@wyong.nsw.gov.au | www.wyong.nsw.gov.au | ABN 47 054 613 735 | DX 7306 Wyong

Appendix 1

10. Copy of 28th November 2011 letter sent to OzArk by National Native Title Tribunal.

National Native Title Tribunal

South-East & Central Registry –Sydney Office
Level 25, 25 Bligh Street
Sydney NSW 2000
GPO Box 9973
Sydney NSW 2001
Telephone (02) 9227 4000
Facsimile (02) 9227 4030

28th November 2011

Cheryl Burke
PO Box 2069
Dubbo NSW 2830

Our Reference: 4603/11KL
Your Reference: -

Dear Ms Burke

Native Title Search Results of Wyong Shire Council Local Government Area

Thank you for your search request received on 24th November 2011 in relation to the above area.

Search Results
The results provided are based on the information you supplied and are derived from a search of the following Tribunal databases:

Register Type	NNTT Reference Numbers
Schedule of Applications (unregistered claimant applications)	Nil.
Register of Native Title Claims	Nil.
National Native Title Register	Nil.
Register of Indigenous Land Use Agreements	Nil.
Notified Indigenous Land Use Agreements	Nil.

At the time this search was carried out, there were **no relevant entries** in the above databases.

Please note: There may be a delay between a native title determination application being lodged in the Federal Court and its transfer to the Tribunal. As a result, some native title determination applications recently filed with the Federal Court may not appear on the Tribunal's databases.

Tribunal accepts no liability for reliance placed on enclosed information
The enclosed information has been provided in good faith. Use of this information is at your sole risk. The National Native Title Tribunal makes no representation, either express or implied, as to the accuracy or suitability of the information enclosed for any particular purpose and accepts no liability for use of the information or reliance placed on it.

Facilitating timely and effective outcomes.

Freecall 1800 640 501
www.nntt.gov.au

Appendix 1

11. Copy of 2nd December 2011 letter sent to OzArk by ATOAC.

ATOAC
Awabakal Traditional Owners Aboriginal Corporation

2 December 2011

Cheryl Burke
Administration / Consultation Officer
OzArk EHM P/L
PO Box 2069, Dubbo, NSW 2830

Dear Cheryl,

Re: Registration of Interest Regarding the Wallarah 2 Coal Project

The Awabakal Traditional Owners would like to register our interest for the Proposed Wallarah 2 Coal Project. We wish to be consulted with regard to the Aboriginal Cultural Heritage being undertaken as participants in the consultation process for the proposed project.

The Awabakal People have a Primary Cultural Association with this area as the Wallarah region is well within our Traditional Cultural Boundary. The Awabakal Traditional Owners Aboriginal Corporation are descendants of the Awabakal people, our connection to our ancestral country is both physical and spiritual.

We would like to take this opportunity to clarify our position being the direct descendants of the Traditional Awabakal People of the Newcastle and Lake Macquarie Region.
As Awabakal Descendants our cultural association with our area (Awabakal region) is derived through the history of our ancestors Margaret and Ned of the Awabakal People, the original inhabitants of the land.

Margaret and Ned are a well documented Aboriginal couple of whom numerous newspaper articles and several books have recorded their lives within the Awabakal Nation. Margaret and Ned are remembered and celebrated in Lake Macquarie and have two Bays at Swansea respectfully named in their honour, Black Neds Bay and Margarets Bay. Margarets Bay was officially named by her descendants, and is adjacent to Parbury Park which in 1880 was part of a reserve set aside for the use of Margaret and her children.

1

Appendix 1

The Wallarah region is regarded as highly significant to the Awabakal People, and was utilised by our people repeatedly for many purposes including ceremony, fishing, hunting and food gathering. This is evident by the vast amount of documentation recorded from the region. This evidence indicates a lifestyle of educational value of traditional occupation, and therefore requires the respect of the historical value that this particular and surrounding area provides.

We are a registered Aboriginal Corporation under the Federal Governments Aboriginal Corporations Act and we are registered with the Office of Environment and Heritage, formally the Department of Environment, Climate Change and Water (DECCW).

Representatives of the Awabakal Traditional Owners Aboriginal Corporation involvement is crucial during any consultation process and subsequent assessment, given that our People continue to have a primary connection with this area as our ancestors had for thousands of years, and our continued caring for country encompasses Cultural Knowledge held by us relating to our Cultural Heritage and Traditional Country.

Our site officer representatives are experienced in providing information regarding our cultural heritage and also have the training and experience to identify cultural material.

The Awabakal Traditional Descendants are affiliated and in consultation with many community organisations and committees, however we can only represent our own views and do not presume to speak for others.

The principle vision and aims of the Awabakal People is to protect the cultural heritage of our ancestors. Therefore, any artifacts and/or residual evidence of our people are held in high regard and are considered a cultural reminder that unites us with our country, our past and spirituality.

We would like to thank you for the opportunity to care for country and would appreciate confirmation regarding our involvement in the proposed project at your earliest convenience, and If you require any further information please do not hesitate in contacting me.

Yours sincerely,

K. Brauer

Kerrie Brauer
Director | Administration

Awabakal Traditional Owners Aboriginal Corporation
ABN: 90 203 408 390 | ICN: 4411
PO Box 253 Jesmond NSW 2299 Australia
T: 61 2 49 58 81 70 | E: info@awabakal.com.au | www.awabakal.com.au

2

Appendix 1

12. Copy of 12th December 2011 letter sent to OzArk by ADTOAC.

"From the Mountains to the Sea"
AWABAKAL
Descendants Traditional Owners
Aboriginal Corporation
ICN:4500 ABN:20402046601

PO BOX 86
CLARENCE TOWN
NSW 2321

Date: 12 December 2011

Attention: Cheryl Burke
Ozark Environmental & Heritage P/L
PO Box 2069 DUBBO 2830

Re: Registration of Interest Regarding Consultation for Aboriginal Cultural Heritage Assessment for proposed Wallarah 2 Coal Project.

ALLA (Hello in Awabakal) Cheryl,

The ***Awabakal Descendants Traditional Owners Aboriginal Corporation (ADTOAC)*** would like to register our interest regarding consultation for the Aboriginal Cultural Heritage Assessment proposed for the *Wallarah 2 Coal Project*. It is our desire to be consulted in regard to any Aboriginal archaeological management, consultation and assessment that is to take place for any area located within the Traditional Awabakal Tribal area.

