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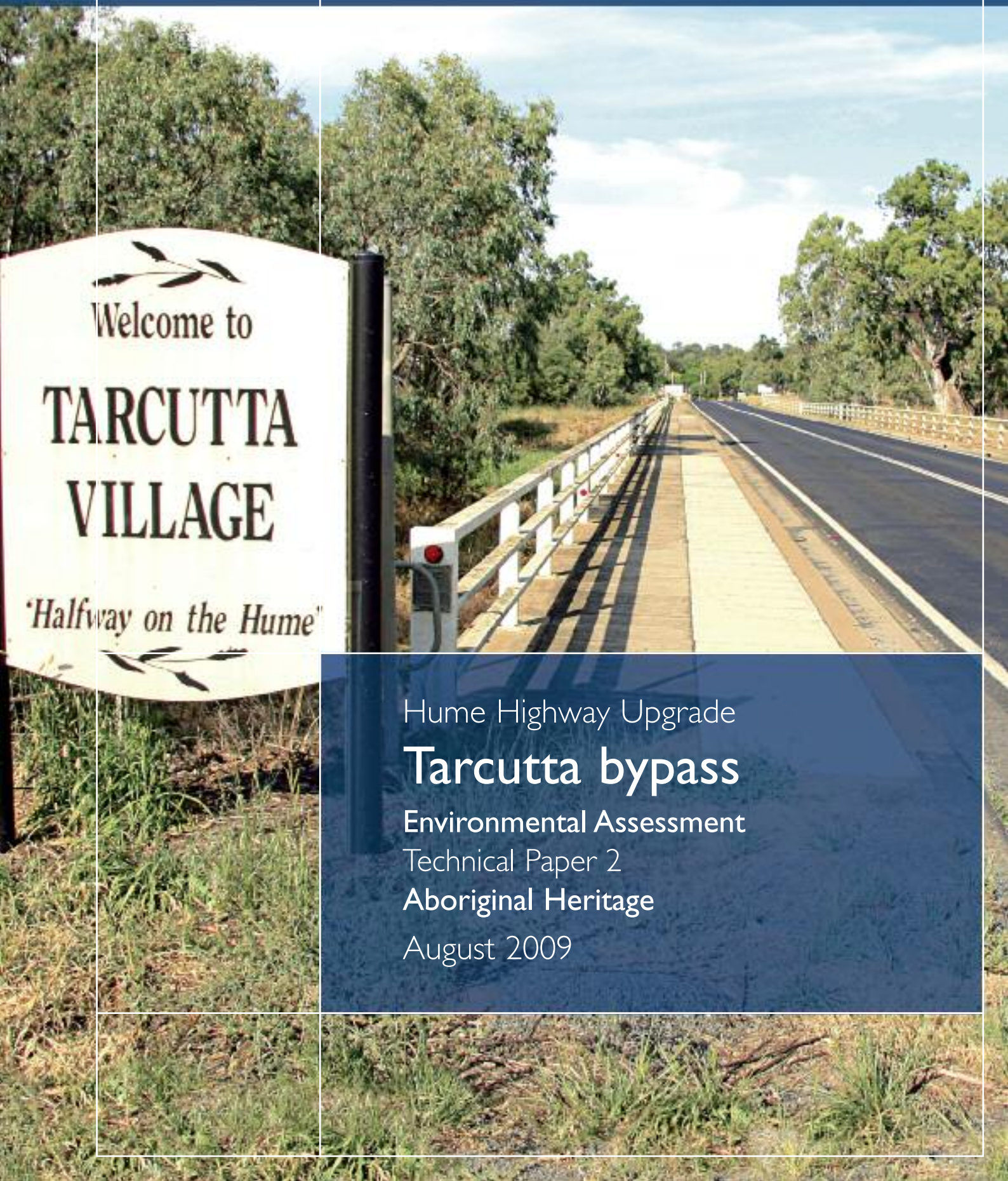
RTA



Hume Highway Upgrade

Tarcutta bypass

Environmental Assessment

Technical Paper 2

Aboriginal Heritage

August 2009

HUME HIGHWAY TOWN BYPASS: TARCUTTA
ABORIGINAL CULTURAL HERITAGE

Cultural Heritage Assessment Report

Prepared for Parsons Brinckerhoff on behalf of
the Roads and Traffic Authority of NSW (RTA)

Final Report
July 2009

Ref. 7008

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1 Introduction

1.1 Project Description

As part of the Hume Highway upgrade works to provide dual carriageway between Sydney and Melbourne, the Roads and Traffic Authority of New South Wales (RTA) proposes to construct a bypass of the town of Tarcutta, NSW. The general location of the study area and proposed Tarcutta bypass corridor is shown in Figure 1.

The Tarcutta bypass would be approximately seven kilometres long, and a predominantly flat and straight alignment. At its northern extent, the project would adjoin the Hume Highway duplication works, which are under construction to the north of Tarcutta. The route then heads south, maximising opportunities to retain the existing Hume Highway carriageway as the southbound carriageway where appropriate. An interchange would be constructed on farmland to the west of the existing highway in the vicinity of Bardwell Street. The interchange would have a northbound on-load ramp and a southbound off-load ramp.

The route would deviate to the west of the existing highway, skirting the boundary of Tarcutta General Cemetery, parallel to the existing highway south to Tarcutta Creek. Twin bridges would be required over Tarcutta Creek and would be situated downstream (north) of the existing highway bridge. South of these bridges, the route would turn east toward the existing highway at the southern end of the village of Tarcutta and would cross over the existing highway to the east, just north of the Mates Gully Road intersection. An interchange is proposed at this location to provide an on-load ramp for southbound traffic.

The route would continue in a south-westerly direction on the eastern side of the highway for approximately one kilometre, where it would again cross the existing highway from east to west, just north of the Humula Road intersection. An interchange is proposed at this location, providing an off-load ramp for northbound traffic heading into Tarcutta. South of the interchange, the route would cross over Keajura Creek on twin bridges. The alignment would adjoin the existing highway south of Humula Road.

Ancillary facilities and temporary works that would be required for the proposed 2-year construction period include:

- main compound site - proposed to be located on the south-western side of the northbound on-ramp;
- satellite compound sites - numerous proposed along the alignment (within the corridor); approximately 50x50 metres;
- concrete batching plant - proposed to be located on the south-western side of the northbound on-ramp;
- erosion and sedimentation control - numerous proposed along the alignment (some will remain permanently);
- storage and stockpile areas - numerous proposed along the alignment;
- haul road and bridge (Tarcutta Creek) access road - would run parallel with the proposed bypass alignment in the middle section; and
- cross-overs for traffic switches - at northern and southern ends of proposed bypass; both will remain as permanent emergency crossings and private property access.

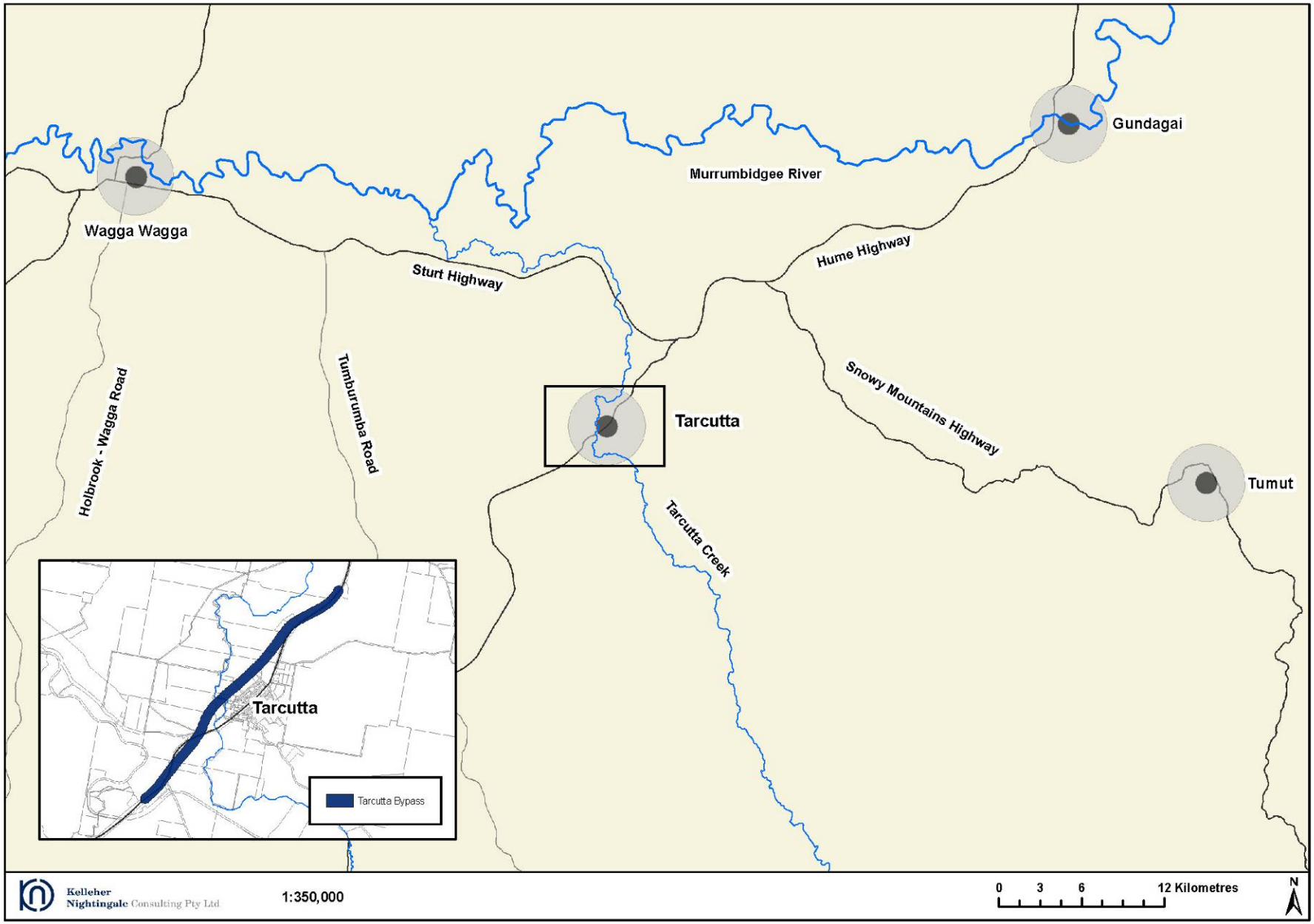

Figure 1. Study area location and bypass corridor

1.2 Scope of Environmental Assessment

An Environmental Assessment (EA) is being undertaken for the proposed bypass. Parsons Brinkerhoff (PB) has been appointed by the RTA to manage the EA process. Kelleher Nightingale Consulting Pty Ltd (KNC) has been engaged to undertake an Aboriginal cultural heritage assessment as part of the EA.

The bypass project is being assessed as a major project under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). As such, the assessment is being undertaken in accordance with the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005) for Part 3A major projects and the RTA Procedure for Aboriginal Cultural Heritage Consultation and Investigation (RTA 2008).

As part of this process, a preliminary environmental assessment, including archaeological survey and cultural mapping of the Tarcutta bypass corridor was undertaken. A number of cultural places, Aboriginal archaeological sites and areas of potential archaeological deposit (PAD) were identified during inspection of the bypass corridor. The assessment provided an understanding of the Aboriginal archaeological and cultural heritage sites and values of the proposed bypass.

Further detailed assessment of the selected route as part of the EA, including archaeological test excavation and detailed cultural mapping with knowledge holders, was required to provide specific management and mitigation advice regarding Aboriginal cultural heritage. The further detailed assessment is provided to assess the impacts of the proposed bypass, refine the detailed road alignment within the route corridor and identify appropriate mitigation measures.

2 Study Objectives

The objectives of the integrated Aboriginal cultural heritage assessment were in accordance with the RTA Procedure for Aboriginal Cultural Heritage Consultation and Investigation.

The processes undertaken for the Preliminary Environmental Investigation and Environmental Assessment phases comply with the requirements of Stages 2, 3 and 4 of the procedure.

The results of the detailed consultation and assessment are integrated into this Cultural Heritage Assessment Report. The report comprises:

- a description of the location and scope of the proposed project, including ancillary works (section 1);
- description and map of the study area (section 1);
- details of Aboriginal stakeholder identification, consultation and participation in the cultural and archaeological assessments (section 3);
- description of the methodologies and results of the cultural and archaeological assessments (sections 4, 5 and 6);
- statement of significance, incorporating assessed cultural and archaeological values (section 7);
- an assessment of the potential impacts of the proposed bypass on identified cultural heritage values (section 8); and
- management and mitigation measures recommended for archaeological sites and cultural values identified through the assessment (section 9).

3 Aboriginal Stakeholder Consultation and Participation

The RTA is committed to effective consultation with Aboriginal communities regarding activities which may impact on Aboriginal cultural heritage. The RTA Procedure for Aboriginal Cultural Heritage Consultation and Investigation (RTA 2008) has been developed to provide a consistent means of effective consultation for RTA activities across NSW.

3.1 Stakeholder Identification and Consultation

The RTA has initiated Aboriginal stakeholder identification and consultation for the Tarcutta bypass Environmental Assessment. The formal consultation process is being coordinated by PB, on behalf of the RTA, as project managers of the overall EA process.

