EPURON

JAMES BAILEY & ASSOCIATES
Environmental and Planning Consultants

APPENDIX I

ABORIGINAL CULTURAL AND HISTORIC HERITAGE REPORTS

BOWMANS CREEK **WIND FARM**
Response to Additional Information Request

View of the landscape in the north of the Project Boundary (2022).

REVISED

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

BOWMANS CREEK WINDFARM

BOWMANS CREEK, NSW

FEBRUARY 2022

Report prepared by

OzArk Environment & Heritage

for James Bailey and Associates

on behalf of

Epuron Projects Pty Ltd

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ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT COVER SHEET

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Address of Subject Area	Address: Albano Road, Bowmans Creek Local Government Area: Singleton, Muswellbrook, and Upper Hunter Shire LGA
Report prepared for	Company Name: James Bailey and Associates Contact Person: James Bailey Address: baileyassociates.com.au Email: jbailey@baileyassociates.com.au Phone: (02) 6536 2999
Date of Report	February 2022
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Ben Churcher, OzArk Environment & Heritage Principal Archaeologist

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Acknowledgement

OzArk acknowledge the traditional custodians of the land on which this assessment took place, and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

ABBREVIATIONS AND GLOSSARY

Aboriginal object	A statutory term, meaning: any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains' (s.5 NPW Act).
ACHAR	Aboriginal Cultural Heritage Assessment Report. As set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*, all developments where harm to Aboriginal objects is likely must be assessed in an ACHAR.
ACHCRs	*Aboriginal Cultural Heritage Consultation Requirements for Proponents.* Guidelines for conducting Aboriginal community consultation for developments where harm to Aboriginal objects is likely.
ACHMP	Aboriginal Cultural Heritage Management Plan
AHIMS	Aboriginal Heritage Information Management System. Administered by Department of Premier and Cabinet, AHIMS is the central register of all Aboriginal sites within NSW.
AHIP	Aboriginal Heritage Impact Permit
BP	Years before present
Code of Practice	*Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* under Part 6 NPW Act. Issued by DECCW in 2010, the Code of Practice is a set of guidelines that governs archaeological investigations in NSW.
DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement. A required document for state significant development documenting all potential impacts to the environment, including heritage, that may arise due to the development.
ETL	Electricity transmission line
GSE	Ground surface exposure
GSV	Ground surface visibility
HNSW	Heritage NSW. Government department tasked with ensuring compliance with the NPW Act. HNSW is advised by the Aboriginal Cultural Heritage Advisory Committee (ACHAC) and is part of the Department of Premier and Cabinet.

Impact	Refers to those impacts listed under s.86 and/or s.90 of the NPW Act, i.e. knowing damage, destruction, defacement of Aboriginal objects and Aboriginal places (s.90); disturbance, movement etc. of Aboriginal objects (s.86).
NPW Act	*National Parks and Wildlife Act 1974*. Primary legislation governing Aboriginal cultural heritage within NSW.
PAD	Potential archaeological deposit. Indicates that a particular location has potential to contain subsurface archaeological deposits, although no Aboriginal objects are visible.
RAP	Registered Aboriginal Party. An individual or group who have indicated through the ACHCR process that they wish to be consulted regarding the project.
SEARs	Secretary's Environmental Assessment Requirements issued by DPIE.

EXECUTIVE SUMMARY

Report background

This revised *Aboriginal Cultural Heritage Assessment Report* (ACHAR) incorporates and extends the ACHAR for the Bowmans Creek Wind Farm (the Project) finalised on 13 April 2021 and included in the Environmental Impact Statement (EIS).

The EIS was placed on exhibition between 31 March 2021 and 11 May 2021. During this period 167 submissions were received from stakeholders, including 19 from government agencies and 148 from members of the public. A Submissions Report (James Bailey & Associates 2021) has been prepared to respond to the issues raised by these stakeholders.

In addition to this, in response to submissions and further detailed planning, several refinements were made to the Project layout (Amended Project). This includes removing four wind turbine generators (WTGs), relocating three others, as well as removing sections of access tracks and power reticulation infrastructure, along with the minor repositioning of other lineal infrastructure, to reduce ecological, visual, and other impacts.

The Amended Project design has resulted in an overall decrease in the extent of ground disturbance that will be associated with the Project.

In response to these Project changes, OzArk prepared an *Appendix Technical Report: ACHAR* in September 2021 that presented predictive modelling for the unsurveyed areas and concluded that it is unlikely that sites of high significance would be recorded in the additional areas.

Following their review of the *Appendix Technical Report*, Heritage NSW (HNSW) advised on 21 October 2021 that unsurveyed land with a slope less than 10 degrees in the Survey Boundary required additional survey.

In 2022, Epuron Projects Pty Ltd engaged OzArk Environment & Heritage (OzArk) to survey those areas not assessed for the 2021 EIS and as defined by HNSW's letter.

This revised ACHAR has been updated to include the results of the additional survey in 2022 and to assess likely harm to Aboriginal cultural heritage from the Amended Project.

Project background

The Project includes seeking approval for the construction, operation, maintenance and decommissioning of the Project.

The Project is located at Bowmans Creek, approximately 10 kilometres east of Muswellbrook.

Epuron seeks State Significant Development (SSD) Development Consent approval under Division 4.7 of Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) for the Project (SSD 10315).

OzArk Environment & Heritage (OzArk) has been engaged by James Bailey & Associates Pty Ltd to provide specialist heritage assessment for the Project.

The current assessment follows the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales*. Field assessment and reporting followed the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*. The Aboriginal cultural heritage assessment of the proposal has followed the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.

Survey results

15 sites were recorded during the survey: eight artefact scatters with a low to moderate artefact density and seven isolated artefacts. There are also three previously identified sites recorded on the AHIMS database that are considered in this report.

Eight of these sites are within the Survey Boundary and may potentially be harmed by the Project (**Executive Summary Table 1**). The ten sites outside the Survey Boundary are either near the Survey Boundary or were recorded because of survey for Project components that are no longer part of the Project. The sites associated with Project components that no longer form part of the Project are now located at a distance to the current Survey Boundary.

Most sites were recorded in Survey Unit 2 which consists of lowland landforms in the south of the Survey Boundary or areas along Albano Road within the broad Bowmans Creek valley.

The fieldwork component of this assessment was undertaken by OzArk and members of the Registered Aboriginal Parties on:

- Fieldwork Session 1: 25–29 November 2019
- Fieldwork Session 2: 23–27 March 2020
- Fieldwork Session 3: 27 November 2020
- Fieldwork Session 4: 23 February 2021
- Fieldwork Session 5: 18–19 January 2022.

Impact assessment

The changes to the Survey Boundary for the Amended Project have resulted in some small changes to the likely impacts arising from the Amended Project and, therefore, the management required to ensure that Aboriginal cultural values are appropriately considered.

In summary, the ACHAR considers 18 sites (15 recorded during the survey and three previously recorded) in or near the Survey Boundary (**Executive Summary Table 1**). Of these, the Amended Project is likely to:

- Avoid harm to ten sites that are outside the Survey Boundary

- Harm five sites: total harm to two isolated finds, and partial harm to two artefact scatters and a potential archaeological deposit (PAD)
- Potentially harm two further sites, however, these sites (Coalhole Creek OS-01 and Liddell Power Station-IF1) have a high chance for avoidance through micro-siting components associated with the electricity transmission line (ETL)
- Avoid harm to ANT 22 that is within the Survey Boundary through management.

Including ANT 22 and the two sites that may be avoided in the ETL corridor, the Amended Project will avoid 13 known sites or 72 per cent of the sites considered for this ACHAR.

This is a decrease of impact as three sites that were identified in the 2021 ACHAR as likely to be harmed (Liddell Hebden Road OS-1, ANT 4, and Liddell Power Station-IF2) are now outside the Survey Boundary and will not be harmed by the Amended Project.

Further, one site that was listed in the ACHAR as likely to be totally destroyed (Hunter Gas Project PAD) is now considered as likely to be partially destroyed as it will only be impacted where ground disturbing components of the ETL will be sited, leaving all other areas of the potential archaeological deposit (PAD) intact.

Executive Summary Table 1: Aboriginal heritage management for the Project.

AHIMS ID. Site Name	Overall scientific significance of site	Likely harm from the Project	Management
37-3-1592. Liddell Hebden Road OS-01 (formerly LID34)	Low (isolated find)	Will not be harmed	Temporarily fence site if it is considered that it may be inadvertently impacted (the site is located approximately 50 m south of the Survey Boundary)
37-3-1593. Liddell Hebden Road IF-01 (formerly LID35)	Low (isolated find)	Will not be harmed	Located on the edge of the Survey Boundary. Temporarily fence site with high visibility fencing for the duration of works in the area
37-3-1594. Coalhole Creek OS-01	Low (low-density artefact scatter)	Avoid with project design	Within the Survey Boundary but with a high chance for avoidance if spanned. If cannot be avoided, manage as a Group 1 site (surface artefact collection)
37-3-1595. Bowmans Tributary OS-01	Low-Moderate (low-density artefact scatter with some potential for subsurface deposits)	Will not be harmed	No management required
37-3-1596 Bowmans Tributary IF-01	Low (low-density artefact scatter)	Will not be harmed	No management required
37-2-6043. Hillcrest OS-01	Low (low-density artefact scatter)	Will not be harmed	No management required
37-2-6044. Hillcrest OS-02	Low (low-density artefact scatter)	Will not be harmed	No management required
37-3-1587. Albano Road OS-01	Low (low-density artefact scatter)	Will not be harmed	Temporarily fence site
37-3-1588. Albano Road OS-02	Low-Moderate (low-density artefact scatter with some potential for subsurface deposits)	Partial harm	Conserve in landscape those portions of the site outside of the Survey Boundary. Apply Group 2 management (limited manual excavation) to those areas within the Survey Boundary

AHIMS ID. Site Name	Overall scientific significance of site	Likely harm from the Project	Management
37-3-1589. Albano Road OS-03	Low-Moderate (low-density artefact scatter with some potential for subsurface deposits)	Partial harm	Conserve in landscape those portions of the site outside of the Survey Boundary. Apply Group 2 management (limited manual excavation) to those areas within the Survey Boundary
37-3-1590. Albano Road IF-01	Low (isolated find)	Will not be harmed	Temporarily fence site
37-2-6263. Liddell Power Station-IF1	Low (isolated find)	Avoid with project design	Within the Survey Boundary but with a high chance for avoidance if spanned. If cannot be avoided, manage as a Group 1 site (surface artefact collection)
37-2-6541. Liddell Power Station-IF2	Low (isolated find)	Will not be harmed	Temporarily fence site
37-2-2021. ANT 4	Low (low-density artefact scatter)	Will not be harmed	No management required
37-2-2072. ANT 22	Low (very few or no tangible features). High cultural value as a potential ceremonial area	Avoid with project design	Installation of electricity poles and access tracks within 50 m of the site should be avoided. Any felling of trees that are necessary within this buffer should be hand cleared and machinery should not enter the 50 m exclusion zone
37-2-2029. Hunter Gas Project PAD	Low (assessed that there is a low potential for subsurface deposits)	Partial harm	Conserve in landscape those portions of the site outside of the project impacts. Apply Group 2 management (limited manual excavation) to those areas directly impacted
37-3-1632 Sandy Creek IF-1	Low (isolated find)	Likely to be harmed	Manage as a Group 1 site (surface artefact collection)
37-3-1633 Sandy Creek IF-2	Low (isolated find)	Likely to be harmed	Manage as a Group 1 site (surface artefact collection)

Conclusion

This investigation considers 18 sites: 15 newly recorded and three previously recorded sites. Eight of these sites are within the Survey Boundary (**Executive Summary Table 1**) and ten are outside the Survey Boundary and will not be harmed.

Of the eight sites that could potentially be harmed, it is recommended that harm to ANT 22 and to two further sites be avoided. If the management recommendations in relation to these sites (ANT 22, Coalhole Creek OS-01, and Liddell Power Station-IF1) are achievable, this report assumes that two sites (Sandy Creek IF-1 and Sandy Creek IF-1) will be totally harmed by the Project and three sites (Albano Road OS-02, Albano Road OS-03, and Hunter Gas Project PAD) will be partially harmed (n= 5; **Executive Summary Table 1**).

Therefore, with considered project design, 72 per cent of the known Aboriginal sites associated with the Project will be conserved within the landscape.

Recommendations concerning Aboriginal cultural values within the Survey Boundary are as follows:

1. As many sites as is possible should be avoided in the final design of the ETL. Further details on these potential avoidance measures are provided in **Section 9.2.1.1** and **Section 9.2.1.2**.
2. Those sites that can be avoided should be protected from inadvertent damage during the works by temporarily fencing the site as set out in **Table 9-3**.
3. Those sites that are not able to be avoided should be managed by the procedures set out in **Table 9-3**.
4. Before any works on the Project begin, an *Aboriginal Cultural Heritage Management Plan* (ACHMP), approved by the Department of Planning and Environment, and prepared in consultation with the Registered Aboriginal Parties, will need to be developed. The ACHMP will quantify the exact sites to be impacted, the methods by which they will be managed and the fate of any artefacts that are recovered prior to the works. The ACHMP will also provide a protocol for unanticipated finds and the discovery of human skeletal material.

PLAIN ENGLISH SUMMARY

The survey for the Bowmans Creek Wind Farm took place in five sessions in November 2019, March 2020, November 2020, February 2021, and January 2022.

The first session included four archaeologists from OzArk and four members of the Aboriginal community split into two teams. Fieldwork Session 2 included two OzArk archaeologists and two community members. Fieldwork Sessions 3 and 4 consisted of one team with one OzArk archaeologist and one community member. Fieldwork Session 5 consisted of one team with one OzArk archaeologist and two community members. This means that there was 70 person days of survey.

The survey was in the steep country north of Lake Liddell. Some significant 4WD skills were required to get around, and even then, you could only drive so far, and the rest had to be walked.

With effort, the teams got to all the crests where the turbines are proposed to be located. The teams also sampled other Project components including many access tracks, electricity lines and areas where facilities will be constructed.

The result of all this effort was a little surprising as only two Aboriginal sites, both isolated finds, were recorded anywhere in the Project Boundary. While we did not expect too much in this steep country, there were also small areas where the terrain was flatter and where there was water nearby such as the headwaters of Bowmans Creek; but even these generally failed to record sites.

It was only when the team was either in the much broader valley around Bowmans Creek where Albano Road is, or once the teams got out of the hills and down on to the flat valley floor that the sites started to be recorded. Even then there was not a great number, but it was clear that the camp sites were not up in the hills but down where access was easier.

Additional to the three already recorded AHIMS sites, 15 Aboriginal sites were recorded during the survey: eight artefact scatters and seven isolated finds. These sites were mostly recorded in areas associated with the electricity line to the Liddell Power Station and areas where existing roads need to be widened.

Adding the two together—the newly recorded and the previously recorded—there are 18 sites under consideration. Of these 18 sites, ten are outside of the Survey Boundary and will not be harmed. The remaining eight sites are within the Survey Boundary and could be harmed, however, while five sites will be impacted to some degree, three sites are likely to be avoided through project design. One of these sites is ANT 22 that is registered as a 'ceremonial ring' or Bora Ring that was recorded north of Lake Liddell in 2006. This site is within the Survey Boundary, but it is recommended that direct impacts to this site be avoided by a 50 metre buffer being established around the AHIMS coordinates. It is noted in this report that overhead electricity wires spanning the site will not impact the potential tangible and intangible values of the site.

If ANT 22 and a further two sites can be avoided through project design, there are five sites that could be impacted.

If sites can be avoided, the recommendation is to fence the site during construction so that the site is not inadvertently impacted.

If a site will be impacted, then it will be salvaged either through a collection of surface artefacts, or by limited archaeological excavation. All the salvage procedures, as well as the final count of sites to be impacted, will be contained in a management plan that the Aboriginal community will get the opportunity to see and comment on following Project approval.

While the loss of any site is regretful, to have such a relatively small impact from such a large project that will bring good environmental outcomes has been a real positive from the assessment.

OzArk thanks those who were involved in the survey, as well as those involved through the consultation process, and appreciates the various contributions that have aided our understanding of the cultural values of the Project Boundary.

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1 INTRODUCTION

1.1 PROJECT OUTLINE

Epuron Projects Pty Ltd (Epuron) is seeking approval for the construction, operation, maintenance and decommissioning of the Bowmans Creek Wind Farm (the Project).

The Project is located at Bowmans Creek, approximately 10 kilometres (km) east of Muswellbrook and 120 kilometres (km) from the Port of Newcastle in NSW (**Figure 1-1**).

Epuron seeks State Significant Development (SSD) Development Consent approval under Division 4.7 of Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) for the Project (SSD 10315). Epuron also seeks an Approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The two Applications are supported by the 'Bowmans Creek Wind Farm Environmental Impact Statement' (EIS) (Hansen Bailey 2021). The 2021 version of this assessment supported the EIS that was placed on exhibition between 31 March 2021 and 11 May 2021. During this period 167 submissions were received from stakeholders, including 19 from government agencies and 148 from members of the public. A Submissions Report (James Bailey & Associates 2021) has been prepared to respond to the issues raised by these stakeholders.

In addition to this, in response to submissions and further detailed planning, several refinements were made to the Project layout (Amended Project; henceforth referred to as the Project). This includes removing four wind turbine generators (WTGs), relocating three others, as well as removing sections of access tracks and power reticulation infrastructure, along with the minor repositioning of other lineal infrastructure, to reduce ecological, visual, and other impacts.

The amended Project design has resulted in an overall decrease in the extent of ground disturbance that will be associated with the Project.

The Project extends predominantly across two Local Government Areas (LGAs), being the Muswellbrook and Singleton Council LGAs. A small number of turbines are additionally proposed in the Upper Hunter Shire LGA.

The Project will generally involve the construction, operation, maintenance, and decommissioning comprised of:

- Up to 56 wind turbine sites consisting of:
    - A three-blade rotor mounted onto a tubular tower
    - Crane hardstand area
    - Turbine laydown area.

- Electricity infrastructure:
    - Up to two substations
    - A 330kv transmission line (with above and underground components) to transmit the generated electricity into the existing TransGrid network
    - Connections between the wind turbines and the substations, which will include a combination of underground reticulation cables and overhead powerlines.
- Ancillary infrastructure:
    - Operation and Maintenance Facility (O&M Facility)
    - Construction compound and storage facilities
    - Unsealed access tracks within the Project Boundary
    - Ongoing use of existing and additional monitoring masts and other monitoring
    - Temporary construction facilities (including concrete batching plant, laydown areas and rock crushing facilities).
- Minor upgrades to the road network to facilitate delivery of oversized loads (such as wind turbine components) to the Project
- Administrative activities (including boundary adjustments and subdivisions).

The conceptual project layout is shown on **Figure 1-2**.

This assessment generally applies to the Project Boundary unless otherwise stipulated in this assessment and the EIS Project Description.

In the Amended Project redesign, the following changes were made:

- Deletion of four WTGs, including WTG 10, 33, 60 and 61, hence a reduction from 60 WTGs to 56 WTGs
- Re-siting of WTG 8, 9, and 32
- Minor adjustments of several WTGs (micro siting up to 100 m)
- Removal and relocation of site access tracks because of changes to the WTG layout and in response to individual landholder concerns
- A 10.4 km net reduction in underground power reticulation
- A 13.5 km net reduction in overhead power reticulation
- An overall reduction of project disturbance footprint of approximately 97.6 hectares (ha).

While the Amended Project has reduced the impact area, there were areas that are proposed for impact that were not surveyed for the EIS. These areas are:

1. A 1.6 km portion of Albano Road in the north of the Project Boundary
2. A new access track in the north of the Project Boundary that extends for approximately 4.5 km
3. A new corridor for overhead electricity reticulation in the north of the Project Boundary that extends for approximately 3.6 km
4. A new access track in the centre of the Project Boundary that extends for approximately 2.2 km
5. A new corridor for overhead electricity reticulation in the centre of the Project Boundary that extends for approximately 650 m
6. A new access track in the centre of the Project Boundary that extends for approximately 760 m
7. A new access track to the north of the O&M facility that extends for approximately 1.3 km
8. A new portions of access track in the east of the Project Boundary that extend for a total of approximately 3 km.

Figure 1-3 shows the additional areas numbered according to the list above. Each of these areas will be discussed in more detail in this report. All other additional areas are very close to areas previously surveyed and are not considered a major addition to the areas already surveyed.

Within the Project Boundary, the Survey Boundary incorporates conservative buffers around all Project components (including turbine locations to allow for micro-siting). Therefore, the Survey Boundary encompasses all areas that may be disturbed by the Project.

Within the Survey Boundary, a Disturbance Area has been defined for the purposes of relevant assessments and represents the maximum hectares to be directly impacted by the Project.

The three major boundaries that will be used in this report are set out below:

- Project Boundary defines the Project Site and includes all the main Project components apart from the electricity transmission line (ETL) to the Liddell Power Station. The Project Boundary covers an area of approximately 16,720 ha
- Survey Boundary defines the area that was assessed in which all Project impacts will be located, including the ETL. The Survey Boundary covers an area of approximately 1,193 ha
- Disturbance Area defines the area where it is currently planned that disturbance will occur. The Disturbance Area is within the Survey Boundary and covers an area of approximately 417 ha (including the Transport Route Disturbance).

Figure 1-1: Regional context of the Project Boundary.

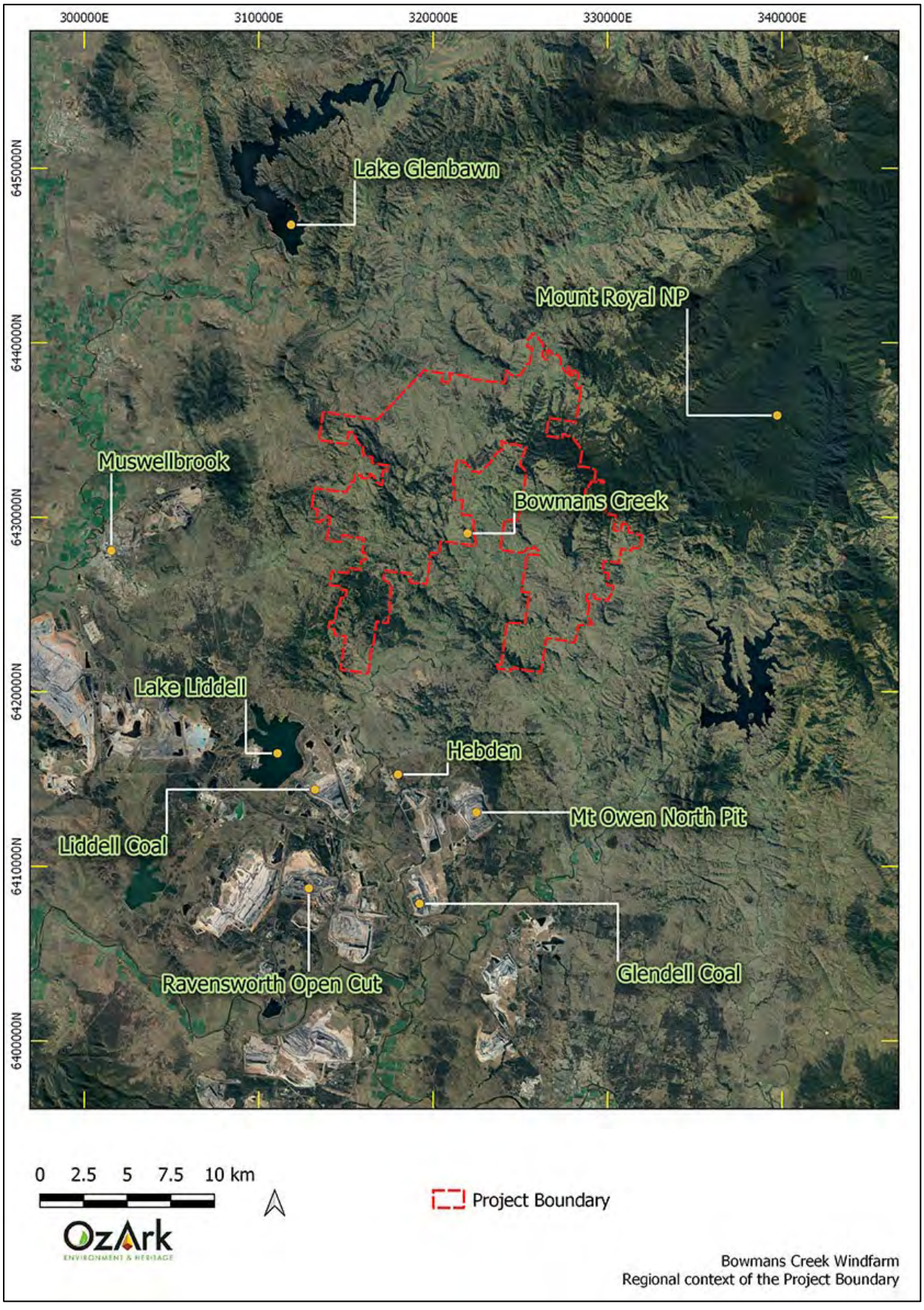


Figure 1-2: Conceptual project layout.

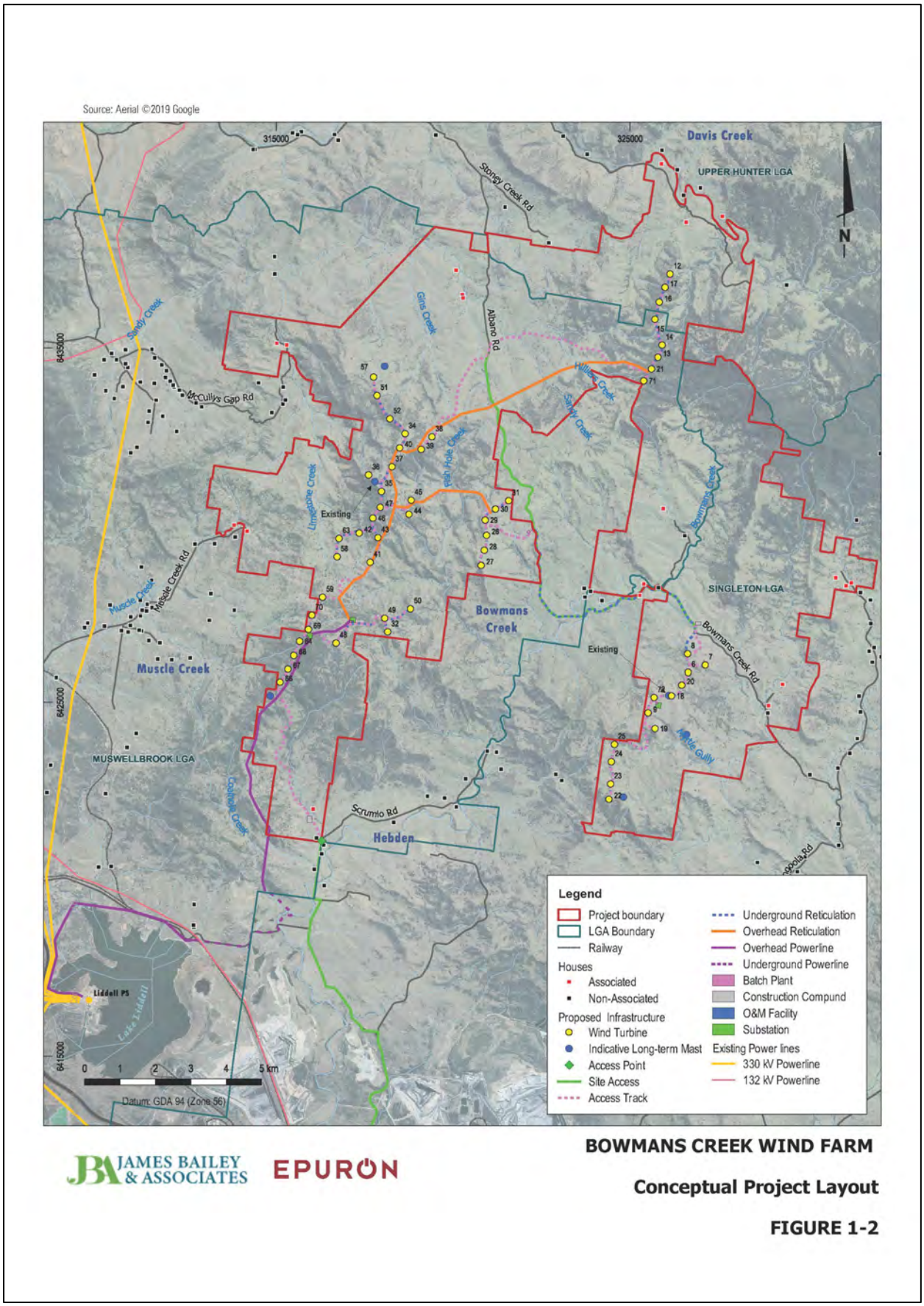
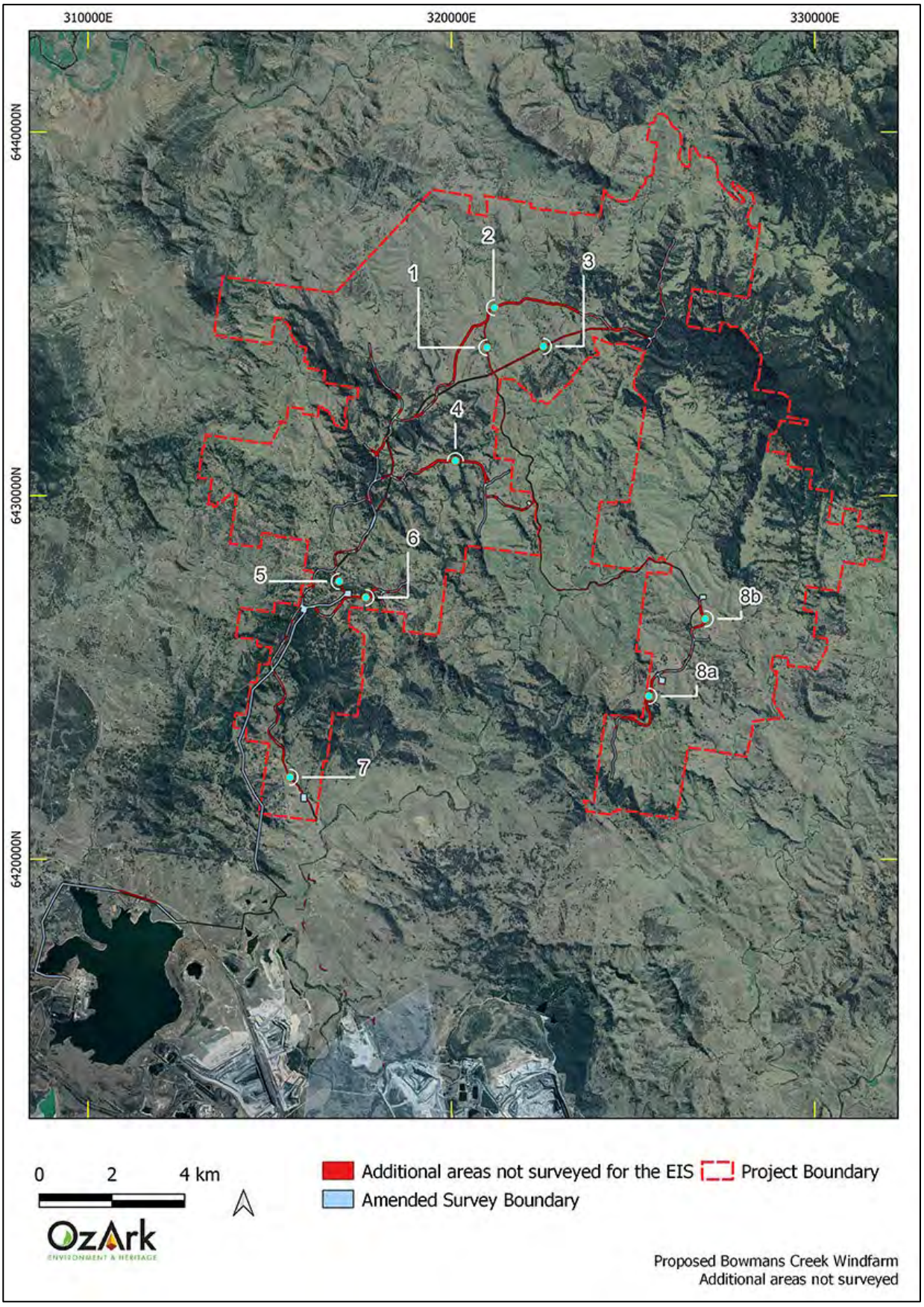


Figure 1-3: Major additional areas not initially surveyed for the EIS.



1.2 LOCATION OF THE PROJECT BOUNDARY

Mount Royal National Park is located at least 5 km to the northeast of the Project Boundary. Lake St Clair is over 10 km to the southeast and Lake Liddell over 6 km to the southwest of the Project Boundary. Project components within the Project Boundary are at greater distances from these localities. The southern-most part of Glenbawn Dam is over 15 km from the closest proposed turbine. The Project Boundary is shown within its regional context on **Figure 1-1**.

There are a number of rural communities in proximity to the Project Site including: Hebden, Muscle Creek, McCully's Gap, Rouchel Brook, Bowmans Creek, and Goorangoola.

The Project Site and surrounding area is used for farming and grazing operations. The region supports a number of active coal mines and two coal fired power stations. Historically, a number of mineral exploration licences have been granted over the Project Site, however, there are no current active exploration licences.

The Project is located primarily on freehold land within and adjacent to agricultural areas. There are a number of small parcels of Crown land within the Project Boundary.

Generally, the wind turbines have been positioned along a series of ridges running north–south.

1.3 SURVEY BOUNDARY

The Survey Boundary is generally located within steep hills overlooking the flat valley floor of the Hunter Valley, although a portion is on the flatter landforms around Lake Liddell (**Figure 1-4**). In the south the elevation is around 140 metres (m) above sea level while some of the turbine locations further north are at an elevation of greater than 700 m above sea level (**Figure 1-5**). The defining characteristic of the topography within the Survey Boundary is the very sharp local increase in elevation meaning that many of the hillslopes can only be walked up with difficulty. While the ridges generally tend north–south, they are only rarely a continuous ridge which one could imagine being utilised as a transit route by traditional Aboriginal groups. Instead the impression is of separated steep hills either rising from narrow V-shaped valleys or being connected by thin swales.

Disturbances across most of the Survey Boundary in the north is limited to the agricultural land use of the area and is primarily limited to vegetation clearing, soil loss and the construction of farm infrastructure such as fences.

In the south where the Survey Boundary reaches the valley floor, the terrain is more level. However, in this portion of the Survey Boundary the disturbances increase from activities associated with mining, infrastructure construction (roads and railway), the creation of Lake Liddell, and the construction and use of the Liddell Power Station.

The landforms throughout the Survey Boundary are either cleared and used for grazing or have been cleared at some time in the past although now trees have regenerated. Only the steepest slopes retain pockets of native vegetation.

Figure 1-4: Aerial showing the Survey Boundary.

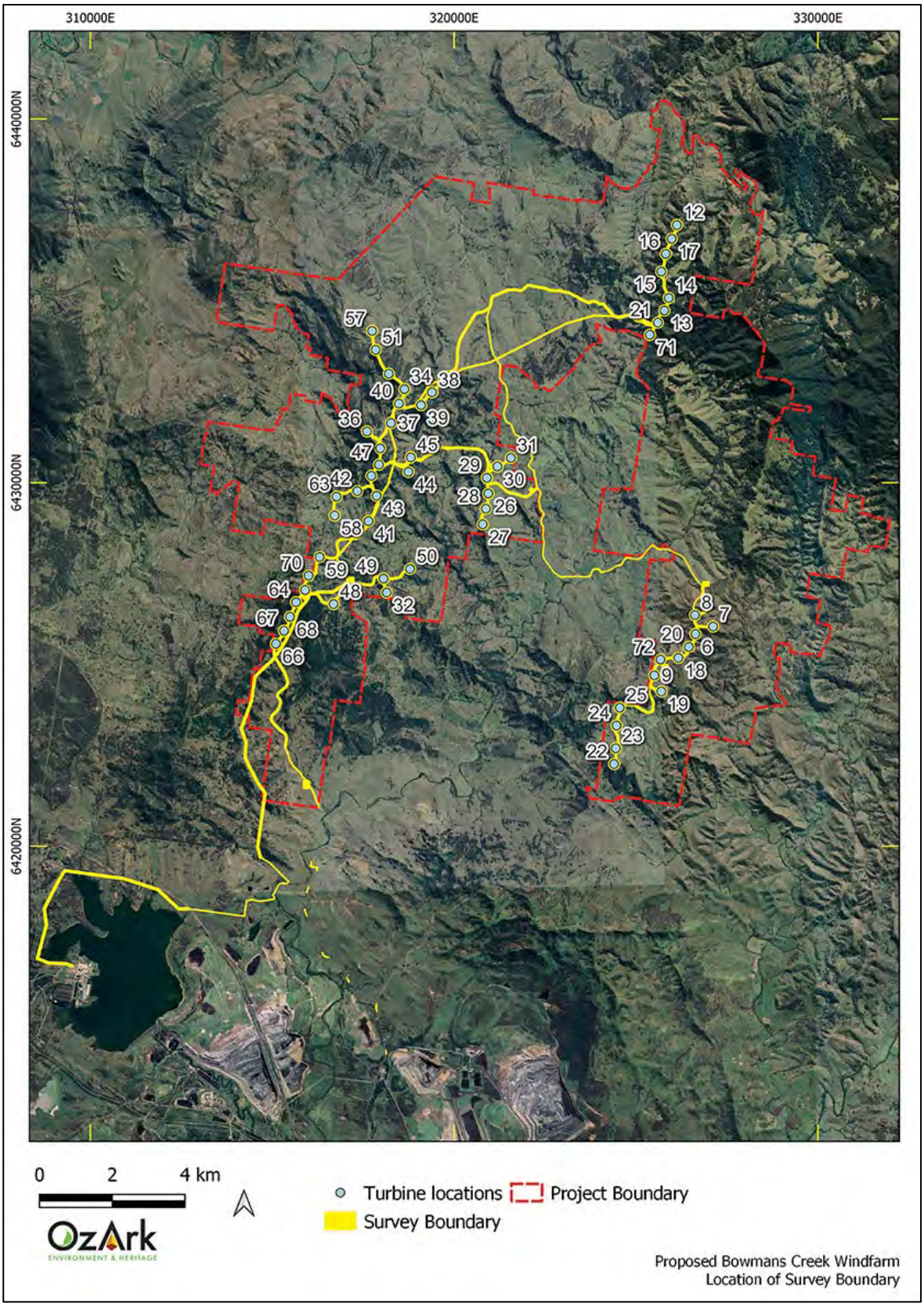


Figure 1-5: Views of the Survey Boundary.

1. Landscape around Turbine 14 in the north of the Survey Boundary.

2. Landscape around Turbine 49 in the west of the Survey Boundary.

3. Landscape in the north of the Survey Boundary traversed by the access track to Turbine 71.

4. Headwaters of Bowmans Creek in the northeast of the Survey Boundary.

5. Landscape along the ETL approaching the valley floor.

6. View of the route of the ETL on the valley floor.

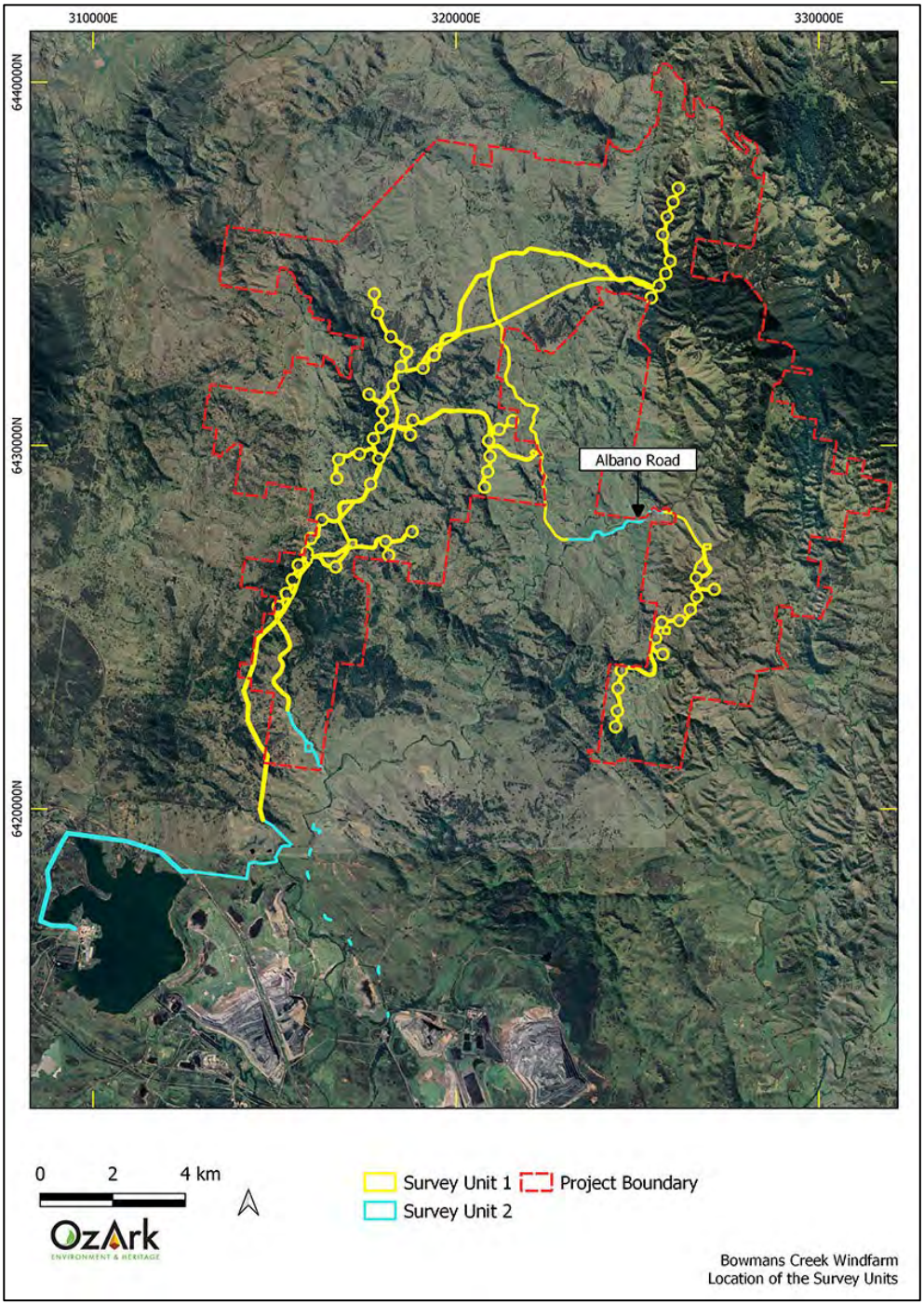
1.4 SURVEY UNITS

Due to the spread-out nature of the Survey Boundary it is not possible to differentiate changes in landform on a micro level.

The only realistic division is between the hill and valley landforms in the north of the Survey Boundary (Survey Unit 1) and the lowland landforms in the south of the Survey Boundary (Survey Unit 2). Survey Unit 2 also included the areas along Albano Road that is situated in a broad valley on either side of Bowmans Creek.

This report will refer to these survey units that are shown on **Figure 1-6**.

Figure 1-6: Aerial showing the survey units.



1.5 PROPOSED IMPACTS

The Survey Boundary is the area that the surface assessment applies to. Within the Survey Boundary is the Disturbance Area that is currently estimated to include 417 ha (including the Transport Route Disturbance).

The Survey Boundary includes:

- 150 m from centre of each turbine
- 20 m or 50 m from access tracks (i.e. 10 or 25 m from centre)
- 60 m from ETL/Overhead Reticulation routes
- 30 m (i.e. 15 m from centre) of the underground portion of the ETL
- 20 m buffer around Facilities such as substations
- 2 m (i.e. 1 m from centre) for the Underground Reticulation route.

Auxiliary facilities generally include:

- Operation and Maintenance Facility (O&M Facility) contains offices, car parking and amenities located between Turbine 48 and 49
- Three Concrete Batching Plants. One near Turbine 69, one near Turbine 72, and one adjacent to Albano Road
- Rock Crushing Facility involves mobile equipment located at each second turbine. Used during construction hours except when pouring concrete and lifting
- Two Construction Compounds, one located near the south-western corner of the Project Boundary, and one located near Turbine 8 adjacent to Bowmans Creek Road
- Up to two substations with one located near Turbine 69 (option 1a) or between Turbine 48 and 49 (option 1b), and one located near Turbine 72 (option 2).

The turbine maximum height (blade tip height) will be 220 m. Turbine foundation construction causes high, localised impacts. To assist with the visualisation of the degree of impact associated with transporting turbines to their location and the construction of the turbines themselves, a number of indicative photos are included on **Figure 1-7**. These photos indicate that most of the Survey Boundary surrounding turbine locations could be impacted to some degree, either from the excavation of turbine foundations, or from impacts associated with soil stockpiles, material laydown and construction vehicle use.

Similarly, the construction of access tracks to turbine locations involves localised impact. The tracks must be wide enough to allow use by extra-long loads, and in hilly topography such as the Survey Boundary, this involves substantial cut and fill. Any activities associated with access tracks is accounted for in the Survey Boundary.

Project elements such as the ETL and the Overhead Reticulation can also result in substantial localised impact if benches need to be cut to allow construction and stringing equipment to be used safely. These elements also require access tracks, albeit not as substantial as those servicing turbine locations.

The underground portion of the ETL will either be trenched or underbored. The underbored sections will pass beneath streams and avoid the need for disturbance of stream beds or banks, whereas trench crossings will involve temporary disturbance during construction.

Figure 1-7: View of wind turbine transport and construction (various sources).

1. A view of impacts associated with the construction of turbine foundations (Photo source: Engineers Australia: *Design and Construction*. *Aspects of Foundations for Onshore Wind Turbines*).

2. Construction of the turbine foundations involves a localised impact including the area of foundations, as well as soil stockpiles and construction vehicle parking areas (photo source: Vestas, Collector Wind Farm, NSW).

3. Transporting the turbine elements requires substantial access tracks given the length of the components being transported (photo source: Goldwind. Cattle Hill Wind Farm, Tasmania).

4. A view of the blades being attached to the turbine hub. Note the area needed for material laydown and construction vehicle, such as the crane, and parking (photo source: Vestas, Collector Wind Farm, NSW).

2 THE ARCHAEOLOGICAL ASSESSMENT

2.1 DATE OF ARCHAEOLOGICAL ASSESSMENT

The fieldwork component of this assessment was undertaken by OzArk on:

- Fieldwork Session 1: 25–29 November 2019
- Fieldwork Session 2: 23–27 March 2020
- Fieldwork Session 3: 27 November 2020
- Fieldwork Session 4: 23 February 2021
- Fieldwork Session 5: 18–19 January 2022.

2.2 OZARK INVOLVEMENT

2.2.1 Field assessment

Fieldwork Session 1 consisted of two teams of two OzArk archaeologists in each team. Fieldwork Session 2 consisted of one team of two OzArk archaeologists. Fieldwork Session 3 and 4 consisted of one team with one OzArk archaeologist.

The fieldwork component of the heritage assessment was undertaken by:

- Fieldwork Session 1
    - Fieldwork Director: Ben Churcher (OzArk Principal Archaeologist, BA[Hons], Dip Ed)
    - Archaeologist: Stephanie Rusden (OzArk Senior Archaeologist, BS University of Wollongong, BA University of New England)
    - Archaeologist: Dr Alyce Cameron (OzArk Senior Archaeologist, BA [Hons] and PhD [Archaeology & palaeoanthropology] Australian National University)
    - Archaeologist: Kirwan Williams (OzArk Project Archaeologist, BA University of Queensland).
- Fieldwork Session 2
    - Fieldwork Director: Dr Alyce Cameron
    - Archaeologist: Kirwan Williams.
- Fieldwork Session 3
    - Fieldwork Director: Stephanie Rusden
- Fieldwork Session 4
    - Fieldwork Director: Stephanie Rusden.
- Fieldwork Session 5

- Fieldwork Director: Ben Churcher.

2.2.2 Reporting

The reporting component of the heritage assessment was undertaken by:

- Report Author: Ben Churcher
- Contributor: Stephanie Rusden
- Reviewer: Dr Alyce Cameron.

2.3 RELEVANT LEGISLATION

Cultural heritage is managed by several state and national Acts. Baseline principles for the conservation of heritage places and relics can be found in the *Burra Charter* (Burra Charter 2013). The *Burra Charter* has become the standard of best practice in the conservation of heritage places in Australia, and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The *Burra Charter* generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a state level.

Several Acts of parliament provide for the protection of heritage at various levels of government.

2.3.1 State legislation

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

This Act established requirements relating to land use and planning. The framework governing environmental and heritage assessment in NSW is contained within the following part of the EP&A Act:

- Part 4: Local government development assessments, including heritage. May include schedules of heritage items
    - Division 4.7: Approvals process for State Significant Development (SSD).

Section 4.41 of the EP&A Act notes that approvals for an Aboriginal heritage impact permit under Section 90 of the *National Parks and Wildlife Act 1974* are not required. It is normally a condition of approval for SSD projects that Aboriginal heritage be managed under an Aboriginal Cultural Heritage Management Plan (ACHMP).

Secretary's Environmental Assessment Requirements

The Planning Secretary's Environmental Assessment Requirements (SEARs) were issued for SSD 10315 on 23 July 2019.

In relation to Aboriginal heritage, the SEARs state:

The EIS must:

- assess the impact to Aboriginal cultural heritage impact under the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) and the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010)
- provide evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010)

Compliance with the SEARs has governed the survey and reporting of the Project and this report contains all evidence of consultation with the Aboriginal community.

National Parks and Wildlife Act 1974 (NPW Act)

Amended during 2010, the NPW Act provides for the protection of Aboriginal objects (sites, objects, and cultural material) and Aboriginal places. Under the Act (Part 6), 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 NSW, 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 NPW Act as an area which has been declared by the Secretary 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 NPW Act 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, such as:

- 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 Secretary of the Department of Premier and Cabinet of the location of an Aboriginal object. Identified Aboriginal items and sites are registered on Aboriginal Heritage Information Management System (AHIMS).

2.3.2 Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act, administered by the Commonwealth Department of Agriculture, Water and the Environment, provides a framework to protect nationally significant flora, fauna, ecological communities, and heritage places. The EPBC Act establishes both a National Heritage List and Commonwealth Heritage List of protected places. These lists may include Aboriginal cultural sites or sites in which Aboriginal people have interests. The assessment and permitting processes of the EPBC Act are triggered when a proposed activity or development could potentially have an impact on one of the matters of national environment significance listed by the Act. Ministerial approval is required under the EPBC Act for proposals involving significant impacts to national/commonwealth heritage places.

Other Commonwealth Acts

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* is aimed at the protection from injury and desecration of areas and objects that are of significance to Aboriginal Australians. This legislation has usually been invoked in emergency and conflicted situations.

2.3.3 Applicability to the Project

The Project will be assessed under Part 4 Division 4.7 of the EP&A Act.

Any Aboriginal sites within the Survey Boundary are afforded legislative protection under the NPW Act.

It is noted there are no Commonwealth or National heritage listed places within the Survey Boundary, and as such, the heritage provisions of the EPBC Act and other Commonwealth Acts do not apply.

2.4 ASSESSMENT APPROACH

The current assessment follows the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) and the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010).

2.5 PURPOSE AND OBJECTIVES

The purpose of the current study is to identify and assess heritage constraints relevant to the Project.

2.5.1 Aboriginal archaeological assessment objectives

The current assessment will apply the Code of Practice in the completion of an Aboriginal archaeological assessment to meet the following objectives:

Objective One: Undertake background research on the Project Boundary to formulate a predicative model for site location within the Survey Boundary

Objective Two: Identify and record objects or sites of Aboriginal heritage significance within the Survey Boundary, as well as any landforms likely to contain further archaeological deposits

Objective Three: Assess the likely impacts of the Project to Aboriginal cultural heritage and provide management recommendations.

2.6 REPORT COMPLIANCE WITH THE CODE OF PRACTICE

The Code of Practice establishes requirements that should be followed by all archaeological investigations where harm to Aboriginal objects may be possible. **Table 2-1** tabulates the compliance of this report with the requirements established by the Code of Practice.

Table 2-1: Report compliance with the Code of Practice.

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 1	Review previous archaeological work	*See subsections below*
Requirement 1a	Previous archaeological work	**Section 5**
Requirement 1b	AHIMS searches	**Section 5.3.1**
Requirement 2	Review the landscape context	**Section 4**
Requirement 3	Summarise and discuss the local and regional character of Aboriginal land use and its material traces	**Section 5.4**
Requirement 4	Predict the nature and distribution of evidence	*See subsections below*
Requirement 4a	Predictive model	**Section 5.5**
Requirement 4b	Predictive model results	**Section 5.5.8**
Requirement 5	Archaeological survey	*See subsections below*
Requirement 5a	Survey sampling strategy	**Section 6.1**
Requirement 5b	Survey requirements	This Requirement was fulfilled during the undertaking of the survey
Requirement 5c	Survey units	**Section 1.4**
Requirement 6	Site definition	**Section 5.5.8**
Requirement 7	Site recording	*See subsections below*
Requirement 7a	Information to be recorded	This Requirement is fulfilled in this report.
Requirement 7b	Scales for photography	All artefact photographs employed a centimetre scale bar.
Requirement 8	Location information and geographic reporting	*See subsections below*
Requirement 8a	Geospatial information	All artefact locations were logged using a non-differential handheld GPS.
Requirement 8b	Datum and grid coordinates	All coordinates are provided in GDA Zone 56.
Requirement 9	Record survey coverage data	**Section 6.3**
Requirement 10	Analyse survey coverage	**Section 6.3**
Requirement 11	Archaeological Report content and format	This report adheres to this Requirement.

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 12	Records	OzArk undertakes to maintain all survey records for at least five years.
Requirement 13	Notifying OEH (now HNSW) and reporting	*See subsections below*
Requirement 13a	Notification of breaches	Not applicable
Requirement 13b	Provision of information	Not applicable
Requirement 14	Test excavation which is not excluded from the definition of harm	Not applicable as test excavation was not required.
Requirement 15	Pre-conditions to carrying out test excavation	*See subsections below*
Requirement 15a	Consultation	Not applicable as test excavation was not required.
Requirement 15b	Test excavation sampling strategy	Not applicable as test excavation was not required.
Requirement 15c	Notification	Not applicable as test excavation was not required.
Requirement 16	Test excavation that can be carried out in accordance with this Code	*See subsections below*
Requirement 16a	Test excavations	Not applicable as test excavation was not required.
Requirement 16b	Objects recovered during test excavations	Not applicable as test excavation was not required.
Requirement 17	When to stop test excavations	Not applicable as test excavation was not required.

3 ABORIGINAL COMMUNITY CONSULTATION

3.1 ABORIGINAL COMMUNITY CONSULTATION

The Aboriginal cultural heritage assessment of the proposal has followed the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs) (DECCW 2010b). A log of correspondence with Aboriginal community stakeholders is presented in **Appendix 1**.

The ACHCRs include four main stages, and these are detailed in the following sections.

3.1.1 ACHCRs Stage 1

The aim of Stage 1 is to identify the Registered Aboriginal Parties (RAPs) who wish to be consulted about the Project.

An advertisement requesting registrations of interest in the proposal was placed in the *Hunter Valley News* printed on 18 September 2019 (**Appendix 2 Figure 1**).

A list of Aboriginal groups with interest in the Project was obtained by writing to the following agencies on 16 September 2019: Department of Planning, Industry and Environment (DPIE, now Heritage NSW [HNSW]); Wanaruah Local Aboriginal Land Council; Office of The Registrar, ALRA; National Native Title Tribunal; NTSCORP; Upper Hunter Shire Council; Muswellbrook Shire Council; Singleton Council; Hunter Local Land Services (**Appendix 2 Figure 2**). Aboriginal community members and organisations whose names were obtained from the agencies were notified of the proposed project in writing on 18 September 2019 and provided with at least 14 days to register interest (**Appendix 2 Figure 3**). Registrations were received from the following groups or individuals (hereafter referred to as the RAPs):

- A1 Indigenous Services
- Aliera French Trading
- Amanda Hickey - AHCS
- Cacatua Culture Consultants
- David Horton
- Gidawaa Walang & Barkuma Neighbourhood Centre
- Glen Morris
- Hunter Valley Aboriginal Corporation
- Hunters & Collectors
- Kevin Duncan
- Lower Hunter Aboriginal Incorporated

- Merrigarn Indigenous Corporation
- Muragadi Heritage Indigenous Corporation
- Murra Bidgee Mullangari Aboriginal Corporation
- Nunawanna Aboriginal Corporation
- Plains Clans of the Wonnarua People (PCWP)
- Stakeholder 1
- Stephen Talbott
- Tocomwall Pty Limited
- Ungooroo Aboriginal Corporation
- Upper Hunter Wonnarua Council Inc
- Wallagan Cultural Services
- Wanaruah Local Aboriginal Land Council
- Widescope Indigenous Group Pty Ltd
- Wonn 1 Contracting
- Wonnarua Nation Aboriginal Corporation
- Yinarr Cultural Services.

The names of two RAPs who originally registered for the Project but unfortunately are now deceased have been removed from this list. A stakeholder who did not wish to have their name included is identified as 'Stakeholder 1'.

3.1.2 ACHCRs Stages 2 and 3

The aim of Stages 2 and 3 is provide information about the proposal to the RAPs and to acquire information regarding Aboriginal cultural values associated with the proposal either through consultation and/or field work. Often these two stages are run together, and the detailed project information is provided in the assessment methodology that is issued to all RAPs for their consideration.

The Stage 2/3 document (**Appendix 2 Figure 4**, **Appendix 2 Figure 5**) was sent to RAPs on 18 October 2019 with a closing date of 18 November 2019. In the cover letter attached to the survey methodology for the Project RAPs were asked to identify whether any Aboriginal cultural values exist in the Survey Area that should be incorporated into the survey methodology.

The original survey methodology did not include a proposed powerline easement extending from the Project Boundary to Liddell Power Station in the south. As such, an addendum survey

methodology was prepared to inform all RAPs that the powerline easement had been added to the Survey Boundary and that it would be surveyed soon (**Appendix 2 Figure 6**). This amended methodology was sent to all RAPs on 24 February 2020 with a further review period of 21 days.

3.1.2.1 Stage 2/3 feedback

Four responses to the Stage 2/3 survey methodology were received. None of the responses required changes to be made to the survey methodology (**Table 3-1**).

Table 3-1: RAP responses to the Stage 2/3 survey methodology.

Date	Individual/Organisation	Response received
19.10.19	Deceased	Rebecca Hardman (RH) received email confirming no concerns with Stage 2 methodology
21.10.19	Wonnarua Nation Aboriginal Corporation	RH received thanks
21.10.19	Muragadi Heritage Indigenous Corporation	RH received email agreeing with the recommendations in the methodology. Also noting they have recently moved back to the area
25.10.19	A1 Indigenous Services	RH received email supporting the methodology and noting they would like to be involved in fieldwork

Five responses to the addendum Stage 2/3 survey methodology were received. None of the responses required changes to be made to the addendum survey methodology (**Table 3-2**).

Table 3-2: RAP responses to the addendum Stage 2/3 survey methodology.

Date	Individual/Organisation	Response received
27.2.20	Widescope Indigenous Group Pty Ltd	Rebecca Hardman (RH) received email: *I have reviewed and support the addendum survey methodology of a powerline easement being added to the survey area.*
1.3.20	A1 Indigenous Services	RH received response: *I have reviewed the document and support the additional survey area Excavation Methodology for the Bowmans Creek Wind Farm Powerline Easement.* *A1 would like to be involved in any future field work, or Meetings*
2.3.20	Aliera French Trading	RH received email: *I have no further comment on the methodology for the additional survey area as I have not been out on site up to this point.* *I would however like to express my interest in being included on the roster for fieldworks. Can you please advise if there are any forms I need to complete to be included in the fieldwork for this project.*
3.3.20	Muragadi Heritage Indigenous Corporation	RH received response: *I have read the project information and additional survey area (addendum) for the above project, I agree with the recommendations made.*
3.3.20	Murra Bidgee Mullangari Aboriginal Corporation	RH received response: *I have read the project information and additional survey area notes, I endorse the recommendations made.*

3.1.3 ACHCRs Stage 4

Stage 4 involves the production of a draft ACHAR that is issued to all RAPs for their consideration. The ACHAR will document the results of the assessment, outline opportunities for the conservation of Aboriginal cultural values, and suggest recommendations for the management of Aboriginal objects should impacts to these objects be unavoidable.

All RAPs were sent a draft of this ACHAR on 4 June 2020 with a closing date for responses of 2 July 2020 providing all RAPs with the statutory 28 day review period (**Appendix 2 Figure 7**).

Five responses to the draft ACHAR were received. None of the responses required changes to be made to the ACHAR (**Table 3-3**).

Table 3-3: RAP responses to the draft ACHAR.

Date	Individual/Organisation	Response received
4.6.20	Hunters & Collectors	Rebecca Hardman (RH) received thanks
7.6.20	Stakeholder 1	RH received thanks, requested to be included in any future fieldwork
11.6.20	Widescope Indigenous Group Pty Ltd	RH received email: *Thank you for the documents for Stage 4 of the ABORIGINAL CULTURAL HERITAGE ASSESSMENT FOR THE BOWMANS CREEK WINDFARM. I have view and I am satisfied with the report* *It was pleasure assisting the Ozark team*
28.6.20	Wonnarua Nation Aboriginal Corporation	RH received thanks
2.7.20	Ungooroo Aboriginal Corporation	RH received request for allowance of extra time to submit comment and new google link to open

3.1.4 Project update and additional review

In 2020 a portion of the ETL not surveyed in 2019 was surveyed (Fieldwork Session 3) and in 2021 a portion of realigned ETL was surveyed (Fieldwork Session 4). As these surveys recorded sites and have deviated from areas reported in the earlier version of this ACHAR, a draft of this version of the ACHAR was sent to all RAPs for their information (**Appendix 2 Figure 8**).

This draft was sent on 11 March 2021 with a request that any comments or questions be raised by 26 March 2021.

No comments arising from the review of the revised ACHAR were received by the closing date for review. As no RAP responses were received in the review period, no further entries were made to the consultation log and the log presented in **Appendix 1** of the ACHAR is a complete record of all consultation related to the Project.

3.1.5 Additional survey for the Amended Project

In 2021 the Project was amended in response to agency and community comments from the public exhibition of the EIS. While the overall area of disturbance was decreased, there were areas of land that had not been previously surveyed. Following the recommendation of Heritage NSW (letter: 21 October 2021), those portions of the Survey Boundary in landforms with a slope of less than 10 degrees not previously surveyed were subject of a renewed survey in January 2022 (Fieldwork Session 5).

As this survey recorded sites and has deviated from areas reported in the 2021 version of this ACHAR, the revised ACHAR was sent to all RAPs for their information on 28 February 2022.

3.2 ABORIGINAL COMMUNITY INVOLVEMENT IN THE ASSESSMENT

Table 3-4 provides a log of the community members and groups who participated in the fieldwork.

Table 3-4: Log of RAP involvement in the field survey.

Organisation	Representative					
		25/11/19	**26/11/19**	**27/11/19**	**28/11/19**	**29/11/19**
Team 1: Fieldwork Session 1						
Tocomwall PTY Limited	Danny Franks	X	X	X	X	X
Hunter Valley Aboriginal Corporation	Leanne Kirkman	X	X			
A1 Indigenous Services	Steven Hickey			X	X	X
Team 2: Fieldwork Session 1						
	Stephen Talbot	X	X	X	X	X
Wallagan Cultural Services	Maree Waugh	X	X			
Wonnarua Nation Aboriginal Corporation	Renee Gillane			X	X	X
Fieldwork Session 2		**23/3/20**	**24/3/20**	**25/3/20**	**26/3/20**	**27/3/20**
Ungooroo Aboriginal Corporation	Allen Paget				X	X
	Stephen Talbot	X	X	X		
A1 Indigenous Services	Jason Braneley	X	X	X		
Aliera French Trading	Aliera French				X	X
Fieldwork Session 3		**27/11/20**				
Ungooroo Aboriginal Corporation	Allen Paget	X				
Fieldwork Session 4		**23/2/21**				
Ungooroo Aboriginal Corporation	Allen Paget	X				
Fieldwork Session 5		**18–19/1/22**				
Ungooroo Aboriginal Corporation	Allen Paget	X				
	Stephen Talbott	X				

3.2.1 Comments arising from the assessment

No specific cultural values pertaining to the Survey Boundary were received during the fieldwork. The general feeling was that the steep sided hills of Survey Unit 1 would not have attracted occupation in the past. As no sites were recorded in these landforms, there were no management recommendations discussed in the field.

In Survey Area 2, the recorded sites were held to be significant by the RAP representatives and there was a unanimous desire to see the sites conserved and protected. None of the RAPs involved in the field assessment of the Survey Boundary knew of the existence of the previously recorded site 37-2-2072 (ceremonial ring) or any cultural associations with it. Mr Paget, who attended the survey of the area of site 37-2-2072, noted the abundance of naturally occurring stone across the crest of the hill, however, agreed with the archaeologist that there was no indication of a ceremonial ring.

4 LANDSCAPE CONTEXT

An understanding of the environmental contexts of a study area is requisite in any Aboriginal archaeological investigation (DECCW 2010). It is a particularly important consideration in the development and implementation of survey strategies for the detection of archaeological sites. In addition, natural geomorphic processes of erosion and/or deposition, as well as humanly activated landscape processes, influence the degree to which these material culture remains are retained in the landscape as archaeological sites; and the degree to which they are preserved, revealed and/or conserved in present environmental settings.

4.1 TOPOGRAPHY

The distinct geology of the Survey Boundary influences the overall topography. The northern half of the Survey Boundary comprised of Carboniferous deposits reflects a relatively elevated and rugged terrain where bedrock outcrops and linear escarpments are common. The southern half of the Survey Boundary composed of Permian deposits comprises broad ridges with gently to moderately inclined slope forms which gradually reduce in gradient southwards towards the southern boundary of the Survey Boundary.

Figure 4-1 shows a DEM model with a vertical exaggeration of two. This model shows the topographical differences between Survey Unit 1 and 2.

Survey Unit 1 is characterised by broadly benched spurs with moderate to steep slope forms off the crests/ridgelines. The slopes and creeks are largely bedrock controlled except for areas adjacent to the larger drainage lines such as Bowmans Creek that have some alluvial development. This topography has been largely cleared of trees in the past and has been used for long-term, low density grazing.

Survey Unit 1 is described as 'hills' in the *Australian soil and land survey field handbook* (CSIRO 2009):

> *Landform pattern of high relief (90–300 m) with gently inclined to precipitous slopes. Fixed, shallow, erosional stream channels, closely to very widely spaced, form a non-directional or convergent, integrated tributary network. There is continuously active erosion by wash and creep and, in some cases, rarely active erosion by landslides.*

Using the terrain classifications in CSIRO 2009, Survey Unit 1 is a 'Type C' terrain with steep slopes and no terrace formation in the narrow V-shaped valleys.

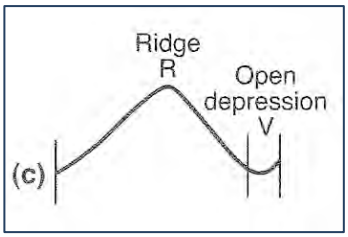


Figure 4-2 shows views of Survey Unit 1. In terms of the topography of the Survey Boundary in this unit, these photos show:

- Photo 1: shows outcropping rock on crest tops and the steeply undulating nature of the landscape
- Photo 2: shows the isolated, rocky crests where turbine locations are proposed
- Photo 3: shows the thin ridges along which access tracks and turbines are proposed
- Photo 4: shows the broader ridges that are also present. Although broader, these ridges are still within steep country
- Photo 5: shows the broad saddles that are present in Survey Unit 1
- Photo 6: shows the gradient and condition of the landscape at the time of survey.

Survey Unit 2 contains the low undulating hills typical of the Hunter Valley floor, which are divided by drainage lines that once flowed into Bayswater Creek (now Lake Liddell) to the south. The lowlands have historically been (although not currently) used for grazing, with extensive grasslands the result of past clearance.

The *Australian soil and land survey field handbook* (CSIRO 2009) defines the landforms of Survey Unit 2 as 'low hills':

> *Landform pattern of low relief (30–90 m) and gentle to very steep slopes, typically with fixed, erosional stream channels, closely to very widely spaced, which form a non-directional or convergent, integrated tributary pattern. There is continuously active sheet flow, creep, and channelled stream flow.*

Using the terrain classifications in CSIRO 2009, Survey Unit 2 is a 'Type E' terrain and contains waning lower slope and flat landforms.

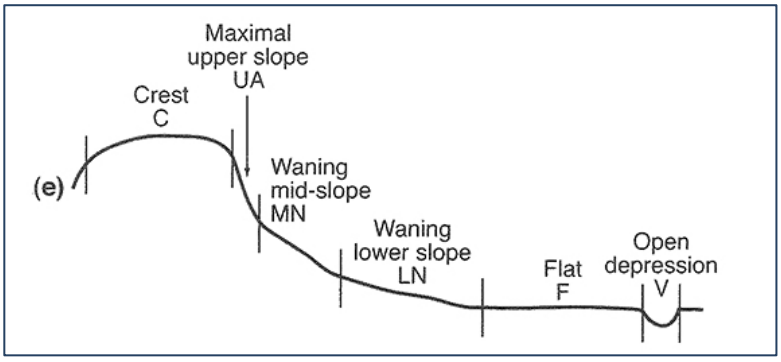


Figure 4-3 shows views of Survey Unit 2. In terms of the topography of the Survey Boundary in this unit, these photos show:

- Photo 1: shows the gentle, undulating nature of the landforms
- Photo 2: shows the extensive level landforms where the ETL corridor is proposed
- Photo 3: shows the flat landforms of the valley floor and the high degree of agricultural activity
- Photo 4: shows the flat landforms to the north of Lake Liddell
- Photo 5: shows the broad valley landforms that surround Bowmans Creek along Albano Road
- Photo 6: shows the broad valley landforms that surround Bowmans Creek along Albano Road

Figure 4-1: DEM model of a portion of the Survey Boundary showing topography.

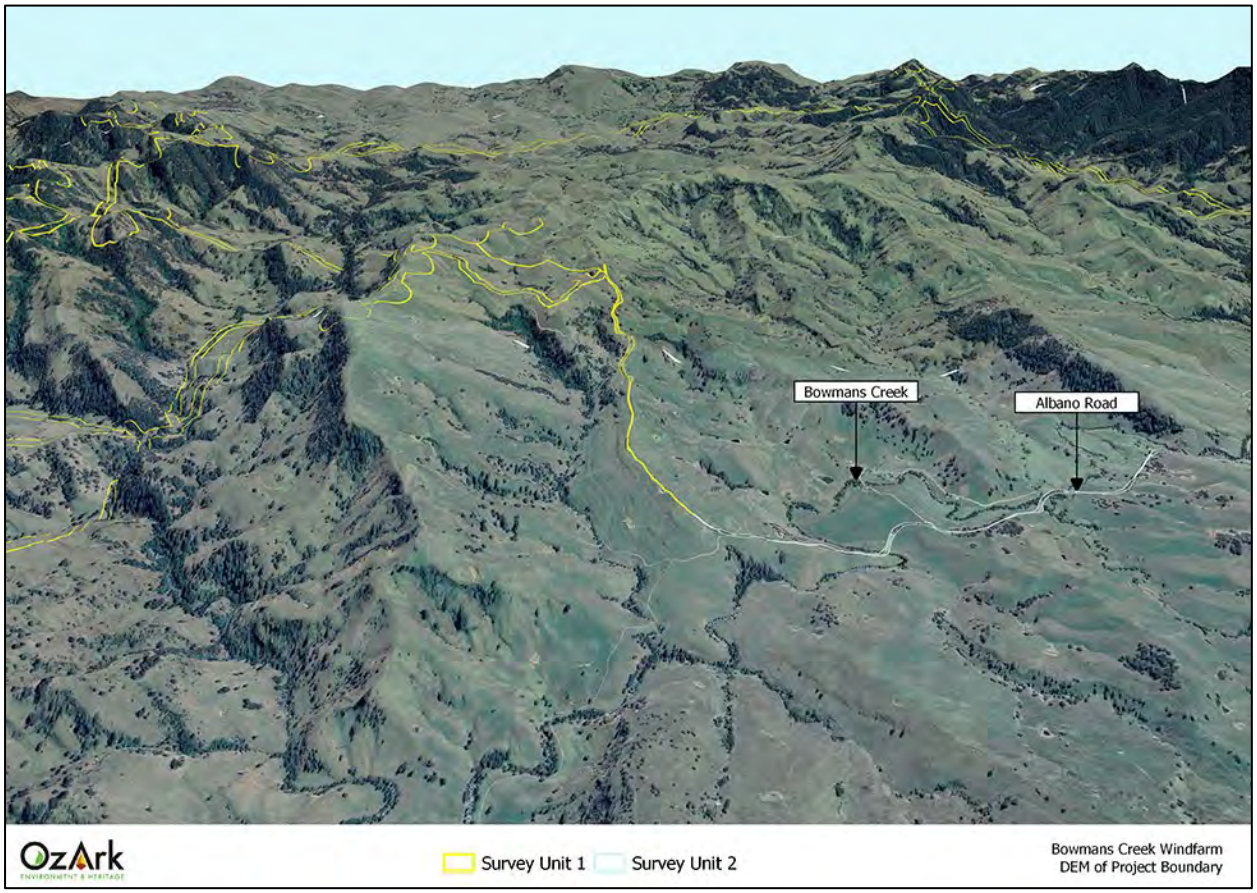


Figure 4-2: Views of the Survey Unit 1.

1. Landscape around Turbine 36.

2. Landscape around Turbine 57.

3. Landscape around Turbine 36.

4. Landscape around Turbine 58.

5. Landscape along the route of proposed Underground Reticulation between Turbines 36 and 37.

6. View of the slope towards Turbine 45.

Figure 4-3: Views of the Survey Unit 2.

1. Landscape along an access track route in the southeast of the Survey Boundary.

2. Landscape within the Liddell Mine site.

3. Landscape at the junction of Hebden Road and Pictons Lane where Transport Route Disturbance is proposed.

4. Landscape along Hebden Road to the north of the Lake Liddell recreation area.

5. Landscape along the Albano Road portion of the Survey Boundary.

6. Landscape along the Albano Road portion of the Survey Boundary.

4.2 GEOLOGY AND SOILS

The geology of the Survey Boundary reflects a single geological era known as the Paleozoic. It can be sub-divided into two distinct geological periods: the Carboniferous and Permian. Most of the Survey Boundary reflects the earlier Carboniferous period and is represented by an undifferentiated bedrock geology that includes conglomerates, sandstone, shale, and acid tuffs (Geological Survey of NSW 1969). The southern portion of the ETL corridor includes two distinct geological formations. The first is composed of the Maitland Group and includes the Mulbring siltstone which is made up of siltstone and mudstones.

Soil analysis has important ramifications for archaeological research through the potential impact of different soils on human activity (such as agricultural exploitation) and the impact of the soils on archaeological evidence (such as post-depositional movement). The soils known to occur throughout the Survey Boundary are identified here to delineate their nature and impact on the survival and location of archaeological material.

In the Soil Landscapes of the Singleton 1:250,000 Sheet (Kovac and Lawrie 1991), four main soil landscapes are mapped in the Survey Boundary (**Table 4-1**).

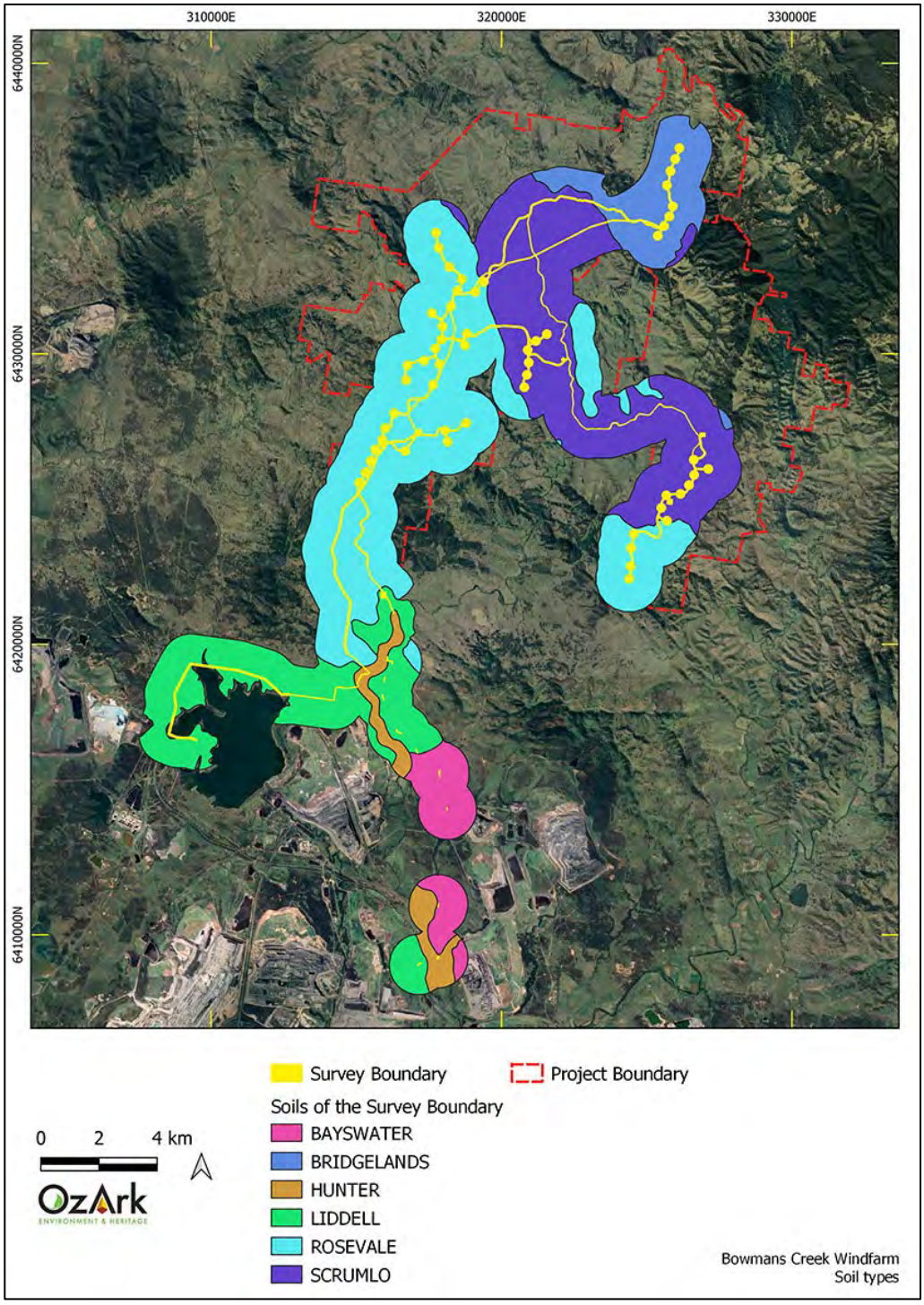
In addition, there are small portions of the Hunter soil landscape (alluvial soils derived from the Hunter River) and the Bayswater soil landscape (Yellow Solodic Soils on slopes with generally alluvial soils in drainage lines) within the Survey Boundary (**Figure 4-4**). In **Figure 4-4** the soil landscapes have been cropped to a 1 km buffer around the Survey Boundary.

Table 4-1: Major soil landscapes in the Survey Boundary.

Soil landscape	Location in Survey Boundary	Soil characteristics
Liddell	South	The southern portion of the Survey Boundary is mapped as the Liddell Soil Landscape. The main soils are yellow Soloths on slopes, with some yellow Solodic soils on concave slopes. Earthy and Siliceous sands are found on mid to lower slopes. Red Soloths, red Solodic soils and red podsolic soils are also known to be present. Minor sheet erosion is common, with some minor rill erosion. In drainage lines, there may be moderate gully erosion and salting may be a feature. In the Survey Boundary this soil landscape consists of aggrading environments along the toe slopes of the hillier country to the north. Waterways have incised gullies and evidence of former erosion and alluvium deposition can be seen in the bank edges.
Rosevale	Central west	The main soils are red and brown podzolic soils on the upper to lower slopes and on the steeper sections of footslopes. Drainage varies from rapid and imperfectly drained, to well drained. The soils are susceptible to minor to moderate sheet erosion on cleared areas and mass movement on steeper slopes. In the Survey Boundary this soil landscape is associated with the more elevated landscape to the north of the lower areas mapped as the Liddell Soil Landscape. Generally, soils are thin on slopes and crests and rock outcropping is common. These landforms remain in a degrading environment. Some small areas of aggrading alluvium in valley floors is noted although, generally, these areas remain limited.
Scrumlo	North and east	The Scrumlo Soil landscape present across the central portions of the Project Boundary is a Kurosol in the Australian Soil Classification. This soil is described as a strongly acid soil with an abrupt increase in clay. In New South Wales, some areas of this soil type have been cleared and used for dairying on improved pastures. The soil also supports sparse cattle grazing. In the higher rainfall areas of New South Wales, Kurosols are used for forestry. Vegetation associated with this soil group is largely dependent on rainfall and ranges from eucalypt woodlands to open forests. In the Survey Boundary this soil landscape is mapped in topography that ranges from steep hills to the broad valley associated with Bowmans Creek and Albano Road. Slopes

Soil landscape	Location in Survey Boundary	Soil characteristics
		and crests have a degrading environment while the landforms associated with Bowmans Creek are aggrading, although some areas more than others.
Bridgelands	Northeast	The northeast of the Project Boundary is mapped as the Bridgelands Soil landscape which is a Rudosols and Tenosols in the Australian Soil Classification. These soils orders generally have a low fertility and low water-holding capacity. Rudosols and Tenosols are poorly developed and can be shallow and stony. In the Survey Boundary this soil landscape is associated with the more elevated landscape to the northeast of the Project Boundary. Generally, soils are thin on slopes and crests and rock outcropping is common. These landforms remain in a degrading environment. Some small areas of aggrading alluvium in valley floors are noted although, generally, these areas remain limited.