We are a registered Aboriginal Corporation under the Federal Governments ***Aboriginal Corporations Act*** to carry out business within Australia in regard to the representation of our people through this corporation known as the ***Awabakal Descendants Traditional Owners Aboriginal Corporation (ADTOAC)***.

Being the direct descendants of the Traditional Awabakal People of the Lake Macquarie/Newcastle area we take this opportunity in a few sentences to quickly formalise our position with you.

Our great great great Grandmother was one of the first Aboriginal People to be recorded in the Lake Macquarie and Newcastle area in 1828 when the Reverend L.E.Threlkeld made the first list of the Aboriginal People of the Lake Macquarie and Newcastle districts from his mission station at Belmont. At Warner's Bay our great great great Grandmother and her daughter, our great great Grandmother, were recorded by Jonathon Warner in 1833 and then again at Toronto in 1836 by L.E.Threlkeld at his mission there. Our great grandmother and family lived in the Wyee and Hue Hue Rd area in the late 1890's early 1900's and subsequently following her death she was laid to rest at Wyee. This is one of many reasons why this area is of great importance to our People. Therefore our people still live and maintain our Cultural ties with our Traditional Country and are concerned with the overall welfare of our Cultural Heritage and desire to be involved in all the affairs that may affect that Cultural Heritage which is vital to our People in maintaining connectedness in respect of our Traditional Country.

Regarding the area of the proposed project referred to in the correspondence received via email from OzArk on Monday 12th December 2011, most assuredly indicates that this project is located within the Traditional Tribal Country of our People, the Awabakal and the Guringai. This is an area that both the Guringai and Awabakal People have together relied upon over many thousands of years as part of our Traditional Country and the landscape that the proposed project intends to undermine, incorporates a large variety of our Cultural Heritage sites.

This is why it is crucial for the correct People to be involved in this process and any information relevant to this area to be accurate and forthcoming at the outset of this project. This can only be accomplished by involving those who are the direct Descendants of the original People and that were born and raised in the Traditional Country of their Ancestors and as a result also hold that Traditional Cultural Knowledge of the proposed project area. Our Traditional Tribal area is significant to us because our people have lived around Newcastle, Lake Macquarie and surrounding areas for many thousands of years, these resource rich areas were utilised on many occasions to hunt, fish and carry on Traditions that have now been passed down for centuries from one generation to another. Subsequently, there are many sites located within our Traditional Country which provide tangible evidence of the Cultural Heritage of our People and of which identification and information regarding the locations and significance of many of these is only held by the Awabakal and Guringai People who hold this knowledge.

As already explained, this area and every part of our Traditional Country are special to us, not just for the Physical aspect but also the Spiritual and Oral aspect which, when all combined, give us our complete Culture. Our Cultural Heritage and Traditional Tribal Country are two of the reasons why we take every opportunity to make ourselves available for consultation concerning the very important issues

1

Appendix 1

and decisions that need to be made in regard to protecting what is Culturally ours, handed onto us as a legacy from our Ancestors and what also gives us the right through birth to be called Awabakal/Guringai People.

Given the opportunity to take part in this consultation and any subsequent assessment process, I (being the selected representative for this corporation) would make representation on behalf of our People and provide the necessary qualifications which are vital in delivering all aspects of the ***Cultural Knowledge*** of the proposed project area (as required by the OEH Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010)[1]. I am also physically capable to undertake any potential assessments/surveys due to spending many hours walking our Awabakal Country and carrying out assessments/surveys for Cultural Heritage and educational purposes.

As far as field identification or assessment/survey techniques are concerned and as previously outlined, I was brought up in the bush around Newcastle, Lake Macquarie and the Watagan and Sugarloaf mountains and have many years of experience spending most of my life being instructed and shown much by my Father and Grandmother in regard to our places, stories, tools/weapons and foods and how to acquire/make and use them. I have also been actively involved with Aboriginal archaeological heritage, consultation and assessments/surveys conducted within our Awabakal Country over many years. Our corporation has successfully worked with and accompanied many archaeological consultants from well known companies, (located from within and outside our area) into the field and have taken part in many projects which required a detailed consultation process and where monitoring was necessary or excavation was required and carried out to locate artefacts or to gather information which aimed to provide a greater understanding of our People both now and in the future and also add to the research potential by identifying primarily the use of certain artefacts, the type used and the utilisation and significance of place along with the underlying connection that exists between each site.

Some of those companies we have worked with on many occasions include AECOM, AHMS, CNC Project Management, ENSR, ERM, Insite Heritage, McCardle Cultural Heritage Pty Ltd, Peter Kuskie-South East Archaeology, RPS, Umwelt and many others on major and minor projects located within our Traditional area. We have provided assistance and advice for a diverse range of proponents/developers from large mining companies and government departments through to small private developers. We are presently involved with many ongoing long term projects, working with organisations to see favourable outcomes for all those involved and through these processes endeavouring to secure long term preservation and protection in relation to all issues pertaining to Awabakal Cultural Heritage.

It is imperative that we be involved with this consultation and any subsequent assessment process because of our People's connection to this area for thousands of years and as a consequence the ***Cultural Knowledge*** held by us regarding our Traditional Country.

Also as far as communicating the results of any consultation or assessment process back to stakeholder community and returning advice on the response, as Managing Director of our corporation, I have the capacity and occasion to contact our members for any comments and information that may be pertinent to this project and also have the necessary experience in production and reporting of any information required in written format in relation to any draft report that is produced.

We also hold all relevant insurances needed to participate in the event of possible fieldwork/assessments taking place and any representative selected by our corporation is covered by public liability and workers compensation insurance. These certificates of currency are supplied separately to this letter (when requested) due to confidentiality.

Our schedule fees for engagement of our representative to take part in any fieldwork/assessments which may result from the consultation process would be inclusive of all relevant and associated costs for us to participate in this process and like our insurance documents are supplied separately to this letter for confidentiality reasons (when requested)

We look forward to your reply and hope this addresses any queries you may have Cheryl, if not, and further information is required please don't hesitate to contact us ASAP. Our contact details are as follows.