The RTA advertised for Aboriginal stakeholders following the Department of Environment and Climate Change (DECC) Interim Community Consultation Requirements for Applicants (DEC 2004) and the RTA Procedure. Registered Aboriginal stakeholders have been consulted as part of the Aboriginal cultural heritage assessment.

Registered stakeholders for the Tarcutta bypass (based on the list as advised by PB) are listed in the table below.

Table 1. Registered Stakeholders

Group / Individual	Representative / Contact
Wagga Wagga Aboriginal Elders Inc	Isobel Reid
Waagan Waagan Project Group	Robert Hampton
Wagga Wagga Local Aboriginal Land Council	CEO
Douglas Connors	Individual
Kathy Williams	Individual
Jerrawa Freeman	Individual
Alice Williams	Individual
Lindsay Connolly	Individual
Shawn Williams	Individual
Beverly Herrington	Individual
Arinya Freeman	Individual
Donna Freeman	Individual
Muriel Williams	Individual
Vicky Parsley	Individual
Shirley Tidmarsh	Individual
Ronald Grovenor	Individual
Ramsay Freeman	Individual
Janice Considine	Individual
Margaret Williams	Individual
Neville Williams	Individual
Sharon Williams	Individual
Enid Clarke	Individual
Krystal Ingram	Individual
Norma Freeman	Individual
Keith Freeman	Individual
Margaret Berg	Individual
Calca Freeman	Individual
Enid Freeman	Individual
Jessica Berg	Individual
Shirley Marlowe	Individual
Wayne Williams	Individual

The formal consultation process has included:

- advertising for registered stakeholders in local and Indigenous media (refer Appendix A);
- notification of closing date for registration;
- Aboriginal Focus Group (AFG) meeting held at the Holbrook Community Technology Centre on Wednesday 20th February 2008, at which the results of the preliminary archaeological and Aboriginal cultural heritage assessments and methodology for Aboriginal cultural assessment were presented and discussed;
- provision of the archaeological test excavation methodology (research design) to each of the registered stakeholders for review and comment. Comments received were included in full in the research design;
- AFG meeting held at the Holbrook Community Technology Centre on 11th February 2009, at which the results of the survey and methodology for the proposed test excavation program was presented and discussed;
- AFG meeting held at the Holbrook Community Technology Centre on 18th June 2009, at which the Cultural Heritage Assessment Report (CHAR) was presented and discussed;
- ongoing compilation of registrants list, through continuing to register individuals and groups for consultation on the project; and
- ongoing consultation with the local Aboriginal community.

In addition, registered stakeholders have participated in both the archaeological surface survey of the Tarcutta bypass corridor and the subsequent archaeological test excavation program. Aboriginal stakeholders were involved in each day of the survey program, which was carried out on 5th and 6th November 2008, and the archaeological test excavation program, which was conducted between 24th February and 20th March 2009.

A copy of the draft CHAR was provided to Aboriginal stakeholders for review and comment. Over 21 days was provided to receive comments. No comments have been received.

3.2 Aboriginal Stakeholder Comments

Throughout the Aboriginal stakeholder consultation process and discussions on-site between stakeholders and archaeologists, it has been clearly identified that the study area has cultural heritage value to the local Aboriginal community. Some of the Aboriginal cultural heritage values expressed by stakeholders include:

- strong association with the land;
- responsibility to look after the land, including the heritage sites, plants and animals, creeks and the land itself;
- scarred trees;
- artefact sites and areas of potential;
- landscape features and areas of Aboriginal cultural value identified by knowledge holders around Tarcutta;
- creek lines;
- Indigenous plants and animals; and
- general concern for burials, as their locations are not always known and they can be found anywhere.

3.3 Aboriginal Knowledge Holder Identification

As part of the cultural assessment, registered Aboriginal stakeholders were invited to identify individuals they regarded as knowledge holders for the area. Identified knowledge holders would be invited to participate in the cultural assessment process. The methodology and results of the cultural assessment, as considered appropriate for incorporation into the CHAR, are outlined in the following section.

4 Aboriginal Cultural Assessment

4.1 Cultural Assessment Methodology

An assessment of the Aboriginal cultural heritage of the Tarcutta bypass potential impact corridor has been undertaken as part of the overall assessment of Aboriginal heritage for the Environmental Assessment and a report has been prepared (Waters Consultancy 2009). The Aboriginal cultural assessment methodology was presented at the AFG in Holbrook on 20th February 2008.

The assessment identified locations of Aboriginal cultural value within the potential impact corridor as provided by the RTA.

The assessment involved consultation with Aboriginal knowledge holders as identified by the registered Aboriginal stakeholders for the Tarcutta bypass project. Registered Aboriginal stakeholders were contacted directly by Waters Consultancy to discuss the current project, identify those individuals they regarded as knowledge holders for the area and to learn any additional relevant stakeholder concerns or issues. Stakeholders also identified knowledge holders during the Aboriginal Focus Group meeting.

As a result of this process, seven of the identified knowledge holders were spoken with to determine their willingness to participate in the assessment process through field surveys and interviews. Three knowledge holders were willing to be involved in the assessment through both interviews and field surveys. Of the remaining knowledge holders, one chose not to be involved and three were satisfied that the three who had indicated they would participate would provide sufficient information for the assessment.

As a result of the cultural assessment process, six locations of specific Aboriginal cultural value were identified within the Tarcutta Bypass potential impact corridor. [redacted].

4.2 Cultural Landscape

[redacted]

4.3 Identified Cultural Places

[redacted]

[redacted]

5 Archaeological Assessment

The archaeological assessment for the Tarcutta Town Bypass Project was undertaken by KNC and comprised intensive survey and a series of test excavations. This section outlines the results of the survey and test excavation program. The information presented in this section offers an understanding of the archaeological resource potentially impacted by the Tarcutta Town Bypass and enables a full archaeological impact assessment.

5.1 Archaeological Context

Archaeological surveys of the Tarcutta area prior to the bypass program identified a range of archaeological features including scarred trees, isolated finds, artefact scatters and potential archaeological deposits (PAD) (Kelleher and Nightingale 2007a). In total eight sites and one PAD are listed for the immediate Tarcutta area (10km radius from town) on the Aboriginal Heritage information Management System (AHIMS) prior to the current assessment. Eight of the nine previously recorded sites were identified during surveys for the Hume Highway Duplication Project and have been documented as part of the associated reporting process (see RTA 2007). These sites are listed in the table below.

Table 2. Previously recorded Aboriginal archaeological sites near Tarcutta

Site Name	Site Type	AHIMS Number
T1	Scarred Tree	56-2-0058
T2	Scarred Tree	56-2-0059
T3	Scarred Tree	56-2-0060
T4	Isolated Find	56-2-0061
T5	Artefact Scatter	56-2-0062
T6 (formerly T-PAD-1)	Artefact Scatter	56-2-0063
T7 (formerly T-PAD-2)	Artefact Scatter	56-2-0064
T-PAD-3	PAD	56-2-0065
	Scarred Tree	56-2-0003

Among the identified archaeological sites, quartz is the most common raw material for flaked stone artefacts, with chert, silcrete and quartzite also being recorded. Artefact scatter sites are mostly located in well-drained, elevated areas associated with water courses, such as terraces above rivers or creek lines. Scarred trees occur across the landscape where old growth native woodland or trees remain, but are also most likely located near water.

Two of the identified archaeological sites, T6 and T7 (both originally identified as PADs), were excavated as part of the overall Hume Highway duplication (Kelleher and Nightingale 2007c). Both sites were located north of Tarcutta on high ground near Dellatory Creek (a tributary to Tarcutta Creek). Results from these excavations suggest a moderate level of Aboriginal occupation with both sites exhibiting around 16 artefacts per/m^2 with a total of c.2000 artefacts recovered. (A greater intensity of artefacts can be expected in more favourable resource areas.) The most interesting finding was the radiocarbon date for T6 showing a significant age of 6500 years before present. Aboriginal people were occupying the flood plain margins for some time. The excavations of T6 and T7 clearly show an intensity and longevity of Aboriginal use of the Tarcutta area that was unknown to science prior to excavation. Based on the excavation results we can expect a range of occupation areas around Tarcutta for the bypass corridor which closely follows Tarcutta creek. Perhaps some of these sites will display a long and significant chronology.

Preliminary analysis showed that only three of the previously identified nine sites/PADs are within the Tarcutta bypass corridor. All three of the sites are scarred trees.

Table 3. Previously recorded Aboriginal archaeological sites in the Tarcutta bypass corridor

Site Name	Site Type	AHIMS Number
T1	Scarred Tree	56-2-0058
T2	Scarred Tree	56-2-0059
T3	Scarred Tree	56-2-0060

One additional previously recorded site, a scarred tree (56-2-0003) is located near the new truck parking area in Tarcutta, but not near the bypass corridor (refer Hardy 2006). No other Aboriginal archaeological sites have previously been recorded near the Tarcutta bypass corridor.

5.2 Archaeological Survey

PB commissioned Kelleher Nightingale Consulting to undertake an archaeological survey of the Tarcutta bypass corridor. The survey around Tarcutta was carried out on the 5th and 6th of November 2008. These surveys utilised the results of previous Hume Highway assessments (Kelleher and Nightingale 2007a, b, c) to assist the investigation process.

The methodology of the survey followed a standard approach and was consistent with the survey methodology employed for the Hume Highway Duplication Project. Two teams of archaeologists and Aboriginal community members undertook a pedestrian survey of each bypass corridor. 100% of the bypass corridor was assessed.

Each team consisted of around 5-6 people. Digital and print maps showing the proposal and standard topographic maps were used for reference. Handheld GPS were used to register grid references. Areas of exposed ground such as tracks or eroded surfaces which provided good visibility formed the focus of the pedestrian survey (although all areas were assessed). Generally surface visibility was poor with a resulting low level of effective coverage.

Effective survey coverage along the Tarcutta bypass survey area was low averaging c. 3-4%. This is predominately due to relatively high levels of grass or other vegetation covering the survey corridor. Ploughed fields offered good surface visibility, but their disturbed nature hindered artefact identification. Where surface visibility was high it was usually related to erosional or one off disturbance events (e.g. trenching, dam construction). Because of the poor surface visibility there is potential that Aboriginal archaeological sites if present were missed. The concept of PADs was thus used to identify places that are likely to be archaeologically significant. This significance is based on a series of assessments relating to: geology, soil type, erosion potential, stream order, proximity to water and land use. Two PADs were identified during the Tarcutta survey.

As a result of the survey, a total of 15 Aboriginal archaeological sites and 2 PAD areas were identified within the proposed bypass corridor. (Each site is discussed in section 5.3). This total includes three scarred trees (T1, T2, T3) previously identified near Tarcutta. The two PADs have since been reclassified as sites following the test excavation program.

Total Aboriginal archaeological sites for the Tarcutta bypass number 17 sites (13 artefact scatters and 4 scarred trees).

Table 4. All identified Aboriginal archaeological sites in the Tarcutta bypass corridor

Site Name	Site Type	AHIMS Number
T1	Scarred Tree	56-2-0058
T2	Scarred Tree	56-2-0059
T3	Scarred Tree	56-2-0060
T8	Artefact Scatter	56-2-0066
T9 (TA14)	Artefact Scatter	56-2-0067
T10	Artefact Scatter	56-2-0068
T11	Artefact Scatter	56-2-0069
T12 (TA15)	Artefact Scatter	56-2-0070
T13	Artefact Scatter	56-2-0071
T14	Scarred Tree	56-2-0072
T15	Artefact Scatter	56-2-0073
T16	Artefact Scatter	56-2-0074
T17	Artefact Scatter	56-2-0075
T18	Artefact Scatter	56-2-0076
T19	Artefact Scatter	56-2-0077
T20 (TA16) (formerly T-PAD-4)	Artefact Scatter	56-2-0078
T21 (TA17) (formerly T-PAD-5)	Artefact Scatter	56-2-0079

Artefact scatters were generally identified where surface visibility was high; such as where large surfaces have eroded as a single layer (almost like removing the top sheet of a bed). The highest density scatter was T15 where erosion prone soils revealed over 50 artefacts. Quartz was the dominant raw material representing 97% of all artefacts. Quartz was found in all parts of the study area, but preference for flaked pieces was given to 'higher quality' minerals which exhibited few internal fractures and a crystalline structure

(in other words people were being selective in the precise minerals being chosen for flaking). Consistent with previous studies, around 10%-15% of all artefacts displayed some level of retouching suggesting more selective knapping (and perhaps some curatorial action) was taking place as opposed to the more common 'use and discard' often associated with quartz artefacts (Kelleher 2003).

Figures 2, 3 and 4 show the locations of archaeological sites and test excavation areas.

5.3 Archaeological Sites

T1
This site is a scarred tree situated on the western side of the Hume Highway within the [redacted] property. It is located on the top of a gentle slope (see site T10) in a paddock. The tree is a Box (possibly Apple Box) with an elongated elliptical scar. This tree was identified as part of the 2006 Hume Highway duplication survey.

T2
This site is a scarred tree situated on the western side of the Hume Highway within the [redacted] property. The tree is a dead Red Gum with an elongated triangular scar. The tree has been ringbarked, creating a relatively straight edge to the base of the scar. It is located on a gentle slope. This tree was identified as part of the 2006 Hume Highway duplication survey. The tree is top heavy and may need some remedial branch cutting to lower its centre of gravity. This work should only be undertaken after consultation with stakeholders.