Figure 4-4: Map showing the soil landscapes associated with the Survey Boundary.



4.3 HYDROLOGY

As the Survey Boundary covers a relatively large area of land in a generally well-watered part of NSW, it intersects with a number of waterways, both named and unnamed.

In terms of considerations for Aboriginal site locations, the archaeological context for the Survey Boundary shows a generally strong correlation between site location and distance to water (see **Section 5.2**). Due to the erodible nature of the soils in the Survey Boundary, particularly associated with those portions in the Liddell Soil Landscape, sites are often recorded associated with waterways as this is where artefacts have either accumulated or are being eroded from the banks.

The main source of water in the Survey Boundary is Bowmans Creek (**Figure 4-5**). The headwaters of this creek are in the Project Boundary and by the time it reaches the southern areas of the Survey Boundary it is a mature system with defined banks and associated floodplains. Currently Bowmans Creek runs dry, but it is assumed that in the past it would have afforded permanent water, particularly as now-lost pools would have retained water into dry period.

Beyond Bowmans Creek there are a number of named waterways that were probably always ephemeral; although as a landowner pointed out, a water hole on one of these more minor creeks, Fish Hole Creek, has never been dry. This indicates that these systems would also have afforded water resources at least for most of the year.

The unnamed waterways in the Survey Boundary are either cut to bedrock without bank formation (Survey Unit 1) or are gullies that have probably formed post-1788 and have, in paces, eroded to sizeable areas (Survey Unit 2).

Figure 4-6 provides photographs of the main hydrological morphologies noted within the Survey Boundary.

The Survey Boundary is therefore well-watered generally allowing traditional Aboriginal occupation over most portions of the Survey Boundary. However, the Survey Boundary lacks larger order waterways, such as the Hunter River, where aquatic and terrestrial resources would have been more abundant than that able to be afforded by systems such as Bowmans Creek. The conclusion is that the hydrology of the Survey Boundary probably only supported short-term or sporadic visits into the area and that the large base camps would have been associated with higher order waterways to the south of the Survey Boundary.

Figure 4-5: Aerial showing the main named waterways associated with the Survey Boundary.

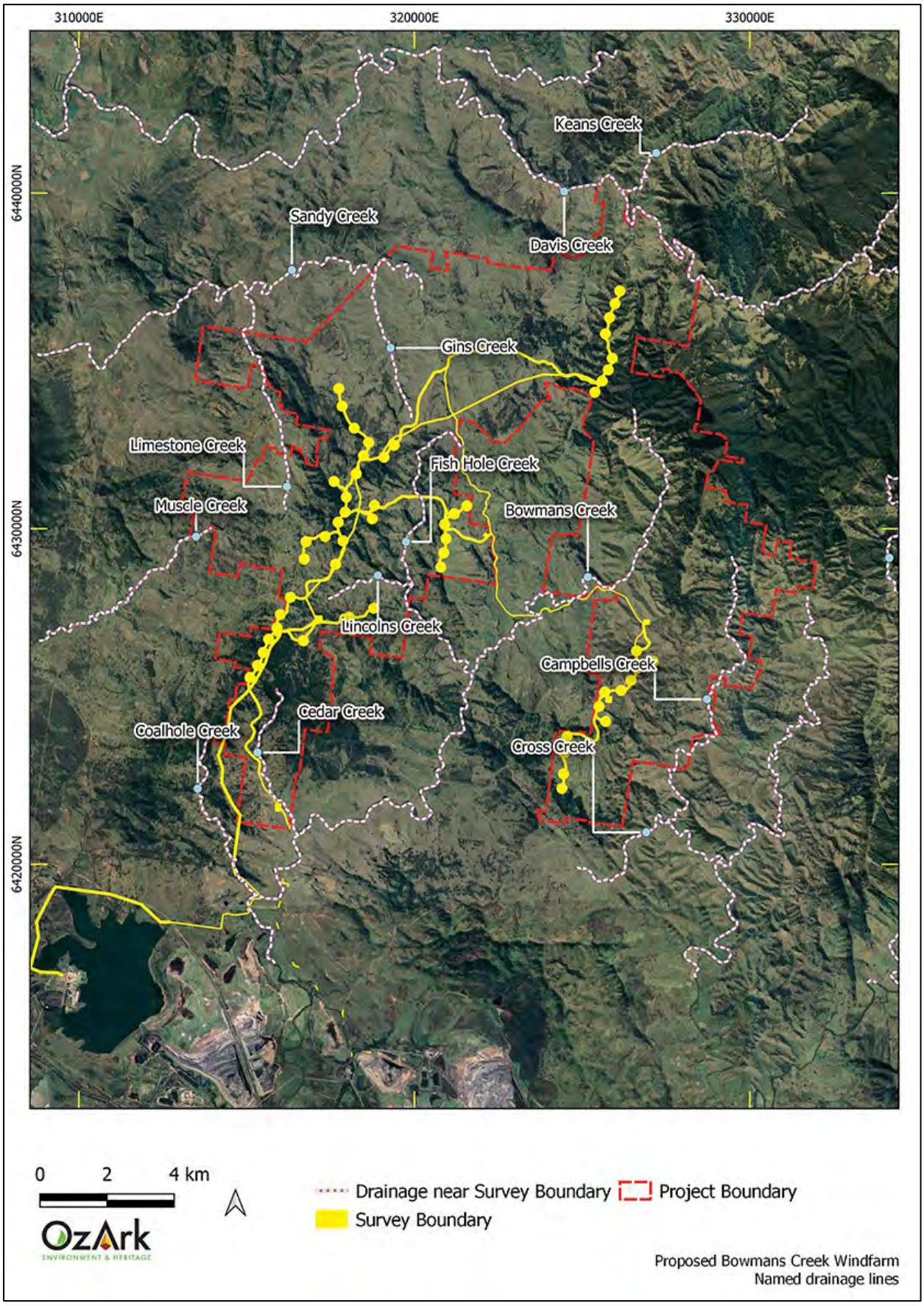


Figure 4-6: Examples of hydrology in the Survey Boundary.

1. A typical minor waterway in Survey Unit 1.

2. The pool on Fish Hole Creek that 'has never run dry'.

3. The headwaters of Bowmans Creek in the north of Survey Unit 1. While sedimentation is evident there is no bank formation in this area.

4. Cedar Creek in Survey Unit 2. Note the lack of bank formation.

5. A view of Bowmans Creek being crossed by Albano Road (Survey Area 2). Note that minor bank and terrace formation has occurred.

6. A view of an eroded, minor, unnamed, waterway in Survey Unit 2. These waterways appear larger than they may have been due to historic erosion.

4.4 VEGETATION

The distribution of vegetation and water resources within the local landscape are important factors influencing patterns of Aboriginal land use and occupation. Additionally, the effectiveness of the archaeological survey is directly impacted by visibility conditions, of which vegetative cover is an important feature.

The Survey Boundary has experienced widespread changes in vegetation during the past century, with the original vegetation essentially removed (for pastoral grazing), resulting in a mainly open area with minimal extant vegetation. The original vegetation of the local area consisted of Savannah woodland, with box, gum and ironbark dominant. Natural vegetation most likely included yellow box (*Eucalyptus melliodora*), white box (*Eucalyptus albens*), spotted gum (*Eucalyptus maculata*), Blakelys red gum (*Eucalyptus blakelyi*), rough-barked apple (*Callitris preissit*), kurrajong (*Brachychiton populneum*), bull oak (*Casurina leuhmannil*), swamp oak (*Casurina glauca*), smooth bark-apple (*Angophora costata*), narrow-leaved red ironbark (*Eucalyptus crebra*), grey gum (*Eucalyptus punctata*) and grey box (*Eucalyptus moluccana*) (Kovac and Lawrie 1991).

Due to extensive clearance, the Survey Boundary now consists of a dense grass cover with limited tree and shrub vegetation. The native vegetation mainly consists of regrowth from earlier clearance for grazing land. This grazing process has also resulted in a substantive change in the form of grass cover, with grazing stock preferring the introduced grasses over native grasses (**Figure 4-7**).

Figure 4-7: Examples of vegetation in the Survey Boundary.

1. A typical view in Survey Unit 1 where the steepest slopes contain standing timber, but all other areas are grasslands. Much of the standing timber in the gullies is regrowth.

2. A view of a regrowth woodland near Turbine 35.

4.5 CLIMATE

The climate of the Survey Boundary is warm temperate. The average annual temperature is 17.8 °C and precipitation is approximately 692 mm per year. The summers are hot, the winters are short and cool, and it is mostly clear year-round.

At higher elevations in the Survey Boundary, it was sometimes very windy (as one would expect for a proposed wind farm). The winds at the time of survey were from the southwest and were strong enough at times to almost blow a person off their feet when you were on a crest or hilltop. This would imply that landforms facing west, as well as those on elevated crests, ridges and hilltops would be too windy for long term occupation by traditional Aboriginal groups.

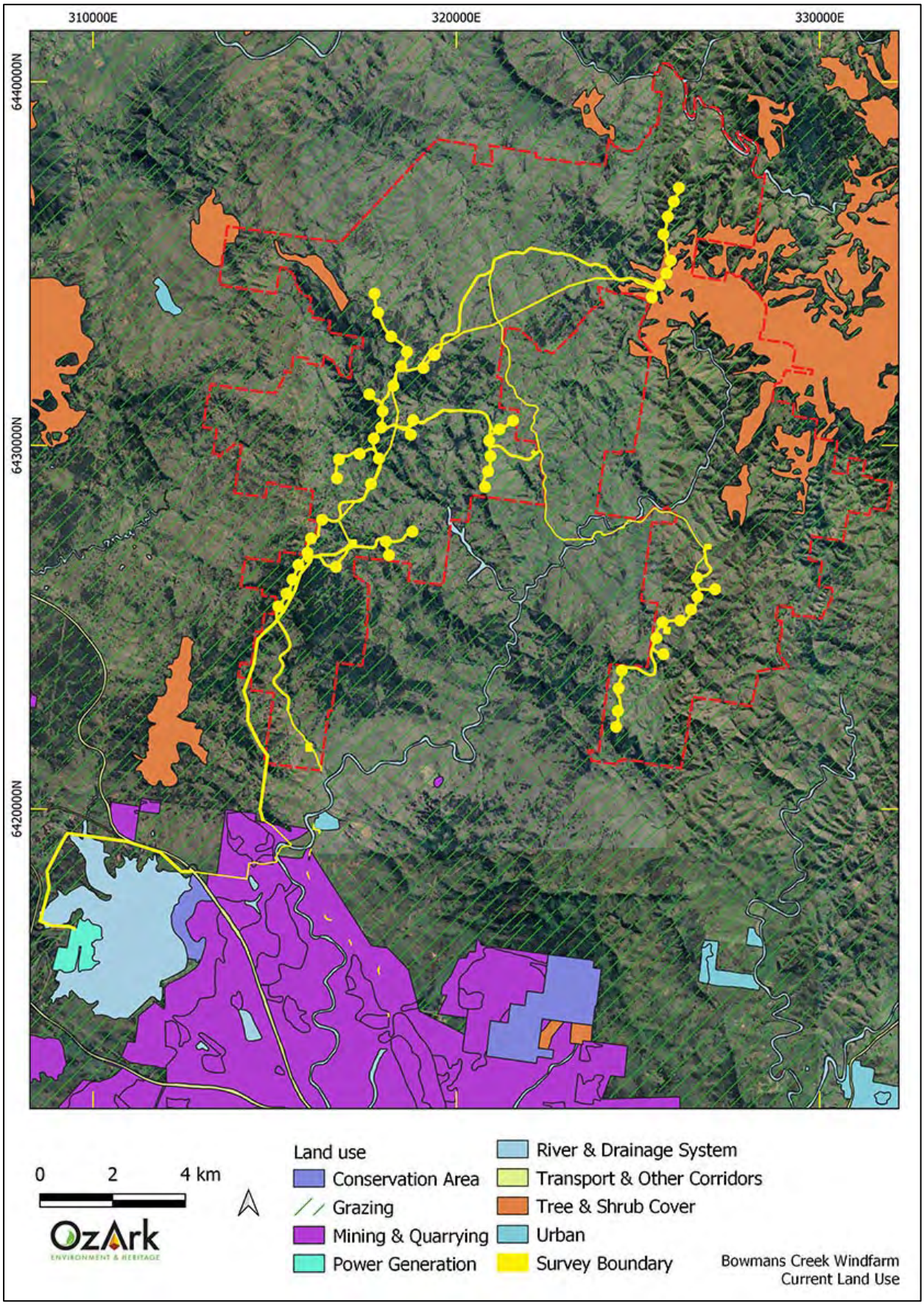
4.6 LAND USE HISTORY AND EXISTING LEVELS OF DISTURBANCE

The predominant land use of the Survey Boundary is grazing (**Figure 4-8**). The establishment of the grazing industry involved the widespread clearance of native vegetation and the introduction of heavy, hard hoofed animals. The extent of clearing was noted during the survey where even the steepest slopes have been laboriously cleared.

The combination of the steeply sloping terrain, a high rainfall, the loss of trees and the breaking apart of the soil by cattle has meant that the already thin soils have become much thinner. In many portions of Survey Unit 1, soils on slopes, crests ridges and hilltops were skeletal. Conversely, sedimentation in waterways, such as the headwaters of Bowmans Creek, show the result of the downward movement of soils from the slopes.

Other land uses include small areas of tree cover, and along the ETL corridor, mining impacts associated with Liddell Coal and power generation uses associated with the Liddell Power Station. These land uses will have impacted the ground surface substantially where mining or infrastructure is located. While this applies to the Liddell Power Station, the portions of the Survey Boundary impacted by mining activity is outside of the main mining area and the landforms remain intact.

Figure 4-8: Aerial showing the Survey Boundary in relation to current land use.



4.7 CONCLUSION

The review of the environmental factors associated with the Survey Boundary allows the following conclusions to be drawn in terms past Aboriginal occupation:

Topography: The topography of the Survey Boundary is unlikely to have been a favoured area for Aboriginal occupation for extended periods of time and is more likely to have been utilised as a vantage point or access route. Areas facing west would have been unfavourable occupation areas due to the winds

Hydrology: No major hydrological features are present within the Survey Boundary. Therefore, this would have made the Survey Boundary an unfavourable location for long-term occupation. Water resources were available for short-term or sporadic occupation

Geology: The underlying geology of the Survey Boundary has limited resources in terms of stone for stone tool production

Soils: Soil types present within the Survey Boundary have low fertility. The implications of this are that these soils would not have supported a rich and diverse range of flora in the past which would have been a limiting factor in the past use of the area by Aboriginal people. In addition, these soils have high erodibility with the implications being that archaeological deposits in the area may have been removed by erosion or covered from deposition

Vegetation: The examples of vegetation within the Survey Boundary currently give little appreciation for what may have been present. While vegetation types would have had a limited spread due to the ruggedness of the terrain, there would have been resources sufficient to attract occupation and use of the area

Climate: The climate of the Survey Boundary provides amenable temperatures and sufficient rainfall to allow year-round occupation by Aboriginal people in the past. However, the more exposed areas of the Survey Boundary would have been unsuitable for occupation in the cooler months due to high winds and cooler temperatures

Land use: Erosion across the landforms of Survey Unit 1 will likely have led to the displacement of any Aboriginal stone artefacts by moving them downslope. In those areas of Survey Unit 2 in an aggrading environment, the movement of soil may lead to objects or features being covered by accumulated sediment.

5 ABORIGINAL ARCHAEOLOGY BACKGROUND

5.1 ETHNO-HISTORIC SOURCES OF REGIONAL ABORIGINAL CULTURE

The Survey Boundary is located in the border country of the Wonnarua, Geawegal and Kamilaroi tribal areas of the upper Hunter River valley.

Tocomwall (2017: 49) records that ethnographic accounts and anthropological notes written in the mid-to late 19th century indicate that the traditional territory of the Wonnarua people extended over a two thousand square mile area of land that included the Hunter River and all its tributaries from within ten miles of Maitland to the apex of the Liverpool Ranges. This interpretation is challenged by the Wanaruah Local Aboriginal Land Council (Tocomwall 2017: 482) who states that there is much debate about the tribal boundaries and that the dividing line between the Wonnarua and the Kamilaroi may have been much further south in the area of 'Jerrys Plains'.

The Wonnarua people and their neighbours lived in an environment rich in food resources. Freshwater fish, shellfish, reptiles, mammals, birds and plant food provide a diverse diet (see Brayshaw 1981). Brayshaw (1986: 82) suggests that inland groups visited the coast during the summer when marine resources were plentiful, and coastal groups travelled inland to participate in the winter kangaroo hunts. Trade and/or exchange also occurred between the coastal and inland groups including visiting by coastal and inland groups for initiations and ceremonies seemed to occur. These were conducted within earthen circles. Carved trees were associated with these sites (Brayshaw 1981: 12). Reed spears and shells were traded inland for possum skin rugs and fur cord (Brayshaw 1986: 41). Social gatherings were a feature of Aboriginal life in this area.

There is virtually no reference to flaked stone tools in the nineteenth century descriptions of Aboriginal material culture in the Hunter Valley. This paucity of information is at odds with the types of occupation evidence which are preserved in the Hunter Valley. By far the most common type of Aboriginal site in the inland part of the Hunter Valley is the "open campsite" or stone artefact scatter.

5.2 REGIONAL ARCHAEOLOGICAL CONTEXT

5.2.1 Introduction

The Aboriginal occupation of Australia begins prior to 40,000 BP (years before present) and possibly earlier than 50,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period, poor preservation of archaeological materials (particularly dateable organic materials) and significant coastline change over the past 18,000 years.

In 1986, Koettig undertook an archaeological survey approximately 12.5 km southeast of the Survey Boundary between Glennies Creek and Singleton (cited in Umwelt 2003). Following that survey, Koettig carried out several excavations at six locations along Glennies Creek. Koettig considered artefacts found in Site SGCD 16 (about 1 m deep in Unit B of on an old alluvial terrace) were 'markedly different' to artefacts recovered from the artefacts in Unit A. Her conclusion was formed on the basis of the raw material used, large number of cores, the large percentage of cortex remaining on artefacts and larger sizes of artefacts. Artefacts from Unit B were from volcanic rocks while those in Unit A were predominantly mudstone and silcrete. Later, a date of >20,200 BP was obtained from a hearth associated with the artefacts placing the site well into the Pleistocene.

A review of GHD (2005), HLA-Envirosciences (2005a) and Umwelt (2007) provides the following regional synthesis:

- Archaeological sites, even where surface evidence is not present, occur on most landforms. This was confirmed by HLA-Envirosciences (2005a) excavation program, in which Aboriginal sites were encountered on alluvial terraces, flats, slopes, bench areas, spurs and ridgelines. HLA-Envirosciences acknowledges that the sample areas were biased somewhat as they were all near creek lines
- Site frequency and density are dependent on their location in the landscape. This theme is consistent throughout NSW and is influenced by a range of factors, the most relevant of which the existing level of disturbance. More specifically, the potential for undisturbed in situ deposits remaining in the upper Hunter Valley is generally low
- The highest concentration of Aboriginal sites on the valley floor surrounds creeks and waterways
- Few scarred trees are recorded, reflecting the high degree of tree clearing in the region
- The most frequently recorded raw material is indurated mudstone (a fine-grained siliceous material) associated with Hunter River gravels. Other frequently recorded materials include locally sourced silcrete, quartz and volcanic stones
- Assemblages recorded in the region consist largely of unmodified flakes with few formed tools. Backed blades comprise the characteristic diagnostic artefact in the region. The mid- to late-Holocene appears to have witnessed this move to smaller tools, perhaps as an impetus to conserve raw material during tool manufacture or due to new functionality requirements.

5.2.2 Previous assessments within or near the Survey Boundary

A very large amount of archaeological work has been undertaken in the Hunter Valley and consequently only a brief regional archaeological context that focuses on work in similar landforms to the Project Boundary is provided here.

The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (**Section 5.5**).

5.2.2.1 A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project (Dyall 1982)

In 1982, Len Dyall assessed the northern reaches of Bowmans Creek, partially extending into the south of the Project Boundary. 18 artefact scatters and two grinding groove sites were recorded during the survey. The artefact scatters were small except for one that contained over 150 artefacts. Most of the artefact scatters were identified on creek flat, with only one site (a low-density scatter) located on a ridge line. One grinding groove site was suggestive of a seed processing location rather than for axe grinding.

5.2.2.2 Archaeological Survey of Pikes Gully Colliery Area, Liddell, NSW (Haglund 1982)

In the same area of Bowmans Creek and to the south of the Project Boundary, Laila Hagland (Hagland 1982) recorded two artefact scatters:

- Site 1: Aboriginal stone artefacts were noted in several exposures within, and along, the edge of a terrace west of Bowmans Creek. It was noted that the artefacts recorded varied in type, size range and density between the exposures. Small thin flakes and small, well-made artefacts such as bondi points were noted only close to the southern end. Artefact density appeared greater in this part. These observations may reflect real distribution trends, but may also result from the smaller and more shallow areas of exposure further north
- Site 2: Aboriginal stone artefacts were noted in two exposures along the northeast bank of Bowmans Creek, northwest of its junction with Stringybark Creek, and within a minor erosion gully on the slope above.

5.2.2.3 Proposed Optic Fibre Cable Route between Cessnock and Scone and Muswellbrook and Singleton (Davies 1991)

The Muswellbrook to Singleton phase of this assessment recorded five Aboriginal sites, including two artefact scatters and three isolated finds. The artefacts consisted predominately of flakes and flaked pieces manufactured from mudstone and chert. The survey comprised of riparian corridors and disturbed landforms. Most sites were recorded within riparian corridors.

5.2.2.4 Proposed Rail Unloader and Conveyor near Antiene (HLA-Envirosciences 200b5)

HLA-Envirosciences (HLA) completed an archaeological survey for a coal unloader facility at Antiene, located to the north of Lake Liddell, partially overlapping with the Survey Boundary. The assessment area comprised gently undulating low hills intersected by drainage lines and low ridges.

25 Aboriginal sites were identified during the survey. These included 14 artefact scatters, nine isolated finds, one scarred tree and one artefact scatter associated with a potential ceremonial ring (Ant-22; **Section 5.3.1**). Overall, the greater number of sites were located in the flat landforms and alluvial terraces as opposed to the gentle slopes.

Two knapping events were identified (Ant-20 and 23). Ant-20 was considered likely to be the result of a single knapping event, while Ant-23 was considered more likely to be several superimposed knapping events. Furthermore, Ant-23 revealed multiple raw material types including porcellanite, a material not locally available.

5.2.2.5 Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales (Resource Planning 1991)

In 1991 Resource Planning undertook a large assessment for the Mount Owen Coal Project that was focussed on Swamp and Yorks Creeks, located south of the Project Boundary (Resource Planning 1991). This study included 25 km of drainage line (including left and right banks) along Swamp Creek and Yorks Creek. Traverses were also made across side slopes and along ridge lines. The survey area totalled 370 ha. 98 Aboriginal archaeological sites, ranging from isolated artefacts to dense concentrations of more than 100 pieces of flaked stone, were mapped and recorded.

Table 5-1 presents the artefact densities recorded by Resource Planning and this shows clearly that Swamp Creek displays a lower artefact density when compared to Yorks Creek. In the case of Swamp Creek over 75% of sites were isolated finds or very low-density artefact scatters while along Yorks Creek 54% of sites recorded over 50 artefacts at each site (a moderate artefact density). Resource Planning noted that the sites in the Swamp Creek catchment are regarded as an excellent representative assemblage of occupational evidence in the small tributary valleys of the Hunter River (Resource Planning 1991: 5). This report recommends, based on the survey evidence "*that part of the Yorks Creek drainage line would be set aside as an archaeological conservation zone*" (Resource Planning 1991: 5): a recommendation that was followed as the northern reaches of Yorks Creek are now within a permanent Voluntary Conservation Area (VCA). The Yorks Creek VCA is located outside the Project Boundary approximately 5.6 km to the south.

Table 5-1: Artefact densities at sites recorded by Resource Planning 1991.

Artefact Numbers	Swamp Creek (%)	Yorks Creek (%)
Isolated Artefact	27.6	9
<10 Flakes	50.0	18
10-20	14.5	18
20-50	6.6	27
50-100	1.3	18
>100		9

5.2.2.6 Mount Owen Biodiversity Offset Areas (Umwelt 2006a)

In 2006, Umwelt completed an archaeological assessment of the proposed Mount Owen Biodiversity Offset Area, 5 km south of the Project Boundary. The topography of the assessed areas generally comprised low hills and moderate gradient slopes, although some included ridge

lines and steep slopes. Seven sites were recorded during the field inspection, all artefact scatters. Three of the artefact scatters were recorded with potential archaeological deposits (PAD). All recorded sites were identified on spurs, adjacent to waterways.

5.2.2.7 Proposed 132kV feeder at Antiene, near Lake Liddell (Umwelt 2006b)

Umwelt (2006b) completed an archaeological survey across the 5 km long by 45 m wide easement to the north of Lake Liddell. Portions of the surveyed area overlap with the proposed powerline of the Project. The surveyed area traversed low, undulating hills and ephemeral drainage lines.

Nine Aboriginal sites were identified during the survey, including one previously recorded site. Seven of these sites were artefacts scatters and two were isolated finds. No areas of PAD were identified.

The following findings of the survey are outlined below:

- 72 artefacts were identified across the nine sites
- Broken flakes dominated the artefact assemblage followed by flakes, flaked pieces, cores, retouched flakes and blades
- Mudstone was the dominant material followed by silcrete. Additional recorded materials included porcellanite, hornfels, chalcedony, basalt and quartz
- Most sites were identified within the riparian corridors followed by mid-slopes. Two sites were identified on lower slopes
- Sites identified along drainage lines recorded higher numbers of artefacts.

5.2.2.8 Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations (OzArk 2014a)

The assessment area for the Mount Owen Continued Operations (MOCO) project disturbance area covered approximately 500 ha of land, located at its closest 4.7 km south of the Project Boundary.

Australian Cultural Heritage Management Pty Limited (ACHM) were engaged by Mount Owen to undertake Aboriginal community consultation for the MOCO Project and to author the Aboriginal Cultural Heritage Assessment Report (ACHAR) to which OzArk 2014a contributed (ACHM 2013). The ACHM report appeared as Appendix 13a (Parts 1 and 2) of the MOCO Project *Environmental Impact Statement* (EIS). ACHM 2013 contains the cultural, aesthetic, and historic values of the area, while OzArk 2014a contains an examination of the scientific values of the area.

Cultural values

ACHM 2013: 114 summarises the cultural values of the area. What follows is an edited excerpt of the MOCO Project Statement of Significance (ACHM 2013: Section 5:10):

It is noted that the numerous Aboriginal stakeholders who participated in this cultural values assessment process hold values which relate to the wider Hunter Valley region generally, and less directly to the MOCO area specifically. However, one of the Knowledge Holder groups holds very strong values over the MOCO area. Other than the one group expressing strong connection to the MOCO area, there was very little other information presented in the disclosed material or values workshops which relates specifically to the MOCO area.

A common theme in many Aboriginal cultural heritage assessments is the proprietary interest members of the relevant Aboriginal communities hold in regard to the wider cultural landscape including archaeological sites or places within any given area. The project is no exception in this regard. Within the context of the current assessment, there are strong on-going connections to places created and used by ancestors alongside demonstrably strong interests in the manner in which those places are managed or harmed as a result of this project. These sentiments are not unique, and must certainly be considered in the overall assessment of the significance of the places in question. The connection to these places is noted as often being relatively unspecific and generally do not appear to relate to any surviving traditional knowledge or customary cultural practices, apart from one of the Knowledge Holder groups who express a strong connection to on-going cultural knowledge and customary lore in this location.

The cultural values expressed by the participants in this assessment have been consistent in voicing an over-arching concern for the wider landscape and criticism of the negative impact of mining on that landscape. Consistent in the material disclosed is a sense of 'outrage' and grief at the treatment of Aboriginal people since First Settlement (dispossession and genocide are mentioned repeatedly) through to more contemporary experiences (i.e. the Stolen Generation).

ACHM 2013: Section 5:10 concludes:

There is little doubt that the wider cultural landscape surrounding (and encompassing) the MOCO area is of high cultural and historical significance to Wonnarua people. The historical associations with early settlement, conflict, dispossession and survival are important, and the nature of the area as a surviving cultural landscape of significance to numerous members of the Wonnarua people makes this an area of regional and national significance. The regional archaeological record is also of high regional significance. Overall, the cultural significance of the wider region is considered to be high and requires considerable additional research to fully understand.

Scientific values

Large portions of the MOCO project (223 ha) had been subject to previous Aboriginal Heritage Impact Permits (AHIPs) with extensive areas having already undergone archaeological assessment and salvage. Within the disturbance area, 18 sites had already been salvaged by manual excavation and more expansive additional areas have been subject to grader scrapes to salvage subsurface artefacts. Over the years, both from within the disturbance area and from adjacent landforms, over 11,000 artefacts had already been recovered as a result of these programs.

As a result of the scientific values assessment for the MOCO project, 39 Aboriginal sites were recorded, consisting of:

- 11 artefact scatters (37-3-1189 to 37-3-1199)
- 25 isolated finds (37-3-1170 to 37-3-1188 and 37-3-1212 to 37-3-1216)
- Three extensions to previously recorded sites (Extension to site 37-3-0649, Extension to site 37-3-0611 and Extension to site 37-3-0600).

In addition, the disturbance area contained three previously recorded sites, 37-3-0611, 37-3-0985 (low density artefact scatters) and 37-3-0527 (isolated artefact). Thus, 42 sites were known to exist within or close to the disturbance area.

At two locations within the disturbance area, test excavations were carried out. At one location (37-3-1191), no artefacts were recorded during the test excavations, while at the second location (37-3-1192), 114 artefacts were recorded, with over 80% coming from one discrete concentration. As a result, it was determined that 37-3-1191 is a displaced site with no associated archaeological deposits, while 37-3-1192 is a low-density artefact scatter along the banks of the 'eastern drainage' line with one known concentration of artefacts.

Conclusion

Those archaeological sites in the disturbance area investigated revealed relatively sparse artefact concentrations in shallow and disturbed contexts. Archaeologically, all the places located and/or identified conform to the Australian Small Tool Tradition[1], and most likely date to no more than the last 2,000 to 3,000 years.

Given the nature and extent of the archaeological sites identified, there was little additional knowledge which could be added to the archaeological record from any further investigation of this material. There is little probability for the presence of undisturbed and deeply stratified archaeological sites within the disturbance area.

[1] The Australian Small Tool Tradition (also sometimes referred to as 'Bondaian') is a term applied to the Holocene period Aboriginal tool kit; distinguishing it from the earlier Australian Core Tool and Scraper Tradition generally dated to the Pleistocene period.

In general, the archaeological sites in the MOCO disturbance area offered:

- Limited research potential regarding regional and/or localised subsistence and resource procurement activities
- Limited research potential to address questions on stone tool technologies in the region
- Limited potential for radiometric dating methods to be applied to the sites
- Limited research potential to address questions about the timing of the first occupation of this region of the Hunter Valley
- Limited research potential to address questions about the timing of the Aboriginal settlement history of the Hunter Valley
- Limited potential to reveal further unique spatiotemporal patterning which would add to the archaeological record.

5.2.2.9 Track Maintenance at Hillcrest Offset Area (OzArk 2013)

In 2013, OzArk conducted a study of the Hillcrest property to assess the impact of proposed track maintenance. The Hillcrest property is partially within the Survey Boundary.

Five sites were recorded as part of the assessment. All recorded sites consisted of either low-density artefact scatters or isolated finds located adjacent to waterways on gentle gradients and have been affected by erosion. The artefacts recorded were noted as being typical to other sites in the district in terms of site type, artefact type and raw materials utilised, except for one site where a potential quartzite grinding stone and volcanic pestle were recorded. The results of the assessment supported the predictive model and indicate, in a general way, that past occupation was focused in the flatter terrain in south of the OzArk 2013 survey area: although this occupation was at a low and/or sporadic level as people probably returned to areas of more reliable water outside of the survey area for longer-term occupation.

5.2.2.10 Ravensworth Offset Property Maintenance (OzArk 2014b)

OzArk (2014b) completed a Due Diligence assessment and site inspection to update the existing archaeological record where a number of sites had been informally recorded within the Ravensworth Offset Area at Hillcrest, to the southwest of the Project Boundary. Eight of the nine previous informally recorded sites to be ground-truthed were located, including 37-2-4551 and 37-3-1206. All sites are in areas subject to high levels of erosion and were therefore concluded to be in secondary contexts.

5.2.2.11 Erosion Control Works at Hillcrest Offset Area (OzArk 2015)

OzArk (2015) completed an archaeological Due Diligence assessment of proposed erosion control works at the Hillcrest Offset Area. Eight new recordings were made of Aboriginal sites during the visual inspection (Hillcrest 16 to Hillcrest 23). However, apart from Hillcrest 19, all sites

consist of very low-density artefact scatters in displaced contexts within erosion scalds. Three previously recorded sites (Hillcrest 4 to 6) were also located during the field survey. OzArk concluded that sites Hillcrest 4 to Hillcrest 6, Hillcrest 16 to Hillcrest 18 and Hillcrest 20 to Hillcrest 23 represent recordings of artefacts in secondary contexts. In all cases it is assumed that the original context of the artefacts was nearby although it is impossible to know this precisely. Hillcrest 19 was the only recorded site noted as being an exception to the above. The landform containing Hillcrest 19 has relatively low disturbance and the artefacts recorded along the farm track are likely to have originated in the immediate vicinity. It is also likely that the whole landform containing Hillcrest 19 (i.e. the spur between the creek and ephemeral gully) has the potential to contain a low density of artefacts although poor visibility made it difficult to determine precise site boundaries during the survey.

5.2.2.12 Hillcrest Aboriginal Cultural Values Assessment Report (Tocomwall 2017)

In 2017 Tocomwall completed an archaeological survey of the Hillcrest Offset Area, partially located within the Survey Boundary to the north of Lake Liddell. The landforms were divided into three 'zones' with each being covered by a series of transects. These zones reflect 'gross' geomorphic zones that are characterised by the rugged and elevated terrain of the northern portions of the Hillcrest Offset Area (Zone 1), the spurs and associated upper to lower slope forms (Zone 2) and the lowlands/swampy areas along the southern boundary (Zone 3). Zone 1 and Zone 2 landforms are frequently represented within the Survey Boundary.

A total of 35 artefact scatters, 89 isolated finds and one site composed of four cairns were identified during the fieldwork. All artefact scatters were recorded within the southern portion of the survey area consisting mainly of gentle slopes, low spurs and valley flats (Zones 2 and 3). Based on the distribution of finds, analysis of landform features and predictive archaeological modelling, a series of landforms are also identified as PAD.

A large number of the Tocomwall sites were located within extensive erosion scalds that exist in lower and mid-slope landforms within the Hillcrest property. Like in the case of OzArk 2015, these recordings are out of context and represent an accumulation of artefacts from the general landscape into these depositional zones. Rather than originating in the slope landforms, the artefacts probably originate from level benches in the slope landforms that are located upslope from the erosion scalds.

The dominant raw material recorded was mudstone followed by silcrete. Other raw materials recorded in smaller quantities included quartz, quartzite, fine-grained siliceous materials, chert, porcellanite, petrified wood and glass.

In relation to the Hillcrest property, Tocomwall (2017: 35) notes:

The property known as Hillcrest has always been of importance to the Smith/Franks family lines of the Plains Clan of the Wonnarua People (PCWP)… With regards to understanding the current connection to country, the property was a place that still today contains the area that was one of confrontation. In the early days the Mt Arthur locality contained a men's site only. This site was always frequented by boys that were taken there to learn about hunting and ritual beliefs…

Adjacent to this property is the stone arrangement as reported within the Native Title Claim[2] prepared by PCWP. The stone arrangement for these families is a well-known initiation and birthing place for our people…and as a place of ceremonial importance where a fire was maintained to allow direct contact with Kawal, son of Biami our creator.

5.2.2.13 Liddell Coal Offset Areas (OzArk 2017a)

In 2017, OzArk completed a Due Diligence archaeological assessment for a suite of proposed environmental management activities within various offset areas at LCO: The Bowmans Creek Corridor (82.6 ha); The Mountain Block Offset (150.37 ha); and additional access areas (56.5 ha). The Survey Boundary crosses the Bowmans Creek Corridor Offset. Ten new Aboriginal sites were recorded during the assessment, as well as two new sensitive archaeological landforms (SALs). Artefacts were typically observed within areas of exposure where soil surfaces had eroded, i.e. along access tracks, near ant hills, sloping terraces, along creek lines (Bowmans and Coalhole Creeks) and areas where artefacts had been exposed by sheet wash erosion. No sites were identified on steep slopes or along ridge lines. Sites included five isolated finds and five artefact scatters. The dominant raw material recorded was mudstone followed by silcrete. Other materials included chert, volcanics, siltstone and quartzite.

5.2.2.14 Mitchell Hills South Offset Area (OzArk 2017b)

In 2017, OzArk completed a Due Diligence archaeological assessment on 37 ha of land within the Mitchell Hills South Offset Area, 600 m west of the Project Boundary. The area comprised moderate to steep gradients slopes on lower, mid and upper slope landforms associated with a ridge line. Three ephemeral drainages were present within the survey area, however, based on the topography these were assessed as likely to present as shallow valleys in the landscape that would not have held water in the past. Similar landforms are well represented within the Survey Boundary.

No Aboriginal objects were recorded during the inspection and no areas of potential intact subsurface archaeological deposits were identified. The absence of isolated finds and artefact

[2] The PCWP Native Title claim has since been withdrawn.

scatters was best attributed to the steeply sloping landforms which were steeper than expected and dominated the survey area.

5.2.2.15 Liddell Coal Operations DA305-11-01 Modification 7 (OzArk 2018)

OzArk (2018) completed an archaeological assessment of 14 ha of land within the Mountain Block Offset Area for proposed rehabilitation works, located 1.5 km south of the Project Boundary. Landforms within the Project Boundary consisted of steep to moderate slopes which rise in the north to a hill crest. Similar landforms are well represented within the Survey Boundary.

No new Aboriginal objects were recorded during the inspection and no areas of potential intact subsurface archaeological deposits were identified. Stone artefact sites were predicted to be the most likely site to be identified, however their absence was unsurprising given the steeply sloping landforms distant from water which dominated the area, and the high levels of disturbance from historical earthworks.

5.2.2.16 Lake Liddell Recreation Area Reserve (Arrow Heritage Solutions 2019)

Arrow Heritage Solutions (2019) completed archaeological assessment of 40 ha of land within the Lake Liddell Recreation Area Reserve, located immediately south of the Survey Boundary, to the north of Lake Liddell. A total of nine Aboriginal sites were recorded during the survey including six isolated finds and three low-density artefact scatters. Significant levels of disturbance were noted as being evident across the assessment area from the construction of a dam, road and railway infrastructure and former recreation activities.

5.3 LOCAL ARCHAEOLOGICAL CONTEXT

5.3.1 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any potential previously recorded heritage within the Survey Boundary. The results of this search are summarised in **Table 5-2**. Four AHIMS searches have been undertaken for the Project. The first was in September 2019 prior to the survey of the Project Boundary (Fieldwork Sessions 1 and 2), the second and third searches were in January and May 2020 prior to the survey of the ETL portion of the Survey Boundary (Fieldwork Sessions 3 and 4). The fourth search was in February 2022 to ensure that no new sites had been recorded in the Survey Boundary that are not considered in this report. All AHIMS searches are presented in detail in **Appendix 3**.

Table 5-2: Aboriginal cultural heritage: desktop-database search results.

Name of Database Searched	Date of Search	Type of Search	Comment
Commonwealth Heritage Listings	27 September 2019	Singleton, Muswellbrook, and Upper Hunter Shire LGAs	No places listed on either the National or Commonwealth heritage lists are located within the Survey Boundary.
National Native Title Claims Search	6 May 2020	NSW	No Native Title Claims cover the Survey Boundary[3].
AHIMS	27 September 2019	24 x 24 km centred on the Survey Boundary	108 AHIMS sites located within the designated search area.
	29 January 2020	500 m buffer on the powerline easement.	42 AHIMS sites located within the designated search area.
	6 May 2020	500 m buffer on those transport routes located outside the search area of the Survey Boundary that was searched on Sept. 2019	18 AHIMS sites within the designated search area.
Local Environmental Plan (LEP)	27 September 2019	Singleton LEP of 2013 Muswellbrook LEP of 2009 Upper Hunter LEP of 2013	None of the Aboriginal places noted occur near the Survey Boundary.

A search of the AHIMS database returned 154[4] records for Aboriginal heritage sites within the designated search areas. **Figure 5-1** shows the location of the AHIMS sites that have been recorded near the Survey Boundary and **Table 5-3** list the recorded site types.

Table 5-3 shows that stone artefact sites (isolated finds, artefact scatters) are the most commonly recorded local site types, together representing 148 (96%) of the 154 sites returned in the AHIMS search area. The majority of these have been recorded in areas of high exposure, with the densest and most complex sites being recorded on distinct landforms in proximity to watercourses. The near absence of modified trees and rock shelters conforms with the rarity of this site type for the region, likely related to the extensive clearance that has occurred historically, and a lack of escarpments in the surrounding area which contain suitable sandstone formations (overhangs).

In February 2022, a new AHIMS search was undertaken across the Project Boundary (GDA Zone 56, Eastings: 313789–327516, Northings: 6419457–6437476 and Eastings: 308091–315750,

[3] Native Title Claim NC2013/006 (NSD1680/2013, Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People) covered the Survey Boundary at the commencement of the Project, however, the claim was withdrawn prior to the completion of the ACHAR.

[4] A number of the same sites were returned within the search area for both the powerline easement and the Survey Boundary. Therefore, the overall number of sites is lower than what is documented in **Table 5-2**.

Northings: 6416386–6419457). No additional sites, other than those considered in this report, have been recorded in the Survey Boundary.

5.3.1.1 Site location discrepancies

Following review of Umwelt (2006), and the mapped located of their recorded sites, it became apparent for the sites recorded during this survey that the coordinates provided by AHIMS are in GDA, however, Umwelt provided them in AGD. In particular, site AN5 (Energy Australia) that the AHIMS data plots within the Survey Boundary is shown in AHIMS as GDA 311642E, 6418872N, whereas it should have been entered as AGD 311642E, 6418872N. When converted to GDA, the site should be at GDA 311748E, 6419063N and outside the Survey Boundary.

Site 37-2-5528 (HCR074AS) has been recorded with incorrect coordinates and is actually located 600 m to the north of its AHIMS location and outside the Survey Boundary.

Site recordings by Len Dyall in early 1982 have also been entered wrongly into AHIMS. These sites, (Cedar Creek A [37-3-0047], Cedar Creek B [37-3-0048], and Cedar Creek C [37-3-0049]), should be located further north and east of their AHIMS locations. The correct locations are GDA Zone 56: 316096E, 6422183N, 315614E, 6423385N, and 315262E, 6423450N respectively. All sites are outside of the Survey Boundary.

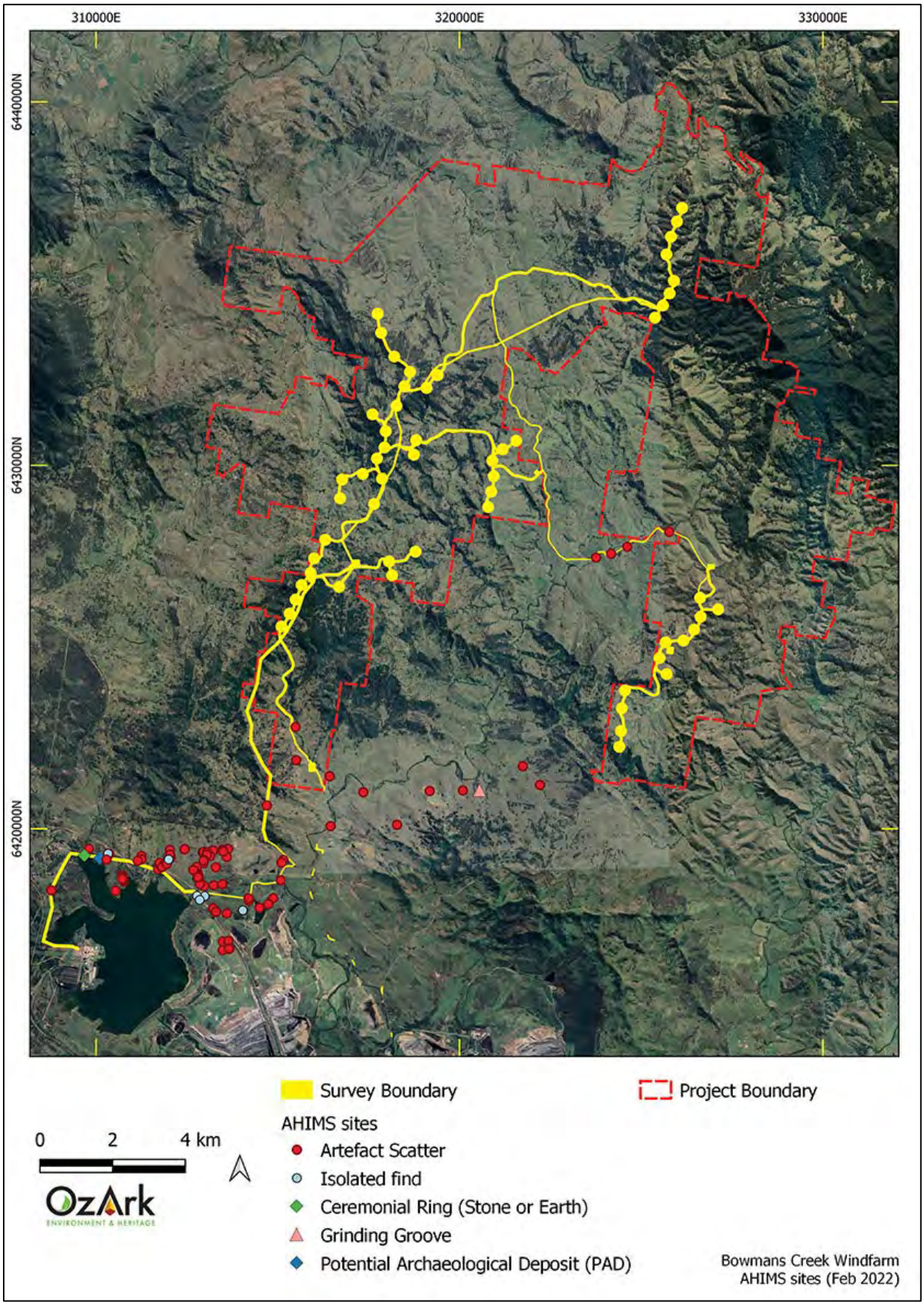
Now that these discrepancies have been noted, OzArk has updated the relevant site cards to ensure that the AHIMS register is as accurate as possible.

Figure 5-1 shows the location of the corrected coordinates as opposed to the AHIMS coordinates from the 2022 AHIMS search. This search includes sites recorded as part of this investigation.

Table 5-3: Site types and frequencies of AHIMS sites near the Survey Boundary.

Site Type	Number	% Frequency
Isolated find	75	48.7%
Artefact scatter	73	47.3%
Grinding grooves	1	0.5%
Ceremonial ring and artefact scatter	1	0.5%
Artefact scatter with PAD	1	0.5%
PAD	1	0.5%
Shelter with isolated find	1	0.5%
Scarred tree	1	0.5%
Total	**154**	**100**

Figure 5-1: Location of previously recorded AHIMS sites in relation to the Survey Boundary.



5.3.2 Previously recorded sites within the Survey Boundary

As a result of the previous assessments outlined in **Section 5.2**, there are three valid Aboriginal sites that have been recorded within the Survey Boundary on AHIMS. These sites include an artefact scatter, a PAD, and a ceremonial ring with associated artefacts. All these sites are located within the proposed ETL to the north of Lake Liddell. **Table 5-4** lists the site characteristics of these previously recorded sites.

Table 5-4. Previously recorded valid sites within the Survey Boundary.

AHIMS ID	Site name	GDA Zone 56 East	GDA Zone 56 North	Site type	Site details
37-2-2021	ANT 4	310366	6419306	Artefact scatter	20 mudstone flakes and five silcrete flakes recorded in a 5 m x 5 m area of erosion on the eastern bank of a drainage line.
37-2-2029	Hunter Gas Project PAD	310105	6419190	PAD	Unknown. Site card and associated report are unable to be accessed.
37-2-2072	ANT 22	309677	6419268	Ceremonial ring and artefact scatter	Site description provided notes "*interpreted by the community as a bora ground. The site consists of a bare exposure surrounded by rocks both artefactual and simple rocks*". Recorded artefacts included an anvil, hammerstone and a flake. Site described as being on a promontory, north of Lake Liddell.

5.4 ARCHAEOLOGICAL CONTEXT: CONCLUSION

The extensive and long-running archaeological investigations surrounding the Survey Boundary as summarised in **Section 5.2** and **5.3** indicate that:

- Stone artefact sites (isolated finds and artefact scatters) are the most commonly recorded site types in the area and that other site types, such as culturally modified trees, grinding grooves and rock shelters are very rare or non-existent
- Artefacts tend to be associated only with the A-Horizon soil layers indicating a date in the Holocene period (i.e. 10,000 BP to the present)
- The predominant raw materials used for stone artefact manufacture are locally sourced mudstone and silcrete
- Excavations generally reveal a low-density of artefacts, but some spatial patterning has been observed: principally concentrations of artefacts interpreted as 'knapping areas'. Other archaeological features such as hearths are rarely identified across the Hunter Valley region
- Sites tend to be associated with waterways and a discernible pattern has been observed whereby larger sites are associated with larger waterways offering permanent water supplies
- Sites on ridges tend to be low-density scatters and those on slopes are generally in a secondary context having been displaced by erosional processes. These sites are also generally of low-density

- Bowmans Creek would have been a major focus of past occupation near the Survey Boundary; although most landforms with archaeological potential associated with Bowmans Creek are outside of the Survey Boundary, further to the south.

5.5 PREDICTIVE MODEL FOR SITE LOCATION

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including plant and animal foods, stone and ochre resources and rock shelters, as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shells, and some bones that remain preserved in the current landscape. Even these, however, may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short- and long-time scales—or (b) the historical impacts associated with the introduction of European farming practices including grazing and cropping, land degradation, and farm related infrastructure. Scarred trees, due to their nature, may survive for up to several hundred years but rarely beyond.

5.5.1 Aboriginal Site Decision Support Tool

Aboriginal site features occur across the entire landscape; however, some parts of the landscape have a greater capacity to contain certain site features or features of different types. The variation in site feature likelihood across the landscape is useful for planning assessments of potential site impacts. The Aboriginal Site Decision Support Tool (ASDST) has been developed to support the assessment Aboriginal sites issues in NSW at the landscape-scale. The tool extends the AHIMS by illustrating the potential distribution of site features recorded in the database.

The maps of site feature predictions made by the ASDST are based on the application of site predictive modelling. This is a technique used to correlate site information in AHIMS with landscape patterns such as proximity to water, vegetation, terrain, soils etc. The maps provide a regional overview about site feature distribution and related issues about the level of accumulated impacts they have experienced.

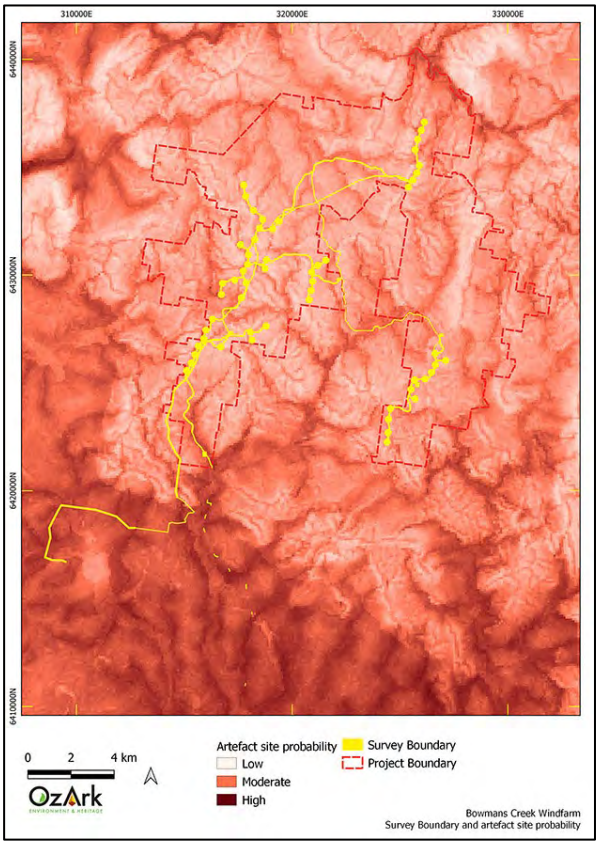
The ASDST has been developed to meet the needs of regional planning. For this reason, it is designed to be used at scales of 1:100,000 and above. Application at finer scales is possible, but it should be borne in mind that the datasets used to derive the products were themselves derived at a scale of 1:100,000 or coarser, and therefore the inaccuracies of those layers at finer scales will be carried through to the ASDST models. In short, The ASDST is a good tool to give a general prediction of certain site types, but it is not accurate at scales less than a square hectare.

Three models have been mapped: artefact site probability; scarred tree site probability and accumulated impacts (**Figure 5-2**).

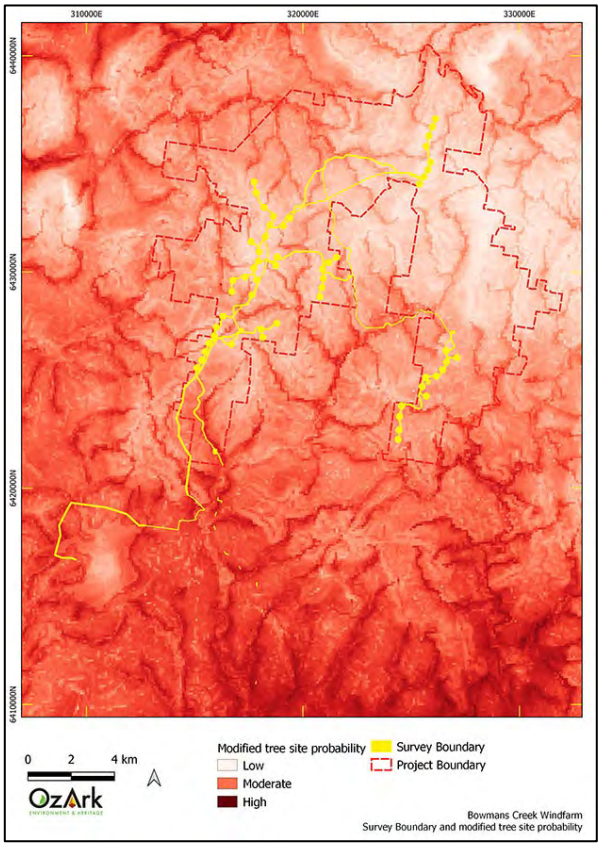
These models show:

- The majority of the Survey Boundary is in landforms with a low to moderate probability of recording artefact sites. Only the very southern portions of the Survey Boundary have a higher probability of recording this site type
- The majority of the Survey Boundary is in landforms with a low to moderate probability of recording modified tree sites. The southern portions of the Survey Boundary have a slightly raised probability of recording this site type
- The majority of the Survey Boundary is in landforms with a low accumulated impact. This raises the possibility of recording sites in these landforms.

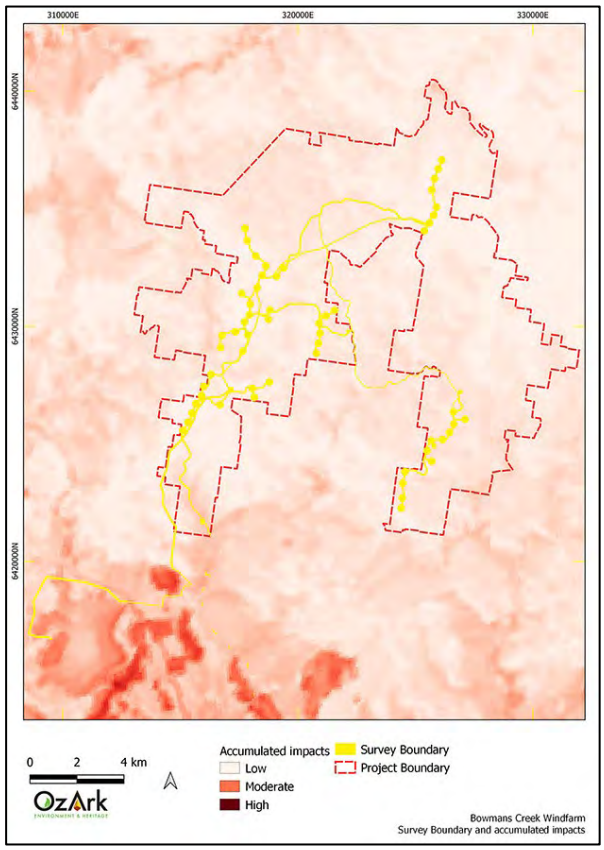
Figure 5-2: ASDST models and the Survey Boundary.



1. ASDST model of artefact site probability.



2. ASDST model of modified tree site probability.

	This cell is blank
3. ASDST model of accumulated impacts.	

5.5.2 Settlement strategies

The large number of archaeological studies undertaken within the vicinity of the Survey Boundary are mostly confined to the southern portions of the Survey Boundary on the valley floor. As this is where coal mines are located, along with associated infrastructure, it is these lowlands that have been intensively investigated. As the hills of the valley to the north have not been subjected to systematic survey, the site distribution pattern that emerges from a study of previous recordings (**Figure 5-1**) cannot be trusted as there is a bias for site location towards the intensively investigated lowlands. However, as a working hypothesis it will be investigated whether site location in the lowlands is actually more common that in the hills and valleys to the north.

5.5.3 Past land use

Crucial for the preservation of archaeological deposits is the history of past land use in an area. As all the Survey Boundary has been subjected to long-term low-level grazing, the types of disturbances one would expect to find are:

- Vegetation clearance. Aerial photography shows that the Survey Area has been largely cleared of native vegetation with only the steepest slopes and gullies supporting what looks like native vegetation. The implication for site recordings is that site types such as scarred/modified trees will be rare as these would have been removed during the tree clearing phase

- Soil loss. Due to the steeply sloping terrain, once the tree cover was removed, soil loss from the hills would have accelerated and deposition in valleys would have increased. In addition, greater water flows into drainage lines mean that drainage channels have widened and deepened. The implication for site recordings is that sites on crests and slopes have probably been displaced downslope, and sites in valleys have either been covered with sediment or removed due to morphological changes to the drainage lines

- Stock trampling. Not only do heavy stock, such at cattle, compact the soil leading to greater water shedding (and increased erosion around waterways) and disturb banks of waterways leading to wider channels, they can also disperse features such as stone arrangements. The implication for site recordings is that site types such as stone arrangements will be rare and that stock contribute to the loss of sites through erosion, particularly near waterways.

5.5.4 Previously recorded sites

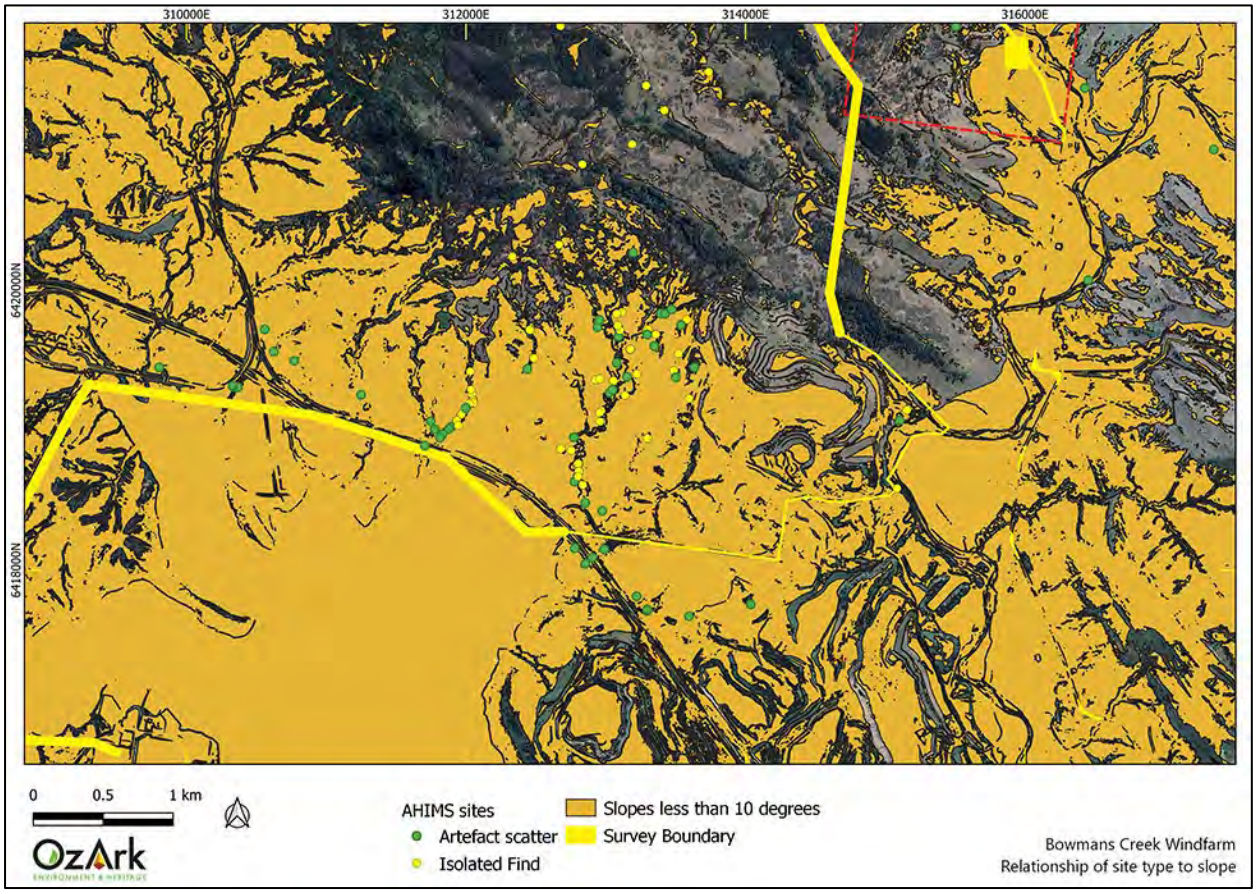
The results of past archaeological investigations near the Survey Boundary indicate that the most common site type will be artefact sites consisting of mudstone and silcrete artefacts. Artefact densities are expected to be low as all areas of the Survey Boundary are located away from larger waterways.

5.5.5 Landform modelling

A consideration of the landforms within the Survey Boundary enables a prediction regarding the type and distribution of sites to be made.

Figure 5-3 shows that artefact scatters will almost exclusively only be recorded on slopes of less than 10 degrees, while isolated artefacts can be recorded in slopes with a greater gradient where they have potentially been displaced from more level areas.

Figure 5-3: Aerial showing the relationship between degree of slope and the recording of artefact scatters and isolated finds.

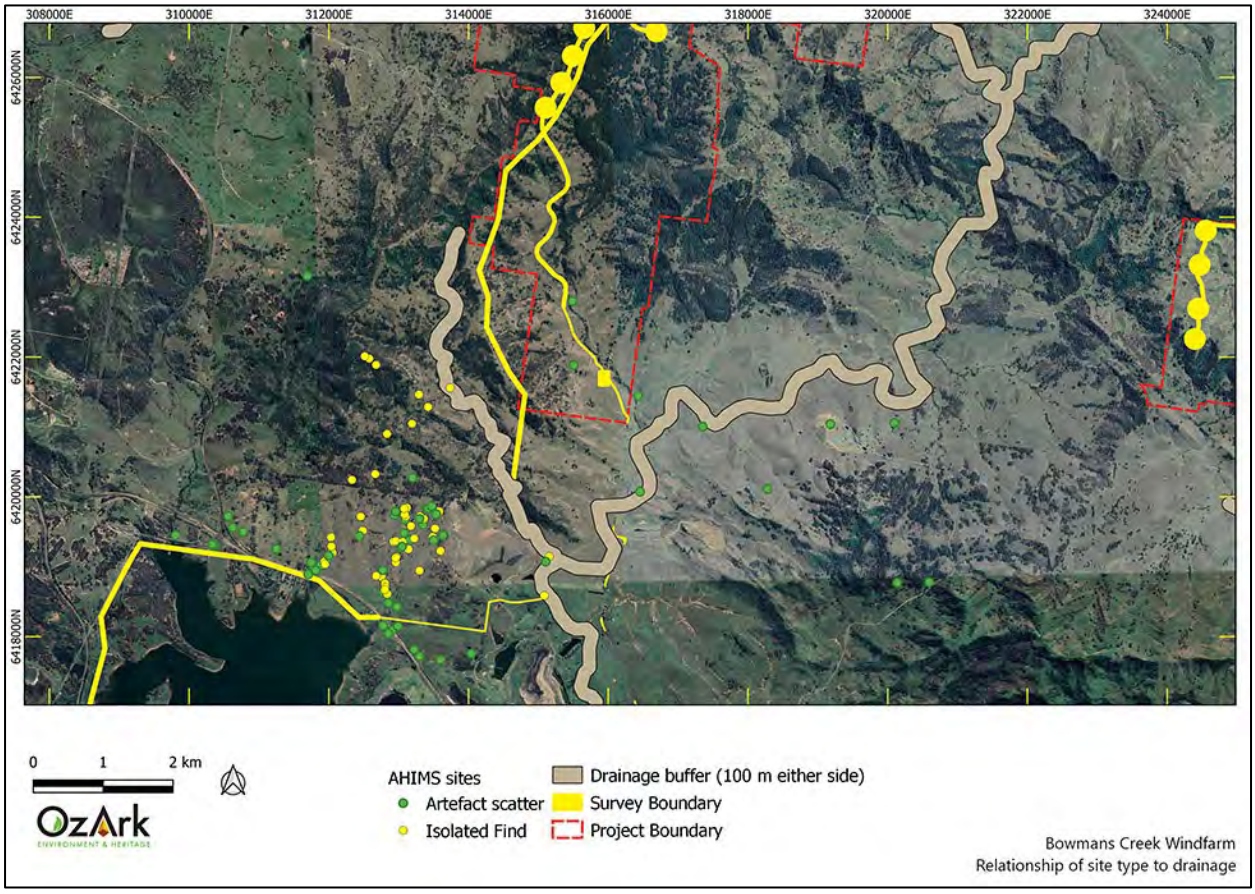


When the distance of previously recorded sites to drainage is mapped, the correlation is very uncertain, although across the state there has been an observed strong relationship between waterways and site location (**Figure 5-4**).

The lack of any sort of correlation in the landforms surrounding the Survey Boundary is probably due to the lack of systematic survey, as well as the cluster of sites recorded by Tocomwall in the Hillcrest property (Tocomwall 2017) that skew the data as this area was subjected to full survey.

In addition, drainage mapping concentrates on named or major waterways. Sites could be clustering along small, mostly ephemeral waterways that are not captured in **Figure 5-4**.

Figure 5-4: Aerial showing the relationship between the distance to water and the recording of sites.



5.5.6 Landform modelling for the Amended Project

The study area for the survey associated with the Amended Project include all landforms that were not surveyed for the 2021 ACHAR. The major areas outside of previously surveyed landforms are listed in **Section 1.1** and each of these areas will be described below following the numbering established in **Section 1.1** and shown on **Figure 1-3**.

Areas 1, 2, and 3 (**Figure 5-5**)

The additional areas are in steeply undulating landforms. Samples of this landform type were surveyed in nearby areas; however, the additional impacts are to the north and south of the areas previously surveyed. The landforms are cleared and have been used for long-term grazing. The additional impact areas cross several waterways that are within steep, V-shaped valleys without any evidence of creek flats or terraces.

Area 4 (**Figure 5-6**)

Area 4 consists of a new portion of access track. Rather than crossing a ridge as was surveyed for the EIS, the new alignment follows gentler gradients to the north. The new alignment is within cleared and grazed paddocks and is entirely contained within sloping landforms. The alignment crosses a seasonal waterway, better termed a gully, within a steep, V-shaped valley.

Areas 5 and 6 (**Figure 5-7**)

The additional areas include the alignment of an overhead electricity corridor (Area 5) and the alignment of access track (Area 6). Area 5 is within a steep, V-shaped valley where there is remnant vegetation due to the steepness of the terrain. Area 6 is within cleared, grazed paddocks and crosses slopes and a minor ridge line. Area 5 crosses a seasonal waterway, while Area 6 avoids any waterway crossings.

Area 7 (**Figure 5-8**)

Area 7 consists of a new alignment of access track that is entirely within clear, grazed paddocks. The new alignment crosses undulating landforms with some moderately steep slopes. The alignment crosses a seasonal waterway in an area that has relatively gentle gradients when compared to other landforms in the alignment.

Area 8 (**Figure 5-9**)

Area 8 consists of two portions of new access track. Area 8a crosses undulating landforms with some steep gradients. In the western portion the alignment is along a narrow ridge and steep V-shaped valley that contains some remnant vegetation. Elsewhere the alignment crosses cleared, grazed paddocks. Area 8b is a short section of track within steep slopes. Area 8b is entirely within cleared, grazed paddocks.

Figure 5-5: Digital elevation model of Areas 1, 2 and 3.

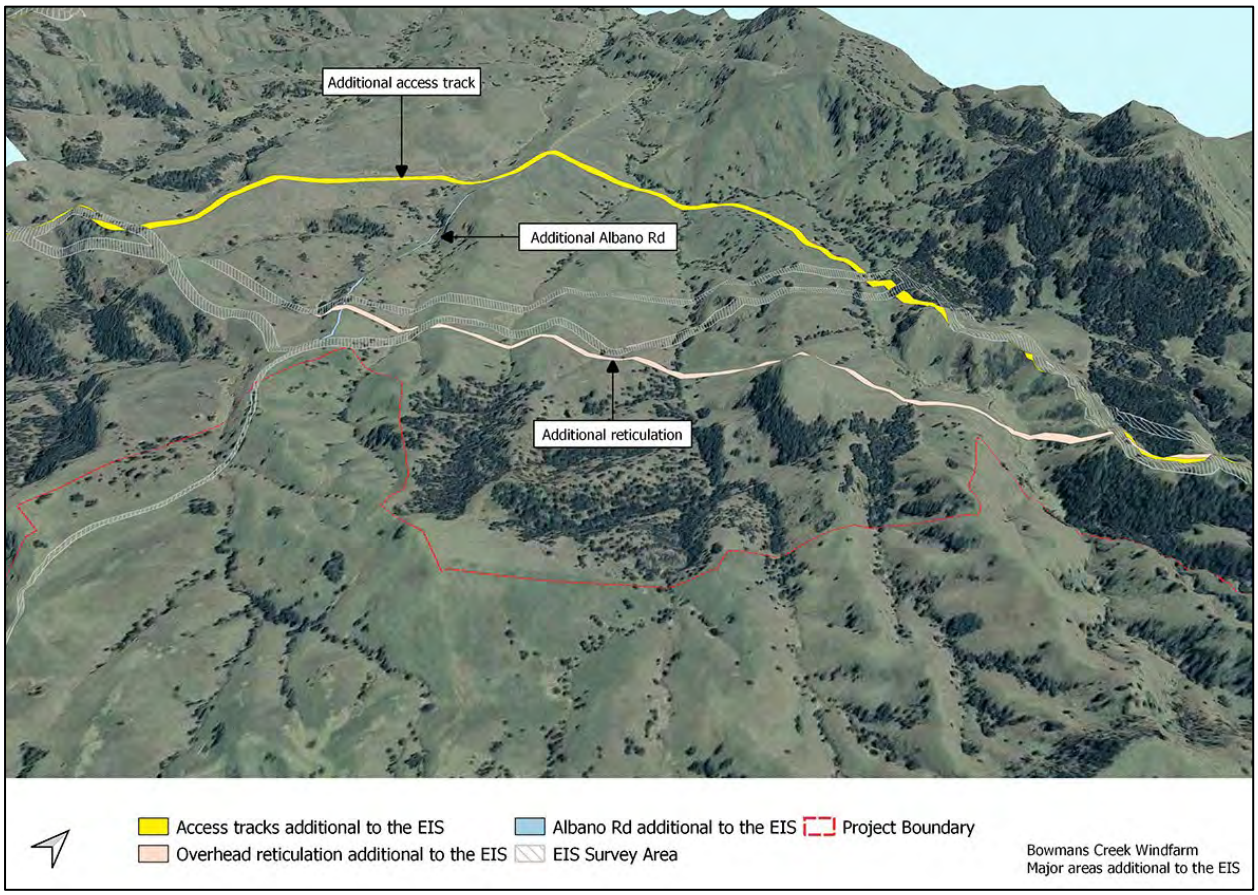


Figure 5-6: Digital elevation model of Area 4.

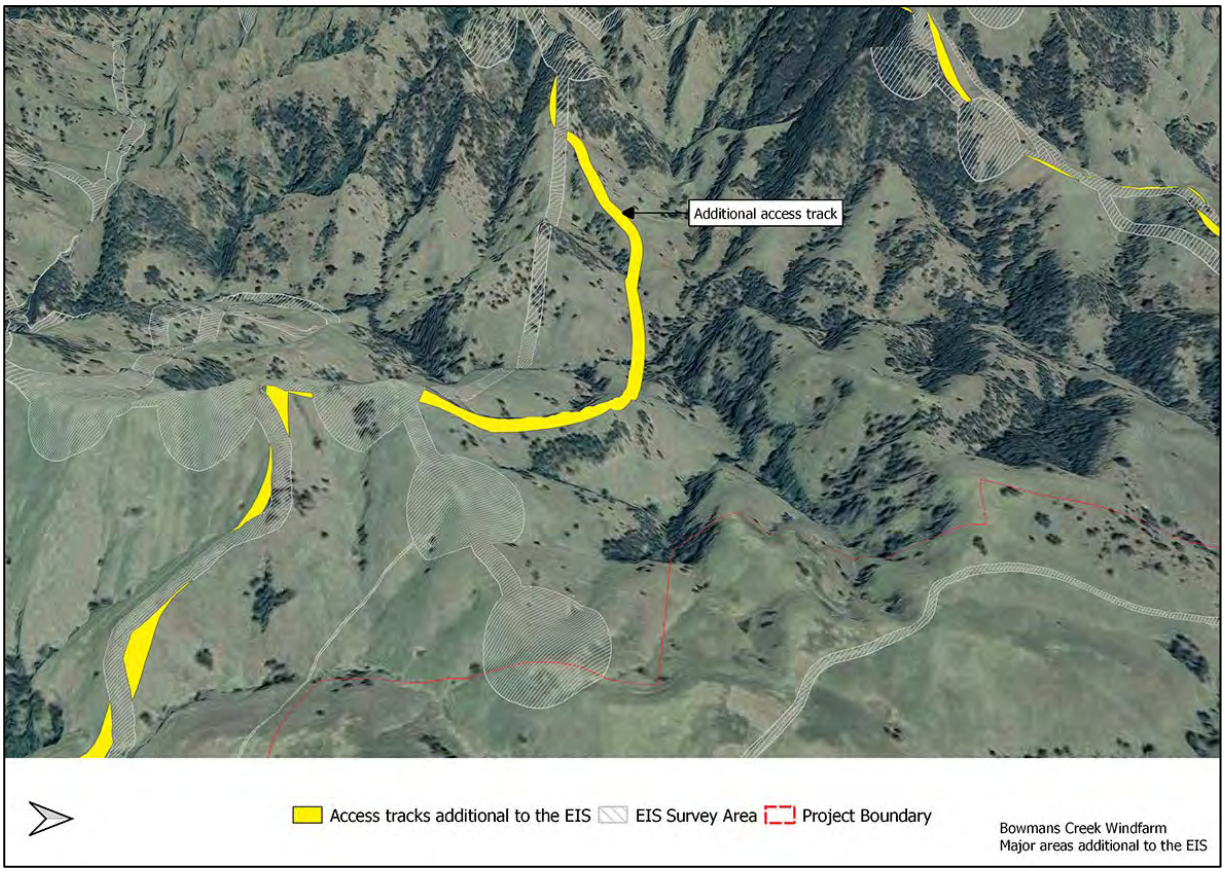


Figure 5-7: Digital elevation model of Areas 5 and 6.

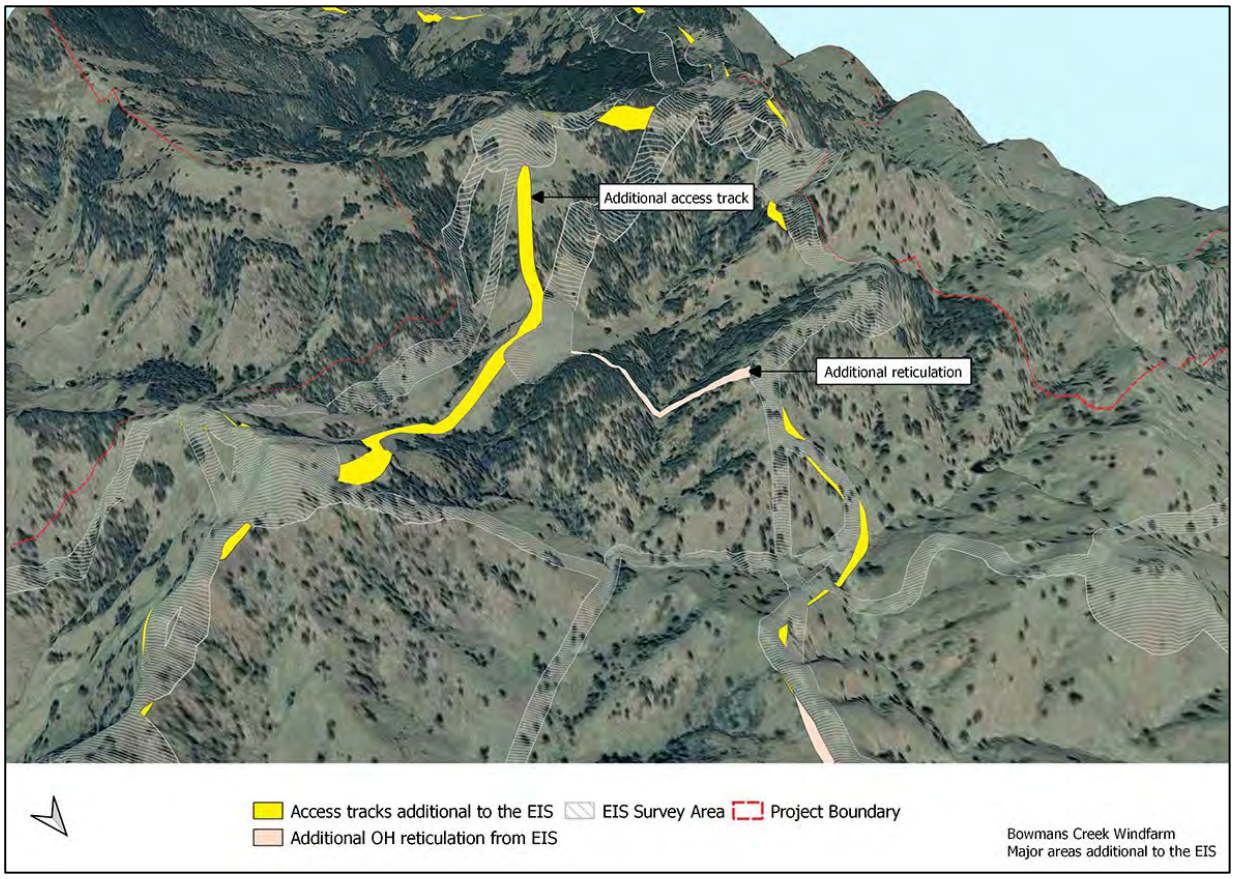


Figure 5-8: Digital elevation model of Area 7.