NGI NOA (Farewell in Awabakal)
Shane Frost-Managing Director: Awabakal Descendants Traditional Owners Aboriginal Corporation
Email:shanefrost@bigpond.com Phone: 49964325 Fax: 49964325 Mobile: 0428320671

[1] ***Page 8, section 3.3.1, NSW DECCW Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010***

2

13. Plain text copy of 10th April 2012 letter sent by OzArk to DLALC, GTLAC, ATOAC and ADTOAC.

Dear [redacted]

Wallarah 2 Coal Project

Aboriginal Archaeology and Cultural Heritage Impact Assessment

Request for Cultural Heritage Knowledge and Offer of Briefing

Thank you for [redacted] ongoing interest as part of the stakeholder group to be consulted concerning potential Indigenous heritage issues for the proposed Wallarah 2 Coal Project (W2CP).

As you may be aware, surveys were carried out between November 2006 and September 2011. Table 1 provides a list of the sites which have been identified within and surrounding the Project Boundary.

(Table 1: table of sites omitted)

OzArk would like to seek the views and cultural knowledge from the Aboriginal community regarding these sites within and surrounding the Project Boundary.

If your group is interested in participating in such a session and sharing your cultural knowledge, please advise OzArk before 13 April 2012 and a meeting can be scheduled at the group's convenience shortly thereafter.

Additionally, should your group wish to have a Project briefing at which OzArk will be able to describe the Project, the field work undertaken (including surveys and test pits) and the suggested management measures for the Aboriginal sites, please advise OzArk before 13 April 2012 and a meeting can be scheduled at your convenience.

Should you have any queries in relation to this letter, please contact myself on [redacted].

Yours faithfully

Jodie Benton

Director

Appendix 1

APPENDIX 2: COMMENTS ON THIS REPORT

1. Response from the DLALC.

Local Aboriginal Land Council
DARKINJUNG
168 Pacific Highway Watanobbi NSW 2259
PO Box 401 Wyong NSW 2259
Phone (02) 4351 2930
Fax (02) 4351 2946
ABN 99 583 297 167
Email darkinjung@dlalc.org.au

Ms Cheryl Bourke
Ozark Environmental and Heritage P/L
PO Box 2069
DUBBO NSW 2830

6th August 2012

Dear Cheryl

RE: Draft Report – Aboriginal Cultural Heritage Assessment: Wallarah 2 Coal Project (W2P), Wyong, NSW.

Thank you for the opportunity to formally respond to the above draft report prepared for Wallarah 2 Coal Project.

Darkinjung LALC has now reviewed the above report which identified the following issue and key recommendations that we wish Ozark and Wallarah 2 Coal Project to consider.

DLALC Issues:

- Recommendation 9.The Aboriginal Cultural Heritage Management Plan (ACHMP).

  This recommendation should clearly state: *to be developed in consultation with the Aboriginal registered groups this includes Darkinjung LALC.*

DLALC Recommendations:

1. Recommendation 9: Darkinjung LALC is be consulted and included in the development of this Management Plan.
2. Darkinjung LALC agrees with Recommendations 1 - 8.
3. Include any previous recommendations from Darkinjung LALC.

If you wish to discuss this issue and recommendations please do not hesitate to contact me directly on the number listed above.

Thanking you

Suzanne Naden
Operations Manager

www.darkinjung.com.au www.facebook.com/darkinjung

Appendix 2

2. Response from the ATOAC.

31 July 2012

Awabakal Traditional Owners Aboriginal Corporation

Cheryl Burke
OzArk Environmental & Heritage Management Pty Limited
PO Box 2069
Dubbo NSW 2830

Dear Cheryl,

Re: Comments Regarding the Draft Report for the Aboriginal Cultural Heritage Assessment for the Wallarah 2 Coal Project

With regard to the Draft Report for the Aboriginal Heritage Assessment for the Aboriginal Cultural Heritage Assessment for the Wallarah 2 Coal Project, we recognise the evaluation by OzArk Environmental & Heritage Management appears to be reasonably comprehensive.

Statement of Cultural Significance of the area to the Awabakal Traditional Owners

The Lake Macquarie and Newcastle Region is an iconic landmark that features prominently within its surrounding landscape. This regions mythology, mystery and organic presence that are quite simply, uniquely Awabakal still to this day has an undeniable amount of fascination and attention regarding its cultural value and purpose.

The Awabakal Traditional Owners have a personalised and ever-revitalised bond with our ancestors' culture, tradition & heritage. This inexplicable connection is reverberated within the surrounding landscape of the Awabakal region.

Additionally, we appreciate our unique role and responsibility for the care and protection of the integrity of this landscape, for and on behalf of its original First Peoples and their descendants.

We would like to take this opportunity to assert our focus on the critical flow of intergenerational equity and aim to ultimately safeguard the immeasurable life-changing impact to this and future generations. Intergenerational equity lays the foundation for identifying, assessing, protecting and maintaining the important cultural and heritage values of landscapes, resources, places, objects, customs and traditions so that we, and generations to come, can enjoy, learn from them, and appropriately manage these values

The Lake Macquarie and Newcastle Region is organically and historically imbedded into the Awabakal landscape and is romanticised, photographed, talked about, visited, fought over, and all the time having its substructure relentlessly undermined for its natural resources. And yet, this landscape still hums a very distinctive 'human story' that still reverberates today.
We believe that the principles of the Awabakal tradition and culture still exist today to keep intact the moral and spiritual fibre of this land. Equally, we also believe it is essential to nurture new visions that are inspired by the cultural integrity of our ancestral family and we are encouraged

1

Appendix 2

that so many people in this town are focused on gaining an ever growing respect and understanding for the Awabakal Peoples, this land and environment.

This land has had a wealth of knowledge walk over it, with each one of us deepening the footprints of our ancestral family, the Awabakal People (Awabakal Traditional Owners Aboriginal Corporation 10 & 30 March 2010).

Our comments to the contents of the Draft Report are as follows:

We are greatly concerned that the details of recorded Aboriginal sites are to be included within the draft report and highly recommend that that specific information such as GPS and location readings be excluded from the *Final Report* as a protective and precautionary measure.