T3
This site is a scarred tree situated on the eastern side of the Hume Highway. It is located on a lower hillslope approximately 800m east of Tarcutta Creek. It is a dead tree with three wound scars on the main trunk and one scar on a cut section of the trunk lying on the ground. This tree was identified as part of the 2006 Hume Highway duplication survey.

T4-T7
These sites are not located with the Tarcutta town bypass corridor.

T8
This site is located on the western side of the existing Hume Highway approximately 1.2 kilometres south of [redacted]. The site is situated on top of a hill overlooking Tarcutta Creek. The hill was once part of a low ridge extending from the east, but is now bisected by the highway. Artefacts comprise one good quality quartz flake (16mm x 15mm x 6mm) and one broken flake (blade) of good quality quartz (15mm x 13mm x 6mm). The site is spread over the upper portion of the hill encompassing c.8000m^2 based on the occupation viability of the landform. The site is in good condition with only limited evidence of archaeologically significant erosion.

T9
T9 is located on the western side of the existing Hume Highway approximately 1.5 kilometres south of Toonga Settlement Road. The site is situated on the end of a low spur extending down towards the Tarcutta Creek floodplain. The spur is part of a low ridge extending from the east, but is now bisected by the highway. Artefacts are spread out over the spur with concentrations located on the western end. Two artefacts of a regionally rare fine grained siliceous material were identified during the initial field survey. Subsequent test excavations of T9 have revealed a generally low to moderate density of subsurface archaeological material within a generally shallow and angular colluvial environment. Cultural material was limited to the top 15-30cm of soil. The eastern portion of the site displays an increased gradient which exhibited a proportional drop in both artefacts and soils. In short, the eastern portion of the site is a moderate erosional area representing low archaeological significance with limited archaeological material. In contrast the far western portion of the sites (not impacted by the concept plan) represents a higher value archaeological site.

T10
T10 is a large artefact scatter located on a raised mound adjacent to the Tarcutta Creek floodplain. The site is located approximately one kilometre north of Tarcutta on the west side of the highway within the [redacted] property. Artefacts are scattered across the mound and the site covers an area of around 12,000m^2. Several quartz artefacts were recorded during the field survey including a fine quality (i.e. few internal flaws) quartz flake (20mm x 15mm x 10mm) and a fine quality bipolar core (25mm x 20mm x 12mm). The topography of the site is similar to T9. The site likely represents the margins of Aboriginal occupation along the floodplain. More concentrated cultural activity is more probable near the creek, but successive flood events have severely displaced the archaeology. T10 is spatially linked to artefact scatter T11 and scarred trees T1 and T2. The subsurface of T10 is in relatively good condition. The soils show signs of deflation, but not evidence of significant colluvial flux which indicates that an intact (if somewhat compressed) subsurface soil layer has survived across T10.

T11
This site is a disturbed artefact scatter located on the [redacted] property approximately one kilometre north of Tarcutta. The site is spatially linked to T10, but is noticeably lower in the landscape. The site is located west of the Hume Highway on a gentle slope situated above the Tarcutta Creek floodplain. Artefacts covering a 300m^2 area were identified on a dirt track which bisects a drainage line. Two good quality quartz flakes were recorded (10mm x 10mm x 5mm and 15mm x 15mm x 5mm). The site has been impacted by erosion associated with drainage and little soil remains. The identified artefacts appear to represent the remains of a heavily deflated surface. It is possible that these artefacts have been washed from higher ground such as the mound at T10. T11 is in poor condition and exhibits no evidence of intact cultural material.

T12
This site is an elevated artefact scatter located on a hill amongst a small stand of trees overlooking Tarcutta Creek. The scatter covers an area of c.5,000m^2 and contains quartz and igneous artefacts. One flake artefact (30mm x 25mm x 10mm) is made from a rare green-grey meta-igneous material. It is unusual among sites in the Tarcutta area to exhibit non quartz artefacts. Given the proximity to the creek it is possible that the rare stone materials (see also T9) are sourced from the creek. Test excavation of T12 identified a very shallow soil profile of around 10-25 cm with only a veneer of topsoil. Artefacts were found in the upper profile. Deflation has collapsed the upper soil profile and concentrated the artefacts, but only moderate numbers of objects were found dispersed across the hill top. In total 21 test squares were excavated with an average artefact density of 14 per/m^2. A high proportion of quartz gravels were identified in relation to actual Aboriginal artefacts. Artefacts were clearly discerned because of a preference for fine quality materials such as crystalline quartz over local, milky reef quartz.

T13
Site T13 comprises two artefacts located in an elevated spur crest, c.300m north-west of the church on Gresham Street in Tarcutta. The area is situated above the 250m contour, overlooking Tarcutta Creek. One quartz artefact, a proximal flake, was found near an isolated old Yellow Box tree. Ground visibility beyond the tree was limited and probably masked the identification of further artefacts. Another artefact, a flaked stream cobble of unidentified stone, was found c.50m further to the north-east. Exposure here was patchy between low grass (c.40%) and sheet erosion exposing a reddish brown deposit. This artefact was 44 metres west of the gate entrance from Gresham Road, and 15 metres north-west of two Grey Box trees. Based on an assessment of this elevated landform and its archaeological potential, the site is estimated to cover a 72,250m2 area, from the quartz artefact location, extending north up to the Tarcutta Cemetery. This area encompasses two additional westerly running spurs, especially ground above the 250m contour line. These landforms are well elevated above Tarcutta Creek and were considered to have moderate-high potential for further subsurface material. T13 is also spatially linked to site T20, a low density archaeological site located further west and down slope. The site is generally considered to be in good condition with no signs of excessive erosion.

T14
T14 is a scarred tree situated west and just outside of the Tarcutta town bypass corridor. The tree is in the Tarcutta Creek floodplain approximately 40m southwest of the creek. T14 is River Red Gum with a 3.5m long scar which is c.36cm wide. No axe marks or other unusual scarring was recorded.

T15
T15 is a large artefact scatter located on the eastern edge of the Crown Reserve approximately 30m west of the Hume Highway and just north of the Keajura Creek crossing and south of Mates Gully Road. Large portions of the Crown Reserve are covered in artefacts (cf. cultural place 5) with T15 representing one such concentration demarcated by Keajura Creek to the south and a drainage channel to the north. Most of the site sits above the 240m contour and below the 250m contour. Over 50 quartz artefacts have been identified at T15 during field survey. Most artefacts were debitage but some blades and cores were also recorded. Artefacts were distributed over 500m^2 but concentrated in a 150m^2 area. Erosion has impacted the edges around the steeper slopes, but the majority of the site appears in good condition with little subsurface disturbance. The site is representative of sites within the reserve and is significant both for archaeological reasons and cultural reasons.

T16
This site is a disturbed small cluster of artefacts located in the floodplain of Keajura Creek. T16 is located just north of the creek crossing south of Mates Gully Road along a vehicle track on the west side of the highway. Three quartz artefacts were recorded: distal flake (12mm x 5mm x 2mm), flaked piece (12mm x 5mm x 2mm) and bipolar core (32mm x 20mm x 13 mm). The ground surface has been impacted by flood events and the subsurface appears to consist of mostly homogenised alluvium. It is possible that the artefacts have been washed down into the plain form the adjacent reserve.

T17
T17 is an artefact scatter located at the Keajura Creek crossing south of Mates Gully road on the east side of the Hume Highway. The site is part of the remnant banks of Keajura creek located near Tarcutta House. T17 extends over 15,000m^2 and made up of two parts: the west bank and the east bank. The west bank has been heavily disturbed by previous road, bridge and drainage constructions. No archaeology remains intact

although some artefacts are present. In contrast the east bank is higher in elevation and contains a relatively intact soil profile. All artefacts recorded at T17 were quartz flakes of a poor to good quality. The east bank of T17 is a raised landform in close proximity to a primary water source and as such we can expect a significant quantity of artefacts to be found in the subsurface. Agricultural works on the northern end of T17 (east) have excavated into the site and exposed an intact soil profile capped by a red/brown alluvial topsoil. Artefacts were recorded on the edges of the excavated area and 20cm down in the exposed profile. In sum the west portion of T17 displays a low archaeological significance while the east side is less disturbed overall and shows a moderate level of significance.

T18

T18 is an artefact scatter located on the west side of the Hume Highway c.1.2 kilometres south of Mates Gully Road. The site extends along the highway for about 400m and encompasses an area of c.32,000m^2. T18 is directly related to T19 on the east (opposite) side of the highway, which has artificially bisected the site. T18 is a raised landform resting above the Keajura Creek floodplain and is also associated with a swampy area (possibly archaic billabong) located along the eastern base of the site. The proximity to these water sources makes T18 potentially capable of displaying a range of occupational activities (such as various types of stone tool production linked to a domestic camping, hunting, resource processing). The soils of T18 appear stable and are similar to the profiles seen at T17. Moderate to dense grass cover has resulted in an overall low ground visibility with few surface exposures. Artefacts at T18 include medium sized and long quartz flakes (e.g. 25mm x 14mm x 5mm and 16mm x 12mm x 8mm). The site has high archaeological research potential because it contains a relatively intact soil structure, situated near prominent resources and exhibits identified archaeological materials.

T19

T19 is a large artefact scatter located on the east side of the Hume Highway c. 1.2 kilometres south of Mates Gully Road. T19 is in effect part of T18 and displays similar archaeological features (see T18 description). The two sites have been artificially separated by the highway, but in archaeological terms remain linked. Artefacts have been unearthed along the existing road cutting with an identified large collection of quartz flakes consisting mostly of quartz fragments. The site extends over a raised land surface and covers an estimated 30,000m^2 area. The site has high archaeological research potential because it contains a relatively intact soil structure, situated near prominent resources and exhibits identified archaeological materials.

T20 (formerly T-PAD-4)

This site is a dispersed artefact scatter located on a moderately sloped hill directly overlooking Tarcutta Creek. T20 is located west of Tarcutta, approximately 200m west of the southern end of Gresham Street. The large scatter extends over a 20,000m^2. The area was identified as containing archaeological potential during the field survey for the Tarcutta bypass. The potential of the site was determined based on the elevation, close proximity to the creek and identified archaeological objects in the vicinity (T13). The site was labelled T-PAD-4 during the survey. Subsequent, test excavation of the PAD identified very shallow soils which are only thin veneers covering solid rocks (reef quartz and shales). There were no clusters of artefacts at site T20 which would indicate a focus point of cultural activity. Artefacts were spread around the site in an apparent haphazard fashion. The geomorphology suggests colluvial and erosional forces have moved the majority of artefacts identified at T20. T20 is spatially linked to T13 and it is probable that some of the artefacts at T20 have been washed downslope. In short, the test program has shown that erosion has greatly impacted the archaeological integrity of the site. T20 exhibits low archaeological significance characterised by low artefact numbers in a disturbed context.

T21 (formerly T-PAD-5)

T21 is a small scatter of artefacts resting within a slightly raised landform situated along a remnant channel of Keajura Creek. The site is located on the east side of the Hume Highway 0.5 kilometre south of Tarcutta, just south of the Tarcutta Creek bridge. The site is within the [redacted] property near a hayshed. The area was identified as containing archaeological potential during the field survey for the Tarcutta bypass. The site was labelled T-PAD-5 during the survey. The potential of the PAD was determined based on its relative elevation and proximity to the creek. It was determined that the site's moderate elevation may be sufficient to raise the land out of the primary floodplain. This is an ideal location for glimpsing Aboriginal occupation close to the creek and at the foot of the Crown Reserve (a cultural place). Most activities in such locations have been heavily impacted by floods and no record of the Aboriginal use of the area remains. Subsequent test excavation of the PAD revealed a low density of artefacts situated on average 1m below the surface. Artefacts were found below a series of alluvial layers resting just above what appeared to be a remnant clay surface. The findings suggest that a series of recent flood events (likely during historic times) have built up the alluvial layers at the site capturing the artefacts at T21. The alluvial layers have a high silt content and low gravel component indicating low intensity flooding. Based on this information, T21 is probably located on the flood margins. Artefacts found at depth in this location appear to be in situ barring some deflation. However, the low numbers of artefacts identified during the test means that archaeologically the site is of low significance because it does not offer enough information to characterise past activities (beyond the mere presence of Aboriginal objects).

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Figure 2. Aboriginal cultural places, Aboriginal sites and test excavation areas (north portion)

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Figure 3. Aboriginal cultural places, Aboriginal sites and test excavation areas (middle portion)

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Figure 4. Aboriginal cultural places, Aboriginal sites and test excavation areas (south portion)

6 Tarcutta Test Excavation Results

The Tarcutta test excavation program was designed to be systematic and comparable with previous test excavation programs both local and regional, and especially with the test excavation for the Hume Highway Duplication Project. Excavation was undertaken at four locations as identified through survey (section 5.3) with the aim to test the extent and significance of Aboriginal archaeology within the Tarcutta bypass corridor. The excavation methodology was presented at an AFG on 11th February 2009 (KNC 2009). The approved program commenced on 24th February and finished on 20th March 2009. Each excavation summary shown in this section is outlined in a similar manner detailing: aims, methods, personnel, results and site based summary. A quick reference text box is also provided to allow a quick comparison between sites (from this and other test programs).