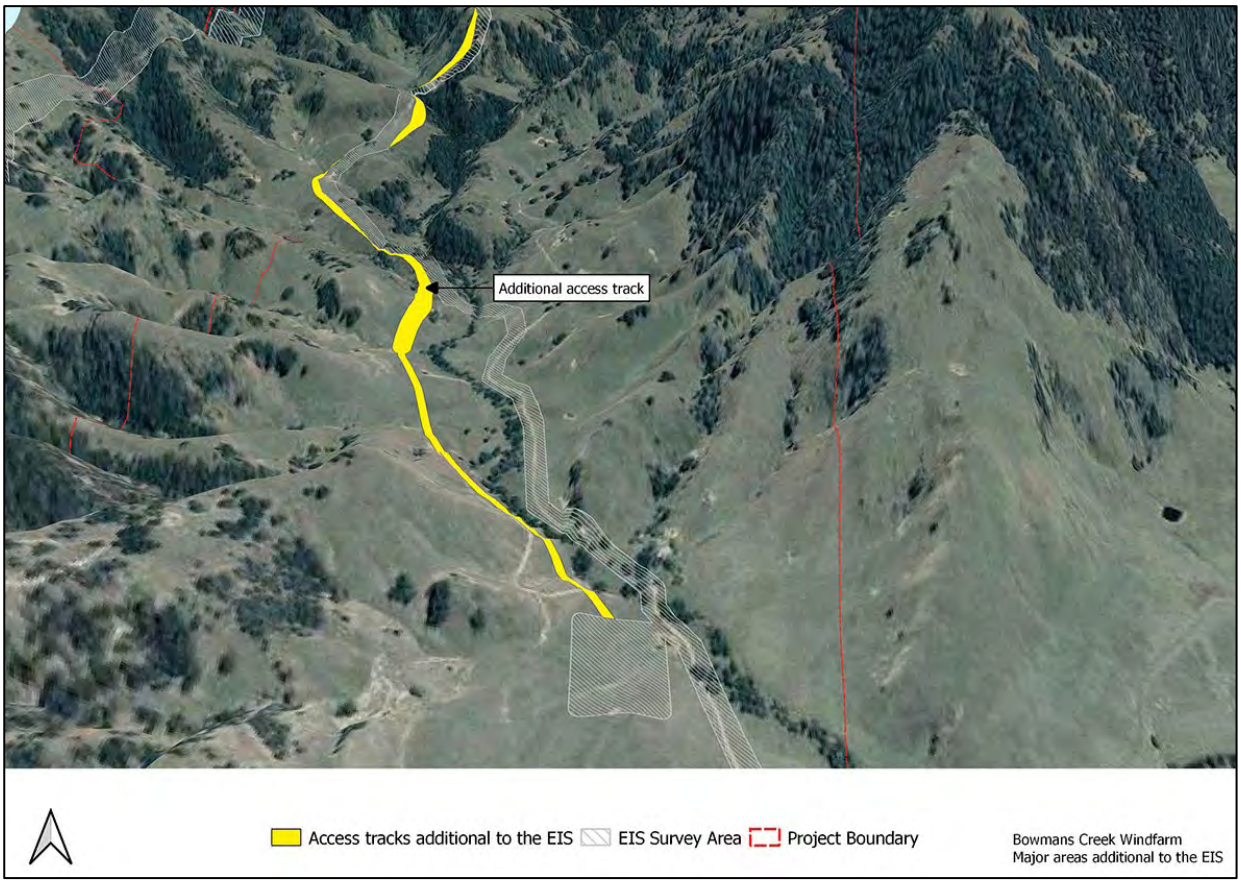
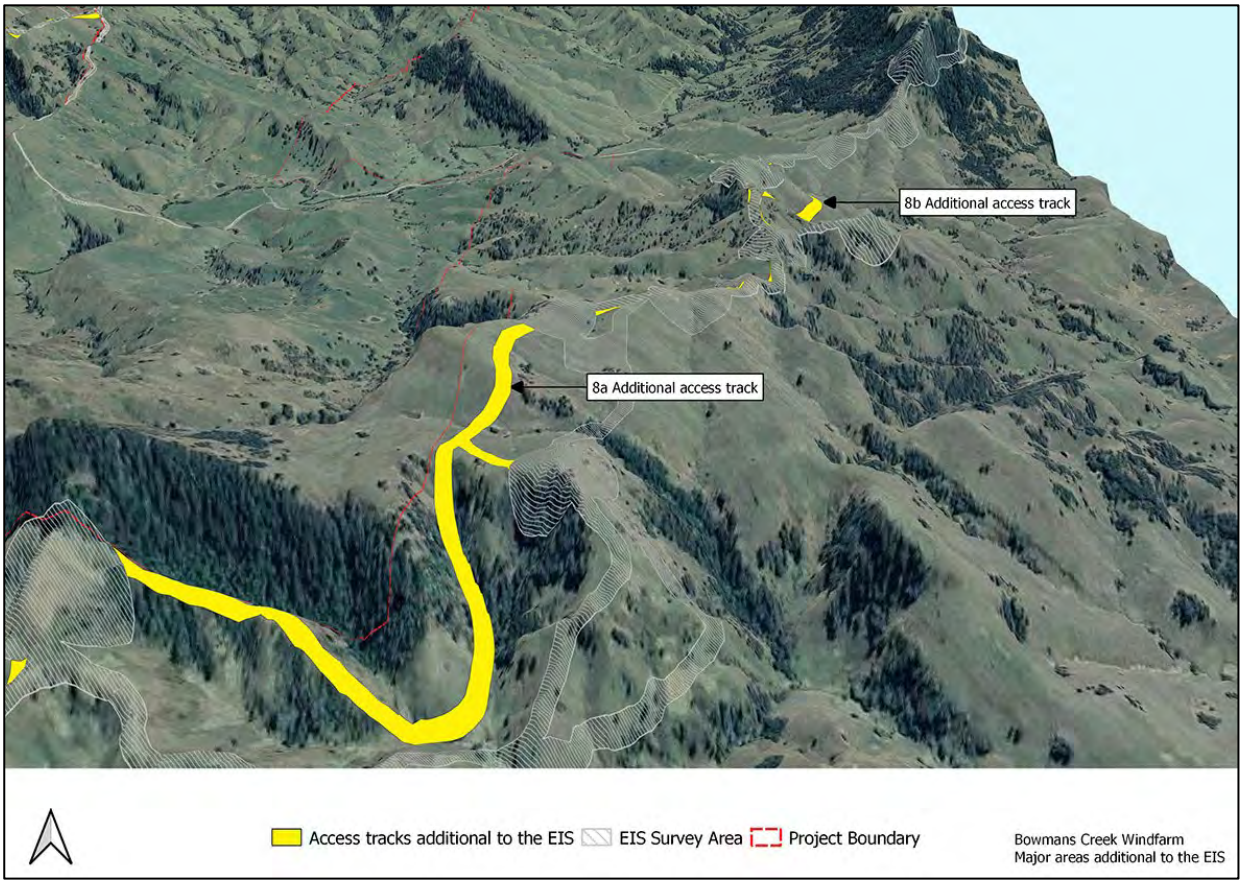


Figure 5-9: Digital elevation model of Area 8.



All the additional areas not surveyed for the 2021 EIS are in:

- Survey Unit 1 landforms
- Landforms where no sites were recorded during the survey for the EIS
- Topographies generally consisting of slopes steeper than 10 degrees
- Landforms distant to permanent or semi-permanent water
- Landforms that have undergone disturbances from vegetation clearing and long-term grazing.

The archaeological potential of each additional area not surveyed for the EIS is shown in **Table 5-5**.

Table 5-5: Archaeological potential of the unsurveyed areas.

Area	Proposed impact	Landform type	Likelihood to contain Aboriginal objects
1	Road widening	Slopes. No waterway crossings	Very low likelihood to contain Aboriginal objects as the area is either side of Albano Road in moderately steep landforms.
2	Access track	Undulating moderately steep. No level areas. Some crossings of minor waterways	Very low likelihood to contain Aboriginal objects due to the nature of the landforms. While the alignment crosses a minor waterway, it is in a V-shaped valley and unlikely to have landforms conducive to Aboriginal occupation. Culturally modified trees will not be recorded due to widespread clearing.
3	Overhead electricity reticulation	Undulating moderately steep. No level areas. Some crossings of minor waterways	Very low likelihood to contain Aboriginal objects due to the nature of the landforms. While the alignment crosses a minor waterway, it is in a V-shaped valley and unlikely to have landforms conducive to Aboriginal occupation. Culturally modified trees will not be recorded due to widespread clearing.
4	Access track	Minor ridge and slopes. One crossing of a minor waterway	Very low likelihood to contain Aboriginal objects due to the nature of the landforms. While the alignment crosses a minor waterway, it is in a V-shaped valley and unlikely to have landforms conducive to Aboriginal occupation. Culturally modified trees will not be recorded due to widespread clearing.
5	Overhead electricity reticulation	Steep V-shaped valley	Very low likelihood to contain Aboriginal objects due to the steep nature of the landforms. While there is remnant vegetation in this area, it is unlikely that the area will contain culturally modified trees due to the steep nature of the landforms. The waterway crossing has no associated creek flats or terraces.
6	Access track	Ridge, steep slopes. No waterway crossings	Very low likelihood to contain Aboriginal objects due to the steep nature of the landforms. The termination of the ridge, both to the east and to the west was surveyed for the EIS and no sites were recorded. Culturally modified trees will not be recorded due to widespread clearing.
7	Access track	Slopes	Very low likelihood to contain Aboriginal objects due to the sloping nature of the landforms. Identical landforms on the eastern side of the valley were surveyed for the EIS and no sites were recorded, even in flatter landforms near Cedar Creek. Culturally modified trees will not be recorded due to widespread clearing.
8	Access track	Slopes and minor ridges	Very low likelihood to contain Aboriginal objects due to the sloping nature of the landforms. Identical landforms to the east were surveyed for the EIS and no sites were recorded. While there is remnant vegetation in the west of this area, it is unlikely that the area will contain culturally modified trees due to the steep nature of the landforms.

5.5.7 Previous studies

Even accepting the lack of detailed survey in the hills and valleys to the north of the Hunter Valley, previous archaeological studies would tend to indicate that:

- Sites will be more common in the landforms on the valley floor rather than in topography with steep gradients
- Artefact sites consisting of mudstone and silcrete artefacts will possibly be recorded within the Survey Boundary
- Although not demonstrated by previous recordings, there remains a high probability that sites will be recorded in association to waterways.

5.5.8 Conclusion

Based on knowledge of the environmental contexts of the Survey Boundary and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of those site types being recorded within the Survey Boundary:

Isolated finds may be indicative of random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or sub-surface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.

- As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the Survey Boundary.

Open artefact scatters are defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of a background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

- Stone artefact distributions of variable artefact densities are the most common Aboriginal object found within the Hunter Valley region. A general correlation between different types of watercourses and the nature of the evidence of past Aboriginal occupation is evident. Higher artefact density sites are located near to permanent water sources and low-density artefact distributions are found elsewhere, such as ridge lines and slopes. Based on this, the moderate to steeply sloping landforms within the Survey Boundary are unlikely to have been utilised with the ridges and spurs being more attractive for camping. It is likely that such ridge lines were used as pathways in the past and any sites associated with such landforms are likely to have a low artefact density and a low complexity of tool types as the sites are either one-off events or only infrequently used. The Survey Boundary contains few locations of lower topographic areas associated with permanent or semi-permanent watercourses which have higher archaeological potential for more complex and higher density scatters (**Section 4.1**). While there are named waterways within the Survey Boundary (**Section 4.3**) the major components of the proposal are not located adjacent to these features. It is therefore predicted that large, complex sites will be absent from the Survey Boundary.

Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed because of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.

- The ridgelines where most of the proposed work will take place, are mostly cleared of vegetation, therefore this site type is not predicted likely to occur. It is also noted that this site type is very rare at a regional level due to historical tree clearance.

Quarry sites and stone procurement sites typically consist of exposures of stone material where evidence for human collection, extraction and/or preliminary processing has survived. Typically, these involve the extraction of siliceous or fine grained igneous and meta-sedimentary rock types for the manufacture of artefacts. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations.

- This site type could be recorded within the Survey Boundary should suitable rock outcroppings be available.

Grinding grooves are most likely to occur on flat outcrops of coarse-grained sandstone in the vicinity of water sources, however, grinding grooves have been recorded on fine-grained granite outcrops.

- Given the low prospect of suitable rock exposures being present in the Survey Boundary, grinding groove sites are unlikely to be present. In addition, the Survey Boundary does not contain extensive lengths of waterways where such sites are more likely to be located.

Rock shelters were utilised in the past for both habitation and ceremonial purposes. The term 'rock shelter site' refers to rock shelters/rock overhangs that contain evidence such as stone artefacts and/or bones and/or plant remains (from meals eaten at the site) and/or hearths (fireplaces). Most rock shelter sites are secular in nature, however, those that also contain rock art or engravings are often believed to be non-secular in nature. The term 'rock art site' generally refers to Aboriginal ochre paintings or ochre or charcoal drawings located on a rock slab (generally in a sheltered place like the floor of a cave or rock shelter), boulder, cliff-face, cave or rock shelter wall or roof, or wall of a rock overhang. Most rock art sites are found in positions that are sheltered from the elements. This observation, however, is probably biased to some extent, as rock art would not preserve well in open positions. Rock art sites are generally believed to be non-secular in nature.

- While a rock shelter has been previously recorded in the vicinity of the Survey Boundary (2.6 km to the west of the Survey Boundary), rock shelters are not likely to be common based on examination of available aerial photography. However, as the Survey Boundary contains ridges and the immediately adjacent upper slopes, rock shelters may be present.

Burials are generally found in soft sediments such as aeolian sand, alluvial silts and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.

- Given the topography, nature of the soils and geology, burials are not predicted to be present in the Survey Boundary.

Bora/Ceremonial sites are places which have ceremonial or spiritual connections. Ceremonial sites may comprise of natural landscapes or have archaeological material. Bora sites are ceremonial sites which consist of a cleared area and earthen rings.

- This site type does not necessarily follow landform predictability and are more likely to be identified by local Aboriginal people, rather than through archaeological evidence. These sites are generally identified through consultation with the RAPs. It is noted that there is a 'ceremonial ring' located within the Survey Boundary to the north of Lake Liddell (see **Table 5-4**).

5.5.8.1 Predictive model for the unassessed areas of the Amended Project

The survey for the EIS comprehensively sampled the landforms of Survey Unit 1 within which the major additional areas are located. This Survey Unit consists of slopes, sometimes very steep, narrow localised ridges, and V-shaped valleys. The landforms are largely cleared and have been grazed for many years. While remnant vegetation is located on the steepest slopes, this does not consist of old-growth vegetation but areas that have probably been cleared, or at least logged, in the past. Waterways are best described as headwaters and would generally only hold water on a seasonal basis. Waterways in Survey Unit 1 lack creek flats, terraces, or other areas suitable for Aboriginal occupation.

The extensive survey within Survey Unit 1 failed to record any Aboriginal objects in these landforms at the time of the 2021 EIS. This was entirely due to the nature of the landforms being generally too steep for camping activities and distant to reliable sources of water. The nature of the area's ridges is that they are not extensive to provide a 'pathway' through the landscape. The ridges are localised and while there may be a stretch for several hundred metres of ridge landforms, these landforms terminate in a steep V-shaped valley before the next ridge system begins.

Aboriginal community who assisted the survey said that the landforms of Survey Area 1 were very unlikely to have been extensively used by their ancestors and noted that the Project Area was between topographies more commonly used in the past, namely the more defined ridge systems in Mount Royal National Park and the flat valley floor of the Hunter Valley.

Given the knowledge gained for the survey that has taken place, the observed landform characteristics of the additional areas seen from digital elevation models (**Figure 5-5** to **Figure 5-9**), and the views of the Aboriginal community, it is assessed that the additional areas have a very low potential to contain Aboriginal objects.

5.6 RESEARCH QUESTIONS

A number of research questions can meaningfully be applied to the investigation of the Survey Boundary. These research questions include:

- Is there a correlation between the location of Aboriginal sites and the availability of water?
- What resources were available to the Aboriginal people using the Survey Boundary (food, stone and water) and what resources were transported to the area?
- How do the artefact assemblages from the sites along the slopes and ridge crests in the Survey Boundary differ from sites that are located along creek flats?
- What tasks were Aboriginal people undertaking at the sites?
- Did the Aboriginal people use the Survey Boundary at any particular time of the year?

- If there are hearths present, do they contain remains (animal/plant) that may indicate what people were cooking/eating? Can dates be obtained for the Aboriginal use of the area?
- Is there potential for burials to be present in the landscape?
- Are the outcropping rock materials present suitable for stone tool procurement and manufacture?
- Establish how the findings within the Survey Boundary (if any) accord with the regional archaeological context examined in **Section 5.2**.

6 RESULTS OF ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

6.1 SAMPLING STRATEGY AND FIELD METHODS

Standard archaeological field survey and recording methods were employed in this study (Burke & Smith 2004).

Each team of surveyors during Fieldwork Sessions 1 and 2 consisted of two archaeologists and two members of the Aboriginal community. In the first session of survey there were two teams working independently, and in the second session there was one team. Fieldwork Sessions 3 and 4 consisted of one archaeologist and one member of the Aboriginal community and Fieldwork Session 5 consisted of one archaeologist and two members of the Aboriginal community. This equates to 70 person days of survey.

Survey consisted of reaching all turbine locations and sampling other project components such as the access tracks, the Overhead and Underground Reticulation routes, and the ETL. All locations for facilities were inspected.

Fieldwork Session 5 surveyed all areas associated with the Amended Project that are in landforms with less than a 10-degree gradient and that were not surveyed for the 2021 EIS (**Figure 6-1**). The 2022 survey concentrated on three areas:

- Area 1. Landforms in the north of the Project Boundary. While these landforms are included in Survey Unit 1, the topography is not as steeply undulating as it is further to the south. In this area the dominant landform is undulating hills with a low to moderate gradient. At some locations the slopes are steep, but these areas are limited in their extent. The drainage lines inspected in this area were confined to V-shaped valleys
- Area 2. Landforms in this area are typical of Survey Unit 1 landforms as they consist of isolated ridges with steep flanking slopes. The drainage lines inspected in this area were broader, alluvial channels
- Area 3. Landforms in this area were typical of Survey Unit 1 landforms with steep slopes descending to narrow, V-shaped valleys.

Figure 6-2 shows the areas surveyed, either by vehicle or on foot. **Figure 6-2** shows those areas closely inspected, although other portions of the Survey Boundary, such as along public roads, were also inspected but less closely. These areas are not shown on **Figure 6-2**. Typically, survey consisted of driving along access tracks where the tracks were on slopes but walking or sample surveying (i.e. inspecting landforms with higher archaeological potential) along access tracks on more level gradients. All turbine and facility locations were surveyed on foot. The portions of the ETL corridor within Survey Unit 2 landforms (Hunter Valley lowlands) were inspected on foot. Where the ETL corridor is associated with higher gradient landforms (Survey Unit 1), the route was driven where possible with sample survey, or where it was not possible to drive, the team walked to the corridor from the closest access to undertake sample survey. Proposed impacts

associated with public road corridors consisted of driving to the impact location and inspecting the area on foot.

Reaching the turbine locations to undertake survey necessitated that a lot of slope, ridge and crest landforms within the Survey Boundary were surveyed. However, in Survey Unit 1, particular care was also taken to inspect the narrow valley landforms that are within this area. This included inspecting the location of any impacts near Bowmans Creek within the Survey Boundary, as well as at any other smaller waterways where impacts are proposed. The ETL corridor inspection surveyed all waterway crossings to assess archaeological potential.

At the conclusion of the survey it is considered that a large and representative sample of the landforms within the Survey Boundary have been surveyed.

Figure 6-1: Aerial showing the areas surveyed in 2022.

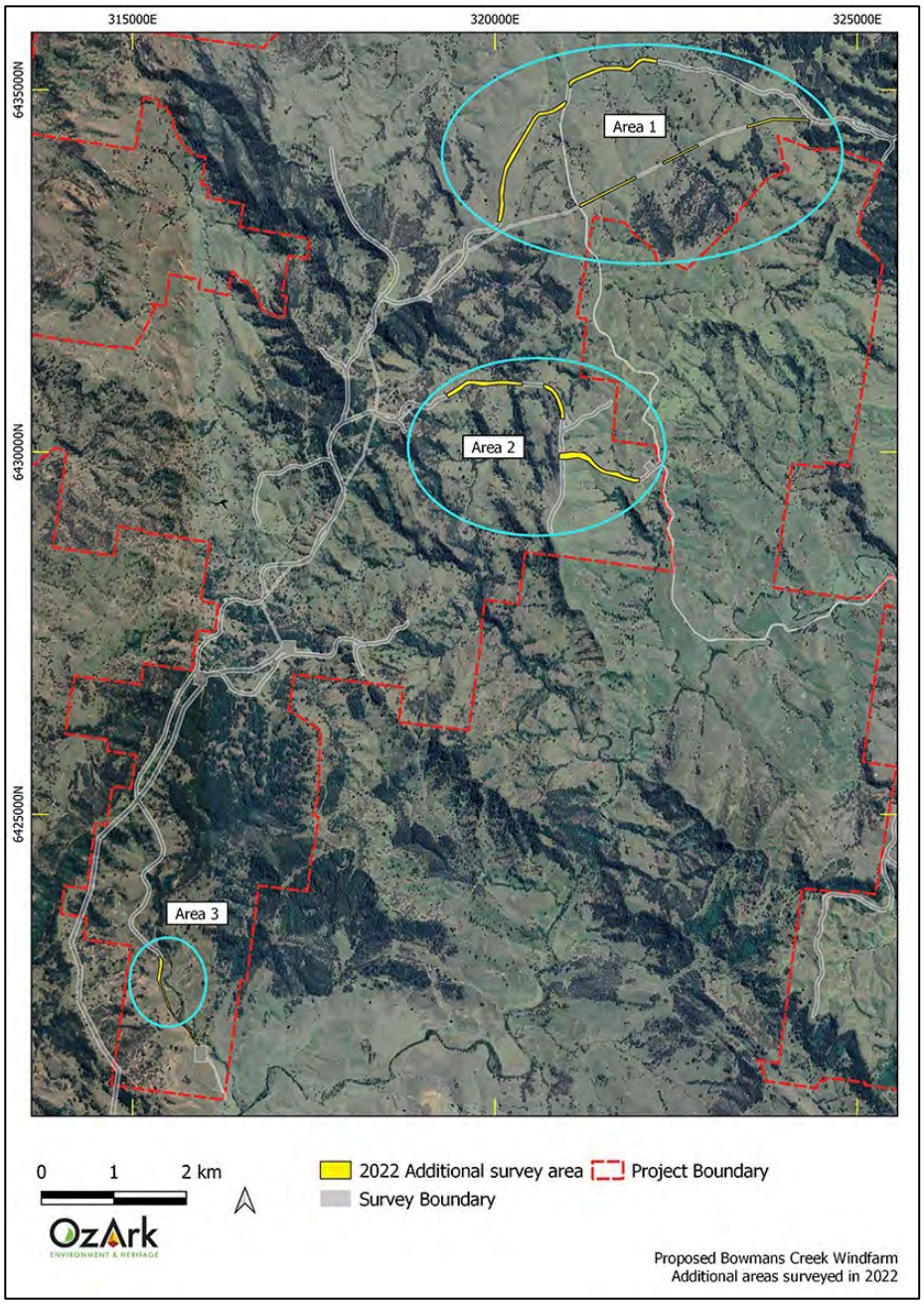
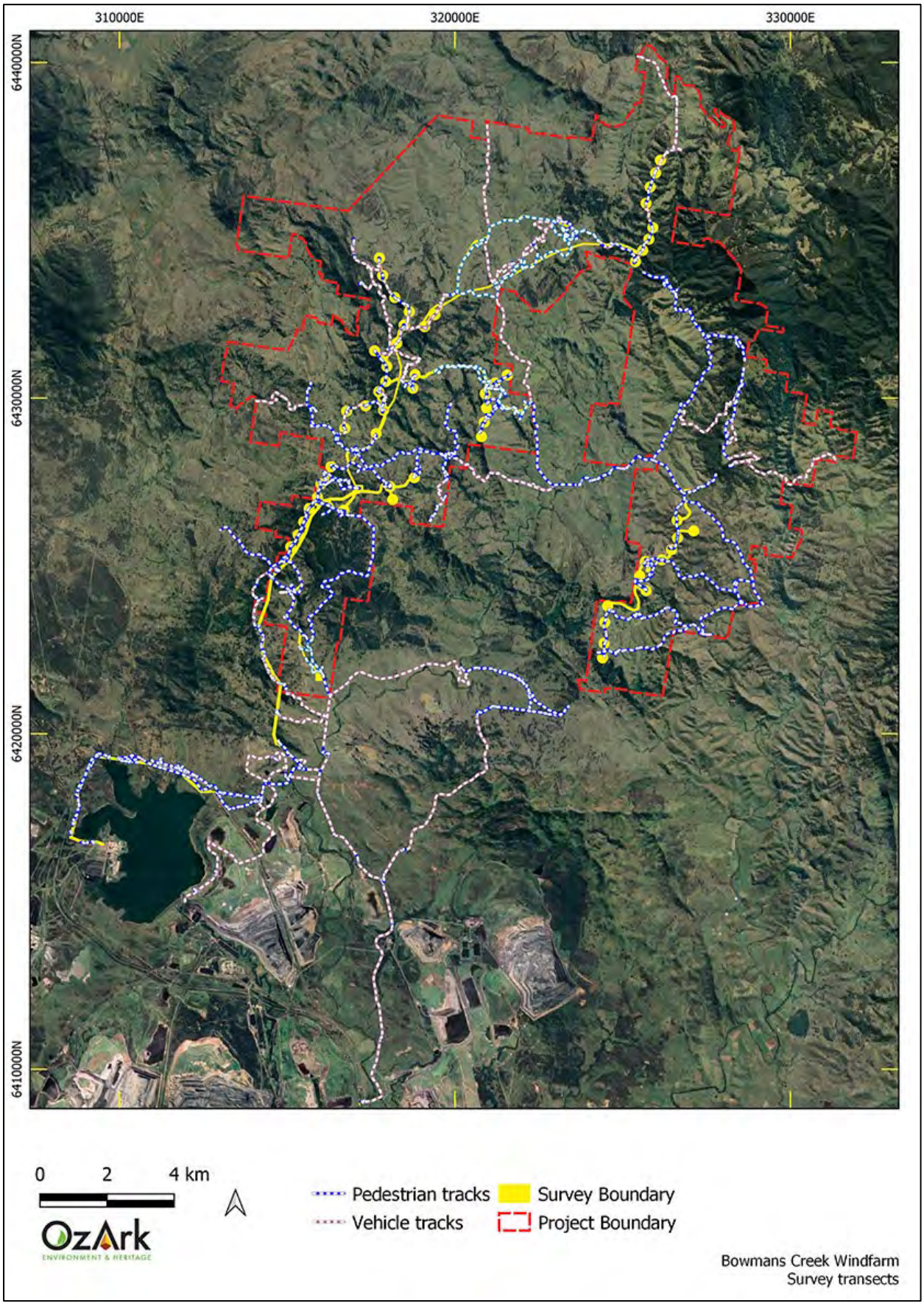


Figure 6-2: Aerial showing the areas fully surveyed.



6.2 SURVEY CONSTRAINTS

Survey constraints included very poor ground surface visibility (GSV) in Survey Unit 2 (valley lowlands) as the survey took place when the ground cover was very thick following an exceptional germination period in early–mid 2020 following late summer rains that ended a long period of below average rainfall. In contrast, most of Survey Unit 1 (hills and valleys) was surveyed in November 2019 at the height of the dry period when GSV was very high.

The nature of the Survey Boundary meant that not all portions were walked; although large portions were walked, or in the case of proposed access tracks on sloping landforms, driven. Aerial photography does not adequately capture the nature of the terrain and the difficulty in moving through it; especially as fences between properties would sometimes bar access and necessitate a detour of up to 40 minutes. Both the OzArk team and the ecology team from Cumberland Ecology swapped route data while in the field and this assisted in a more efficient survey. However, while the archaeological potential of the steep hills and narrow, V-shaped valleys that characterise Survey Unit 1 are adequately understood, the survey did have to extrapolate data to areas that were reasonably unreachable by the survey team. While all turbine locations were surveyed, an example of an portion not surveyed would be a very steep valley (ravine almost) between two turbines that will be spanned by the Overhead Reticulation.

The survey efficacy will be discussed further in **Section 6.3**.

6.3 EFFECTIVE SURVEY COVERAGE

Two of the key factors influencing the effectiveness of archaeological survey are ground surface visibility (GSV) and ground surface exposure (GSE). These factors are quantified 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 assessment, these terms are used in accordance with the definitions provided in the Code of Practice.

GSV 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 leaf litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals'* (DECCW 2010: 39).

GSE 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).

Table 6-1 calculates the effective survey coverage within the Survey Boundary. In general, **Table 6-1** presents an approximation of the amount of ground surface able to be seen at any location within particular landform units. For example, at any one location within Survey Unit 1, approximately 10.5% of the ground surface could be seen. Exposures in Survey Unit 1 were generally confined to naturally bare patches due to the prolonged dry season in 2019. The amount of visible ground decreased across the lowland landforms of Survey Unit 2 due to the luxuriant growth of grass following some good rain late in the summer of 2020. While there were less exposures, these exposures afforded more visibility as they were generally areas of sheet wash with little or no obscuring vegetation.

It should be noted that the percentage of effective coverage in **Table 6-1** is an approximation over a large area. The figures are more an indication whether GSV could have obscured detecting sites. However, these figures do not give a sense of the frequency of the exposures or where the exposures were located (i.e. were more exposures in areas of higher archaeological potential?).

In conclusion, Survey Unit 1 was surveyed under very dry conditions and the level of GSV was sufficient to obtain a meaningful view of the ground surface. It is assessed that the GSV did not hinder the detection of sites in Survey Unit 1. Survey Unit 2 was surveyed in a wet period following a vigorous growth spurt of grasses and other ground covers. This meant that large tracts of ground had zero GSV. However, where there were exposures, these were adjacent to waterways that are identified as archaeologically sensitive landforms requiring inspection. As such, although the survey efficacy in Survey Unit 2 seems low, this was mitigated by the location of the exposures and the skill of the survey team in identifying and inspecting any areas of potential that afforded some GSV.

Table 6-1: Effective survey coverage within the Survey Boundary.

Survey Unit	Landform	Survey Unit Area (ha)	GSV %	GSE %	Effective Coverage Area (ha) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
1	Hills and Valleys	659	70	15	69	10.5%
2	Lowlands	63	85	5	2.7	4.3%

Table 6-2 demonstrates that although the survey efficacy within Survey Unit 2 was the lowest at 4.3 per cent, this did not hamper the recording of sites; generally, because the available exposures were in the most archaeologically sensitive areas (i.e. along the banks of waterways).

Table 6-2: Effective survey coverage and incidences of site recording.

Landform	Landform area (ha)	Area Effectively Surveyed (ha) (= Effective Coverage Area)	% of Landform Effectively Surveyed (= Area Effectively Surveyed / Landform x 100)	Number of Sites	Number of Artefacts or Features
Hills and Valleys	659	69	10.5%	2	2
Lowlands	63	2.7	4.3%	13	100

6.4 ABORIGINAL SITES RECORDED

15 Aboriginal sites were newly recorded during the assessment. These sites consist of eight artefact scatters with a low–moderate artefact density and seven isolated artefacts. All recorded sites are artefact sites, and no other site type was recorded. Six are inside the Survey Boundary (Coalhole Creek OS-01 [37-3-1594], Albano Road OS-02 [37-3-1588], Albano Road OS-03 [37-3-1589], Liddell Power Station-IF1 [37-2-6263], Sandy Creek-IF1 [37-3-1632], and Sandy Creek-IF2 [37-3-1633]).

None of the recorded sites are associated with turbine locations, auxiliary facilities, or electricity infrastructure within the Project Boundary. Instead, they are associated with the ETL linking the Project Site with the Liddell Power Station, on a section of access track in the north of the Project Boundary, or along Albano Road that may be impacted by Transport Route Disturbances.

Table 6-3 summarises the Aboriginal cultural heritage sites recorded during the assessment of the Survey Boundary and **Figure 6-3** shows the location of all sites recorded (identified by the ID number in **Table 6-3**.

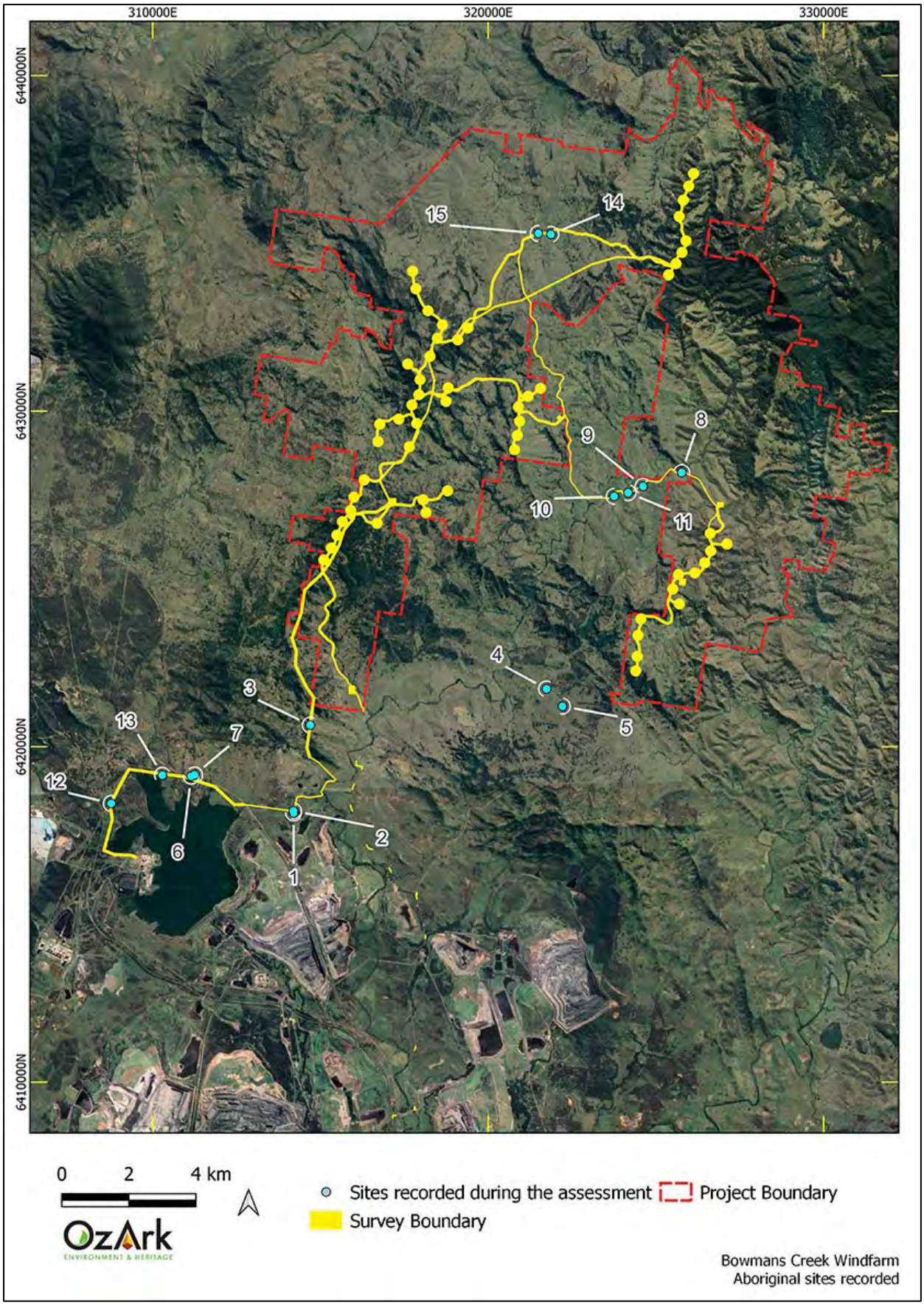
Further details on each site are presented in **Section 6.4.1**.

Table 6-3: Aboriginal cultural heritage sites recorded during the survey.

ID	Site Name	AHIMS ID	Feature(s)	GDA East	GDA North	Survey Unit	Landform
1	Liddell Hebden Road OS-1	37-3-1592	Artefact scatter: five artefacts	314202	6418024	2	Undulating plain
2	Liddell Hebden Road IF-1	37-3-1593	Isolated artefact	314197	6418086	2	Undulating plain
3	Coalhole Creek OS-01	37-3-1594	Artefact scatter: 34 artefacts	314697	6420643	2	Creek valley
4	Bowmans Tributary OS-01	37-3-1595	Artefact scatter: 21 artefacts. PAD present at site	321743	6421723	2	Creek valley
5	Bowmans Tributary IF-01	37-3-1596	Isolated artefact	322216	6421206	2	Creek valley
6	Hillcrest OS-01	37-2-6043	Artefact scatter: six artefacts	311149	6419120	2	Undulating plain
7	Hillcrest OS-02	37-2-6044	Artefact scatter: two artefacts	311249	6419159	2	Undulating plain
8	Albano Road OS-01	37-3-1587	Artefact scatter: three artefacts	325775	6428172	2	Broad valley

ID	Site Name	AHIMS ID	Feature(s)	GDA East	GDA North	Survey Unit	Landform
9	Albano Road OS-02	37-3-1588	Artefact scatter: 13 artefacts. PAD present at site	324620	6427761	2	Broad valley
10	Albano Road OS-03	37-3-1589	Artefact scatter: Three artefacts. PAD present at site	323759	6427462	2	Broad valley
11	Albano Road IF-01	37-3-1590	Isolated artefact	324175	6427570	2	Broad valley
12	Liddell Power Station-IF1	37-2-6263	Isolated find	308766	6418308	2	Undulating plain
13	Liddell Power Station-IF2	37-2-6541	Isolated find	310289	6419152	2	Undulating plain
14	Sandy Creek-IF1	37-3-1632	Isolated find	321875	6435271	1	Undulating hills
15	Sandy Creek-IF2	37-3-1633	Isolated find	321494	6435300	1	Undulating hills

Figure 6-3: Aerial showing all sites recorded during the assessment.



6.4.1 Aboriginal site details

The details of all sites recorded during the assessment follow.

Liddell Hebden Road OS-1 (37-3-1592)[5]

Site Type: Open artefact scatter

GPS Coordinates: 314202E / 6418024N (centroid, GDA94 Zone 56)

Location of Site: The site is located approximately 1.6 km east of Lake Liddell and 100 m south of Hebden Road on land owned by Liddell Coal. The site is directly west of a remnant tree line and 120 m west of a dam. Bowmans Creek is 1.2 km east of the site (**Figure 6-3**, **Figure 6-5**).

Description of Site: The site consists of five artefacts: three flakes and two cores made from mudstone or silcrete (**Table 6-4**). The site is in an erosion scald on the west edge of a remnant tree line (**Figure 6-4**). The erosion scald measures approximately 30 m by 15 m, with the artefact scatter inside the scald measuring approximately 26 m by 10m. Soil at the site location consists of a fine-grained light grey-brown silt with pebble and gravel inclusions. There is also dry light grey-brown clay present in areas where the soil has eroded further. The site has low potential for *in situ* subsurface deposits.

Table 6-4: Artefact attributes: Liddell Hebden Road OS-1.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Mudstone	Complete	Secondary	45x15x1
2	Core	Mudstone	Complete	Tertiary	40x15x10
3	Core	Mudstone	Complete	Secondary	50x20x20
4	Flake	Mudstone	Complete	Tertiary	10x20x0.5
5	Flake	Silcrete	Distal Fragment	Secondary	45x32x13

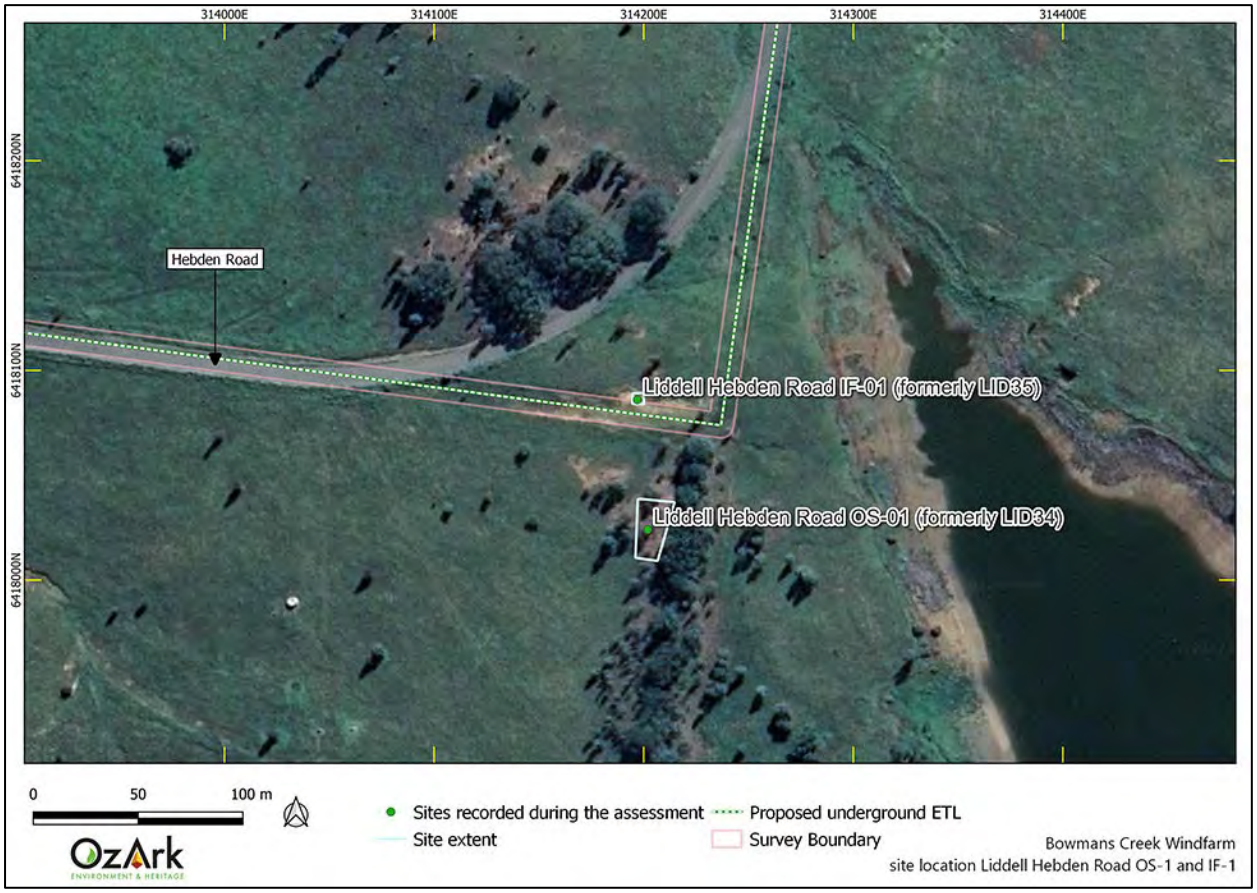
[5] In the 2021 EIS this site was called LID34. However, after the finalisation of the EIS it was realised that this name was already applied to another site. OzArk has submitted a site card update to AHIMS to change the name to Liddell Hebden Road OS-1.

Figure 6-4: Liddell Hebden Road OS-1. View of site and selection of recorded artefacts.

1. View south of Liddell Hebden Road OS-1 from the northern extent of the site.

2. View of an artefact from Liddell Hebden Road OS-1.

Figure 6-5: Aerial showing the location of Liddell Hebden Road OS-1 and IF-1.



Liddell Hebden Road IF-1 (37-3-1593)[6]

Site Type: Isolated find

GPS Coordinates: 314197E / 6418086N (GDA94 Zone 56)

Location of Site: The site is located approximately 1.6 km east of Lake Liddell and 50 m southeast of Hebden Road on land owned by Liddell Coal. The site is northwest of a remnant tree line and 120 m west of a dam. Bowmans Creek is 1.2 km east of the site (**Figure 6-3**, **Figure 6-5**).

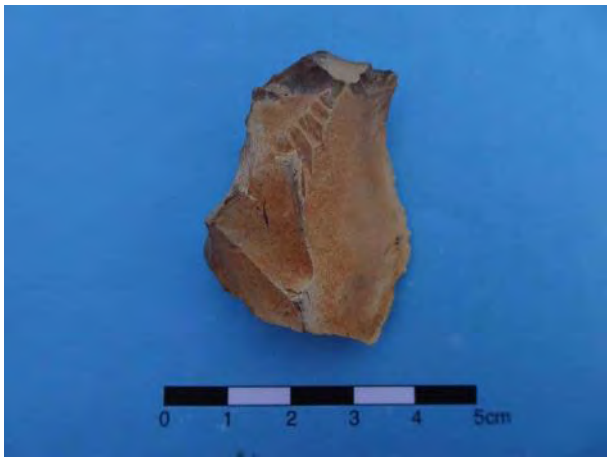
Description of Site: The site consists of a single tuff proximal flake (**Table 6-5**). The flake has a length of 40 mm, width of 30 mm and thickness of 15 mm. The site is in an erosion scald measuring approximately 100 m by 13 m (**Figure 6-6**). The artefact is on the northern edge of the scald. The site is 50 m north of Liddell Hebden Road OS-1. There is low potential for *in situ* subsurface deposits at the site.

Table 6-5: Artefact attributes: Liddell Hebden Road IF-1.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Tuff	Proximal Fragment	Secondary	40x30x15

Figure 6-6: Liddell Hebden Road IF-1. View of site and selection of recorded artefacts.

1. View west of Liddell Hebden Road IF-1 from the eastern extent of erosion scald.



2. View of artefact from Liddell Hebden Road IF-1.

[6] In the 2021 EIS this site was called LID35. However, after the finalisation of the EIS it was realised that this name was already applied to another site. OzArk has submitted a site card update to AHIMS to change the name to Liddell Hebden Road IF-1.

Coalhole Creek OS-01 (37-3-1594)

Site Type: Open artefact scatter

GPS Coordinates: 314697E / 6420643N (centroid, GDA94 Zone 56)

Location of Site: The site is located on private property approximately 1.5 km west of Scrumlo Road and 3.3 km northeast of Lake Liddell. It is in a small saddle between two hills. Coalhole Creek is 270 m west of the site (**Figure 6-3**, **Figure 6-8**).

Description of Site: The site is an open artefact scatter located around the edge of a dam (**Figure 6-7**). The recorded artefacts consist of flakes, cores, and shatter. Materials include mudstone, tuff, silcrete, volcanics, quartzite and chert (**Table 6-6**). The artefacts are mostly present around the west and south walls of the dam, with some scattered to the north. Soil at the location consists of a brown-red silt with pebble and small rock inclusions. Due to the disturbance and subsequent erosion from water wash at the site, there is low potential for *in situ* subsurface deposits.

Table 6-6: Artefact attributes: Coalhole Creek OS-01.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Mudstone	Complete	Secondary	50x35x10
2	Flake	Chert	Complete	Tertiary	30x20x5
3	Flake	Mudstone	Proximal Fragment	Tertiary	20x25x5
4	Flake	Chert	Complete	Tertiary	35x20x3
5	Flake	Chert	Complete	Tertiary	20x15x7
6	Flake	Silcrete	Proximal Fragment	Tertiary	20x22x5
7	Flake	Mudstone	Complete	Tertiary	20x10x3
8	Flake	Chert	Complete	Tertiary	25x15x5
9	Flaked Piece	Quartzite	Complete	Tertiary	20x1x5
10	Core	Chert	Complete	Tertiary	35x15x1
11	Flake	Tuff	Complete	Tertiary	40x30x1
12	Flake	Mudstone	Complete	Tertiary	30x2x5
13	Shatter	Tuff	Proximal Fragment	Tertiary	0-2cm
14	Shatter	Mudstone	Complete	Tertiary	2-4cm
15	Flake	Silcrete	Complete	Tertiary	2-4cm
16	Shatter	Mudstone	Complete	Tertiary	4-6cm
17	Flake	Silcrete	Complete	Tertiary	2-4cm
18	Flake	Tuff	Complete	Tertiary	25x10x5
19	Flake	Mudstone	Complete	Primary	0-2cm
20	Flake	Volcanics	Proximal Fragment	Tertiary	4-6cm
21	Core	Mudstone	Complete	Tertiary	35x40x20
22	Flake	Silcrete	Distal Fragment	Secondary	2-4cm
23	Flake	Tuff	Complete	Tertiary	2-4cm
24	Flake	Mudstone	Proximal Fragment	Tertiary	4-6cm

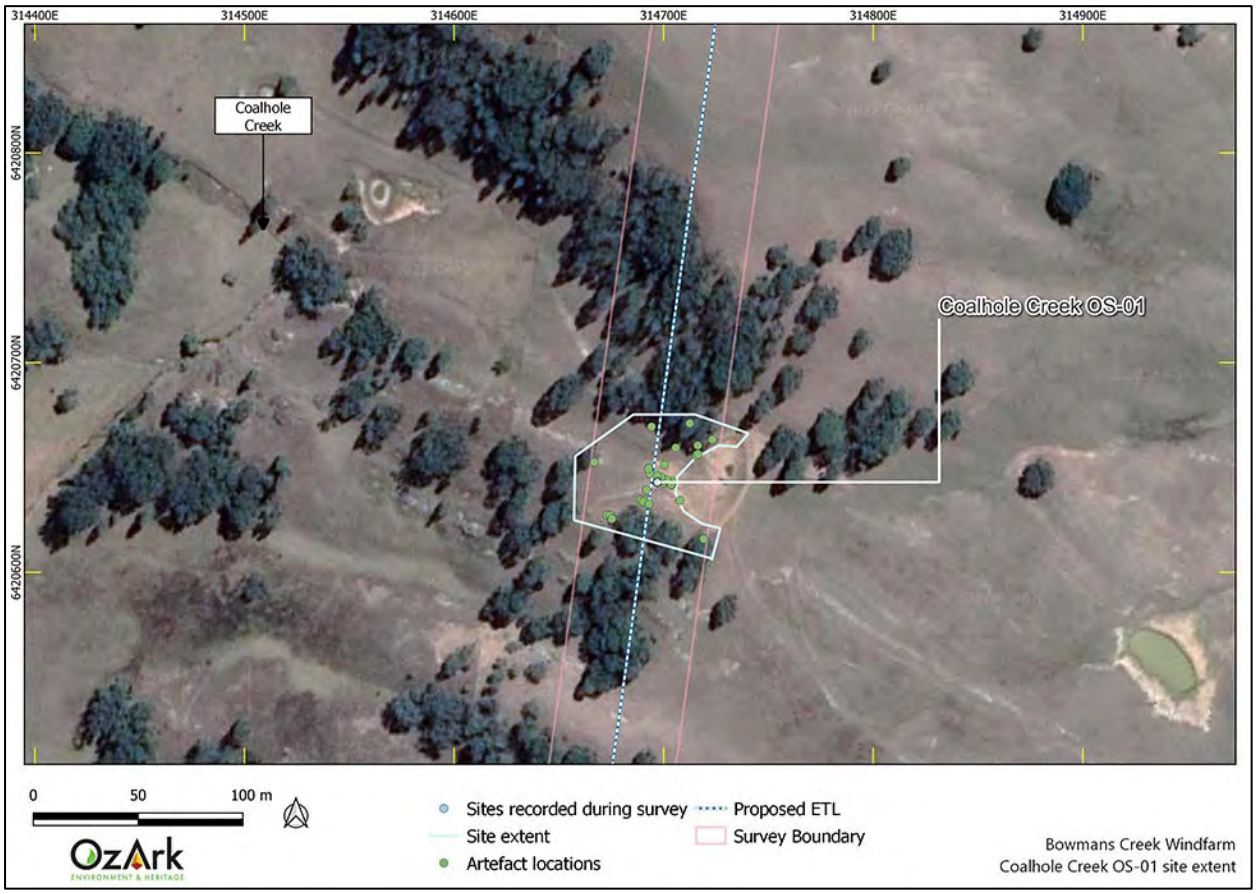
Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
25	End Scraper	Mudstone	Complete	Tertiary	2-4cm
26	Flake	Tuff	Complete	Tertiary	0-2cm
27	Shatter	Mudstone	Complete	Tertiary	0-2cm
28	Flake	Mudstone	Complete	Tertiary	2-4cm
29	Flake	Mudstone	Complete	Secondary	2-4cm
30	Flake	Silcrete	Complete	Tertiary	2-4cm
31	Flake	Mudstone	Proximal Fragment	Tertiary	0-2cm
32	Shatter	Mudstone	Complete	Tertiary	0-2cm
33	Flake	Silcrete	Complete	Tertiary	2-4cm
34	Shatter	Mudstone	Complete	Tertiary	0-2cm

Figure 6-7: Coalhole Creek OS-01. View of site and selection of recorded artefacts.

1. View northwest of Coalhole Creek OS-01 from the southeast site extent.

2. Selection of artefacts from Coalhole Creek OS-01.

Figure 6-8: Aerial showing the site extent of Coal Hole Creek OS-01.



Bowmans Tributary OS-01 (37-3-1595)

Site Type: Open artefact scatter and PAD

GPS Coordinates: 321743E / 6421723N (centroid of scatter, GDA94 Zone 56)

Location of Site: The site is located on private property approximately 1.7 km east of Scrumlo Road. Bowmans Creek is approximately 1.2 km west of the site (**Figure 6-3**, **Figure 6-10**).

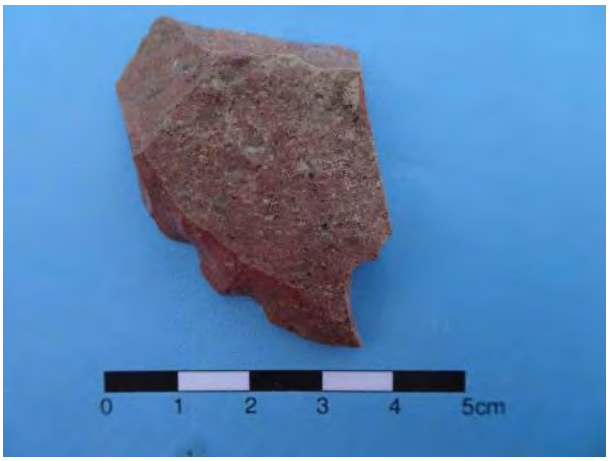
Description of Site: The site is located on a terrace along the south bank of a tributary of Bowmans Creek (**Figure 6-9**). The site is eroding from the ground surface along the edge of a flat elevated terrace. The extent of the artefact scatter visible is approximately 60 m by 20 m. Twenty-one artefacts were recorded at the site and consists of a variety of artefact types such as flakes, blades, shatter, and a scraper. Materials include mudstone, chert and silcrete (**Table 6-7**). The soil at the location consists of medium brown silt. The ground surface visibility surrounding the site is low due to dense grass cover. There is PAD associated with the artefact scatter in the un-eroded and heavily grassed area of the terrace. The PAD extent covers the flat elevated terrace to the west, east and south of the artefact scatter and measures approximately 160 m by 50 m.

Table 6-7: Artefact attributes: Bowmans Tributary OS-01.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Mudstone	Complete	Tertiary	50x30x10
2	Shatter	Mudstone	Complete	Secondary	15x10x3
3	End Scraper	Silcrete	Longitudinal Break	Tertiary	40x30x10
4	Flake	Silcrete	Distal Fragment	Tertiary	15x10x8
5	Shatter	Mudstone	Complete	Secondary	0-2cm
6	Shatter	Mudstone	Complete	Secondary	0-2cm
9	Shatter	Mudstone	Complete	Secondary	20x15x5
7	Flake	Mudstone	Complete	Tertiary	25x15x8
8	Flake	Chert	Complete	Tertiary	40x35x10
10	Backed Blade	Mudstone	Complete	Tertiary	4-6cm
11	Flake	Mudstone	Complete	Tertiary	2-4cm
12	Backed Blade	Mudstone	Distal Fragment	Tertiary	0-2cm
13	Flake	Mudstone	Complete	Tertiary	2-4cm
14	Flake	Mudstone	Complete	Tertiary	2-4cm
15	Flake	Silcrete	Proximal Fragment	Tertiary	0-2cm
16	Flake	Mudstone	Complete	Tertiary	0-2cm
19	Flake	Mudstone	Complete	Tertiary	0-2cm
21	Flake	Mudstone	Complete	Tertiary	0-2cm
17	Flake	Mudstone	Complete	Tertiary	2-4cm
18	Flake	Mudstone	Complete	Tertiary	0-2cm
20	Flake	Mudstone	Complete	Tertiary	2-4cm

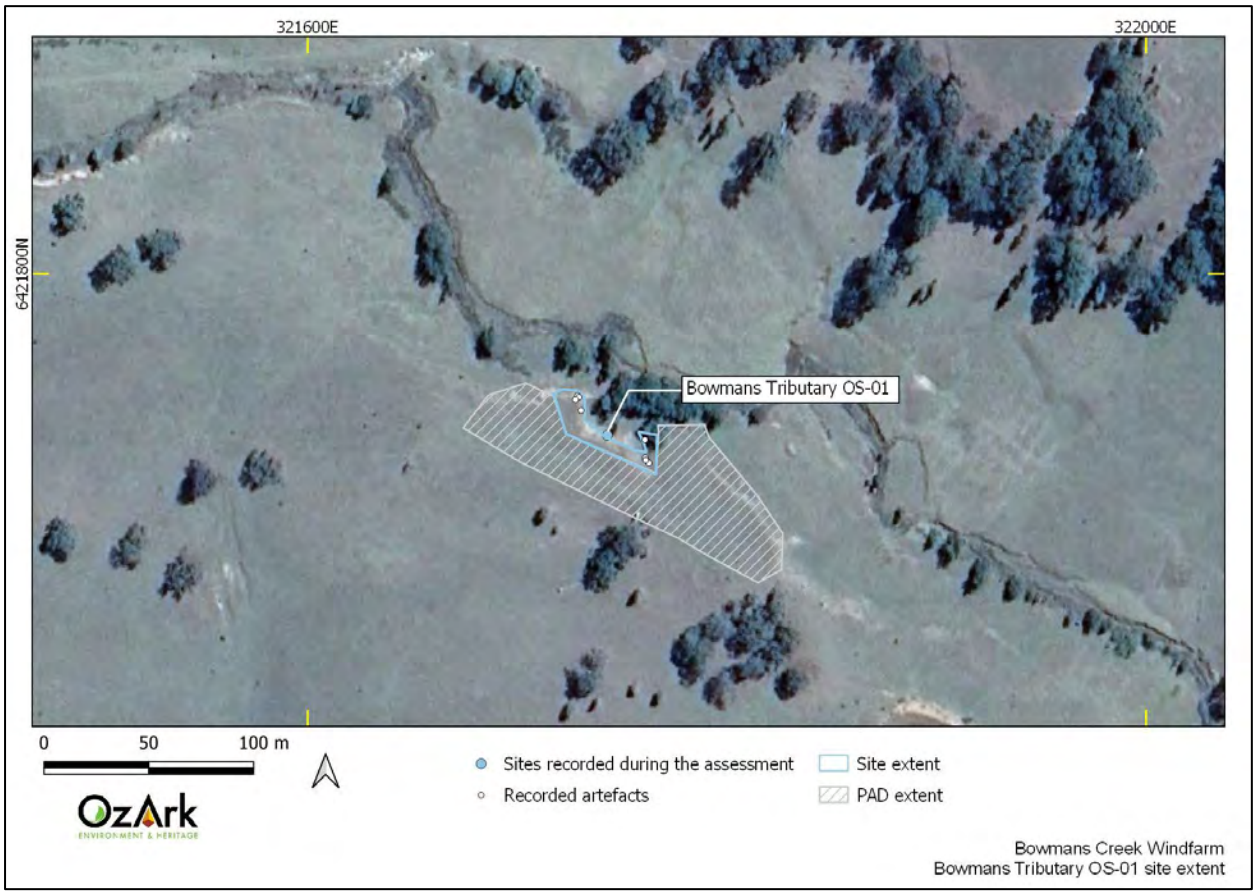
Figure 6-9: Bowmans Tributary OS-01. View of site and selection of recorded artefacts.

1. View southeast of Bowmans Tributary OS-01 from the easternmost extent of site.



2. View of retouched flake from Bowmans Tributary OS-01.

Figure 6-10: Aerial showing the site extent of Bowmans Tributary OS-01.



Bowmans Tributary IF-01 (37-3-1596)

Site Type: Isolated find

GPS Coordinates: 322216E / 6421206N (centroid, GDA94 Zone 56)

Location of Site: The site is located on private property approximately 2.4 km southeast of Scrumlo Road and 1.8 km east of Bowmans Creek (**Figure 6-3**, **Figure 6-11**).

Description of Site: The site consists of a single proximal mudstone flake (**Table 6-8**). The artefact is in an erosion scald located on the west edge of a drainage line at the base of a steep slope (**Figure 6-11**). Soils at the location consists of brown-grey silt. Gravels are prevalent over the area. The area is affected by water wash. There is low potential for *in situ* subsurface deposits at the site.

Table 6-8: Artefact attributes: Bowmans Tributary IF-01.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Mudstone	Proximal Fragment	Tertiary	35x20x15

Figure 6-11: Aerial showing the site extent of Bowmans Tributary IF-01.

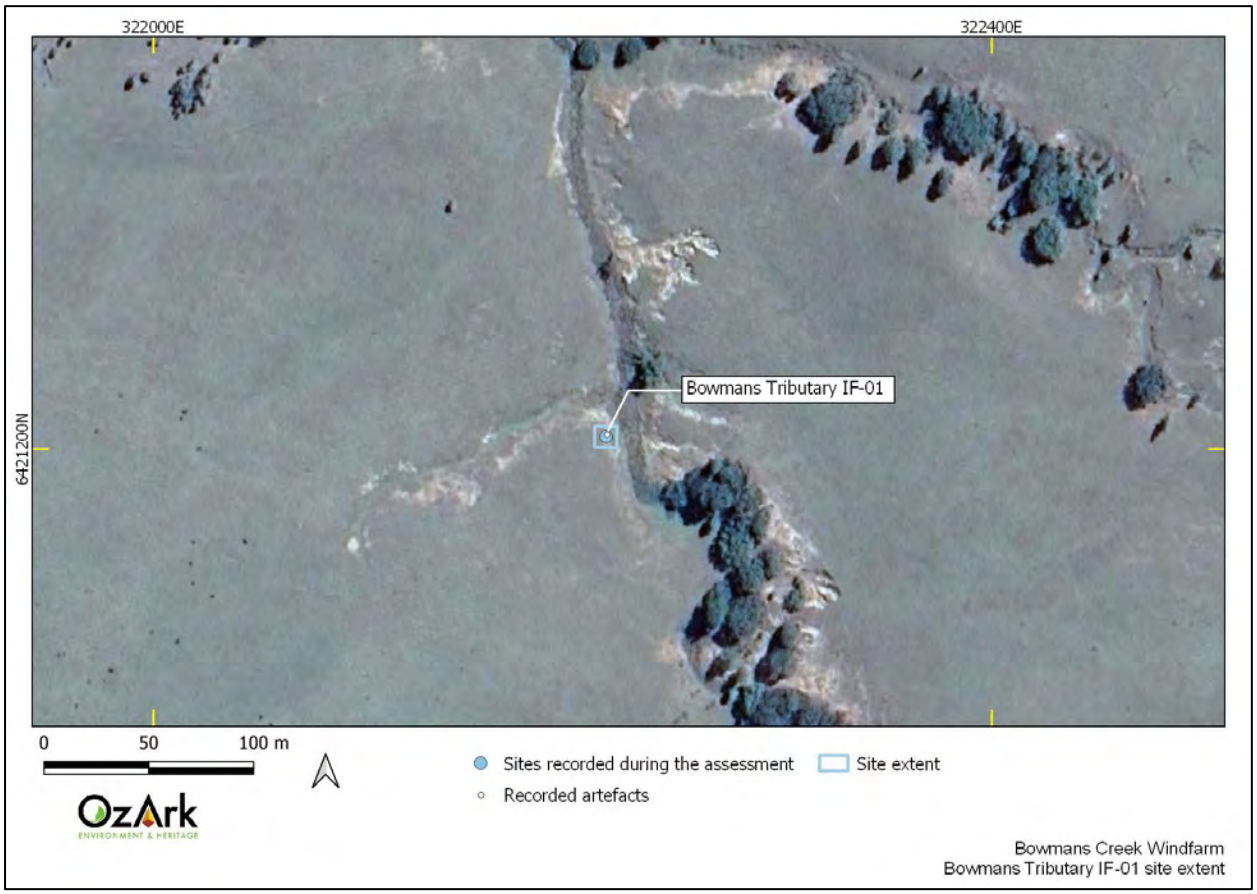


Figure 6-12: Bowmans Tributary IF-01. View of site and selection of recorded artefacts.

1. View north of Bowmans Tributary IF-01. Note drainage line on the right and slope on the left.

2. View of artefact from Bowmans Tributary IF-01.

Hillcrest OS-01 (37-2-6043)

Site Type: Open artefact scatter

GPS Coordinates: 311149E / 6419120N (centroid, GDA94 Zone 56)

Location of Site: The site is located on Ravensworth's Hillcrest property approximately 110 m north of Hebden Road and 440 m north of Lake Liddell (**Figure 6-3**, **Figure 6-14**).

Description of Site: The site consists of six recorded artefacts located between the dirt track and the north edge of a railway corridor (**Figure 6-13**). The artefacts are in an erosion scald on a slight slope approximately 55 m west of a minor drainage line. The recorded artefacts include three flakes (two from mudstone, one from tuff) and three pieces of mudstone or tuff shatter (**Table 6-9**). The site is affected by erosion and water wash. The soil at the site is a light orange silt with pebble and gravel inclusions. There is low potential for *in situ* subsurface deposits at the site.

Table 6-9: Artefact attributes: Hillcrest OS-01.

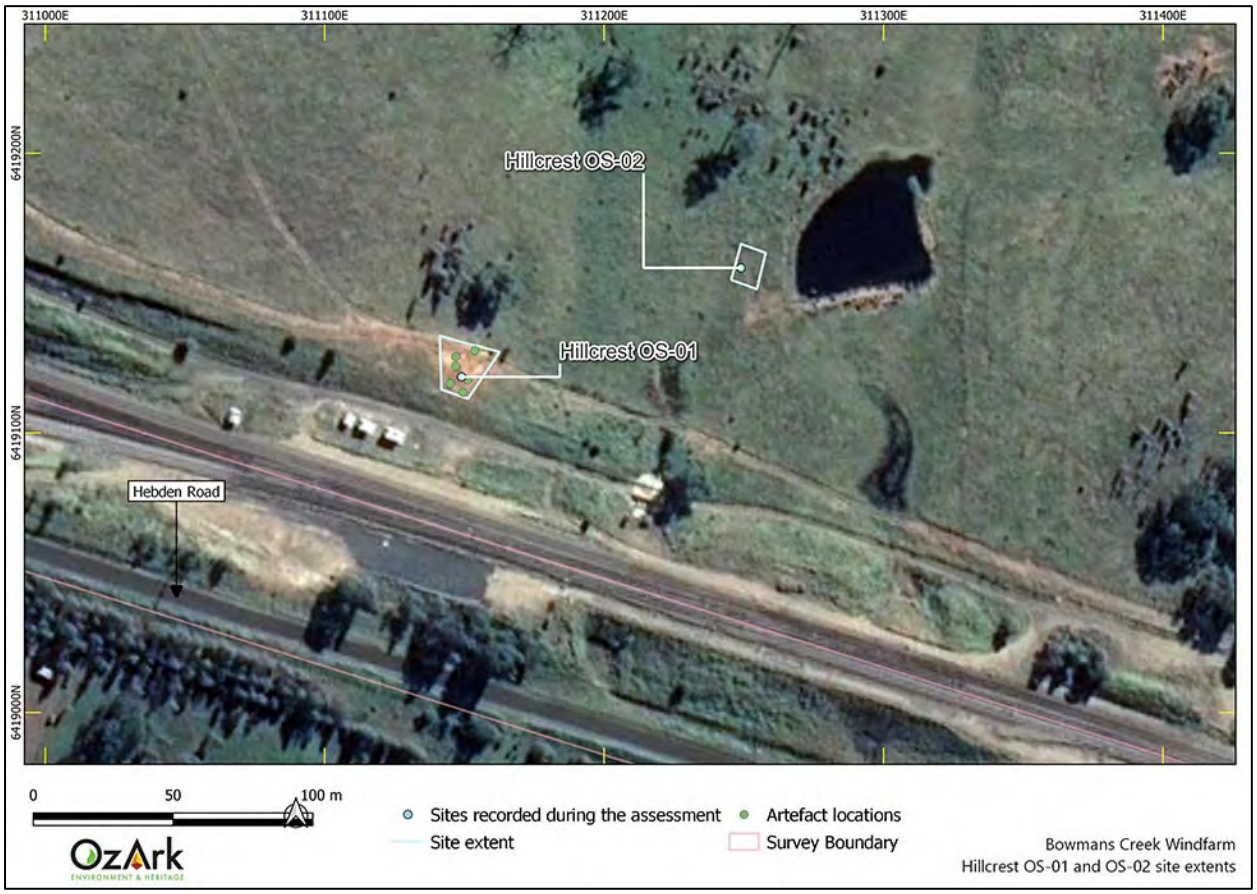
Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Shatter	Mudstone	Complete	Tertiary	25x15x5
2	Flake	Mudstone	Complete	Tertiary	4-6cm
3	Flake	Tuff	Complete	Tertiary	2-4cm
4	Flake	Mudstone	Complete	Tertiary	2-4cm
5	Shatter	Mudstone	Complete	Primary	4-6cm
6	Shatter	Tuff	Complete	Tertiary	0-2cm

Figure 6-13: Hillcrest OS-01. View of site and selection of recorded artefacts.

1. View southwest of Hillcrest OS-01.

2. Selection of artefacts from Hillcrest OS-01.

Figure 6-14: Aerial showing the site extent of Hillcrest OS-01 and Hillcrest OS-02.



Hillcrest OS-02 (37-2-6044)

Site Type: Open artefact scatter

GPS Coordinates: 311249E / 6419159N (artefact 1 location, GDA94 Zone 56)

Location of Site: The site is located on Ravensworth's Hillcrest property approximately 170 m north of Hebden Road and 460 m north of Lake Liddell (**Figure 6-3, Figure 6-14**).

Description of Site: The site consists of two artefacts: one mudstone flake and one piece of mudstone shatter (**Table 6-10**). The artefacts are located on an erosion scald, west of a small dam (**Figure 6-15**). The site extent is approximately 3 m by 3 m. The erosion scald itself is approximately 36 m by 10 m though no further artefacts were located within it. The soil is a light brown-grey loam with pebble inclusions. Dense grass surrounded the erosion scald. There is low potential for *in situ* subsurface deposits at the site.

Table 6-10: Artefact attributes: Hillcrest OS-02.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Shatter	Mudstone	Complete	Tertiary	15x10x7
2	Flake	Mudstone	Longitudinal Break	Tertiary	20x12x5

Figure 6-15: Hillcrest OS-02. View of site and selection of recorded artefacts.

1. View south of Hillcrest OS-02 along erosion scald.

2. Selection of artefacts from Hillcrest OS-02.

Albano Road OS-01 (37-3-1587)

Site Type: Artefact scatter

GPS Coordinates: 325775E / 6428172N (centroid, GDA94 Zone 56)

Location of Site: The site is located in the northern corridor of Albano Road approximately 65 m west of Stony Creek; 95 m directly south of Bowmans Creek and 130 m west of the intersection of Albano Road and Marshalls Road (**Figure 6-3**, **Figure 6-17**).

Description of Site: The site consists of three unmodified flakes manufactured from a variety of materials including chalcedony, mudstone and potentially porcellanite (**Table 6-11**). The site is located within the northern cutting of Albano Road which has further been impacted by erosion (**Figure 6-16**). The artefact scatter measures approximately 11 m (east–west) by 5 m (north–south). Soil at the site location consists of grey to light brown compacted silt with pebble and gravel inclusions. with areas also down to clay present. The site has low potential for *in situ* subsurface deposits due to previous high levels of disturbance.

Table 6-11: Artefact attributes: Albano Road OS-01.

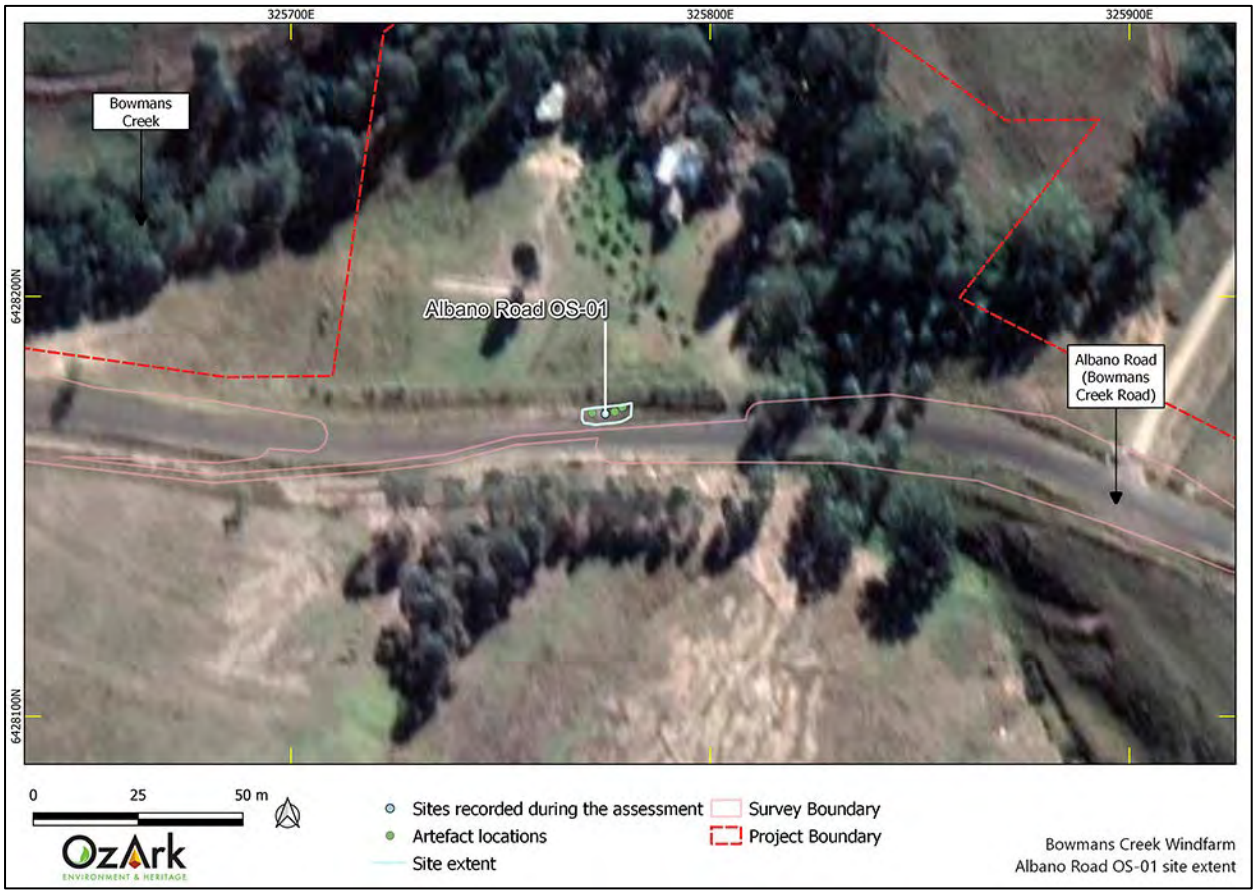
Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Mudstone	Complete	Primary	20x35x5
2	Flake	Chalcedony	Complete	Tertiary	25x20x2
3	Flake	Porcellanite (?)	Complete	Tertiary	15x25x10

Figure 6-16: Albano Road OS-01. View of site and recorded artefacts.

1. View east across Albano Road OS-01 towards Stony Creek (tree line).

2. Albano Road OS-01 recorded artefacts.

Figure 6-17: Aerial showing the site extent of Albano Road OS-01.



Albano Road OS-02 (37-3-1588)

Site Type: Artefact scatter

GPS Coordinates: 324620E / 6427761N (centroid, GDA94 Zone 56)

Location of Site: The site within the road eastern and western corridor of Albano Road, to the south of Bowmans Creek. Albano Road OS-02 is located at the confluence of Bowmans Creek and one of its tributaries. The confluence of Bowmans Creek and Alexander Creek is also located 50 m to the north (**Figure 6-3**, **Figure 6-19**).

Description of Site: The site is located on the southern terrace of Bowmans Creek (**Figure 6-18**). 13 artefacts were identified at this location eroding from the cutting of the terrace for Albano Road. Artefacts were predominately present on the eastern side of Albano Road, however, one artefact was also recorded in the cutting to the west. The recorded artefacts consist mostly of unmodified silcrete and mudstone flakes. Two blades and a piece of shatter were also recorded (**Table 6-12**). The area of visible artefacts measures approximately 25 m (east–west) by 7 m (north–south), the extent of the site has been split into two areas to ensure Albano Road is not included within the extent. Areas outside the immediate corridor of Albano Road were unable to be inspected as access had not been granted by the property owner at the time of the survey, but it is expected that further surface artefacts are present. The site is also considered to be associated with PAD in the non-eroded and heavily grassed area of the terrace on either side of Albano Road. The PAD designation is based on the landform type but was not closely inspected as access was not possible.

Table 6-12: Artefact attributes: Albano Road OS-02.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Silcrete	Complete	Tertiary	15x20x5
2	Flake	Mudstone	Complete	Tertiary	15x10x5
3	Flake	Mudstone	Complete	Tertiary	35x25x5
4	Blade	Mudstone	Distal fragment	Tertiary	25x10x5
5	Flake	Mudstone	Complete	Tertiary	40x30x5
6	Flake	Silcrete	Proximal fragment	Tertiary	15x20x5
7	Blade	Silcrete	Complete	Tertiary	45x2x5
8	Flake	Silcrete	Complete	Tertiary	25x15x10
9	Flake	Mudstone	Complete	Tertiary	30x30x5
10	Shatter	Silcrete		Tertiary	20x10x5
11	Flake	Silcrete	Distal Fragment	Tertiary	15x5x5
12	Blade	Silcrete	Complete	Tertiary	50x30x5
13	Flake	Silcrete	Complete	Tertiary	40x20x5

Figure 6-18: Albano Road OS-02. View of site and selection of recorded artefacts.

1. View northeast across Albano Road to the terrace where Albano Road OS-02 is located (at the figures).

2. View north towards Albano Road OS-02 and Bowmans Creek (tree line).

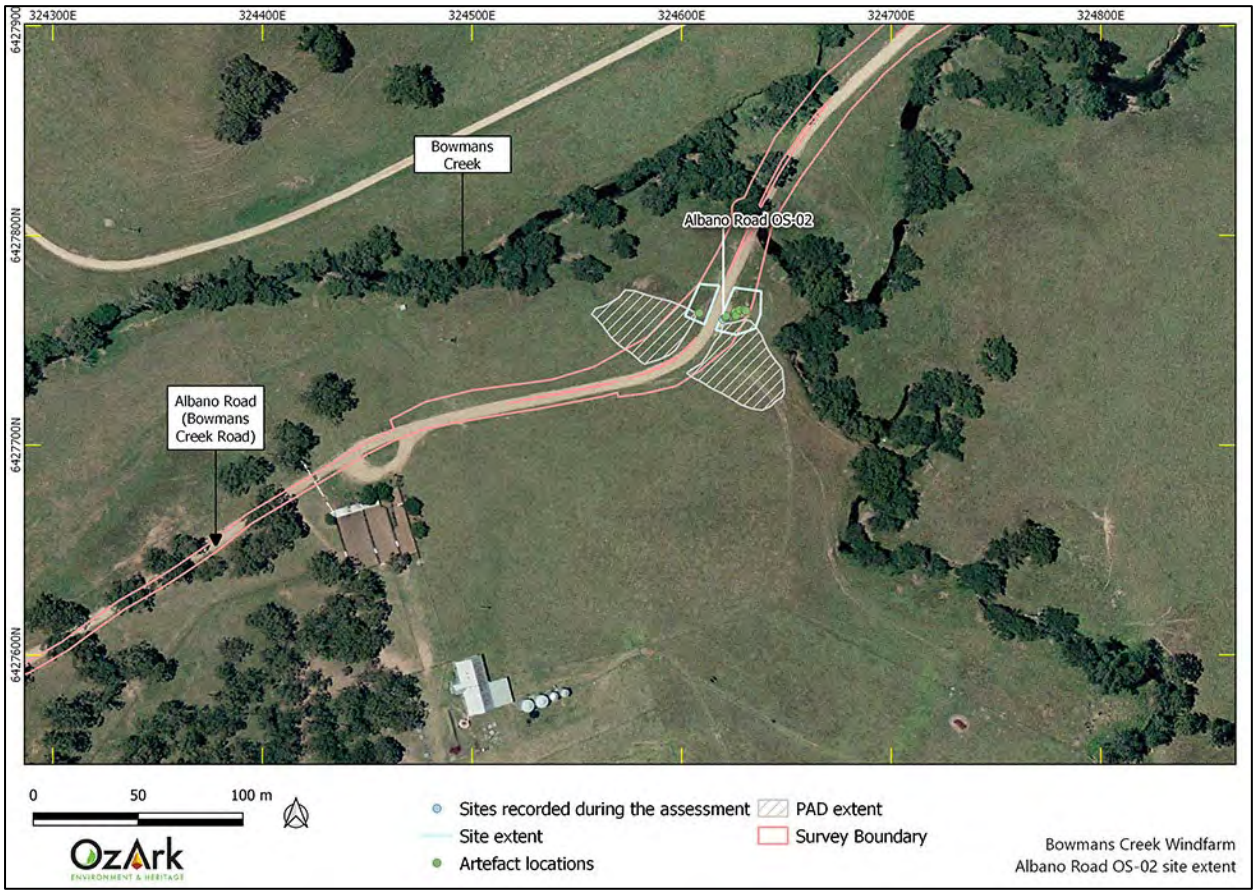
3. Selection of mudstone and silcrete flakes.

4. Silcrete flakes.

5. Mudstone flakes.

6. Selection of silcrete and mudstone flakes.

Figure 6-19: Aerial showing the site extent of Albano Road OS-02.



Albano Road OS-03 (37-3-1589)

Site Type: Artefact scatter

GPS Coordinates: 323759E / 6427462N (centroid, GDA94 Zone 56)

Location of Site: The site is located north of Bowmans Creek, to the east of Albano Road, and is approximately 730 m west of a large shearing shed and 450 m directly south of the nearest homestead (**Figure 6-3**, **Figure 6-21**).

Description of Site: The site is located on the northern terrace of Bowmans Creek with artefacts largely present in an area disturbed by high levels of erosion (**Figure 6-20**). Three artefacts were identified in association with the site, including a multi-directional core (**Table 6-13**). The extent of visible artefacts measures 30 m (north–south) by 8 m (east–west). Areas outside the immediate corridor of Albano Road were unable to be inspected as access had not been granted by the property owner at the time of the survey, but it is expected that further surface artefacts are present at a low-density. Soils at the location consists of brown-grey silt. There is moderate potential for *in situ* subsurface deposits at the site in areas to the east of the area of high erosion across the terrace. The PAD designation is based on the landform type but was not closely inspected as access was not possible.