The Awabakal Traditional Owners (peoples) of the Wallarah area are deeply concerned at the **complete absence of the Awabakal and Guringai voice** in the draft Aboriginal Cultural Heritage Assessment report.

We believe both the process of consultation and the assessment reporting is **fundamentally flawed** and inconsistent with the intent of the:

- Burra Charter
- OEH Guidelines for investigating and assessing Aboriginal cultural heritage (the guide)
- And both the DP&I and OEH consultation guidelines

We note that the project is being assessed under Part 4.1 of the DP&I assessment process yet we have been **excluded from the broader Part 4 consultation program and Social impact assessment process**. Therefore the only mechanism available to us to provide comment on the proposed development to inform its EIS assessment and articulate our cultural connection, our concerns relating to proposed project and alert DP&I and OEH to its adverse impacts on our cultural heritage and custodial care and management obligations and make comment regarding the irreversible impact to our cultural and spiritual landscape, our access and values of the area is through this commentary feedback.

We also note that the draft archaeological assessment is exactly that—an archaeological assessment not a cultural assessment as required under the **DGR requirements to demonstrate both archaeological and cultural values assessment**. The draft report refers to the interim draft consultation guidelines 2004 and the former DECCW consultation guidelines for proponents 2010; the code of practice for archaeologists and the April 2011 guide for investigating and assessing and reporting Aboriginal cultural heritage.

In keeping with the Office of Environment and Heritage NSW (OEH) Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW that recognises Aboriginal people need to determine and provide information to inform assessment. Key elements of the ACHA must demonstrate and Aboriginal people comment on:

- Social/cultural values—refers to the spiritual, traditional, historical or contemporary associations the attachment to the object of place has for Aboriginal people
- Cultural values is how people express the value of an area
- Places of social value have associations with contemporary community identity

2

The Awabakal traditional peoples understand that it is important to recognise that there is not always consensus regarding the social or cultural value of a place because people experience places or experiences differently— however process must be in place to record and report these differences.

> *Expressions of cultural or social values vary and in some instances maybe in direct conflict. When identifying values it is not necessary to agree with or acknowledge the validity of each other's values, but it is necessary to document the range of values identified.*

What is of greatest concern is that these values can only be identified through consultation and applying a range of methodologies including (but not limited to) recording and reporting specific information provided by the Registered Aboriginal Parties and synthesising this information with archival and archaeological empirical evidence and assessment.

We assert that this draft ACHA fails to demonstrate this synthesis requirement for assessment

Part 6 of the National Parks and Wildlife Act 1974 (NPW Act), administered by OEH, provides specific protection for Aboriginal objects and declared Aboriginal places by establishing offences of harm.

Harm is defined to mean destroying, defacing or damaging an Aboriginal object or declared Aboriginal place, or moving an object from the land. Anyone proposing to carry out an activity that may harm an Aboriginal object or a declared Aboriginal place must investigate, assess and report on the harm that may be caused by the activity they propose.

The investigation and assessment of Aboriginal cultural heritage is supposed to be undertaken to explore the harm of a proposed activity on Aboriginal objects and declared Aboriginal places and to clearly set out which impacts are avoidable and which are not. **The voice of traditional people is paramount to be able to undertake such an investigation and assessment.**

> *Harm to significant Aboriginal objects and declared Aboriginal places should always be avoided wherever possible. Where harm to Aboriginal objects and declared Aboriginal places cannot be avoided, proposals that reduce the extent and severity of harm to significant Aboriginal objects and declared Aboriginal places should be developed (2011).*

In terms of best practice and in compliance with the Department of Environment Climate Change (DECCW 2010) the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* needs to be demonstrated. Ideally this archaeological assessment archaeological assessment should be included as an Appendix to an Aboriginal Cultural Heritage Assessment **or** inform the scientific chapter of the Aboriginal cultural heritage assessment not dominate the ACHA.

Important note: On the basis of reviewing the DGR's assessment requirements, we assert that the draft Aboriginal Cultural Heritage Assessment **has not** been prepared in compliance with the OEH (2011) *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (hereafter the OEH Guide (2011).

We also assert that there has been inadequate opportunity to inform and identify:

1. Aboriginal cultural values and levels of attachment
2. Historic values including traditional, contact and contemporary values
3. Scientific values
4. Aesthetic values

3

5. Intergenerational values
6. Other cultural considerations identified as important to the Aboriginal cultural heritage assessment process; and
7. Care and control considerations

To inform the assessment it is our assertion that the consultation approach was inadequate, with minimal involvement and development of mechanisms in which we are able to input into and influence the draft assessment report (contrary to the Burra Charter principles and DGR Guide requirements). Of greatest concern is that at no time in the draft report does it reflect the cultural interpretation and cultural values of place and the meaning of the artefacts and features relating to our sacred stories and our cultural values as Awabakal and Guringai peoples.

We strongly assert that the process to date have not been adequate nor undertaken in a way in which we are able to fully contribute against the required assessment processes i.e. we have not been able to inform and consider various facets of Aboriginal cultural heritage including (but not limited to):

1. Our spiritual and social association with the area
2. Historical associations and information passed down through our families
3. Flora and Fauna and ecosystem considerations
4. Spatial ethnography and use of the land and ecosystems over time; and
5. Cultural interpretation of the scientific or archaeological evidence to inform the Aboriginal cultural heritage assessment

It instead provides a 'heavy dose' of non-Aboriginal desktop referencing and interpretation of the Darkinjung people, and It focuses on a dominated and purely scientific, archaeological perspective based on individual impact assumptions and is devoid of the consideration of cumulative impact and landscape impacts from a cultural context.

At this juncture, we would like to enlighten OzArk regarding the writings of the Reverend Lancelot Threlkeld are an informative overview of the Awabakal and Guringai People. We consider that the "Cultural Heritage perspective" pertaining to the Aboriginal Cultural Heritage aspects of the study area is excluded from the Draft Report, and believe that the writings of the Reverend Lancelot Threlkeld are an informative adjunct to the Awabakal and Guringai Peoples lifestyle that would indeed broaden the context of the Report of the local area.