6.1 Test Area 14 (TA 14) Site T9

Date work commenced: 24th February 2009
Date work completed: 3rd March 2009

Aims

Test Area 14 (TA14) was located approximately 2km to the north of Tarcutta along the western side of the Hume Highway on the [redacted] pastoral station. TA14 was the test component of site T9. The area was a cleared paddock with testing undertaken on a raised western reaching spur overlooking an alluvial floodplain associated with Tarcutta Creek, located approximately 300m west of the subject area. The spur was bounded on the northern side by a moderate slope running into a drainage gulley and excavated dam, the Hume Highway to the east and a moderate slope running into floodplain to the south. The western spur included moderate to steep slopes running directly onto floodplain. Pedestrian surveys undertaken in 2008 identified quartz and metastone artefacts. The landform was heavily eroded, with exposed shale bedrock and large quartz outcrops running down the entire spine of the spur with smaller exposed areas scattered along the slopes. There was little to no vegetation cover, with only occasional remnant dry and desiccated grass patches. Testing aimed to investigate the presence and integrity of subsurface archaeology at the site and to ascertain the spatial extent of the site across the landform.

TA14/T9 *Quick Reference Guide*	
Test Squares/ Artefact Density	**Landform/Elevation**
27 squares 6.7 artefacts/m²	Terrace / Spur 243-246m Ahd
Grid Area/ Sample Size	**Soil**
4,500m² 0.006% of Grid	Erosional soils Mixed clay and degrading shale / sandstone bedrock
Artefacts Total/Range	**Distance to Water/Type**
180 total artefacts 0-20 artefact range	300m-350m Tarcutta Creek

Plate 1. TA14/T9 looking west from the highway with Tarcutta Creek in the distance

Methodology

The proposed Tarcutta Town Bypass corridor runs parallel to the current Hume Highway, with the potential area of impact extending approximately 70m west into the paddock. Based on the potential impacts to the site it was subdivided into an east (impacted) and west (no impact) portion. The east portion was test excavated.

A baseline was established and three transects were laid out running at right angles to the highway, starting 3m from the fence line and running parallel with the general direction of the spur. A further two transects were added on either side of the original three (north and south) in order to sample the slopes. The north – south line was interpreted as the direction of the transects (actual compass bearing 310º). Test squares measuring 1m² were excavated at 15m intervals and staggered across the width of the impact corridor (5m offsets). A total of 27 test squares were excavated over a grid area of 60 x 70 metres (4,500m²), with one square excavated (659E 140N) slightly outside this area.

All test squares were dug in bulk after it was determined little vertical integrity remained in the subsurface due to long term erosion and colluvial forces. Standard KNC procedure for excavation of test squares is to dig to basal clay, bedrock, or to dig to a determined sterile layer of deposit. The subsurface deposit on TA14 contained no soil horizon apart from 2-3cm of loose sandy dust, only partially humic. In general, excavation was directly onto mixed orange to pale clays and ironstone shales, with occasional large columnar quartz deposits. The shales were interpreted as degrading bedrock deposits, and were found in both horizontal and vertical sheets, with quartz deposits mixed into the shales. The base of the test squares was decomposing shales. Squares were excavated to an average depth of 20cm, with four squares excavated to a depth of between 26cm and 30cm (604E 135N, 604E 180N, 619E 190N and 659E 140N).

All excavated deposit was wet sieved using nested 2.5mm and 5mm mesh screens. Artefactual material and related background material was collected and underwent analysis on site. All material was recorded and labelled accordingly for further detailed analysis. Charcoal samples were collected with detailed provenancing. All test squares, including all sections and base plans were photographed, with detailed section drawings of selected test squares. A site plan was completed showing placement of test squares in relation to prominent landform features and contours.

Personnel present on site:

Senior Archaeologist / Site Manager: Brent Levy
Archaeological Assistants: Jaclyn Ward, Wayne Brennan, Brian Armstrong, Amy Wood, Ben Anderson.
Aboriginal Representatives: Shirley (Tammy) Tidmarsh, Neville Williams, Wayne Williams, Ronald Grosvenor Snr, Ronald Grosvenor Jnr, Jason Grosvenor, Damien Kennedy.

Table 5. Summary of findings for TA14

Number of Squares	Artefact Number	Cores	Bipolar Cores	Backed Artefact	Scraper	Geometric	Retouched / Usewear	Average Density / m²
27	180	4	0	0	0	1	2	6.7/m²
Raw Material	Quartz	Quartzite		Silcrete	Tuff / Mudstone	Chert	FGS	Other
	180	0		0	0	0	0	0

Material

All artefactual material recovered during the test excavation was quartz (100%). Natural quartz is common throughout the area, and due to the highly eroded nature of the spur being investigated, can be seen scattered over the entire ground surface. Large columnar quartz incorporated into the underlying bedrock is also visible both on the surface and in a number of the excavated test squares. The natural quartz material is of generally good quality, with an opaque milky appearance and minimal internal fracturing. Artefactual quartz was generally crystalline to glassy with a translucent milky appearance. This artefactual material was of mixed quality ranging from moderate to poor with occasional good to high quality artefacts recovered. In short, the artefactual material indicates that artefacts were probably sourced from the immediate area and represent opportunistic knapping rather than a targeted activity. The initial finding suggests that the site may have acted as a short term camp site, possibly in support of other camps near the creek or other locations.

Plate 2. Excavation works at TA14/TT9

Lithics

A total of 180 quartz artefacts were identified during the preliminary analysis with an average of 6.7 artefacts/m². Three test squares contained no artefactual material (11.1% of test squares), with a range of artefacts in the remaining 24 test squares from 1 and 20. Due to the absence of a soil profile across the test grid, no test squares were excavated in spits. It was noted, however, that during the sieving process the artefacts were appearing within the top 20cm of each square.

The lithic assemblage shows signs of heavy breakage with a high percentage of angular fragments (38.9%) and small distal flake fragments (26.1%), a total of 65% of the total assemblage (Table 6).

Of the artefacts recovered, one formal tool was identified (geometric microlith), and two retouched complete flakes were also indentified. The retouched flake recovered from test square 649E 145N appeared to have been discarded after some attempted backing. Of the cores located (n=4), only one recovered from test square 604E 169N was of good quality with at least 6 negative scars identified. The others were of medium to poor quality with 1 to 2 negative scars. One bipolar flake of medium – poor quality was identified at 634E 185N.

Table 6. Summary of stone flake qualities TA14

	Cores	Bipolar Core	Complete Flake	Proximal Fragment	Medial Fragment	Distal Fragment	Angular Fragment
Total	4	0	31	9	19	47	70
Percentage of Total	2.2%	0.0%	17.2%	5.0%	10.6%	26.1%	38.9%

The artefacts recovered from TA14 indicate that there is no intact activity area across the site. The artefacts that remain in the area have likely undergone severe movement and breakage through heavy erosion and colluvial movement. Greater impacts have occurred on the slopes extending up the landform and away from the creek (towards the highway). In short, no discernable focus of activity was found within the test area (east portion of site).

Table 7. Test squares and artefact density TA14

Easting	Northing	Artefacts	Easting	Northing	Artefacts	Easting	Northing	Artefacts
589	125	1	619	116	0	634	185	9
589	140	13	619	130	1	649	130	12
589	155	8	619	145	7	649	145	20
589	170	14	619	160	10	649	160	3
589	185	5	619	175	3	649	175	9
604	120	4	619	190	8	649	190	7
604	135	0	634	125	8	659	140	3
604	150	4	634	140	2			
604	165	12	634	155	11			
604	180	0	634	170	4			

Summary

Artefacts recovered from TA14 show a low density, residual cultural deposit within a heavily eroded area which has been disturbed by colluvial forces. The soils located in the eastern portion of TA14 show no integrity and do not support the retention of artefacts. Simply based on this result the site does not warrant further investigations.

It is probable that the test area was sampling only the background of a more intensive area to the west (located at the end of the spur). This may be why we were unable to uncover an activity focus point as such a point was west (outside) of the test area. The current concept plan for the Tarcutta Town Bypass does not impact on the western portion of the site and no excavation of this area is warranted at this time.

Plate 3. Sieving the shale deposit from TA14/T9

6.2 Test Area 15 (TA15) Site T12

Date work commenced: Tues 24th February 2009
Date work completed: Wed 4th March 2009

Aims

Test area 15 (TA15) was located on the [redacted] pastoral station, approximately 1km north of Tarcutta, and 200m west of the present Hume Highway. TA15 was the test component of site T12. Quartz artefacts were located on the hilltop here, 500m south of the homestead, during a pedestrian survey in late 2008. Landform comprised a level hillcrest with gentle to moderate side slopes. The test area was bordered to the west by a NNE running fence line. The hilltop featured a grove of mature Grey Box trees. Large Grey Box also grow on lower slopes off the impact corridor, and River Red Gums line Tarcutta Creek 350m to the west. Adjoining paddocks to the south have been cleared for cultivation. During the excavations ground cover comprised leaf litter, low grass stubble, fallen branches from recent storms, sheep scats and locally occurring quartz fragments. Tarcutta Creek was completely dry. The proposed impact corridor is a ramp which will be approximately 30-60 metres wide by c.1000 metres long. Testing aimed to investigate the likelihood of subsurface archaeological deposits on this hilltop landform and assess their nature and intactness.

TA15/T12 *Quick Reference Guide*	
Test Squares / Artefact Density	**Landform / Elevation**
21 squares 14 artefacts/m^2	Hillcrest-ridge/ 247-251m Ahd
Grid Area/ Sample Size	**Soil**
3600m^2 0.006% (of grid)	Colluvial. Erosional. Silty clay loam. On weathered bedrock.
Artefacts Total/Range	**Distance to Water/Type**
296 total artefacts/ 0-43 artefact range	100-375m Tarcutta Creek

Plate 4. TA15/T12 looking north from the hill top down onto the Tarcutta creek floodplain

Methodology

Testing was carried out over a period of seven days between 24th February and 4th March 2009. A baseline was laid along the centre of the proposed impact corridor downslope in a NNE direction, parallel to an existing fence line. Squares were located at 15 metre intervals. Two more (parallel) transects with staggered squares were placed 15m either side of the baseline to encompass the width of the impact corridor.

A total of 21 test squares 1m² were hand excavated, within a 120m x 30m area. Initially these were to be dug in 20cm spits, but became bulk due to the shallowness of the deposit. Soils were uniformly dry, shallow, and gravelly with abundant fragments of locally occurring quartz and micaceous shale. Some pits at the southern end of the test area came straight onto yellow shale bedrock.

Wet sieving was carried out under a large Grey Box tree at the south-western end of the test area, using nested 2.5mm and 5mm sieves and a water truck. There were a high proportion of natural angular fragments of quartz, shale and sandstone which were bagged for further examination. Gravels were often large (up to 10cm) and angular to subround.

Personnel present on site:

Project Archaeologist/ Site Manager: Mark Rawson
Archaeological Assistants: Anne-Marie Beavis, Michael Jackson, Tristram Miller, Joshua Symons, Kylie McDonald.
Aboriginal Representatives: James Ingram, Keith Freeman, Kathy Williams, Shaun Williams, Douglas Connors, Robert Hampton.

Table 8. Summary of findings for TA15

Number of Squares	Artefact Number	Cores	Bipolar Cores	Backed Artefacts	Scraper	Geometric	Retouched / Usewear	Average Density / m^2
21	296	8	1	4	1	1	5	14/m^2

Raw Material	Quartz	Quartzite	Silcrete	Tuff / Mudstone	Chert	FGS	Other
	290	0	0	0	0	1	5

Summary of Results

Testing revealed a shallow, gravelly colluvial deposit at TA15, with an average depth of only 20cm to weathered bedrock or basal clay. Most squares showed evidence of topsoil loss from sheet erosion, and local rock fragments were present on the surface. 296 pieces of artefactual stone was identified in the field, producing an interim low to moderate density of 14 artefacts/m². However, this figure includes a number of angular fragments of good flaking quality quartz that is probably naturally fractured local stone. The large proportion of background quartz made artefact identification difficult, and quartz can often fracture unpredictably. No historical material was found. Stratigraphy varied slightly over the tested area as excavation progressed down the north facing slope (120m x 30m test area). Bedded and folded shale bedrock (Ordovician) was encountered just under the surface on the hill crest (793E 725N), with slightly more soil development occurring lower downslope. Soils typically had thin, loose grey brown recent humus (0-5cm) straight onto compact paler brown to orange brown silty clay loam containing abundant large coarse fragments (quartz and micaceous shale). Decomposing sandstone was also found at the base of pit 793E 740N (at 20cm). Densely packed colluvial gravels were encountered in orange brown silty clay loam further downslope (793E 785N). Soil pH at TA15 ranged from 4.5 to 5.5.

Plate 5. Shale gravels within the deposit at TA15/T12

Material

At TA15 there was a high fraction of natural quartz coarse and shale fragments in the soil matrix which made artefact identification difficult. A natural vein of milky quartz outcrops on the northern slopes of the test area. Much of the local quartz is opaque milky white with internal flaws and fracture planes. This material was potentially useable but flakes unpredictably. Initial results suggest that different quartz types of varying

translucence and flaking quality were being utilised here at different times, ranging from high quality clear to translucent white or grey quartz, to opaque milky quartz of lesser quality. The finer glassy quartz may have been brought in from an off site source.

Many of the stone fragments at the sieves was large in size (up to 10cm), angular to subround. Natural gravels included local quartz, shale and occasional sandstone. Apart from quartz, no other useable local stone was found.