Table 6-13: Artefact attributes: Albano Road OS-03.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class	Notes
1	Flaked piece	Mudstone		Tertiary	20x25x5	
2	Flaked piece	Silcrete	Complete	Tertiary	20x15x5	
3	Core	Silcrete		Tertiary	60x40x30	Multi-directional; 8 flake scars

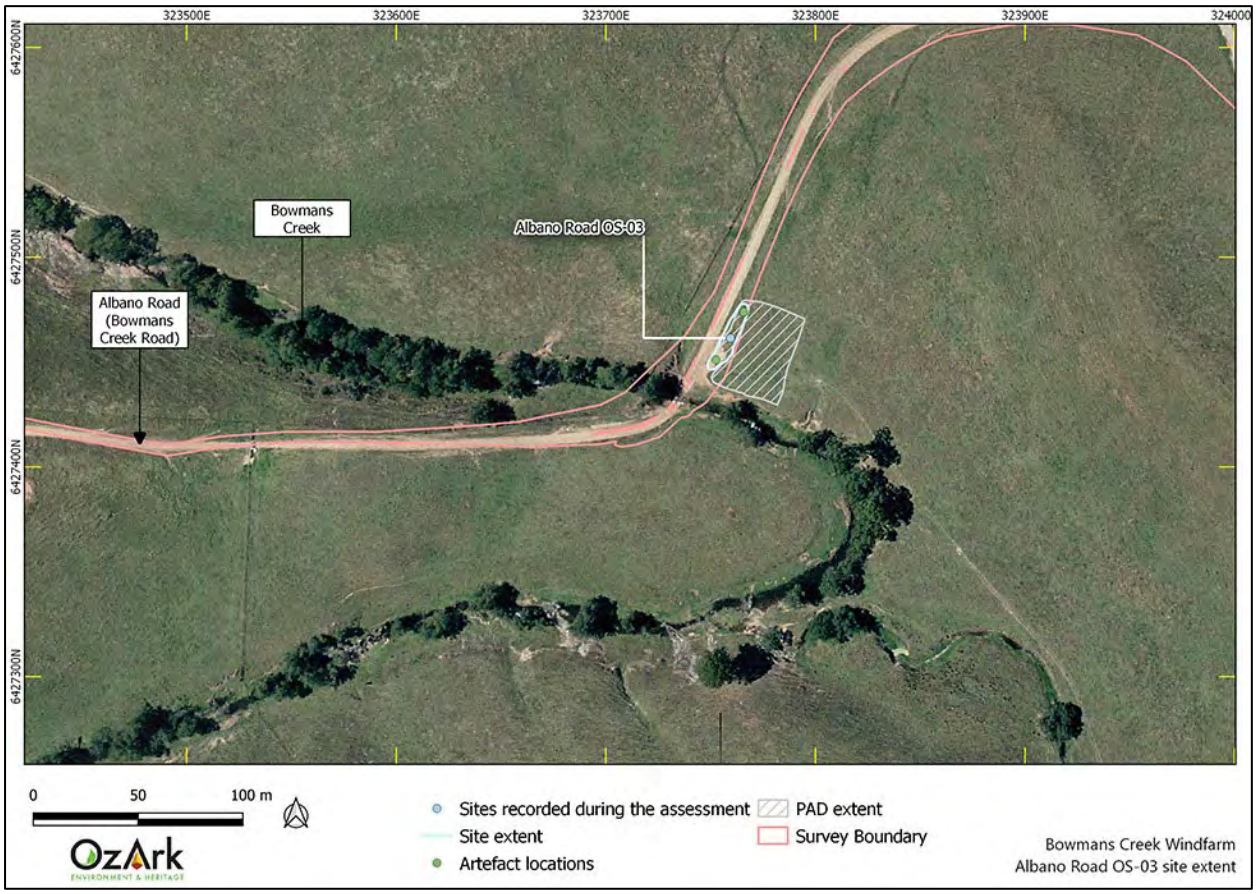
Figure 6-20: Albano Road OS-03. View of site and selection of recorded artefacts.

1. View of the southern extent of Albano Road OS-03 showing Bowmans Creek in the background.

2. A multi-directional porcellanite core from Albano Road OS-03.

3. A mudstone flake from Albano Road OS-03.

Figure 6-21: Aerial showing the site extent of Albano Road OS-03.



Albano Road IF-01 (37-3-1590)

Site Type: Isolated find

GPS Coordinates: 324175E / 6427570N (centroid, GDA94 Zone 56)

Location of Site: The site is within the northern corridor of Albano Road, approximately 105 m south of Bowmans Creek; 30 m west of a tributary of Bowmans Creek and 315 m west of a shearing shed (**Figure 6-3**, **Figure 6-23**).

Description of Site: The site is located on a flat landform surrounded by regrowth and mature trees (**Figure 6-22**). One silcrete flake was identified within a small area of exposure within the table drain of Albano Road (**Table 6-14**). Soils at the location consists of brown-grey silt. There is low potential for *in situ* subsurface deposits at the site.

Table 6-14: Artefact attributes: Albano Road IF-01.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Silcrete	Complete	Tertiary	10x10x5

Figure 6-22: Albano Road IF-01. View of site and recorded artefact.

1. View west towards Albano Road IF-01 (at the figure) within the corridor of Albano Road.

2. Albano Road IF-01 silcrete flake.

Figure 6-23: Aerial showing the location of Albano Road IF-01.

Liddell Power Station-IF1 (37-2-6263)

Site Type: Isolated find

GPS Coordinates: GDA Zone 56 308766E 6418308N

Location of Site: Liddell Power Station-IF1 is located approximately 350 m east of the New England Highway and 1.6 km south of Hebden Road on land that is owned by AGL Macquarie as part of the Liddell Power Station. The site is 65 m east of a coal conveyor belt and 1 km directly west of Lake Liddell within an area of regrowth woodland (**Figure 6-3**, **Figure 6-24**).

Description of Site: Liddell Power Station-IF1 consists of an isolated silcrete flake located on a moderate slope which recedes to the east (**Table 6-15**, **Figure 6-25**). The site is in a secondary context along a contour bank. There is low potential for *in situ* subsurface deposits at the site. The extent of the site is 5 m x 5m.

Figure 6-24: Aerial showing the location of Liddell Power Station-IF1.

Figure 6-25: Liddell Power Station-IF1. View of site and recorded artefact.

1. Location of Liddell Power Station-IF1 on a contour bank within a gentle slope landform.

2. Liddell Power Station-IF1 artefact: a silcrete flake.

Table 6-15: Artefact attributes: Liddell Power Station-IF1.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Silcrete	Complete	Tertiary	41x40x10

Liddell Power Station-IF2 (37-2-6541)

Site Type: Isolated find

GPS Coordinates: GDA Zone 56 310289E 6419152N

Location of Site: Liddell Power Station-IF1 is located approximately 290 m south of the Hebden Road and 2 km northeast of the New England Highway on land that is owned by AGL Macquarie as part of the Liddell Power Station. The site is north of Lake Liddell on the eastern bank drainage line (**Figure 6-3**, **Figure 6-26**).

Description of Site: Liddell Power Station-IF2 consists of an isolated silcrete backed blade (**Table 6-16**, **Figure 6-27**). The site is located on the edge of an erosion scald along the drainage line. There is low potential for *in situ* subsurface deposits at the site. The extent of the site is 5 m x 5m.

Table 6-16: Artefact attributes: Liddell Power Station-IF2.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Backed blade	Silcrete	Proximal fragment	Tertiary	22x10x5

Figure 6-26: Aerial showing the location of Liddell Power Station-IF2.

Figure 6-27: Liddell Power Station-IF2. View of site and recorded artefact.

1. Location of Liddell Power Station-IF2 on the eastern edge of a drainage line.

2. Liddell Power Station-IF1 artefact: a silcrete backed blade.

Sandy Creek-IF1 (37-3-1632)

Site Type: Isolated find

GPS Coordinates: GDA Zone 56 321875E, 6435271N

Location of Site: Sandy Creek-IF1 is located on the western bank of Sandy Creek approximately 890 m due east of Albano Road (**Figure 6-3, Figure 6-28**). The site is located just upstream from the confluence of Stringybark and Sandy Creeks.

Description of Site: Sandy Creek-IF1 consists of an isolated silcrete scraper with steep, invasive retouch to the proximal end and one margin (**Table 6-17**). The site is located on the edge of a cutting for a farm track that crosses Sandy Creek at this point (**Figure 6-29**). The site is in an undulating landform of low to moderate gradient hills. There is a flat area to the west of the site, but this is not considered PAD as all available cuttings into the soil profile (by the track and the creek) indicates that this 'flat' is composed of post-European settlement alluvium. Therefore it is considered that the artefact is in a secondary context without any associated PAD. The extent of the site is 5 m x 5m.

Figure 6-28: Aerial showing the location of Sandy Creek-IF1 and IF2.

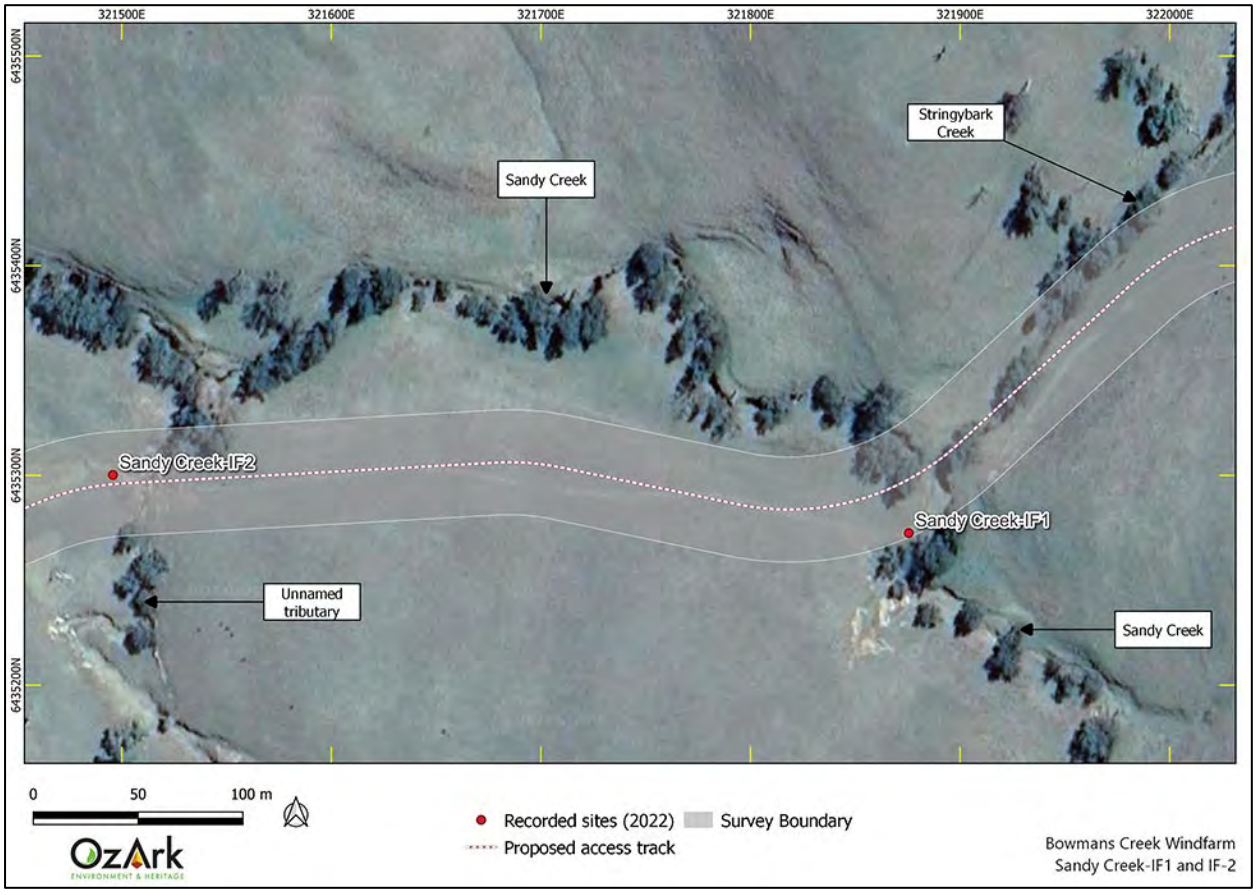


Figure 6-29: Sandy Creek-IF1. View of site and recorded artefact.

1. Location of Sandy Creek-IF1 (pin flag) on the western bank of Sandy Creek. View northeast.

2. Location of Sandy Creek-IF1 (pin flag in cutting) on the western bank of Sandy Creek. View southwest.

3. View of Sandy Creek-IF1.

4. View of Sandy Creek-IF1 showing retouch and use wear.

Table 6-17: Artefact attributes: Sandy Creek-IF1.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Scraper	Silcrete	Complete	Tertiary	43x24x11

Sandy Creek-IF2 (37-3-1633)

Site Type: Isolated find

GPS Coordinates: GDA Zone 56 321494E, 6435300N

Location of Site: Sandy Creek-IF2 is located on an unnamed tributary that flows north and joins Sandy Creek approximately 60 m to the north of the site. The site is approximately 510 m due east of Albano Road (**Figure 6-3, Figure 6-28**). The site is

located approximately 360 m downstream from the confluence of Stringybark and Sandy Creeks.

Description of Site: Sandy Creek-IF2 consists of an isolated mudstone flake (**Table 6-18**). The site is located on the edge of an area disturbed by a farm track that crosses the tributary at this point (**Figure 6-30**). The site is in an undulating landform of low to moderate gradient hills. There is a flat area to the west of the site, but this is not considered PAD as all available cuttings into the soil profile (by the track and the waterway) indicates that this 'flat' is composed of post-European settlement alluvium. Therefore it is considered that the artefact is in a secondary context without any associated PAD. The extent of the site is 5 m x 5m.

Figure 6-30: Sandy Creek-IF2. View of site and recorded artefact.

1. Location of Sandy Creek-IF2 (pin flag) on the western bank of an unnamed tributary to Sandy Creek. View northeast.

2. View of Sandy Creek-IF2.

Table 6-18: Artefact attributes: Sandy Creek-IF2.

Artefact ID	Art. Type	Material	Integrity	Reduction	Length x width x thickness (mm) or size class
1	Flake	Mudstone	Complete	Secondary	28x22x5

6.5 PREVIOUSLY RECORDED ABORIGINAL SITES LOCATED

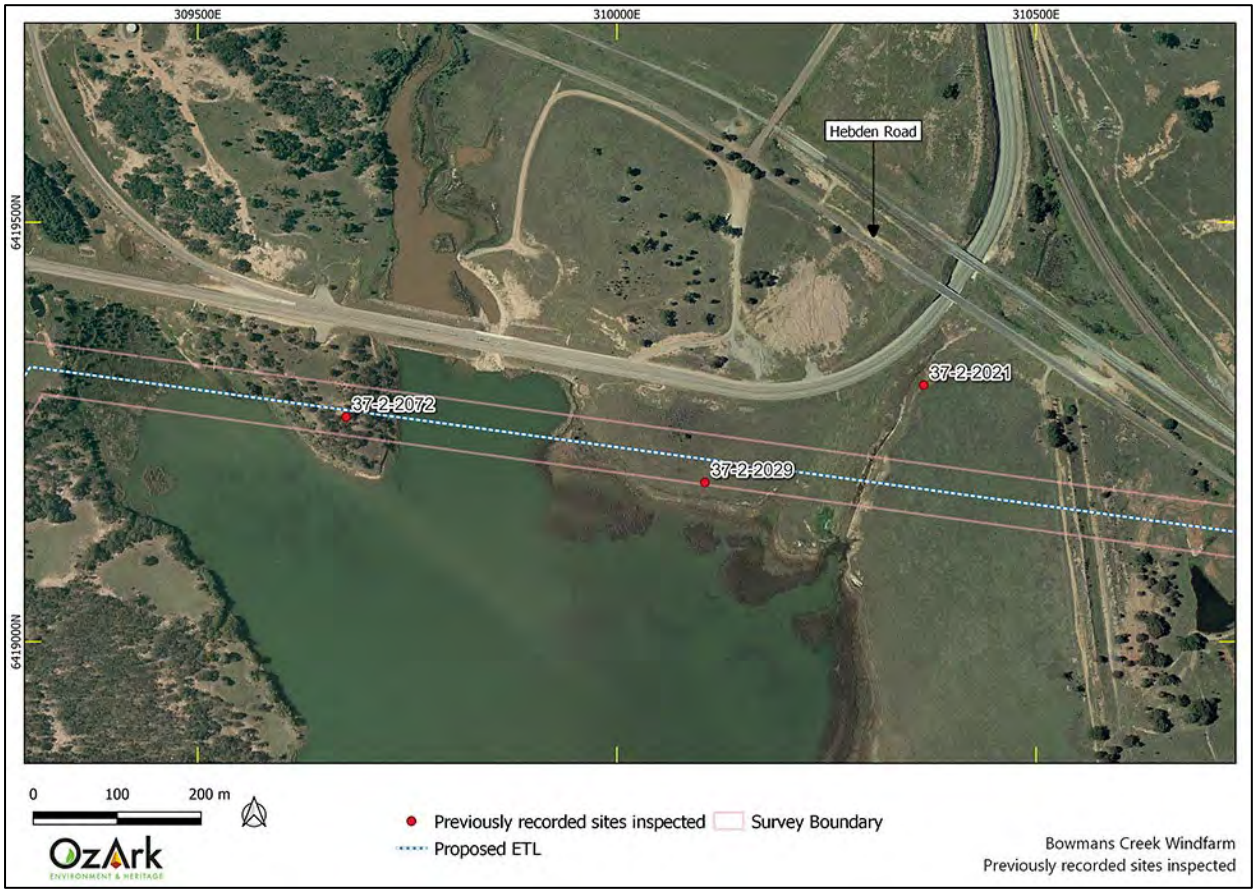
There are two previously recorded sites in the Survey Boundary (ANT 22 and Hunter Gas Project PAD) and one site that was in a former iteration of the Survey Boundary (ANT 4) that were inspected during the survey (**Figure 6-31**).

Details of these sites are shown in **Table 6-19**. The sites within the Survey Boundary are located within the proposed ETL disturbance area where the ETL corridor passes to the north of Lake Liddell. These sites include a PAD, and a ceremonial ring with associated artefacts (ANT 22).

Table 6-19: All previously recorded sites inspected.

AHIMS ID	Site Name	Feature(s)	GDA East	GDA North	Survey Unit
37-2-2021	ANT 4	Artefact scatter: 20 artefacts	310366	6419306	2
37-2-2029	Hunter Gas Project PAD	PAD	310105	6419190	2
37-2-2072	ANT 22	Ceremonial ring	309677	6419268	2

Figure 6-31: Previously recorded sites inspected.



37-2-2021 (ANT 4)

37-2-2021 was recorded by HLA Envirosciences in 2005 as an artefact scatter consisting of 25 artefacts eroding out of the eastern bank of a drainage line.

Eight artefacts were identified close to the site location (**Figure 6-32**, **Figure 6-33**). All artefacts were identified along the heavily eroded side of the drainage line. As artefacts are present in proximity to 37-2-2021, they are considered to be part of this site.

This site is included in this report as it was within an earlier iteration of the Survey Boundary but is now outside of the Survey Boundary and will not be harmed by the Project.

Figure 6-32: Defined site extent of 37-2-2021.

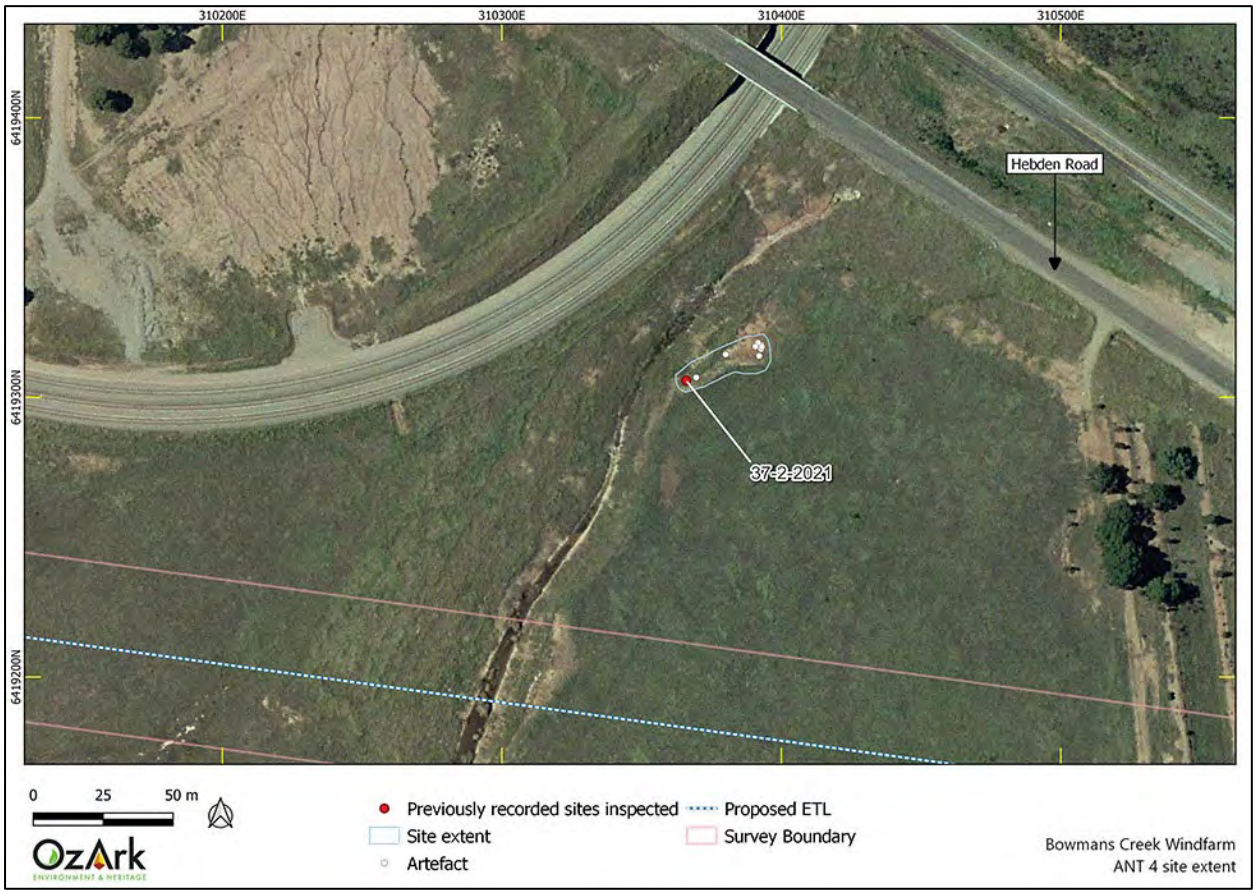


Figure 6-33: Site 37-2-2021: Views of site and visible artefacts.

1. View of site 37-2-2022. View southwest showing flagged artefacts along the eroding bank.

2. Sample of recorded mudstone and silcrete flakes.

37-2-2029 (Hunter Gas Project PAD)

This site was recorded by McCardle Cultural Heritage in 2005 as a PAD. Unfortunately, the site card is not held by AHIMS and there is no accompanying report. The recorder has been contacted by OzArk to obtain a copy of the site card to no avail. As such, it has to be assumed that the AHIMS location is correct (**Figure 6-34**). Site 37-2-2029 is located on a lower slope to the north

of Lake Liddell in a cleared area (**Figure 6-35**). As the extent of the PAD is unknown, the assumed extent of the PAD based on the landform present is shown in **Figure 6-34**.

Figure 6-34: Aerial showing the location of 37-2-2029.

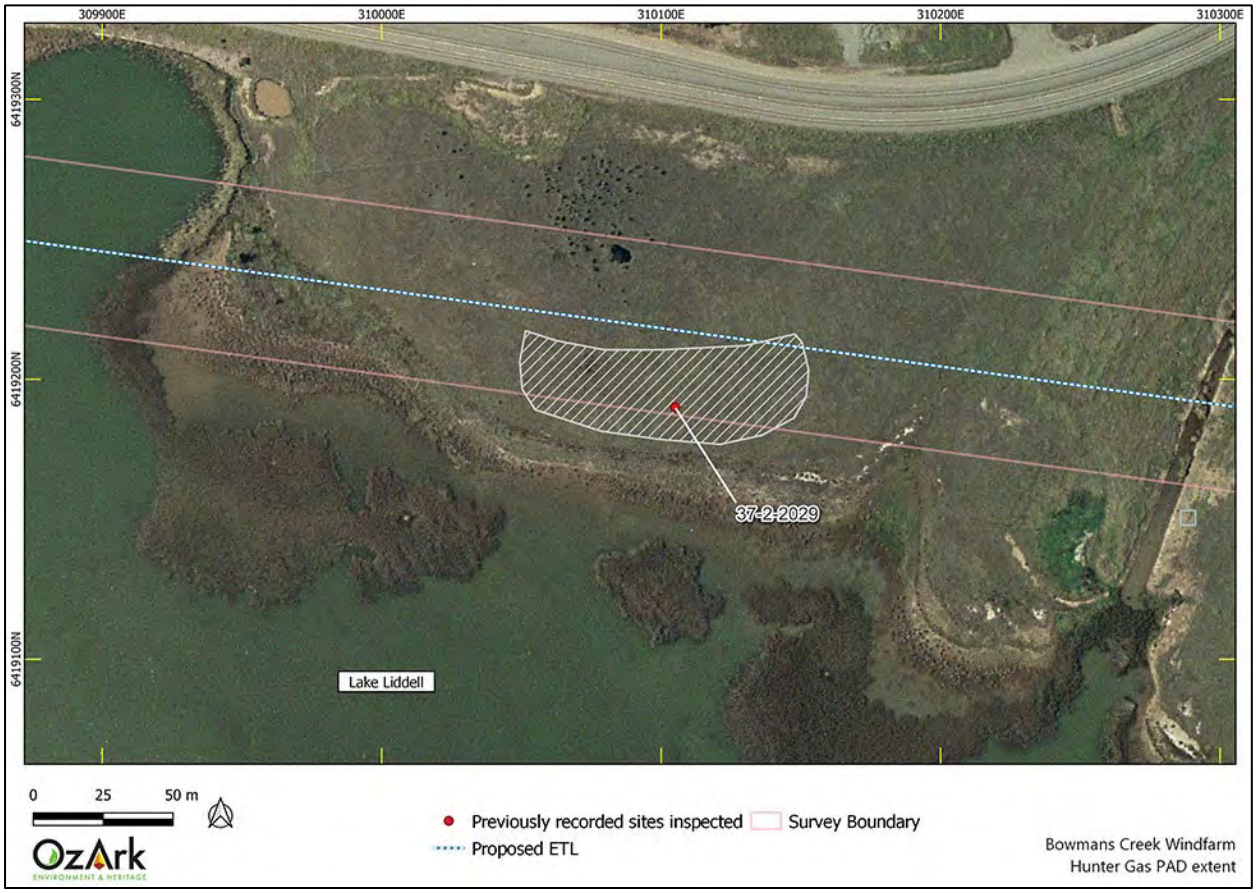


Figure 6-35: View west across 37-2-2029.

37-2-2072 (ANT 22)

This site was recorded by HLA-Envirosciences (2005b) and is described as a 'mythological place' consisting of '*multiple artefacts identified around a cleared area thought to be a Boora* (sic) *ring*'. The artefacts included an anvil (a volcanic cobble with pitting), a quartz bipolar flake and a hammerstone. The site location is described as being '*on the crest of a promontory to the north of Lake Liddell*'.

The assessment of significance HLA-Envirosciences (2005b: 54) concludes:

> *…the research potential of the possible mythological site / bora ring (Ant-22) is very low since there are no physical archaeological remains to investigate. This last site's potential lies in possible cultural avenues of assessment into its significance.*

Further details are provided on the site card:

> *Interpreted by the community as a Boora* (sic) *ground. The site consists of a bare exposure surrounded by rocks both artefactual and simple rocks.*
>
> *Many artefacts were covered in lichen, indicating (If they are real) that they have been there a long time.*

A view of the site in 2004 at the time of its recording is shown on **Figure 6-36**. This shows the site to be on a relatively flat crest without any obvious sign of earth embankments or stones. The site is described as on a promontory to the north of Lake Liddell. While this is technically correct, it must be remembered that Lake Liddell is artificial and that the aesthetic qualities of the site today being on an elevated, flat area overlooking the lake is a modern construct. In the past the site would have been at the end of a spur overlooking the confluence of Maidswater Creek and a tributary. While still potentially a landform with archaeological sensitivity, these waterways were, in turn, tributaries to the major watercourse of the pre-Lake Liddell period, Bayswater Creek. While not discounting the possibility that this landform could have had ceremonial functions, the previous, less aesthetic outlook of the landform must be considered.

The location of the site is shown on **Figure 6-37**. This figure shows that the centroid of the site is located within the central portion of the Survey Boundary and the 50 m buffer, that will be recommended for avoidance, occupies most of the peninsula that the site is located on.

Inspection of site 37-2-2072 did not locate any artefacts or any physical indication of a Bora Ring (**Figure 6-38**). Numerous stones are scattered across the crest, however, there are no man-made arrangements visible, nor were any artefacts identified. Further, the attending Aboriginal site officer, Mr Paget, did not have any knowledge of tangible or intangible values associated with the site.

In conclusion, it is difficult to verify whether this site once had ceremonial functions. However, there is little evidence to support the registration and it is not known who in the '*community*' interpreted the site as a Bora Ring.

Figure 6-36: A view of 37-2-2072 from HLA-Envirosciences (2005b: Plate 24).

Figure 6-37: Aerial showing the location of 37-2-2072 with 50 m buffer.

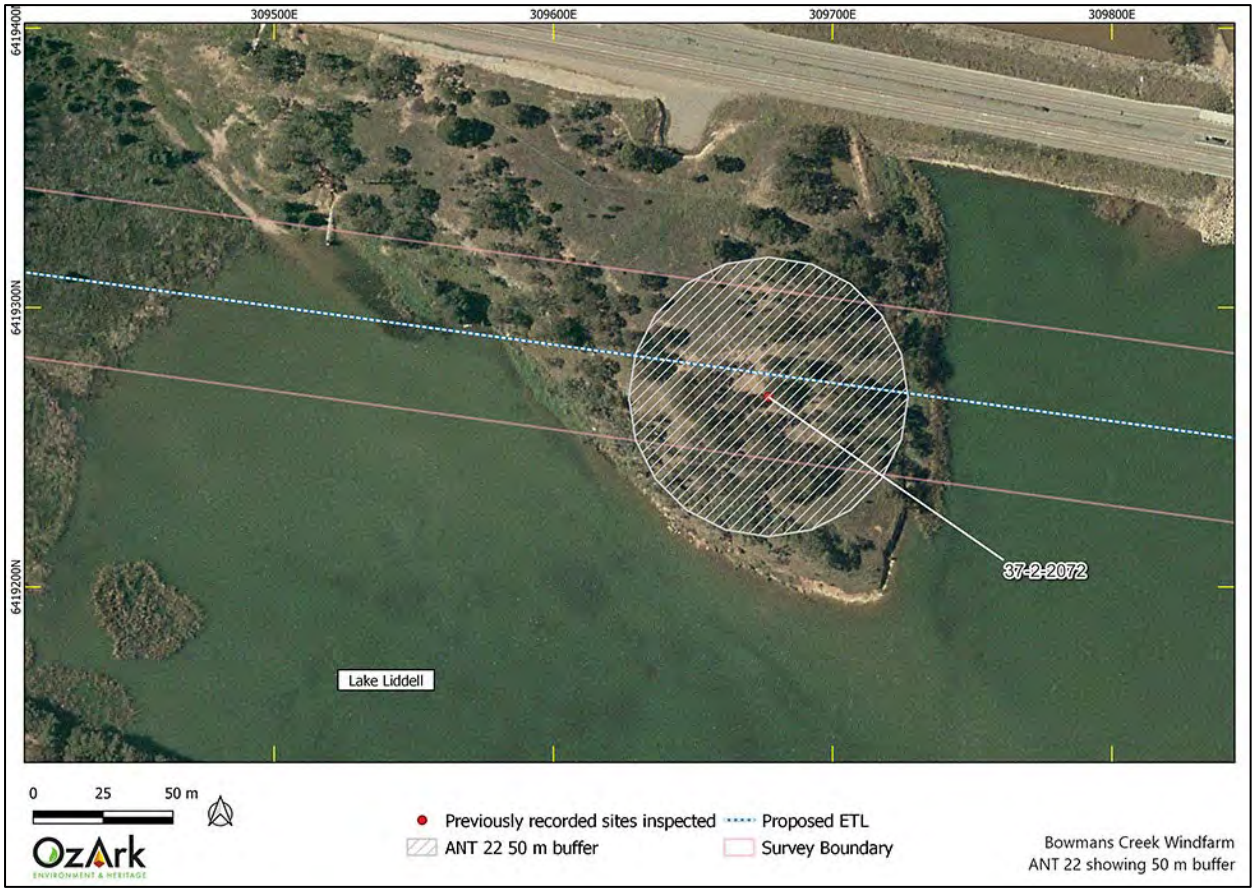


Figure 6-38: A view of 37-2-2072 from the 2020 survey.

6.6 TEST EXCAVATION

During the survey for the Project, it was identified that two sites with PAD are likely to be partially harmed should the Project proceed (Albano Road OS-02 [37-3-1588] and Albano Road OS-03 [37-3-1589]).

At both sites, that recorded 13 and three surface artefacts respectively, artefacts were recorded in road cuttings within a terrace for Bowmans Creek. However, areas outside the immediate corridor of Albano Road were unable to be inspected as access had not been granted by the property owner at the time of the survey. These areas have been designated as PADs.

At both sites the proposed work is to increase the width of the road cutting to allow the transport of wind farm turbine components along Albano Road. This would involve impact to the PAD area at Albano Road OS-02 (37-3-1588) of 13 m by 34 m to the west of Albano Road and 8 m by 36 m to the east of the road. At Albano Road OS-03 (37-3-1589) the impact to the PAD area is limited to a 7 m by 42 m area to the east of Albano Road.

At Albano Road OS-02 (37-3-1588), of a total PAD area of 2,247 m^2, 607 m^2 (or 27 per cent) will be impacted. At Albano Road OS-03 (37-3-1589), of the total PAD area of 1422 m^2, 222 m^2 (or 16 per cent) will be impacted.

Given the nature of the surface expression of artefacts recorded in the road cuttings at both sites (13 and three artefacts) it is not considered that the PAD areas at either site will contain archaeological deposits of conservation value.

As the sites have associated PAD, OzArk therefore recommends that the areas of the PAD within the Survey Boundary should be investigated by limited archaeological excavation following the methodology set out in **Section 9.2.1.2**. It is recommended that this work should take place following approval of the Project but before any ground disturbing impacts occur around the sites.

The overarching reason for delaying the subsurface investigation until after approval is that an object of the NPW Act is the '*conservation of objects places and features… of cultural value within the landscape, including… places, objects and features of significance to Aboriginal people*' (s.2A(1(b)(i)).

As heritage professionals, OzArk, strives for good conservation outcomes. In this case, as Project approval, and the subsequent decision to construct the wind farm, is not certain, OzArk considers that a more prudent approach, given the low likelihood that the sites contain subsurface deposits of conservation value, is not to harm the areas of PAD until such time as impacts are approved and about to be undertaken.

Further, only portions of the PADs are within the Survey Boundary (27 per cent at Albano Road OS-02 [37-3-1588] and 16 per cent at Albano Road OS-03 [37-3-1589]). Therefore, most of the PAD areas (73 per cent and 84 per cent respectively) will not be impacted by the Project. In the unlikely event that the post-approval subsurface investigations within the impact footprint demonstrate that there are significant subsurface deposits at either site, then most of these deposits in the remaining areas of the PADs will not be impacted.

While further investigation of the PAD areas is warranted should impacts be approved to add to our knowledge about past Aboriginal use of the area, it is considered that there is a very low risk in delaying these investigations until a time that Project impact is certain. Leaving the PADs unharmed until such time is achieving a major aim of the NPW Act, especially given that Project impacts are far from certain at this stage.

7 DISCUSSION

7.1 DISCUSSION OF SURVEY RESULTS

7.1.1 Summary of survey results

15 sites were recorded during the survey: eight artefact scatters with a low to moderate artefact density and seven isolated artefacts.

All except two sites were recorded in Survey Unit 2 which consists of lowland landforms in the south of the Survey Boundary or areas along Albano Road within the broad Bowmans Creek valley. Some sites, such as Coalhole Creek OS-01 were within topography that is included in Survey Unit 1 (hills and valleys) but the site itself is on level terrain associated with the Coalhole Creek valley. Therefore, it is regarded that the site is within Survey Unit 2, although it is surrounded by Survey Unit 1 landforms. The 2022 survey (Fieldwork session 5) partially included landforms in the north of the Project Boundary. These landforms conform to Survey Unit 1 landforms, although the slopes are more gradual in this area when compared to landforms further south. It was in these more-gentle undulating landforms that the two sites associated with Survey Unit 1 were recorded.

7.1.2 Discussion

In **Section 5.5.5**, previously recorded sites were plotted against slopes less than 10 degrees and distance to water. It was shown that there was a strong tendency for sites to be recorded in topography with slopes less than 10 degrees and that artefact scatters are almost exclusively recorded in landforms with a gentler topography. In terms of distance to water it was seen that there was not a strong correlation between previous site recordings and proximity of water.

When the sites (identified by the ID shown in **Table 6-3**) that were recorded as part of this assessment are plotted against these same variables, the following observations can be made:

- **Figure 7-1** shows the recorded sites plotted against landforms with slopes less than 10 degrees. This shows that all sites were recorded in more level landforms (although it does not appear on the figure to be the case, Coalhole Creek OS-01 is also in terrain with a slope of less than 10 degrees)
- **Figure 7-2** shows that the correlation between water sources and recorded sites is a little stronger than was seen with previously recorded sites, but it is still not a clear relationship. The sites along Albano Road are in proximity to Bowmans Creek, Coalhole Creek OS-01 is on Coalhole Creek, and Sandy Creek-IF1 and IF2 are associated with Sandy Creek but other sites plot away from watercourses. However, the issue here is the resolution of the mapping as, in fact, all sites, except for Liddell Hebden Road OS-1 and Liddell Hebden Road IF-1, were recorded associated with some form of waterway. However, these waterways are smaller systems and are not mapped at the scale required to depict such a large Project.

Figure 7-1: Aerial showing the relationship of recorded sites with degree of slope.

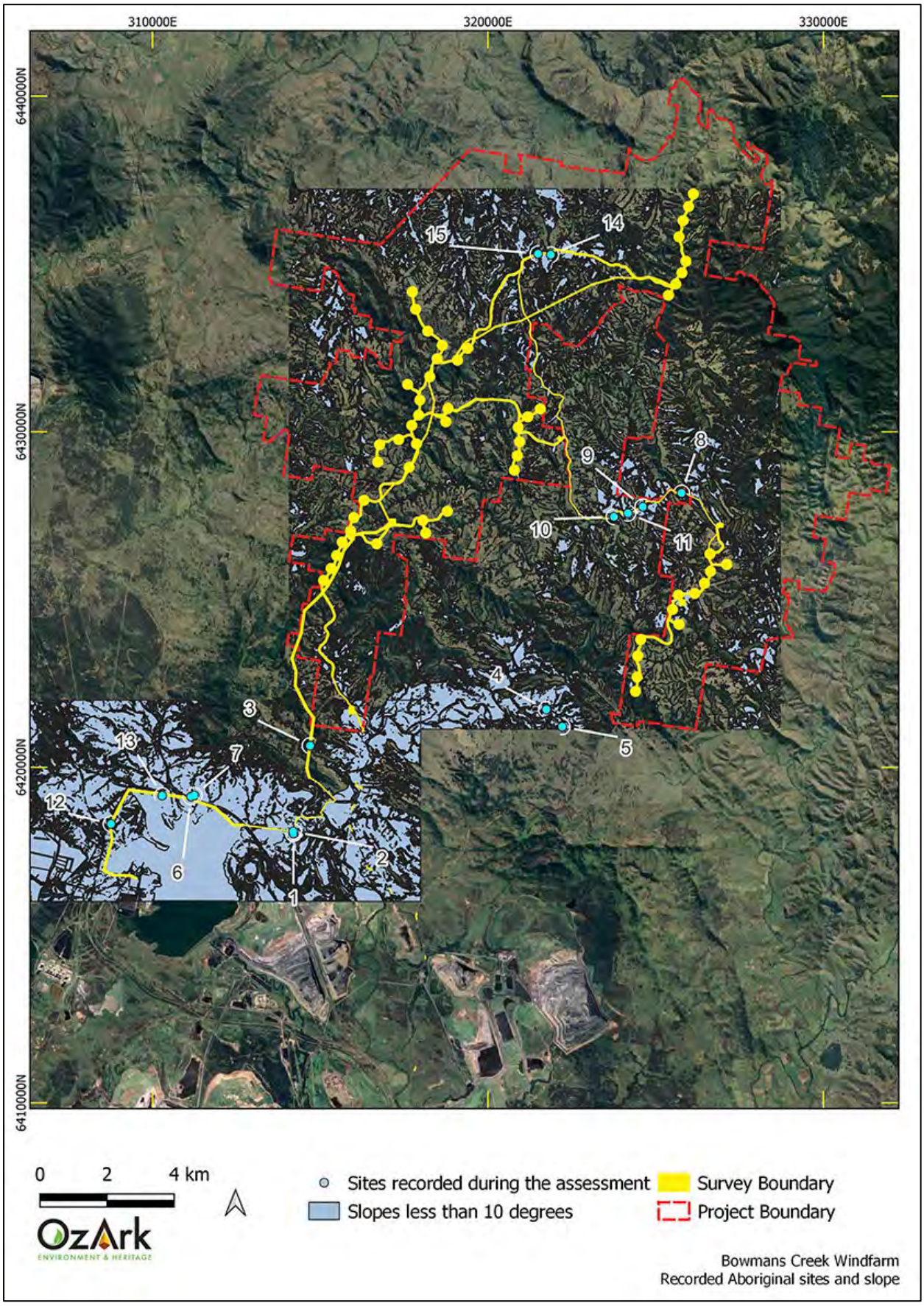
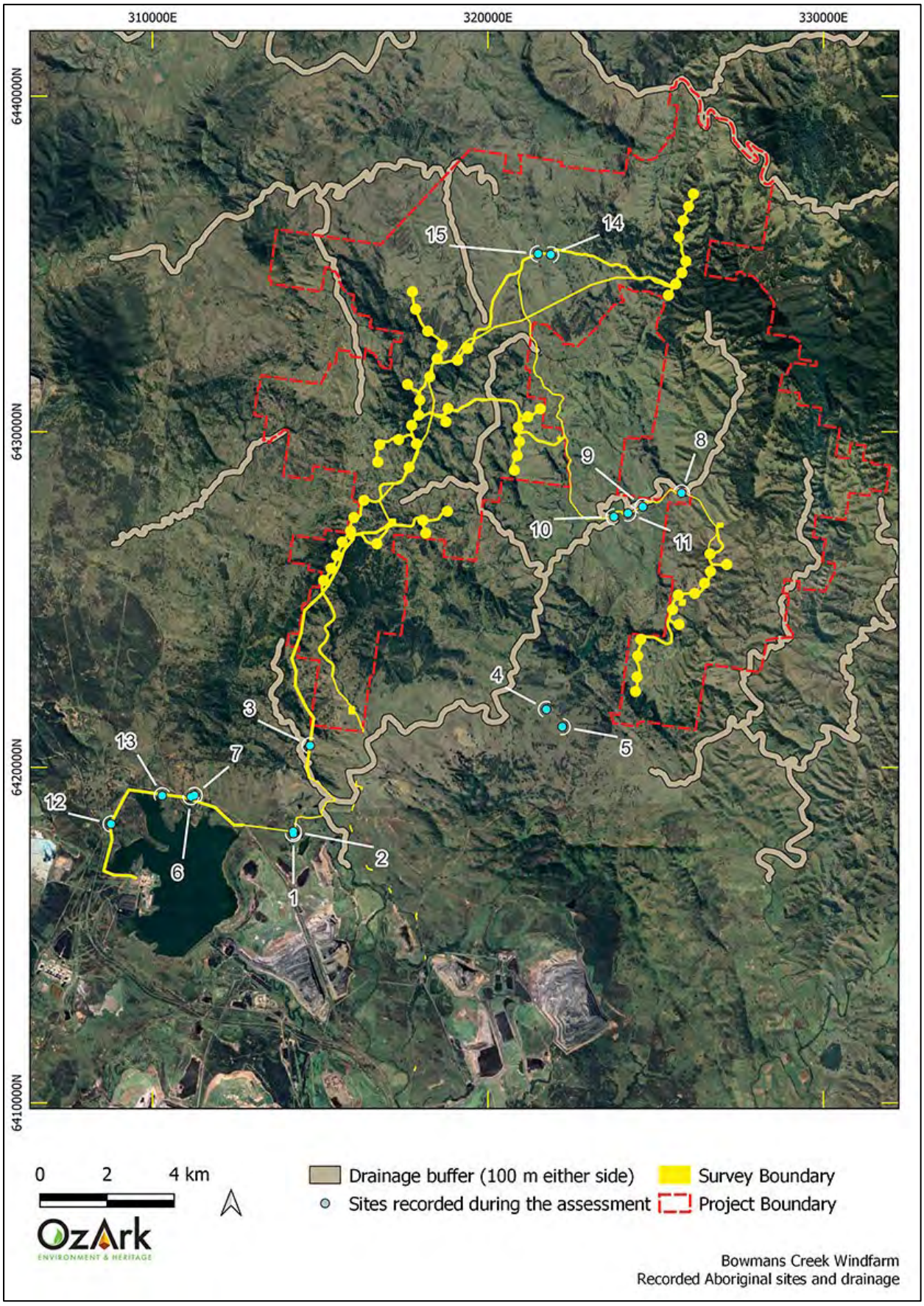


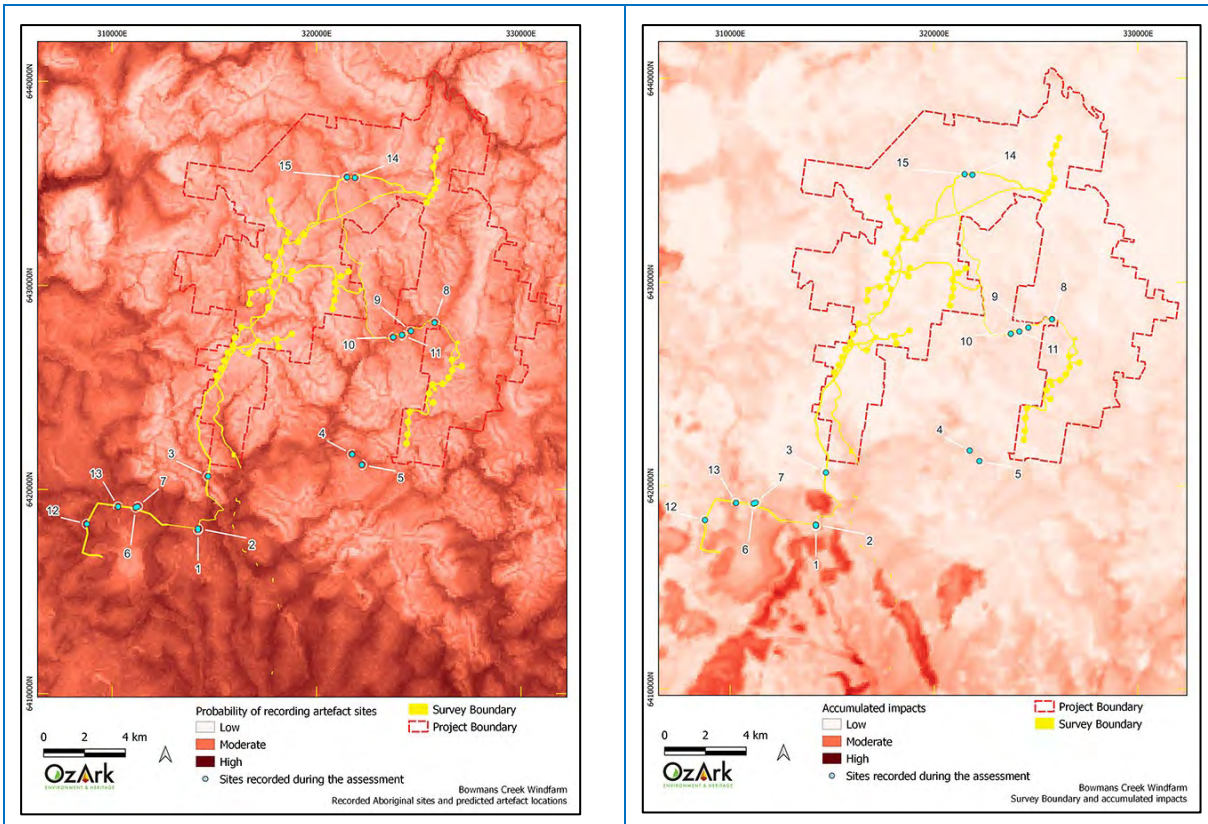
Figure 7-2: Aerial showing the relationship of recorded sites with drainage.



In **Section 5.5.1** the ASDST models were used to develop a predictive model for site location. When the recorded sites are plotted against these models, the veracity of the models can be demonstrated. An examination of **Figure 7-3** allows the following observations to be made:

- The ASDST model predicting the likelihood of an area recording an artefact site is reasonably accurate when the sites recorded during the assessment are plotted against the model. As this model uses waterways as a defining variable, it illustrates that the association of Aboriginal camping locations and the availability of water was confirmed by the findings of the assessment
- The ASDST model showing accumulative impact shows that sites are recorded where impacts are lower. However, not too much can be read into this as most of the Survey Boundary is within landforms with low accumulative impacts.

Figure 7-3: Recorded sites in relation to ASDST models.



1. Recorded sites and the ASDST model of artefact site probability.
2. Recorded sites and the ASDST model of accumulated impacts.

In **Section 5.6**, a series of research questions were posed, and these will be answered here.

- Is there a correlation between the location of Aboriginal sites and the availability of water?
    - As noted above, the recorded sites were recorded, in most cases, adjacent to some form of waterway. These waterways range from permanent waterways such as Bowmans Creek, through to ephemeral systems that would only hold water following rain. However, the correlation between site location and the availability of water was demonstrated. However, a more important factor for camping locations seems to be the availability of flat land as waterways in the hill

and valley landforms to the north of the Survey Boundary generally failed to record any sites except for Sandy Creek-IF1 and IF2 that are in less steep, undulating hill landscapes. The recording of these sites does not negate the observation that no sites were recorded in the steep hills and valleys that characterise most of the Project Boundary.

- What resources were available to the Aboriginal people using the Survey Boundary (food, stone, and water) and what resources were transported to the area?
    - No specific resources were noted during the assessment. No quarry sites were recorded, and no specific food resource locations were noted. No naturally occurring mudstone or silcrete sources were recorded and the implication is that all raw material for tool manufacture was transported into the area.
- How do the artefact assemblages from the sites along the slopes and ridge crests in the Survey Boundary differ from sites that are located along creek flats?
    - It is not possible to answer this question as no sites were recorded in landforms consisting of steep slopes, ridges, and crests in Survey Unit 1. Even creek flats within Survey Unit 1 generally failed to record sites and sites, albeit two sites of low artefact density were recorded once the terrain becomes less steep in the north of the Project Boundary.
- What tasks were Aboriginal people undertaking at the sites?
    - The lack of any sites on ridge and crest landforms would indicate that these landforms were not used as transit routes or pathways. The sites recorded in flatter terrain did not have sufficient distinguishing features to provide clues about what was happening at these sites beyond standard tool manufacture and curation.
- Did the Aboriginal people use the Survey Boundary at any particular time of the year?
    - The data set is too small to attempt an answer to this question and no evidence was noted that would indicate a seasonal preference for site use.
- If there are hearths present, do they contain remains (animal/plant) that may indicate what people were cooking/eating? Can dates be obtained for the Aboriginal use of the area?
    - No hearths or other features were recorded. The results of the assessment indicate that the sites probably date to the past few thousand years although the paucity of data makes such assumptions uncertain.
- Is there potential for burials to be present in the landscape?
    - There was no indication of there being burials in the Survey Boundary. Generally, the landscape has been farmed for a long period and this may have removed or dispersed any evidence of burials over time had they existed. No sand bodies, a favoured burial location, were noted in the Survey Boundary.
- Are the outcropping rock materials present suitable for stone tool procurement and manufacture?

- No sources of stone suitable for the manufacture of stone tools was noted during the assessment.

- Establish how the findings within the Survey Boundary (if any) accord with the regional archaeological context examined in **Section 5.2**.
    - The recordings of the current assessment are representative of the findings of other researchers in the region. The type of artefacts, the raw material they are constructed from, and the range of tool types does not present a unique or distinguishing paradigm to the archaeological context that has been established in the upper Hunter Valley.

8 SIGNIFICANCE AND IMPACT ASSESSMENT

8.1 ASSESSMENT OF SIGNIFICANCE

8.1.1 Introduction

The appropriate management of cultural heritage items is usually determined based on their assessed significance, as well as the likely impacts of any proposed developments. Cultural, scientific, aesthetic, and historical significance are identified as baseline elements of significance assessment, and it is through the combination of these elements that the overall cultural 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/Scientific 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 a site can contribute to current research also involves defining 'research potential'. 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 (Burra Charter 2013).

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 recognised 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 enough understanding of historic values.

8.2 ASSESSED SIGNIFICANCE OF THE RECORDED SITES

Table 8-1 presents a summary of the significance assessment of the 15 Aboriginal cultural heritage sites recorded during this assessment. Further details of each of the assessment criteria are provided below.

Social or Cultural Value

The social and cultural value of Aboriginal sites is generally determined through consultation with Aboriginal people.

Generally, the Aboriginal community regard all sites as having high cultural significance. This is due to all sites, even displaced artefact sites, being able to provide a connection to their ancestors, as well as being a tangible reminder of the past Aboriginal occupation of the area.

Specific cultural values associated with the recorded sites have not been made known to OzArk through the consultation process. Based on views expressed regarding other sites in the upper Hunter Valley by the Aboriginal community, all recorded sites have been afforded high cultural values.

Archaeological/Scientific Value

The sites recorded are representative of artefact sites recorded elsewhere in the Hunter Valley in that they mostly consist of mudstone and silcrete unmodified flakes. While some retouch was noted, this was rarely more complicated than simple marginal retouch. No specialised tools such as ground-edge hatchet heads were recorded.

In addition, many of the sites were recorded in locations where disturbances from the area's agricultural land use and/or erosion was prevalent. The implication is that the artefacts are likely to be in a secondary context and that site integrity is very low.

A few locations were noted to have associated PAD. At these places, the research potential is raised although intact stratified deposits are not expected.

Consequently, 10 of the recorded sites are assessed as having low scientific value as the sites are in poor condition, their contents are unremarkable, they are representative of other sites in the area, and they offer very limited research potential to understand either past occupation or subsistence strategies.

Three sites are assessed as having low–moderate scientific value as the PADs that are associated with the sites suggest that there could be some research potential.

Aesthetic Value

All the recorded sites consist of unremarkable stone artefacts scattered on the ground. Sites of this nature do not manifest themselves in the landscape and they are extremely difficult for the layperson to interpret and understand. Unlike rock art sites, or even scarred trees, that can provide a tangible link to the past, artefact sites are generally only appreciated by specialists or the Aboriginal community. As such, all sites are assessed to have low aesthetic values.

Historic Value

None of the recorded sites have any association with important persons, places, or events. Therefore, they have no historic values.

Table 8-1: Aboriginal cultural heritage: significance assessment.

AHIMS ID	Site Name	Social or Cultural Value	Scientific Value	Aesthetic Value	Historic Value
37-3-1592	Liddell Hebden Road OS-1	High	Low	Low	None
37-3-1593	Liddell Hebden Road IF-1	High	Low	Low	None
37-3-1594	Coalhole Creek OS-01	High	Low	Low	None
37-3-1595	Bowmans Tributary OS-01	High	Low-Moderate	Low	None
37-3-1596	Bowmans Tributary IF-01	High	Low	Low	None
37-2-6043	Hillcrest OS-01	High	Low	Low	None
37-2-6044	Hillcrest OS-02	High	Low	Low	None
37-3-1587	Albano Road OS-01	High	Low	Low	None
37-3-1588	Albano Road OS-02	High	Low-Moderate	Low	None
37-3-1589	Albano Road OS-03	High	Low-Moderate	Low	None
37-3-1590	Albano Road IF-01	High	Low	Low	None
37-2-6263	Liddell Power Station-IF1	High	Low	Low	None
37-2-6541	Liddell Power Station-IF2	High	Low	Low	None
37-3-1632	Sandy Creek IF-1	High	Low	Low	None
37-3-1633	Sandy Creek IF-2	High	Low	Low	None

8.3 AVOIDING AND MINIMISING HARM

8.3.1 Conserving significant Aboriginal cultural heritage

An object of the NPW Act is the '*conservation of objects places and features… of cultural value within the landscape, including… places, objects and features of significance to Aboriginal people*' (s.2A(1(b)(i)).

As heritage professionals, OzArk, strives for good conservation outcomes. In particular, OzArk is primarily concerned with the conservation and protection of Aboriginal cultural heritage that is of significance to Aboriginal people.

Two primary objectives when managing harm to an Aboriginal object are:

- Impacts to significant Aboriginal objects and places should always be avoided wherever possible
- Where impacts to Aboriginal objects and places cannot be avoided, proposals should be amended to reduce the extent and severity of impacts to significant Aboriginal objects and places through the use of reasonable and feasible measures.

8.3.2 Opportunities to conserve Aboriginal cultural heritage values

8.3.2.1 Sites outside of the Survey Boundary

Of the 18 sites considered in this assessment, ten sites are outside of the Survey Boundary and will be avoided by the Project. Four of these sites (Albano Road OS-01, Albano Road IF-01, Liddell Power Station-IF2, and Liddell Hebden Road IF-1) will require management during the construction of the Project to ensure that they are not harmed. The management measures set out in **Table 8-2** should be followed to ensure these sites are conserved in the landscape.

The remaining sites outside of the Survey Boundary (Liddell Hebden Road OS-01, Hillcrest OS-1, Hillcrest OS-2, Bowmans Tributary OS-01, Bowmans Tributary IF-01, and ANT 4) are over 20 m from the Survey Boundary and do not require any specific management.

Table 8-2: Sites that require management during the duration of works in their vicinity.

AHIMS ID	Site Name	GDA East	GDA North	Management protocol
37-3-1587	Albano Road OS-01	325775	6428172	This site is located on the northern side of Albano Road, while all impacts in this area are to the southern side of Albano Road. The site will be avoided by the works associated with the Project. The site extent as shown on **Figure 6-17** should be fenced in high visibility fencing for the duration of work in the area to ensure that the site is not inadvertently impacted.
37-3-1590	Albano Road IF-01	324175	6427570	This site is located on the northern side of Albano Road, while all impacts in this area are to the southern side of Albano Road. The site will be avoided by the works associated with the Project. The site extent as shown on **Figure 6-23** should be fenced in high visibility fencing for the duration of work in the area to ensure that the site is not inadvertently impacted.
37-2-6541	Liddell Power Station-IF2	310289	6419152	The site is located approximately 12 m south of the Survey Boundary. Temporarily fence site with high visibility fencing for the duration of works in the area.
37-3-1593	Liddell Hebden Road IF-01	314197	6418086	This site is located on the northern side of the Survey Boundary in the ETL corridor. The site will be avoided by the works associated with the Project by fencing the site (5m x 5m area) in high visibility fencing for the duration of work in the area to ensure that the site is not inadvertently impacted.

8.3.2.2 Sites in the ETL corridor

In **Table 9-1**, four sites are located within the ETL corridor. It is noted, however, that there is some flexibility in the construction of ETLs so that Aboriginal heritage sites can be avoided, and it is understood that there is a high likelihood that two sites (Coalhole Creek OS-01 and Liddell Power Station-IF1) will to be avoided by the ETL construction and the use of the associated access track.

Furthermore, the proponent has also undertaken to ensure site ANT 22 is also not harmed within the 50 m buffer shown on **Figure 6-37**.

To conserve Aboriginal sites in the landscape, the final ETL design should be planned to avoid as many Aboriginal heritage sites as is possible.

If it is determined that sites can be avoided, they should be temporarily fenced with high visibility fencing for the duration of works in that area to ensure that they are not inadvertently impacted (**Table 8-3**).

Table 8-3: Sites that may be impacted by the ETL construction.

AHIMS ID	Site Name	Site type	GDA East	GDA North	Management strategy
37-3-1594	Coalhole Creek OS-01	Artefact scatter: 34 artefacts	314697	6420643	The site occupies a low point in the local topography, and it should be possible to place electricity structures so that the site is spanned. Access tracks will have to remain to the east of the Survey Boundary to avoid the site. If this site is harmed by the Project, the site should be salvaged by a collection of all surface artefacts (Group 1 management). The methodology of this management, if required, is set out in **Section 9.3.1**.
37-2-2029	Hunter Gas Project PAD	PAD	310105	6419190	The PAD occupies a low point in the local topography, and it should be possible to place electricity structures so that the PAD extent is spanned (see **Figure 6-34**). If any area within the PAD is harmed by the Project, limited archaeological excavation will be undertaken to investigate the nature of the PAD at the locations where ground disturbing impacts are sited. The methodology of such an investigation, if required, is set out in **Section 9.3.2**.
37-2-2072	ANT 22	Ceremonial ring	309677	6419268	If there are no direct impacts within the 50 m buffer the potential intangible and tangible values of this site will be conserved (see **Figure 6-37**). Direct impacts include the installation of electricity poles and access tracks within 50 m of the site, and these should be avoided. It is acceptable for the electricity wires to be overhead within this 50 m buffer. Any felling of trees that are necessary within this buffer should be hand cleared and machinery should not enter the 50 m exclusion zone (i.e. any timber will have to be left where it falls, or, preferably, manually dragged out of the buffer area).
37-2-6263	Liddell Power Station-IF1	Isolated find	308766	6418308	The site occupies a low point in the local topography, and it should be possible to place electricity structures so that the site is spanned. Access tracks will have to remain to the west to avoid the site. If this site is harmed by the Project, the site should be salvaged by a collection of all surface artefacts (Group 1 management). The methodology of this management, if required, is set out in **Section 9.3.1**.

8.3.2.3 Sites in Transport Route Disturbances

There are two sites associated with Transport Route Disturbances that span the Survey Boundary: Albano Road OS-02 and Albano Road OS-03.

Those portions of these sites outside of the Survey Boundary will not be harmed by the Project and will be conserved in the landscape. Harm will be avoided by fencing off the boundary of the Survey Boundary in these areas and ensuring that areas beyond the Survey Boundary are a no-go zone for all activities associated with the Project including vehicle movements and lay-down areas.

8.4 LIKELY IMPACTS TO ABORIGINAL CULTURAL HERITAGE FROM THE PROJECT

Table 8-4 presents a summary of potential impacts to Aboriginal cultural heritage associated with the proposal.

It is assumed that all sites known to exist within the current Survey Boundary may be impacted and in summary, this means that the Project will:

- Avoid harm to ten sites that are outside the Survey Boundary
- Harm five sites: total harm to two isolated finds, and partial harm to two artefact scatters and a PAD
- Potentially harm two further sites, however, these sites have a high chance for avoidance through micro-siting components associated with the ETL corridor
- ANT 22 is within the Survey Boundary but harm to the site will be avoided through management.

Therefore, of the 18 sites discussed in this report, a total of 13 sites will be avoided by the Project assuming that ANT 22, and the two sites that will potentially be avoided in the ETL corridor (**Section 8.3.2.2**), are not harmed. These sites are noted in **Table 8-4** as either being avoided (ANT 22) or having a 'high' likelihood for avoidance (Coalhole Creek OS-01 and Liddell Power Station-IF1).

The opportunity to avoid sites will not be known until final design of components, such as the ETL, are complete. Therefore, a precautionary approach will be taken here, and it will be assumed that all sites in the Survey Boundary will be impacted, except for ANT 22.

While every effort will be made to avoid harm to as many sites as possible, taking the precautionary principle at this stage means that of the seven discrete sites in the Survey Boundary (excluding ANT 22), three will be partially harmed and four sites will be totally harmed.

Table 8-4: Aboriginal cultural heritage: impact assessment.

AHIMS ID	Site Name	Type of Harm (Direct/Indirect / None)	Degree of Harm (Total/Partial / None)	Consequence of Harm (Total/Partial/No Loss of Value)	Likelihood for avoidance
37-3-1592	Liddell Hebden Road OS-1	None	None	No loss of value	Will be avoided
37-3-1593	Liddell Hebden Road IF-1	None	None	No loss of value	Will be avoided
37-3-1594	Coalhole Creek OS-01	Direct	Total	Total loss of value	High
37-3-1595	Bowmans Tributary OS-01	None	None	No loss of value	Will be avoided
37-3-1596	Bowmans Tributary IF-01	None	None	No loss of value	Will be avoided
37-2-2021	ANT 4	None	None	No loss of value	Will be avoided
37-2-2029	Hunter Gas Project PAD	Direct	Partial	Partial loss of value	Moderate

AHIMS ID	Site Name	Type of Harm (Direct/Indirect / None)	Degree of Harm (Total/Partial / None)	Consequence of Harm (Total/Partial/No Loss of Value)	Likelihood for avoidance
37-2-2072	ANT 22	None	None	No loss of value	Will be avoided
37-2-6043	Hillcrest OS-01	None	None	No loss of value	Will be avoided
37-2-6044	Hillcrest OS-02	None	None	No loss of value	Will be avoided
37-3-1587	Albano Road OS-01	None	None	No loss of value	Will be avoided
37-3-1588	Albano Road OS-02	Direct	Partial	Partial loss of value	Low
37-3-1589	Albano Road OS-03	Direct	Partial	Partial loss of value	Low
37-3-1590	Albano Road IF-01	None	None	No loss of value	Will be avoided
37-2-6263	Liddell Power Station-IF1	Direct	Total	Total loss of value	High
37-2-6541	Liddell Power Station-IF2	None	None	No loss of value	Will be avoided
37-3-1632	Sandy Creek-IF1	Direct	Total	Total loss of value	Low
37-3-1633	Sandy Creek-IF2	Direct	Total	Total loss of value	Low

8.4.1 The Ravensworth Estate

OzArk notes that a notice of an application for the preservation and protection of a specified area described as the 'Ravensworth Estate' and including Bowmans Creek and Glennies Creek, in the Hunter Valley (the Specified Area) has been made.

The Specified Area as defined in the Section 10 application under the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* includes a portion of the overhead electricity line, a portion of the underground electricity line, a construction compound/batching plant, an access track, as well as some minor locations for road works along Hebden Road. All areas have been surveyed by archaeologists and RAPs.

OzArk was aware at the time of the survey of the values that have been identified in the Specified Area and took care to observe any attributes associated with these values within the Survey Boundary. No tangible items associated with these values were observed, and it is concluded that the project will not impact the values ascribed to the Specified Area. As the impacts are occurring within areas previously cleared and farmed, it is assessed that these actions have removed or altered the aesthetic values ascribed to the Specified Area. The specific values within the Specified Area that are identified as significant and the impacts to these values from the Amended Project are discussed in **Table 8-5**.

Table 8-5: Analysis of impacts to the identified values of the Specified Area.

Significance identified in the Specified Area	Likely impact from the Project
Represents an area where the conflicts occurred during the early colonisation of the Hunter Valley", including how it "contains a landscape of an open massacre of the Wonnarua people"	The history of resistance and conflict associated with the colonial occupation of the Hunter Valley has been documented by Dr Mark Dunn (*The Convict Valley: The bloody struggle on Australia's early frontier*. Allen and Unwin, 2020). The massacre identified in the significance associated with the Specified Area has been extensively researched and an exact location for this event is unknown.

Significance identified in the Specified Area	Likely impact from the Project
	While this does not preclude the possibility that it occurred in or near the Project Boundary, there is no evidence to suggest that it did. During the survey, no evidence of this early colonial conflict was noted in the Survey Boundary.
Represents [an] area where ceremonies were carried out by the Wonnarua people" and is thus "sacred to our people", including "several places" used for rituals associated with "bora" (male initiation) ceremonies or with "women's business ceremonies"	The Aboriginal community, including representatives for the Applicant for the Section 10 application, assisted the survey. At no location within the Survey Boundary was it suggested that ceremonial places were located within the Survey Boundary.
"It is a spiritual place to us that must be protected so we can pass on to our children (future generations) for an understanding of our people's practices of the past there is an "obligation ... to preserve for future generations the story line that flows through the river, creeks and tributaries of the whole area·: including how "forefathers ... followed the creek lines and carried out ceremonial rituals along the route"	The Survey Boundary impacts minor areas associated with Bowmans Creek including where the Survey Boundary is within the existing Albano Road where it crosses Bowmans Creek and where Bowmans Creek will be underbored for the electricity powerline where Hebden Road crosses Bowmans Creek. The Project will therefore not impact this value any more than has already occurred through the construction of Albano and Hebden Roads.
"The area is part of a transit route"; along Bowmans Creek there are "two fish traps" and a "women's birthing place"	As noted above, the Project will not additionally impact Bowmans Creek and this value will not be impacted. The sites mentioned in the Specified Area are not known to exist within the Survey Boundary.
"Our people have used the area for thousands of years", including recently by "members of the [native title] claimant group", and, "As such, this is one of the few in Wonnarua Country that can demonstrate ongoing occupation and use by a hunter-gatherer society"	This intangible value will not be impacted by the Project as it exists in an area that has been within private ownership for a long period of time and has been subjected to long-term grazing and landform modification. While occupation of the area by traditional Aboriginal people is undisputed, the survey results indicate that the Survey Boundary was not intensively occupied and no evidence of recent occupation (i.e. knapped glass objects etc.) were recorded.
"To ensure that our cultural and heritage values are protected"	A major aim of the survey was to ensure that this value was understood, and every effort made to ensure cultural values were conserved in the landscape. There is an overall low level of harm to known Aboriginal objects arising from the Amended Project (of the 16 sites considered in the EIS, five will potentially be impacted although three will only be partially harmed, and a further two are likely to be avoided). Eleven sites will not be harmed by the Amended Project. The result is that most of the known sites within the Survey Boundary will be conserved.
"We have a responsibility [to] do all we can, to stop the never ending destruction, of our Country" by "uncontrolled agricultural and coal mining practices". As such, the "area contains a landscape of ongoing conflict"	OzArk understands this point of view, however, it is considered that the Amended Project does not materially impact significant Aboriginal cultural heritage vales.

Although not specifically mentioned in the submission, it is noted that the Statement of Heritage Impact for the Ravensworth Estate prepared for the Glendell Continued Operations Project (Lucas Stapleton Johnson & Partners Pty. Ltd. 2019) identifies two areas associated with the former Bowman estate: the place and the Ravensworth Estate core remains. The only Project impacts in either of these areas are minor road works along Hebden Road and there will be no impact to any surviving component within the Place or the Ravensworth Estate core remains.

8.5 ECOLOGICALLY SUSTAINABLE DEVELOPMENT PRINCIPLES

Ecologically sustainable development principles (ESD) (defined in s.6 of the *Protection of the Environment Administration Act 1991*) requires the integration of economic and environmental considerations (including cultural heritage) in the decision-making process. In regard to Aboriginal

cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle.

8.5.1 Intergenerational equity

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity, and productivity of the environment for the benefit of future generations.

In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous permits), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.

Information about the integrity, rarity or representativeness of the Aboriginal objects and places proposed to be impacted, and how they illustrate the occupation and use of land by Aboriginal people across the region, will be relevant to the consideration of intergenerational equity and the understanding of the cumulative impacts of the Project.

Where there is uncertainty, the precautionary principle should also be followed.

8.5.2 The precautionary principle

The precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

In relation to Aboriginal cultural values, the precautionary principle should be guided by:

- The Project involves a risk of serious or irreversible damage to Aboriginal objects or places or to the value of those objects or places
- There is uncertainty about the Aboriginal cultural heritage values or scientific or archaeological values, including in relation to the integrity, rarity or representativeness of the Aboriginal objects or places proposed to be impacted.

8.5.3 Principle of Integration

The Plan of Implementation of the World Summit on Sustainable Development held in Johannesburg, 2002, noted the need to "*promote the integration of the three components of sustainable development- economic development, social development and environmental protection- as interdependent and mutually reinforcing pillars*".

The principle of integration ensures mutual respect and reciprocity between economic and environmental considerations:

- Environmental considerations are to be integrated into economic and other development plans, programs, and projects

- Development needs are to be considered in applying environmental objectives.

8.5.4 Applicability to the Project

For a project of this scale, there is a very low impact to Aboriginal cultural heritage values and no heritage values were recorded in areas where the greater impacts from turbine construction and auxiliary facilities will take place.

All sites are low to medium density artefact sites, most often in disturbed locations because of the area's past agricultural land use, and while the loss of five sites (two totally harmed, three partially harmed: if ANT 22, Coalhole Creek OS-01, and Liddell Power Station-IF1 are not harmed) will have an impact on the region's heritage values, none of the sites are remarkable or represent an irreplaceable heritage loss.

A valid case is often made that the gradual loss of sites as each project is approved in the upper Hunter Valley leads to a cumulative loss of sites and a fragmentation of the remining sites. In this, the Project will have a marginal contribution but one where the loss of heritage values can be mitigated through a robust salvage program that will include further field investigation to gain as much information as is possible from the sites that are being impacted.

If, as is postulated here, the heritage loss is confined to a handful of sites, the loss of inter-generational equity associated with the Project will be negligible.

Table 8-6 examines the application of ESD principles to the Project.

Table 8-6: Application of ESD principles to the Project.

ESD principle	Response
Avoiding and minimising harm	**Section 8.3.2** sets out mechanisms by which Aboriginal sites in the Survey Boundary will be excluded from harm
The integration principle	The Project presents a strong case for the environmental benefits of the wind farm. While some Aboriginal objects may be harmed by the Project, assessment has been made that these are not scientifically significant and the relative number of objects that may be harmed is low. The Project will seek to minimise environmental and heritage harm wherever possible
The precautionary principle	The Project has followed the precautionary principle though undertaking a robust impact assessment to ensure that harm to Aboriginal objects is minimised. The survey adopted a precautionary principle when it came to describing and assessing landforms within the Survey Boundary
The intergenerational equity principle	It is assessed that the potential loss of sites associated with the Project is negligible both in terms of the number of sites being harmed, as well as the types of sites being harmed (i.e. low-density artefact scatters and isolated finds)

9 MANAGEMENT OF ABORIGINAL CULTURAL HERITAGE SITES

9.1 GENERAL MANAGEMENT PRINCIPLES

Appropriate management of cultural heritage items is primarily determined based on their assessed significance as well as the likely impacts of the proposed development. **Section 8.2** and **Section 8.4** 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 Project, or components of the Project, to avoid impact to a recorded Aboriginal site. It has been postulated in **Section 8.3** that this is a distinct possibility with this Project as sites recorded in the ETL corridor can be avoided by small Project design changes. 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. However, 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 under the authority of an ACHMP will be required. The ACHMP will be developed in consultation with the RAPs and will include the management recommendations of this ACHAR. It would be in the ACHAR when the final tally of sites to be impacted would be presented, along with any appropriate management protocols. The ACHMP would also define the nature of the additional fieldwork that is required, as well as the salvage strategies to be employed at each site. The ACHMP would set out the long-term management and curation of any salvaged material.

9.2 MANAGEMENT OF RECORDED ABORIGINAL SITES

9.2.1 Management of potentially impacted Aboriginal sites

9.2.1.1 Sites within the ETL easement portion of the Survey Boundary

Disturbances for the construction of an ETL will involve localised impact at the site of the electricity structure and along an access track between the electricity structure. While there can be some flexibility in the siting of electricity structures along a straight stretch, there is little flexibility for moving electricity structures located at corner positions. Therefore, precise impacts associated with ETL will not be known until the precise design plan is finalised and there is some ability to avoid sites either through the site being spanned and avoided by the access track, or by the electricity structure being moved to avoid a site.

As the final ETL design plans are not known, it will be assumed here that all sites within the ETL portion of the Survey Boundary will be impacted. However, it must be borne in mind that some of the sites will be avoided.

Table 9-1: Sites that may be impacted by the ETL construction.

AHIMS ID	Site Name	Site type	GDA East	GDA North	Potential management options
37-3-1594	Coalhole Creek OS-01	Artefact scatter: 34 artefacts	314697	6420643	The site occupies a low point in the local topography, and it should be possible to place electricity structures so that the site is spanned. Access tracks will have to remain to the east of the Survey Boundary to avoid the site. If this site is harmed by the Project, the site should be salvaged by a collection of all surface artefacts (Group 1 management). The methodology of this management, if required, is set out in **Section 9.3.1**
37-2-2029	Hunter Gas Project PAD	PAD	310105	6419190	The PAD occupies a low point in the local topography, and it should be possible to place electricity structures so that the PAD extent is spanned (see **Figure 6-34**). If any area within the PAD is harmed by the Project, limited archaeological excavation will be undertaken to investigate the nature of the PAD. The methodology of such an investigation, if required, is set out in **Section 9.3.2**
37-2-2072	ANT 22	Ceremonial ring	309677	6419268	If there are no direct impacts within the 50 m buffer the potential intangible and tangible values of this site will be conserved (see **Figure 6-37**). Direct impacts include the installation of electricity poles and access tracks within 50 m of the site, and these works should be avoided. It is acceptable for the electricity wires to be overhead within this 50 m buffer. Any felling of trees that are necessary within this buffer should be hand cleared and machinery should not enter the 50 m exclusion zone (i.e. any timber will have to be left where it falls, or, preferably, manually dragged out of the buffer area).
37-2-6263	Liddell Power Station-IF1	Isolated find	308766	6418308	The site occupies a low point in the local topography, and it should be possible to place electricity structures so that the site is spanned. Access tracks will have to remain to the west to avoid the site. If this site is harmed by the Project, the site should be salvaged by a collection of all surface artefacts (Group 1 management). The methodology of this management, if required, is set out in **Section 9.3.1**.

9.2.1.2 Sites within the Transport Route Disturbances

Two sites were recorded partially within the Survey Boundary along Albano Road, and they have potential to be harmed by Transport Route Disturbances that involve widening the existing road to allow the wind farm components to be transported to site. As these works involve modification to an existing road, there is little room for avoidance, and it is assumed that all areas within the Survey Boundary will be harmed by the Project.

Only portions of these sites within the Survey Boundary will be subject to the management procedures listed in **Table 9-2**. Areas of these sites outside of the Survey Boundary will be conserved in the landscape.

Table 9-2: Sites that may be impacted by Transport Route Disturbances.

AHIMS ID	Site Name	Site type	GDA East	GDA North	Potential management options
37-3-1588	Albano Road OS-02	Artefact scatter: 13 artefacts	324620	6427761	If this site is harmed by the Project, the site should be first salvaged by a collection of all surface artefacts (Group 1 management). The methodology of this management, if required, is set out in **Section 9.3.1**. As the site has an associated PAD, areas of the PAD within the Survey Boundary should be investigated by limited archaeological excavation (Group 2 management). The methodology of this management, if required, is set out in **Section 9.3.2**.
37-3-1589	Albano Road OS-03	Artefact scatter: three artefacts	323759	6427462	If this site is harmed by the Project, the site should be first salvaged by a collection of all surface artefacts (Group 1 management). The methodology of this management, if required, is set out in **Section 9.3.1**. As the site has an associated PAD, areas of the PAD within the Survey Boundary should be investigated by limited archaeological excavation (Group 2 management). The methodology of this management, if required, is set out in **Section 9.3.2**.

9.2.2 Synthesis of all management recommendations

Table 9-3 lists all sites that were recorded during the assessment, as well as all previously recorded sites within the Survey Boundary.

As part of the project detailed design phase there may be some flexibility to avoid harm to certain Aboriginal sites; particularly with regard to the design of the ETL. Therefore, **Table 9-3** contains two columns with one column containing the recommendations if the site is avoided, and the other if the site is harmed.

In summary, the following statistics characterise the management of Aboriginal cultural heritage regarding the Project:

- Number of sites considered in this report (n=18):
    - 15 newly recorded sites
    - Three additional previously recorded sites in or near the Survey Boundary.
- In terms of impact:
    - Ten sites are outside the Survey Boundary and will not be harmed
    - Eight sites have potential to be harmed by the Project:
        - Two isolated finds (Sandy Creek IF-1 and IF-2) will be totally impacted by the construction of an access track

- Two sites (Albano Road OS-02 and Albano Road OS-03) will be partially harmed by works associated with the Transport Route Disturbances
- One PAD (Hunter Gas Project PAD) will be partially harmed by works associated with the ETL corridor
- One site (ANT 22), at the undertaking of the proponent, will be avoided by the Project
- Two sites (Coalhole Creek OS-01 and Liddell Power Station-IF1) are likely to be avoided by considered project design of the ETL corridor.

Table 9-3: Management of all sites included in this investigation.