We also strongly suggest that the final report be referenced and supported by "Australian Reminiscences & Papers of L.E. Threlkeld" who was a missionary to the Aborigines of Lake Macquarie 1824-1859; in whose correspondence and accounts with the Awabakal and Guringai people of the Lake Macquarie and Newcastle region are the earliest recorded.

We also recommend the Cultural Collection Unit at the University of Newcastle, as they retain a plethora of resource material pertaining to Aboriginal occupation within the region.

We note:

Aboriginal cultural heritage provides essential links between the past and present— it is an essential part of Aboriginal people's cultural identity, connection and sense of belonging to Country. The effective protection and conservation of this heritage is important in maintaining the identity, health and wellbeing of Aboriginal people." (OEH, 2011)

4

Appendix 2

We believe that the process regarding Aboriginal consultation needs improving to provide an informative outline in the early stages of a proposed project. This can be achieved by meeting with the Registered Aboriginal parties to inform and discuss the proposed project to ensure compliance with the Burra Charter, DP&I and OEH guidelines requirements concerning the project assessment and consultation process.

Fundamental documentation such as the DGR's and subsidence control plans should be shared as a standard approach to assessments. Similarly, we should be provided with and referred to assessment requirements such as the OEH guides in order that we are able to influence the statements and reporting of our cultural heritage.

The objective of community consultation is to ensure that Aboriginal people have the opportunity to improve assessment outcomes by:

- Providing relevant information about the cultural significance and values of the Aboriginal object(s) and/or place(s)
- Actively contributing to the development of cultural heritage management options and recommendations for any Aboriginal object(s) and/or place(s) within the proposed project area
- Commenting on draft assessment reports before they are submitted by the proponent to OEH

To date we cannot see how the Burra Charter nor the consultation guidelines are adequately demonstrated **against all the required criteria** nor how the report details how consultation has been used to assist in the assessment process. Integral to the development of any Aboriginal Cultural Heritage Assessment Report should be the principles of the Burra Charter (Australian ICOMOS 1999).

Furthermore, in trying to stress the level of distress a document of this nature causes our community particularly as Awabakal traditional peoples, we make the following inter-related comments:

In order to understand the lived experiences and historic values of the Wallarah Coal Project and surrounding area—one must understand the context in which it relates to the adverse impacts of invasion of the continent (by the British and other settlers). Some of these adverse impacts include:

- The policies and legislative frameworks in which dispossession, mistreatment and violence occurred
- The impacts to land use, and the cultural way of life for Aboriginal peoples impacting language, cultural and religious practices, socialisation; and family and community structures, lores

The psychological impacts of these actions that have had enduring legacy Aboriginal peoples are struggling with still today. The impact of post contact culture and change influencing Registered Aboriginal Parties cultural and historic and aesthetic values, **we need a voice to ensure that our values are understood when assessment and approvals are being sought by mining and other development projects due to their cumulative and profound impact on the remnants of our cultural footprint**.

5

Historical events form part of the landscape of Aboriginal communities and influence how Aboriginal people respond to the mining companies that seek to develop relationships with them.

A shared history forms part of the social value set of every Aboriginal community and influences the community's attitudes, concerns and interests.

The development of any present-day relationship will depend on the ability of mining companies to address these interests and concerns:

- It is important to Aboriginal people—especially traditional people such as the Awabakal and Guringai People that there is an acknowledgement of this history and its impact on our lives. For instance, the loss of known ancestry and other dislocations to family lines has frequently led to a loss of family cohesion. Similarly, when Aboriginal people lost wages and property through discriminatory treatment, or suffered the removal of our children, our future generations lost valuable social and financial capital we may otherwise have inherited. As a consequence, it has become very difficult for some Aboriginal communities to engage effectively with contemporary issues that impact on our communities, such as resource development proposals.
- 'Country' can be described as the lands with which Indigenous people have a traditional attachment or relationship (Stephen Garnett and Bev Sithole, 2007). The phrase 'connection to country' is more complex, and has been described by Garnett and Sithole as follows:

  Connection to land is achieved through very specific localised knowledge of a region's natural history that is coupled with complex layers of past personal and family experiences, and deeper connection to the past and therefore to Aboriginal identity via traditional stories and beliefs. This nexus between land and people is ongoing through hunting and gathering and simply being on 'Country' [references omitted].

However to assist the reader of our statement contained in this feedback report we concur with the following description based on Deborah Rose's much cited definition:

> *Country is multi-dimensional — it consists of people, animals, plants, Dreamings, underground, earth, soils, minerals and waters, air ... People talk about country in the same way that they would talk about a person: they speak to country, sing to country, visit country, worry about country, feel sorry for country, and long for country.*

We assert that Awabakal and Guringai Traditional peoples' relationship with our Country is complex and multifaceted. It has also been well documented, despite the relatively recent incorporation of connection to Country into health literature (Morrissey, 2003). The studies demonstrate that Country and connection to Country is intricately linked to caring for Country, maintaining cultural life, identity, individual autonomy and Indigenous sovereignty (Rodney Morice, 1976; Paul Burgess, F.H. Johnston, D.M.J.S Bowman, and P.J Whitehead, 2005).

It needs to also be recognised that while there have been advances since the referendum of 1967, the struggle for recognition and the acknowledgement of Australia's history, struggle over land rights land access and self-determination, struggle for reconnection to families, clans and land, constitutional change, social and economic participation continue (Delaney-John, J, 2011).

The Aboriginal and Torres Strait Islander social and emotional wellbeing (SEWB) determinants of wellbeing are multiple, interconnected, and develop and act across the life course from conception

6

to late life, all of which influence the expression of positive or negative wellbeing (Stephen R. Zubrick, Pat Dudgeon, Graham Gee, Belle Glaskin, Kerrie Kelly, Yin Paradies, Clair Scrine and Roz Walker, 2007).

It is important to recognise interrelated and cumulative effects that negatively impact on social and emotional wellbeing include and are amplified by:

- unresolved grief and loss
- trauma and abuse
- systemic racism
- dislocation; and
- social disadvantage for many Aboriginal people

The understanding of the historic, political and lived experiences of Aboriginal people needs to also be recognised and integrated into the social impact assessment context of EIS study (Stephen R. Zubrick, Pat Dudgeon, Graham Gee, Belle Glaskin, Kerrie Kelly, Yin Paradies, Clair Scrine and Roz Walker, 2007).