Plate 6. Excavation of test squares on the hill top at TA15/T9

Lithics

The majority of identifiable artefacts were of quartz, which was the dominant stone raw material previously encountered on surveys and excavations during the Hume Highway Duplication project. Quartz makes up over 90% of the test artefact assemblage, followed by one fine grained siliceous (FGS) and five igneous. Overall, there were low numbers of whole flakes, with most artefacts being flake fragments or angular fragments. Eight cores, one bipolar core and four backed artefacts were found. There appears to be a preference for the finer clear to translucent quartz for production of small elongate flakes (<2cm), probably intended for backing.

Spatially there appears to be two broad loci of stone working activities at TA15. One is the most level and elevated part of the hillcrest, at the southern end of the test area (between 725N and 755N). Another area is further downslope, on gently sloping ground in the centre of the test area (from 790N to 815N). One glossy grey quartz backed artefact was found in 793E 800N, and a part backed flake of opaque white quartz was in 778E 810N. At the southern most pit (778E 720N), a total of seven artefacts included one distal fragment of a Bondi point, made on opaque white quartz, two elongate flakes of clear to banded quartz, a retouched artefact of opaque white quartz and a large quartz unifacial core. No good quality quartz artefacts at TA15 have cobble or pebble cortex, which may suggest that the source is some distance away, or is from an outcrop. One core-scraper of clear to banded fine quartz was found in test pit 793E 725N. Pit 793E 740N included small quartz flakes with platform faceting preparation, as well as a small bipolar core.

Six non-quartz artefacts were recovered at TA15. One was a retouched flake fragment of grey mudstone, and five others were of an unidentified pinkish brown igneous rock with crystal phenocryst inclusions. The igneous artefacts were all found in one test pit in the middle of the test area (793E 800N). They were larger than the mean for quartz artefacts (up to 5cm in size). One complete flake was 4cm in length. All have smooth remnant cobble cortex. It appears that this material may have been used for different purposes to quartz, or could be a remnant of older occupation.

Table 9. Test squares and artefact density for TA15

Easting	Northing	Total	Easting	Northing	Total	Easting	Northing	Total
778	720	**7**	778	840	**19**	793	830	**16**
778	735	**19**	793	725	**20**	808	790	**43**
778	750	**19**	793	740	**33**	808	805	**1**
778	765	**12**	793	755	**35**	808	820	**1**
778	780	**3**	793	770	**9**	808	835	**3**
778	795	**0**	793	785	**6**			
778	810	**10**	793	800	**12**			
778	825	**8**	793	815	**20**			

Plate 7. Documenting each part of the excavation is a crucial part of archaeology

Summary

The test excavations and interim field analysis at TA15 has revealed a preliminary total of 296 lithic items, mostly of quartz, from 21 test pits excavated. It appears that both local and introduced quartz was utilised. Artefacts include four partly backed Bondi points, of translucent or opaque white quartz, and one geometric microlith of clear/banded quartz. Field analysis identified at least eight cores, all of quartz and unifacially reduced, except for one small bipolar of fine grey quartz (793E 740N). A small number of retouched pieces have so far been identified (n=5), including a core-scraper of glassy translucent quartz (793E 725N) and one retouched flaked of opaque white quartz (778E 750N). No intact knapping floors could be identified, mostly due to the enormous amount of background quartz and likely soil movement at the site.

The shallow colluvial soils at TA15 indicate previous removal of topsoil and likely downslope movement of deposit. Much of this may be quite recent in origin, probably soon after European land use practises commenced. The preliminary results suggest that while subsurface archaeological materials still exist at TA15, these will be either at the surface or shallow and not intact. While there is still limited potential for further artefacts to be recovered from this landform, these are likely to be disturbed from their original location of discard, diminishing their scientific value. While some additional archaeological information may be gained about prehistoric use of this elevated landform from further archaeological investigations, this would be limited by the shallowness of the deposit. There is also low potential for dating the archaeological material. Due to these factors, further work is not recommended.

6.3 Test Area 16 (TA 16) T20

Date work commenced: 4th March 2009
Date work Completed: 20th March 2009

Aims

Test Area 16 (TA16) was located directly northwest of the town of Tarcutta. TA16 was the test component of site T20 (formerly T-PAD-4). The test area was situated on a raised ridge bearing northeast and overlooking an area of floodplain associated with Tarcutta Creek located between 100 and 150m south and west of the test area. The area under investigation was the southernmost spur line of a series of similar landforms, two of which were tested during this project (TA14 and TA15). The test area consists of the crest of the ridge, a moderate to steep slope to the south, a slight to moderate slope to the west and a series of slight to moderate undulations to the north and east, with the land rising to the east. Pedestrian surveys undertaken in late 2008 identified the area as exhibiting archaeological potential (see section 5.3). The surface of the test area appeared relatively intact with soil and patchy grass cover over most of the ridge, although only one tree remains standing in the paddock. Large craters within the site give evidence to the removal of trees across the area. Natural quartz gravels were apparent, scattered across the area. Testing aimed to investigate the presence and integrity of possible subsurface archaeology and to ascertain the spatial extent of the archaeology.

TA16/T20 *Quick Reference Guide*	
Test Squares/ Artefact Density	**Landform/Elevation**
44 squares 15.9 artefacts/m²	Terrace / Spur 245-251m Ahd
Grid Area/ Sample Size	**Soil**
9,300m² 0.005% of Grid	Mixed clay and degrading shale, quartz, sandstone bedrock
Artefacts Total/Range	**Distance to Water/Type**
699 total artefacts 0-48 artefact range	150 – 200m Tarcutta Creek

Plate 8. TA16/T20 looking east from the midslope up onto the upper slope and site

Methodology

The proposed impact corridor runs through the site and in effect bisects the test area. The primary aim during the test program was to examine the crest of the ridge, with further aims to try to locate the extent of the site by excavating down slope from the main crest area. Five transects were laid out running at right angles from the fence line of the paddock. Further transects were added to the southwest and the northeast. For the purposes of this excavation, the north – south line was interpreted as the direction of the transects (actual compass bearing 290º). 1m² test squares were excavated at 15m intervals and staggered across the width of the impact corridor (5m offsets). A total of 44 test squares were excavated over a grid area of 9,300m².

Test squares were excavated in bulk to ascertain the presence of cultural material and the presence of an intact soil profile. The subsurface deposit was found to change significantly across the site, with some test squares retaining some intact soil profile and some retaining minimal soil with excavation digging directly on to degrading bedrock and large columnar quartz and quartz gravels. Due to the presence of at least a

minimal soil profile, test squares were then excavated in 10cm spits in an attempt to detect the vertical distribution of artefact discard. The average depth of test squares was between 25-30cm with the deepest being 40cm (899E 440N), although this depth included 10-15cm of introduced landfill (located at the southernmost section of the transects within a mounded area centred around a group of young trees and the fence line). Squares were dug to basal clay where possible, however a majority of squares led onto degrading bedrock, shales and quartz, and in a number of cases, sandstone. All test squares had high concentrations of quartz gravels and shale.

Plate 9. Degrading shales and fractured quartz in the profile resulted in a high gravel content for TA16/T20

All excavated deposit was wet sieved using nested 2.5mm and 5mm mesh screens. Artefactual material and related background material was collected and underwent preliminary analysis on site. All material was recorded and labelled accordingly for further in-depth analysis. Where possible, charcoal samples were collected with detailed provenancing, plans and photos. All test squares, including all sections and base plans were photographed, with detailed section drawings of a representative sample of test squares. Finally, a site plan was completed showing placement of test squares in relation to prominent landform features and contours.

Personnel present on site:

Senior Archaeologist / Site Manager: Brent Levy
Archaeological Assistants: Jaclyn Ward, Wayne Brennan, Brian Armstrong, Amy Wood, Ben Anderson.
Aboriginal Representatives: Shirley (Tammy) Tidmarsh, Neville Williams, Wayne Williams, Ronald Grosvenor Snr, Ronald Grosvenor Jnr, Jason Grosvenor, Damien Kennedy.

Table 10. Summary of findings for TA16

Number of Squares	Artefact Number	Cores	Bipolar Cores	Backed Artefact	Scraper	Geometric	Retouched / Usewear	Average Density / m²
44	699	11	2	2	0	1	10	15.9 / m²

Raw Material	Quartz	Quartzite	Silcrete	Tuff / Mudstone	Chert	FGS	Other
	699	0	0	0	0	0	0

Material

All cultural material recovered during the test excavation was quartz (100%). Natural quartz gravels were found in high density throughout all spits, with density generally increasing with depth. As with TA14, the natural quartz was predominantly of good quality, milky opaque quartz. Such predominance of naturally occurring good quality quartz led to difficulties in accurately identifying natural from artefactual quartz. A large number of angular fragments (n=333, 47.6%) and small distal fragments (n=161, 23%) were identified at the site. Many of these fragments would appear as 'natural fragments' (i.e. not artefacts) upon first analysis.

Test squares excavated downslope from the crest of the ridge show very distinctive colluvial characteristics, indicating possible heavy movement of natural and artefactual material from the crest. Artefact numbers on these downslope areas were generally higher than numbers on the crest. Heavy erosion and movement of gravels and soils was experienced during the excavation after a heavy thunderstorm. Test squares

excavated on the downslope portions of the site in some cases were covered with up to 15cm of fresh deposit.

Lithics

A total of 699 quartz artefacts were identified during the preliminary analysis with an average of 15.9 artefacts/m². Only one test square contained no artefactual material (899E 455N), with the remaining test squares containing a range of artefacts from 1 to 48. Test squares excavated in 10cm spits (n=26) indicated that artefactual material was found predominantly in the first 10cm of deposit (n=384, 79.5%), with numbers dropping dramatically in the second spit (10-20cm, n=88 18.2%) and very little artefactual material recovered beneath this depth (n=11, 2.3%).

Bipolar techniques were indicated by the presence of cores and bipolar cores (11 and 2, or 1.5% and 0.3% of total assemblage). No bipolar flakes were identified. Backed artefacts were identified in the assemblage (n=2, 0.3%) both in the form of blades, although one was a distal fragment. A geometric microlith (n=1) was also identified with backing evident. 10 retouched artefacts (1.4%) were also identified with a number showing possible evidence of usewear. The total number of tools was 13, or 1.9% of the total assemblage.

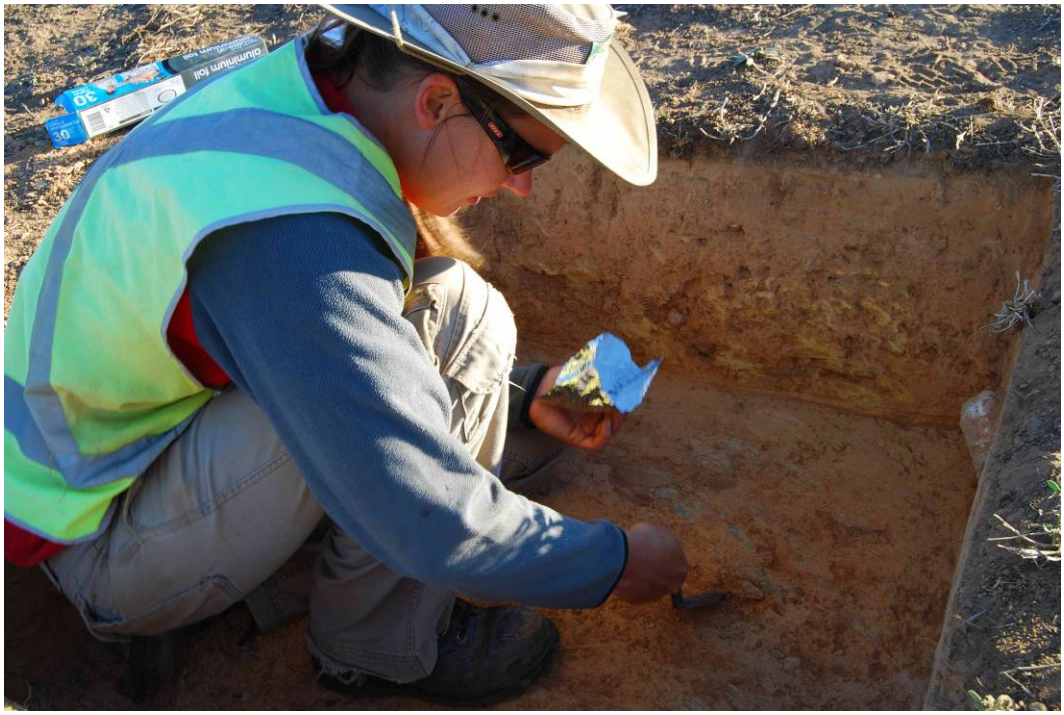

Plate 10. Collecting organic samples for carbon dating at TA16

Table 11. Summary of stone flake qualities TA16

	Core	Bipolar Core	Complete Flake	Proximal Fragment	Medial Fragment	Distal Fragment	Angular Fragment
Total	11	2	104	41	47	161	333
Percentage of Total	1.6%	0.3%	14.9%	5.9%	6.7%	23.0%	47.6%

The breakdown of the reduction sequence (number of complete flakes and flake fragments) indicate that the site retains some cultural integrity, particularly with the number of complete flakes and flake fragments (Table 11). The nature of the subsurface deposit, however, is degraded by evident colluvial and erosional movements indicating a significant disturbance amongst the remaining cultural material.