AHIMS ID	Site Name	GDA East	GDA North	Potential for avoidance	Management if impacted
37-3-1592	Liddell Hebden Road OS-1	314202	6418024	Outside of the Survey Boundary. Will not be impacted.	Will not be impacted
37-3-1593	Liddell Hebden Road IF-1	314197	6418086	Outside of the Survey Boundary. Will not be impacted. Temporarily fence site with high visibility fencing for the duration of works in the area	Will not be impacted
37-3-1594	Coalhole Creek OS-01	314697	6420643	Within the Survey Boundary but with a high chance for avoidance if spanned by the ETL. Temporarily fence site with high visibility fencing for the duration of works in the area if ground disturbing works can be avoided within the site extent (see **Figure 6-8**)	Group 1
37-3-1595	Bowmans Tributary OS-01	321743	6421723	Outside of the Survey Boundary. Will not be impacted. Site is distant to the Survey Boundary, therefore no management required.	Will not be impacted
37-3-1596	Bowmans Tributary IF-01	322216	6421206	Outside of the Survey Boundary. Will not be impacted. Site is distant to the Survey Boundary, therefore no management required.	Will not be impacted
37-2-6043	Hillcrest OS-01	311149	6419120	Outside of the Survey Boundary. Will not be impacted.	Will not be impacted
37-2-6044	Hillcrest OS-02	311249	6419159	Site is distant to the Survey Boundary, therefore no management required.	Will not be impacted
37-3-1587	Albano Road OS-01	325775	6428172	Outside of the Survey Boundary. Will not be impacted. Temporarily fence site with high visibility fencing for the duration of works in the area	Will not be impacted
37-3-1588	Albano Road OS-02	324620	6427761	Low probability for avoidance. Those portions of the site outside of the Survey Boundary will not be harmed	Group 2

AHIMS ID	Site Name	GDA East	GDA North	Potential for avoidance	Management if impacted
				by the Project and will be conserved in the landscape (see **Figure 6-19**). Harm will be avoided by fencing off the boundary of the Survey Boundary in these areas and ensuring that areas beyond the Survey Boundary are a no-go zone for all activities associated with the Project including vehicle movements and lay-down areas	
37-3-1589	Albano Road OS-03	323759	6427462	Low probability for avoidance. Those portions of the site outside of the Survey Boundary will not be harmed by the Project and will be conserved in the landscape (see **Figure 6-21**). Harm will be avoided by fencing off the boundary of the Survey Boundary in these areas and ensuring that areas beyond the Survey Boundary are a no-go zone for all activities associated with the Project including vehicle movements and lay-down areas	Group 2
37-3-1590	Albano Road IF-01	324175	6427570	Outside of the Survey Boundary. Will not be impacted. Temporarily fence site with high visibility fencing for the duration of works in the area	Will not be impacted
37-2-6263	Liddell Power Station-IF1	308766	6418308	Within the Survey Boundary but with a high chance for avoidance if spanned by the ETL. Temporarily fence site with high visibility fencing for the duration of works in the area	Group 1
37-2-6541	Liddell Power Station-IF2	310289	6419152	Outside of the Survey Boundary. Will not be impacted. Temporarily fence site with high visibility fencing for the duration of works in the area	Will not be impacted
37-2-2021	ANT 4	310366	6419306	Outside of the Survey Boundary. Will not be impacted.	Will not be impacted
37-2-2072	ANT 22	309677	6419268	Within the Survey Boundary but with a high chance for avoidance if spanned by the ETL. Installation of electricity poles and access tracks within 50 m of the site should be avoided (see **Figure 6-37**). It is acceptable for the electricity wires to be overhead within this 50 m buffer. Any felling of trees that are necessary within this buffer should be hand cleared and machinery should not enter the 50 m exclusion zone (i.e. any timber will have to be	Will not be impacted if management procedures can be achieved

AHIMS ID	Site Name	GDA East	GDA North	Potential for avoidance	Management if impacted
				left where it falls, or, preferably, manually dragged out of the buffer area)	
37-2-2029	Hunter Gas Project PAD	310105	6419190	Within the Survey Boundary but with a chance for avoidance if spanned by the ETL. Works within the PAD extent should be avoided (see **Figure 6-34**). Temporarily fence the PAD extent with high visibility fencing for the duration of works in the area. If works are required within the PAD area shown on **Figure 6-34**, limited test excavation will be required prior to the works commencing to determine the nature of the PAD.	Group 2 Only at locations where there will be ground disturbing works (i.e. at the location of the electricity pole should one be required in the PAD extent)
37-3-1632	Sandy Creek-IF1	321875	6435271	Low likelihood for avoidance	Group 1
37-3-1633	Sandy Creek-IF2	321494	6435300	Low likelihood for avoidance	Group 1

9.3 MANAGEMENT PROCESS

9.3.1 Group 1: Archaeological salvage: surface artefact collection

Research aim: Is there any variation, on a macro level, in the distribution of certain artefact attributes such as raw material type and artefact type across the Survey Boundary?

Action: To conduct an analysis of the raw materials and basic artefact features to determine whether there is site to site variation across the Survey Boundary, particularly at sites located away from water.

Aim: Archaeological data obtained will allow a local level analysis of distribution patterns within the Survey Boundary.

Research Design: All visible artefacts would be flagged in the field. On hand-held GIS units, the location, artefact class and artefact type will be catalogued in the field. A representative sample of artefacts and views of site and *in situ* artefacts will be photographed. When recorded, all artefacts from the surface of the site will be collected.

Stone artefact sites managed under this archaeological salvage will contribute to the research aim in that the sites will have surface artefacts mapped, catalogued, selectively photographed, collected, and moved to a place agreed to by the RAPs. The final fate of any salvaged objects will be done through consultation for the ACHMP.

It is envisioned that these investigations would include the following methodology although the final form of any investigation would be done in consultation with the RAPs as part of development of an ACHMP.

Archaeological salvage: surface collection of artefacts

To fulfil the research aim, the following program is suggested:

- All visible artefacts at a site should be flagged in the field
- The site should be photographed after flagging and before recording
- All artefacts should have the following artefact information entered directly into a GPS unit, albeit one set up with all variable fields already entered to make the field recording job more efficient:
    - Location
    - Artefact Class
    - Artefact Type
    - Size
    - Reduction level
    - Raw Material
    - Notes.
  - A selection of indicative and / or unusual artefacts from each site will be photographed
  - If required, a sketch plan of the site will be completed indicating zones for the surface collection of artefacts
  - Once all recording is complete, the artefacts will be collected according to site zones with artefacts from each zone being kept separate.
- Should the collection team encounter a human burial, all work will cease in the area and advice from the NSW Police sought. Should the remains be Aboriginal, HNSW, and the RAPs will be contacted
- The recording of the artefacts recovered will largely be completed in the field and this data would be incorporated into a report
- Analysis will attempt to answer the research aim which is to record a statistically valid artefact assemblage from across the Survey Boundary to better understand inter-site variations.

The sites recommended for archaeological salvage by means of surface collection (Group 1) are detailed in **Table 9-3**.

9.3.2 Group 2: Archaeological salvage: limited manual excavation

At the sites recommended for subsurface excavation in **Table 9-3** (Group 2), it is recommended that the surface collection of artefacts occur first (**Section 9.3.1**) and that manual excavation at the sites should take place. The maximum area of excavation should be determined by the results

of the excavations but a minimum of 2 m^2 at each site would be required to confirm the nature of the subsurface deposits.

The manual excavation at these locations should follow the following framework.

Archaeological Salvage: Limited Subsurface Investigations

Research Aim: Are there either subsurface artefacts or intact archaeological deposits at the location?

Action: To conduct targeted, limited archaeological excavations at the site.

Aim: To use the results of the limited manual excavation to confirm the nature of the subsurface deposits.

Research Design: At locations indicated in **Table 9-3** limited manual excavation will take place to determine the nature and extent of any subsurface deposits.

If the results of the limited manual excavations demonstrate that there is archaeological data that will enable a meaningful analytical analysis, then this analysis will be undertaken. This analysis could include, but not be limited to:

- Allowing the Survey Boundary to be placed within the broader Hunter Valley context
- Analysing chronological changes that may occur in technology, raw materials, tool use, or the spatial patterns of site use.

The methodology for the possible salvage by manual excavation at these sites is as follows:

- A minimum of eight 0.5 m by 0.5 m excavation squares (two square metres) would be excavated to culturally sterile soil levels such as the basal clays at each site. Should basal clays be too deep to be reasonably reached by manual excavation, the decision as to whether sufficient excavation has occurred will rest with the Excavation Director
- The eight excavation squares be spaced at no more than 5 m apart. Thus a 35 m transect will be investigated
- Spits at each area would start in 5 cm increments although 10 cm increments could be used once it is established it is archaeologically prudent to do so
- All deposits would be dry sieved at location
- All recording will be done in the field in standard context sheets and the archaeologist will ensure that all necessary photographs, section drawings and soil analysis shall take place
- The decision to expand from the initial two square metres shall be determined by the results of the eight 0.5 m by 0.5 m squares and would be done in consultation between the archaeologists and RAPs present. The final decision on whether expansion is desirable will rest with the Excavation Director
- The grounds for expansion would include:

  - The complete excavation of a feature (such as a hearth) that may have been intersected by an excavation square
  - The complete excavation of a concentration of artefacts such as a knapping floor that may have been intersected by an excavation square.

- Any expansion beyond the two square metres would include areas totalling no more than an additional two square metres
- In what is assessed as an unlikely event, should the excavations encounter high value archaeological deposits, it should be possible to commence larger scale manual excavation at that location. Deposits or features that would characterise high value deposits include:
  - Undisturbed deposits showing discernible archaeological stratigraphy
  - Any exceptional finds (unusual materials, rare preservation, rare artefact type) believed to have archaeological context
  - A high density of artefacts[7] (more than 80 per square metre) in largely undisturbed contexts.
- Should the excavation team encounter a human burial, all work will cease in the area and advice from the NSW Police sought. Should the remains be Aboriginal, HNSW, and the RAPs will be contacted
- All excavated material (stone tools, bone, shell etc.) will be fully analysed and a report of the findings prepared.

[7] An artefact is regarded as any debitage with a maximum dimension greater than 15 mm.

10 RECOMMENDATIONS

Under Section 89A of the NPW Act it is mandatory that all newly-recorded Aboriginal sites be registered with AHIMS. As a professional in the field of cultural heritage management it is the responsibility of OzArk to ensure this process is undertaken.

To this end it is noted that 15 Aboriginal sites were recorded during the assessment.

The following recommendations are made based on these impacts and regarding:

- Legal requirements under the terms of the NPW Act whereby it is illegal to damage, deface or destroy an Aboriginal place or object without the prior written consent of HNSW
- The findings of the current investigations undertaken within the Survey Boundary
- The interests of the Aboriginal community.

This investigation considers 18 sites: 15 newly recorded and three previously recorded in or near the Survey Boundary.

Of these 18 sites that remain in the landscape, ten will not be harmed by the Project as they are outside the Survey Boundary where Project impacts will be located.

Of the eight sites that could potentially be harmed, it is recommended that harm to ANT 22 and to two further sites be avoided. If the management recommendations in relation to these sites (ANT 22, Coalhole Creek OS-01, and Liddell Power Station-IF1) are achievable, this report assumes that two sites (Sandy Creek IF-1 and Sandy Creek IF-1) will be totally harmed by the Project and three sites (Albano Road OS-02, Albano Road OS-03, and Hunter Gas Project PAD) will be partially harmed (n= 5).

Therefore, with considered project design, 72 per cent of the known Aboriginal sites associated with the Project will be conserved within the landscape.

Recommendations concerning Aboriginal cultural values within the Survey Boundary are as follows:

1. As many sites as is possible should be avoided in the final design of the ETL. Further details on these potential avoidance measures are provided in **Section 9.2.1.1** and **Section 9.2.1.2**.
2. Those sites that can be avoided should be protected from inadvertent damage during the works by temporarily fencing the site as set out in **Table 9-3**.
3. Those sites that are not able to be avoided should be managed by the procedures set out in **Table 9-3**.

4. Before any works on the Project begin, an ACHMP, approved by DPE and prepared in consultation with the RAPs, will need to be developed. The ACHMP will quantify the exact sites to be impacted, the methods by which they will be managed and the fate of any artefacts that are recovered prior to the works. The ACHMP will also provide a protocol for unanticipated finds and the discovery of human skeletal material.

REFERENCES

Arrow Heritage Solutions 2019 Arrow Heritage Solutions. 2019. *Aboriginal Cultural Heritage Assessment Report for the lake Liddell Recreation Area Reserve Proposed Development Aboriginal Heritage Impact Permit Application*. Report for the Trustees of the Board of the Lake Liddell Recreation Area Reserve.

Brayshaw 1981 Helen Brayshaw. *Archaeological survey of Authorisation 89, proposed site of Bloomfield Collieries' Coal Mine at Rix's Creek, Singleton*. Report for NSW NPWS.

Brayshaw 1986 Brayshaw, H. 1986. *Aborigines of the Hunter Valley: a study of colonial records*. Scone and Hunter Historical Society: Scone.

Burke & Smith 2004 Burke, H. and Smith, C. 2004. *The Archaeologist's Field Handbook*, Blackwell, Oxford.

Burra Charter 2013 International Council on Monuments and Sites 2013. The Burra Charter: *The Australia ICOMOS Charter for Places of Cultural Significance*.

CSIRO 2009 Commonwealth Scientific and Industrial Research Organisation (CSIRO). 2009. *Australian soil and land survey field handbook. Third Edition.* CSIRO Publishing.

Davies 1991 Davies. 1991. *An Archaeological Assessment of the Proposed Optic Fibre Cable Route between Cessnock and Scone, and Muswellbrook and Singleton*. Report to Telecom Australia.

DECCW 2010 Department of Environment, Climate Change and Water, Sydney (now OEH). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*.

DECCW 2010b Department of Environment, Climate Change and Water, Sydney (now OEH). *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*.

Dyall 1982 Len Dyall. 1982. *A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project*. Report for ELCOMM.

GHD 2005 GHD (International) Pty Limited. *Proposed Coal Stockpile at Newpac No. 1 Colliery, Ravensworth. Environmental Impact Statement, Volume 1*. Report for Resource Pacific Ltd.

Haglund 1982 Hagland, L. 1982. *Archaeological Survey of Pikes Gully Colliery Area, Liddell, N.S.W*. Report for Longworth and McKenzie Pty. Limited.

HLA-Envirosciences 2005a HLA Envirosciences (J. Czastka). 2005. *Preliminary Research Permit #1982: Excavations and Findings at Newdell Junction, Ravensworth*. Report for Macquarie Generation.

HLA-Envirosciences 2005b HLA Envirosciences. 2005. *Proposed Rail Unloader and Conveyor near Antiene*. Report for Macquarie Generation.

Kovac and Lawrie 1991 M. Kovac, J.W. Lawrie. 1991. *Soil landscapes of the Singleton 1:250 000 sheet*. Soil Conservation Service of NSW.

Mitchell 2002 Mitchell, Dr. Peter. 2002. *Description for NSW (Mitchell) Landscapes Version 2.* Department of Environment and Climate Change NSW.

OEH 2011 Office of Environment and Heritage. 2011. *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales.* Department of Environment, Climate Change and Water, Sydney.

OzArk 2013 OzArk Environment & Heritage. 2013. *Due Diligence Assessment Proposed Track Maintenance Hillcrest Offset Area, Upper Hunter Valley NSW*. Report for Ravensworth Operations Pty Limited.

OzArk 2014a OzArk Environment & Heritage. 2014. *Aboriginal Archaeological Values Assessment. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW*. Report for Mt Owen Pty Ltd.

OzArk 2014b OzArk Environment & Heritage. 2014, *Aboriginal Archaeological Assessment. Ravensworth Offset Property Maintenance*. Report for Ravensworth Open Cut.

OzArk 2015 OzArk Environment & Heritage. 2015. *Archaeological Due Diligence Assessment. Proposed Erosion Control Works. Hillcrest Offset Area, Upper Hunter Valley NSW*. Report for Ravensworth Open Cut, Glencore.

OzArk 2017a OzArk Environment & Heritage. 2017. *Aboriginal Due Diligence Archaeological Assessment: Liddell Coal Offset Areas for Revegetation, Muswellbrook LGA*. Report for Liddell Coal Operations.

OzArk 2017b OzArk Environment & Heritage. 2017. *Aboriginal Due Diligence Archaeological Assessment: Mitchell Hills South Offset Area, Liddell Coal Operations, Muswellbrook LGA*. Report for Liddell Coal Operations Pty Limited.

OzArk 2018 OzArk Environment & Heritage. 2018. *Aboriginal and Historic Due Diligence Archaeological Assessment: Liddell Coal Operations DA305-11-01 Modification 7*. Report for Liddell Coal Operations Pty Limited.

Resource Planning 1991 — Resource Planning Pty Limited. 1991. *Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales*. Report for Hunter Valley Coal Corporation Pty Limited.

Tocomwall 2017 — Tocomwall Pty Ltd. *Hillcrest Aboriginal Cultural Values Assessment Report*. Report to Glencore Coal Assets Australia.

Umwelt 2003 — Umwelt (Australia) Pty Limited. 2003. *Survey and Assessment of Impact on Aboriginal Cultural Heritage and Archaeological Values, Main Creek, Hunter Valley, NSW*. Prepared for Glennies Creek Coal Management.

Umwelt 2006a — Umwelt (Australia) Pty Limited. 2006. *Aboriginal Cultural Heritage Management Strategy for the Mt Owen Biodiversity Offset Areas*. Report for Report for Xstrata Mt Owen Pty Limited.

Umwelt 2006b — Umwelt (Australia) Pty Limited. 2006. *Archaeological Survey and Assessment for a Proposed 132 kV feeder at Antiene, near Lake Liddell*. Report to Energy Australia.

Umwelt 2007 — Umwelt (Australia) Pty Limited. 2007. *Environmental Assessment for Modification of Glendell Mine Operations* (3 Volumes). Report for Xstrata Mt Owen Pty Limited.

Umwelt 2010 — Umwelt (Australia) Pty Limited. 2010. *Ravensworth Operations Project Environmental Assessment, Volume 4*. Report for Xstrata Ravensworth Operations

APPENDIX 1: ABORIGINAL COMMUNITY CONSULTATION

COMMUNITY CONSULTATION LOG

The Aboriginal Community Consultation Log is presented in **Appendix 1 Table 1**.

Appendix 1 Table 1: Aboriginal Community Consultation Log for the Project.

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
26.8.19	Hunter Valley News	10am cut off on Monday, only prints Tuesdays. Is a free paper. Must note the Hunter Valley News in add and proof email	phone
16.9.19	Hunter Valley News	Rebecca Hardman (RH) sent advert for proof and quote	email
16.9.19	Hunter Valley News	RH phoned to see if can get advert placed in time as only received with 10min to deadline	email
16.9.19	Hunter Valley News	RH received proof and quote	email
16.9.19	Hunter Valley News	RH sent back edits	email
16.9.19	Hunter Valley News	RH received proof	email
16.9.19	Hunter Valley News	RH approved proof	email
16.9.19	Hunter Valley News	RH phoned to pay for advert and clarified print date, paper is printed on Tuesday but distributed Wednesday. RH requested a tear sheet	phone
16.9.19	Hunter Valley News	RH received receipt	email
16.9.19	DPIE	RH sent Stage1 agency letter requesting potential stakeholders. Closing date 30.9.19	email
16.9.19	Wanaruah Local Aboriginal Land Council	RH sent Stage1 agency letter requesting potential stakeholders. Closing date 30.9.19	email
16.9.19	Office of The Registrar, ALRA	RH sent Stage1 agency letter requesting potential stakeholders. Closing date 30.9.19	email
16.9.19	National Native Title Tribunal	RH sent Stage1 agency letter requesting potential stakeholders. Closing date 30.9.19	email
16.9.19	NTSCORP	RH sent Stage1 agency letter requesting potential stakeholders. Closing date 30.9.19	email
16.9.19	Upper Hunter Shire Council	RH sent Stage1 agency letter requesting potential stakeholders. Closing date 30.9.19	email
16.9.19	Muswellbrook Shire Council	RH sent Stage1 agency letter requesting potential stakeholders. Closing date 30.9.19	email
16.9.19	Singleton Council	RH sent Stage1 agency letter requesting potential stakeholders. Closing date 30.9.19	email
16.9.19	Hunter Local Land Services	RH sent Stage1 agency letter requesting potential stakeholders. Closing date 30.9.19	email
16.9.19	Wanaruah Local Aboriginal Land Council	RTS - email undeliverable	RTS
16.9.19	Wanaruah Local Aboriginal Land Council	RH phoned to get updated email	phone
16.9.19	Wanaruah Local Aboriginal Land Council	RH resent Stage 1 agency letter	email
16.9.19	National Native Title Tribunal	RH received notification *Records held by the National Native Title Tribunal as at 16 September 2019 indicate that the identified parcels appear to be freehold, and freehold tenure extinguishes native title.*	email
17.9.19	Plains Clans of the Wonnarua People (PCWP)	RH received email registering as a RAP	email
17.9.19	Plains Clans of the Wonnarua People (PCWP)	RH responded requesting contact details	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
17.9.19	Plains Clans of the Wonnarua People (PCWP)	RH received contact details	email
17.9.19	Wanaruah Local Aboriginal Land Council	RH received list of 80+ stakeholders and LALC registered as a RAP	email
18.9.19	DPIE	RH received stakeholder list	email
18.9.19	A1 Indigenous Services	RH sent Community EOI letter	email
18.9.19	Deceased	RH sent Community EOI letter	Post
18.9.19	AGA Services	RH sent Community EOI letter	email
18.9.19	Aliera French Trading	RH sent Community EOI letter	email
18.9.19	Alison Sampson	RH sent Community EOI letter	email
18.9.19	Awabakal Traditional Owners Aboriginal Corporation	RH sent Community EOI letter	email
18.9.19	Barry French	RH sent Community EOI letter	Post
18.9.19	Black Creek Aboriginal Corporation	RH sent Community EOI letter	email
18.9.19	Bullen Bullen	RH sent Community EOI letter	Post
18.9.19	Cacatua Culture Consultants	RH sent Community EOI letter	email
18.9.19	Carol Ridgeway- Bissett	RH sent Community EOI letter	Post
18.9.19	Carrawonga Consultants	RH sent Community EOI letter	Post
18.9.19	Stakeholder 1	RH sent Community EOI letter	email
18.9.19	Crimson-Rosie	RH sent Community EOI letter	Post
18.9.19	Culturally Aware	RH sent Community EOI letter	email
18.9.19	D F T V Enterprises	RH sent Community EOI letter	email
18.9.19	Deslee Talbott Consultants	RH sent Community EOI letter	email
18.9.19	Deceased	RH sent Community EOI letter	email
18.9.19	Didge Ngunawal Clan	RH sent Community EOI letter	email
18.9.19	DRM Cultural Management	RH sent Community EOI letter	Post
18.9.19	Esther Tighe	RH sent Community EOI letter	Post
18.9.19	Gidawaa Walang & Barkuma Neighbourhood Centre	RH sent Community EOI letter	email
18.9.19	Giwiirr Consultants	RH sent Community EOI letter	email
18.9.19	Gomeroi People NC2011/006	RH sent Community EOI letter	email
18.9.19	Griffiths Group	RH sent Community EOI letter	Post
18.9.19	Hunter Traditional Owner	RH sent Community EOI letter	email
18.9.19	Hunter Valley Aboriginal Corporation	RH sent Community EOI letter	email
18.9.19	Hunter Valley Cultural Consultants	RH sent Community EOI letter	Post
18.9.19	Hunter Valley Cultural Surveying	RH sent Community EOI letter	email
18.9.19	Hunter Valley Environment Land & Mining Services	RH sent Community EOI letter	email
18.9.19	Hunter Valley Natural & Cultural Resources	RH sent Community EOI letter	Post
18.9.19	Hunters & Collectors	RH sent Community EOI letter	email
18.9.19	Indigenous Learning	RH sent Community EOI letter	email
18.9.19	Indigenous Outcomes	RH sent Community EOI letter	email
18.9.19	J & A Leonardi	RH sent Community EOI letter	Post

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
18.9.19	Jarban + Mugrebea	RH sent Community EOI letter	email
18.9.19	JLC Cultural Services	RH sent Community EOI letter	email
18.9.19	Jumbunna Traffic Management Group Pty Ltd	RH sent Community EOI letter	email
18.9.19	Kauma Pondee Inc.	RH sent Community EOI letter	email
18.9.19	Kawul Cultural Services	RH sent Community EOI letter	email
18.9.19	Kawul Pty Ltd trading as Wonn1 Sites	RH sent Community EOI letter	email
18.9.19	Kayaway	RH sent Community EOI letter	email
18.9.19	Kevin Duncan	RH sent Community EOI letter	email
18.9.19	Lower Hunter Aboriginal Incorporated	RH sent Community EOI letter	email
18.9.19	Lower Hunter Wonnarua Council Inc	RH sent Community EOI letter	email
18.9.19	Lower Wonnaruah Tribal Consultancy Pty Ltd	RH sent Community EOI letter	email
18.9.19	Mandy Howard	RH sent Community EOI letter	email
18.9.19	Mayaroo	RH sent Community EOI letter	email
18.9.19	Michelle Saunders	RH sent Community EOI letter	Post
18.9.19	Michelle Saunders	RH sent Community EOI letter	email
18.9.19	Mingga Consultants	RH sent Community EOI letter	Post
18.9.19	Mooki Plains Management	RH sent Community EOI letter	Post
18.9.19	Mooki Plains Management	RH sent Community EOI letter	Post
18.9.19	Moreeites	RH sent Community EOI letter	email
18.9.19	Murra Bidgee Mullangari Aboriginal Corporation	RH sent Community EOI letter	email
18.9.19	Murrawan Cultural Consultants Pty Ltd	RH sent Community EOI letter	email
18.9.19	Muswellbrook Cultural Consultants	RH sent Community EOI letter	Post
18.9.19	Myland Cultural & Heritage Group	RH sent Community EOI letter	email
18.9.19	Ngarramang-Kuri Aboriginal Culture & Heritage Group	RH sent Community EOI letter	email
18.9.19	Nunawanna Aboriginal Corporation	RH sent Community EOI letter	email
18.9.19	Rebecca Lester	RH sent Community EOI letter	email
18.9.19	Roger Matthews Consultancy	RH sent Community EOI letter	Post
18.9.19	Roger Noel Matthews Consultancy	RH sent Community EOI letter	Post
18.9.19	Ron Smith	RH sent Community EOI letter	email
18.9.19	Rosyln Sampson	RH sent Community EOI letter	email
18.9.19	Scott Smith	RH sent Community EOI letter	Post
18.9.19	Smith Dhagaans Cultural group	RH sent Community EOI letter	email
18.9.19	St Clair Singleton Aboriginal Corporation	RH sent Community EOI letter	Post
18.9.19	Stephen Talbot	RH sent Community EOI letter	email
18.9.19	Steven Saunders	RH sent Community EOI letter	Post
18.9.19	T & G Culture Consultants	RH sent Community EOI letter	Post

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
18.9.19	Thawan Heritage Consultant	RH sent Community EOI letter	email
18.9.19	Tocomwall	RH sent Community EOI letter	email
18.9.19	Trevor Robinson	RH sent Community EOI letter	Post
18.9.19	Ungooroo Aboriginal Corporation	RH sent Community EOI letter	email
18.9.19	Ungooroo Cultural & Community Services	RH sent Community EOI letter	email
18.9.19	Upper Hunter Heritage Consultants	RH sent Community EOI letter	Post
18.9.19	Upper Hunter Wonnarua Council Inc	RH sent Community EOI letter	Post
18.9.19	Valley Culture,	RH sent Community EOI letter	Post
18.9.19	Waabi Gabinya Cultural Consultancy	RH sent Community EOI letter	email
18.9.19	Wallagan Cultural Services	RH sent Community EOI letter	email
18.9.19	Wanaruah Custodians	RH sent Community EOI letter	Post
18.9.19	Warren Taggart	RH sent Community EOI letter	email
18.9.19	Warrigal Cultural Services	RH sent Community EOI letter	email
18.9.19	Wattaka Wonnarua C.C. Service	RH sent Community EOI letter	email
18.9.19	Widescope Indigenous Group pty Ltd	RH sent Community EOI letter	email
18.9.19	Wonn 1 Contracting	RH sent Community EOI letter	email
18.9.19	Wonnarua Culture Heritage	RH sent Community EOI letter	Post
18.9.19	Wonnarua Elders Council	RH sent Community EOI letter	Post
18.9.19	Wonnarua Nation Aboriginal Corporation	RH sent Community EOI letter	email
18.9.19	Wonnarua Traditional Custodian	RH sent Community EOI letter	email
18.9.19	Wurrumay Consultants	RH sent Community EOI letter	email
18.9.19	Yinarr Cultural Services	RH sent Community EOI letter	email
18.9.19	David Horton	RH phoned left voice to txt	phone
18.9.19	Glen Morris	RH phoned to get email address	phone
18.9.19	David Horton	RH received call back with address, requested posted. Also registered as a RAP	phone
18.9.19	Glen Morris	RH emailed EOI	email
18.9.19	David Horton	RH emailed EOI	email
18.9.19	David Horton	RH posted EOI	post
18.9.19	Waabi Gabinya Cultural Consultancy		RTS
18.9.19	Waabi Gabinya Cultural Consultancy	RH phoned and left msg requesting call back tomorrow with update email address	phone
18.9.19	Rebecca Lester		RTS
18.9.19	Rebecca Lester	RH phoned, automated msg said phone has been disconnected	phone
18.9.19	Alison Sampson		RTS
18.9.19	Alison Sampson	RH phoned N/A	phone
18.9.19	Black Creek Aboriginal Corporation		RTS
18.9.19	Black Creek Aboriginal Corporation	RH phoned, number is disconnected	phone
18.9.19	Lower Wonnaruah Tribal Consultancy Pty Ltd		RTS

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
18.9.19	Lower Wonnaruah Tribal Consultancy Pty Ltd	RH phoned to get updated email address	phone
18.9.20	Lower Wonnaruah Tribal Consultancy Pty Ltd	RH resent EOI	email
18.9.19	Indigenous Outcomes		RTS
18.9.19	Indigenous Outcomes	RH phoned N/A	phone
18.9.19	Awabakal Traditional Owners Aboriginal Corporation	RH thanked Kerrie	email
18.9.19	Nunawanna Aboriginal Corporation	RH received email registering as a RAP and submitting business Insurance	email
19.9.19	Wallagan Cultural Services	RH received call back, not part of the Waabi Gabinya Cultural Consultancy so unable to provide updated email details however noted her email address had changed	email
19.9.19	Wallagan Cultural Services	RH resent email EOI	email
19.9.19	Awabakal Traditional Owners Aboriginal Corporation	RH received email: The Awabakal Traditional Owners Aboriginal Corporation appreciates Oz Ark in contacting us regarding an Invitation to Register an Interest for the Aboriginal Cultural Heritage Assessment for the Bowmans Creek project at Windfarm. However we would like to inform Oz Ark that the Windfarm Project is not within our Cultural Boundary and therefore are unable to register an interest in this project and/or make any comments on the Aboriginal Cultural Heritage within the project area.	email
19.9.19	Wonnarua Nation Aboriginal Corporation	RH received email: *Interesting....I am in... Ben...what is happening with St Clair Mission replacement of power poles*	email
19.9.19	Wonnarua Nation Aboriginal Corporation	BC replied: *We will register the WNAC as a RAP for the Bowmans Creek Windfarm Project.* *I don't know anything about the replacement of poles out at St Clair – who is doing the work? Is it something that I could try to find out about?*	email
19.9.19	Ungooroo Aboriginal Corporation	RH received email: *I am emailing you on behalf of Ungooroo Aboriginal Corporation & our Representative Mr Allen Paget to register our interest in the Bowmans Creeks Windfarm project.*	email
19.9.19	Ungooroo Aboriginal Corporation	BC replied: *Thanks Melanie: it will be our pleasure to work with Allen on this one*	email
19.9.19	Muswellbrook Shire Council	RH received email recommending to contact Wanaruah Local Aboriginal Land Council & Hunter Valley Aboriginal Corporation	email
19.9.19	Hunter Valley Aboriginal Corporation	RH received alternative email. Re sent EOI to make sure received	email
19.9.19	Hunter Valley News	RH emailed requesting tear sheet	email
19.9.19	Hunter Valley News	RH received tear sheet	email
19.9.19	Hunter Valley News	RH thanked Donna	email
19.9.19	Muswellbrook Shire Council	RH received email: In addition to the contacts provided by Kim, Tocomwall is a Registered Aboriginal Party and the organisation that acts on behalf of the Plains Clan of the Wonnarua People (PCWP), the Registered Native Title Claimants for the Hunter Valley region.	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
		They will need to be involved if any of the land is currently Crown land	
19.9.19	Muswellbrook Shire Council	RH thanked Kim & Sharon	email
19.9.19	Deceased	RH received email registering as a RAP	email
19.9.19	Deceased	RH thanked "deceased'	email
20.9.19	Gidawaa Walang & Barkuma Neighbourhood Centre	RH received email registering as a RAP	email
20.9.19	Cacatua Culture Consultants	RH received email registering as a RAP	email
20.9.19	AGA Services	RH received email registering as a RAP	email
20.9.19	Widescope Indigenous Group pty Ltd	RH received email registering as a RAP	email
22.9.19	Yinarr Cultural Services	RH received email registering as a RAP and copy of Workers Comp insurance	email
22.9.19	Kevin Duncan	RH received email registering as a RAP	email
23.9.19	Deceased	RH received call, registered as a RAP. Also provided email for Wanarua LALC as alternative point of contact. 'Deceased' said if not enough work, happy to volunteer. He is an elder and knowledge holder and has been working for 31yrs	phone
23.9.19	Stephen Talbot	RH received email registering as a RAP	email
24.9.19	Stephen Talbot	Ben Churcher (BC) thanked Steven	email
24.9.19	Wallagan Cultural Services	RH received email registering as a RAP	email
25.9.19	Hunter Valley Aboriginal Corporation	RH received phone call to register as a RAP. RH checked contact details and updated email address	Phone
25.9.19	Wallagan Cultural Services	RH thanked Maree	email
27.9.19	Glen Morris	RH received email registering as a RAP	email
29.9.19	A1 Indigenous Services	RH received email registering as a RAP	email
30.9.19	Trevor Robinson	RTS	Post
1.10.19	Wonn 1 Contracting	RH received email registering as a RAP as well as copy of insurances	email
3.10.19	Roger Noel Matthews Consultancy	RH received RTS	Post
1.10.19	David Baker	Enquires at OZARK received and email from David noting that Wanaruah LALC and the franks family had received notification. He also registered Laurie Perry	email
2.10.19	Stakeholder 1	RH received email registering as a RAP and noting they do not want their correspondence published nor notification to LALC of their involvement	email
4.10.19	Upper Hunter Wonnarua Council Inc	RH received call registering as a RAP	phone
4.10.19	Merrigarn Indigenous Corporation	Registered as a RAP	email
4.10.19	Muragadi Heritage Indigenous Corporation	Registered as a RAP	email
4.10.19	Murra Bidgee Mullangari Aboriginal Corporation	Registered as a RAP	email
11.10.19	Lower Hunter Aboriginal Incorporated	RH received email registering as a RAP.	email
13.10.19	Tocomwall	BC sent email checking if Tocomwall wished to register for the project	email
13.10.19	Tocomwall	RH and BC received email confirming to Register both Tocomwall and PCWP	email
13.10.19	Tocomwall	BC thanked Scott	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
14.10.19	Upper Hunter Shire Council	RH received email suggesting to contact Wanaruah LALC	email
17.10.19	Office of The Registrar, ALRA	RH received email noting there are not Registered Aboriginal Owners in the Project area and to contact Wanaruah LALC	email
17.10.19	St Clair Singleton Aboriginal Corporation	RH received RTS	Post
18.10.19	Wanaruah Local Aboriginal Land Council	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	David Horton	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Nunawanna Aboriginal Corporation	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Wonnarua Nation Aboriginal Corporation	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Ungooroo Aboriginal Corporation	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Deceased	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Gidawaa Walang & Barkuma Neighbourhood Centre	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Cacatua Culture Consultants	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Widescope Indigenous Group Pty Ltd	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Yinarr Cultural Services	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Kevin Duncan	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Deceased	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Stephen Talbott	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Hunter Valley Aboriginal Corporation	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Wallagan Cultural Services	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Glen Morris	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	A1 Indigenous Services	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Wonn 1 Contracting	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Stakeholder 1	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	mail
18.10.19	Upper Hunter Wonnarua Council Inc	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Merrigarn Indigenous Corporation	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Muragadi Heritage Indigenous Corporation	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Murra Bidgee Mullangari Aboriginal Corporation	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Plains Clans of the Wonnarua People (PCWP)	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Tocomwall PTY Limited	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
18.10.19	Lower Hunter Aboriginal Incorporated	Sent from RH email - Stage 2 cover letter and methodology. Feedback closes 18.11.19	email
18.10.19	Deceased	Received bounce-back emailing ceo.wanarua@bigpond.com. Resent Stage 2/3 to postal address.	mail
19.10.19	Deceased	RH received email confirming no concerns with Stage 2 methodology	email
21.10.19	Wonnarua Nation Aboriginal Corporation	RH received thanks	email
21.10.19	Muragadi Heritage Indigenous Corporation	RH received email agreeing with the recommendations in the methodology. Also noting they have recently moved back to the area	email
25.10.19	A1 Indigenous Services	RH received email supporting the methodology and noting they would like to be involved in fieldwork	email
5.11.19	DPIE	RH sent notification of RAPs	email
5.11.19	Wanaruah Local Aboriginal Land Council	RH sent notification of RAPs	email
5.11.19	Wanaruah Local Aboriginal Land Council	RH received email back with alternative contacts for RTS RAPs	email
6.11.19	Wanaruah Local Aboriginal Land Council	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	David Horton	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Nunawanna Aboriginal Corporation	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Wonnarua Nation Aboriginal Corporation	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Ungooroo Aboriginal Corporation	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Deceased	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Gidawaa Walang & Barkuma Neighbourhood Centre	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Cacatua Culture Consultants	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Widescope Indigenous Group pty Ltd	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Yinarr Cultural Services	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Kevin Duncan	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Deceased	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Stephen Talbott	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
6.11.19	Hunter Valley Aboriginal Corporation	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Wallagan Cultural Services	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Glen Morris	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	A1 Indigenous Services	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Wonn 1 Contracting	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Stakeholder 1	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Upper Hunter Wonnarua Council Inc	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	Post
6.11.19	Merrigarn Indigenous Corporation	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Muragadi Heritage Indigenous Corporation	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Murra Bidgee Mullangari Aboriginal Corporation	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Plains Clans of the Wonnarua People (PCWP)	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Tocomwall PTY Limited	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Lower Hunter Aboriginal Incorporated	RH sent fieldwork application and requested it be returned with a copy of Valid workers comp by the 15.11.19. it was noted applications received after this date may not be considered.	email
6.11.19	Stakeholder 1	RH received email with workers comp and form for staff	email
6.11.19	Stakeholder 1	RH received email with form for alternative staff	email
6.11.19	Stakeholder 1	RH thanked	email
6.11.19	Murra Bidgee Mullangari Aboriginal Corporation	RH received workers compensation, form and white card	email
6.11.19	Murra Bidgee Mullangari Aboriginal Corporation	RH thanked	email
6.11.19	Nunawanna Aboriginal Corporation	RH received fieldwork application and Workers comp	email
6.11.19	Stakeholder 1	RH received updated application	email
7.11.19	Gidawaa Walang & Barkuma Neighbourhood Centre	RH received application form, workers comp and WHS	email
11.11.19	Gidawaa Walang & Barkuma Neighbourhood Centre	RH thanked Craig and clarified the 4th PDF document could not be opened	email
8.11.19	Wonnarua Nation Aboriginal Corporation	RH received email noting will complete forms	email
8.11.19	Tocomwall PTY Limited	RH received completed application form	email
8.11.19	Tocomwall PTY Limited	RH received copy of expired workers comp	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
8.11.19	Hunter Valley Aboriginal Corporation	RH received application and workers comp	email
8.11.19	Wallagan Cultural Services	RH received application and workers comp	email
8.11.19	Aliera French Trading	RH received email requesting leniency to be included in consultation due to personal family responsibilities.	email
11.11.19	Tocomwall PTY Limited	RH requested copy of workers comp	email
11.11.19	Wonnarua Nation Aboriginal Corporation	RH received application and workers comp	email
11.11.19	A1 Indigenous Services	RH received application	email
12.11.19	Aliera French Trading	RH sent Stage 2 package and fieldwork application	email
12.11.19	A1 Indigenous Services	RH email requesting copy of workers comp	email
12.11.19	Aliera French Trading	BC responded: *Thanks Rebecca – and we fully understand your late registration Aliera – good to have you involved with this project (although the fieldwork will be a killer).*	email
12.11.19	A1 Indigenous Services	RH received workers comp	email
12.11.19	Lower Hunter Aboriginal Incorporated	RH received application and workers comp	email
13.11.19	Gidawaa Walang & Barkuma Neighbourhood Centre	RH received email confirming the PDF that wouldn't open was correct	email
13.11.19	Muragadi Heritage Indigenous Corporation	RH received application and workers comp	email
13.11.19	Merrigarn Indigenous Corporation	RH received application and workers comp	email
14.11.19	Hunter Valley Aboriginal Corporation	RH received call asking if fieldwork has been awarded. RH confirmed it has not yet	phone
14.11.19	Upper Hunter Wonnarua Council Inc	RH received phone call clarifying fieldwork application. RH explained challenges of this fieldwork and was questioned if will be working in the heat, RH confirmed fieldwork will go ahead. Rh obtained email address	phone
15.11.19	Stephen Talbott	RH received workers comp and business insurance	email
15.11.19	Stephen Talbott	RH received phone call to confirm receipt of insurances. RH confirmed but asked for application to be sent through. Steve said he would	email
15.11.19	Upper Hunter Wonnarua Council Inc	RH received application and Workers comp	email
15.11.19	Yinarr Cultural Services	RH received application and Workers comp. Requested confirmation of receipt	email
16.11.19	Stephen Talbott	BC emailed Steve asking what days he is available	email
18.11.19	Yinarr Cultural Services	RH confirmed receipt of application	email
18.11.19	Hunter Valley Aboriginal Corporation	RH phoned to check is Leanne is available and noted invite would be for her only, unable to include other workers	phone
18.11.19	Wonnarua Nation Aboriginal Corporation	RH phoned landline, was told to contact Laurie via mobile	Phone
18.11.19	Wonnarua Nation Aboriginal Corporation	RH phoned mobile - N/A	phone
18.11.19	Tocomwall PTY Limited	RH phoned and left message asking for valid workers comp to be sent through today so can be considered for fieldwork	phone
18.11.19	Tocomwall PTY Limited	RH received call back from Scott, he asked RH to email Danny for a copy of workers comp	phone
18.11.19	Tocomwall PTY Limited	BC spoke to Danny re fieldwork, noting he is expecting his first child, BC accepted Sam to attend in Danny's place. BC also mentioned needing current insurance	phone

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
18.11.19	Tocomwall PTY Limited	BC emailed Danny noting insurance he sent is expired and needing current one	email
18.11.19	Stephen Talbott	BC spoke to Steve who confirmed availability	phone
18.11.19	Tocomwall PTY Limited	RH received insurance	email
18.11.19	Tocomwall PTY Limited	RH Sent invitation to fieldwork. RSVP 20.11.19	email
18.11.19	Hunter Valley Aboriginal Corporation	RH Sent invitation to fieldwork. RSVP 20.11.19	email
18.11.19	A1 Indigenous Services	RH Sent invitation to fieldwork. RSVP 20.11.19	email
18.11.19	Stephen Talbott	RH Sent invitation to fieldwork. RSVP 20.11.19	email
18.11.19	Wallagan Cultural Services	RH Sent invitation to fieldwork. RSVP 20.11.19	email
18.11.19	Wonnarua Nation Aboriginal Corporation	RH Sent invitation to fieldwork. RSVP 20.11.19	email
18.11.19	Tocomwall PTY Limited	RH asked for current insurance, the one sent is expired	email
18.11.19	Tocomwall PTY Limited	RH received reply, noting Danny will send updated copy soon	email
18.11.19	Stephen Talbott	RH received thanks and noted will see Ben Monday	email
18.11.19	A1 Indigenous Services	RH received email noting the site officer will be Steven	email
18.11.19	Wonnarua Nation Aboriginal Corporation	RH received email noting FW invite received and response has included site officer and bookkeeper. Also asked would Ben be on site for the duration	email
18.11.19	Wonnarua Nation Aboriginal Corporation	BC responded noting he will attend all week and asked for the site officer's phone number. BC also mentioned she bring a hat, hiking boots, sunscreen, insect repellent, food and water	email
18.11.19	Merrigarn Indigenous Corporation	RH received email asking if site officers have been allocated yet	email
18.11.19	Muragadi Heritage Indigenous Corporation	RH received email asking if site officers have been allocated yet	email
18.11.19	Upper Hunter Wonnarua Council Inc	RH received phone message asking for call back	phone
18.11.19	Murra Bidgee Mullangari Aboriginal Corporation	RH received phone message asking for call back	phone
18.11.19	Amanda Hickey - AHCS	RH received email: My name is Amanda Hickey from AHCS I'm just running to inquiring about the upcoming field works for Bowman's creek windfarm I have previously registered for this before but have not had any correspondence. AHCS holds cultural knowledge towards the land of Muswellbrook. And if anything open vacancies for work a rap from AHCS can attend asap .	email
19.11.19	A1 Indigenous Services	BC emailed Carolyn and asked Steven to complete the form	email
19.11.19	Stakeholder 1	RH emailed Unsuccessful for fieldwork letter. Noted there may be future fieldwork they will considered for.	email
19.11.19	Gidawaa Walang & Barkuma Neighbourhood Centre	RH emailed Unsuccessful for fieldwork letter. Noted there may be future fieldwork they will considered for.	email
19.11.19	Lower Hunter Aboriginal Incorporated	RH emailed Unsuccessful for fieldwork letter. Noted there may be future fieldwork they will considered for.	email
19.11.19	Merrigarn Indigenous Corporation	RH emailed Unsuccessful for fieldwork letter. Noted there may be future fieldwork they will considered for.	email
19.11.19	Muragadi Heritage Indigenous Corporation	RH emailed Unsuccessful for fieldwork letter. Noted there may be future fieldwork they will considered for.	email
19.11.19	Murra Bidgee Mullangari Aboriginal Corporation	RH emailed Unsuccessful for fieldwork letter. Noted there may be future fieldwork they will considered for.	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
19.11.19	Nunawanna Aboriginal Corporation	RH emailed Unsuccessful for fieldwork letter. Noted there may be future fieldwork they will considered for.	email
19.11.19	Upper Hunter Wonnarua Council Inc	RH emailed Unsuccessful for fieldwork letter. Noted there may be future fieldwork they will considered for.	email
19.11.19	Yinarr Cultural Services	RH emailed Unsuccessful for fieldwork letter. Noted there may be future fieldwork they will considered for.	email
19.11.19	Amanda Hickey - AHCS	RH responded noting Amanda is not currently a RAP and asked would she like to be. RH also noted all fieldwork positions are currently full	email
19.11.19	Murra Bidgee Mullangari Aboriginal Corporation	RH received email asking to call	phone
19.11.19	Aliera French Trading	RH received call asking if fieldwork has been awarded and could still submit paperwork. RH advised fieldwork had been awarded but there may be more possible fieldwork in the future so they can submit and will be considered should this arise	phone
19.11.19	Aliera French Trading	RH received email asking if fieldwork has been awarded and could still submit paperwork. RH advised fieldwork had been awarded but there may be more possible fieldwork in the future so they can submit and will be considered should this arise	email
19.11.19	Murra Bidgee Mullangari Aboriginal Corporation	RH received call demanding to know why not picked for fieldwork and wanting contact number for proponent.	phone
19.11.19	Murra Bidgee Mullangari Aboriginal Corporation	RH received email: As per our conversation today could you send me the proponents contact details. I will cc Jackie Taylor in this email (Jackie could you please let Rebecca know the requirements re proponents contact details)as you have informed me that you are under no obligation to give me these details. As per OEH regulations the proponents details are suppose to be in detail so as the RAPS have them Regards Darleen	email
19.11.19	Murra Bidgee Mullangari Aboriginal Corporation	BC emailed Draleen:	Phone
19.11.19	Murra Bidgee Mullangari Aboriginal Corporation	BC emailed Darleen: I'm just checking with our client as to what is the best contact number for the proponent. However, Epuron Projects Pty Ltd (the proponent) had nothing to do with the selection of the field workers. That was done by OzArk and we picked people from local knowledge holder groups, particularly people associated with the two active Native Title claims in the area (The Plains Clans of the Wonnarua People [PCWP] and the Gomeroi People: the study area is within the PCWP claim area and the Gomeroi People's claim area is about 11km to the NW of the study area). We also took people from the Wonnarua Nation Aboriginal Corporation, another recognised local knowledge holder group, as well as representatives of local families who have worked in the upper Hunter for many years. I hope you understand that we have to make available positions for the knowledge holder groups as this is the primary reason we have the Aboriginal community with us on survey – to be able to comment on the cultural values of the area. I'm not saying that others cannot do this, but the groups we have selected are recognised as having particular connection to the Country of the study area. As we said in our email, there will be further work associated with this project, and as the knowledge holder groups will have visited the project area next week, we are freer to invite other applicants (and there were a few!) to help out with this subsequent work.	email
20.11.19	Amanda Hickey - AHCS	RH received response asking to register as a RAP	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
20.11.19	Amanda Hickey - AHCS	RH sent Stage 2 for Amanda's records and modified application for FW so Amanda can be considered for any future work	email
20.11.19	Murra Bidgee Mullangari Aboriginal Corporation	BC emailed Darleen: Thanks for chatting earlier today – I took on board what you said and I hope we will working with you on this and other projects in the near future. In the meantime, here is the contact information for the proponent Epuron that are proposing the Bowmans Creek Windfarm	email
20.11.19	Murra Bidgee Mullangari Aboriginal Corporation	Darleen responded: *The proponents name is no good to me if your company Ozark chose the RAPS, as per our discussion today I look forwarding to working with you.*	email
20.11.19	Upper Hunter Wonnarua Council Inc	RH received email: Received your email concerning the consultation for work at Bowmans Creek. Could you send the list of those who were selected for the up and coming work starting on the 25/11/19. We appreciate your input and look forward to hearing from you.	email
20.11.19	Upper Hunter Wonnarua Council Inc	BC responded: Due to privacy issues we cannot provide you with a list of the field workers for this project. However, I can say that having people who are physically fit to undertake the work was a major concern of ours in this case. As we said, there will be further fieldwork associated with this project and we will make sure to roster on groups who missed out this time when that fieldwork happens. Thanks for your interest in this project.	email
20.11.19	Hunters & Collectors	HR received call from Tania asking RH to call back	phone
20.11.19	Hunters & Collectors	RH phoned back, Tania would like to register as a RAP, RH explained FW has closed however their maybe more in the future. RH will email a copy of the application form and Stage 2 methodology. RH explained methodology feedback is closed but all future correspondence will be sent out.	phone
20.11.19	Hunters & Collectors	RH emailed Stage 2 methodology and fieldwork application	email
20.11.19	Tocomwall PTY Limited	BC received copy of insurance	email
21.11.19	Hunters & Collectors	RH received fieldwork application and public liability insurances	email
21.11.19	Hunters & Collectors	RH thanked Tania, noted she will put her on the list and contact if anything becomes available for fieldwork. RH also requested copy of workers compensation	email
24.11.19	A1 Indigenous Services	BC received completed application for Steve	email
26.11.19	Wonnarua Nation Aboriginal Corporation	RH received call, site officer sick and unable to attend	email
27.11.19	Wonnarua Nation Aboriginal Corporation	Emma Grey (EG) received call, site officer not going tomorrow either	email
28.11.19	Wallagan Cultural Services	RH received invoice for fieldwork	email
26.11.19	Wonnarua Nation Aboriginal Corporation	RH received call, site officer sick and unable to attend	email
29.11.19	Ungooroo Aboriginal Corporation	RH had phone call from Alan asking why not included on fieldwork	email
29.11.19	Ungooroo Aboriginal Corporation	BC had phone call from Alan asking why not included on fieldwork	email
29.11.19	Ungooroo Aboriginal Corporation	RH re sent fieldwork application form	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
29.11.19	Ungooroo Aboriginal Corporation	RH received completed fieldwork application form and workers comp	email
2.12.19	Tocomwall PTY Limited	RH received invoice for fieldwork	email
2.12.19	Stephen Talbott	RH received invoice for fieldwork	email
2.12.19	Hunter Valley Aboriginal Corporation	SB received invoice for FW	email
5.12.19	A1 Indigenous Services	RH received invoice for fieldwork	email
24.2.20	A1 Indigenous Services	Sheridan Baker (SB) sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Deceased	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Aliera French Trading	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Amanda Hickey - AHCS	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Cacatua Culture Consultants	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	David Horton	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Deceased	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Gidawaa Walang & Barkuma Neighbourhood Centre	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Glen Morris	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Hunter Valley Aboriginal Corporation	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Hunters & Collectors	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Kevin Duncan	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Lower Hunter Aboriginal Incorporated	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Merrigarn Indigenous Corporation	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Muragadi Heritage Indigenous Corporation	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Murra Bidgee Mullangari Aboriginal Corporation	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Nunawanna Aboriginal Corporation	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Plains Clans of the Wonnarua People (PCWP)	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Stakeholder 1	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Stephen Talbott	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Tocomwall PTY Limited	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Ungooroo Aboriginal Corporation	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Upper Hunter Wonnarua Council Inc	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
24.2.20	Wallagan Cultural Services	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Wanaruah Local Aboriginal Land Council	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Widescope Indigenous Group pty Ltd	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Wonn 1 Contracting	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Wonnarua Nation Aboriginal Corporation	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Yinarr Cultural Services	SB sent Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Deceased	SB received automated bounce back - incorrect email address	email
24.2.20	Deceased	SB sent to amended email address - Addendum to Stage 2-3 methodology sent for additional area. Feedback closes 12.3.20	email
24.2.20	Wonnarua Nation Aboriginal Corporation	SB received email from Laurie, confirming receipt	email
25.2.20	Widescope Indigenous Group pty Ltd	RH received email: *Thanks for the update, I have reviewed and support the addendum for Additional Survey*	email
27.2.20	Widescope Indigenous Group pty Ltd	RH received email: *I have reviewed and support the addendum survey methodology of a powerline easement being added to the survey area.*	email
27.2.20	Widescope Indigenous Group pty Ltd	RH thanked Steve	email
1.3.20	A1 Indigenous Services	RH received response: *I have reviewed the document and support the additional survey area Excavation Methodology for the Bowmans Creek Wind Farm Powerline Easement.* *A1 would like to be involved in any future field work, or Meetings*	email
2.3.20	Aliera French Trading	RH received email: I have no further comment on the methodology for the additional survey area as I have not been out on site up to this point. I would however like to express my interest in being included on the roster for fieldworks. Can you please advise if there are any forms I need to complete to be included in the fieldwork for this project.	email
2.3.20	Aliera French Trading	RH thanked Aliera and re sent copy of fieldwork application	email
3.3.20	Muragadi Heritage Indigenous Corporation	RH received response: *I have read the project information and additional survey area (addendum) for the above project, I agree with the recommendations made.*	email
3.3.20	Murra Bidgee Mullangari Aboriginal Corporation	RH received response: *I have read the project information and additional survey area notes, I endorse the recommendations made.*	email
6.3.20	Aliera French Trading	RH received fieldwork application back	email
11.3.20	Ungooroo Aboriginal Corporation	RH sent invites to fieldwork	email
11.3.20	Aliera French Trading	RH sent invites to fieldwork	email
11.3.20	A1 Indigenous Services	RH sent invites to fieldwork	email
11.3.20	Stephen Talbott	RH sent invites to fieldwork	email
12.3.20	Ungooroo Aboriginal Corporation	RH received confirmation of attending fieldwork and site officer	email
12.3.20	Ungooroo Aboriginal Corporation	RH requested mobile number for site officer	email
12.3.20	Ungooroo Aboriginal Corporation	RH received site officer contact number	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
12.3.20	Ungooroo Aboriginal Corporation	RH received new contact details	email
16.3.20	Aliera French Trading	RH phoned to confirm will attend fieldwork and site officer details	phone
16.3.20	A1 Indigenous Services	RH phoned to confirm will attend fieldwork and site officer details	phone
16.3.20	Stephen Talbott	RH phoned to confirm will attend fieldwork and site officer details	phone
16.3.20	A1 Indigenous Services	RH received confirmation of site officer and contact number	email
16.3.20	A1 Indigenous Services	RH thanked Carolyn	email
16.3.20	Stephen Talbott	RH received email confirming will attend fieldwork	email
16.3.20	Stephen Talbott	RH thanked Steve	email
18.3.20	Aliera French Trading	RH received copy of workers compensation	email
18.3.20	Aliera French Trading	RH asked for current copy of workers compensation as attached copy was expired	email
18.3.20	Aliera French Trading	RH received email saying will send when she gets home	email
19.3.20	Aliera French Trading	RH sent copy of updated fieldwork invite and requested copy of workers comp	email
20.3.20	A1 Indigenous Services	RH received email notifying of site officer attending detail change	email
23.3.20	A1 Indigenous Services	RH received email asking if fieldwork will be continuing this week	email
20.3.20	A1 Indigenous Services	RH advised Carolyn it is business as normal at this Stage but will be in touch if anything changes	email
23.3.20	Aliera French Trading	RH phoned and left message asking for copy of workers compensation	Phone
23.3.20	Aliera French Trading	RH received call back from Aliera, will send copy through this afternoon	Phone
23.3.20	Aliera French Trading	RH received copy of workers compensation	email
23.3.20	Aliera French Trading	RH thanked Aliera	email
25.3.20	Stephen Talbott	RH received invoice	email
26.3.20	Stephen Talbott	RH thanked Steve and noted account passed to our accounts for payment	email
27.3.20	A1 Indigenous Services	RH received invoice for fieldwork	email
30.3.20	A1 Indigenous Services	RH thanked Carolyn and noted account passed to our accounts for payment	email
7.4.20	Aliera French Trading	Aliera requested where to invoice	email
7.4.20	Ungooroo Aboriginal Corporation	RH received invoice	email
9.4.20	Aliera French Trading	RH sent copy of fieldwork invite with invoicing details	email
9.4.20	Ungooroo Aboriginal Corporation	RH noted invoice was not the original agreed amount and asked to be revised	email
9.4.20	Ungooroo Aboriginal Corporation	Rh received thanks and invoice will be amended	email
15.4.20	Aliera French Trading	RH received invoice	Email
22.5.20	Ungooroo Aboriginal Corporation	RH received invoice	email
4.6.20	A1 Indigenous Services	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Deceased	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Aliera French Trading	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Amanda Hickey - AHCS	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Cacatua Culture Consultants	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	David Horton	RH sent Stage 4. feedback ends 2.7.20	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
4.6.20	Deceased	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Gidawaa Walang & Barkuma Neighbourhood Centre	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Glen Morris	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Hunter Valley Aboriginal Corporation	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Hunters & Collectors	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Kevin Duncan	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Lower Hunter Aboriginal Incorporated	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Merrigarn Indigenous Corporation	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Muragadi Heritage Indigenous Corporation	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Murra Bidgee Mullangari Aboriginal Corporation	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Nunawanna Aboriginal Corporation	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Plains Clans of the Wonnarua People (PCWP)	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Stakeholder 1	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Stephen Talbott	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Tocomwall PTY Limited	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Ungooroo Aboriginal Corporation	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Upper Hunter Wonnarua Council Inc	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Wallagan Cultural Services	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Wanaruah Local Aboriginal Land Council	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Widescope Indigenous Group Pty Ltd	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Wonn 1 Contracting	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Wonnarua Nation Aboriginal Corporation	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Yinarr Cultural Services	RH sent Stage 4. feedback ends 2.7.20	email
4.6.20	Hunters & Collectors	RH received thanks	email
7.6.20	Stakeholder 1	RH received thanks, requested to be included in any future fieldwork	email
11.6.20	Widescope Indigenous Group Pty Ltd	RH received email: *Thank you for the documents for Stage 4 of the ABORIGINAL CULTURAL HERITAGE ASSESSMENT FOR THE BOWMANS CREEK WINDFARM. I have view and I am satisfied with the report* *It was pleasure assisting the Ozark team*	email
28.6.20	Wonnarua Nation Aboriginal Corporation	RH received thanks	email
2.7.20	Ungooroo Aboriginal Corporation	RH received request foe allowance of extra time to submit comment and new google link to open	email
2.7.20	Ungooroo Aboriginal Corporation	RH granted short extension	email
2.7.20	Ungooroo Aboriginal Corporation	RH sent new link to documents	email
2.7.20	Ungooroo Aboriginal Corporation	RH received thanks and confirmation could open new link	Email
15.9.20	Ungooroo Aboriginal Corporation	RH sent invite to fieldwork	email

Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
17.9.20	Ungooroo Aboriginal Corporation	RH received copy of workers compensation	email
12.11.20	Ungooroo Aboriginal Corporation	RH received invoice	email
5.2.21	Ungooroo Aboriginal Corporation	RH sent invite to fieldwork	email
10.2.21	Ungooroo Aboriginal Corporation	RH chased up AGL form	email
10.2.21	Ungooroo Aboriginal Corporation	AL phoned to confirm requirements. Since sending follow up RH had received email for instead. Al said would do strainght away	email
10.2.21	Ungooroo Aboriginal Corporation	RH forwarded link to induction	email
15.2.21	Ungooroo Aboriginal Corporation	RH phoned to confirm induction completed - yes	email
15.2.21	Ungooroo Aboriginal Corporation	SR received call from Taasha saying Al had not done induction	email
16.2.21	Ungooroo Aboriginal Corporation	RH phoned Al to confirm, Al advised will do it at 11:30am today. Will copy RH into email he sends once completed	email
11.3.21	A1 Indigenous Services	Taylor Foster (TF) sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Deceased	Email not sent as deceased	email
11.3.21	Aliera French Trading	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Amanda Hickey - AHCS	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Cacatua Culture Consultants	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	David Horton	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Deceased	Email not sent as deceased	email
11.3.21	Gidawaa Walang & Barkuma Neighbourhood Centre	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Glen Morris	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Hunter Valley Aboriginal Corporation	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Hunters & Collectors	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Kevin Duncan	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Lower Hunter Aboriginal Incorporated	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Merrigarn Indigenous Corporation	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Muragadi Heritage Indigenous Corporation	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Murra Bidgee Mullangari Aboriginal Corporation	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Nunawanna Aboriginal Corporation	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Plains Clans of the Wonnarua People (PCWP)	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Stakeholder 1	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Stephen Talbott	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Tocomwall PTY Limited	TF sent project update and report. Feedback ends on 26/03/2021	email

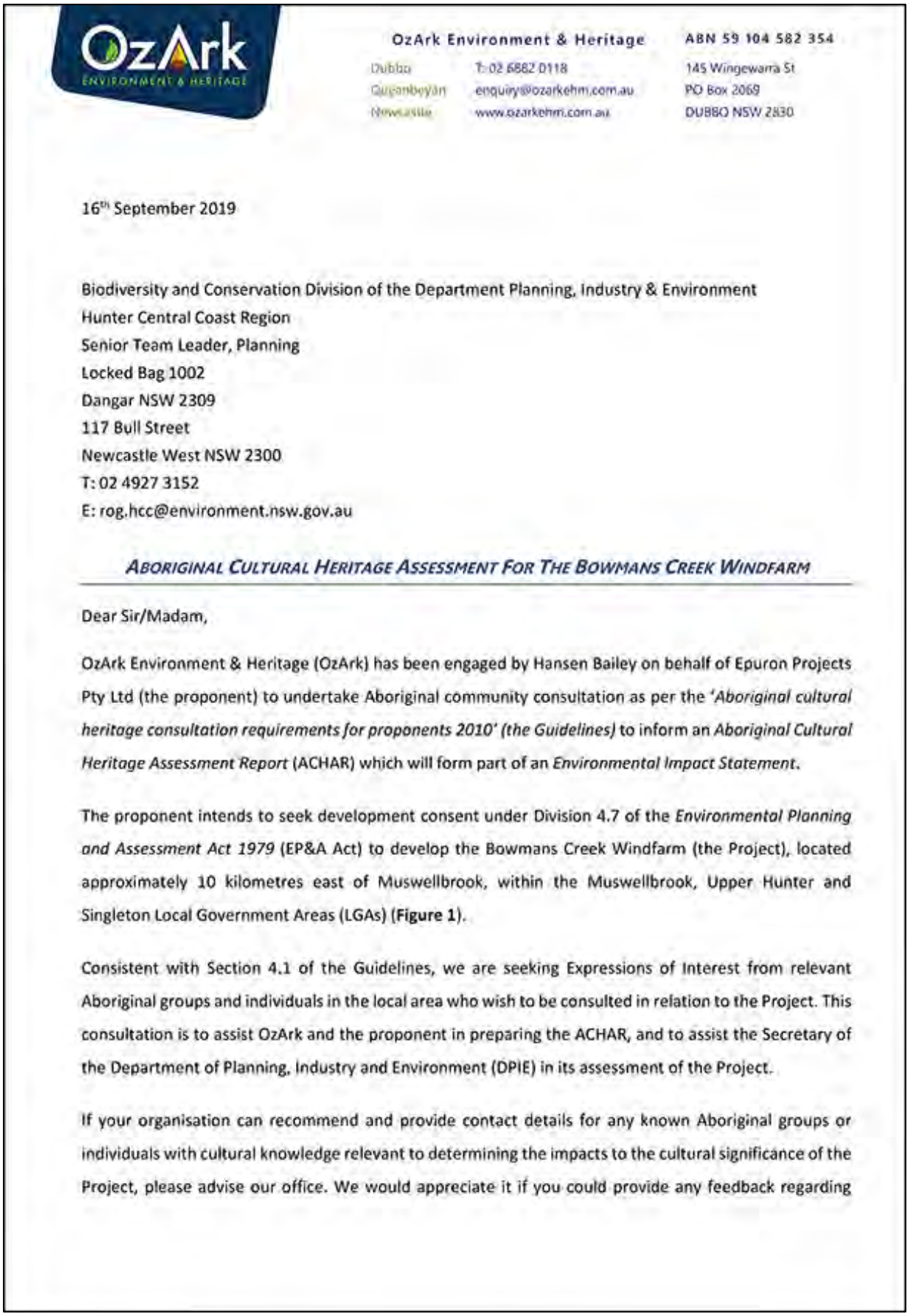
Aboriginal Consultation Log			
Date	**Organisation**	**Comment**	**Method**
11.3.21	Ungooroo Aboriginal Corporation	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Upper Hunter Wonnarua Council Inc	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Wallagan Cultural Services	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Wanaruah Local Aboriginal Land Council	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Widescope Indigenous Group pty Ltd	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Wonn 1 Contracting	TF sent project update and report. Feedback ends on 26/03/2021	email
11.3.21	Wonnarua Nation Aboriginal Corporation	TF sent project update and report. Feedback ends on 26/03/2021. Email to personal could not be delivered, however admin email was.	email
11.3.21	Yinarr Cultural Services	TF sent project update and report. Feedback ends on 26/03/2021	email

APPENDIX 2: CONSULTATION DOCUMENTS

STAGE 1

Appendix 2 Figure 1: Advertisement: Hunter Valley News 18 September 2019.

Appendix 2 Figure 2: Letter sent to agencies on 16 September 2019.



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ABN 59 104 582 354
145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

16th September 2019

Biodiversity and Conservation Division of the Department Planning, Industry & Environment
Hunter Central Coast Region
Senior Team Leader, Planning
Locked Bag 1002
Dangar NSW 2309
117 Bull Street
Newcastle West NSW 2300
T: 02 4927 3152
E: rog.hcc@environment.nsw.gov.au

ABORIGINAL CULTURAL HERITAGE ASSESSMENT FOR THE BOWMANS CREEK WINDFARM

Dear Sir/Madam,

OzArk Environment & Heritage (OzArk) has been engaged by Hansen Bailey on behalf of Epuron Projects Pty Ltd (the proponent) to undertake Aboriginal community consultation as per the *'Aboriginal cultural heritage consultation requirements for proponents 2010' (the Guidelines)* to inform an *Aboriginal Cultural Heritage Assessment Report* (ACHAR) which will form part of an *Environmental Impact Statement*.

The proponent intends to seek development consent under Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to develop the Bowmans Creek Windfarm (the Project), located approximately 10 kilometres east of Muswellbrook, within the Muswellbrook, Upper Hunter and Singleton Local Government Areas (LGAs) (**Figure 1**).

Consistent with Section 4.1 of the Guidelines, we are seeking Expressions of Interest from relevant Aboriginal groups and individuals in the local area who wish to be consulted in relation to the Project. This consultation is to assist OzArk and the proponent in preparing the ACHAR, and to assist the Secretary of the Department of Planning, Industry and Environment (DPIE) in its assessment of the Project.

If your organisation can recommend and provide contact details for any known Aboriginal groups or individuals with cultural knowledge relevant to determining the impacts to the cultural significance of the Project, please advise our office. We would appreciate it if you could provide any feedback regarding

OzArk Environment & Heritage

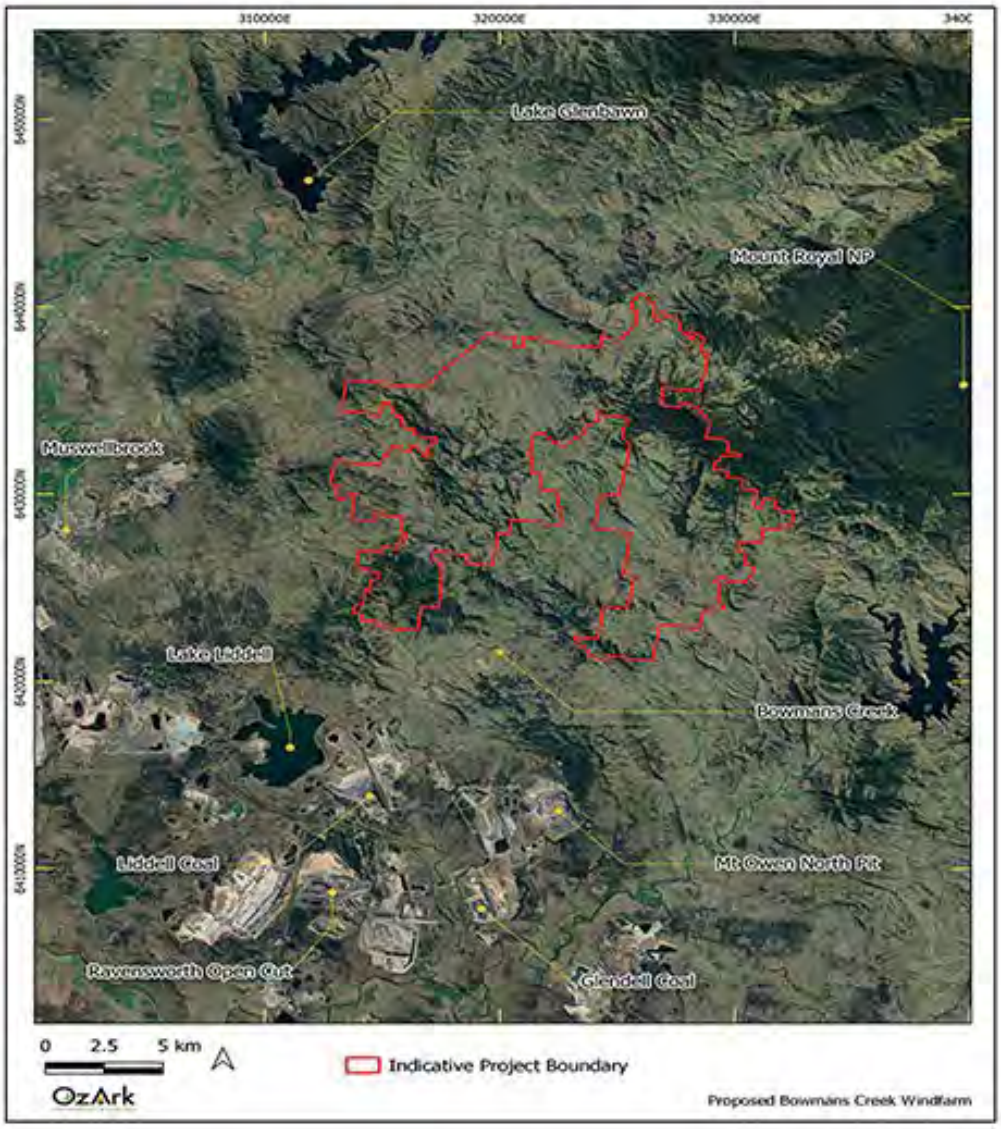
these Aboriginal stakeholder groups to the contact details provided at the top of the page by **Monday 30th September 2019**, or sooner if possible.

Once relevant groups and individuals have been identified, they will form part of the formal consultation process for the Project.

Kind regards,

Rebecca Hardman
Community Liaison & Administration

Figure 1. Indicative Project Location



Appendix 2 Figure 3: Letter sent to individuals and organisations on 18 September 2019.

OzArk Environment & Heritage
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145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

18th September 2019

ABORIGINAL CULTURAL HERITAGE ASSESSMENT FOR THE BOWMANS CREEK WINDFARM.

Dear Members,

OzArk Environment & Heritage (OzArk) has been engaged by Hansen Bailey on behalf of Epuron Projects Pty Ltd (the proponent) to undertake Aboriginal community consultation as per the *'Aboriginal cultural heritage consultation requirements for proponents 2010' (the Guidelines)* to inform an *Aboriginal Cultural Heritage Assessment Report* (ACHAR) which will form part of an *Environmental Impact Statement*.

The proponent intends to seek development consent under Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to develop the Bowmans Creek Windfarm (the Project), located approximately 10 kilometres east of Muswellbrook, within the Muswellbrook, Upper Hunter and Singleton Local Government Areas (LGAs) (**Figure 1**).

Consistent with Section 4.1 of the Guidelines, we are seeking Expressions of Interest from relevant Aboriginal groups and individuals in the local area who wish to be consulted in relation to the Project. This consultation is to assist OzArk and the proponent in preparing the ACHAR, and to assist the Secretary of the Department of Planning, Industry and Environment (DPIE) in its assessment of the Project.

If you hold cultural knowledge relevant to determining the impacts to the cultural significance of this project area, please register your interest by contacting our office. The closing date for expressions of interest is **COB Friday 4th October 2019**.

If you wish to register interest it is noteworthy that as per the OEH guidelines we are required to provide your details to the OEH unless advised you do not wish your details to be released.

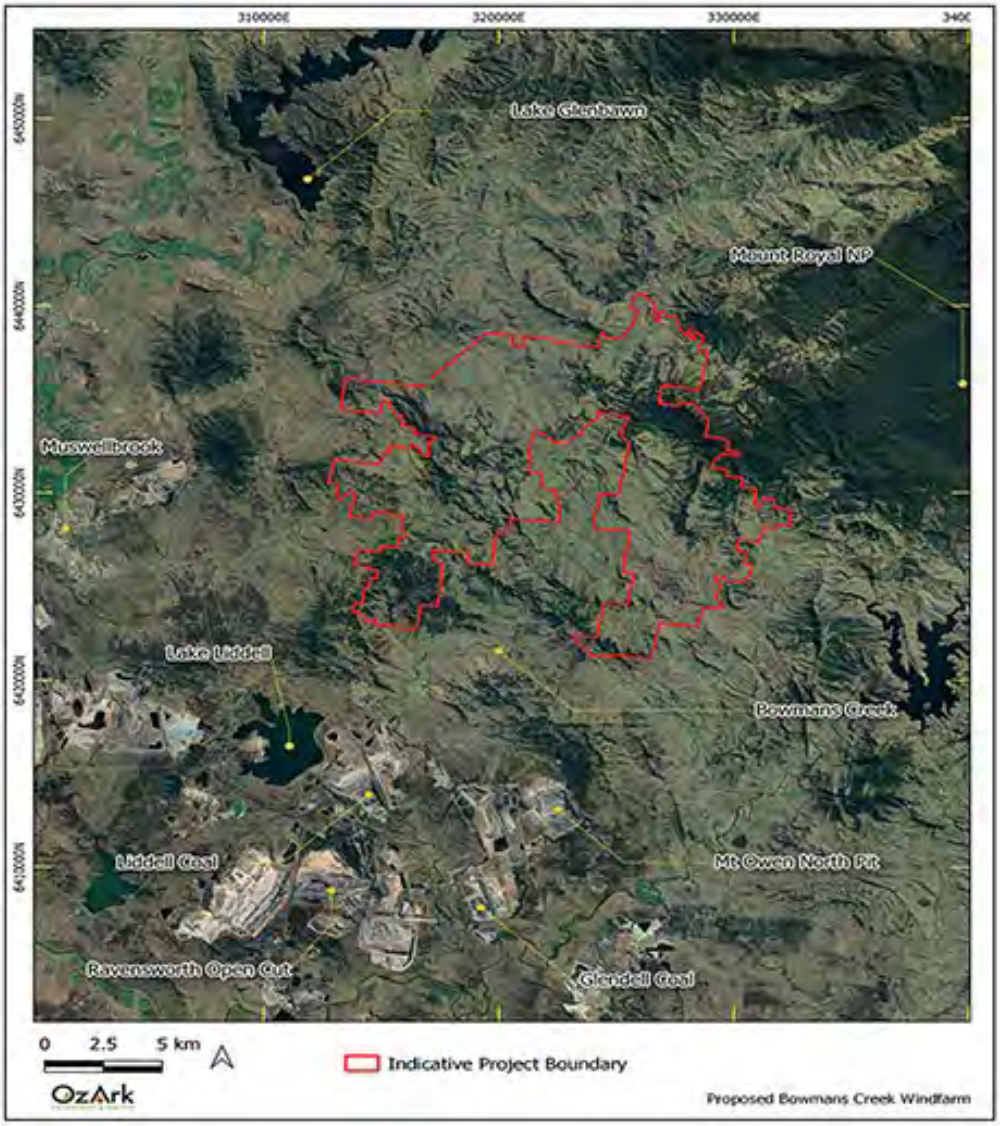
Once relevant groups and individuals have been identified, they will form part of the formal consultation process for the project.

Kind regards,

Rebecca Hardman
Consultation Officer

OzArk Environment & Heritage

Figure 1: Indicative Project Location.



STAGE 2/3

Appendix 2 Figure 4: Cover letter for the survey methodology (18 October 2019).

OzArk Environment & Heritage
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www.ozarkehm.com.au
ABN 59 104 582 354
145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

18 October 2019

Members
Wanaruah Local Aboriginal Land Council
PO Box 127
MUSWELLBROOK NSW 2333
ceo@wanaruahlandcouncil.com.au

ABORIGINAL CULTURAL HERITAGE ASSESSMENT FOR THE BOWMANS CREEK WIND FARM.

Dear Members,

Thank-you for your registration of interest to become a Registered Aboriginal Party (RAP) and be consulted for the proposed Bowmans Creek Wind Farm development, located 15 kilometres (km) east of Muswellbrook; 25 km north of Singleton and 30 km southeast of Scone within the Upper Hunter region of New South Wales. The Project is within three Local Government Areas (LGAs): Muswellbrook, Singleton and Upper Hunter.

The purpose of this letter is to invite you to comment on the enclosed draft survey methodology: *Aboriginal Cultural Heritage Survey Methodology: Bowmans Creek Wind Farm, Muswellbrook, Singleton and Upper Hunter Local Government Area* (OzArk 2019). This assessment will support a potential Aboriginal Heritage Impact Permit (AHIP) application when lodged with Department of Planning, Industry and Environment (DPIE).

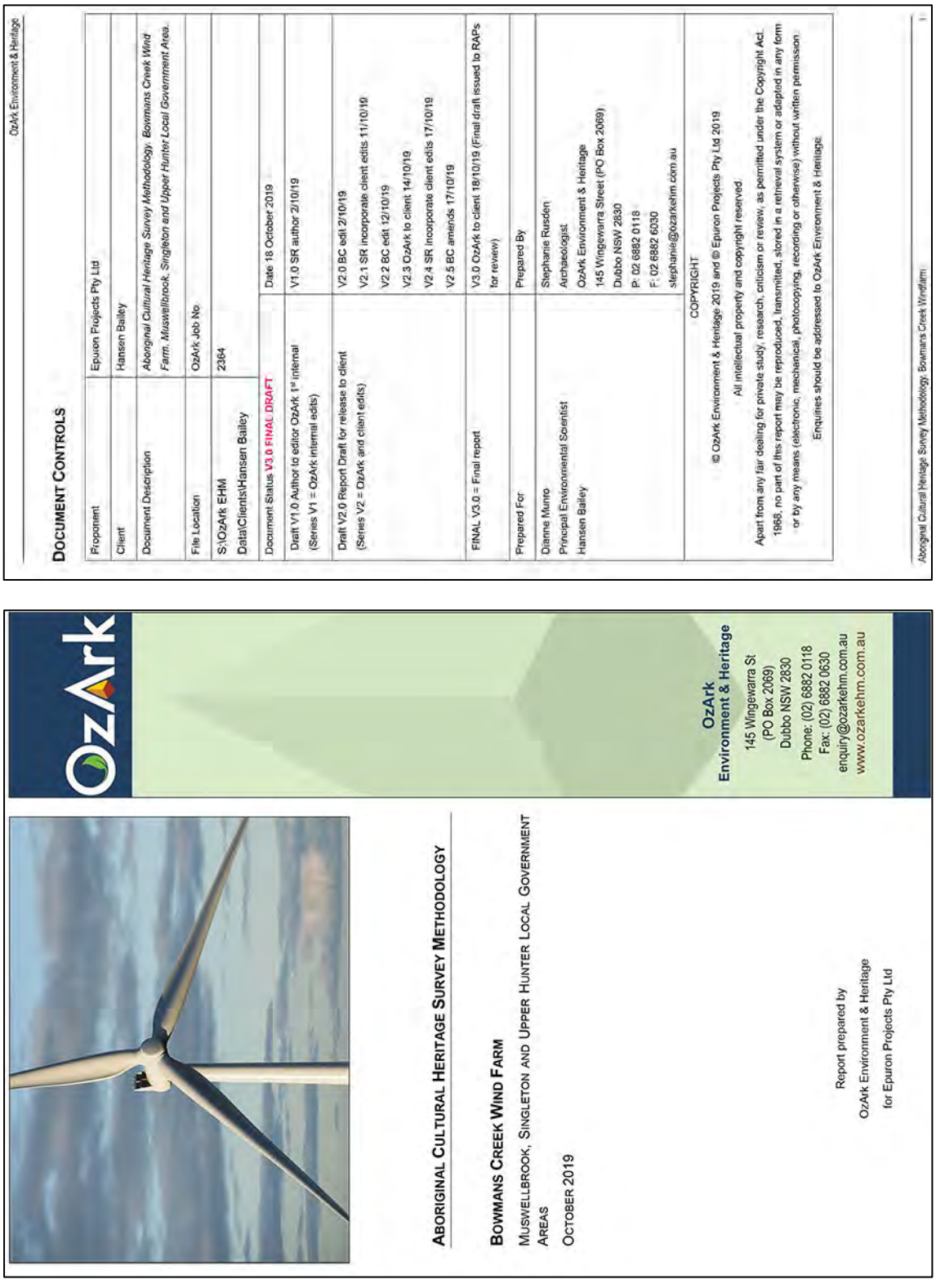
In addition to comments on the draft report, if you can share any Aboriginal cultural heritage knowledge relevant to the proposed assessment area, we welcome this input to improve our assessment outcomes and to ensure Aboriginal cultural values are considered. OzArk is required to give you 28 days to supply feedback on the attached documents. This period closes 5pm **on Monday 18th November 2019.** If you need any help supplying feedback (written or verbal), please do not hesitate to contact our office. Feedback can be emailed to rebecca@ozarkehm.com.au, or phone on 02 6882 0118, or by mail to PO box 2069, Dubbo 2830 NSW.