This is why we also find the failing of Wallarah Coal to include us in the social impact assessment and EIS is fundamentally flawed.

The failure of OzArk to maximise our participation in and align their assessment of our cultural heritage of the area is also concerning.

Because of the factors detailed in this feedback report, we believe we have no other cause of action than to assert in the strongest forms possible that the draft assessment report:

1. should not be accepted as adequate
2. should not be accepted as providing enough documentary evidence to inform assessment and mitigation
3. should not be accepted as compliant to the Director Generals Requirements to adequately and confidently undertake assessment and inform an approvals or non-approvals assessment outcome

In the spirit of a greater understanding of Aboriginal Culture and Heritage,

Yours sincerely,

K. Brauer

Kerrie Brauer
Director | Administration

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7

3. Response from the ADTOAC.

"From the Mountains to the Sea"
AWABAKAL
Descendants Traditional Owners
Aboriginal Corporation
ICN:4500 ABN:20402046601

PO BOX 86
CLARENCE TOWN
NSW 2321

Date: 27 July 2012

Attention: Cheryl Burke
Ozark Environmental & Heritage P/L
PO Box 2069 DUBBO 2830

Re: Response/Comments-Draft Report-Wallarah 2 Coal Project (W2CP), Wyong, NSW.

ALLA Cheryl,

The ***Awabakal Descendants Traditional Owners Aboriginal Corporation (ADTOAC)*** have reviewed the draft report and following this review we have provided some points of concern in the following dot points.

Awabakal and Guringai Traditional Country

- We would like to bring to your attention the statement made on page 37 of the draft report under heading ***4.1 Ethno-historic Sources of Regional Aboriginal Culture***. In this statement it says*'...most of the Central Coast in the Gosford Local Government Area (LGA) and Wyong LGA was the country of the Darkinjung tribe.'* This is incorrect as the area of the proposed project is the Traditional Country of the Awabakal and Guringai People. It is very disconcerting to say the least that you do not even make mention of the Guringai People in this whole section and yet you have as one of the Aboriginal Stakeholder groups the Guringai Tribal Link who are Traditional Owners of the area!!

- We would draw your attention to the massive amount of historical and contemporary ethnographical information and documentation from Threlkeld, Warner, Mann, Larmer, Capell and many others which exists which proves beyond a shadow of doubt that this is not Darkinjung Country but that of the People known as the Awabakal and Guringai.

- This anomaly within this draft report needs to be corrected as soon as possible so as to address this inconsistency and so this misconception does not impact on what is the correct information being presented in the future.

Assessment/Survey

- We believe that the targeted areas of survey should have included all areas (100%) to which there is greater risk associated due to the expected and possible subsidence levels and impacts on grinding groove sites and rock shelters/overhangs.

- This does not seem the case as on page 71 of the draft report, last paragraph, it states that *'...not all areas of the Subsidence Impact Limit were directly assessed...there may be further axe grinding groove sites on other drainage systems (that were not visited as part of this assessment), within the Wyong State Forest/Jilliby SCA.'*

  a. Therefore, unless this assessment did cover all areas of concern (rock platforms etc and (100%) of the creek lines and rock outcrops that could contain shelters/overhangs in the proposed project area, then this is not going to provide any suitable protection through management or mitigation recommendations or strategies for these *"further axe grinding groove sites"* or shelters etc that may be present.

  b. We would suggest that this then negates the findings of this assessment because it has stated that it may have overlooked possible sites due to the sampling aspect used for the assessment.

  c. We would then request that there be another investigation/assessment of these creek lines and all areas that display rock outcrops that may contain rock shelters or overhangs as they should be visited and assessed for the possibility of any Cultural sites that may have been overlooked in these earlier assessments. It is better to know

1

Appendix 2

then not know!! If this is not done then it leaves the Wallarah 2 Coal Project open to possible damage to Cultural sites without permission and could result in prosecution.

Cultural Significance

- First, we would question where is the Cultural Significant assessment within the draft report which is supposed to outline what the Aboriginal Cultural significance of the area is and in what regard we hold it significant to us. We know that we have been asked for comments regarding this project but there needs to be some framework and statements for this at the front of this report (in consultation with us) as now under the legislative requirements it is the Cultural Significance report that should be presented first and then the archaeological report that follows this in the document. This has not been done in the first instance and therefore presents this draft report in the light of already not meeting current legislative requirements or standards. This is only an archaeological assessment!! Again where is the Cultural Significance assessment??

Significance of the Artefact Scatters, Isolated Finds and Axe Grinding Grooves

- For us as Awabakal People the artefact scatters, isolated finds and the axe grinding grooves are all part of our Cultural Heritage and are considered by us to be of high significance. For archaeologists there is a clinical 'put it in a box' view 'so it can be categorised and assessed when stacked up against criteria that someone has formulated to fit it into their bigger picture' type of response. This is fine in some circumstances but it doesn't always work. Not always can we narrow things down to squeeze them into the box of our choosing that we want them to fit into. We are talking about the influence of a lot of variables over many centuries. Therefore to restrict something to a standard that is only defined by someone who formulates a process so as to control or have it conform to their opinion, is not looking out to see what is there, but confines their perspectives which then limit the true boundaries of that same process. We should look past those things that limit and constrain us; there is always more than meets the eye!!

Ground Visibility, Surface Exposure and Subsequent Impacts to Aboriginal Cultural Heritage

- Also it is stated that the majority of the assessments carried out have been hindered by thick vegetation which covers most of the proposed project area this produced minimal visibility. As can be expected, the result is then shown as minimal Cultural Heritage. This does not mean that there is no Cultural Heritage present; it only shows that it was not visible at the time.

  Many Aboriginal Cultural Heritage assessments suffer due to the poor visibility which very often presents itself when a field inspection is undertaken. It is expected that during a normal field inspection/assessment approximately 1-2 percent of the surface of the overall area to be surveyed will be clear of vegetation. It is suffice to say then that in nearly all of these field inspections the visibility plays, to a great extent, a pivotal role in what decisions will be arrived at concerning the existence of Aboriginal Cultural material present within the landscape (with some exceptions). Unfortunately the visibility question can be misleading and it is a common practise to assume that if there are little or no visible evidence/signs of Aboriginal Cultural Heritage then it is ok to assume there is none or only a small amount present. Adopting this attitude could be no further from the truth.