Table 12. Test squares and artefact density TA16

Easting	Northing	Artefacts	Easting	Northing	Artefacts	Easting	Northing	Artefacts
824	465	43	869	520	10	914	475	6
824	480	11	884	445	19	914	490	6
839	445	15	884	460	20	914	505	16
839	460	17	884	475	10	914	520	21
839	475	12	884	490	11	929	440	32
839	490	21	884	505	7	929	455	19
854	455	25	884	520	1	929	470	5
854	470	28	899	440	15	929	485	6
854	485	48	899	455	0	929	500	10
854	500	19	899	470	9	929	515	41
869	450	9	899	485	5	959	440	8
869	465	41	899	500	22	959	455	11
869	480	23	899	515	1	959	470	4
869	495	9	914	445	23	959	485	9
869	510	14	914	460	14			

Summary

Test Area 16 revealed a low to moderate density of cultural material, however is unlikely to retain any intact activity areas, such as knapping floors or production sites. Intact soil profiles vary across the site with minimal soil profiles to a depth of 5 to 20cm. It is apparent that the area has undergone significant erosion due to land clearing and farming practises and is still actively deflating. With this said the land is not as disturbed and deflated as TA14/T9. Erosion, however is only half the story and the archaeology is also strongly affected by colluvial processes. The soil layers are moving in subsurface sheets down the slope. The slope itself is moderate but the soils clearly show significant downslope movement. The end result is that the site contains a moderate quantity of artefacts, but the archaeological significance of those objects has been lessoned due to the poor subsurface integrity. In short, the site does not warrant further archaeological investigation or mitigation.

Plate 11. Sharing and learning new things during excavations at Tarcutta

6.4 Test Area 17 (TA17) Site T21

Date work commenced: Thursday 5th March 2009
Date work completed: Friday 20th March 2009

Aims

This test area was located on the [redacted] property, less than 1km south of Tarcutta and only 100-130 metres east of the present Hume Highway, directly opposite the Mates Gully Road intersection. Test area 17 (TA17) was the test component of site T21 (formerly T-PAD-5). The test area had been identified during a pedestrian survey in 2008 as having moderate potential for subsurface archaeological deposit. The area was given the designation T-PAD-5. This PAD was originally considered to be a possible low lying eastern extension of a hillslope cut through by the present highway. The PAD area was level ground, slightly elevated above the present active floodplain of Tarcutta Creek. A gentle slope drops off in the southern half of the test area. The landform was also adjacent to the modified channel of Keajura Creek, altered during construction of the present highway, to the west. The test area was within a small fenced off paddock (c.250 x 100m). At the northern end of the paddock was a large earthen levee bank, constructed in the 1990s for flood control. Flood waters from Tarcutta Creek are reported to have reached as high as the western half of the paddock, up to the western end of the levee bank [redacted]. To the south was a larger paddock cultivated with lucerne, and to the east cleared broad floodplain used for grazing cattle. The study area has been completely cleared and was being used for horse grazing at the start of the excavations. On the western boundary fence was a windmill and 10m deep well. During the excavations ground cover was low, dry pasture grass stubble. Both creek channels were dry. The only trees in the vicinity, mostly large River Red Gums, occur along Keajura Creek and Tarcutta Creek. Two proposed impact corridors are to run through the study area. One is a new main highway route through the NW corner of the paddock, 60 metres wide by 1000 metres long. The other, is a smaller off ramp, 30m wide by 1500m long, which is to run from the NE to the SW corners of the paddock. Testing aimed to investigate the likelihood of subsurface archaeological deposits on this landform and if found, to assess their nature and intactness.

TA17/T21 *Quick Reference Guide*	
Test Squares / Artefact Density	**Landform / Elevation**
18 squares 0.9 artefacts/m^2	Floodplain/ Low terrace to active flood plain. 227-229 m Ahd
Grid Area/ Sample Size	**Soil**
3375 m^2 0.005% (of grid)	Alluvium. Deep Silty Clay Loam.
Artefacts Total/Range	**Distance to Water/Type**
16 total artefacts 0-3 artefact range	0-100m / Keajura Creek and 400m/ Tarcutta Creek

Plate 12. Test squares staggered over TA17/T21 (former Keajura Creek channel in the tree line)

Methodology

Testing was carried out over a period of 12 days between 5th March and 20th March, 2009. A baseline was laid parallel to, and 9 metres east of the existing NW-SE fence line, at the western edge of the paddock (092E). All squares were located at 15 metre intervals. Four more transects with staggered squares were placed parallel to, and to the east of the baseline, testing the elevated portion of this landform (107E, 122E, 137E, 152E). Two pits were also located in the adjacent paddock, west of the baseline (077E 325N and 340N), to test closer to Keajura Creek, within the proposed main highway corridor.

A total of 18 test squares 1 m² were hand excavated at TA17, over a 45m x 75m area. All pits were dug in 20cm spit intervals, to an average depth of 120cm. Two exploratory pits were dug to 140cm, to test for buried soils that may contain artefacts.

Wet sieving was carried out adjacent to a flood control levee bank at the northern end of the paddock, using nested 2.5mm and 5mm sieves and utilising a water truck. All stone at the sieves was bagged for further examination. This was achievable due to the low proportion of coarse fragments in the deposit. Section drawings were completed for all squares.

Plate 13. Test square at TA17/T21 showing the many alluvial layers covering the archaeological deposit near the base of the square

Personnel present on site:

Project Archaeologist/ Site Manager: Mark Rawson
Archaeological Assistants: Anne-Marie Beavis, Michael Jackson, Kylie McDonald, Tristram Miller.
Aboriginal Representatives: James Ingram, Kathy Williams, Keith Freeman, Robert Hampton, Douglas Connors, Daniel Williams.

Table 13. Summary of findings form TA17

Number of Squares	Artefact Number	Cores	Bipolar Cores	Backed Artefacts	Scraper	Geometric	Retouched / Usewear	Average Density / m^2
18	16	0	0	0	0	0	0	0.9/m^2
Raw Material	Quartz	Quartzite		Silcrete	Tuff / Mudstone	Chert	FGS	Other
	16	0		0	0	0	0	0


Plate 14. Excavation works at TA17/T21

Summary of Results

Testing at TA17 revealed homogeneous deep deposits of grey silty clay alluvium with minor soil inclusions. Gravels were mostly small (<2cm diameter) and well rounded. Occasional lenses of redeposited charcoal, orange clay and rounded burnt clay nodules were encountered. Bioturbation was found throughout the deposit. A large animal burrow was encountered in 122E 295N at 20-40cm depth. Earthworm burrows continued into the floor of all squares (>120cm depth). Spit 1 (0-20cm) of some squares contained recent historical material, including glass, blue metal, quartz pebbles, angular fragile quartz pieces and other redeposited material clearly associated with the nearby Hume Highway construction and moved by flooding.

Stratigraphy was uniform in colour and texture across the whole area tested. Some changes were seen with depth. Gleyed and mottled yellowish to orange silty clay became apparent at 40cm to up to 100cm depth in some pits. The two pits dug west of the fence line showed considerable disturbance to their upper 40cm, with nails, pebbles and small brick fragments especially in the top 20cm.

Material

Inclusions were uniformly small in size (average <2cm) and well rolled. Gravels included tiny pebbles of quartz (<1cm), shale and dispersed burnt clay nodules. Minor amounts of redeposited European historical material were found, all in the upper 20cm of the deposit and well rolled by flood activity. These included blue metal, one small (1.2cm) heavily edge rounded “Chinese” (blue glazed porcelain) fragment (137E 285N), a metal button (077E 325N) and occasional small rolled brick fragments.

Lithics

All artefacts identified were of quartz and small in size (<1.5cm). All were small debitage i.e. flake fragments, except for one backed artefact fragment, from Spit 5 (100-120cm) of test pit 107E 320N. All were of good quality translucent quartz with zero cortex. These were found in various spits, from Spit 1(0-20cm) through to two in Spit 7 (120-140cm). Spatially there appeared to be no patterning across the test area. Ten of the eighteen pits revealed zero artefacts. Highest density was three artefacts, each in two squares (092E 285N & 107E 320N). No intact knapping floors or cores were found. The deepest occurrence of artefacts was two small flake fragments, both 1cm in size, found in Spit 7 (120-140cm) of 092E 300N. One fragment of a backed artefact was found in Spit 5 (100-120cm) of 107E 320N.

Table 14. Test squares and artefact densities from TA17

Easting	Northing	Total	Easting	Northing	Total	Easting	Northing	Total
077	325	**3**	107	320	**3**	152	275	**0**
077	340	**0**	122	280	**0**	152	290	**2**
092	285	**3**	122	295	**0**			
092	300	**2**	122	310	**1**			
092	315	**0**	137	270	**0**			
092	330	**1**	137	285	**0**			
107	290	**0**	137	300	**0**			
107	305	**1**	152	260	**0**			

Plate 15. Recording the deep deposit at TA17/T21

Summary

Testing and the field analysis of TA17 reveals a low density of artefacts (n=16, average 0.9 per m²) from 18 test pits. A few of these were recovered from a considerable depth below ground surface, including two small flake fragments at 120-140cm (092E 300N) and three at 100-120cm (107E 320N). Soil profiles indicate a flood prone environment, with at least 1 metre deep silty alluvium of possible recent origin. The excavations revealed no clear indication of intact buried soil horizons, although soils become more compact, mottled and yellowish with depth. All soil inclusions found were rolled to some extent by water activity. This includes natural gravels, burnt clay, charcoal, shale, quartz and recent European historic material.

While past Aboriginal occupation along creeks and floodplains would have occurred, initial results suggest that prehistoric archaeological deposits at TA17 have not remained intact. While there is still limited potential for subsurface artefacts to be found on this landform, these would probably be redeposited, diminishing their scientific value. Little additional information would be gained from further archaeological investigations at TA17 and no further work is recommended.

6.5 Archaeology Summary

The archaeology of Tarcutta covers the landscape in time and space. Aboriginal people occupied the Tarcutta area for at least 6500 years. Aboriginal people lived and utilised all parts of the Tarcutta environment from the creek flats to hill tops. We find artefacts on the surface today where the environment was resource rich along well watered and elevated lands, but we also find artefacts nestled into secluded places, visually appealing locations and places with good views. Aboriginal people did not just occupy the land around Tarcutta but they lived with those lands. What does this mean?

The archaeological picture of Tarcutta is controlled by the creek. Survey shows us that the largest concentrations of artefacts occur near Tarcutta Creek or its tributaries. The creeks are the reason we find an abundance of archaeology at Tarcutta. Successive floods, however, have literally washed the floodplains clean of most archaeology. The bulk of the archaeology we find today therefore is along the protected floodplain margins. These marginal areas are by definition on the outskirts, but it would be wrong to assume the margins represent a dwindling material background. People are not driven solely by subsistence pressures which could be best satisfied by living near the creek, rather the evidence is clear that a rich social life was a dominant force in how Aboriginal people structured their lives. Place is very important to Aboriginal people. Land is the crux of Aboriginal cosmology. Aboriginal people organised their world in relation to how they perceived space. From this perspective, many of the areas away from the creek may represent more than a simple background for subsistence. The creeks marginal lands may be focus points for select activities requiring a physical/psychological distance from the day to day. Archaeologically we find many such satellite sites: specialised maintenance areas, support camps, hunting camps, ceremonial grounds and social or gender refuges. The archaeology of Tarcutta as identified in this assessment contains an array of these marginal areas and therefore represents an opportunity to investigate the more social side of Aboriginal life.

Regional investigations to date have focused on landforms and the range of artefacts associated with various landforms (Kelleher and Nightingale 2007b, c). These studies have shown that the archaeological record changes in relation to landform. Different places exhibit a different archaeology. These differences in themselves are interesting, but what do they tell us about culture? The aim of the current work is to further investigate these differences by targeting specific activity areas within the landscape (represented by the Tarcutta bypass).

The archaeological survey around Tarcutta identified 17 archaeological sites within the bypass corridor (although many more exist outside this corridor). These sites are found in a range of landforms, but because the corridor roughly follows the creek many of the sites found on the survey are situated on the margins of the floodplain (e.g. T8, T9, T10, T11, T12, T15, T17, T18, T19, T20, T21). The archaeological sites associated with the bypass corridor are therefore well placed to offer insights into Aboriginal cultural activities occurring outside of the main domestic setting associated with the creek. The test excavation methodology reflected this opportunity and the sampling strategy targeted likely activity areas associated with landforms (as opposed to previous methodologies which targeted the landforms themselves).

The results of the survey and test excavation program show a probable series of cultural areas stretching out from the creek, much in the way the towns (main domestic area) and homesteads spread around Tarcutta today. The bulk of the sites identified during the survey are these homestead-like sites. However, it would be wrong to simply label all the Aboriginal sites as simple camps (or home sites). It is important to remember that within Aboriginal cultural the greater landscape is like a house with a series of rooms (rooms being different landforms). It is not uncommon for each of these rooms to have specific activities. In this way camp sites are represented by many rooms (archaeological sites) combined over an area. Landform features such as hill tops, terraces, clearings and creek flats can be seen as rooms all working together to create a house or landscape for Aboriginal people. When archaeologists investigate this landscape we must be careful as to not compartmentalise the material we find, rather we must be mindful that in many instances there is an interconnection between places.