Should you have any queries in relation to the enclosed information please do not hesitate to contact our office.

Kind regards,

Rebecca Hardman
Community Liaison & Administration

Appendix 2 Figure 5: Project Survey Methodology



OzArk Environment & Heritage

DOCUMENT CONTROLS

Proponent	Epuron Projects Pty Ltd
Client	Hansen Bailey
Document Description	*Aboriginal Cultural Heritage Survey Methodology. Bowmans Creek Wind Farm. Muswellbrook, Singleton and Upper Hunter Local Government Area.*
File Location	OzArk Job No.
S:\OzArk EHM Data\Clients\Hansen Bailey	2364

Document Status **V3.0 FINAL DRAFT**	Date 18 October 2019
Draft V1.0 Author to editor OzArk 1st internal (Series V1 = OzArk internal edits)	V1.0 SR author 2/10/19
Draft V2.0 Report Draft for release to client (Series V2 = OzArk and client edits)	V2.0 BC edit 2/10/19 V2.1 SR incorporate client edits 11/10/19 V2.2 BC edit 12/10/19 V2.3 OzArk to client 14/10/19 V2.4 SR incorporate client edits 17/10/19 V2.5 BC amends 17/10/19
FINAL V3.0 = Final report	V3.0 OzArk to client 18/10/19 (Final draft issued to RAPs for review)
Prepared For	Prepared By
Dianne Munro Principal Environmental Scientist Hansen Bailey	Stephanie Rusden Archaeologist OzArk Environment & Heritage 145 Wingewarra Street (PO Box 2069) Dubbo NSW 2830 P: 02 6882 0118 F: 02 6882 6030 stephanie@ozarkehm.com.au

Aboriginal Cultural Heritage Survey Methodology, Bowmans Creek Windfarm

OzArk

ABORIGINAL CULTURAL HERITAGE SURVEY METHODOLOGY

BOWMANS CREEK WIND FARM

MUSWELLBROOK, SINGLETON AND UPPER HUNTER LOCAL GOVERNMENT AREAS

OCTOBER 2019

Report prepared by
OzArk Environment & Heritage
for Epuron Projects Pty Ltd

OzArk
Environment & Heritage
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Acknowledgement

OzArk acknowledge Traditional Owners of the area on which this assessment took place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

OzArk Environment & Heritage (OzArk) has been engaged by Hansen Bailey (the client) on behalf of Epuron Projects Pty Ltd (the proponent) to prepare a survey methodology for the proposed Bowmans Creek Wind Farm (the Project). This methodology is in accordance with Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs). The Project information provided here also complies with Stage 2 of the ACHCRs.

1.1 PROJECT BOUNDARY

The Project is located approximately 15 kilometres (km) east of Muswellbrook; 25 km north of Singleton and 30 km southeast of Scone within the Upper Hunter region of New South Wales. The Project is within three Local Government Areas (LGAs): Muswellbrook, Singleton and Upper Hunter (**Figure 1-1**).

The Project Boundary is located at least 5 km southwest of Mount Royal National Park; 6 km northeast of Lake Liddell and 10 km northwest of Lake St Clair, although the Project components are at greater distances from these localities (**Section 1.2**). The Project Boundary is also located in proximity to the existing Bayswater and Liddell Power Stations and several existing coal mines to the south, including Liddell Coal Operations and the Mount Owen Complex.

The majority of the Project Boundary is used for agricultural practices, particularly grazing and is primarily freehold land.

The topography of the Project Boundary is characterised by a series of ridges running north–south with moderate to steep slopes south of the foothills of the Barrington Tops and Mount Royal Range. Lower topographic areas are associated with Bowmans Creek, the primary watercourse and catchment zone within the Project Boundary. Numerous other non-ephemeral watercourses and their tributaries transect the Project Boundary which flow between the spurs associated with the ridges.

1.2 PROJECT OVERVIEW

The Project consists of the following proposed infrastructure (**Figure 1-3**):

- Up to 80 wind turbines
    - Three blades mounted on a tubular steel tower, not exceeding 220 metres (m)
- An operations and maintenance facilities
- Up to two on-site substations and transmission lines
- Minor upgrades to local roads to facilitate site access for installation of wind turbines and related facilities during construction, and continued use of these roads during operation for routine maintenance of infrastructure

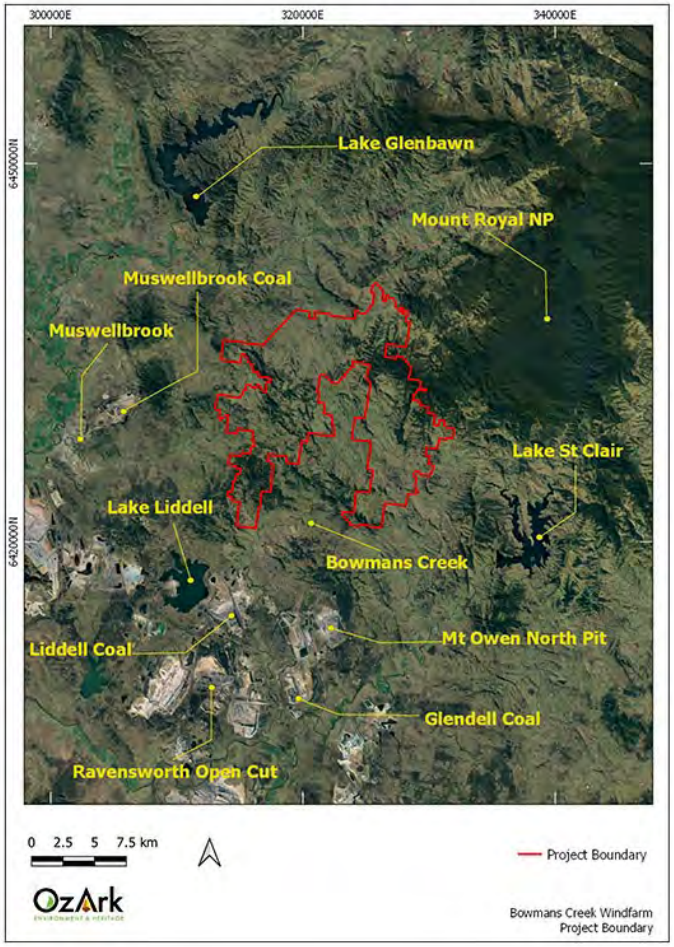
- Unsealed access tracks
- Minor ancillary infrastructure
- Electrical connections between wind turbines and the on-site substation/s
- Ancillary activities (including boundary adjustments and subdivision).

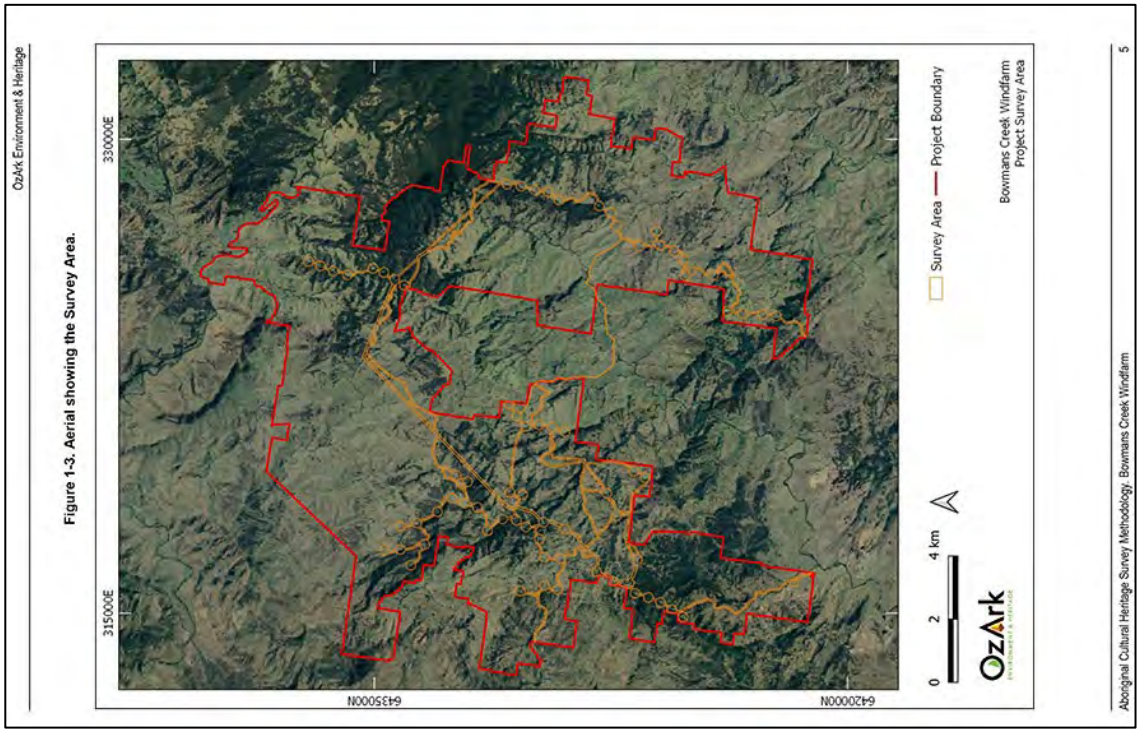
1.3 SURVEY AREA

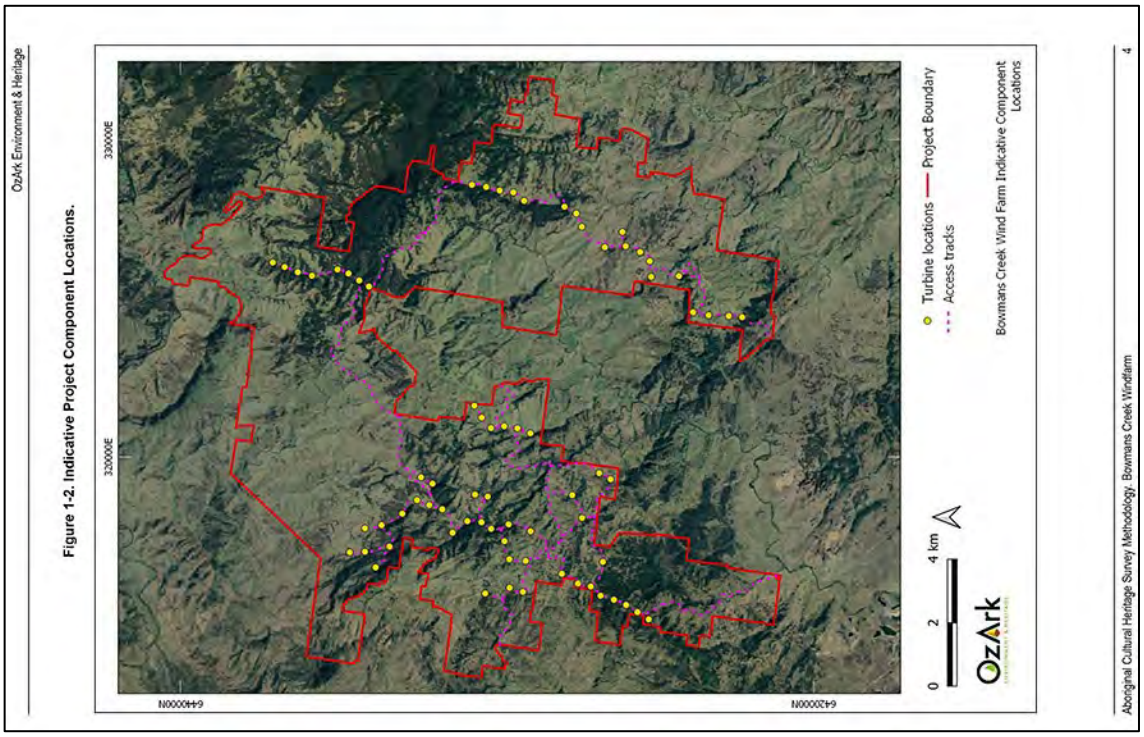
The Survey Area comprises all land within the Project Boundary that will be impacted by the Project components (**Section 1.2**) as well as a buffer to allow for some relocation of infrastructure. The Survey Area includes approximately 935 ha of land (**Figure 1-3**), however, a lesser area will be disturbed by the Project. Generally, the wind turbines are positioned along ridgelines which are mostly clear of native vegetation.

Additionally, and external to the Project Boundary, an underground powerline adjacent to a small section of Albano Road, a transmission line from the Project to the existing Ausgrid or TransGrid electricity networks, and small sections where road widening of minor public roads will be required to allow access for construction of the turbines will need to be surveyed.

Figure 1-1. Location of the Project Boundary.




OzArk Environment & Heritage
Figure 1-3. Aerial showing the Survey Area.
330000E
315000E
6435000N
6420000N
Survey Area
Project Boundary
Bowmans Creek Windfarm
Project Survey Area
0
2
4 km
OzArk
Aboriginal Cultural Heritage Survey Methodology: Bowmans Creek Windfarm
5


OzArk Environment & Heritage
Figure 1-2. Indicative Project Component Locations.
330000E
320000E
6440000N
6420000N
Turbine locations
Project Boundary
Access tracks
Bowmans Creek Wind Farm Indicative Component Locations
0
2
4 km
OzArk
Aboriginal Cultural Heritage Survey Methodology: Bowmans Creek Windfarm
4

1.4 CONSULTATION ON THIS METHODOLOGY

Consultation for this proposal has followed the guidelines established in the *Aboriginal cultural heritage consultation requirements for proponents* (ACHCRs, DECCW 2010) whereby an advertisement was placed in the local press and relevant agencies were contacted to ascertain if they were aware of groups or individuals who may have cultural knowledge of the region containing the Project.

On Wednesday 18 September 2019 an advertisement was placed in the 'Hunter Valley News' requesting expressions of interest in being consulted about the Project. In addition, the following agencies were contacted to identify potential stakeholders for the area: Biodiversity and Conservation Division (BCD) of the Department of Planning, Industry and Environment; Wanaruah Local Aboriginal Land Council, Office of The Registrar: Aboriginal Land Rights Act; National Native Title Tribunal; Native Title Service Corporation (NTSCORP); Muswellbrook, Singleton and Upper Hunter Councils; and Hunter Local Land Services.

As a result, the groups or individuals listed in **Table 1-1** registered to be consulted about the Project. These groups or individuals constitute the Registered Aboriginal Parties (RAPs) for the Project.

Table 1-1: Registered Aboriginal Parties.

RAPs	
Wanaruah Local Aboriginal Land Council	Cacatua Culture Consultants
Nunawanna Aboriginal Corporation	Widescope Indigenous Group Pty Ltd
David Horton	Yinarr Cultural Services
Wonnarua Nation Aboriginal Corporation	Kevin Duncan
Ungooroo Aboriginal Corporation	Aboriginal Native Title Elders Consultants
Devine Diggers Aboriginal Cultural Consultants	Stephen Talbott
Wallagan Cultural Services	Hunter Valley Aboriginal Corporation
Glen Morris	A1 Indigenous Services
Wonn 1 Contracting	Wallagan Cultural Services
Merrigarn Indigenous Corporation	Upper Hunter Wonnarua Council Inc
Murra Bidgee Mullangari Aboriginal Corporation	Stakeholder 1
Lower Hunter Aboriginal Incorporated	Wonnarua Nation Aboriginal Corporation
Gidawaa Walang & Barkuma Neighbourhood Centre	Tocomwall Pty Ltd
Plains Clans of the Wonnarua People (PCWP)	

2 ARCHAEOLOGICAL CONTEXT

2.1 ANTIQUITY OF ABORIGINAL OCCUPATION

The Project Boundary is located in the border country of the Wonnarua, Geawegal and Kamilaroi tribal areas of the upper Hunter River Valley.

Tocomwall (2017: 49) records that ethnographic accounts and anthropological notes written in the mid-to late 19th century indicate that the traditional territory of the Wonnarua people extended over a two thousand square mile area of land that included the Hunter River and all its tributaries from within ten miles of Maitland to the apex of the Liverpool Ranges. This interpretation is challenged by the Wonaruah Local Aboriginal Land Council (Tocomwall 2017: 482) who states that there is much debate about the tribal boundaries and that the dividing line between the Wonnarua and the Kamilaroi may have been much further south in the area of 'Jerrys Plains'.

The Wonnarua people and their neighbours lived in an environment rich in food resources. Freshwater fish, shellfish, reptiles, mammals, birds and plant food provide a diverse diet (see Brayshaw 1981). Brayshaw (1986: 82) suggests that inland groups visited the coast during the summer when marine resources were plentiful, and coastal groups travelled inland to participate in the winter kangaroo hunts. Trade and/or exchange also occurred between the coastal and inland groups including visiting by coastal and inland groups for initiations and ceremonies seemed to occur. These were conducted within earthen circles. Carved trees were associated with these sites (Brayshaw 1981: 12). Reed spears and shells were traded inland for possum skin rugs and fur cord (Brayshaw 1986: 41). Social gatherings were a feature of Aboriginal life in this area.

There is virtually no reference to flaked stone tools in the nineteenth century descriptions of Aboriginal material culture in the Hunter Valley. This paucity of information is at odds with the types of occupation evidence which are preserved in the Hunter Valley. By far the most common type of Aboriginal site in the inland part of the Hunter Valley is the "open campsite" or stone artefact scatter.

2.2 REGIONAL ARCHAEOLOGICAL CONTEXT

2.2.1 Introduction

The Aboriginal occupation of Australia begins prior to 40,000 BP (years before present) and possibly earlier than 50,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period, poor preservation of archaeological materials (particularly dateable organic materials) and significant coastline change over the past 18,000 years.

In 1986, Koettig undertook an archaeological survey approximately 12.5 km southeast of the Project Boundary between Glennies Creek and Singleton (cited in Umwelt 2003). Following that survey, Koettig carried out several excavations at six locations along Glennies Creek. Koettig considered artefacts found in Site SGCD 16 (about 1 m deep in Unit B of on an old alluvial terrace) were 'markedly different' to artefacts recovered from the artefacts in Unit A. Her conclusion was formed on the basis of the raw material used, large number of cores, the large percentage of cortex remaining on artefacts and larger sizes of artefacts. Artefacts from Unit B were from volcanic rocks while those in Unit A were predominantly mudstone and silcrete. Later, a date of >20,200 BP was obtained from a hearth associated with the artefacts placing the site well into the Pleistocene.

A review of GHD (2005), HLA-Envirosciences (2005) and Umwelt (2007) provides the following regional synthesis:

- Archaeological sites, even where surface evidence is not present, occur on most landforms. This was confirmed by HLA-Envirosciences (2005) excavation program, in which Aboriginal sites were encountered on alluvial terraces, flats, slopes, bench areas, spurs and ridgelines. HLA-Envirosciences acknowledges that the sample areas were biased somewhat as they were all near creek lines
- Site frequency and density are dependent on their location in the landscape. This theme is consistent throughout NSW and is influenced by a range of factors, the most relevant of which the existing level of disturbance. More specifically, the potential for undisturbed in situ deposits remaining in the upper Hunter Valley is generally low
- The highest concentration of Aboriginal sites on the valley floor surrounds creeks and waterways
- Few scarred trees are recorded, reflecting the high degree of tree clearing in the region
- The most frequently recorded raw material is indurated mudstone (a fine-grained siliceous material) associated with Hunter River gravels. Other frequently recorded materials include locally sourced silcrete, quartz and volcanic stones
- Assemblages recorded in the region consist largely of unmodified flakes with few formed tools. Backed blades comprise the characteristic diagnostic artefact in the region. The mid- to late-Holocene appears to have witnessed this move to smaller tools, perhaps as an impetus to conserve raw material during tool manufacture or due to new functionality requirements.

2.2.2 Previous assessments within or near the Project Boundary

A very large amount of archaeological work has been undertaken in the Hunter Valley and consequently only a brief regional archaeological context that focuses on work in similar landforms to the Project Boundary is provided here.

The results of these investigations provide an archaeological context for the current assessment and were used in the preparation of a predictive model of Aboriginal site location (**Section 3**).

2.2.2.1 A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project (Dyall 1982)

In 1982, Len Dyall assessed the northern reaches of Bowmans Creek, partially extending into the south of the Project Boundary. 18 artefact scatters and two grinding groove sites were recorded during the survey. The artefact scatters were small except for one that contained over 150 artefacts. Most of the artefact scatters were identified on creek flat, with only one site (a low-density scatter) located on a ridge line. One grinding groove site was suggestive of a seed processing location rather than for axe grinding.

2.2.2.2 Archaeological Survey of Pikes Gully Colliery Area, Liddell, NSW (Haglund 1982)

In the same area of Bowmans Creek and to the south of the Project Boundary, Laila Hagland (Hagland 1982) recorded two artefact scatters:

- Site 1: Aboriginal stone artefacts were noted in several exposures within, and along, the edge of a river terrace west of Bowmans Creek. It was noted that the artefacts recorded varied in type, size range and density between the exposures. Small thin flakes and small, well-made artefacts such as bondi points were noted only close to the southern end. Artefact density appeared greater in this part. These observations may reflect real distribution trends, but may also result from the smaller and more shallow areas of exposure further north
- Site 2: Aboriginal stone artefacts were noted in two exposures along the northeast bank of Bowmans Creek, northwest of its junction with Stringybark Creek, and within a minor erosion gully on the slope above.

2.2.2.3 Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales (Resource Planning 1991)

In 1991 Resource Planning undertook a large assessment for the Mount Owen Coal Project that was focussed on Swamp and Yorks Creeks, located south of the Project Boundary (Resource Planning 1991). This study included 25 km of drainage line (including left and right banks) along Swamp Creek and Yorks Creek. Traverses were also made across side slopes and along ridge lines. The survey area totalled 370 ha. 98 Aboriginal archaeological sites, ranging from isolated artefacts to dense concentrations of more than 100 pieces of flaked stone, were mapped and recorded.

Table 2-1 presents the artefact densities recorded by Resource Planning and this shows clearly that Swamp Creek displays a lower artefact density when compared to Yorks Creek. In the case of Swamp Creek over 75% of sites were isolated finds or very low-density artefact scatters while along Yorks Creek 54% of sites recorded over 50 artefacts at each site (a moderate artefact density). Resource Planning noted that the sites in the Swamp Creek catchment are regarded as an excellent representative assemblage of occupational evidence in the small tributary valleys of

the Hunter River (Resource Planning 1991: 5). This report recommends, based on the survey evidence "*that part of the Yorks Creek drainage line would be set aside as an archaeological conservation zone*" (Resource Planning 1991: 5): a recommendation that was followed as the northern reaches of Yorks Creek are now within a permanent Voluntary Conservation Area (VCA). The Yorks Creek VCA is located outside the Project Boundary approximately 5.6 km to the south.

Table 2-1: Artefact densities at sites recorded by Resource Planning 1991.

Artefact Numbers	Swamp Creek (%)	Yorks Creek (%)
Isolated Artefact	27.6	9
<10 Flakes	50.0	18
10-20	14.5	18
20-50	6.6	27
50-100	1.3	18
>100		9

2.2.2.4 *Mount Owen Biodiversity Offset Areas (Umwelt 2006)*

In 2006, Umwelt completed an archaeological assessment of the proposed Mount Owen Biodiversity Offset Area, 5 km south of the Project Boundary. The topography of the assessed areas generally comprised low hills and moderate gradient slopes, although some included ridge lines and steep slopes. Seven sites were recorded during the field inspection, all artefact scatters. Three of the artefact scatters were recorded with potential archaeological deposits (PAD). All recorded sites were identified on spurs, adjacent to waterways.

2.2.2.5 *Aboriginal Archaeological Values Assessment: Mount Owen Continued Operations (OzArk 2014a)*

The assessment area for the Mount Owen Continued Operations (MOCO) project disturbance area covered approximately 500 ha of land, located at its closest 4.7 km south of the Project Boundary.

Australian Cultural Heritage Management Pty Limited (ACHM) were engaged by Mount Owen to undertake Aboriginal community consultation for the MOCO Project and to author the Aboriginal Cultural Heritage Assessment Report (ACHAR) to which OzArk 2014a contributed (ACHM 2013). The ACHM report appeared as Appendix 13a (Parts 1 and 2) of the MOCO Project *Environmental Impact Statement* (EIS). ACHM 2013 contains the cultural, aesthetic and historic values of the area, while OzArk 2014a contains an examination of the scientific values of the area.

Cultural values

ACHM 2013: 114 summarises the cultural values of the area. What follows is an edited excerpt of the MOCO Project Statement of Significance (ACHM 2013: Section 5:10):

> *It is noted that the numerous Aboriginal stakeholders who participated in this cultural values assessment process hold values which relate to the wider Hunter Valley region generally, and less directly to the MOCO area specifically. However, one of the Knowledge Holder groups holds very strong values over the MOCO area. Other than the one group expressing strong connection to the MOCO area, there was very little other information presented in the disclosed material or values workshops which relates specifically to the MOCO area.*
>
> *A common theme in many Aboriginal cultural heritage assessments is the proprietary interest members of the relevant Aboriginal communities hold in regard to the wider cultural landscape including archaeological sites or places within any given area. The project is no exception in this regard. Within the context of the current assessment, there are strong on-going connections to places created and used by ancestors alongside demonstrably strong interests in the manner in which those places are managed or harmed as a result of this project. These sentiments are not unique, and must certainly be considered in the overall assessment of the significance of the places in question. The connection to these places is noted as often being relatively unspecific and generally do not appear to relate to any surviving traditional knowledge or customary cultural practices, apart from one of the Knowledge Holder groups who express a strong connection to on-going cultural knowledge and customary lore in this location.*
>
> *The cultural values expressed by the participants in this assessment have been consistent in voicing an over-arching concern for the wider landscape and criticism of the negative impact of mining on that landscape. Consistent in the material disclosed is a sense of 'outrage' and grief at the treatment of Aboriginal people since First Settlement (dispossession and genocide are mentioned repeatedly) through to more contemporary experiences (i.e. the Stolen Generation).*

ACHM 2013: Section 5:10 concludes:

> *There is little doubt that the wider cultural landscape surrounding (and encompassing) the MOCO area is of high cultural and historical significance to Wonnarua people. The historical associations with early settlement, conflict, dispossession and survival are important, and the nature of the area as a surviving cultural landscape of significance to numerous members of the Wonnarua people makes this an area of regional and national significance. The regional archaeological record is also of high*

regional significance. Overall, the cultural significance of the wider region is considered to be high and requires considerable additional research to fully understand.

Scientific values

Large portions of the MOCO project (223 ha) had been subject to previous Aboriginal Heritage Impact Permits (AHIPs) with extensive areas having already undergone archaeological assessment and salvage. Within the disturbance area, 18 sites had already been salvaged by manual excavation and more expansive additional areas have been subject to grader scrapes to salvage subsurface artefacts. Over the years, both from within the disturbance area and from adjacent landforms, over 11,000 artefacts had already been recovered as a result of these programs.

As a result of the scientific values assessment for the MOCO project, 39 Aboriginal sites were recorded; consisting of:

- 11 artefact scatters (37-3-1189 to 37-3-1199)
- 25 isolated finds (37-3-1170 to 37-3-1188 and 37-3-1212 to 37-3-1216)
- Three extensions to previously recorded sites (Extension to site 37-3-0649, Extension to site 37-3-0611 and Extension to site 37-3-0600).

In addition, the disturbance area contained three previously recorded sites, 37-3-0611, 37-3-0985 (low density artefact scatters) and 37-3-0527 (isolated artefact). Thus, 42 sites were known to exist within or close to the disturbance area.

At two locations within the disturbance area, test excavations were carried out. At one location (37-3-1191), no artefacts were recorded during the test excavations, while at the second location (37-3-1192), 114 artefacts were recorded, with over 80% coming from one discrete concentration. As a result, it was determined that 37-3-1191 is a displaced site with no associated archaeological deposits, while 37-3-1192 is a low-density artefact scatter along the banks of the 'eastern drainage' line with one known concentration of artefacts.

Conclusion

Those archaeological sites in the disturbance area investigated revealed relatively sparse artefact concentrations in shallow and disturbed contexts. Archaeologically, all the places located and/or identified conform to the Australian Small Tool Tradition[1], and most likely date to no more than the last 2,000 to 3,000 years.

[1] The Australian Small Tool Tradition (also sometimes referred to as 'Bondaian') is a term applied to the Holocene period Aboriginal tool kit; distinguishing it from the earlier Australian Core Tool and Scraper Tradition generally dated to the Pleistocene period.

Given the nature and extent of the archaeological sites identified, there was little additional knowledge which could be added to the archaeological record from any further investigation of this material. There is little probability for the presence of undisturbed and deeply stratified archaeological sites within the disturbance area.

In general, the archaeological sites in the MOCO disturbance area offered:

- Limited research potential regarding regional and/or localised subsistence and resource procurement activities
- Limited research potential to address questions on stone tool technologies in the region
- Limited potential for radiometric dating methods to be applied to the sites
- Limited research potential to address questions about the timing of the first occupation of this region of the Hunter Valley
- Limited research potential to address questions about the timing of the Aboriginal settlement history of the Hunter Valley
- Limited potential to reveal further unique spatiotemporal patterning which would add to the archaeological record.

2.2.2.6 Track Maintenance at Hillcrest Offset Area (OzArk 2013)

In 2013, OzArk conducted a study of the Hillcrest property to assess the impact of proposed track maintenance. The Hillcrest property is immediately southwest of the Project Boundary.

Five sites were recorded as part of the assessment, including 37-2-4514 and 37-3-1200. All recorded sites consisted of either low-density artefact scatters or isolated finds located adjacent to waterways on gentle gradients and have been affected by erosion. The artefacts recorded were noted as being typical to other sites in the district in terms of site type, artefact type and raw materials utilised, except for one site where a potential quartzite grinding stone and volcanic pestle were recorded. The results of the assessment supported the predictive model and indicate, in a general way, that past occupation was focused in the flatter terrain in south of the OzArk 2013 study area: although this occupation was at a low and/or sporadic level as people probably returned to areas of more reliable water outside of the study area for longer-term occupation.

2.2.2.7 Ravensworth Offset Property Maintenance (OzArk 2014b)

OzArk (2014b) completed a Due Diligence assessment and site inspection to update the existing archaeological record where a number of sites had been informally recorded within the Ravensworth Offset Area at Hillcrest, to the southwest of the study area. Eight of the nine previous informally recorded sites to be ground-truthed were located, including 37-2-4551 and 37-3-1206. All sites are in areas subject to high levels of erosion and were therefore concluded to be in secondary contexts.

2.2.2.8 Erosion Control Works at Hillcrest Offset Area (OzArk 2015)

OzArk (2015) completed an archaeological Due Diligence assessment of proposed erosion control works at the Hillcrest Offset Area. Eight new recordings were made of Aboriginal sites during the visual inspection (Hillcrest 16 to Hillcrest 23). However, apart from Hillcrest 19, all sites consist of very low-density artefact scatters in displaced contexts within erosion scalds. Three previously recorded sites (Hillcrest 4 to 6) were also located during the field survey. OzArk concluded that sites Hillcrest 4 to Hillcrest 6, Hillcrest 16 to Hillcrest 18 and Hillcrest 20 to Hillcrest 23 represent recordings of artefacts in secondary contexts. In all cases it is assumed that the original context of the artefacts was nearby although it is impossible to know this precisely. Hillcrest 19 was the only recorded site noted as being an exception to the above. The landform containing Hillcrest 19 has relatively low disturbance and the artefacts recorded along the farm track are likely to have originated in the immediate vicinity. It is also likely that the whole landform containing Hillcrest 19 (i.e. the spur between the creek and ephemeral gully) has the potential to contain a low density of artefacts although poor visibility made it difficult to determine precise site boundaries during the survey.

2.2.2.9 Hillcrest Aboriginal Cultural Values Assessment Report (Tocomwall 2017)

In 2017 Tocomwall completed an archaeological survey of the Hillcrest Offset Area, located directly southwest of the current study area. The landforms were divided into three 'zones' with each being covered by a series of transects. These zones reflect 'gross' geomorphic zones that are characterised by the rugged and elevated terrain of the northern portions of the Hillcrest Offset Area (Zone 1), the spurs and associated upper to lower slope forms (Zone 2) and the lowlands/swampy areas along the southern boundary (Zone 3). Zone 1 and Zone 2 landforms are frequently represented within the Project Boundary.

A total of 35 artefact scatters, 89 isolated finds and one site composed of four cairns were identified during the fieldwork. All artefact scatters were recorded within the southern portion of the study area consisting mainly of gentle slopes, low spurs and valley flats (Zones 2 and 3). Based on the distribution of finds, analysis of landform features and predictive archaeological modelling, a series of landforms are also identified as PAD.

A large number of the Tocomwall sites were located within extensive erosion scalds that exist in lower and mid-slope landforms within the Hillcrest property. Like in the case of OzArk 2015, these recordings are out of context and represent an accumulation of artefacts from the general landscape into these depositional zones. Rather than originating in the slope landforms, the artefacts probably originate from level benches in the slope landforms that are located upslope from the erosion scalds.

The dominant raw material recorded was mudstone followed by silcrete. Other raw materials recorded in smaller quantities included quartz, quartzite, fine-grained siliceous materials, chert, porcellanite, petrified wood and glass.

In relation to the Hillcrest property, Tocomwall (2017: 35) notes:

> *The property known as Hillcrest has always been of importance to the Smith/Franks family lines of the Plains Clan of the Wonnarua People (PCWP)… With regards to understanding the current connection to country, the property was a place that still today contains the area that was one of confrontation. In the early days the Mt Arthur locality contained a men's site only. This site was always frequented by boys that were taken there to learn about hunting and ritual beliefs…*
>
> *Adjacent to this property is the stone arrangement as reported within the Native Title Claim prepared by PCWP. The stone arrangement for these families is a well-known initiation and birthing place for our people…and as a place of ceremonial importance where a fire was maintained to allow direct contact with Kawal, son of Biami our creator.*

2.2.2.10 Liddell Coal Offset Areas (OzArk 2017a)

In 2017, OzArk completed a Due Diligence archaeological assessment for a suite of proposed environmental management activities within various offset areas at LCO: The Bowmans Creek Corridor (82.6 ha); The Mountain Block Offset (150.37 ha); and additional access areas (56.5 ha). Ten new Aboriginal sites were recorded during the assessment, as well as two new sensitive archaeological landforms (SALs). Artefacts were typically observed within areas of exposure where soil surfaces had eroded, i.e. along access tracks, near ant hills, sloping terraces, along creek lines (Bowmans and Coalhole Creeks) and areas where artefacts had been exposed by sheet wash erosion. No sites were identified on steep slopes or along ridge lines. Sites included five isolated finds and five artefact scatters. The dominant raw material recorded was mudstone followed by silcrete. Other materials included chert, volcanics, siltstone and quartzite.

2.2.2.11 Mitchell Hills South Offset Area (OzArk 2017b)

In 2017, OzArk completed a Due Diligence archaeological assessment on 37 ha of land within the Mitchell Hills South Offset Area, 600 m west of the Project Boundary. The area comprised moderate to steep gradients slopes on lower, mid and upper slope landforms associated with a ridge line. Three ephemeral drainages were present within the study area, however, based on the topography these were assessed as likely to present as shallow valleys in the landscape that would not have held water in the past. Similar landforms are well represented within the Project Boundary.

No Aboriginal objects were recorded during the inspection and no areas of potential intact subsurface archaeological deposits were identified. The absence of isolated finds and artefact scatters was best attributed to the steeply sloping landforms which were steeper than expected and dominated the study area.

2.2.2.12 Liddell Coal Operations DA305-11-01 Modification 7 (OzArk 2018)

OzArk (2018) completed an archaeological assessment of 14 ha of land within the Mountain Block Offset Area for proposed rehabilitation works, located 1.5 km south of the Project Boundary. Landforms within the study area consisted of steep to moderate slopes which rise in the north to a hill crest. Similar landforms are well represented within the Project Boundary.

No new Aboriginal objects were recorded during the inspection and no areas of potential intact subsurface archaeological deposits were identified. Stone artefact sites were predicted to be the most likely site to be identified, however their absence was unsurprising given the steeply sloping landforms distant from water which dominated the area; and the high levels of disturbance from historical earthworks.

2.3 Local Archaeological Context

A search of the Department of Premier and Cabinet (DPC) administered Aboriginal Heritage Information Management System (AHIMS) database on 27 September 2019 returned 108 records for Aboriginal heritage sites within a 24 x 24 km search area over the Survey Area (GDA Zone 56 Eastings: 311680–335680; Northings: 6418525–6442525 with no buffer) (see **Table 2-2** for the site types and frequencies; results mapped in **Figure 2-1**).

Two sites, 37-3-0048 and 37-3-0049, are located within the Project Boundary, with 37-3-0047 in close proximity (**Figure 2-1**). All three sites were recorded by Dyall in 1982 (**Section 2.2.2.1**). None of these sites are located within the Survey Area. All sites are recorded as low-density artefact scatters located either on the bank of Cedar Creek or one of its tributaries. Following review of the site card descriptions and coordinates provided, it appears that all three sites appear to be in the incorrect location on AHIMS, however, their approximate corrected location is still outside the Survey Area. The upcoming survey will confirm that these sites will not be harmed by the Project.

A large accumulation of sites is located to the southwest of the Survey Area, within the Hillcrest Offset Area, recorded as part of OzArk 2014, 2015 and Tocumwal 2017. These sites represent 89 of the 108 sites returned within the AHIMS search area. All sites are located on the lower slopes in large erosion scalds and therefore consist of sites within a secondary context.

Due to the context of the artefacts, 'site' definition was noted as a difficulty, particularly during the OzArk 2015 and Tocomwall 2017 studies. OzArk 2015 undertook the methodology of grouping disparate, displaced artefacts into one 'site' that was to be seen more as a management zone

rather than an archaeological site. By contrast, Tocomwall 2017 undertook a methodology of recording each disparate, displaced artefact as a single site; unless it was felt that artefacts were related to each other in which case they were grouped into an artefact scatter. As such, while a large number of sites are recorded in this area, these are generally not *in situ* sites. While the clustering of these sites may demonstrate that it would have been a central focus for past Aboriginal occupation, little more can be inferred from the distribution of the sites as any site patterning is largely artificial and a product of erosional forces and water movement. It should also be noted that the Hillcrest property has been intensively surveyed leading to a large number of recordings. This has probably biased the distribution pattern of regional site location, and if other areas were as intensively investigated, a more nuanced distribution pattern may emerge.

Additional site types returned within the AHIMS search area include a scarred tree, 5.6 km to the northwest of the Project Boundary; a grinding groove site, 2.7 km to the southwest of the south easternmost extent of the Project Boundary; and a rock shelter with an isolated stone artefact, 1.9 km to the west of the Project Boundary (**Table 2-2**).

Table 2-2: AHIMS site types and frequencies.

Site Type	Number	% Frequency
Isolated finds	68	63%
Artefact scatters	37	34%
Culturally modified (scarred tree)	1	1%
Grinding grooves	1	1%
Rock shelter and artefact	1	1%
Total	**108**	**100%**

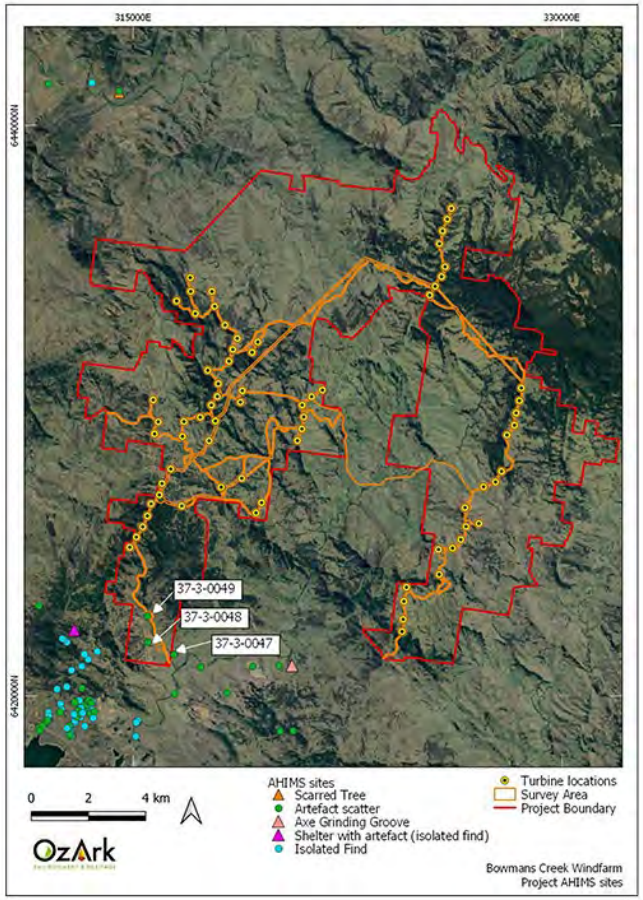
2.4 Archaeological Context: Conclusion

The extensive and long-running archaeological investigations surrounding the Project Boundary as summarised in **Section 2.2** and **2.3** indicate that:

- Stone artefact sites (isolated finds and artefact scatters) are the most commonly recorded site types in the area and that other site types, such as culturally modified trees, grinding grooves and rock shelters are very rare or non-existent
- Artefacts tend to be associated only with the A-Horizon soil layers indicating a date in the Holocene period (i.e. 10,000 BP to the present)
- The predominant raw materials used for stone artefact manufacture are locally sourced mudstone and silcrete
- Excavations generally reveal a low-density of artefacts, but some spatial patterning has been observed: principally concentrations of artefacts interpreted as 'knapping areas'. Other archaeological features such as hearths are rarely identified across the Hunter Valley region

- Sites tend to be associated with waterways and a discernible pattern has been observed whereby larger sites are associated with larger waterways offering permanent water supplies
- Sites on ridges tend to be low-density scatters and those on slopes are generally in a secondary context having been displaced by erosional processes. These sites are also generally of low-density
- Bowmans Creek would have been a major focus of past occupation near the Project Boundary; although most landforms with archaeological potential associated with Bowmans Creek are outside of the Project Boundary, further to the south.

Figure 2-1. AHIMS sites in relation to the Survey Area.



3 PREDICTIVE MODEL

3.1 LANDFORM MODELLING

The Project components which comprise the Survey Area, are generally situated on the crests of high ridges (**Figure 3-1**), as these areas are subject to higher wind speeds. Such an environment is unlikely to have been a favoured area for Aboriginal occupation for extended periods of time and is more likely to have been utilised as vantage points or access routes. The greatest point of elevation within the Survey Area is Blue Gum Top at 710 m. The slopes which fall away from the ridges are of either moderate or steep gradient. Generally, such landforms are not likely to contain intact sites and any finds in this environment would be in a secondary context as a result of erosion.

Lower topographic areas within the Survey Area are associated with the numerous creeks and their tributaries, although these landforms comprise only a small portion of the Survey Area (**Figure 3-1**). Bowmans Creek, the primary watercourse and catchment zone within the Project Boundary, is located within Survey Area, however, most of Bowmans Creek within the Survey Area is non-perennial, as it is located at the headwaters which begins in the Mount Royal Range (**Figure 3-2**). The upper catchment of Bowmans Creek is deeply incised in steep bedrock-controlled terrain, while the lower reaches (located south of the Survey Area), consists of broad, alluvial floodplain and terrace sequences (Umwelt 2010).

The ridges are generally clear of native vegetation, while the sheltered slopes contain dry forest vegetation. Remnant stands of the original vegetation remain as paddock trees or larger scattered patches of forest/woodland. Remnant vegetation species within the Survey Area are likely to consist of river oak, spotted gum and narrow-leaved ironbark.

The Survey Area has been used historically and is currently used for low-intensity livestock grazing. The presence of hoofed livestock is likely to have resulted in trampling and compaction of the ground surface which accelerates soil loss. Erosional process within the Survey Area would be exacerbated by the types of landforms present which are generally clear vegetation.

Figure 3-1. Aerial of the study area showing terrain.

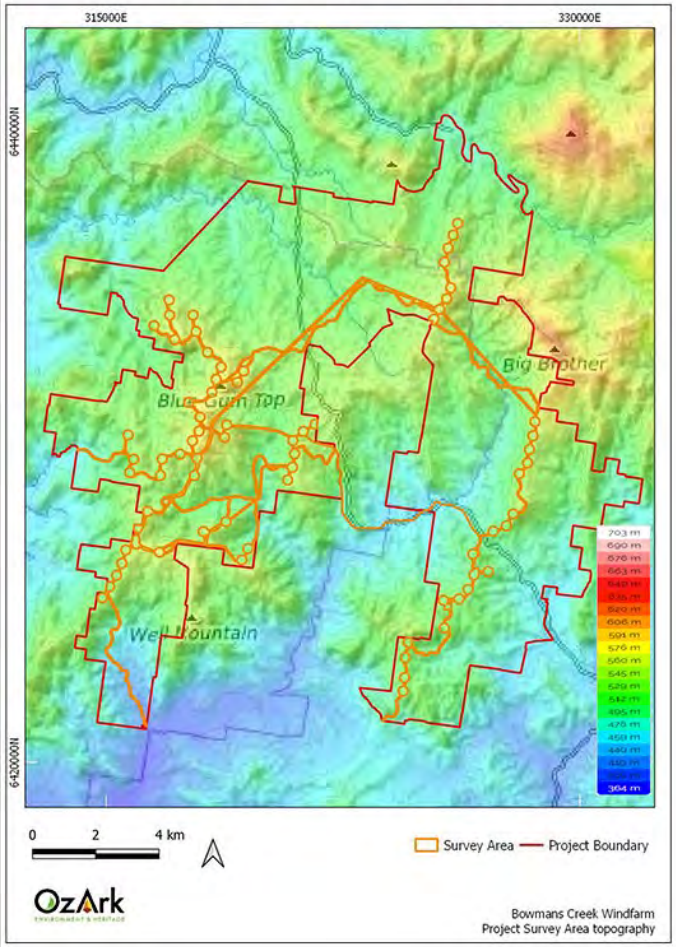
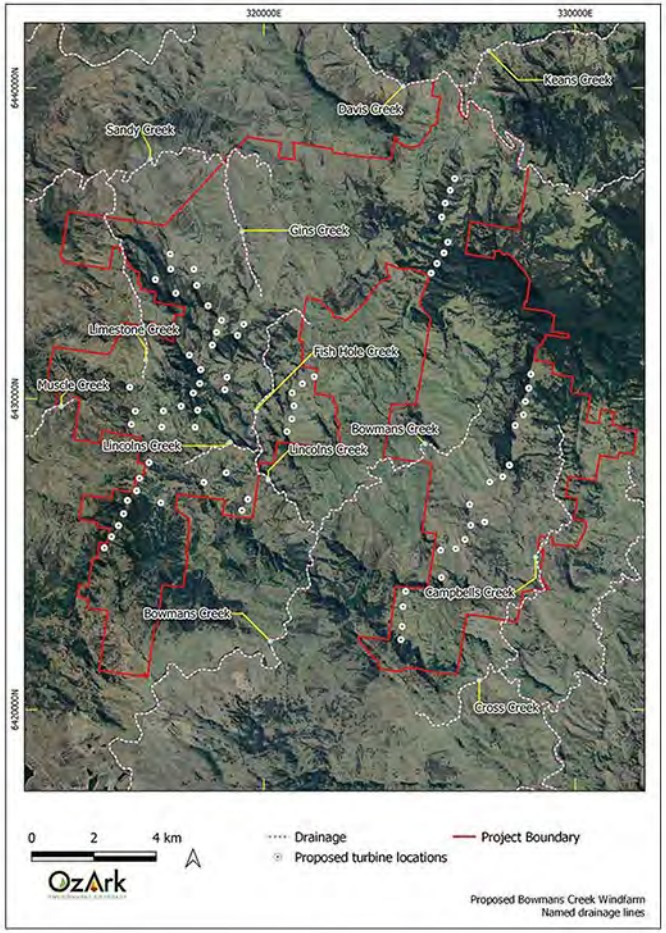


Figure 3-2. Named watercourses intersecting the Survey Area.[2]



[2] Drainages as per the NSW Spatial Data Catalogue 'watercourses'.

3.2 PREDICTIVE MODEL FOR THE SURVEY AREA

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rock shelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short- and long-time scales—or (b) the historical impacts associated with the introduction of colonial farming practices. Scarred trees, by their nature, may survive for up to several hundred years but rarely beyond.

The archaeological studies undertaken in the vicinity of Survey Area provide an insight into the nature and distribution of archaeological sites within the area. However, the location of sites can only reflect what has been identified, usually as a result of infrastructure/development-driven projects, thus presenting the site data as clustered or on linear alignments. Generally, sites have been recorded in proximity to a recognised water source, in locations that have been subject to reduced landform disturbance, and on gentle, elevated landforms. However, landform disturbance may also explain why Aboriginal objects become revealed on the ground surface, such as within modified and disturbed landforms.

Knowledge of the environmental contexts of the Survey Area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of those site types being recorded:

- Isolated finds may be indicative of: random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or sub-surface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
    - As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the study area. It is noted in **Section 2** that isolated finds are commonly recorded near the Survey Area.

- Open artefact scatters are here defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'.

  Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

  Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.

  - Stone artefact distributions of variable artefact densities are the most common Aboriginal object found within the Hunter Valley region. A general correlation between different types of watercourses and the nature of the evidence of past Aboriginal occupation is evident. Higher artefact density sites are located near to permanent water sources and low-density artefact distributions are found elsewhere, such as ridge lines and slopes. Based on this, the moderate to steeply sloping landforms within the Survey Area are unlikely to have been utilised with the ridges and spurs being more attractive for camping. It is likely that such ridge lines were used as pathways in the past and any sites associated with such landforms are likely to have a low artefact density and a low complexity of tool types as the sites are either one-off events or only infrequently used. The Survey Area contains few locations of lower topographic areas associated with permanent or semi-permanent watercourses which have higher archaeological potential for more complex and higher density scatters (**Figure 3-1**). While there are named waterways within the Survey Area (**Figure 3-2**) the major components of the proposal are not located adjacent to these features. It is therefore predicted that large, complex sites will be absent from the survey area.

- Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed as a consequence of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any

particular example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.

  - The ridgelines where most of the proposed work will take place, are mostly cleared of vegetation, therefore this site type is not predicted likely to occur. It is also noted that this site type is very rare at a regional level due to historical tree clearance.

- Quarry sites and stone procurement sites typically consist of exposures of stone material where evidence for human collection, extraction and/or preliminary processing has survived. Typically, these involve the extraction of siliceous or fine grained igneous and meta-sedimentary rock types for the manufacture of artefacts. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations.

  - This site type could be recorded within the Survey Area should suitable rock outcroppings be available.

- Grinding grooves are most likely to occur on flat outcrops of coarse-grained sandstone in the vicinity of water sources, however, grinding grooves have been recorded on fine-grained granite outcrops.

  - Given the low prospect of suitable rock exposures being present in the Survey Area, grinding groove sites are unlikely to be present. In addition, the Survey Area does not contain extensive lengths of waterways where such sites are more likely to be located.

- Rock shelters were utilised in the past for both habitation and ceremonial purposes. The term 'rock shelter site' refers to rock shelters/rock overhangs that contain evidence such as stone artefacts and/or bones and/or plant remains (from meals eaten at the site) and/or hearths (fireplaces). Most rock shelter sites are secular in nature, however, those that also contain rock art or engravings are often believed to be non-secular in nature. The term 'rock art site' generally refers to Aboriginal ochre paintings or ochre or charcoal drawings located on a rock slab (generally in a sheltered place like the floor of a cave or rock shelter), boulder, cliff-face, cave or rock shelter wall or roof, or wall of a rock overhang. The majority of rock art sites are found in positions that are sheltered from the elements. This observation, however, is probably biased to some extent, as rock art would not preserve well in open positions. Rock art sites are generally believed to be non-secular in nature.

  - While a rock shelter has been previously recorded in the vicinity of the Survey Area (2.6 km to the west of the Survey Area), rock shelters are not likely to common based on examination of available aerial photography. However, as the Survey Area contains ridges and the immediately adjacent upper slopes, rock shelters may be present.

- Burials are generally found in soft sediments such as aeolian sand, alluvial silts and rock shelter deposits. In valley floor and plains contexts, burials may occur in locally

elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas. Burials are generally only visible where there has been some disturbance of sub-surface sediments or where some erosional process has exposed them.

  - Given the topography, nature of the soils and geology, burials are not predicted to be present in the Survey Area.

- Bora/Ceremonial sites are places which have ceremonial or spiritual connections. Ceremonial sites may comprise of natural landscapes or have archaeological material. Bora sites are ceremonial sites which consist of a cleared area and earthen rings.

  - This site type does not necessarily follow landform predictability and are more likely to be identified by local Aboriginal people, rather than through archaeological evidence. These sites are generally identified through consultation with the RAPs.

3.3 Research Questions

A number of research questions can meaningfully be applied to the investigation of the Survey Area. These research questions include:

- What resources were available to the Aboriginal people using the Survey Area (food, stone and water) and what resources were transported to the area?
- How do the artefact assemblages from the sites along the slopes and ridge crests in the Survey Area differ from sites that are located along creek flats?
- What tasks were Aboriginal people undertaking at the sites?
- Did the Aboriginal people use the Survey Area at any particular time of the year?
- If there are hearths present, do they contain remains (animal/plant) that may indicate what people were cooking/eating?
- Is there potential for burials to be present in the landscape?
- Are the outcropping rock materials present suitable for stone tool procurement and manufacture?
- Is there evidence to suggest that Aboriginal people were using the area earlier than the mid to late Holocene?
- Can dates be obtained for the Aboriginal use of the area?
- Establish how the findings within the Survey Area (if any) accord with the regional archaeological context examined in **Section 2.2**.

The survey methodology set out in **Section 4** will be framed to help answer these questions; should sites of sufficient significance be encountered. However, based on the results of previous assessments and past disturbances, it not expected that the Survey Area will contain sites of sufficient significance to help answer those research questions that require a robust data set.

4 Survey Methodology

4.1 Assessment Approach

The Aboriginal cultural heritage assessment of the study area will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010b). The field inspection will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011).

4.2 Survey Aims

The aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within a study area are known. Therefore, the aims of the survey will be to:

- Conduct pedestrian transects across all landforms in the Survey Area so that their archaeological potential can be determined
- Confirm that previously recorded sites 37-3-0047, 37-3-0048 and 37-3-0049 are outside of the Survey Area (see **Section 2.3**)
- Evaluate whether the predictive model set out in **Section 3.2** is valid
- Determine if the research questions set out in **Section 3.3** can be answered
- Determine if any landforms of the Survey Area require test excavation to understand the archaeological potential at a particular location
- Undertake sufficient assessment in order to satisfy Sections 2.2, 2.4, 2.5, 2.6, and 2.7 in the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011)
- Collecting sufficient data so that the results can be presented in an ACHAR as set out in Section 3 in the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011)
- Undertaking survey and record keeping satisfying Requirements 1–13 of the Code of Practice.

4.3 Survey Methodology

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004) and will follow the Code of Practice.

As highlighted in **Section 2**, greater Aboriginal archaeological potential tends to exist on landforms within 200 m of permanent and ephemeral water sources, along access or trade routes, and areas with suitable flora/fauna and shelter. Archaeological potential is generally reduced on steep landforms unsuitable for camping, and landforms disturbed by erosion and historical impacts (e.g. farming and infrastructure installation). As such, during the field assessment,

greater survey effort will be expended on landforms deemed to have greater Aboriginal archaeological potential. 'Full pedestrian survey' refers to systematic transects walked by surveyors spaced approximately 10–20 m apart throughout the landform or area being surveyed. 'Targeted pedestrian survey' refers to transects walked by surveyors spaced approximately 10–20 m apart that do not cover the entire landform or area. Distances between surveyors may be decreased in areas however, where the width of the Survey Area is narrower.

As such, the field assessment will include:

- Full pedestrian survey will occur in areas with minimal disturbance and good ground surface visibility within landforms possessing Aboriginal archaeological potential, i.e. areas within 200 m of water, along ridgelines and ridge tops
- Targeted pedestrian survey will occur in all other areas – i.e. areas more than 200 m from watercourses; areas with poor ground surface visibility; landforms with low archaeological potential i.e. steep slopes
- All trees deemed to be of sufficient maturity to contain cultural modification will be inspected, as will any areas with outcropping rock
- Some areas may not be physically surveyed if RAPs and OzArk staff agree they are too disturbed or possess a very low likelihood of sites.

In the field, OzArk staff will identify, record and evaluate physical (i.e. archaeological) evidence. Site recording will capture all the information required to complete current AHIMS site recording forms (e.g. site location, site boundary, site plan, representative photographs, artefact recording and feature recording).

All survey will be undertaken with the assistance of RAP representatives. Apart from their valuable experience in recognising and recording archaeological sites, the RAP representatives will be able to acquaint themselves with the Survey Area in order to inform the cultural value assessment.

4.4 TEST EXCAVATION

It is possible that the survey may identify landforms where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, the test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.

4.5 PHYSICAL FITNESS

The fieldwork for the survey would be completed in one week with two teams. Each team will consist of two OzArk archaeologists and two RAPs.

The terrain for this survey will be very demanding and will include the need to walk up steep gradients for long periods of time.

Some locations are remote and field workers may be away from vehicles for much of a day and will need to carry all food and water required. The weather at the time of the survey is also likely to be hot.

Therefore, all RAPs who apply to be involved with the field survey must be able to demonstrate physical fitness, not just for the efficiency of the survey but for the health and safety of the participants. OzArk will reserve the right to exclude any individual from the team who is not able to demonstrate that they will be able to cope with the conditions.

OzArk therefore asks that people seriously consider their own abilities and refrain from applying for survey work associated with this Project if they know that they are not able to cope with the conditions.

4.6 CULTURAL VALUES

Any cultural values relating to the Survey Area will be captured by the OzArk archaeologists (if such information is provided by RAPs during the survey) and included in the ACHAR.

In addition, should any RAPs/ have knowledge of cultural values regarding the Survey Area that they wish to share or that may affect this survey methodology, OzArk invites them to contact us so that these values can be recorded and/or responded to in this methodology.

REFERENCES

Brayshaw 1981 — Helen Brayshaw. *Archaeological survey of Authorisation 89, proposed site of Bloomfield Collieries' Coal Mine at Rix's Creek, Singleton*. Report for NSW NPWS.

Brayshaw 1986 — Brayshaw, H. 1986. *Aborigines of the Hunter Valley: a study of colonial records*. Scone and Hunter Historical Society: Scone.

Burke & Smith 2004 — Burke, H. and Smith, C. 2004. *The Archaeologist's Field Handbook*, Blackwell, Oxford.

DECCW 2010 — DECCW. 2010. *Aboriginal cultural heritage consultation requirements for proponents*. Department of Environment, Climate Change and Water (now OEH).

DECCW 2010b — DECCW. 2010. *Code of Practice for the Protection of Aboriginal Objects in NSW*. Department of Environment, Climate Change.

Dyall 1982 — Len Dyall. 1982. *A Preliminary Assessment of Aboriginal Relics on the area of Foybrook Power Station Project*. Report for ELCOMM.

GHD 2005 — GHD (International) Pty Limited. *Proposed Coal Stockpile at Newpac No. 1 Colliery, Ravensworth. Environmental Impact Statement, Volume 1*. Report for Resource Pacific Ltd.

Haglund 1982 — Hagland, L. 1982. *Archaeological Survey of Pikes Gully Colliery Area, Liddell, N.S.W.* Report for Longworth and McKenzie Pty. Limited.

HLA-Envirosciences 2005 — HLA Envirosciences (J. Czastka). *Preliminary Research Permit #1982: Excavations and Findings at Newdell Junction, Ravensworth*. Report for Macquarie Generation.

Mitchell 2002 — Mitchell, Dr. Peter. 2002. *Description for NSW (Mitchell) Landscapes Version 2*. Department of Environment and Climate Change NSW.

OEH 2011 — Office of Environment and Heritage. 2011. *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales*. Department of Environment, Climate Change and Water, Sydney.

OzArk 2013 — OzArk Environment & Heritage. 2013. *Due Diligence Assessment Proposed Track Maintenance Hillcrest Offset Area, Upper Hunter Valley NSW*. Report for Ravensworth Operations Pty Limited.

OzArk 2014a — OzArk Environment & Heritage. 2014. *Aboriginal Archaeological Values Assessment. Mount Owen Continued Operations. Near Ravensworth, Upper Hunter Valley, NSW*. Report for Mt Owen Pty Ltd.

OzArk 2014b — OzArk Environment & Heritage. 2014, *Aboriginal Archaeological Assessment. Ravensworth Offset Property Maintenance*. Report for Ravensworth Open Cut.

OzArk 2015 — OzArk Environment & Heritage. 2015. *Archaeological Due Diligence Assessment. Proposed Erosion Control Works. Hillcrest Offset Area, Upper Hunter Valley NSW*. Report for Ravensworth Open Cut, Glencore.

OzArk 2017a — OzArk Environment & Heritage. 2017. *Aboriginal Due Diligence Archaeological Assessment: Liddell Coal Offset Areas for Revegetation, Muswellbrook LGA*. Report for Liddell Coal Operations.

OzArk 2017b — OzArk Environment & Heritage. 2017. *Aboriginal Due Diligence Archaeological Assessment: Mitchell Hills South Offset Area, Liddell Coal Operations, Muswellbrook LGA*. Report for Liddell Coal Operations Pty Limited.

OzArk 2018 — OzArk Environment & Heritage. 2018. *Aboriginal and Historic Due Diligence Archaeological Assessment: Liddell Coal Operations DA305-11-01 Modification 7*. Report for Liddell Coal Operations Pty Limited.

Resource Planning 1991 — Resource Planning Pty Limited. 1991. *Environmental Impact Statement Mount Owen Coal Project Hebden - New South Wales*. Report for Hunter Valley Coal Corporation Pty Limited.

Tocomwall 2017 — Tocomwall Pty Ltd. *Hillcrest Aboriginal Cultural Values Assessment Report*. Report to Glencore Coal Assets Australia.

Umwelt 2003 — Umwelt (Australia) Pty Limited. 2003. *Survey and Assessment of Impact on Aboriginal Cultural Heritage and Archaeological Values, Main Creek, Hunter Valley, NSW*. Prepared for Glennies Creek Coal Management.

Umwelt 2006 — Umwelt (Australia) Pty Limited. 2006. *Aboriginal Cultural Heritage Management Strategy for the Mt Mowen Biodiversity Offset Areas*. Report for Report for Xstrata Mt Owen Pty Limited.

Umwelt 2007 — Umwelt (Australia) Pty Limited. 2007. *Environmental Assessment for Modification of Glendell Mine Operations* (3 Volumes). Report for Xstrata Mt Owen Pty Limited.

Umwelt 2010 — Umwelt (Australia) Pty Limited. 2010. *Ravensworth Operations Project Environmental Assessment, Volume 4*. Report for Xstrata Ravensworth Operations.

Appendix 2 Figure 6: Cover letter for the amended survey methodology (24 February 2020).

Note: At the time of the survey, Option 1B and Option 2B shown in Figure 1 in this document were no longer part of the Survey Boundary.

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24 February 2020

Members
Wanaruah Local Aboriginal Land Council
ceo@wanaruahlandcouncil.com.au

ADDITIONAL SURVEY AREA: BOWMANS CREEK WIND FARM POWERLINE EASEMENT

Dear Members,

On 18 October 2019, OzArk Environment & Heritage (OzArk) circulated the *Aboriginal Cultural Heritage Survey Methodology: Bowmans Creek Wind Farm, Muswellbrook, Singleton and Upper Hunter Local Government Areas* to all Registered Aboriginal Parties (RAPs) in accordance with Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs). Survey of the study area was completed on 25 to 29 November 2019 by two teams each comprising two OzArk archaeologists and two RAPs.

The original survey methodology did not include a proposed powerline easement extending from the Project Site to Liddell Power Station in the south. As such, this addendum survey methodology has been prepared to inform all RAPs that the powerline easement has been added to the survey area and will be surveyed in the near future (**Figure 1**). The proposed powerline easement is approximately 32 kilometres (km) (maximum) in length and a 100 metre (m) wide corridor will be assessed. **Figure 1** also shows two optional sections: 1a and 1b; and 2a and 2b; both of which will be surveyed, but only one of each option will be included in the EIS. Survey of the electricity line will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales*.

The Additional Survey Area (**Figure 1**) starts near the southern-most turbine location (#65) and heads south to Lake Liddell. The portion of the proposed powerline route shown on **Figure 1** that extends to the north of the Additional Survey Area was assessed during the previous archaeological assessment of the Project Area. Any heavily modified landforms along the proposed powerline route, such as those associated with Lake Liddell or the disused mine/quarry site to the northeast of Lake Liddell, will not be assessed. These areas have been removed from the Additional Survey Area shown on **Figure 1**. Other than these areas, the entire length of the Additional Survey Area will be assessed through sampling all landform types within the survey area. In general, the terrain in the north of the Additional Survey Area consists of steep hills with a low archaeological potential based on the results of the survey already undertaken in similar landforms. In the south, the terrain is flatter, but in this area the disturbances from mining activity, electricity generation, roads and rail are greater. In addition, there are few natural waterways in this area and therefore the likelihood of recoding sites is lower, and due to the prevalent disturbances, if they are present, they are likely to be disturbed. Areas adjacent to the few streams that do exist in this area, such as adjacent to Bowmans Creek, have a raised archaeological potential.

A search of the Heritage Information Management System (AHIMS) database on 29 January 2020 returned 42 records for Aboriginal heritage sites within a 250 m buffer either side of the centre of the powerline. Of these sites, five valid sites are located within the 100 m wide Additional Survey Area (**Figure 2**). These sites are artefact sites (isolated artefacts or scatters). The additional survey will also assess four sites shown on **Figure 2** that are closely adjacent (i.e. within 20 m) to the Additional Survey Area to ensure that they do not

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extend into the Additional Survey Area. These sites include a potential archaeological deposit (37-2-2029), two artefact sites (an artefact scatter of 14 artefacts [37-2-5528] and an isolated find [37-3-0192]), and a ceremonial ring (37-2-2072). In addition, **Figure 2** shows the location of two areas identified as being Sensitive Archaeological Landforms (SALs). Neither of these SALs are in the Additional Survey Area, although nearby and similar landforms are included within the Additional Survey Area. The assessment, therefore, will also determine if the landforms within the Additional Survey Area in the vicinity of these SALs also have archaeological potential.

In addition to comments on the methodology presented here to assess the Additional Survey Area, we welcome any Aboriginal cultural heritage knowledge relevant to the area that you care to share. This input will help to improve our assessment outcomes and ensure Aboriginal cultural values are considered during the survey.

We will provide 21 days to comment on the additional study area as this is an addendum to the Stage 2-3 document previously sent. This period closes 5pm on **Friday 13 March 2020**. If you need any help supplying feedback (written or verbal), please do not hesitate to contact our office. Feedback can be emailed to rebecca@ozarkehm.com.au, or phone on 02 6882 0118, or by mail to PO Box 2069, Dubbo 2830 NSW.

Should you have any queries in relation to the enclosed information please do not hesitate to contact our office.

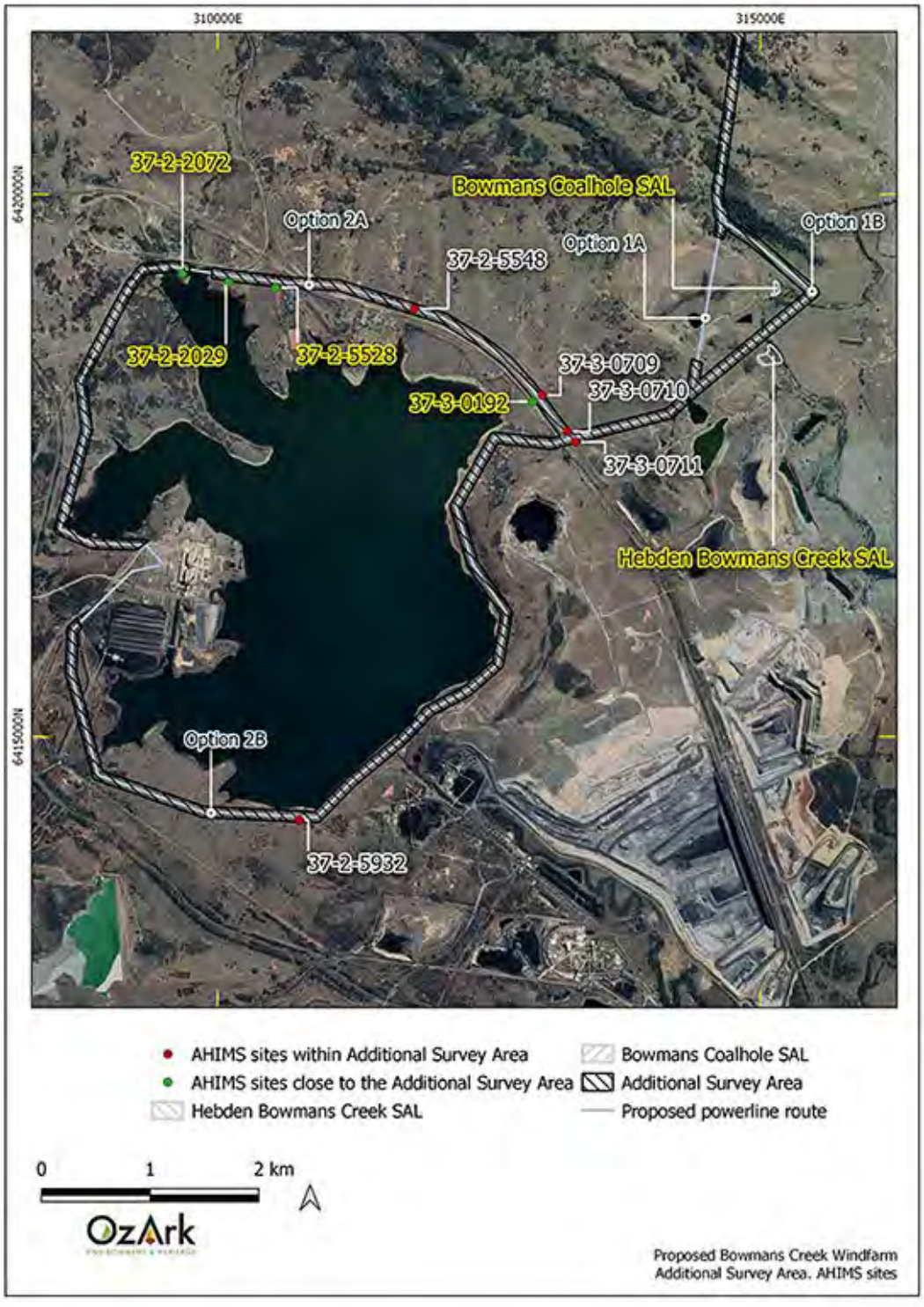
Kind regards,

Rebecca Hardman
OzArk Community Liaison & Administration

OzArk Environment & Heritage

Figure 1: Location of the Additional Survey Area.

Figure 2: Location of the AHIMS site locations within or near the Additional Survey Area.



STAGE 4

Appendix 2 Figure 7: Cover letter for the draft ACHAR (4 June 2020).

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4 June 2020

Members
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ABORIGINAL CULTURAL HERITAGE ASSESSMENT FOR THE BOWMANS CREEK WINDFARM.

Dear Members,

Thank-you for your continued participation as a Registered Aboriginal Party (RAP) and involvement in the above-mentioned project.

Epuron Projects Pty Ltd (the Proponent) would like to offer you the opportunity to provide feedback on the draft report that has been undertaken in accordance with stage four (4) of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCR).

As per the ACHCRs we are required to give you twenty-eight (28) days to supply feedback on the attached documents. This period closes on the **Thursday 2nd July 2020**. Should our office not be contacted within this time frame, we will presume that you are satisfied with the contents of the report as it stands.

Should you need any help supplying feedback or have any queries, please do not hesitate to contact our office.

Kind regards,

Rebecca Hardman
Community Liaison & Administration

Appendix 2 Figure 8: Cover letter for the revised draft ACHAR (11 March 2021).

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11 March 2021

ABORIGINAL CULTURAL HERITAGE ASSESSMENT UPDATE
BOWMAN CREEK WIND FARM

Dear Members,

We wish to apologise for the delay in correspondence and thank you for your registration of interest to become a Registered Aboriginal Party (RAP) for the proposed Bowman Creek Wind Farm (the Project). The Project is located approximately 10 kilometres (km) east of Muswellbrook and is within three local government areas (LGAs): Muswellbrook; Singleton; and Upper Hunter Shire.

The purpose of this letter is to update you in relation to the progress of this Project.

OzArk was contacted in mid-2019 by Hansen Bailey (now James Bailey and Associates), to complete an Aboriginal Cultural Heritage Assessment for the Project.

Since that time, four fieldwork survey sessions have been completed, namely:

- Fieldwork Session 1: 25–29 November 2019
- Fieldwork Session 2: 23–27 March 2020
- Fieldwork Session 3: 27 November 2020
- Fieldwork Session 4: 23 February 2021.

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The first two fieldwork sessions were reported in an earlier version of the *Aboriginal Cultural Heritage Assessment Report* (ACHAR) that you have already had the opportunity to review (sent to you on 4 July 2020 with a closing date for comments on 2 September 2020).

However, following your review of the draft ACHAR, two developments occurred that have resulted in changes to the ACHAR:

- Fieldwork Session 3: 27 November 2020. In the draft ACHAR you have reviewed there was a portion of the electricity transmission line (ETL) that was not able to be surveyed. This portion along the northern shore of Lake Liddell leading to the Liddell Power Station was not able to be surveyed when the main survey took place as the owner, AGL, declined access due to COVID-19 concerns. As the COVID-19 restrictions eased, this portion of the proposed ETL was surveyed in November 2020
- Fieldwork Session 4: 23 February 2021. In early 2021 the alignment of the ETL was re-designed meaning that further survey was required of any portions of the ETL not previously surveyed.

The attached ACHAR includes the results of all survey effort in relation to the Project.

As you have previously had the opportunity to review the bulk of the ACHAR (as per the Stage 4 requirements of the *Aboriginal cultural heritage consultation requirements for proponents*) and due to tight Project timelines, we ask that you provide any comments you may have in 14 days (by **26 March 2021**). If this is not possible, or if you have further questions with regard to the Project, please contact us at your earliest convenience.