  Ground visibility during this field survey was limited to some areas that had been subject to impacts such as tracks and areas that were eroded or areas disturbed as a result of clearing etc. However, it would be wrong to conclude that, because of the lack of visibility or detection of Aboriginal Cultural materials in the various locations within the survey area, that there would be no Aboriginal Cultural Heritage material present. On the contrary; the survey areas and that surrounding it has been used by our People for thousands of years for a variety of purposes from procurement of resources from these various creek lines within and surrounding the project area.

- To demonstrate the possibility of what could be contained subsurface and subsequently disturbed during any excavations in the event of the proposed development of the project, provided is a quote which sums up the possibility of disturbing, or worse, destroying Aboriginal Cultural Heritage objects or sites;

  'Once discarded on the ground surface, artefacts are often readily incorporated into the topsoil horizons through the

2

Appendix 2

process of bioturbation. Most commonly, dense artefact deposits exist hidden beneath the upper surface, unobservable by the casual observer.' (c.f.Wandsnider and Camilli 1992; Fanning and Holdaway 2001).[1]

- Also another example we have been involved with personally was an AHIP was obtained to excavate an area of which was believed may produce a minimal amount of artefacts. One of the sections chosen was believed to be nothing more than a couple of shells visible on the surface. After starting the excavation attitudes were changed dramatically, the archaeologist admitting they would have stated beyond a shadow of doubt that it was only a couple of shells scattered on the surface. It was found we were within what would be considered a quite large midden site (but was not visible) and what resulted from this excavation was the collection of many artefacts along with an undisturbed and virtually intact hearth surrounded by stones lying about 2 and a half feet below the surface underneath about 2 feet of midden shells. If we had employed the fact that what we could see is the extent of what we may find, then we would never have uncovered such an important and Culturally significant site as we did.

  *******We then must reiterate again that just because there is low visibility or a small quantity of Aboriginal Cultural Heritage located or none at all, it does not mean the area is not rich in Aboriginal Cultural Heritage sites, objects or significance!!!**

- For us, the Cultural significance/value is not determined by how many artefacts are present in a particular area because whether it be one (an isolated find) or many artefacts (a scatter), they are all significant to us as these are a physical reminder of our People living within the context of this landscape and directly connects us physically to our Ancestors.

- We have been involved with several other assessments within this area in the mountains etc and they have proved to hide many more sites than is expected and this area is no exception!!

- This area is of significance to our People due to being located close to the mountains and the creeks that flow throw it. Also it can be seen that there are many sites positioned around the proposed project area some being rock shelters with deposit and a grinding groove sites which only indicate even more that there needs to be afforded the appropriate level of mitigation and protection so as not to destroy our Cultural Heritage that more than likely is concealed sub-surface.

Excavations/Ground Disturbance

- Within the draft report it states that there is potential for more Aboriginal archaeological sites to be located along the creek lines and other areas through the site.

  a. Therefore if there is the possibility that any disturbances to the proposed project development area from any subsurface excavations or ground disturbance works (including vegetation clearance/removal of trees etc/grading) could impact on Aboriginal Cultural Heritage we would suggest that it would be advantageous for the Aboriginal Stakeholders to be on site to monitor any clearing or soil disturbance within these areas.

- It has been demonstrated from the draft report that there are identified Aboriginal Cultural Heritage sites within close proximity to the area that is proposed for development and that it is most likely that there will be Aboriginal Cultural Heritage sites (which were not discovered during the survey/test excavations) that can and would be impacted/damaged or disturbed if excavations were to take place within this area without mitigation and management and monitoring and observation. It does not matter if they are in situ or not if they are going to be impacted they need to be found and recorded.

[1] ***Page 3, Hunter Water Stage 2 Aboriginal Heritage Assessment Shortland Street, Newcastle 5.1.1 Archaeological Potential. (ERM2009)***

3

Appendix 2

Baseline Recording and Monitoring of Sites

- There is an issue regarding Baseline Recording for all sites that may be subject to impacts from subsidence due to this mining process that is proposed. We believe that without proper recording data prior to undermining these areas and successive data updates by revisiting these sites during and after the mining process is finished will put at risk our sites of Cultural Significance.

- Therefore there is a need for all the Aboriginal Stakeholders again to be recognised in this regard and given the opportunity to be present for baseline recording and ongoing monitoring of all Cultural Heritage sites that may be impacted or the possibility of being impacted by the proposed mining activity within the Wallarah 2 Coal Project area.

Aboriginal Heritage Management Plan (AHMP)

- As set out on page 88 of the draft report regarding the AHMP there is an oversight in its current form and there is a need to include within the AHMP that the AHMP be prepared in consultation with the Aboriginal Stakeholders so that our concerns are addressed and the utmost protection afforded to our cultural heritage.

Intergenerational Equity

We believe that there has been a drastic oversight within this draft report again which noticeably fails to address the question of Intergenerational Equity. Where Cultural Heritage sites are compromised (of which they are going to be as stated in the draft report that there are grinding groove sites to which subsidence may cause cracking to occur) then there needs to be the question raised as to address the issue of Intergenerational Equity..

Where is the intergenerational equity for the possible destruction of our Cultural Heritage??

We must ask ourselves what is intergenerational Equity?? We see *Intergenerational Equity* as a provision for future generations to benefit from what has transpired in the past and to have been left as much as the previous generation.

Below are provided three (3) examples we have included quoted from international organisations/standards from around the world which explain what *Intergenerational Equity* represents;

a. ***Intergenerational equity**: A core proposition is that future generations have a right to an inheritance (capital bequest) sufficient to allow them to generate a level of well-being no less than that of the current generation. Also refers to fairness in the treatment of different members of the same generation.*[2]

b. ***Intergenerational equity:** Meeting the needs of the present without compromising the ability of future generations to meet their own needs.*[3]

c. ***Inter-generational equity:** The principle of equity between people alive today and future generations. The implication is that unsustainable production and consumption by today's society will degrade the ecological, social, and economic basis for tomorrow's society, whereas sustainability involves ensuring that future generations will have the means to achieve a quality of life equal to or better than today's.*[4]

Does WACJV think they adequately address ***Intergenerational Equity*** in their underground mining activities and the potential to impact our Cultural Heritage sites within that underground mining area?