Some of the surface sites are clearly representative of these connections and display an archaeological significance from surface finds alone. Sites T8, T10, T13, T15, T18 all exhibit strong landscape and archaeological features which mark them as significant places. Each of these sites is a probable activity area or a portion of an activity area. The significance of other sites was less clear from the surface survey and required subsurface investigations.

The test excavation results have further hinted at these connections between sites/places around Tarcutta. Excavations at TA14/T9 suggest a larger quantity of artefacts can be found in the western portion of the site. The rather limited array of objects recovered during the excavation may also indicate that the site was a satellite camp for other activities. T9 for example may have acted as a support camp for T8 (located on the nearby hill top), which displays indications of a more specialised activity. Luckily, impacts to T9 are confined to the eastern edges and will not affect the significant (western) deposit.

TA15/T12 is different again. T12 displays a relatively high frequency of artefacts (c.18 artefact/m2) and is situated in an elevated position indicative of more select activities (Kelleher 2003). Higher proportions of tools from T12 are representative of maintenance camps, often gender specific, located around a more domestic site. T12 is likely to be related in some way to T10, located just to the north on a lower surface. For instance T12 could be a refuge where gender or task specific activities were undertaken in relative isolation from daily domestic life. Unfortunately the details of the activities from T12 have been lost due to the disturbed nature of the subsurface.

TA16/T20 shows a landform and archaeological site in flux. T20 represents the slope of a large resource rich area. In other locations near Tarcutta, such as TA7/T6, such landforms and the sites which sit on these landforms have remained remarkably intact, offering highly significant chronologic information. The geology of T12 is degrading and erosion and colluvial forces have caused great disruption. Quantities of artefacts were found across the site (c.16 artefacts/m2) however they were mostly a disturbed deposit offering no information beyond their physical presence. The high degree of movement showed the slope (T20) to be not archaeologically significant, yet it still offered information about the nearby area. Site T13 is the hill top associated with the slopes of T20. The relatively rapid movement of soils and artefacts down the slope suggests that the T20 artefacts are likely to have originated from concentrations located on the adjoining hill (T13). The T13-T20 relationship is similar to other hill top - hill slope relationships seen in the region. For example M20-M19 is a hill top - hill slope site complex overlooking Mullengandra Creek. Similar colluvial movements and artefact densities are found on the M19 slope. Subsequent excavation of the hill top revealed over 15000 artefacts. The quantities, qualities and range of artefacts recovered from M20 make it the pre-eminent archaeological site in the region. At this stage the test results from T20 do not show that T13 would be of a similar calibre as M20, but they clearly demonstrate, even with the noted disturbance, that T13 has exceptional potential. As we have seen each site is a link within the overall landscape.

TA17/T21 gives us a glimpse of the way change has occurred within the Tarcutta landscape. Tarcutta Creek was logically the centre of much Aboriginal activity in the past. We know that flood events have washed away much of the material objects resulting from this creek based activity. The layer and layers of alluvium covering T21 attest to this fact. Nevertheless, T21 represented an opportunity to glimpse some of the past events. Amazingly we were able to find a capped layer of Aboriginal cultural material over one metre below the current surface. Even this layer however has been subject to the impacts of flooding (although to a much lesser intensity it would appear than the more recent historic floods). The excavation was able to identify Aboriginal use of the area, but unfortunately the detail has been lost.

The most important finding from the current assessment is the range of sites identified around Tarcutta. Previous assessments have shown that many of these sites will likely display a good archaeological integrity (e.g. T8, T10, T18). Test excavation has been undertaken in locations where the subsurface integrity was questionable. These insights have proven accurate with all test locations identifying artefacts in disturbed context. These sites (or portions of the sites) do not pose a constraint to development. Some of the remaining sites however are significant because they contain information about the way Aboriginal people organised their world both economically and socially. Sites such as T8, T10, T13, T15, T18 and T19 all work together to create an Aboriginal landscape. Scientifically it is important to better understand these more socio-cultural relationships. Salvage excavation of the impacted sites will be a necessary step. A better understanding of these sites will also increase our ability to manage and conserve the region's archaeology because we will have a tool (the results of the excavations) with which to assess the significance of other sites.

Specific to the current assessment, understanding the archaeology of the Tarcutta bypass allows for an informed assessment of the proposed impacts caused by the bypass. Important short term implications stemming from the survey and test excavation program make it possible to outline mitigation measures (section 8). Recommendations for further work are dependent on assessed archaeological significance in relation to proposed impacts (section 7). The tables in section 8 outline the requirement for salvage excavation based on the results of the survey and test program.

7 Significance Assessment

7.1 Significance Assessment Criteria

One of the important primary steps in the process of cultural heritage management is the assessment of significance. Not all sites are equally significant and not all are worthy of equal consideration and management (Sullivan and Bowdler 1984, Pearson and Sullivan 1995:7). The determination of significance can be a difficult process as the social and scientific context within which these decisions are made is subject to change (Sullivan and Bowdler 1984). This does not lessen the value of the heritage approach, but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why, also changes over time.

Significance assessment can generally be described under three broad headings (Pearson and Sullivan 1995:7):

- value to groups such as Aboriginal communities;
- value to scientists and other information gatherers; and
- value to the general public in the context of regional, state and national heritage.

Professional guidelines for the assessment of significance (NPWS 1997) discuss two types of significance relevant to the assessment of Aboriginal sites: social significance and archaeological significance.

Cultural / Social Significance
This area of assessment concerns the value/s of a place, feature or site to a particular community group, in this case the local Aboriginal community. Aspects of social significance are relevant to sites, objects and landscapes that are important or have become important to the local Aboriginal community. This importance involves both traditional links with specific areas as well as an overall concern by Aboriginal people for sites generally and their continued protection. Aboriginal cultural significance may include social, spiritual, historic and archaeological values.

In this document cultural significance is given a relative ranking of Very High, High, Medium or Low. This ranking has been developed in consultation with key knowledge holders. All listed places hold Aboriginal cultural heritage significance and the relative ranking is designed only to assist future planning.

Scientific / Archaeological Significance
For archaeologists, scientific significance refers to the potential of a site to contribute to current research questions. Alternately, a site may be an in situ repository of demonstrably important information, for example rare artefacts of unusually high antiquity.

Scientific significance is assessed using criteria to evaluate the contents of a site, state of preservation, integrity of deposits, representativeness of the site type, rarity/uniqueness and potential to answer research questions on past human behaviour (NPWS 1997). DECC guidelines recommended criteria for assessing archaeological significance include:

- Archaeological Research Potential - significance may be based on the potential of a site or landscape to explain past human behaviour and can incorporate the intactness, stratigraphic integrity or state of preservation of a site, the association of the site to other sites in the region (connectivity), or a datable chronology;
- Representativeness - all sites are representative of those in their class (site type/subtype) however the issue here relates to whether particular sites should be conserved to ensure a representative sample of the archaeological record is retained. Representativeness is based on an understanding of the regional archaeological context in terms of site variability in and around the study area, the resources already conserved and the relationship of sites across the landscape; and
- Rarity – which defines how distinctive a site may be, based on an understanding of what is unique in the archaeological record and consideration of key archaeological research questions (i.e. some sites are considered more important due to their ability to provide certain information). It may be assessed at local, regional, state and national levels.

High significance is usually attributed to sites which are so rare or unique that the loss of the site would affect our ability to understand an aspect of past Aboriginal use/occupation of an area. In some cases a site may be considered highly significant because it is now rare due to destruction of the archaeological record through development. Moderate/Medium significance is attributed to sites which provide information on an established research question. Low significance is attributed to sites which cannot contribute new information about past Aboriginal use/occupation of an area. This may be due to site disturbance or the nature of the site's contents.

7.2 Significance of Aboriginal Sites

On the basis of discussions with the knowledge holders, the identified cultural places around Tarcutta have been assessed in terms of their cultural significance (Waters Consultancy 2009). All listed places hold Aboriginal cultural heritage significance. However, the cultural significance of the places was ranked through discussions with the relevant knowledge holder/s relative to the current proposal, to assist in future planning.

[redacted]

In addition to the assessment of identified cultural places, on-site discussions with Aboriginal stakeholders has revealed a strong attachment to the area and identified that all archaeological sites, whether an isolated artefact or a larger scatter of artefacts, scarred tree or area of archaeological potential, are highly significant to them. They are evidence of their forebears who lived in this land. They have been entrusted with their protection. Scarred trees appear to have a particular sensitivity. On the basis of this, all the recorded archaeological sites are considered to be of high cultural or social significance.

The scientific significance of the recorded Aboriginal archaeological sites ranges in significance from low to high, with the majority having been assessed as being of moderate to high significance. This assessment is based on a consideration of the research potential, connectivity (association with other sites), representativeness and rarity, in accordance with DECC guidelines (NPWS 1997). The general level of moderate to high significance is predominantly driven by the fact that all the recorded sites are considered rare in a local and regional context. That is, these sites are rare, not necessarily on the basis of site type, but because there is very little known of the archaeology of the locality and region in which they occur. For a similar reason, they can generally be considered representative. Their research potential differs, as this has been affected by the condition of the site (i.e. the more disturbed a site context is, the less research potential it has).

The integration of the cultural and archaeological information has led to an assessment of the area being of high Aboriginal cultural heritage significance.

The proposed bypass project offers an opportunity for a positive conservation outcome for Aboriginal heritage. Early consideration of Aboriginal cultural heritage has led to detailed design taking into consideration all identified cultural places and archaeological sites. Changes to the road design have been made to avoid some archaeological and cultural sites, especially sensitive cultural areas and scarred trees, and to minimise (where possible) the impacts at other locations. Although it will not be possible to avoid all sites, the remaining features are significant. The value of these features is enhanced by their physical connections which can be interpreted as a landscape microcontinuum (e.g. creek banks – terrace – slopes – hilltops extending over a handful of kilometres). Information obtained through the test excavations and by salvaging key locations along this continuum will greatly enhance our cultural and archaeological understanding of the area and allow for significant interpretation of past events within this cultural zone.

8 Impact Assessment and Mitigation Strategies

All identified Aboriginal cultural places and archaeological sites recorded within or near the Tarcutta bypass have been considered by the RTA in relation to the proposed road construction and associated activities. Where significant sites or places were identified, where possible the design has been modified to avoid or limit the impact to the identified cultural places and archaeological sites. In some instances the RTA has gone to great lengths during the preliminary route selection stages to limit the impacts to Aboriginal cultural heritage. [redacted]

Early input by knowledge holders allowed the RTA time to redesign the road in this portion of the bypass. As a result, only minor impacts will occur to this significant cultural area within the current concept design. Some level of impact is unfortunately unavoidable for such a large road project. Best practice is to try to limit most impacts and where appropriate mitigate impacts.

Despite the RTA's numerous attempts to limit impacts, a number of identified archaeological places and two cultural places will still be impacted by the Tarcutta bypass. A mitigation strategy therefore is required and has been provided in Table 15. For cultural places, this is based on the impacts and recommendations documented in the cultural assessment report (Waters Consultancy 2009). For archaeological sites, this is based on consideration of both the surface survey and test excavation results (see section 6 this report).

Although several archaeological sites will be impacted according to the detailed design, in most cases the impacts amount to only a relatively small portion of the actual site or place. Overall, it can be argued that this represents a positive outcome for Aboriginal heritage. In this light, the Tarcutta bypass is an opportunity for increasing our understanding, strengthening our interpretation and bettering our recognition of Aboriginal culture and heritage within an area where little previous documented information exists.

8.1 Impacts

Of the six identified cultural places, four will not be impacted by the proposed bypass construction. The locations of these cultural places will be identified in the construction environmental management plan to ensure they are not inadvertently impacted.

Of the 17 archaeological sites, five will not be impacted, and 12 sites will be impacted by road works as shown in the concept design. All sites (and portions of sites) not impacted will be identified in the construction environmental management plan to ensure the highest level of protection. Specific mitigation strategies for each site are outlined in Table 15.

Table 15 below provides the site reference number, site type, a brief description, significance, impact and mitigation strategies for each identified cultural place and archaeological site identified along the Tarcutta bypass. For simplicity, impacts are colour coded according to the key below.