Kind regards,

Rebecca Hardman
Community Liaison & Administration

APPENDIX 3: EXTENSIVE AHIMS SEARCH

2019 AHIMS search undertaken prior to the survey of the Project Boundary

Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans
Client Service ID : 452974

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-2-0159	Dangar Field Rock Hill	AGD	56	311930	6441250	Open site	Valid	Artefact : -	Open Camp Site	156
	Contact	Recorders	Helen Brayshaw					Permits		
37-2-0543	Telecom site 3;	AGD	56	311600	6418700	Open site	Valid	Artefact : -	Open Camp Site	2032,103038
	Contact	Recorders	S Davies Davies Heritage Consultants Pty Ltd					Permits		
37-3-0040	Bowmans Creek;	AGD	56	320446	6420874	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	Len Dyall					Permits		
37-3-1200	Hillcrest 12	GDA	56	313737	6421559	Open site	Valid	Artefact : 1		
	Contact	Recorders	OzArk Environmental and Heritage Management,Mr.Ben Churcher					Permits		
37-3-1417	HCR007AS	GDA	56	313092	6419670	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1418	HCR008IF	GDA	56	313100	6419716	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1419	HCR009IF	GDA	56	313086	6419747	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1420	HCR010IF	GDA	56	313080	6419832	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1421	HCR014AS	GDA	56	312941	6419736	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1422	HCR015IF	GDA	56	312332	6420241	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1423	HCR017IF	GDA	56	312464	6419715	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1424	HCR016IF	GDA	56	312455	6419717	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1425	HCR018IF	GDA	56	312486	6419515	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1426	HCR019IF	GDA	56	312440	6419441	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1427	HCR020IF	GDA	56	312439	6419438	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1447	HCR049IF	GDA	56	313521	6419547	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1448	HCR050IF	GDA	56	313488	6419426	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		

Report generated by AHIMS Web Service on 27/09/2019 for Stephanie Rusden for the following area at Datum :GDA, Zone : 56, Eastings : 311680 - 335680, Northings : 6418525 - 6442525 with a Buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 108

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 1 of 7

Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans
Client Service ID : 452974

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-3-1449	HCR052IF	GDA	56	313299	6418942	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1450	HCR051AS	GDA	56	313501	6419378	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1452	HCR054IF	GDA	56	312959	6419367	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1453	HCR056IF	GDA	56	313139	6419250	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1454	HCR055IF	GDA	56	313056	6419354	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1455	HRC057AS	GDA	56	313048	6419288	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1456	HCR058IF	GDA	56	312968	6419139	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1457	HCR062IF	GDA	56	312753	6418856	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1458	HCR060IF	GDA	56	312959	6419062	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1459	HCR059IF	GDA	56	312956	6419125	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1460	HCR066IF	GDA	56	312807	6418709	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1461	HCR061AS	GDA	56	312772	6418950	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1462	HCR064IF	GDA	56	312805	6418759	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1463	HCR065IF	GDA	56	312797	6418759	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1464	HCR063IF	GDA	56	312804	6418761	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1465	HCR067IF	GDA	56	312807	6418707	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1466	HCR069IF	GDA	56	312837	6418609	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		

Report generated by AHIMS Web Service on 27/09/2019 for Stephanie Rusden for the following area at Datum :GDA, Zone : 56, Eastings : 311680 - 335680, Northings : 6418525 - 6442525 with a Buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 108

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans
Client Service ID : 452974

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-3-1468	HCR068IF	GDA	56	312802	6418670	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1469	HCR071IF	GDA	56	312679	6418867	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1428	HCR022IF	GDA	56	313186	6421042	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1429	HCR023IF	GDA	56	313190	6421045	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1430	HCR024IF	GDA	56	313420	6421285	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1431	HCR025IF	GDA	56	313289	6421462	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1432	HCR026IF	GDA	56	312676	6421887	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1433	HCR027IF	GDA	56	312579	6421976	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1434	HCR028IF	GDA	56	312514	6422009	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1435	HCR030AS	GDA	56	313347	6419602	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1436	HCR031IF	GDA	56	313359	6419686	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1437	HCR032IF	GDA	56	313360	6419695	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1438	HCR033IF	GDA	56	313304	6419721	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1439	HCR034AS	GDA	56	313297	6419684	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1440	HCR035AS	GDA	56	313394	6419833	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1442	HCR036AS	GDA	56	313424	6419832	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1443	HCR037AS	GDA	56	313472	6419864	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		

Report generated by AHIMS Web Service on 27/09/2019 for Stephanie Rusden for the following area at Datum :GDA, Zone : 56, Eastings : 311680 - 335680, Northings : 6418525 - 6442525 with a Buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 108

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans
Client Service ID : 452974

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-3-1444	HCR038IF	GDA	56	313580	6419791	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1445	HCR039AS	GDA	56	313539	6419752	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-2-5900	HVO/2019PP/MHIA/1	GDA	56	311693	6423159	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms Jessica Blackman,Yancoal Australia Ltd					Permits		
37-3-1413	HCR001IF	GDA	56	312834	6420899	Open site	Valid	Artefact : 1		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1414	HRC005IF	GDA	56	312666	6420325	Open site	Valid	Artefact : 1		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1415	HCR011	GDA	56	313117	6419843	Open site	Valid	Artefact : 1		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1416	HCR012AS	GDA	56	313198	6420270	Open site	Valid	Artefact : 1		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1470	HCR101IF	GDA	56	312050	6419219	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1471	HCR100IF	GDA	56	312043	6419260	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1472	HCR102IF	GDA	56	312050	6419212	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1473	HCR103IF	GDA	56	312053	6419198	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1474	HCR104IF	GDA	56	312023	6419189	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1475	HCR105IF	GDA	56	312004	6419166	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1476	HCR021IF	GDA	56	312440	6419438	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1477	HCR107IF	GDA	56	311966	6419113	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1478	HCR106IF	GDA	56	311982	6419138	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1479	HCR108IF	GDA	56	311967	6419112	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		

Report generated by AHIMS Web Service on 27/09/2019 for Stephanie Rusden for the following area at Datum :GDA, Zone : 56, Eastings : 311680 - 335680, Northings : 6418525 - 6442525 with a Buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 108

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans
Client Service ID : 452974

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-3-1480	HCR109IF	GDA	56	311936	6419069	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1481	HCR110IF	GDA	56	311936	6419069	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1482	HCR111IF	GDA	56	311946	6419035	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1483	HCR095AIF	GDA	56	313176	6419579	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1484	HCR095BIF	GDA	56	313177	6419575	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1485	HCR096IF	GDA	56	313176	6419580	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1486	HCR098IF	GDA	56	312030	6419420	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1487	HCR099IF	GDA	56	312036	6419290	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-2-5546	HCR112IF	GDA	56	311895	6419025	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-2-5547	HCR113AS	GDA	56	311878	6419009	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-2-5548	HRC114AS	GDA	56	311814	6418947	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1441	HCR013AS	GDA	56	312956	6419788	Open site	Valid	Artefact : 1		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1468	HCR121AS	GDA	56	312439	6419438	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1489	HCR040AS	GDA	56	313078	6419482	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1495	Hillcrest 23	GDA	56	311998	6419158	Open site	Valid	Artefact : 1		103538
	Contact	Recorders	OzArk Environmental and Heritage Management,Mr.Ben Churcher					Permits		
37-3-0272	ROUCHEL 3;	AGD	56	314400	6440950	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Pam Dean-Jones					Permits		
37-3-0049	Cedar Creek Cedar Creek C	AGD	56	315384	6422609	Open site	Valid	Artefact : -	Open Camp Site	

Report generated by AHIMS Web Service on 27/09/2019 for Stephanie Rusden for the following area at Datum :GDA, Zone : 56, Eastings : 311680 - 335680, Northings : 6418525 - 6442525 with a Buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 108

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans
Client Service ID : 452974

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Len Dyall					Permits		
37-3-0270	LOUCHEL 1;	AGD	56	313450	6441300	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Pam Dean-Jones					Permits		
37-3-0271	ROUCHEL 2;	AGD	56	314400	6441000	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Pam Dean-Jones					Permits		
37-3-0030	Stringybark Creek	AGD	56	320032	6418580	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0032	Bowmans Creek;	AGD	56	316349	6419883	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0038	Stringybark Creek	AGD	56	320489	6418589	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0041	Bowmans Creek;	AGD	56	319989	6420866	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0042	Bowmans Creek;	AGD	56	319075	6420849	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0043	Bowmans Creek;	AGD	56	318178	6419917	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0044	Bowmans Creek;	AGD	56	317247	6420815	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0047	Cedar Creek;Cedar Creek A;	AGD	56	316324	6421255	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0048	Cedar Creek;Cedar Creek B;	AGD	56	315401	6421695	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-2-2213	AN3 (Energy Australia)	GDA	56	311726	6418781	Open site	Valid	Artefact : 33		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		
37-3-1203	hillcrest 1	GDA	56	313030	6419269	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Nicholas Harrop					Permits		
37-3-1204	hillcrest 2	GDA	56	312928	6419360	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.NICHOLAS HARROP					Permits		
37-3-1205	Hillcrest 8	GDA	56	312776	6418634	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.NICHOLAS HARROP					Permits		
37-3-1206	Hillcrest 10	GDA	56	312929	6422318	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.NICHOLAS HARROP					Permits		
37-3-1208	Hillcrest 14	GDA	56	313152	6419381	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 27/09/2019 for Stephanie Rusden for the following area at Datum :GDA, Zone : 56, Eastings : 311680 - 335680, Northings : 6418525 - 6442525 with a Buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 108

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Office of Environment & Heritage NSW

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans
Client Service ID : 452974

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.Ben Churcher					Permits		
37-3-1209	Hillcrest 15	GDA	56	313224	6419403	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Ben Churcher					Permits		
37-3-1403	Bowman Coalhole Ck IF2	GDA	56	315156	6419144	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Philippa Sokol					Permits		
37-3-1405	Hebden Bowmans Ck IF1	GDA	56	315085	6418585	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Philippa Sokol					Permits		
37-3-1406	Bowman Coalhole Ck IF1	GDA	56	315104	6419071	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Philippa Sokol					Permits		
37-3-1408	Liddell Muddle OS1	GDA	56	313636	6419449	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management,OzArk Environmental and Herita					Permits		
37-3-1409	Liddell Muddle IF1	GDA	56	313598	6419226	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Philippa Sokol					Permits		

Report generated by AHIMS Web Service on 27/09/2019 for Stephanie Rusden for the following area at Datum :GDA, Zone : 56, Eastings : 311680 - 335680, Northings : 6418525 - 6442525 with a Buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 108

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AHIMS search undertaken prior to Fieldwork Sessions 3 and 4 (ETL corridor)

Office of Environment & Heritage NSW

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans Ck Wind Farm
Client Service ID : 480192

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-3-0192	Telecom site 4;	AGD	56	312800	6417900	Open site	Valid	Artefact : -	Isolated Find	2032,103038
	Contact	Recorders	S Davies,Davies Heritage Consultants Pty Ltd					Permits		
37-2-0176	Lake Liddell;	AGD	56	309700	6414400	Open site	Valid	Artefact : -	Open Camp Site	4525
	Contact	Recorders	Len Dyall					Permits		
37-2-0188	Liddell,Liddell Site F;	AGD	56	308900	6414600	Open site	Valid	Artefact : -	Open Camp Site	4525
	Contact	Recorders	ASRSYS					Permits		
37-2-0037	Liddell Power Station;	AGD	56	309133	6414535	Open site	Valid	Artefact : -	Open Camp Site	310,4525
	Contact	Recorders	ASRSYS					Permits		
37-2-5932	LI-AS1-19	GDA	56	310751	6414232	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Geordie Oakes,AECOM Australia Pty Ltd - Sydney					Permits		
37-3-0455	SP3	GDA	56	313596	6417672	Open site	Destroyed	Artefact : -		100886
	Contact	Recorders	Umwelt (Australia) Pty Limited,Umwelt (Australia) Pty Limited,Miss.Nicola Roche					Permits	2896	
37-3-0456	SP2	GDA	56	313298	6417709	Open site	Destroyed	Artefact : -		100886
	Contact	Recorders	Umwelt (Australia) Pty Limited,Umwelt (Australia) Pty Limited,Miss.Nicola Roche					Permits	2896	
37-3-0457	SP1	GDA	56	314039	6417756	Open site	Destroyed	Artefact : 1		100886
	Contact	Recorders	Umwelt (Australia) Pty Limited,Umwelt (Australia) Pty Limited,Miss.Nicola Roche					Permits	2896	
37-2-2020	ANT 3	AGD	56	310226	6419128	Open site	Valid	Artefact : 1		
	Contact S Scanlon	Recorders	Iain Stuart					Permits	2165,2417	
37-2-2021	ANT 4	AGD	56	310261	6419116	Open site	Valid	Artefact : 25		
	Contact S Scanlon	Recorders	Iain Stuart					Permits	2425	
37-2-2022	ANT 5	AGD	56	310226	6419122	Open site	Valid	Artefact : 4		
	Contact S Scanlon	Recorders	Iain Stuart					Permits	2165,2417	
37-2-2023	ANT 6	AGD	56	310226	6419128	Open site	Valid	Artefact : 1		
	Contact S Scanlon	Recorders	Iain Stuart					Permits	2165,2417	
37-2-2060	ANT 7	AGD	56	309700	6419260	Open site	Valid	Artefact : 4		
	Contact Searle	Recorders	Iain Stuart					Permits	2425	
37-2-2029	Hunter Gas Project PAD	AGD	56	310000	6419000	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact T Russell	Recorders	MCH - McCardle Cultural Heritage Pty Ltd					Permits	2276	
37-2-2072	ANT 22	AGD	56	309572	6419078	Open site	Valid	Ceremonial Ring (Stone or Earth) : 3		99852,99853,99854
	Contact	Recorders	J Czastka,Doctor Alan Williams					Permits		
37-3-0709	AN1 (Liddell Mine)	AGD	56	312884	6417959	Open site	Valid	Artefact : 1		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		

Report generated by AHIMS Web Service on 29/01/2020 for Stephanie Rusden for the following area at Search using shape-file Electricity easement_500m buffer2.SHP with a buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 42

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans Ck Wind Farm
Client Service ID : 480192

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-3-0710	Site cAN2 (Liddle Mine)	AGD	56	313116	6417624	Open site	Valid	Artefact : 8		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		
37-2-2213	AN3 (Energy Australia)	GDA	56	311726	6418781	Open site	Valid	Artefact : 33		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		
37-2-2214	AN4 (Energy Australia)	GDA	56	311670	6418816	Open site	Valid	Artefact : 2		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		
37-2-2215	AN5 (Energy Australia)	GDA	56	311642	6418872	Open site	Valid	Artefact : 3		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		
37-2-2216	AN6 (Energy Australia)	GDA	56	311143	6419062	Open site	Valid	Artefact : 2		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		
37-2-2217	AN7 (Energy Australia)	GDA	56	310665	6419305	Open site	Valid	Artefact : 1		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		
37-2-2218	AN8 (Energy Australia)	GDA	56	310519	6419371	Open site	Valid	Artefact : 3		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		
37-3-0711	SP2 (Liddle Mine)	AGD	56	313193	6417529	Open site	Valid	Artefact : 19		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited					Permits		
37-2-0543	Telecom site 3;	AGD	56	311600	6418700	Open site	Valid	Artefact : -	Open Camp Site	2032,103038
	Contact	Recorders	S Davies,Davies Heritage Consultants Pty Ltd					Permits		
37-3-1205	Hillcrest 8	GDA	56	312776	6418634	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.NICHOLAS HARROP					Permits		
37-3-1201	DR-OS1	GDA	56	312779	6418157	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.NICHOLAS HARROP					Permits		
37-3-1202	DR-IF1	GDA	56	312853	6418045	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.NICHOLAS HARROP					Permits		
37-3-1403	Bowman Coalhole Ck IF2	GDA	56	315156	6419144	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Philippa Sokol					Permits		
37-3-1405	Hebden Bowmans Ck IF1	GDA	56	315085	6418585	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Philippa Sokol					Permits		
37-3-1406	Bowman Coalhole Ck IF3	GDA	56	315104	6419071	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Philippa Sokol					Permits		
37-3-1451	HCR053AS	GDA	56	312976	6418424	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1467	HCR0070AS	GDA	56	312853	6418481	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		

Report generated by AHIMS Web Service on 29/01/2020 for Stephanie Rusden for the following area at Search using shape-file Electricity easement_500m buffer2.SHP with a buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 42

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Office of Environment & Heritage NSW

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans Ck Wind Farm
Client Service ID : 480192

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-2-5528	HCR074AS	GDA	56	310534	6419141	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1477	HCR107IF	GDA	56	311966	6419113	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1479	HCR109IF	GDA	56	311967	6419112	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1480	HCR109IF	GDA	56	311936	6419069	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1481	HCR110IF	GDA	56	311936	6419069	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1482	HCR111IF	GDA	56	311946	6419035	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-2-5546	HCR112IF	GDA	56	311895	6419025	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-2-5547	HCR113AS	GDA	56	311878	6419009	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-2-5548	HCR114AS	GDA	56	311814	6418947	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		

Report generated by AHIMS Web Service on 29/01/2020 for Stephanie Rusden for the following area at Search using shape-file Electricity easement_500m buffer2.SHP with a buffer of 0 meters. Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 42

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Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans Ck Wind Farm
Client Service ID : 502664

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-3-0390	Ravensworth Massacre	AGD	56	317000	6409000	Open site	Valid	Conflict : -	Massacre	100865,10222 0,102380
	Contact	Recorders	Ms.Adrienne Howe-Piening					Permits		
37-3-0056	Stringybark Creek;Hebden;	GDA	56	316890	6416254	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	ASRSYS,OzArk Environmental and Heritage Management,Mr.Ben Churcher					Permits		
37-3-0614	Bowmans Creek 2	GDA	56	317816	6409176	Open site	Destroyed	Artefact : -		99019,100895, 102380
	Contact	Recorders	Janice Wilson					Permits	2267	
37-3-0758	York Creek 15	AGD	56	317743	6411011	Open site	Valid	Artefact : 7		102380
	Contact	Recorders	Janice Wilson					Permits		
37-3-0762	Bowmans Ck 6	GDA	56	317645	6410765	Open site	Valid	Artefact : 1		102380
	Contact	Recorders	Janice Wilson					Permits		
37-3-0746	York Creek 3	AGD	56	317639	6410817	Open site	Valid	Artefact : 17		102380
	Contact	Recorders	Janice Wilson					Permits		
37-3-0985	REA89	GDA	56	317742	6409391	Open site	Destroyed	Artefact : -		103364
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,OzArk Environmental and Herita					Permits		
37-3-1155	MT OWEN ISOLATED FIND2	GDA	56	317854	6411236	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Mary-Jean Sutton,Virtus Heritage					Permits		
37-3-1187	MOCO IF-19	GDA	56	317195	6409045	Open site	Destroyed	Artefact : 1		
	Contact	Recorders	OzArk Environmental and Heritage Management,OzArk Environmental and Herita					Permits		
37-3-1188	MOCO IF-20	GDA	56	317236	6408936	Open site	Destroyed	Artefact : 1		
	Contact	Recorders	OzArk Environmental and Heritage Management,OzArk Environmental and Herita					Permits		
37-3-1198	MOCO OS-10	GDA	56	317840	6409364	Open site	Valid	Artefact : 1		
	Contact	Recorders	OzArk Environmental and Heritage Management,OzArk Environmental and Herita					Permits		
37-3-1225	REA 444 (Tower 31)	GDA	56	317718	6409098	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Ms.Alison Lamond,Ms.Alison Lamond					Permits		
37-3-1573	Glendell North OS16	GDA	56	317599	6410970	Open site	Partially Destroyed	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,OzArk Environmental and Herita					Permits		
37-3-1515	Glendell North IFZ0	GDA	56	318022	6409310	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Stephanie Rusden					Permits		
37-3-1516	Glendell North IF22	GDA	56	317984	6410954	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Stephanie Rusden					Permits		
37-3-1522	Glendell North IF14	GDA	56	317752	6410825	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Stephanie Rusden					Permits		

Report generated by AHIMS Web Service on 06/05/2020 for Stephanie Rusden for the following area at Search using shape-file HB_Transport routesbuffer.SHP with a buffer of 0 meters.
Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 18

Office of Environment & Heritage

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Bowmans Ck Wind Farm
Client Service ID : 502664

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
37-3-1523	Glendell North IF13	GDA	56	317688	6410830	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Stephanie Rusden					Permits		
37-3-1524	Glendell North IF12	GDA	56	317765	6410903	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management,Miss.Stephanie Rusden					Permits		

Report generated by AHIMS Web Service on 06/05/2020 for Stephanie Rusden for the following area at Search using shape-file HB_Transport routesbuffer.SHP with a buffer of 0 meters.
Additional Info : Survey. Number of Aboriginal sites and Aboriginal objects found is 18

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AHIMS search undertaken in February 2022

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : 18022022
Client Service ID : 660767

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
37-2-6263	Liddell Power Station-IF1	GDA	56	308766	6418308	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Taylor Foster					Permits		
37-2-5923	LLL-19-04	GDA	56	310731	6418631	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Joel Deacon,Arrow Heritage Solutions					Permits		
37-3-0466	LID25	GDA	56	314500	6417826	Open site	Destroyed	Artefact : -		100666,10088 6
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Umwelt (Australia) Pty Limited -					Permits	2896	
37-2-5546	HCR112IF	GDA	56	311895	6419025	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1477	HCR107IF	GDA	56	311966	6419113	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1473	HCR103IF	GDA	56	312053	6419198	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1462	HCR064IF	GDA	56	312805	6418759	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1466	HCR069IF	GDA	56	312837	6418609	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1467	HCR0070AS	GDA	56	312853	6418481	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-0468	LID 7 (Duplicate copy see 37-3-0447)	AGD	56	313560	6416510	Open site	Valid	Artefact : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users					Permits		
37-2-2214	AN4 (Energy Australia)	GDA	56	311670	6418816	Open site	Valid	Artefact : 2		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited - Individual users					Permits		
37-3-1479	HCR108IF	GDA	56	311967	6419112	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1459	HCR059IF	GDA	56	312956	6419125	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-0465	LID24	GDA	56	314874	6418090	Open site	Destroyed	Artefact : -		100666,10088 6
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Umwelt (Australia) Pty Limited -					Permits	2896	
37-3-0711	SP2 (Liddle Mine)	AGD	56	313193	6417529	Open site	Valid	Artefact : 19		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited - Individual users					Permits		
37-3-1454	HCR055IF	GDA	56	313056	6419354	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1450	HCR051AS	GDA	56	313501	6419378	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1406	Bowman Coalhole Ck IF1	GDA	56	315104	6419071	Open site	Valid	Artefact : -		103769

Report generated by AHIMS Web Service on 18/02/2022 for Ben Churcher for the following area at Datum :GDA, Zone : 56, Eastings : 308091.0 - 315750.0, Northings : 6416386.0 - 6419457.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 100

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : 18022022
Client Service ID : 660767

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Philippa Sokol					Permits		
37-3-1486	HCR098IF	GDA	56	312030	6419420	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1488	HCR121AS	GDA	56	312439	6419438	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1476	HCR021IF	GDA	56	312440	6419438	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1205	Hillcrest 8	GDA	56	312776	6418634	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Nicholas James Harrop					Permits		
37-3-1461	HCR061AS	GDA	56	312772	6418950	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-0455	SP3	GDA	56	313596	6417672	Open site	Destroyed	Artefact : -		100816
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Umwelt (Australia) Pty Limited -					Permits	2896	
37-2-2022	ANT 5	AGD	56	310226	6419122	Open site	Valid	Artefact : 4		
	Contact S Scanlon	Recorders	Iain Stuart					Permits	2165,2417	
37-2-2021	ANT 4	AGD	56	310261	6419116	Open site	Valid	Artefact : 25		
	Contact S Scanlon	Recorders	Iain Stuart					Permits	2425	
37-3-1403	Bowman Coalhole Ck IF2	GDA	56	315156	6419144	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Philippa Sokol					Permits		
37-2-5922	LLL-19-03	GDA	56	310750	6418595	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Joel Deacon,Arrow Heritage Solutions					Permits		
37-2-6043	Hillcrest OS-02	GDA	56	311249	6419159	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-2-0543	Telecom site 3;	AGD	56	311600	6418700	Open site	Valid	Artefact : -	Open Camp Site	2032,103038
	Contact	Recorders	S Davies,Davies Heritage Consultants Pty Ltd					Permits		
37-2-5548	HRC114AS	GDA	56	311814	6418947	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1463	HCR065IF	GDA	56	312797	6418759	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1464	HCR063IF	GDA	56	312804	6418761	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1465	HCR067IF	GDA	56	312807	6418707	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-0192	Telecom site 4;	AGD	56	312800	6417900	Open site	Valid	Artefact : -	Isolated Find	2032,103038
	Contact	Recorders	S Davies,Davies Heritage Consultants Pty Ltd					Permits		
37-3-1451	HCR053AS	GDA	56	312976	6418424	Open site	Valid	Artefact : -		

Report generated by AHIMS Web Service on 18/02/2022 for Ben Churcher for the following area at Datum :GDA, Zone : 56, Eastings : 308091.0 - 315750.0, Northings : 6416386.0 - 6419457.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 100

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 18022022
Client Service ID : 660767

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1452	HCR054IF	GDA	56	312959	6419367	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1593	Liddell Hebden Rd IF-01	GDA	56	314197	6418086	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
37-3-1469	HCR071IF	GDA	56	312679	6418867	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-0447	LID7	AGD	56	313563	6416505	Open site	Destroyed	Artefact : -		100666,10088 6
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users					Permits	1301	
37-2-2216	AN6 (Energy Australia)	AGD	56	311143	6419062	Open site	Valid	Artefact : 2		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited - Individual users					Permits		
37-3-1481	HCR110IF	GDA	56	311936	6419069	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1482	HCR111IF	GDA	56	311946	6419035	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1495	Hillcrest 23	GDA	56	311998	6419158	Open site	Valid	Artefact : 1		103538
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-3-1471	HCR100IF	GDA	56	312043	6419260	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1427	HCR020IF	GDA	56	312439	6419438	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1204	hillcrest 2	GDA	56	312928	6419360	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Nicholas James Harrop					Permits		
37-2-2029	Hunter Gas Project PAD	AGD	56	310000	6419000	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact T Russell	Recorders	MCH - McCardle Cultural Heritage Pty Ltd					Permits	2276	
37-3-0710	Site cAN2 (Liddle Mine)	AGD	56	313116	6417624	Open site	Valid	Artefact : 8		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited - Individual users					Permits		
37-3-0456	SP2	GDA	56	313298	6417709	Open site	Destroyed	Artefact : -		100886
	Contact	Recorders	Umwelt (Australia) Pty Limited - individual users,Umwelt (Australia) Pty Limited -					Permits	2896	
37-3-0445	LID9	AGD	56	313382	6416706	Open site	Destroyed	Artefact : -		100666,10088 6
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users					Permits	1301	
37-2-2072	ANT 22	AGD	56	309572	6419078	Open site	Valid	Ceremonial Ring (Stone or Earth) : 3		99852,99853,9 9854
	Contact	Recorders	I Czastka,Doctor Alan Williams					Permits		

Report generated by AHIMS Web Service on 18/02/2022 for Ben Churcher for the following area at Datum :GDA, Zone : 56, Eastings : 308091.0 - 315750.0, Northings : 6416386.0 - 6419457.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 100

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 18022022
Client Service ID : 660767

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
37-3-1203	hillcrest 1	GDA	56	313030	6419269	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Nicholas Harrop					Permits		
37-3-1455	HRC057AS	GDA	56	313048	6419288	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1208	Hillcrest 14	GDA	56	313152	6419381	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Ben Churcher					Permits		
37-3-1409	Liddell Muddie IF1	GDA	56	313598	6419226	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Philippa Sokol					Permits		
37-3-1405	Hebden Bowmans Cr IF1	GDA	56	315085	6418585	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Philippa Sokol					Permits		
37-2-6044	Hillcrest OS-01	GDA	56	311149	6419120	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-3-1475	HCR105IF	GDA	56	312004	6419166	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1468	HCR068IF	GDA	56	312802	6418670	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1460	HCR066IF	GDA	56	312807	6418709	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1592	Liddell Hebden Rd OS-01	GDA	56	314202	6418024	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
37-3-1209	Hillcrest 15	GDA	56	313224	6419403	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Ben Churcher					Permits		
37-2-2023	ANT 6	AGD	56	310226	6419128	Open site	Valid	Artefact : 1		
	Contact S Scanlon	Recorders	Iain Stuart					Permits	2165,2417	
37-2-5928	LLL-19-09	GDA	56	310718	6418618	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Joel Deacon,Arrow Heritage Solutions					Permits		
37-2-5926	LLL-19-07	GDA	56	310723	6418717	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Joel Deacon,Arrow Heritage Solutions					Permits		
37-2-2215	AN5 (Energy Australia)	GDA	56	311642	6418872	Open site	Valid	Artefact : 3		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited - Individual users					Permits		
37-2-5547	HCR113AS	GDA	56	311878	6419009	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1480	HCR109IF	GDA	56	311936	6419069	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1474	HCR104IF	GDA	56	312023	6419189	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		

Report generated by AHIMS Web Service on 18/02/2022 for Ben Churcher for the following area at Datum :GDA, Zone : 56, Eastings : 308091.0 - 315750.0, Northings : 6416386.0 - 6419457.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 100

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 18022022
Client Service ID : 660767

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
37-3-1487	HCR099IF	GDA	56	312036	6419290	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1472	HCR102IF	GDA	56	312050	6419212	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1426	HCR019IF	GDA	56	312440	6419441	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1457	HCR062IF	GDA	56	312753	6418856	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1456	HCR058IF	GDA	56	312968	6419139	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-0457	SP1	GDA	56	314039	6417756	Open site	Destroyed	Artefact : 1		100886
	Contact	Recorders	Umwelt (Australia) Pty Limited - individual users,Umwelt (Australia) Pty Limited -					Permits	2896	
37-2-6541	Liddell Power Station-IF2	GDA	56	310289	6419152	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
37-3-1401	Liddell Mountain Block OS2	GDA	56	313240	6418444	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Philippa Sokol					Permits		
37-3-1402	Liddell Mountain Block OS1	GDA	56	313477	6418480	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Philippa Sokol					Permits		
37-2-2060	ANT 7	AGD	56	309700	6419260	Open site	Valid	Artefact : 4		
	Contact Searle	Recorders	Iain Stuart					Permits	2425	
37-3-1453	HCR056IF	GDA	56	313139	6419250	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1448	HCR050IF	GDA	56	313488	6419426	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-0446	LID8	AGD	56	313534	6416723	Open site	Destroyed	Artefact : -		100666,10088 6
	Contact	Recorders	Umwelt (Australia) Pty Limited - individual users					Permits	1301	
37-3-1408	Liddell Muddle OS1	GDA	56	313636	6419449	Open site	Valid	Artefact : -		103769
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
37-2-2020	ANT 3	AGD	56	310226	6419128	Open site	Valid	Artefact : 1		
	Contact S Scanlon	Recorders	Iain Stuart					Permits	2165,2417	
37-2-5927	LLL-19-08	GDA	56	310709	6418673	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Joel Deacon,Arrow Heritage Solutions					Permits		
37-2-5925	LLL-19-06	GDA	56	310719	6418681	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Joel Deacon,Arrow Heritage Solutions					Permits		
37-2-5924	LLL-19-05	GDA	56	310750	6418625	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Joel Deacon,Arrow Heritage Solutions					Permits		

Report generated by AHIMS Web Service on 18/02/2022 for Ben Churcher for the following area at Datum :GDA, Zone : 56, Eastings : 308091.0 - 315750.0, Northings : 6416386.0 - 6419457.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 100

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 18022022
Client Service ID : 660767

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
37-2-5921	LLL-19-02	GDA	56	310761	6418559	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Joel Deacon,Arrow Heritage Solutions					Permits		
37-2-2213	AN3 (Energy Australia)	GDA	56	311726	6418781	Open site	Valid	Artefact : 33		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited - individual users					Permits		
37-3-1478	HCR106IF	GDA	56	311982	6419138	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1470	HCR101IF	GDA	56	312050	6419219	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-1201	DR-OS1	GDA	56	312779	6418157	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Nicholas James Harrop					Permits		
37-3-1202	DR-IF1	GDA	56	312853	6418045	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Nicholas James Harrop					Permits		
37-3-1458	HCR060IF	GDA	56	312959	6419062	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-0709	AN1 (Liddell Mine)	AGD	56	312884	6417959	Open site	Valid	Artefact : 1		100354
	Contact Searle	Recorders	Umwelt (Australia) Pty Limited - individual users					Permits		
37-2-5920	LLL-19-01	GDA	56	310541	6418298	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Joel Deacon,Arrow Heritage Solutions					Permits		
37-3-0467	LID23	GDA	56	314743	6417929	Closed site	Destroyed	Artefact : -		100666,10088 6
	Contact	Recorders	Umwelt (Australia) Pty Limited - individual users,Umwelt (Australia) Pty Limited -					Permits	2896	
37-3-1449	HCR052IF	GDA	56	313299	6418942	Open site	Valid	Artefact : -		
	Contact	Recorders	Tocomwall Pty Ltd					Permits		
37-3-0444	LID10	AGD	56	313379	6416469	Open site	Destroyed	Artefact : -		100666,10088 6
	Contact	Recorders	Umwelt (Australia) Pty Limited - individual users					Permits	1301	

** Site Status

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 18/02/2022 for Ben Churcher for the following area at Datum :GDA, Zone : 56, Eastings : 308091.0 - 315750.0, Northings : 6416386.0 - 6419457.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 100

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 18022022_2
Client Service ID : 660771

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
37-3-1589	Albano Road OS-03	GDA	56	323759	6427462	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-3-1588	Albano Road OS-02	GDA	56	324620	6427761	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-3-1596	Bowmans Tributary IF-01	GDA	56	322216	6421206	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-3-1594	Coalhole Creek OS-01	GDA	56	314697	6420643	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-3-0044	Bowmans Creek;	AGD	56	317247	6420815	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-1587	Albano Road OS-01	GDA	56	325775	6428122	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-3-0043	Bowmans Creek;	AGD	56	318178	6419917	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0049	Cedar Creek:Cedar Creek C	AGD	56	315384	6422609	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0042	Bowmans Creek;	AGD	56	319075	6420849	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-1595	Bowmans Tributary OS-01	GDA	56	321743	6421723	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-3-0032	Bowmans Creek;	AGD	56	316349	6419883	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0041	Bowmans Creek;	AGD	56	319989	6420866	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0048	Cedar Creek;Cedar Creek B;	AGD	56	315401	6421695	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		
37-3-0040	Bowmans Creek;	AGD	56	320446	6420874	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	Len Dyall					Permits		
37-3-1590	Albano Road IF-01	GDA	56	324175	6427570	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Ben Churcher					Permits		
37-3-0047	Cedar Creek;Cedar Creek A;	AGD	56	316324	6421255	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Len Dyall					Permits		

Report generated by AHIMS Web Service on 18/02/2022 for Ben Churcher for the following area at Datum :GDA, Zone : 56, Eastings : 313789.0 - 327516.0, Northings : 6419457.0 - 6437476.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 16

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View of Rock Lily Gully-HS01.

REVISED

HERITAGE IMPACT STATEMENT

BOWMANS CREEK WINDFARM

BOWMANS CREEK, NSW

FEBRUARY 2022

Report prepared by

OzArk Environment & Heritage

for James Bailey and Associates

on behalf of

Epuron Projects Pty Ltd

OzArk
Environment & Heritage

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DOCUMENT CONTROLS

Proponent	Epuron Projects Pty Ltd
Client	James Bailey and Associates
Document Description	Revised Heritage Impact Statement. Bowmans Creek Windfarm
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Prepared for	Prepared by
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ABBREVIATIONS AND GLOSSARY

DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement. A required document for major projects documenting all potential impacts to the environment, including heritage, that may arise due to the development.
EP&A Act	*Environmental Planning and Assessment Act 1979*
Heritage Act	*Heritage Act 1977.* Provides for the protection and conservation of historical places and objects of cultural heritage significance and the registration of such places and objects.
Heritage Council	The Heritage Council makes decisions about the care and protection of heritage places and items that have been identified as being significant to the people of NSW.
Heritage NSW	Government department tasked with ensuring compliance with the Heritage Act. Heritage NSW is part of the Department of Premier & Cabinet.
HHMP	Historic Heritage Management Plan
LEP	Local Environmental Plan
SEARs	Secretary's Environmental Assessment Requirements issued by the DPIE.
SHR	State Heritage Register. A register of places in NSW that are protected by the Heritage Act.
SSD	State Significant Development

EXECUTIVE SUMMARY

Report background

This revised *Historic Impact Statement* (HIS) incorporates and extends the HIS for the Bowmans Creek Wind Farm (the Project) finalised on 11 March 2021 and included the Environmental Impact Statement (EIS).

The EIS was placed on exhibition between 31 March 2021 and 11 May 2021. During this period 167 submissions were received from stakeholders, including 19 from government agencies and 148 from members of the public. A Submissions Report (James Bailey & Associates 2021) has been prepared to respond to the issues raised by these stakeholders.

In addition to this, in response to submissions and further detailed planning, several refinements were made to the Project layout (Amended Project). This includes removing four wind turbine generators (WTGs), relocating three others, as well as removing sections of access tracks and power reticulation infrastructure, along with the minor repositioning of other lineal infrastructure, to reduce ecological, visual, and other impacts.

The Amended Project design has resulted in an overall decrease in the extent of ground disturbance that will be associated with the Project.

In response to these Project changes, OzArk prepared an *Appendix Technical Report: HIS* in September 2021 that presented predictive modelling for the unsurveyed areas and concluded that it is unlikely that sites of high significance would be recorded in the additional areas.

Following their review of the *Appendix Technical Report*, Heritage NSW (HNSW) advised on 21 October 2021 that unsurveyed land with a slope less than 10 degrees in the Survey Boundary required additional survey.

In 2022, Epuron Projects Pty Ltd (the proponent) engaged OzArk Environment & Heritage (OzArk) to survey those areas not assessed for the 2021 EIS and as defined by HNSW's letter.

This revised HIS has been updated to include the results of the additional survey in 2022 and to assess likely harm to historic heritage from the Amended Project.

Project background

Epuron Projects Pty Ltd is seeking approval for the construction, operation, maintenance and decommissioning of the Bowmans Creek Wind Farm (Project).

The Project is located at Bowmans Creek, approximately 10 kilometres east of Muswellbrook.

The proponent seeks State Significant Development (SSD) Development Consent approval under Division 4.7 of Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) for the Project (SSD 10315).

OzArk Environment & Heritage (OzArk) has been engaged by James Bailey and Associates which is preparing the EIS to provide specialist historic heritage assessment for the Project.

Desktop database searches completed prior to the survey showed three listed heritage places located near the Survey Boundary (this term is defined later in this report).

The initial historic heritage assessment took place at the same time as the Aboriginal heritage assessment for the Project (OzArk 2021). The survey was completed by OzArk over 14 days from 25–29 November 2019; 23–27 March 2020; 27 November 2020; and 23 February 2021. Additional survey for the Amended Project over landforms not surveyed for the EIS took place on 18–19 January 2022.

During the survey, two historic heritage sites were recorded: Hilliers Creek-HS01 and Rock Lily Gully-HS01. The sites consist of a farm house ruin and a family grave site, respectively.

The two identified historic items have been assessed as having no significant historic value under the current Heritage NSW guidelines and the Burra Charter. It is noted, however, that Rock Lily Gully-HS01 has a personal significance for the current owners of the property and that the site should be respected as such. In addition, while Hilliers Creek-HS01 does not have significant heritage values, this report recommends that efforts be made to retain the site in the landscape.

The Survey Boundary is immediately outside the heritage curtilage of one item listed on the Singleton Local Environmental Plan (LEP) 2013, the ‘Former Roman Catholic Church’, located on Lot 1 DP1167323 to the north of Bowmans Creek Road. This item (I156) was listed in 2017 on the Singleton LEP 2013 and while it appears on the spatial heritage map, it is not listed in Schedule 5 of the LEP, nor on the State Heritage Register. Therefore, this report concludes that it is listed on the LEP but that the relevant registers have not been updated. As such, this report contains a Statement of Heritage Impact (SOHI) to assess whether there will be any impacts to the heritage values of the place and concludes that there will be no impacts from the Project.

The Survey Boundary is also shown to be close to the heritage curtilage of another two items listed on the Muswellbrook LEP 2009, ‘Fairview’ homestead (I47) and ‘Hillcrest’ homestead (I48). The heritage curtilage for both ‘Fairview’ and ‘Hillcrest’ are 80 m from the Survey Boundary and the homesteads themselves are over 300 m from the Survey Boundary. These items are discussed further in **Section 4.2.1**. As there is no proposed work within the defined heritage curtilage of these items, there are no management recommendations to avoid harm to these places.

On a broader level, it is recognised that the Project is occurring within a cultural landscape typified by small rural holdings containing a variety of structures such as homesteads that exemplify a long history of settlement over the past 150 years. An assessment of the Project’s impact on this cultural landscape is that it will, in places, have a visual impact that could disrupt the rural nature of the landscape. However, this impact will not adversely impact the fundamental values of the

cultural landscape that will remain physically intact. It is also recognised that the values identified in the vicinity of the Project are representative of rural landscapes across large areas of NSW and do not contain any rare or unique features worthy of special conservation efforts.

It was assessed that there are no areas within the Survey Boundary that are likely to contain significant archaeological deposits of conservation value.

Recommendations concerning the historic values within Survey Boundary are as follows:

1. All land-disturbing activities must be confined within the assessed Survey Boundary. Should project impacts change such that the area to be impacted is outside of the assessed Survey Boundary, then additional assessment may be required.
2. The grave site (Rock Lily Gully-HS01) at GDA Zone 56 316931E, 6428480N should be fenced with a high visibility barrier during construction of the Project to avoid inadvertent impacts. To mitigate visual impacts from the access roads, the proponent will restore the fence surrounding the graves and install plantings to shield the graves from the nearby proposed access tracks.
3. The location of Hilliers Creek-HS01 located at GDA Zone 56 323003E, 6435229N should be considered when the design of the access track is finalised to ensure that the place is avoided. No access track should be designed to be within 10 m of the farm house ruin.
4. There should be no impacts within Lot 1 DP1167323 that contains the 'Former Roman Catholic Church' (Item I156 on the Singleton LEP).
5. In terms of the cultural landscape surrounding the Survey Boundary, particularly along Albano (Bowmans Creek) Road, the proponent will commission a community-based heritage study that will document and archivally record any items held to be significant by the local community. This study will provide a record of the cultural landscape prior to any impacts associated with the Project commencing.
6. Procedures for the unexpected discovery of historic items and/or human skeletal material during the construction and/or use of the Project will be set out in an approved Historic Heritage Management Plan (HHMP) that will be developed following project approval in consultation with relevant regulators. Normally, no construction work associated with the Project can commence until the HHMP has been approved by the Department of Planning and Environment.

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

Epuron Projects Pty Ltd (the proponent) is seeking approval for the construction, operation, maintenance and decommissioning of the Bowmans Creek Wind Farm (the Amended Project referred henceforth as the Project).

The Project is located at Bowmans Creek, approximately 10 kilometres (km) east of Muswellbrook and 120 km from the Port of Newcastle in NSW (**Figure 1-2**).

The proponent seeks State Significant Development (SSD) Development Consent approval under Division 4.7 of Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) for the Project (SSD 10315). The proponent also seeks an Approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The two Applications are supported by the 'Bowmans Creek Wind Farm Environmental Impact Statement' (EIS) (Hansen Bailey 2020). This assessment supports the EIS.

The Project extends predominantly across two Local Government Areas (LGAs), being the Muswellbrook and Singleton Council LGAs. A small number of turbines are additionally proposed in the Upper Hunter Shire LGA.

The Project will generally involve the construction, operation, maintenance, and decommissioning comprised of:

- Up to 56 wind turbine sites (WTGs) consisting of:
    - A three-blade rotor mounted onto a tubular tower
    - Crane hardstand area
    - Turbine laydown area.
- Electricity infrastructure:
    - Up to two substations
    - A 330kv transmission line (with above and underground components) to transmit the generated electricity into the existing TransGrid network
    - Connections between the wind turbines and the substations, which will include a combination of underground reticulation cables and overhead powerlines.
- Ancillary infrastructure:
    - Operation and Maintenance Facility (O&M Facility)
    - Construction compound and storage facilities
    - Unsealed access tracks within the Project Boundary

  - Ongoing use of existing and additional monitoring masts and other monitoring
  - Temporary construction facilities (including concrete batching plant, laydown areas and rock crushing facilities).
- Minor upgrades to the road network to facilitate delivery of oversized loads (such as wind turbine components) to the Project
- Administrative activities (including boundary adjustments and subdivisions).

The Project impacts following the redesign of the Project in late 2021 are similar to that set out in EIS. However, in the Project redesign, the following changes have been made:

- Deletion of four WTGs, including WTG 10, 33, 60 and 61, hence a reduction from 60 WTGs to 56 WTGs
- Re-siting of WTG 8, 9, and 32
- Minor adjustments of several WTGs (micro siting up to 100 metres [m])
- Removal and relocation of site access tracks because of changes to the WTG layout and in response to individual landholder concerns
- A 10.4 km net reduction in underground power reticulation
- A 13.5 km net reduction in overhead power reticulation
- An overall reduction of project disturbance footprint of approximately 97.6 hectares (ha).

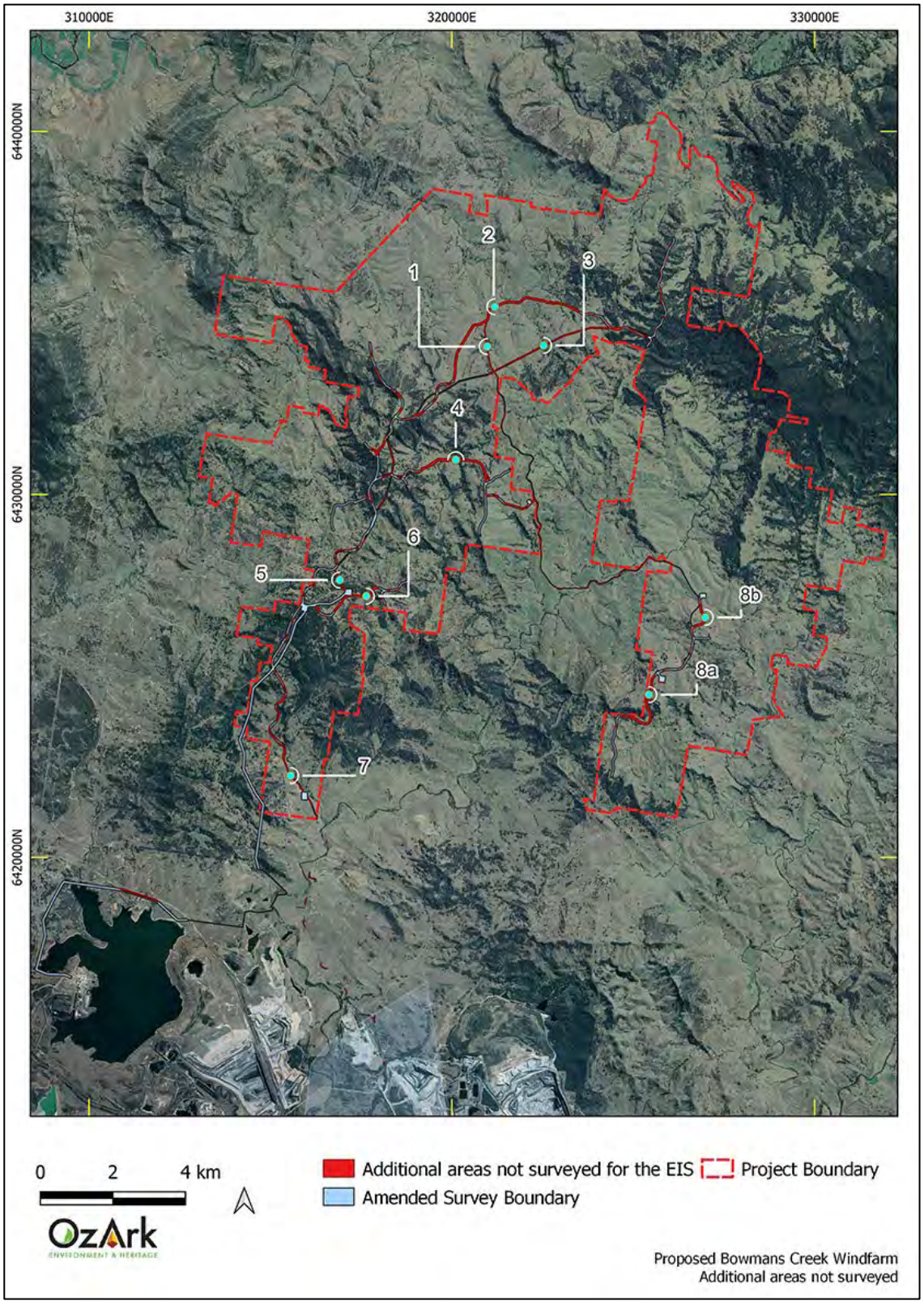
While the resigned Project has reduced the impact area, there were areas that are proposed for impact that were not surveyed for the EIS. These areas are:

1. A 1.6 km portion of Albano Road in the north of the Project Boundary
2. A new access track in the north of the Project Boundary that extends for approximately 4.5 km
3. A new corridor for overhead electricity reticulation in the north of the Project Boundary that extends for approximately 3.6 km
4. A new access track in the centre of the Project Boundary that extends for approximately 2.2 km
5. A new corridor for overhead electricity reticulation in the centre of the Project Boundary that extends for approximately 650 m
6. A new access track in the centre of the Project Boundary that extends for approximately 760 m
7. A new access track to the north of the O&M facility that extends for approximately 1.3 km
8. A new portions of access track in the east of the Project Boundary that extend for a total of approximately 3 km.

All other additional areas are very close to areas previously surveyed and are not considered a major addition to the areas already surveyed.

Figure 1-1 shows the additional areas numbered according to the list above. Each of these areas will be discussed in more detail in this report.

Figure 1-1: Major additional areas not surveyed for the EIS.



The conceptual project layout current Project is shown on **Figure 1-3**.

This assessment generally applies to the Project Boundary unless otherwise stipulated in this assessment and the EIS Project Description.

Within the Project Boundary, the Survey Boundary incorporates conservative buffers around all Project components (including turbine locations to allow for micro-siting). Therefore, the Survey Boundary encompasses all areas that may be disturbed by the Project.

Within the Survey Boundary, a Disturbance Area has been defined for the purposes of relevant assessments and represents the maximum hectares to be directly impacted by the Project.

The three major boundaries that will be used in this report are set out below:

- Project Boundary defines the Project Site and includes all the main Project components apart from the electricity transmission line (ETL) to the Liddell Power Station. The Project Boundary covers an area of approximately 16,720 ha
- Survey Boundary defines the area that was assessed in which all Project impacts will be located. The Survey Boundary covers an area of approximately 1,193 ha
- Disturbance Area defines the area where it is currently planned that disturbance will occur. The Disturbance Area is within the Survey Boundary and covers an area of approximately 417 ha (including the Transport Route Disturbance).

Figure 1-2: Regional context of the Project Boundary.

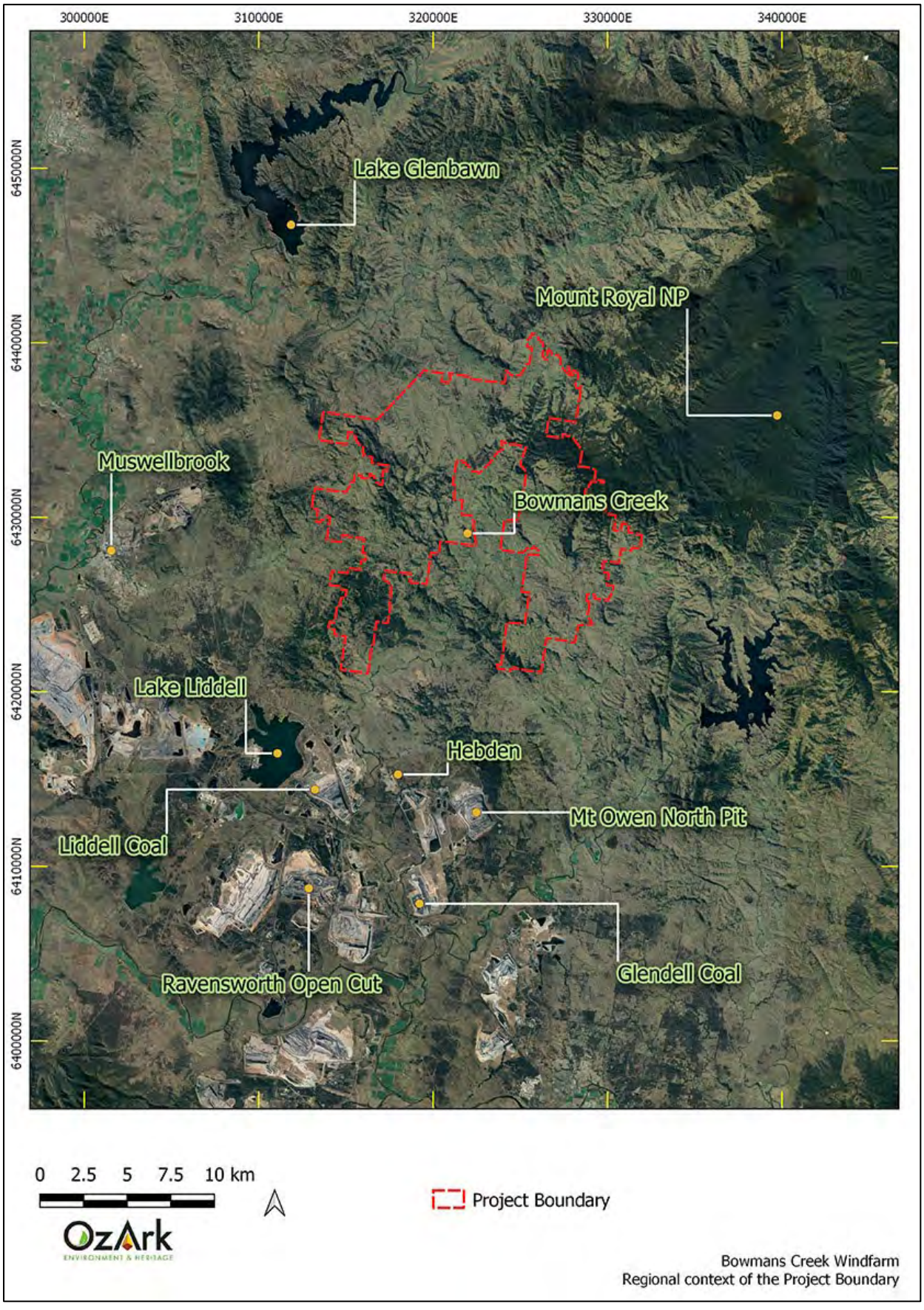
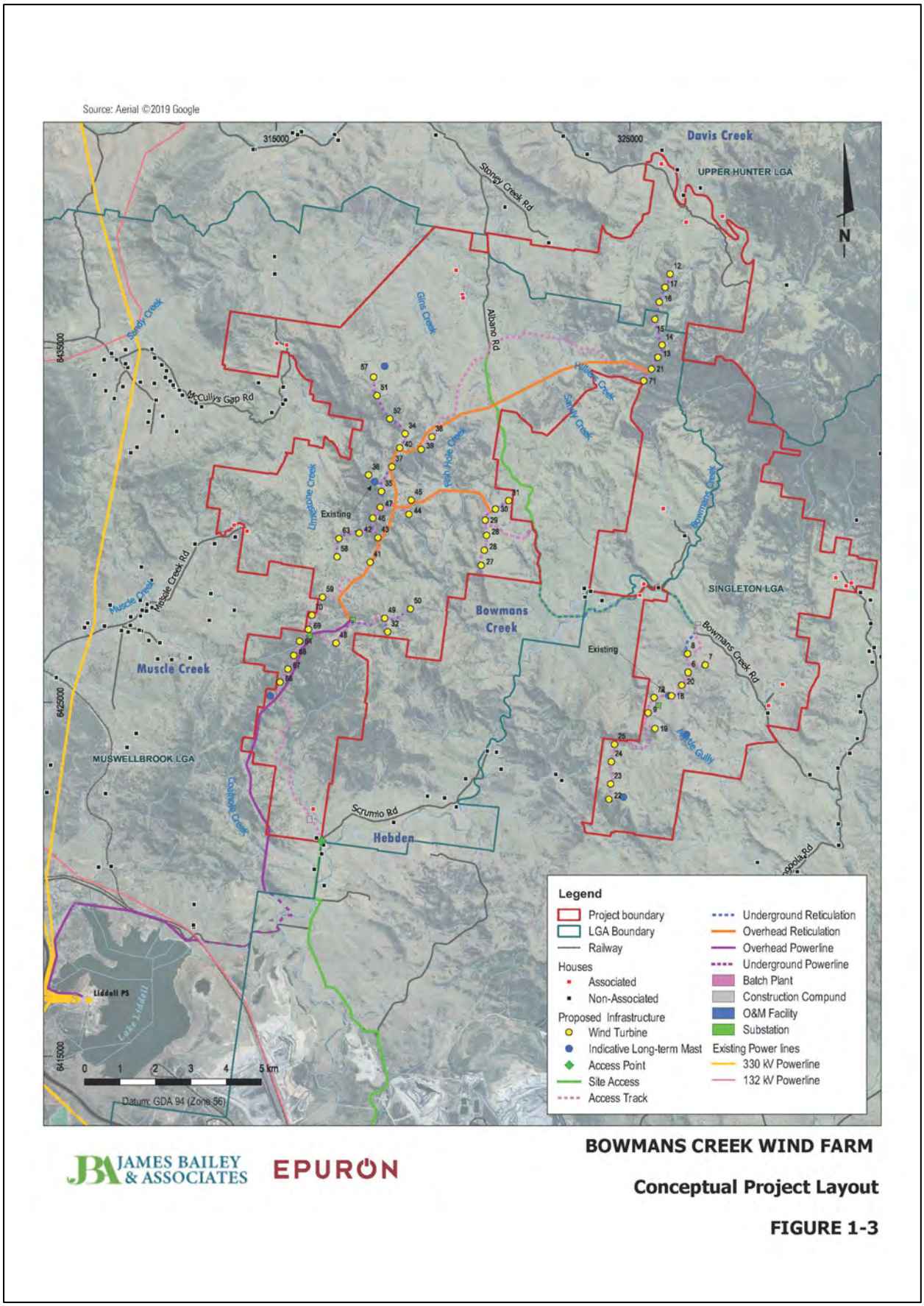


Figure 1-3: Conceptual project layout.



1.1 LOCATION OF THE PROJECT BOUNDARY

Mount Royal National Park is located at least 5 km to the northeast of the Project Boundary. Lake St Clair is over 10 km to the southeast and Lake Liddell over 6 km to the southwest of the Project Boundary. Project components within the Project Boundary are at greater distances from these localities. The southern-most part of Glenbawn Dam is over 13 km from the closest proposed turbine. The Project Boundary is shown within its regional context on **Figure 1-2**.

There are a number of rural communities in proximity to the Project Site including: Hebden, Muscle Creek, McCully's Gap, Rouchel Brook, Bowmans Creek, and Goorangoola.

The Project Site and surrounding area is used for farming and grazing operations. The region supports a number of active coal mines and two coal fired power stations. Historically, a number of mineral exploration licences have been granted over the Project Site, however, there are no current active exploration licences.

The Project is located primarily on freehold land within and adjacent to agricultural areas. There are a number of small parcels of Crown land within the Project Boundary.

Generally, the wind turbines have been positioned along a series of ridges generally running north–south.

1.2 SURVEY BOUNDARY

The Survey Boundary is generally located within steep hills overlooking the flat valley floor of the Hunter Valley, although a portion is on the flatter landforms around Lake Liddell (**Figure 1-4**). In the south the elevation is around 140 m above sea level while some of the turbine locations further north are at an elevation of greater than 700 m above sea level (**Figure 1-5**). The defining characteristic of the topography within the Survey Boundary is the very sharp local increase in elevation meaning that many of the hillslopes can only be walked up with difficulty. The steep hills either rise from narrow V-shaped valleys or are connected by thin swales.

Disturbances across most of the Survey Boundary in the north is limited to the agricultural land use of the area and is primarily limited to vegetation clearing, soil loss and the construction of farm infrastructure such as fences.

In the south where the Survey Boundary reaches the valley floor, the terrain is more level. However, in this portion of the Survey Boundary the disturbances increase from activities associated with mining, infrastructure construction (roads and railway), the creation of Lake Liddell, and the construction and use of the Liddell Power Station.

The landforms throughout the Survey Boundary are either cleared and used for grazing or have been cleared at some time in the past although now trees have regenerated. Only the steepest slopes retain pockets of native vegetation.

Figure 1-4: Aerial showing the Survey Boundary.

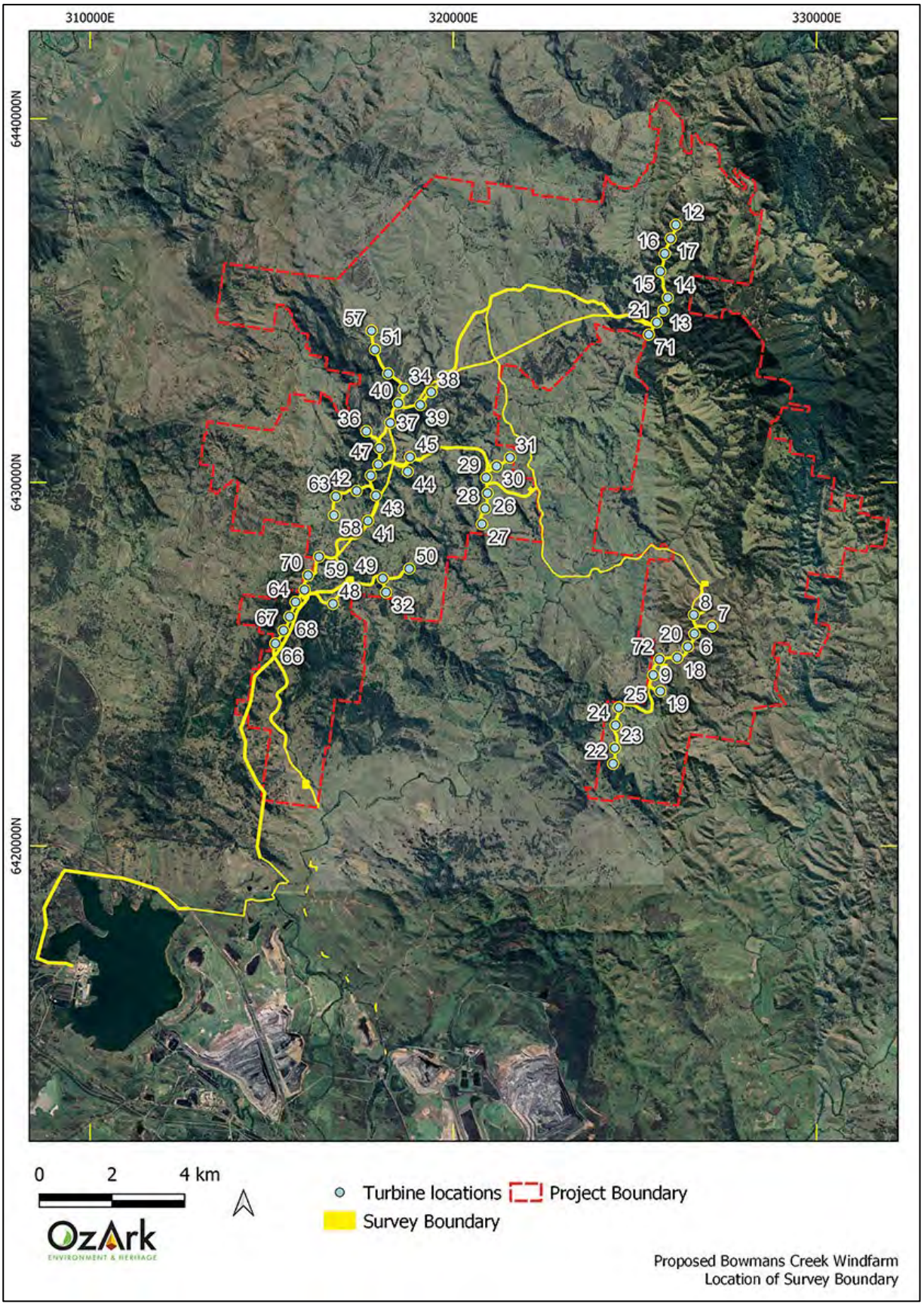


Figure 1-5: Views of the Survey Boundary.

1. Landscape around Turbine 14 in the north of the Survey Boundary.

2. Landscape around Turbine 49 in the west of the Survey Boundary.

3. Landscape in the north of the Survey Boundary traversed by the access track to Turbine 71.

4. Headwaters of Bowmans Creek in the northeast of the Survey Boundary.

5. Landscape along the ETL approaching the valley floor.

6. View of the route of the ETL on the valley floor.

2 HISTORIC HERITAGE ASSESSMENT: INTRODUCTION

2.1 RELEVANT LEGISLATION

Cultural heritage is managed by several state and national Acts. Baseline principles for the conservation of heritage places and relics can be found in the *Burra Charter* (Burra Charter 2013). The *Burra Charter* has become the standard of best practice in the conservation of heritage places in Australia, and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The *Burra Charter* generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a state level.

Several Acts of parliament provide for the protection of heritage at various levels of government.

2.1.1 Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act, administered by the Commonwealth Department of the Environment and Energy, provides a framework to protect nationally significant flora, fauna, ecological communities and heritage places. The EPBC Act establishes both a National Heritage List and Commonwealth Heritage List of protected places. These lists may include historic cultural sites or sites in which the local community have interests. The assessment and permitting processes of the EPBC Act are triggered when a proposed activity or development could potentially have an impact on one of the matters of national environment significance listed by the Act. Ministerial approval is required under the EPBC Act for Projects involving significant impacts to national/commonwealth heritage places.

Applicability to the Project

It is noted there are no Commonwealth or National heritage listed places within the Survey Boundary, and as such, the heritage provisions of the EPBC Act and other Commonwealth Acts do not apply.

2.1.2 State legislation

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

This Act established requirements relating to land use and planning. The framework governing environmental and heritage assessment in NSW is contained within the following parts of the EP&A Act:

- Part 4: Local government development assessments, including heritage. May include schedules of heritage items

- Division 4.7: Approvals process for state significant development.

Applicability to the Project

As the Project is a State Significant Development (SSD), Section 4.41 of the EP&A Act (formerly Section 89J) applies and provides a defence for any investigative or other activities that are required to be carried out for the purpose of complying with any environmental assessment requirements (i.e. Secretary's Environmental Assessment Requirements [SEARs]: see below).

Section 4.41 of the EP&A Act also notes that an approval under Part 4, or an excavation permit under Section 139, of the *Heritage Act 1977* (Heritage Act) are not required. It is normally a condition of approval for SSD projects that historic heritage be managed under an Historic Heritage Management Plan (HHMP).

Secretary's Environmental Assessment Requirements

The SEARs were issued for SSD 10315 on 23 July 2019.

In relation to historic heritage, the SEARs state:

The EIS must:

- assess the impact to historic heritage items under the NSW Heritage Manual.

Compliance with the SEARs has governed the survey and reporting of potential impacts to historic heritage associated with the Project.

Heritage Act 1977 (Heritage Act)

The *Heritage Act 1977* (Heritage Act) is applicable to the current assessment. This Act established the Heritage Council of NSW. The Heritage Council's role is to advise the government on the protection of heritage assets, make listing recommendations to the Minister in relation to the State Heritage Register (SHR), and assess/approve/decline proposals involving modification to heritage items or places listed on the SHR. Most proposals involving modification are assessed under Section 60 of the Heritage Act.

Automatic protection is afforded to 'relics', defined as '*any deposit or material evidence relating to the settlement of the area that comprised New South Wales, not being Aboriginal settlement, and which holds state or local significance*' (note: formerly the Act protected any 'relic' that was more than 50 years old. In 2009 the age determination was dropped from the Act and now relics are protected according to their heritage significance assessment rather than purely on their age). Excavation of land on which it is known or where there is reasonable cause to suspect that 'relics' will be exposed, moved, destroyed, discovered or damaged is prohibited unless ordered under an excavation permit.

Applicability to the Project

There are no SHR listed items within, or near to, the Survey Boundary. Items of local heritage significance that are normally listed in Local Environmental Plans (LEPs) are also protected under the Heritage Act. It is noted below that there are two LEP listed sites adjacent to the Survey Boundary as described in **Section 4.2.1**.

2.1.3 Local legislation

Local Environmental Plans

The Survey Boundary is within areas governed by the Muswellbrook, Singleton and Upper Hunter Shire Council LEPs.

The LEPs include a schedule of heritage conservation areas and items that require either development consent or exemptions for projects that may impact conservation outcomes (Section 5.10). The objectives set out in Section 5.10 of the LEPs state:

(a) to conserve the environmental heritage of an LGA,

(b) to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,

(c) to conserve archaeological sites,

(d) to conserve Aboriginal objects and Aboriginal places of heritage significance.

Section 5.10(3)(a) (i) and (ii) set out the circumstances when a Development Application is not required when there is an impact to heritage items. Exemptions to consent are related to works that are of a minor nature or works that will not adversely impact the heritage values of a place.

Applicability to the Project

The Survey Boundary is adjacent to the heritage curtilages of item I47 ('Fairview' homestead) listed on the Muswellbrook LEP and I156 ('Former Roman Catholic Church') listed in the Singleton LEP. The Survey Boundary is near the heritage curtilage of I48 ('Hillcrest' homestead) listed in the Muswellbrook LEP.

2.2 HISTORIC HERITAGE ASSESSMENT OBJECTIVES

The current assessment will apply the Heritage Council's *Historical Archaeology Code of Practice* (Heritage Council 2006) in the completion of a historical heritage assessment, including field investigations, to meet the following objectives:

Objective One: To identify whether historical heritage items or areas are, or are likely to be, present within the Project Site

Objective Two: To assess the significance of any recorded historical heritage items or areas

Objective Three: Determine whether the proposal is likely to cause harm to recorded historical heritage items or areas

Objective Four: Provide management recommendations and options for mitigating impacts.

2.3 DATE OF HISTORIC HERITAGE ASSESSMENT

The historic heritage assessment took place at the same time as the Aboriginal heritage assessment for the Project (OzArk 2021). The survey was completed by OzArk over 14 days from 25–29 November 2019; 23–27 March 2020; 27 November 2020; 23 February 2021; and 18–19 January 2022.

2.4 OZARK INVOLVEMENT

Fieldwork Session 1 consisted of two teams of two OzArk archaeologists in each team. Fieldwork Session 2 consisted of one team of two OzArk archaeologists. Fieldwork Sessions 3 and 4 consisted of one team of one OzArk archaeologist.

The fieldwork component of the heritage assessment was undertaken by:

- Fieldwork Session 1
    - Fieldwork Director: Ben Churcher (OzArk Principal Archaeologist, BA[Hons], Dip Ed)
    - Archaeologist: Stephanie Rusden (OzArk Senior Archaeologist, BS University of Wollongong, BA University of New England)
    - Archaeologist: Dr Alyce Cameron (OzArk Senior Archaeologist, BA [Hons] and PhD [Archaeology & palaeoanthropology] Australian National University)
    - Archaeologist: Kirwan Williams (OzArk Project Archaeologist, BA University of Queensland).
- Fieldwork Session 2
    - Fieldwork Director: Dr Alyce Cameron
    - Archaeologist: Kirwan Williams.
- Fieldwork Session 3
    - Fieldwork Director: Stephanie Rusden
- Fieldwork Session 4
    - Fieldwork Director: Stephanie Rusden.

- Fieldwork Session 5
    - Fieldwork Director: Ben Churcher.

2.4.1 Reporting

The reporting component of the heritage assessment was undertaken by:

- Report Author: Ben Churcher
- Contributors: Adelia Gower (OzArk Project Archaeologist, BA University of Queensland, who undertook background research), Stephanie Rusden (incorporated fieldwork results of Fieldwork Sessions 3 and 4)
- Reviewer: Stephanie Rusden.

3 ENVIRONMENTAL CONTEXT

3.1 ENVIRONMENTAL OVERVIEW

The Survey Boundary was divided into two survey units: Survey Unit 1 and Survey Unit 2. The environment of each survey unit will be discussed below and the topographic differences between the two is shown on **Figure 3-1** that presents a digital elevation model of the central portion of the Project Boundary.

Survey Unit 1 is characterised by broadly benched spurs with moderate to steep slope forms off the crests/ridgelines. The slopes and creeks are largely bedrock controlled except for areas adjacent to the larger drainage lines such as Bowmans Creek that have some alluvial development. This topography has been largely cleared of trees in the past and has been used for long-term, low density grazing.

Survey Unit 1 is described as 'hills' in the *Australian soil and land survey field handbook* (CSIRO 2009):

> *Landform pattern of high relief (90–300 m) with gently inclined to precipitous slopes. Fixed, shallow, erosional stream channels, closely to very widely spaced, form a non-directional or convergent, integrated tributary network. There is continuously active erosion by wash and creep and, in some cases, rarely active erosion by landslides.*

Using the terrain classifications in CSIRO 2009, Survey Unit 1 is a 'Type C' terrain with steep slopes and no terrace formation in the narrow V-shaped valleys.

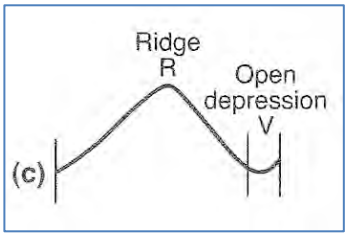


Figure 3-2 shows views of Survey Unit 1. In terms of the topography of the Survey Boundary in this unit, these photos show:

- Photo 1: shows outcropping rock on crest tops and the steeply undulating nature of the landscape
- Photo 2: shows the isolated, rocky crests where turbine locations are proposed
- Photo 3: shows the thin ridges along which access tracks and turbines are proposed
- Photo 4: shows the broader ridges that are also present. Although broader, these ridges are still within steep country
- Photo 5: shows the broad saddles that are present in Survey Unit 1
- Photo 6: shows the gradient and condition of the landscape at the time of survey.

Survey Unit 2 contains the low undulating hills typical of the Hunter Valley floor, which are divided by drainage lines that once flowed into Bayswater Creek (now Lake Liddell) to the south. The lowlands have historically been (although not currently) used for grazing, with extensive grasslands the result of past clearance.

The *Australian soil and land survey field handbook* (CSIRO 2009) defines the landforms of Survey Unit 2 as 'low hills':

> *Landform pattern of low relief (30–90 m) and gentle to very steep slopes, typically with fixed, erosional stream channels, closely to very widely spaced, which form a non-directional or convergent, integrated tributary pattern. There is continuously active sheet flow, creep, and channelled stream flow.*

Using the terrain classifications in CSIRO 2009, Survey Unit 2 is a 'Type E' terrain and contains waning lower slope and flat landforms.

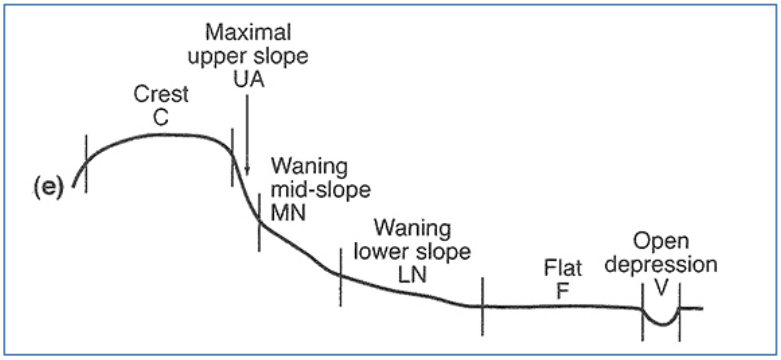


Figure 3-3 shows views of Survey Unit 2. In terms of the topography of the Survey Boundary in this unit, these photos show:

- Photo 1: shows the gentle, undulating nature of the landforms
- Photo 2: shows the extensive level landforms where the ETL corridor is proposed
- Photo 3: shows the flat landforms of the valley floor and the high degree of agricultural activity
- Photo 4: shows the flat landforms to the north of Lake Liddell
- Photo 5: shows the broad valley landforms that surround Bowmans Creek along Albano Road
- Photo 6: shows the broad valley landforms that surround Bowmans Creek along Albano Road.

Figure 3-1: DEM model of a portion of the Survey Boundary showing topography.

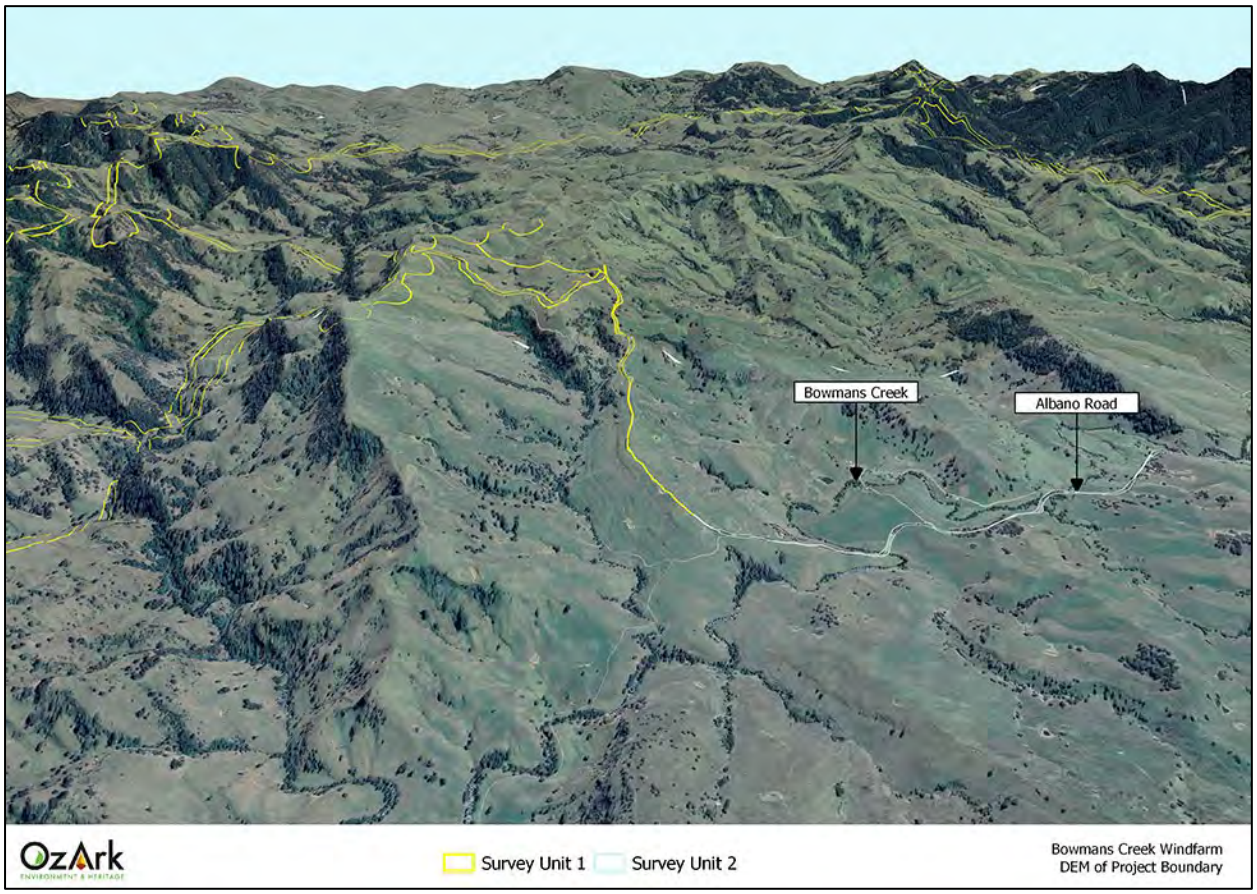


Figure 3-2: Views of the Survey Unit 1.

1. Landscape around Turbine 36.

2. Landscape around Turbine 57.

3. Landscape around Turbine 36.

4. Landscape around Turbine 58.

5. Landscape along the route of proposed Underground Reticulation between Turbines 36 and 37.

6. View of the slope towards Turbine 45.

Figure 3-3: Views of the Survey Unit 2.

1. Landscape along an access track route in the southeast of the Survey Boundary.

2. Landscape within the Glencore landholdings.

3. Landscape at the junction of Hebden Road and Pictons Lane where Transport Route Disturbance is proposed.

4. Landscape along Hebden Road to the north of the Lake Liddell recreation area.

5. Landscape along the Albano Road portion of the Survey Boundary.

6. Landscape along the Albano Road portion of the Survey Boundary.

4 HISTORIC HERITAGE ASSESSMENT: BACKGROUND

4.1 BRIEF HISTORY OF THE MUSWELLBROOK REGION

The Upper Hunter Valley is home to the Wonnarua people, who were also closely affiliated with the Gomeroi (Kamilaroi) peoples to the north. The Project Boundary is in the border region between the Wonnarua, the Geawegal and the Gomeroi (Kamilaroi).

Colonial settlement in the Hunter Valley has been well researched and well documented in a range of sources. Allan Wood's *Dawn in the Valley* provides a comprehensive overview of the colonial history of the Hunter. The earliest tales of the Hunter region and its coal resources came through escaped convicts in 1791. The earliest colonial explorers and surveyors in the upper Hunter Valley were Allan Cunningham in 1823; Henry Dangar in 1824; Robert Dixon in 1831; and Thomas Mitchell in 1831.

The initial phase of colonial exploration of the Hunter region was initiated by Surveyor General John Oxley with instructions to surveyor Henry Dangar and botanist Alan Cunningham in 1823. Henry Dangar started his survey of the Hunter River from Newcastle while Alan Cunningham started his survey of the Goulburn and Pages River from Bathurst. Both were searching of potential pasture lands and land that could be allocated to early settlers. Oxley directed Dangar to note that no settler was to receive more than one square mile fronting the river (GML 2016).

Dangar's survey eventually extended to the upper Hunter Valley. He named Fal and Foy Brooks in July 1824, and his 'discoveries' included detecting the confluence of the Goulburn and Hunter Rivers in October that year. Foy Brook is better known today as Bowmans Creek.

Dangar described the land around Bowmans Creek as:

> *Much alluvial Flat and undulating Land on Banks of Foy Brook. The West, Middle & East Parts are well watered by Foy Brook and two small chains of ponds—forest land, generally undulating surface, of the first and second class description, some being of third class. Iron Bark, scrubby land of small extent—soils rich vegetable alluvial, rich stiff and friable loams with some poor stuff and stone gravelly, yet forming a very desirable tract of Country.*

By 1825 the Hunter River's upper reaches were occupied with large pastoral estates. Dangar's writings describe the rapid pace of European settlement in the Hunter Valley:

> *In this division of country, occupying upwards of 150 miles along the river, which, in 1822, possessed little more than its aboriginal inhabitants, in 1826–27, more than half a million acres were appropriated and in a forward state of improvement… Here in 1827 were upwards of 25,000 head of horned cattle, and 80,000 fine and improved-wool sheep.*

Colonial settlement in the Hunter Valley began with blocks being distributed in 1822 (GML 2016: 8). From the following year, settlers looking to establish farms began to flock to the area. Villages and townships were established as more colonists moved to the upper Hunter Valley, including the villages of Muswellbrook and Scone in the 1830s.

Chief Constable John Howe first discovered Muscle Brook in 1819. It was named due to the large number of mussel shells that were found on the banks of the local creek. Sir Francis Forbes, Chief Justice of New South Wales received several land grants near Muscle Brook when it was first established and some historians say he later influenced the change of the town's name to Muswellbrook, after Muswell Hill in London, England, where his wife was born. Muswellbrook was declared a township in 1833.

The Muswellbrook region provided rich, fertile soils and this, coupled with easy access to watercourses and the relative ease of transport to Newcastle and Sydney, led to Muswellbrook being established as a farming centre. The original vegetation of the Survey Boundary and surrounds would have been covered by tall woodland consisting of spotted gums, forest red gums, swamp and river oak along the streams, yellow and white box with other shrubs and grasses (Mitchell 2002: 84). These have been mostly cleared since colonial contact for pastoralism and agriculture.

Wool production, dairying and wheat growing were the main industries in the Hunter Valley from an early date and by the 1840s, agriculture was a major land use in the Hunter Valley, with crops mostly yielding wheat. Other crops were not as desirable though they were grown in smaller quantities and were used personally or were sold only locally. Other industries in the area included vineyards, tobacco, stock breeding and horses. Leather was another valuable good that was exported from factories at Stockton and Muswellbrook into China (Lucas 2013: 18). Wheat production declined due to issues with disease in the late nineteenth century and instead a more robust crop, Lucerne, took over.

In the mid-nineteenth century, the area's larger estates had begun to be subdivided. Dairying in the region became a significant land use and intensified in the region after World War I. The move towards dairying in the Muswellbrook region was intensified with the growth of urban markets such as Newcastle and Sydney and the development of technological innovations such as the cream separator and refrigeration which opened international markets for meat and dairy products.

The number of dairy farms in the Hunter Valley has declined since the 1950s (Umwelt 2014: 3.21). Government policies of specialisation and amalgamation, introduced in the latter half of the 1960s, impacted smaller dairy farms. In the 1970s, Australia lost the British export market as a result of Britain joining the European Economic Community in 1973. Faced with the prospect of losing its primary dairy export market, the Gorton and Whitlam governments offered assistance

to help some dairy farmers to leave the industry. Milk production in NSW fell from 1,096 million litres in 1951–1952 to 820 million litres in 1981 (HLA 1995: 3).

Coal mining was not prevalent in Muswellbrook Shire until the late 1800s, although it had first been mined in the upper Hunter Valley in the 1860s. Staff at the geological surveyor identified belts of high quality coal in Muswellbrook and deemed the area to be a critical coal field (Scone 1925: 2). As the demand for coal increased, the development of transportation between Muswellbrook and the main cities became vital and this was accomplished by the construction of the Great Northern Railway that connected Singleton to Muswellbrook in 1869. This also led to Muswellbrook's rapid population expansion.

As coal mining started to emerge in the upper Hunter Valley in the 1900s, both dairying and horticulture started declining. Muswellbrook is now more associated with coal mining and the electrical generation industry rather than being an agricultural supply centre as it was in the past.

In the region of the Project Boundary, beef cattle raising has become the major industry following the decline of the dairy industry.

4.2 LOCAL CONTEXT

4.2.1 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any potential previously recorded heritage within the Project Boundary. The results of this search are summarised in **Table 4-1**.

Table 4-1: Historic heritage: desktop-database search results.

Name of Database Searched	Date of Search	Type of Search	Comment
National and Commonwealth Heritage Listings	20/06/2020	NSW	No places listed on either the National or Commonwealth heritage lists are located within the Survey Boundary.
State Heritage Register (SHR)	20/06/2020	Singleton, Muswellbrook and Upper Hunter LGAs	No items on the SHR are located within or near the Survey Boundary. There are no SHR items within 5 km of the Survey Boundary. There are 18 places registered on the SHR within 25 km of the Project Boundary.
Section 170 Register	20/06/2020	Singleton, Muswellbrook and Upper Hunter LGAs	No items on the Section 170 Register are located within or near the Survey Boundary.
Local Environmental Plan (LEP)	20/06/2020	Singleton, Muswellbrook and Upper Hunter LEPs	The curtilage for the following LEP listed items are located immediately outside or in close proximity to the Survey Boundary: • Muswellbrook LEP. I47: 'Fairview' (homestead) • Muswellbrook LEP. I48: 'Hillcrest' (homestead) • Singleton LEP. I156: 'Former Roman Catholic Church'

A search of the State Heritage Register (SHR) and the places listed on the applicable LEPs shows a variety of listings around the Project Boundary. The statutory heritage listed sites in the vicinity of the Project Boundary are shown on **Figure 4-2**.

A search of the Singleton and Muswellbrook LEPs indicates that none of the heritage curtilages extend into the Survey Boundary, although three items are located immediately outside or in close proximity to the Survey Boundary. These items include:

- Muswellbrook LEP I47: 'Fairview' homestead
- Muswellbrook LEP I48: 'Hillcrest' homestead
- Singleton LEP I156: 'Former Roman Catholic Church'.