- We would now like to solicit a response from WACJV in regard to these important questions below.

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[2] ***From Website 'www.traditionalknowledge.info/glossary.php'***

[3] ***From Website'www.konsult.leeds.ac.uk/public/level1/sec17/index.htm'***

[4] ***From Website'www.ic.gc.ca/eic/site/ee-ee.nsf/eng/h_ef00016.html'***

4

a. *What measures have been put in place within this draft report so as to address the issue of Intergenerational Equity in the event of possible damage or disturbance to our Cultural Heritage if potential surface impacts from subsidence eventuate?*
b. *How has and will WACJV address the question now of Intergenerational Equity for future generations of Awabakal and Guringai People?*

Suitable Offsets

- Suitable Offsets such as land should include the same site types as those deemed to be subject to possible impacts from the proposed mining operations within the project area; otherwise where is the Intergenerational Equity?

  a. Our question is, Where has this been done at this point in time? We see no evidence of this!

- A couple of other questions to ponder and address are;

  a. Where are suitable offsets addressed within this draft report considering the possible destruction of our Cultural Heritage sites??
  b. These are important issue concerning suitable offsets that we have not seen any mention of within this draft report but on the contrary, we have seen plenty of evidence to show that there will be impacts to our Cultural Heritage!!
  c. Why is it that there seems to be nothing to protect our Cultural Heritage and to leave something for those who are to come in the future but allows for if it is properly recorded beforehand (and considered low significance) it is ok for it then to be destroyed?? This is blasé to say the least!!

  Are these questions going to be adequately addressed in the report and any AHMP??? Or maybe not!

Conclusion

There are some very good points made in a number of the recommendations for management and mitigation of our Cultural Heritage sites but we do have various concerns regarding the content of the draft report and the ramifications a few of the proposed management and mitigation recommendations would have on several of our Cultural Heritage sites. We are of the opinion that the report overlooks important factors in regard to the management and mitigation of our Cultural Heritage and the inclusion and consultation with Aboriginal Stakeholders and it is our belief that serious consideration needs to be given in regard to reviewing some of the management and mitigation recommendations that this draft report is putting forward. These changes need to be implemented to afford as much protection as possible to any Cultural Heritage sites that may be put at risk regarding any subsidence impacts or surface facility works within the proposed project area.

Considering the information supplied it gives us no other option but to say up front that we cannot agree with the draft report in its current form and in our opinion there needs to be some fine tuning of the recommendations regarding mitigation and management of our Cultural Heritage in consultation with the Aboriginal Stakeholders before this draft report is finalised.

Also we would like to reiterate that our Cultural Heritage should be afforded as much protection as is possible and we do not agree with any mitigation or management recommendations that allows damage or disturbance of any kind to our Cultural Heritage.

Statement of significance of this area to Awabakal Descendants

It also must be remembered that the significance of place to our People does not just rely on the presence of artefacts, grinding grooves, scars or any visible evidence associated with the site or area. Although what does remain in the physical realm whether small or large, does connect us to our Ancestors and our Cultural Heritage being the physical reminder of what helped govern and guide the everyday lives of our people. With this physical evidence we can touch the very stones (artefacts) that they (our Ancestors) worked and fashioned into tools and implements. We can visit the sites they also visited and utilised and left us as reminders of their physical presence within the landscape that makes up our Traditional Country. Unfortunately in this day and age it has become too easy due to ignorance, lack of connection and insufficient understanding of the entire picture, not to mention so called progress, to devalue and debase our People and our Cultural Heritage which has belonged and survived in this area for thousands of years. The fact that this area is a contributing part of what makes us who we are

and where we come from cannot be defined just as something tangible. The feeling of the area and the extensive connection we have with it, the awareness of knowing this is a connection that is confined to just a handful of people living today because it was **OUR** Ancestors that walked upon it. This is sufficient enough for us to be resolute in knowing that we are part of the reason of what makes this place significant. Our people, the Awabakal, have for centuries looked after this area as part of our greater Traditional Tribal Country and we believe that in today's climate we as Awabakal Descendants need to continue to be involved in the Protection, Preservation, consultation and management issues that affect the Traditional Tribal Country of our Ancestors. We consider our involvement paramount and if neglected or overlooked in this process, we believe it is to the detriment of the community and the complete understanding of the Awabakal People and the wellbeing of the area in question. This land holds secrets which are significant to us, many stories from the past connect us to it and these stories will continue to live and be significant because they live in us and are what makes us by birthright, Awabakal People.

Therefore it is imperative that people understand that all of our Cultural Heritage is of great importance to our People, whether it is an isolated find or artefact scatters that are encountered, it is all significant. From the smallest to the largest they are all relevant. Then again, a place may be just as significant to us without any physical evidence or application or designation being placed upon it. A landscape as devoid of physical evidence as is common sense and morality by those who enforce or support much of the legislation that not always, but on many occasions, ultimately sees the demise of the very Cultural Heritage that they themselves have vowed to protect and through their much celebrated but sadly misplaced enthusiasm, is more than often overlooked on many occasions by those who should know better but unfortunately don't.

As outlined above this area is very significant to us as Awabakal People. These Cultural Heritage Values that remain around this area are a glimpse into the lives of our Ancestors and are paramount and integral to the future intergenerational equity and Cultural Heritage and Knowledge of our People, the Awabakal. It is where our People have lived for generations. Our Ancestors fought for centuries for the place they came from and all that had been passed down to them!! This today is the legacy we have inherited. We still fight to protect and preserve the integrity and uniqueness of the Awabakal People. We think of the future; will those to come endure and continue this generational legacy??

We thank you for the opportunity to provide our response and comments for this draft report and would ask for our response and comments to be added to the final report. We look forward to your reply and if you need further clarification regarding the information we have provided please don't hesitate to contact us at your earliest convenience. Our contact details are as follows.

NGI NOA
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***Cultural Heritage Sites** - Physical reminders of our Ancestors; once they are gone, they are gone forever and impossible to bring back!! **THINK** first and make **WISE** decisions last!!*

6