However, the heritage curtilages for I47 and I48 are both in the wrong location, namely:

- The Muswellbrook Heritage Study Inventory 1996 available on the Muswellbrook Shire website notes that 'Fairview' (I47) is located within Lot 3111 DP549456 at the coordinates (converted) GDA Zone 56 312665E, 6418710N. When these coordinates are plotted, the location is within Lot 311 DP549456. Therefore, there is a typological error in the lot number on the inventory sheet, but otherwise everything else is correct and the coordinates plot to a built structure. The correct lot (Lot 311 DP549456) is outside the Survey Boundary, although a portion of the (incorrect) heritage curtilage shown on the LEP heritage mapping is immediately adjacent to the Survey Boundary. This portion does not include the 'Fairview' homestead
- The Muswellbrook Heritage Study Inventory 1996 available on the Muswellbrook Shire website notes that 'Hillcrest' (I48) is located on Lot 311 DP549456 at the coordinates (converted) GDA Zone 56 312665E, 6419290N. When these coordinates are plotted, the location is within Lot 3 DP233020. The coordinates plot to a built structure that the author knows to be the Hillcrest homestead. Therefore, the Lot and DP is wrong on the heritage inventory sheet and on the LEP spatial mapping data. The correct lot (Lot 3 DP233020) is outside the Survey Boundary.

The correct locations of both 'Hillcrest' and 'Fairview' and their associated curtilages are shown on **Figure 4-3**. **Figure 4-3** also shows the location of Lot 313 DP549456 which is the incorrect lot shown on the Muswellbrook spatial mapping for 'Fairview'. This report henceforth will assume that:

- 'Fairview' (I47) is located on Lot 311 DP549456 and all of this lot constitutes its curtilage
- 'Hillcrest' (I48) is located on Lot 3 DP233020 and all of this lot constitutes its curtilage
- There is no heritage listing in Lot 313 DP549456 and this will not be discussed further in this report.

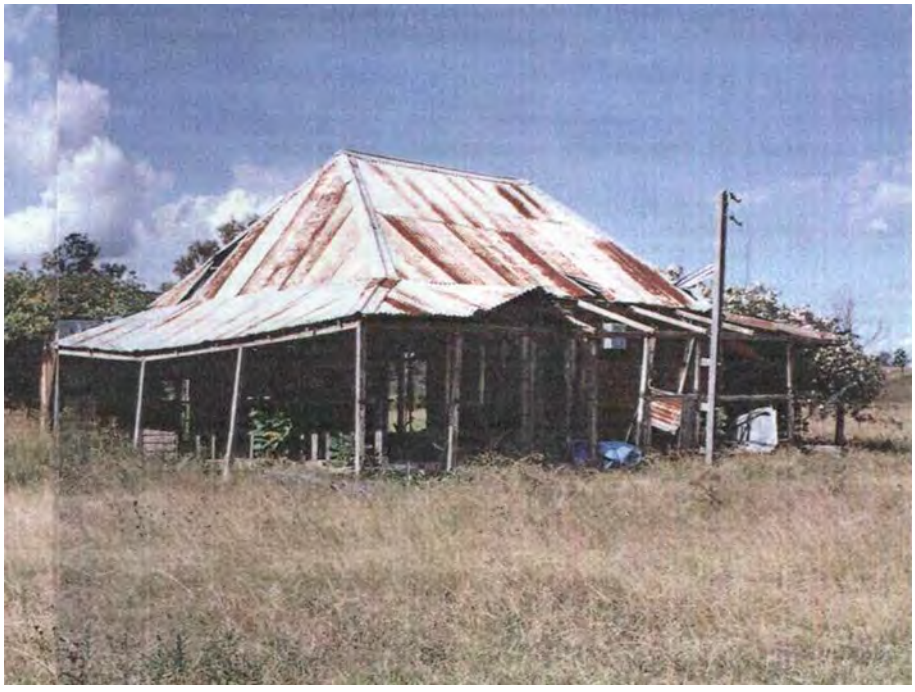
Item 1156 of the Singleton LEP is listed as a 'Former Roman Catholic Church' and this place is located immediately outside the Project Boundary and the Survey Boundary (**Figure 4-4**).

Details on each of the LEP listed items close to the Survey Boundary are shown in **Table 4-2** and views of each item are shown on **Figure 4-1**.

Table 4-2: Description of the LEP listed items near the Survey Boundary.

Name of place	Statutory listing	Description
Fairview	Muswellbrook LEP I47	'Fairview' has exterior weatherboard walls and a galvanised iron roof. On the interior there is evidence of pressed metal ceilings. It is associated with a timber slab and galvanised iron outbuilding. 'Fairview' has local historic significance for its association with later 19th century land subdivision in the Lake Liddell area. It is one of few remaining groupings of its age and type in that area. It has local scientific significance for its potential to reveal information which could contribute to an understanding of the economic means and lifestyle of the earliest tanners in this area. The place was not inspected as part of the current survey.
Hillcrest	Muswellbrook LEP I47	'Hillcrest' has exterior weatherboard walls and a galvanised iron roof. It is associated with a galvanised iron outbuilding. Like 'Fairview', 'Hillcrest' has local historic significance for its association with later 19th century and early 20th century land subdivision in the Lake Liddell area. Its greatest significance must be its aesthetic significance which derives from its being a rare regional example of Federation Bungalow executed in timber. It has local scientific significance for its potential to reveal information which could contribute to an understanding of the economic means and lifestyles of the earliest farmers of the land in this area. The place was not inspected as part of the current survey.
Former Catholic Church	Singleton LEP I156	Weatherboard rural church. Mr William Schmierer erected the Catholic Church in 1902. The church and site have strong historical association with the early settlers of the area and in particular the five generations of the Ball family, who provided the land, worshipped and maintained the church and land for 118 years. The place was inspected as part of the current survey from the road corridor.

Figure 4-1: Photographs of the LEP listed places near the Survey Boundary.



View of 'Fairview' from the Muswellbrook Heritage Study Inventory 1996.

	View of 'Hillcrest' from the Muswellbrook Heritage Study Inventory 1996.
	View of the 'Former Roman Catholic Church' taken from Bowmans Creek Road (source Google Street View c. 2010).

4.2.2 Community consultation

On 27 August 2020 Ben Churcher (OzArk Principal Archaeologist) spoke with Leonie Ball. Leonie confirmed that the 'Former Roman Catholic Church' has not been moved to its current location. However, the church was not built where it was originally intended to be built as it was going to be on the far side of Bowmans Creek and the landowners agreed to build it at its current location to provide easier access.

Ms Ball also confirmed that there is a c. 1940 blacksmith's workshop located on their property. It remains standing and is currently used as a farm shed.

Figure 4-2: Statutory listings in the region of the Project Boundary.

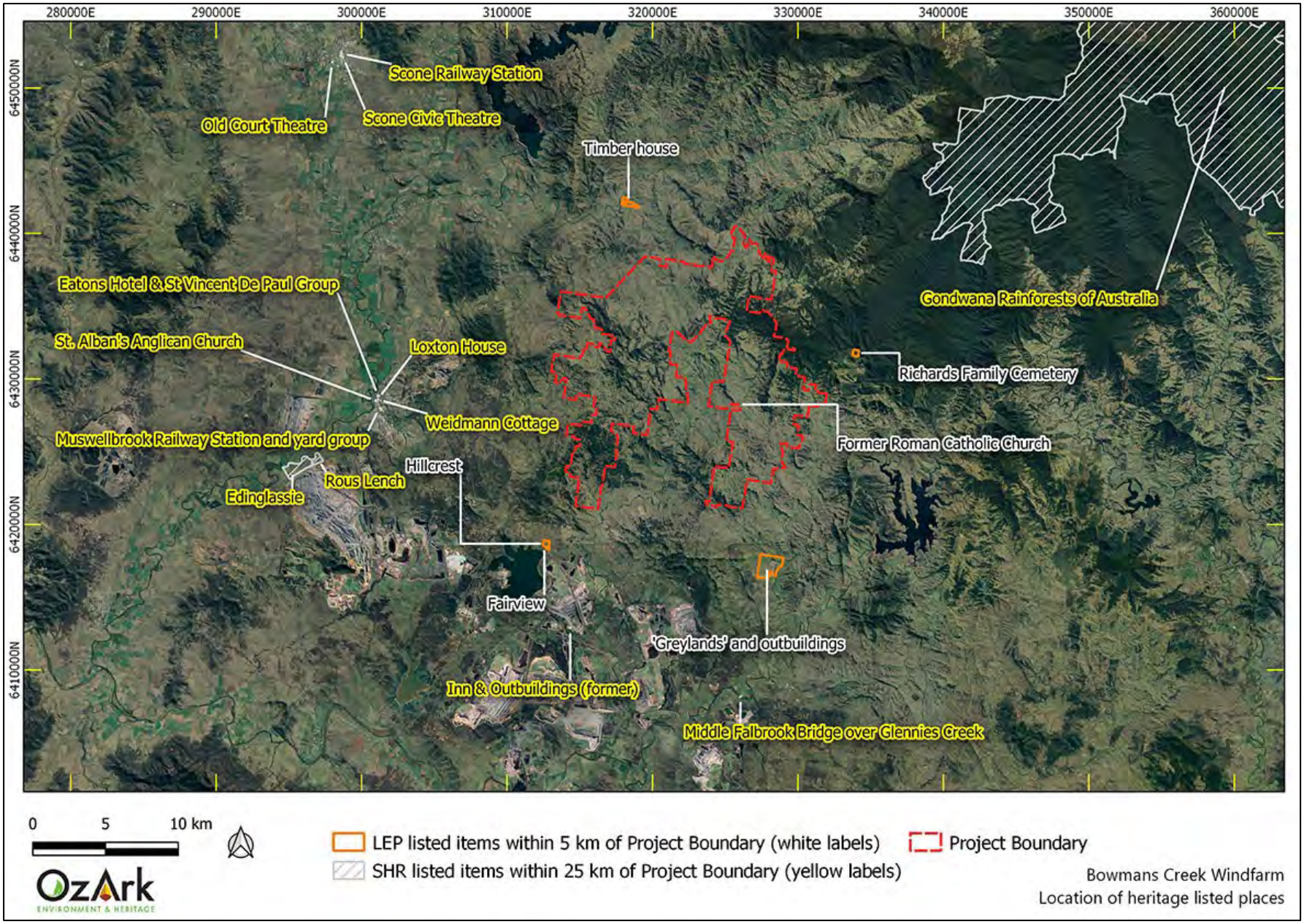
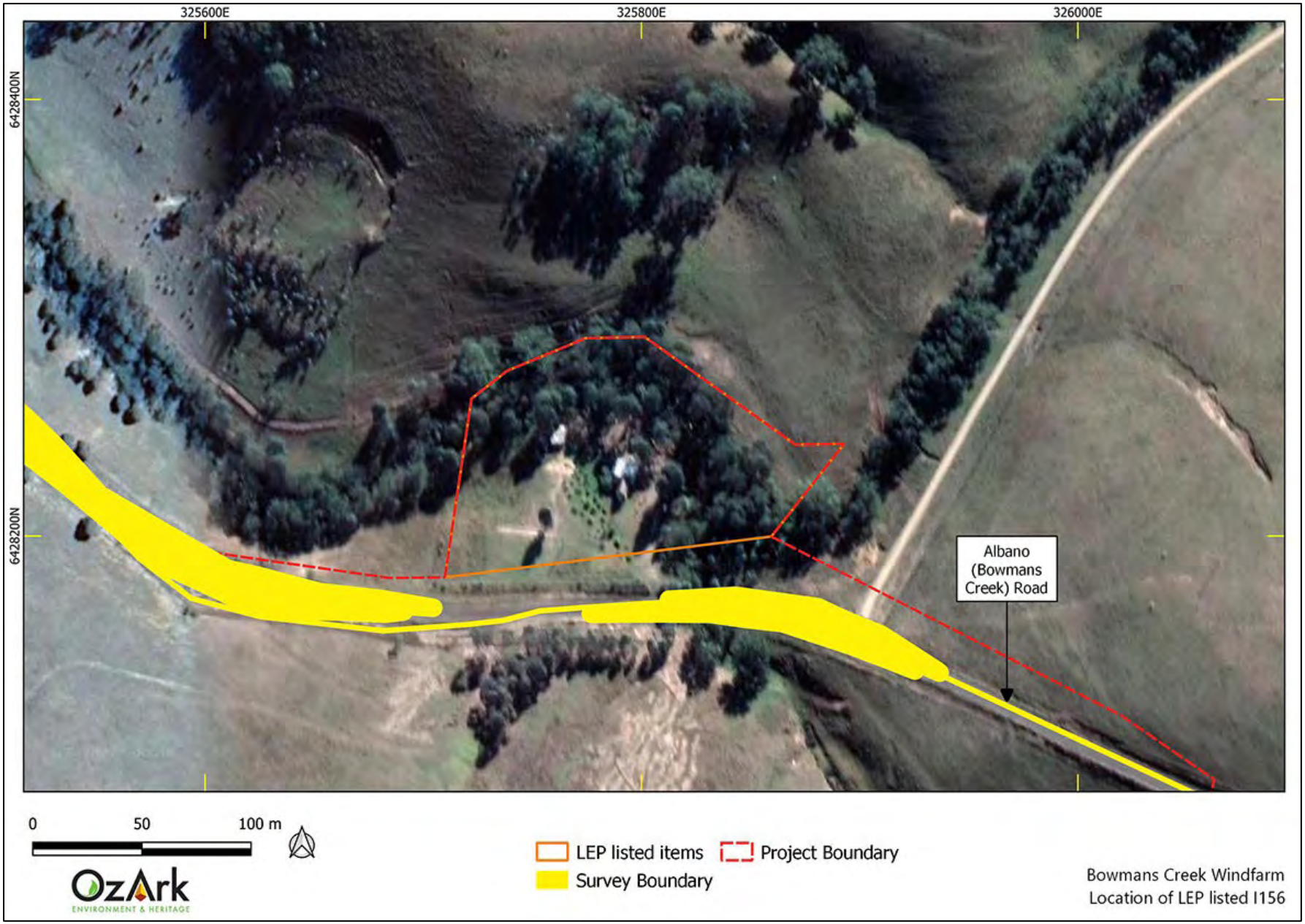


Figure 4-3: LEP listings 'Hillcrest' and 'Fairview' in relation to the Survey Boundary.

Figure 4-4: LEP listing 'Former Catholic Church' in relation to the Survey Boundary.



5 RESULTS OF HISTORIC HERITAGE ASSESSMENT

5.1 SURVEY AND FIELD METHODS

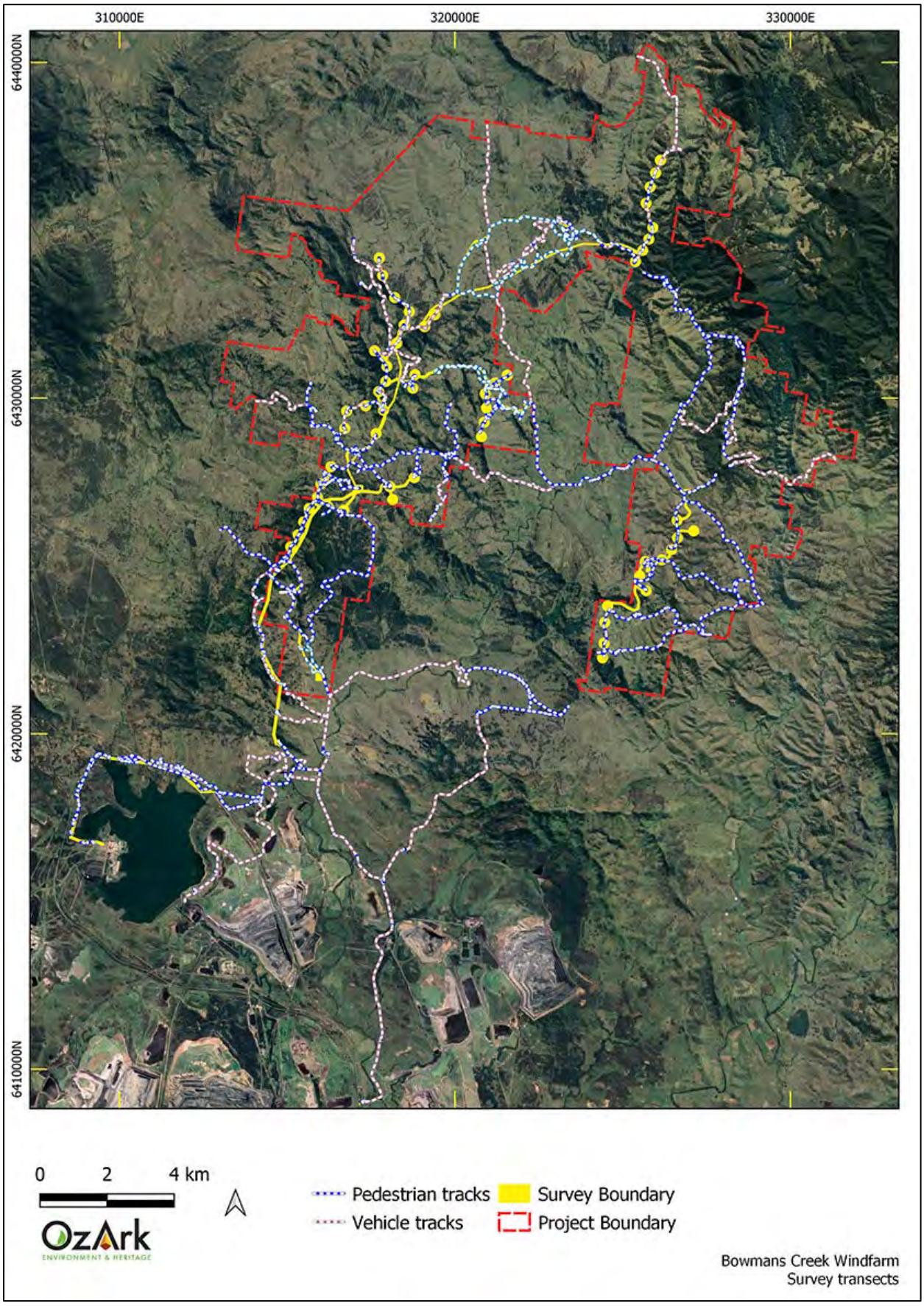
Standard archaeological field survey and recording methods were employed in this study (Burke & Smith 2004). The survey for historic heritage values occurred at the same time as the Aboriginal cultural heritage survey for the Project (OzArk 2021).

Survey consisted of reaching all turbine locations and sampling other project components such as the access tracks and the Overhead and Underground Reticulation routes. All locations for facilities were inspected. **Figure 5-1** shows the areas surveyed, either by vehicle or on foot. Typically, survey consisted of driving along access tracks where the tracks were on slopes but walking or sample surveying (i.e. inspecting landforms with higher archaeological potential) along access tracks on more level gradients. All turbine and facility locations were surveyed on foot. The portions of the ETL corridor within Survey Unit 2 landforms (Hunter Valley lowlands) were inspected on foot. Where the ETL corridor is associated with higher gradient landforms (Survey Unit 1), the route was driven where possible with sample survey, or where it was not possible to drive, the team walked to the corridor from the closest access to undertake sample survey. Proposed impacts associated with public road corridors consisted of driving to the impact location and inspecting the area on foot.

Reaching the turbine locations to undertake survey necessitated that a lot of slope, ridge and crest landforms within the Survey Boundary were surveyed. However, in Survey Unit 1, particular care was also taken to inspect the narrow valley landforms that are within this area as this is where early farming settlements are most likely to exist rather than on the steep slopes or exposed crests. This included inspecting the location of any impacts near Bowmans Creek within the Survey Boundary as this waterway would have attracted early colonial settlement. The ETL corridor inspection surveyed all landforms likely to possess historic archaeological potential.

At the conclusion of the five survey fieldwork sessions it is considered that a large and representative sample of the landforms within the Survey Boundary have been surveyed.

Figure 5-1: Aerial showing the areas surveyed.



5.1.1 Landform modelling for the Amended Project

The study area for the survey associated with the Amended Project include all landforms that were not surveyed for the 2021 HIS. The major areas outside of previously surveyed landforms are listed in **Section 1** and each of these areas will be described below following the numbering established in **Section 1** and shown on **Figure 1-1**.

Areas 1, 2, and 3 (**Figure 5-2**)

The additional areas are in steeply undulating landforms. Samples of this landform type were surveyed in nearby areas; however, the additional impacts are to the north and south of the areas previously surveyed. The landforms are cleared and have been used for long-term grazing. The additional impact areas cross several waterways that are within steep, V-shaped valleys without any evidence of creek flats or terraces.

Area 4 (**Figure 5-3**)

Area 4 consists of a new portion of access track. Rather than crossing a ridge as was surveyed for the EIS, the new alignment follows gentler gradients to the north. The new alignment is within cleared and grazed paddocks and is entirely contained within sloping landforms. The alignment crosses a seasonal waterway, better termed a gully, within a steep, V-shaped valley.

Areas 5 and 6 (**Figure 5-4**)

The additional areas include the alignment of an overhead electricity corridor (Area 5) and the alignment of access track (Area 6). Area 5 is within a steep, V-shaped valley where there is remnant vegetation due to the steepness of the terrain. Area 6 is within cleared, grazed paddocks and crosses slopes and a minor ridge line. Area 5 crosses a seasonal waterway, while Area 6 avoids any waterway crossings.

Area 7 (**Figure 5-5**)

Area 7 consists of a new alignment of access track that is entirely within clear, grazed paddocks. The new alignment crosses undulating landforms with some moderately steep slopes. The alignment crosses a seasonal waterway in an area that has relatively gentle gradients when compared to other landforms in the alignment.

Area 8 (**Figure 5-6**)

Area 8 consists of two portions of new access track. Area 8a crosses undulating landforms with some steep gradients. In the western portion the alignment is along a narrow ridge and steep V-shaped valley that contains some remnant vegetation. Elsewhere the alignment crosses cleared, grazed paddocks. Area 8b is a short section of track within steep slopes. Area 8b is entirely within cleared, grazed paddocks.

Figure 5-2: Digital elevation model of Areas 1, 2 and 3.

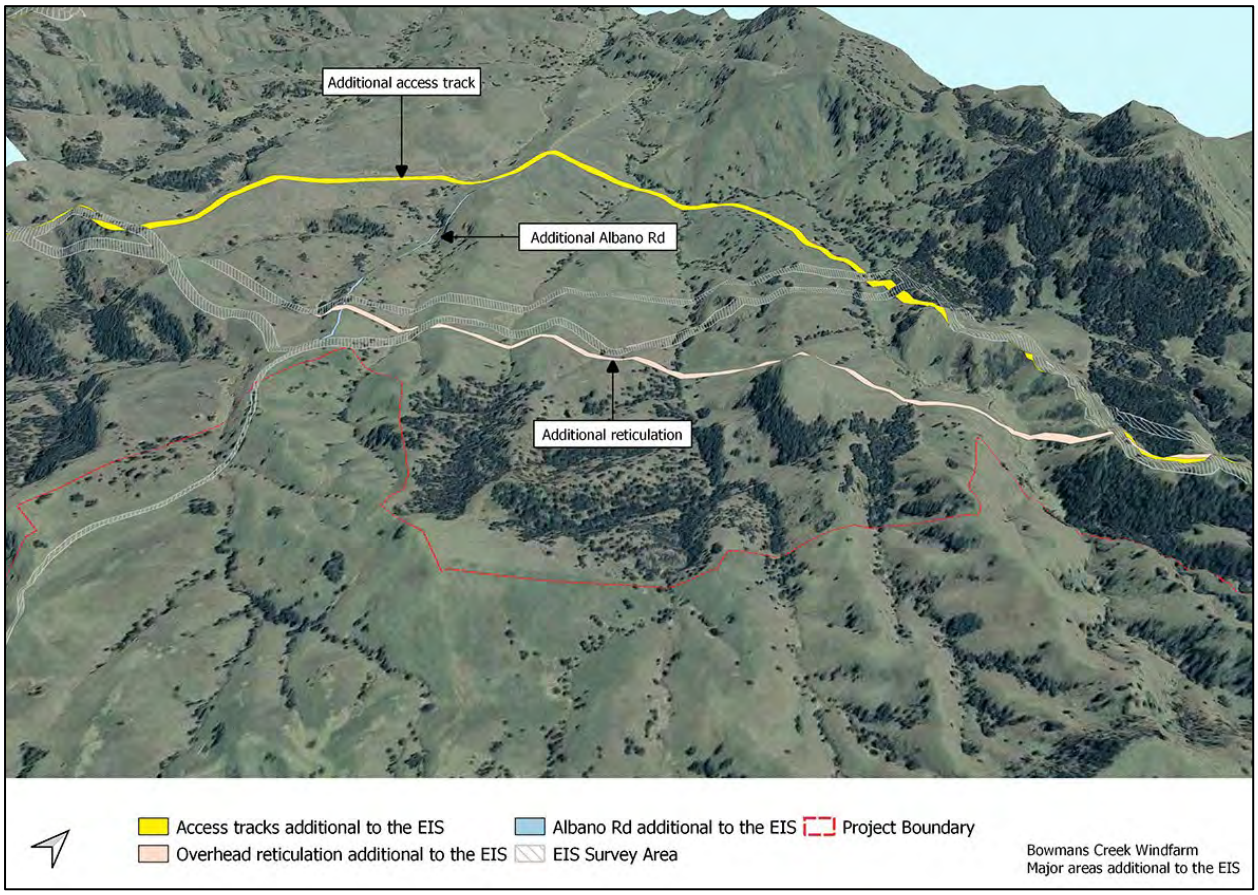


Figure 5-3: Digital elevation model of Area 4.

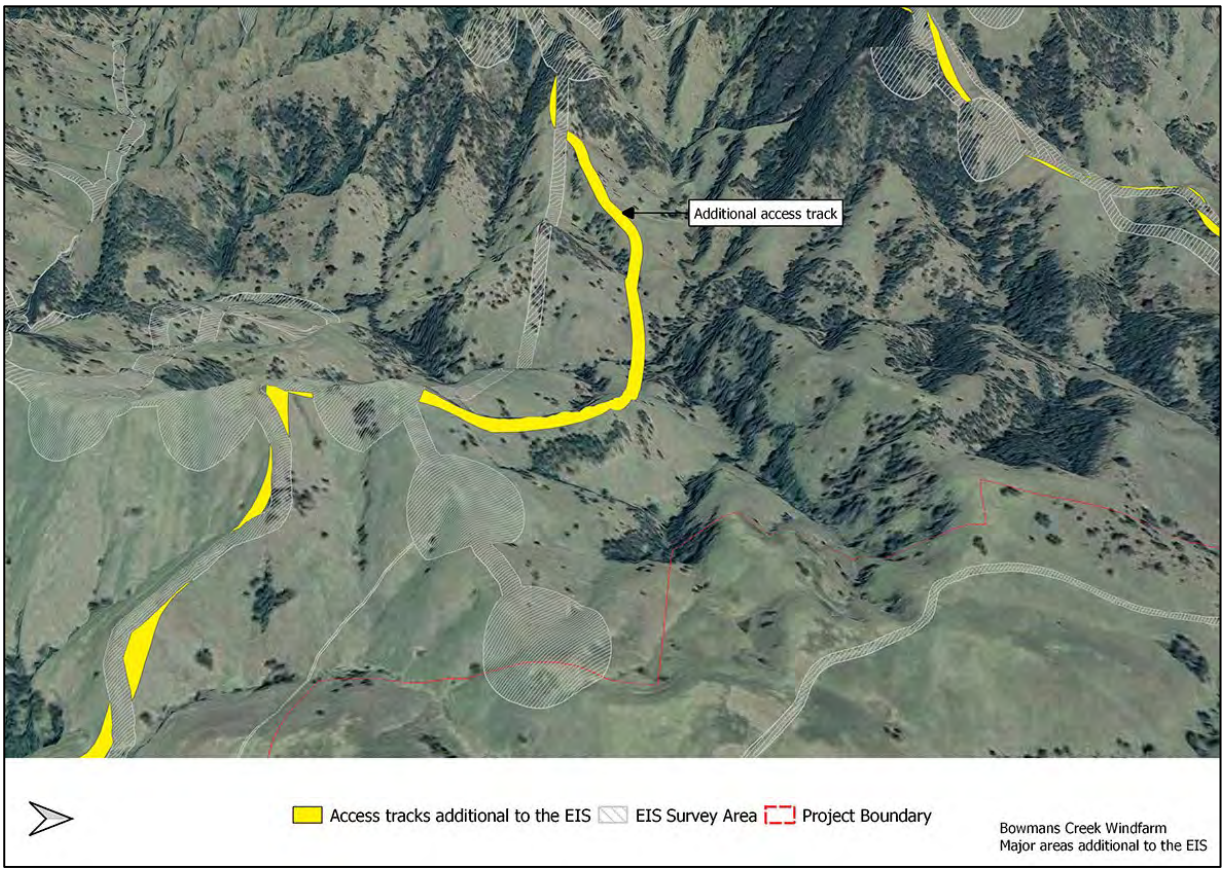


Figure 5-4: Digital elevation model of Areas 5 and 6.

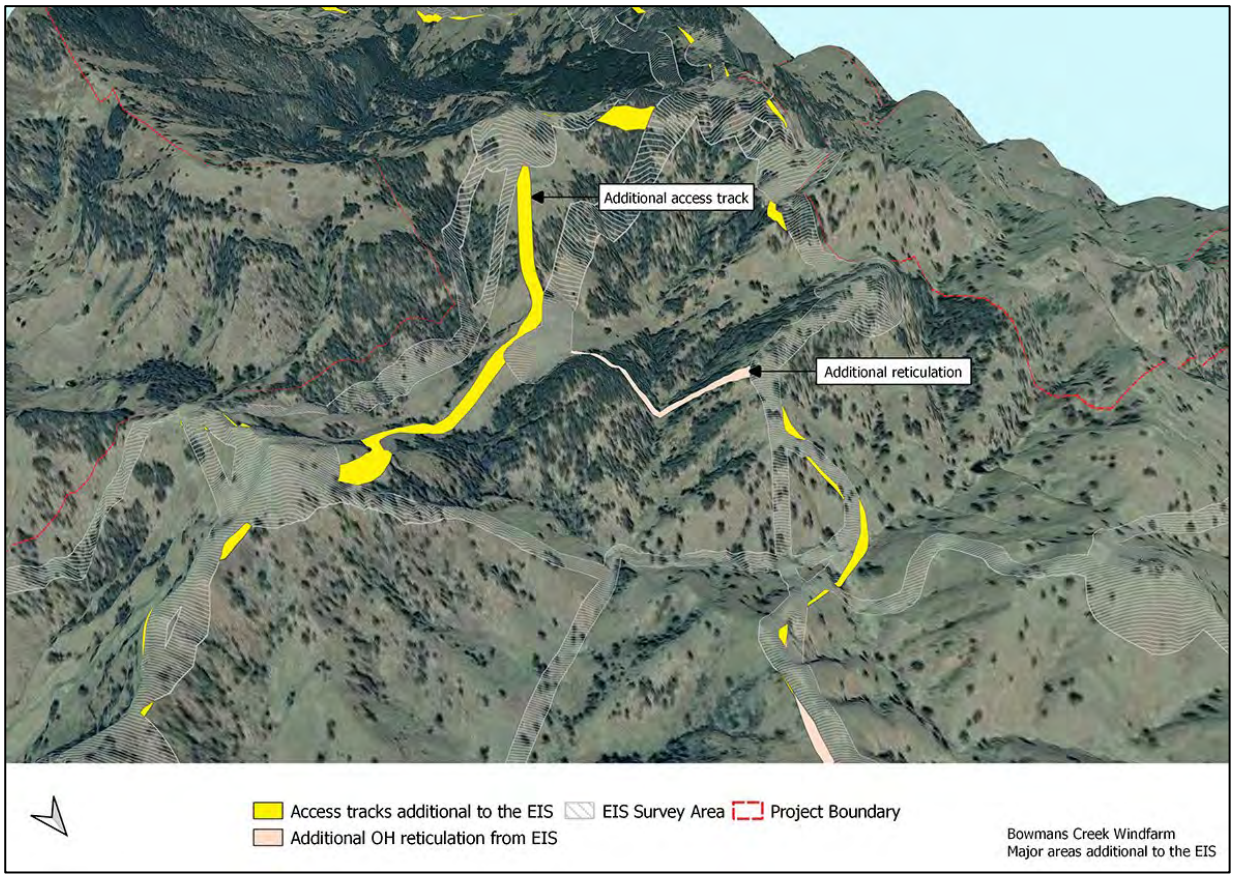


Figure 5-5: Digital elevation model of Area 7.

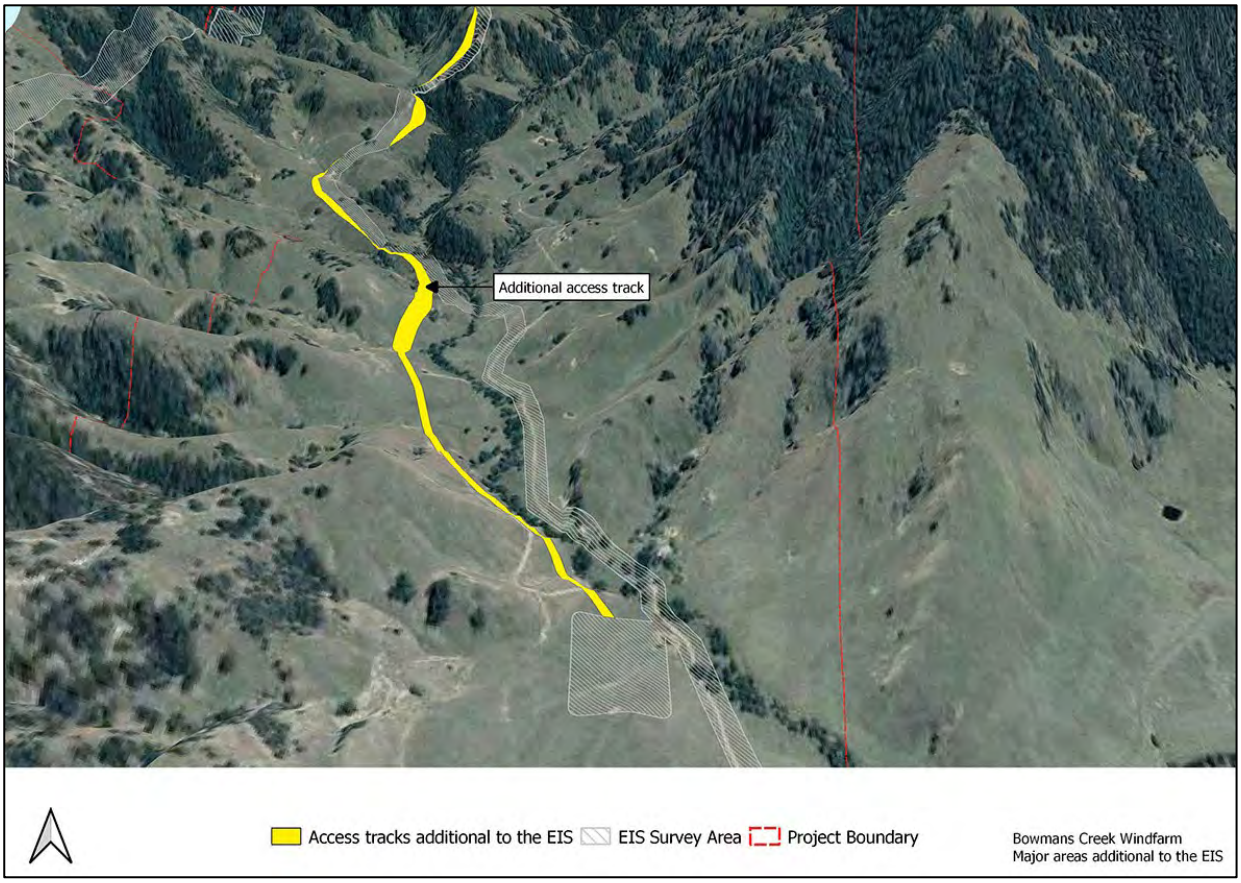
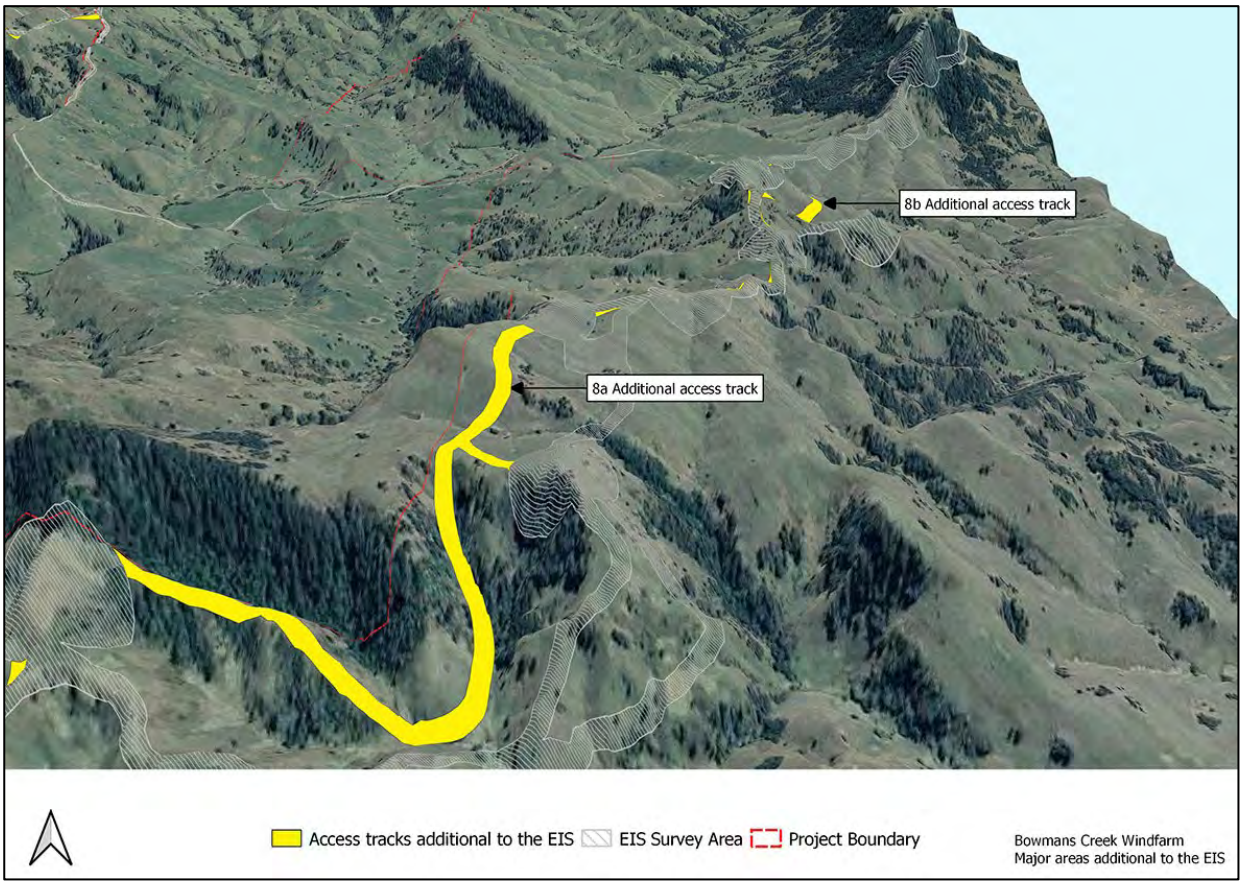


Figure 5-6: Digital elevation model of Area 8.



All the additional areas not surveyed for the 2021 EIS are in:

- Survey Unit 1 landforms
- Landforms where no sites were recorded during the survey for the EIS
- Topographies generally consisting of slopes steeper than 10 degrees
- Landforms distant to permanent or semi-permanent water
- Landforms that have undergone disturbances from vegetation clearing and long-term grazing.

The archaeological potential of each additional area not surveyed for the EIS is shown in **Table 5-1**.

Table 5-1: Archaeological potential of the unsurveyed areas.

Area	Proposed impact	Landform type	Likelihood to contain historic items
1	Road widening	Slopes. No waterway crossings	Very low likelihood to contain historic items as the area is either side of Albano Road in moderately steep landforms.
2	Access track	Undulating moderately steep. No level areas. Some crossings of minor waterways	Very low likelihood to contain historic items due to the nature of the landforms. While the alignment crosses a minor waterway, it is in a V-shaped valley and unlikely to have landforms conducive to historic occupation.
3	Overhead electricity reticulation	Undulating moderately steep. No level areas.	Very low likelihood to contain historic items due to the nature of the landforms. While the alignment crosses a minor

Area	Proposed impact	Landform type	Likelihood to contain historic items
		Some crossings of minor waterways	waterway, it is in a V-shaped valley and unlikely to have landforms conducive to historic occupation.
4	Access track	Minor ridge and slopes. One crossing of a minor waterway	Very low likelihood to contain historic items due to the nature of the landforms. While the alignment crosses a minor waterway, it is in a V-shaped valley and unlikely to have landforms conducive to historic occupation.
5	Overhead electricity reticulation	Steep V-shaped valley	Very low likelihood to contain historic items due to the steep nature of the landforms. The waterway crossing has no associated creek flats or terraces.
6	Access track	Ridge, steep slopes. No waterway crossings	Very low likelihood to contain historic items due to the steep nature of the landforms. The termination of the ridge, both to the east and to the west was surveyed for the EIS and no items were recorded.
7	Access track	Slopes	Very low likelihood to contain historic items due to the sloping nature of the landforms. Identical landforms on the eastern side of the valley were surveyed for the EIS and no items were recorded, even in flatter landforms near Cedar Creek.
8	Access track	Slopes and minor ridges	Very low likelihood to contain historic items due to the sloping nature of the landforms. Identical landforms to the east were surveyed for the EIS and no items were recorded.

5.2 PROJECT CONSTRAINTS

Survey constraints included very poor ground surface visibility (GSV) in Survey Unit 2 (valley lowlands) as the ground cover was very thick following an exceptional germination period following late summer rains that ended a long period of below average rainfall. In contrast, most of Survey Unit 1 (hills and valleys) was surveyed in November 2019 at the height of the dry period when GSV was very high.

The nature of the Survey Boundary meant that not all portions were walked; although large portions were walked, or in the case of proposed access tracks on sloping landforms, driven. Aerial photography does not adequately capture the nature of the terrain and the difficulty in moving through it; especially as fences between properties would sometimes bar access and necessitate a detour of up to 40 minutes. Both the OzArk team and the ecology team from Cumberland Ecology swapped route data while in the field and this assisted in a more efficient survey. However, while the archaeological potential of the steep hills and narrow, V-shaped valleys that characterise Survey Unit 1 are adequately understood, the survey did have to extrapolate data to areas that were reasonably unreachable by the survey team. While all turbine locations were surveyed, an example of an portion not surveyed would be a very steep valley (ravine almost) between two turbines that will be spanned by the Overhead Reticulation.

5.3 HISTORIC HERITAGE SITES

Two historic heritage places were recorded during the survey (**Table 5-2** and **Figure 5-7**). Details on each place are provided below.

It was assessed that there are no areas within the Survey Boundary that are likely to contain significant archaeological deposits of conservation value.

Table 5-2: Recorded historic heritage items.

Site Name	GDA Zone 56 coordinates	Type of heritage item	Figure
Rock Lily Gully-HS01	316931E, 6428480N	Family burial plot	**Figure 5-8**
Hilliers Creek-HS01	323003E, 6435229N	Farm house ruin	**Figure 5-9**

5.3.1 Cultural landscape

On a broader level, it is recognised that the Project is occurring within a cultural landscape typified by small rural holdings containing a variety of structures such as homesteads that exemplify a long history of settlement over the past 150 years.

Figure 5-7: Location of Rock Lily Gully-HS01 and Hilliers Creek-HS01.

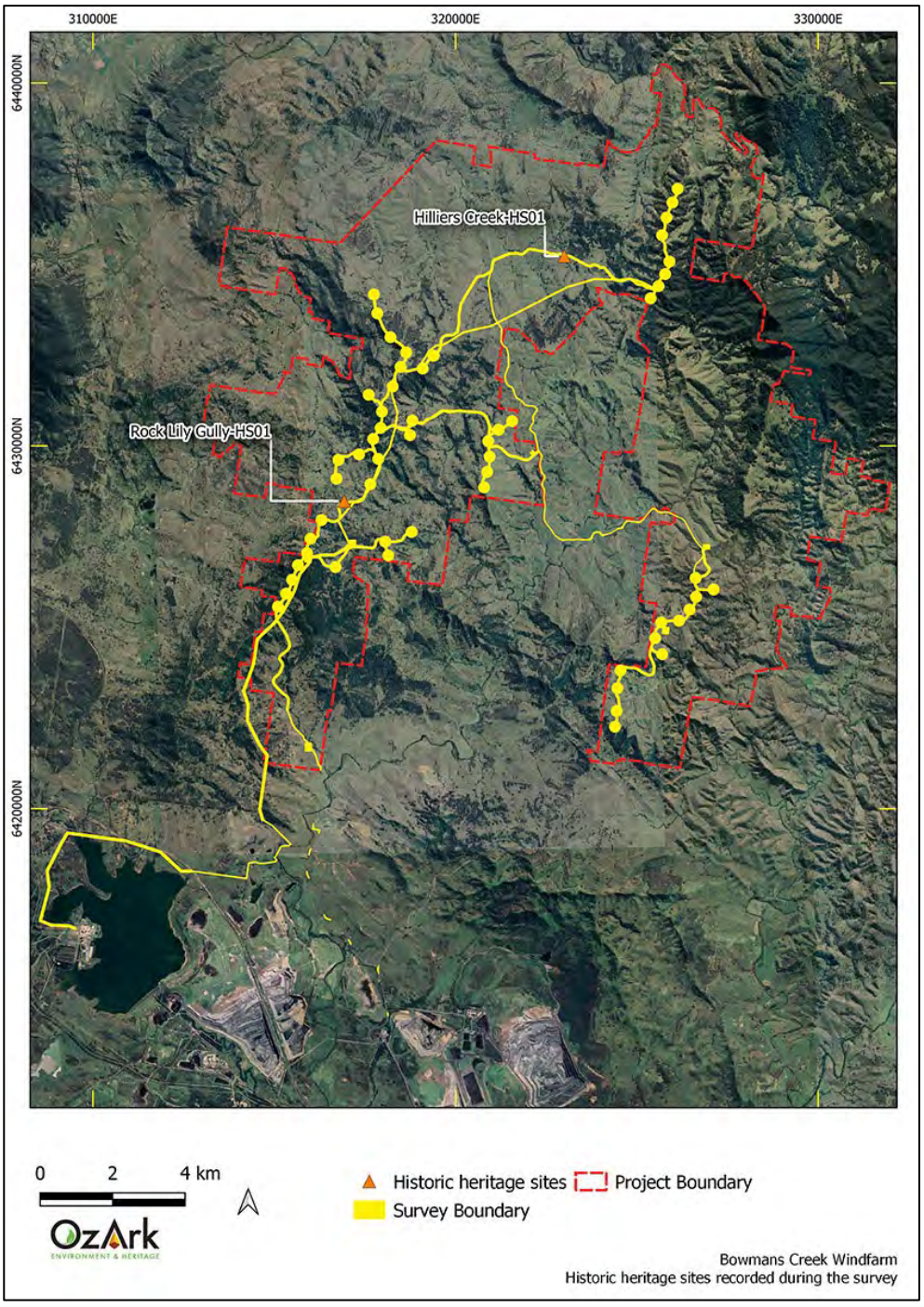


Figure 5-8: Detail of the location of Rock Lily Gully-HS01.

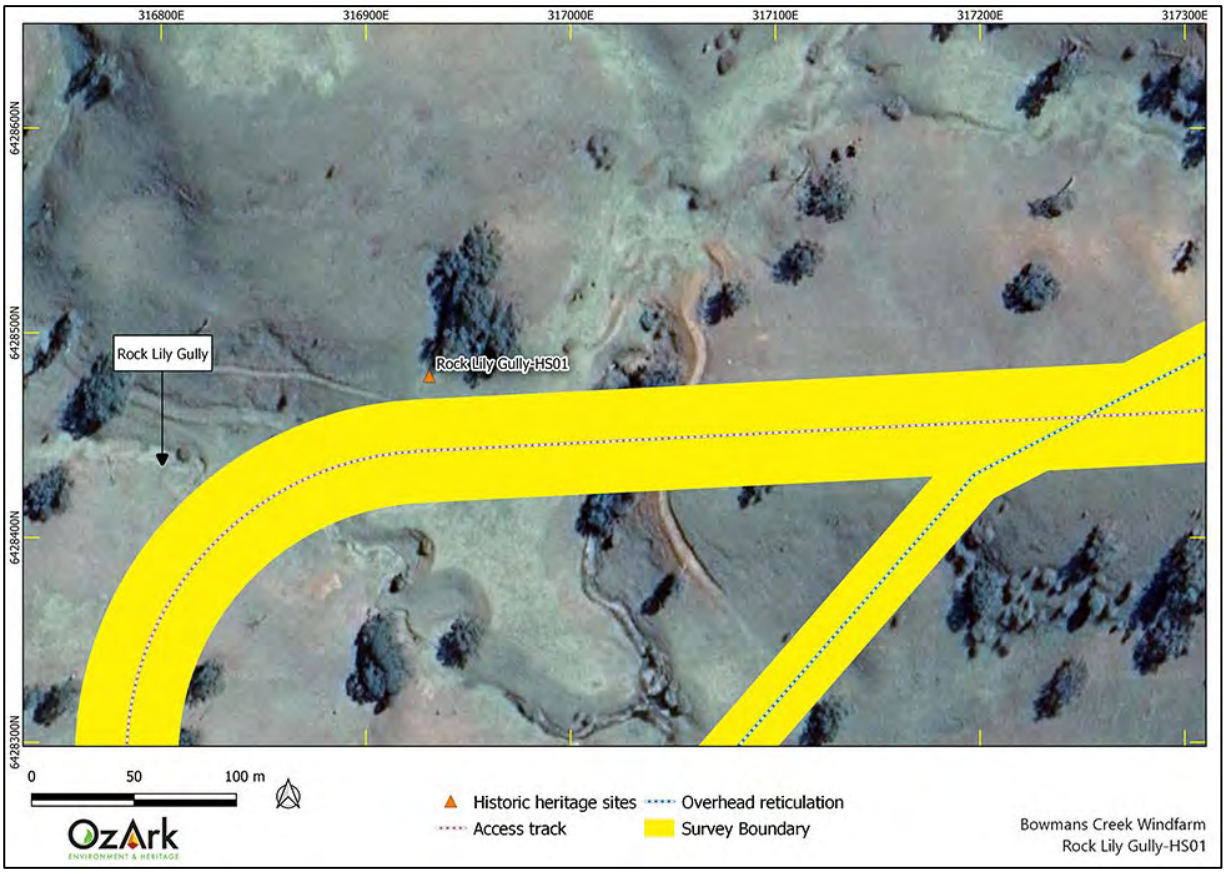
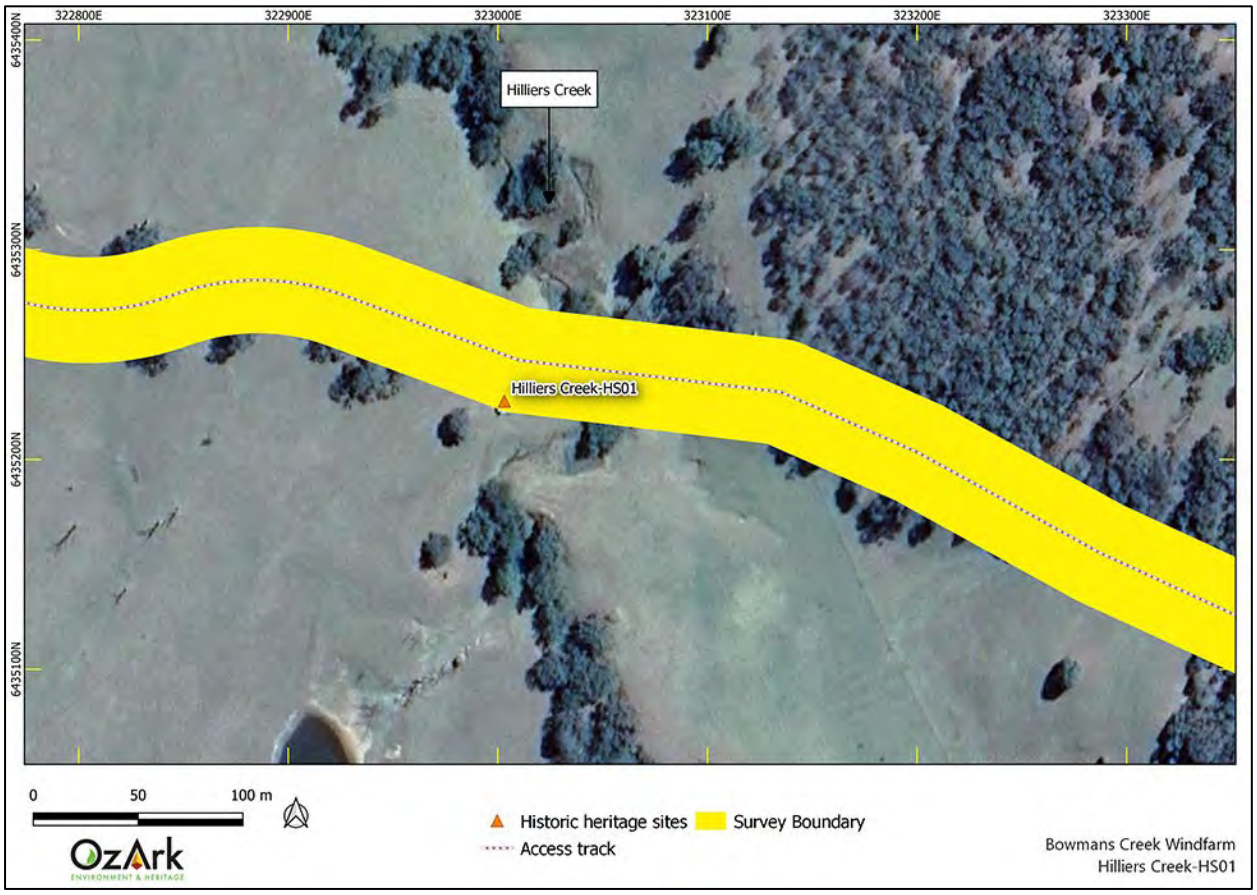


Figure 5-9: Detail of the location of Hilliers Creek-HS01.



Rock Lily Gully-HS01

Site Type: Family burial plot

GPS Coordinates: GDA Zone 56 316931E, 6428480N

Location of Site: The graves are located in Lot 2 DP752465 on the property of R., H., & T. Clendinning (**Figure 5-7** and **Figure 5-8**). The graves are on a slope overlooking the confluence of Rock Lily Gully with another unnamed waterway that joins the creek from the north. The confluence is separated by a low spur that the graves overlook.

Description of Site: The place consists of two graves. From the inscriptions on the headstones, the following people are interred at the grave site:

- George Clendinning (died 72 years Oct 1876) and his wife Sarah (died 62 years Aug 1880)
- John Clendinning (died 60 years Jan 1902) and his wife Eliza Margaret (died 28 years July 1888).

The graves are fenced in a wrought iron fence with a brick base that is in poor repair. John and Eliza's headstone appears to be original while George and Sarah's headstone seems to have been replaced at some time.

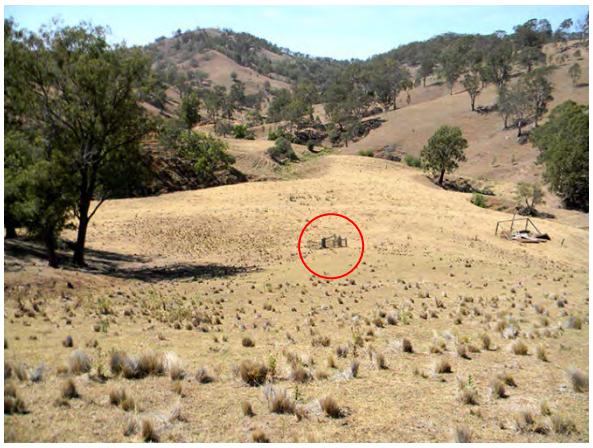
Research indicates that George was born in 1804 or 1805 in North Ireland, he graduated from the University of Dublin in 1832 as a medical doctor. George moved to Ballarat, Victoria, in 1852, and became the mayor of Ballarat East in 1865. He was first married to Martha Holmes in Ireland and they had a daughter together. It was not known when he moved to Muswellbrook, however, it was known that he owned some land in Muswellbrook and that his mother, Frances Isabella (Fanny) Clendinning (born Smith), was born at 'Muscel Creek', NSW. George married Sarah O'Donnell in 1835 and they had eight children together.

The other gravestone recorded was for John Clendinning who died in January 1902 at the age of 60, with this wife Eliza Margaret, who died in July 1888 at the age of 28. Research indicates that John was born in 1843 in Donegal, North Ireland and passed away in Ryde, New South Wales. John was one of eight children that George and Sarah Clendinning had together. He was buried in Muswellbrook with his father.

There is the ruin of a farm shed near to the graves but no visible evidence of a former homestead.

Figure 5-10 shows views of the recorded historic place.

Figure 5-10: Rock Lily Gully-HS01.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>1. View southeast of Rock Lily Gully-HS01 (circled) with the ruined shed to the west.</td><td>2. View of the grave compound.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>3. View of the headstone of George and Sarah Clendinning.</td><td>4. View of the headstone of John and Eliza Clendinning.</td></tr>
</table>

Hilliers Creek-HS01

Site Type: Farm house ruin

GPS Coordinates: GDA Zone 56 323003E, 6435229N

Location of Site: The place is located at Lot 1 DP558324. The site is located on the western bank of Hilliers Creek just to the south of its confluence with Stringybark Creek (**Figure 5-7** and **Figure 5-9**).

Description of Site: Site consists of a corrugated iron structure with a wooden verandah and a brick fireplace and chimney (**Figure 5-11**). There are the remains of the wooden supports for a water tank on the southern side of the building. The structure is standing but in poor condition. There are no obvious attributes to allow the construction date of the structure to be determined but it is assumed to be the early twentieth century given the narrow pitch of the corrugated iron used for the walls. However, during the 2022 survey

the property owner was unsure of the construction date but suggested the 1960s. However, unless old materials were used in the 1960s, it is likely to be older. The hut is well-made with sash-windows, guttering and flashings. Therefore, it would seem that it was constructed as a permanent residence rather than a 'shepherd's hut'.

Figure 5-11: Hilliers Creek-HS01.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>1. View west of Hilliers Creek-HS01.</td><td>2. View southwest of Hilliers Creek-HS01.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>3. View northeast of Hilliers Creek-HS01.</td><td>4. View of the poor condition of the hut.</td></tr>
</table>

5.4 ASSESSMENT OF HISTORIC HERITAGE SIGNIFICANCE

5.4.1 Assessment of significance—general principles

The current assessment will evaluate the heritage significance of the historic heritage sites identified within the study area in accordance with the NSW Heritage Office's publication *Assessing Heritage Significance* (Heritage Office 2001). A historic heritage site must satisfy at minimum one of the following criteria to be assessed as having heritage significance:

Criterion (a): *An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area)*

Criterion (b): *An item has a strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area)*

Criterion (c): *An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area)*

Criterion (d): *An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons*

Criterion (e): *An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)*

Criterion (f): *An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area)*

Criterion (g): *An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments (or a class of the local area's cultural or natural places; or cultural or natural environments).*

Significance assessments are carried out on the basis that decisions about the future of heritage items must be informed by an understanding of these items' heritage values. The *Australia ICOMOS Burra Charter* (Burra Charter 2013) recognises four categories of heritage value: historic, aesthetic, scientific, and social significance.

Items are categorised as having local or state level, or no significance. The level of significance is assessed in accordance with the geographical extent of the item's value. An item of state significance is one that is important to the people of NSW whilst an item of local significance is one that is principally important to the people of a specific LGA.

5.4.2 Assessment of significance of historic items

The two items recorded during the survey are assessed below against the criteria establish by the NSW Heritage Council (**Section 5.4.1**).

Rock Lily Gully-HS01

Table 5-3 assesses Rock Lily Gully-HS01 against the assessment criteria established in the Heritage Office publication, *Assessing Heritage Significance* (Heritage Office 2001).

Table 5-3: Assessment of heritage significance – Rock Lily Gully-HS01.

Criteria	Comments	Significance
a	The item has not influenced the pattern or course of NSW or local history	Does not satisfy this criterion

Criteria	Comments	Significance
b	The item has a known association with individuals from the local area, but the individuals are not well-known to the extent that the item has associative significance.	Does not satisfy this criterion
c	The item does not meet the threshold for aesthetic significance.	Does not satisfy this criterion
d	The item does not have any known strong/special associations for a group of people in the state or local area.	Does not satisfy this criterion
e	While the site demonstrates facets of life in the local area, it does not have broader research potential in relation to local or state history.	Does not satisfy this criterion
f	The item does not represent a class (headstones and memorials) that are endangered or uncommon in the state or local area.	Does not satisfy this criterion
g	The principal or defining characteristics of the item's class are not effectively demonstrated in this example.	Does not satisfy this criterion

Hilliers Creek-HS01

Table 5-4 assesses Hilliers Creek-HS01 against the assessment criteria established in the Heritage Office publication, *Assessing Heritage Significance* (Heritage Office 2001).

Table 5-4: Assessment of heritage significance – Hilliers Creek-HS01.

Criteria	Comments	Significance
a	The item has not influenced the pattern or course of NSW or local history	Does not satisfy this criterion
b	The item has no known associations with an individual of importance to the locality or state.	Does not satisfy this criterion
c	The item does not meet the threshold for aesthetic significance.	Does not satisfy this criterion
d	The item does not have any known strong/special associations for a group of people in the state or local area.	Does not satisfy this criterion
e	While the site demonstrates facets of life in the local area, it does not have broader research potential in relation to local or state history.	Does not satisfy this criterion
f	The item does not represent a class (rural dwellings), that are endangered or uncommon in the state or local area.	Does not satisfy this criterion
g	The principal or defining characteristics of the item's class are not effectively demonstrated in this example.	Does not satisfy this criterion

Table 5-5 details the assessed significance of recorded historic heritage items in accordance with the NSW Heritage Office guidelines and the *Burra Charter*.

Table 5-5: Historic heritage: assessment of significance.

Site Name	Level of Significance
Rock Lily Gully-HS01	Does not have significant heritage values
Hilliers Creek-HS01	Does not have significant heritage values

5.5 DISCUSSION

The two identified historic items have been assessed as having no historic heritage significance under the current Heritage NSW guidelines and the Burra Charter. It is noted that this result reflects the current thresholds and principles of the assessment criteria that rightly emphasise

items with collective, aesthetic, technological and/or natural significance. These values are not present at the sites identified during the survey.

However, it should be noted that while neither item satisfies the criteria for local or state heritage significance, it does not mean that the items are without any historic significance. Rock Lily Gully-HS01, for example, will be obviously significant to the current owners of the property in which the graves are located as the same family continues to own the property. The graves would also be of interest to the general public as they 'speak' of the establishment of farming in the district.

Hilliers Creek-HS01 is representative example of the small rural dwellings that would have been common in the district but are becoming rarer due to natural deterioration. Places such as Hilliers Creek-HS01 would be evocative to the general public as they illustrate a past way of life in rural Australia that no longer exists.

Although neither place would satisfy the criteria to be considered to have local heritage values, the loss of either item would be regretful, and it will be a recommendation of this report that both items are retained in the landscape.

5.6 LIKELY IMPACTS TO HISTORIC HERITAGE FROM THE PROJECT

5.6.1 Places recorded during the survey

Rock Lily Gully-HS01 is located outside of but close to the Survey Boundary and therefore will not be impacted (**Table 5-6** and **Figure 5-8**).

Hilliers Creek-HS01 is within the Survey Boundary, however, it will be avoided by the proposed work (**Table 5-6** and **Figure 5-9**). The planned impact at this location is the construction of an access track and the proponent has undertaken that any planned access track is kept at least 10 m from the ruin.

Table 5-6: Historic heritage recorded during the survey: impact assessment.

Site Name	Will this site be impacted?	Notes
Rock Lily Gully-HS01	No	The site is located outside of proposed impacts and will be avoided. Recommendations will be made to avoid inadvertent damage to the site during construction of the Project
Hilliers Creek-HS01	No, with management	The site is within the Survey Boundary and is therefore liable to be impacted. It is recommended that the site is avoided by ensuring that the access track is kept away from the hut.

5.6.2 Places on an LEP

It was noted in **Section 4.2.1** that there are three places listed on an LEP that are immediately outside or near the Survey Boundary.

The heritage curtilage of the 'Former Roman Catholic Church' is located immediately outside the Survey Boundary and therefore will not be impacted. As there will be impacts immediately outside

the curtilage of the 'Former Roman Catholic Church' listed on the Singleton LEP, a Statement of Heritage Impact (SOHI) is presented in **Section 5.7** to assess the degree of impact to the item's identified heritage values.

The heritage curtilage of both 'Fairview' and 'Hillcrest' is located 80 m from the Survey Boundary and therefore will not be impacted. Additionally, the closest impacts to the homesteads associated within these listings are over 360 m from 'Fairview' homestead and 775 m from 'Hillcrest' homestead (see **Figure 4-3**). As there will not be impacts within or close to the heritage curtilage of these LEP listed items, a SOHI is not required.

Table 5-7 summarises the heritage impact to the three LEP listed items that are immediately outside or close to the Survey Boundary.

Table 5-7: Historic heritage recorded on LEPs: impact assessment.

Site Name	Listing ID	Will this site be impacted?	Notes
'Fairview'	Muswellbrook LEP I47	No	There will be no impacts either to the item itself or within 80 m of its heritage curtilage
'Hillcrest'	Muswellbrook LEP I48	No	There will be no impacts either to the item itself or within 80 m of its heritage curtilage
'Former Roman Catholic Church'	Singleton LEP I56	No	There will be no impacts either to the item itself or to its heritage curtilage.

Beyond impacts to individual items, it was noted in **Section 5.3.1** that the Project exists within a cultural landscape characterised by rural holdings and associated infrastructure such as homesteads and sheds. While the Project will, in places, have a visual impact that could disrupt the rural nature of the landscape, this impact will not adversely impact the fundamental values of the cultural landscape that will remain physically intact. It is also recognised that the cultural landscape values identified in the vicinity of the Project are representative of rural landscapes across large areas of NSW and do not contain any rare or unique features worthy of special conservation efforts.

5.7 STATEMENT OF HERITAGE IMPACT

A SOHI is meant to convey what the impact or impacts of a proposal would be to an item of heritage significance.

The guidelines for preparing a SOHI issued by the NSW Heritage Council contain a number of scenarios where a SOHI may be required. In the case of the 'Former Roman Catholic Church' listed on the Singleton LEP that may be impacted indirectly by the Project, the applicable scenario is: '*new development adjacent to a heritage item*'. Under each scenario are a number of questions that require an answer to help assess the nature and extent of any impact.

How is the impact of the new development on the heritage significance of the item or area to be minimised?

The new development surrounding the 'Former Roman Catholic Church' is road widening works within the road corridor of Bowmans Creek Road. The road works are planned for the opposite side of the road to where the church is located, and these works will not impact the church itself and will not diminish or impact views to or from the church. Visual impacts and any required mitigation in relation to the 'Former Roman Catholic Church' are described in the Visual Impact Assessment Report.

Why is the new development required to be adjacent to a heritage item?

The new development is outside of the defined heritage curtilage of the item 'Former Roman Catholic Church'.

How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?

There will be no impacts in the heritage curtilage of the 'Former Roman Catholic Church' and all proposed impacts (road works) are located over 45 m from the church.

How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?

The new development is road widening works within the road corridor of Bowmans Creek Road. The road works are planned for the opposite side of the road to where the church is located, and these works will not impact the church itself and will not diminish or impact views to or from the church.

Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they rejected?

The location of new impacts in the vicinity of the heritage item has been surveyed by a qualified archaeologist and the conclusion is that no archaeological deposits of conservation values will be impacted by the proposed works at any location.

Is the new development sympathetic to the heritage item? In what way (e.g. form, siting, proportions, design)?

This question is not applicable as there will be no new development immediately adjacent to a heritage item.

Will the additions visually dominate the heritage item? How has this been minimised?

No. All new development is at a distance to the heritage site and will not dominate the heritage item.

Will the public, and users of the item, still be able to view and appreciate its significance?

Yes. As all new development is at a distance to the heritage item, a suitable curtilage is maintained and there will be no diminution of the public's ability to view and interpret the heritage item.

5.7.1 Response to submissions

The owner of the property containing this historic item (P14) disagreed that there would be no heritage impact to this item. OzArk notes the information supplied by P14 in their submission and appreciates the research P14 has completed for the 'Former Roman Catholic Church' including P14's family ties to the building. This constitutes a significant body of research that justifies the item's inclusion on the Singleton LEP. However, the works for the Project will not directly impact the building, and as the works constitute road works within an existing road corridor, visual impacts from the road works will not alter views to or from the item and will not visually dominate the item or distract from its heritage values. OzArk therefore believe that the SOHI presented in **Section 5.7** remains valid.

6 MANAGEMENT AND MITIGATION: HISTORIC HERITAGE

6.1 GENERAL PRINCIPLES FOR THE MANAGEMENT OF HISTORIC SITES

Appropriate management of heritage items is primarily determined based on their assessed significance as well as the likely impacts of the proposed development.

In terms of best practice and desired outcomes, avoiding impact to any historical item is a preferred outcome, however, where a historical site has been assessed as having no heritage value, impacts to these items does not require any legislated mitigation.

6.2 MANAGEMENT AND MITIGATION OF RECORDED HISTORIC SITES

6.2.1 Places recorded during the survey

Rock Lily Gully-HS01 is located outside of the Survey Boundary, although there will be impacts from the construction of an access track within 10 m of the graves. The following management recommendations are made with regard to this place:

- The proponent will undertake to restore the fence surrounding the graves and install plantings to shield the graves from the nearby proposed access track
- The grave site at GDA Zone 56 316931E, 6428480N should be fenced with a high visibility barrier during construction of the Project to avoid inadvertent impacts.

Hilliers Creek-HS01 located at GDA Zone 56 323003E, 6435229N is within the Survey Boundary and liable to be impacted. Although the assessment of heritage significance in **Section 5.4.2** concluded that the place does not have local or state heritage values, it is, nonetheless, highly desirable for the place to remain within the landscape. As such, the following management recommendations should be followed:

- The location of Hilliers Creek-HS01 should be considered when the design of the access track is finalised to ensure that the place is avoided by not constructing the access track within 10 m of the place.

6.2.2 Places recorded on LEPs

As noted in **Section 5.6.2,** there will be no impacts associated with the Project within 80 m of the heritage curtilage of ‘Fairview’ or Hillcrest’. Additionally, the closest impacts to the homesteads associated within these listings are over 360 m from ‘Fairview’ homestead and 775 m from ‘Hillcrest’ homestead. As there is no proposed work within the defined heritage curtilage of these items, there are no further management recommendations.

The SOHI presented in **Section 5.7** demonstrates that there will be no impact, either physical or visual, on the ‘Former Roman Catholic Church’. As there is no proposed work within the defined heritage curtilage of the ‘Former Roman Catholic Church’ (Lot 1 DP1167323), there are no

management recommendations beyond ensuring that there are no impacts within the lot containing this item including vehicle movement and the storage of materials.

6.2.3 Impacts to the cultural landscape

In terms of the cultural landscape surrounding the Survey Boundary, particularly along Albano (Bowmans Creek) Road, some members of the local community feel that the Project will diminish the rural 'feel' of the area by introducing an 'industrial' element into the landscape. In order to provide an avenue for the local community to nominate places and landscapes that they feel are important, the proponent will commission a community-based heritage study that will document and archivally record any items held to be significant by the local community. This heritage study will provide a record of the cultural landscape that exists prior to any impacts associated with the Project commencing.

Following the public exhibition of the EIS in 2021, one respondent (P14) noted that:

> *There will be a loss of local historic heritage in the Bowmans Creek area, such as wool sheds, dance hall, Blacksmiths shop, Local land Heritage listed Church and federation homesteads.*

OzArk acknowledges this view but notes that the proponent will also commission a community community-based heritage study that will document and archivally record any items held to be significant by the local community.

The Project will not directly impact any of the historic items identified by P14 although it is accepted that distant views from some of these items may be impacted by the Project but not to a degree that the heritage values of the items would be diminished.

7 RECOMMENDATIONS

The following recommendations are made based on the impacts associated with the Project and with regard to:

- Legal requirements under the terms of the Heritage Act
- Guidelines presented in the *Burra Charter*
- The findings of the current assessment
- The interests of the local community.

Recommendations concerning the historic values within Project Site are as follows.

1. All land-disturbing activities must be confined within the assessed Survey Boundary. Should project impacts change such that the area to be impacted is outside of the assessed Survey Boundary, then additional assessment may be required.
2. The grave site (Rock Lily Gully-HS01) at GDA Zone 56 316931E, 6428480N should be fenced with a high visibility barrier during construction of the Project to avoid inadvertent impacts. To mitigate visual impacts from the access roads, the proponent will restore the fence surrounding the graves and install plantings to shield the graves from the nearby proposed access tracks.
3. The location of Hilliers Creek-HS01 located at GDA Zone 56 323003E, 6435229N should be considered when the design of the access track is finalised to ensure that the place is avoided. No access track should be designed to be within 10 m of the farm house ruin.
4. There should be no impacts within Lot 1 DP1167323 that contains the 'Former Roman Catholic Church' (Item I156 on the Singleton LEP).
5. In terms of the cultural landscape surrounding the Survey Boundary, particularly along Albano (Bowmans Creek) Road, the proponent will commission a community-based heritage study that will document and archivally record any items held to be significant by the local community. This study will provide a record of the cultural landscape prior to any impacts associated with the Project commencing.
6. Procedures for the unexpected discovery of historic items and/or human skeletal material during the construction and/or use of the Project will be set out in an approved HHMP that will be developed following project approval. Normally, no construction work associated with the Project can commence until the HHMP has been approved by the Department of Planning and Environment.

REFERENCES

Burke & Smith 2004 — Burke, H. and Smith, C. 2004. *The Archaeologist's Field Handbook*, Blackwell, Oxford.

Burra Charter 2013 — International Council on Monuments and Sites 2013. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*.

CSIRO 2009 — Commonwealth Scientific and Industrial Research Organisation (CSIRO). 2009. *Australian soil and land survey field handbook. Third Edition.* CSIRO Publishing.

GML 2016 — GML Heritage. 2016. *Hillcrest Historic Research*. Report for Tocomwall Pty Ltd.

Heritage Council 2006 — Heritage Office of the Department of Planning (now Heritage NSW). *Historical Archaeology Code of Practice.*

Heritage Office 2001 — Heritage Office of the Department of Planning (now Heritage NSW). *Assessing Heritage Significance.*

HLA 1995 — HLA Envirosciences. 1995. *Hillcrest and Fairview Heritage Recording and Analysis*. Report for Pacific Power.

Lucas 2013 — Lucas, Clive. 2013. *Hunter Estates, A comparative heritage study of pre 1850s homestead complexes in the Hunter Region.* NSW Office of Environment and Heritage.

Mitchell 2002 — Mitchell, Dr. Peter. 2002. *Description for NSW (Mitchell) Landscapes Version 2*. Department of Environment and Climate Change NSW.

OzArk 2021 — OzArk Environment & Heritage. *Aboriginal Cultural Heritage Assessment Report. Bowmans Creek Windfarm.* Report to Epuron Projects Pty Ltd.

Scone 1925 — The Scone Advocate: Our Coal Resources: Muswellbrook Area. Article assessed at https://trove.nla.gov.au/newspaper/article/157017911

Umwelt 2014 — Umwelt (Australia) Pty Ltd. 2014. *Glencore Historical Heritage Assessment: Mount Owen Continued Operations Project*. Report to Mount Owen Pty Limited.

Websites

https://bih.federation.edu.au/index.php/George_Clendinning
https://www.myheritage.com/names/george_clendinning
http://freepages.rootsweb.com/~carrick/genealogy/Ballarat%20c%20to%20f.html

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HERITAGE ADVICE
TEST EXCAVATION AT 37-3-1588 AND 37-3-1589

Dear James,

At your request, OzArk Environment & Heritage (OzArk) have prepared this heritage advice in relation to our recommendation that further investigation in the form of test excavation take place at Albano Road OS-02 (37-3-1588) and Albano Road OS-03 (37-3-1589) following project approval rather than prior.

1 BACKGROUND

During the survey for the Bowmans Creek Wind Farm project (the Project), 13 surface artefacts were recorded eroding from a cutting for Albano Road at Albano Road OS-02 (37-3-1588). The road cutting is within a terrace for Bowmans Creek. Areas outside the immediate corridor of Albano Road were unable to be inspected as access had not been granted by the property owner at the time of the survey, but it is expected that further surface artefacts are present. The site is also considered to be associated with potential archaeological deposit (PAD) in the non-eroded and heavily grassed area of the terrace on either side of Albano Road. The PAD designation is based on the landform type but was not closely inspected as access was not possible.

At Albano Road OS-03 (37-3-1589), three surface artefacts were recorded eroding from a cutting for Albano Road at Albano Road OS-02 (37-3-1588). The road cutting is within a terrace for Bowmans Creek. Areas outside the immediate corridor of Albano Road were unable to be inspected as access had not been granted by the property owner at the time of the survey, but it is expected that further surface artefacts are present at a low-density. There is moderate potential for in situ subsurface deposits at the site in areas to the east of the area of high erosion across the terrace. The PAD designation is based on the landform type but was not closely inspected as access was not possible.

At both sites the proposed work is to increase the width of the road cutting to allow the transport of wind farm turbine components along Albano Road. This would involve impact to the PAD area at Albano Road OS-02 (37-3-1588) of 13 metres (m) by 34 m to the west of Albano Road and 8 m by 36 m to the east of the road.

At Albano Road OS-03 (37-3-1589) the impact to the PAD area is limited to a 7 m by 42 m area to the east of Albano Road.

At Albano Road OS-02 (37-3-1588), of a total PAD area of 2,247 m^2, 607 m^2 (or 27 per cent) will be impacted. At Albano Road OS-03 (37-3-1589), of the total PAD area of 1422 m^2, 222 m^2 (or 16 per cent) will be impacted

Given the nature of the surface expression of artefacts recorded in the road cuttings at both sites (13 and three artefacts) it is not considered that the PAD areas at either site will contain archaeological deposits of conservation value.

2 OZARK RECOMMENDATIONS REGARDING TEST EXCAVATION

In the *Aboriginal Cultural Heritage Assessment Report* (ACHAR) for the project, OzArk assumes that all areas within the impact footprint (Survey Boundary) will be harmed by the Project as the works at these sites involve modification to an existing road where there is little room for avoidance.

As the sites have associated PAD, OzArk therefore recommended that the areas of the PAD within the Survey Boundary should be investigated by limited archaeological excavation following the methodology set out in the ACHAR. It was recommended that this work should take place following approval of the Project but before any ground disturbing impacts occur around the sites.

The overarching reason for delaying the subsurface investigation until after approval is that an object of the *National Parks and Wildlife Act 1974* (NPW Act) is the '*conservation of objects places and features… of cultural value within the landscape, including… places, objects and features of significance to Aboriginal people*' (s.2A(1(b)(i)).

As heritage professionals, OzArk, strives for good conservation outcomes. In this case, as project approval, and the subsequent decision to construct the wind farm, is not certain, OzArk considers that a more prudent approach, given the low likelihood of the sites containing subsurface deposits of conservation value, is not to harm the areas of PAD until such time as impacts are approved and about to be undertaken.

Further, only portions of the PADs are within the impact footprint (27 per cent at Albano Road OS-02 [37-3-1588] and 16 per cent at Albano Road OS-03 [37-3-1589]). Therefore, most of the PAD areas (73 per cent and 84 per cent respectively) will not be impacted by the Project. In the unlikely event that the post-approval subsurface investigations within the impact footprint demonstrate that there are significant subsurface deposits at either site, then most of these deposits in the remaining areas of the PADs will not be impacted.

While further investigation of the PAD areas is warranted should impacts be approved to add to our knowledge about past Aboriginal use of the area, it is considered that there is a very low risk in delaying these investigations until a time that Project impact is certain. Leaving the PADs unharmed until such time is achieving a major aim of the NPW Act, especially given that Project impacts are far from certain at this stage.

3 PRECEDENTS

OzArk is aware of many precedents of delaying subsurface investigations until after project approval. To name a few, the following projects all identified areas of subsurface potential but were approved without the need for test excavation to demonstrate the veracity of these assessments. In all cases, subsurface investigations were delayed until project approvals were consented and project impacts were imminent.

1. Narrabri to North Star (N2NS) section of the Inland Rail, which is classified as critical State Significant Infrastructure (CSSI) under the *Environmental Planning and Assessment Act 1979*.
2. Wellington Solar Farm (SSD 8573)
3. Wallerawang Quarry Extension Project (DA No. 344-11-2001). This project is classified as State significant development, under Section 76A(7) of the *Environmental Planning and Assessment Act 1979*, because it is an extractive industry where the proposed extraction rate is greater than 200,000 tonnes per annum. It was also assessed as an Integrated Development and as a Designated Development.
4. Mangoola Coal Continued Operations (SSD-8642).

Given the assessed nature of the PADs in question, the uncertainty around whether Project impacts will ever eventuate, and the fact that delaying subsurface excavations until after approval is consented is not without precedent, OzArk considers the recommendations in the ACHAR as a prudent measure to ensure that Aboriginal cultural values are not unnecessarily harmed.

Kind regards,

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