Key

Impact Assessment	Impact Colour Coding
No Impact	**Green**
Will be impacted	**Pink**

Table 15. Impacts and Mitigation for Tarcutta Bypass

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Identified Aboriginal Cultural Place					
Place 1	[redacted]	[redacted]	High	Will be impacted	The knowledge holder reluctantly accepts the level of impact as shown in the current design (as presented in this report). The knowledge holder has requested a number of mitigation and management actions. • two site visits following the borehole drilling and construction of the permanent ground supports • cultural salvage excavation occurs in relation to all works impacting the Place [redacted] and that any artefact or other cultural material salvaged be rescattered on the Place following analysis and under the direction of the knowledge holder • barrier fencing be erected on the construction line (as shown in the designs in this report) to ensure that no construction impact extends further into the area of the Place other than the borehole drilling as agreed. No signage identifying the area as having Aboriginal cultural significance to be erected, signage stating 'Significant Environmental Area – No Entry Permitted' acceptable. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holder.
Place 2	[redacted]	[redacted]	High	No impact	Substantive buffer zone to be placed around place to protect from potential impacts including any construction impact. Temporary barrier fencing along highway to provide ongoing protection to place and prevent vehicles parking in vicinity of place. No signage to be erected.
Place 3	[redacted]	[redacted]	Medium	No impact	Substantive buffer zone to be placed around place to protect from potential impacts including any construction impact. Temporary barrier fencing along highway to provide ongoing protection to place and prevent vehicles parking in vicinity of place. No signage to be erected.
Place 4	[redacted]	[redacted]	Very High	No impact	Any future work in this area would require further consultation with knowledge holder. The knowledge holder considers that there is no acceptable level of impact on the place due to its very high level of cultural significance.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Place 5	[redacted]	[redacted]	High	Will be impacted	The minimal impact in the current concept design, as shown in this report, is accepted by the knowledge holders as it does not impact on the core area of significance and is a result of substantive redesigns to avoid that core area. The knowledge holders consider that there is no acceptable level of impact on the core area of significance due to its high level of cultural significance. To minimize potential impact temporary fencing along the construction line, as shown in the current concept design in this report, is requested throughout construction. No signage identifying the area as having Aboriginal cultural significance to be erected, signage stating 'Significant Environmental Area – No Entry Permitted' acceptable. Any future work in this area or deviation from the current concept design (as shown in this report) would require further consultation with the knowledge holders.
Place 6	[redacted]	[redacted]	High	No impact	To minimize potential impact temporary fencing of these cultural items, with a buffer zone extending [redacted], is requested throughout construction. No signage identifying the items as having Aboriginal cultural significance to be erected, signage stating 'Significant Environmental Area – No Entry Permitted' acceptable. Any future work in this area would require further consultation with knowledge holders. The knowledge holders consider that there is no acceptable level of impact on the place due to its very high level of cultural significance.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
Archaeological Sites					
T1	Scarred Tree	This site is a scarred tree situated on the western side of the Hume Highway. It is located on the top of a raised landform (T10). The tree is a Box (possibly Apple Box) with an elongated elliptical scar.	Moderate to High	No impact	No action required. The location of the tree will be identified in the construction heritage site map to ensure it is not inadvertently affected.
T2	Scarred Tree	This site is a scarred tree situated on the western side of the Hume Highway. The tree is a dead Red Gum with an elongated triangular scar. The tree has been ringbarked, creating a relatively straight edge to the base of the scar. It is located on a gentle slope.	Moderate to High	No impact	The location of the tree will be identified in the construction heritage site map to ensure it is not inadvertently affected. T2 is a dead tree with heavy upper limbs. It is uncertain how long this tree will remain standing unaided. It is recommended that a portion of the upper limbs be cut back, thereby reducing the weight and lowering the centre of gravity. Any lopping of this scar tree should be undertaken in consultation with an arborist and archaeologist.
T3	Scarred Tree	This site is a scarred tree situated on the eastern side of the Hume Highway. It is located on a lower hillslope approximately 800m east of Tarcutta Creek. It is a dead tree with three wound scars on the main trunk and one scar on a cut section of the trunk lying on the ground.	Moderate to High	No impact	No action required. The location of the tree will be identified in the construction heritage site map to ensure it is not inadvertently affected.
T8	Artefact Scatter	T8 is an artefact scatter on a hilltop on the west side of the Hume Highway. [redacted]	Moderate to High	Will be impacted (partial)	Salvage excavation recommended if avoidance not possible and a significant portion (e.g. 10% or more) of the site is impacted.
T9 / TA14	Artefact Scatter	This site is an artefact scatter on the west side of the Hume Highway located on a truncated slope overlooking Tarcutta Creek. Test excavation results indicate the western portion of the site is significant while the eastern portion is not significant.	Low to Moderate	Will be impacted (partial)	Test excavation undertaken (TA14). No further archaeological mitigation required for the impacted eastern portion of the site (see Figure 2). Site can only be impacted after project approval obtained. The western portion of the site should not be impacted. If the western portion is impacted and avoidance is not possible a salvage excavation is recommended.
T10	Artefact Scatter	This site is a large artefact scatter on the [redacted] property overlooking Tarcutta Creek. The site is representative of Aboriginal occupation areas along the elevated margins of the floodplain.	Moderate to High	Will be impacted	Salvage excavation recommended if avoidance not possible.
T11	Artefact Scatter	This site is a disturbed artefact scatter on the [redacted] property related to T10. The site has been impacted by erosion and vehicles and does not exhibit archaeological research potential.	Low	Will be impacted	No further archaeological works required. Artefacts should be salvaged by surface collection within the impact area with Aboriginal stakeholders. Site can only be impacted after project approval obtained.
T12 / TA15	Artefact Scatter	T12 is located on a hilltop overlooking Tarcutta Creek. Test excavations revealed a low density of subsurface archaeological material with a moderate quantity of backed artefacts. The site has been impacted by colluvial movements and only a thin and disturbed cultural layer remains.	Moderate	Will be impacted	Test excavation undertaken (TA15). No further archaeological mitigation required. Site can only be impacted after project approval obtained.

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
T13	Artefact Scatter	This site is located west of Tarcutta and represents the high ground west of Gresham Street. Artefacts were identified in eroding deposit at several locations. The area has a high potential to retain significant archaeological deposit and is representative of a much larger site encompassing the entire hilltop.	High	No impact	No action required. The location of the site will be identified in the construction heritage site map to ensure it is not inadvertently affected.
T14	Scarred Tree	This site is a scarred tree situated on the western side of the Tarcutta Town Bypass corridor. The tree is in the Tarcutta Creek floodplain approximately 40m west of the creek. T14 is a River Red Gum with a 3.5m long scar which is c.36cm wide.	Moderate to High	No impact	No action required. The location of the tree will be identified in the construction heritage site map to ensure it is not inadvertently affected.
T15	Artefact Scatter	T15 is a large artefact scatter located on the eastern edge of the Crown Reserve approximately 30m west of the Hume Highway just north of the Keajura Creek crossing and south of Mates Gully Road. Over 50 quartz artefacts have been identified at T15 during field survey. Most artefacts were debitage but some blades and cores were also recorded. Artefacts were distributed over 500m^2. Erosion has impacted the edges around the steeper slopes, but the majority of the site appears in good condition with little subsurface disturbance. The site is representative of sites within the reserve [redacted]	High	Will be impacted	Salvage excavation recommended if avoidance not possible.
T16	Artefact Scatter	T16 is a disturbed artefact cluster located just northwest of Keajura Creek crossing. Artefacts recorded: distal flake (12mm x 5mm x 2mm) flaked piece (12mm x 5mm x 2mm) bipolar core (32mm x 20mm x 13mm). The ground has been impacted by flood events and the subsurface appears to consist of mostly homogenised alluvium.	Low	Will be impacted	No further archaeological works required. Artefact should be salvaged by surface collection with Aboriginal stakeholders. Site can only be impacted/ salvaged after project approval obtained.
T17	Artefact Scatter	T17 is an artefact scatter located along Keajura Creek. The site is situated on both the west and east banks of the creek. The west bank is disturbed while the east bank is in relatively good condition. Quartz artefacts were recorded in areas of ground exposure.	Moderate to High	Will be impacted (west portion)	No further archaeological works required. Site can only be impacted after project approval obtained. The eastern portion of this site is significant, if impacts increase beyond the concept plan salvage excavation will be required.
T18	Artefact Scatter	This site is located on the west side of the Hume Highway. The site is part of a larger site associated with T19. The site has high archaeological research potential in its association with Keajura Creek.	Moderate to High	Will be impacted	Salvage excavation recommended if avoidance not possible.
T19	Artefact Scatter	This site is located on the west side of the Hume Highway. The site is part of a larger site associated with T18. The site has moderate archaeological research potential in its association with Keajura Creek.	Moderate	Will be impacted	Salvage excavation recommended if avoidance not possible and a significant portion (e.g. 5% or more) of the intact deposit is impacted (i.e. the area east of the current property fence line).

Site	Type	Description	Significance	Impact Assessment	Mitigation Strategy
T20 / TA16 T-PAD-4	Artefact Scatter (previously recorded PAD)	This site is located on a slope west of Tarcutta overlooking the creek. Testing and interim analysis of T20 has identified a highly dispersed and low density archaeological site. The area represents the eroded margins of T13. Colluvial forces have impacted the site and only disturbed pockets of artefacts remain on the moderately sloping site.	Moderate	Will be impacted	Test excavation undertaken (TA16). No further archaeological mitigation required. Site can only be impacted after project approval obtained.
T21 / TA17 T-PAD-5	Artefact Scatter (previously recorded PAD)	This site is located on a modest rise along Keajura Creek just above the Tarcutta Creek floodplain. Testing identified a deep archaeological deposit at T21. Small numbers of artefacts were found resting above a paleo-clay surface capped by recent (historic) alluvial layers. The remaining cultural material/layer has been impacted by flooding and although some remains intact, not enough archaeology survives to warrant a salvage. No further information will be collected by a salvage program.	Moderate	Will be impacted	Test excavation undertaken (TA17). No further archaeological mitigation required. Site can only be impacted after project approval obtained.

9 Management Outcomes

The following general management outcomes will be implemented in accordance with the management policy for the Project as outlined in section 8.

9.1 Conservation of cultural places and archaeological sites not being impacted by road construction or associated activities

The cultural places and archaeological sites in Table 16 would not be impacted by the Tarcutta bypass project. Their location should be identified in the construction environmental management plan, construction heritage sites map and project inductions to ensure they are not inadvertently damaged as a result of construction works. Cultural places and archaeological sites within the construction corridor should be fenced off prior to the commencement of construction works to ensure that they are not inadvertently affected as a result of construction work. Fencing would be maintained throughout the duration of works.

The cultural places and archaeological sites in Table 16 would not be impacted by the Tarcutta bypass project. However, if conserved archaeological sites fall within the final road reserve, landscaping activities (e.g. seeding by direct drilling, individual tree planting etc.) would likely take place within these sites. Landscaping is considered a neutral impact (on archaeological sites) as the benefits or reducing the erosion hazard will protect the archaeology in the long term.

Table 16. Aboriginal cultural places and archaeological sites not impacted by road construction

Cultural places and archaeological sites not impacted	
Cultural Places (requiring fencing)	Place 2, Place 3
Cultural Places (no fencing required)	Place 4, Place 6
Archaeological Sites	T1, T2, T3, T13, T14

9.2 Minimisation of impacts to cultural places impacted by road construction

Two cultural places will be impacted by road construction (Table 17). To minimise heritage impacts to this place and ensure against inadvertent damage as a result of construction activities fencing will need to be maintained throughout the duration of works.

Table 17. Protection for cultural places impacted by road construction

Protection of impacted cultural places	
Cultural Place	Place 1, Place 5

9.3 Archaeological salvage excavation required to mitigate impacts on highly significant archaeological sites and cultural places

The archaeological sites in Table 18 are of moderate to high Aboriginal heritage significance and require archaeological salvage excavation to mitigate the impacts. Cultural Place 1 has very high cultural significance and requires a cultural salvage excavation. All excavation can only occur after project approval is obtained.

Table 18. Aboriginal archaeological sites requiring salvage excavation

Salvage excavation of archaeological sites	
Archaeological Sites (requiring salvage if cannot be avoided)	T19
Archaeological Sites and Cultural Places (Impacted by concept design)	Place 1, T10, T15, T18

9.4 Salvage through the collection of surface artefacts

Salvage would be undertaken at the sites in Table 19 through collection of surface artefacts within the impact area. Surface collection can only occur after project approval is obtained.

Table 19. Aboriginal archaeological sites requiring salvage collection

Salvage collection of archaeological sites	
Archaeological Sites (requiring collection if cannot be avoided)	T11, T16

9.5 No further archaeological mitigation required

No further archaeological mitigation is required for the sites in Table 20. Sites can only be impacted after project approval is obtained.

Table 20. No further archaeological mitigation required

No further cultural/ archaeological mitigation required	
Archaeological Sites	T12, T20, T21
Archaeological Sites (requiring no further archaeological mitigation provided no increase in impacts to sites)	T8, T9, T17

9.6 Proposed Changes to Approved Projects

The RTA recognises that in the course of undertaking the Tarcutta Town Bypass, design alterations or other changes to the Approved Project may be required.

Sections 9.7 – 9.10 outline the processes that the Proponent must follow to ensure that any changes to the Approved Project which may impact on Aboriginal cultural heritage are dealt with consistently and with ongoing consultation with Aboriginal stakeholders, DECC and DoP.

9.7 Management Policy for Aboriginal Heritage

The policy for the management and conservation of Aboriginal heritage in relation to salvage activities and construction activities (or fencing, investigative drilling, minor clearing, establishing site compounds, adjustment to services/utilities etc) is described below:

Responsibility for compliance with Management Policy

1. The Proponent must ensure all of its employees, contractors and subcontractors and agents are made aware of and comply with this management policy.
2. The Proponent must appoint a suitably qualified and experienced environmental manager who is responsible for overseeing the activities related to this management policy.
3. The Proponent must appoint a suitably qualified and experienced Archaeologist who is responsible for overseeing, for and on behalf of the Proponent, the salvage activities relating to the project.

Operational constraints

4. Where salvage activities have been nominated for impacted sites, no construction activities (or fencing, investigative drilling, minor clearing, establishing site compounds, adjustment to services/utilities etc) can occur on the lands to be salvaged until the relevant salvage activities at the nominated site have been completed. This restriction only relates to the specifically identified portion of an archaeological site to be salvaged and not the entire archaeological site (unless specified). Construction activities may proceed on the portion of a site not designated for salvage provided they do not impact or impede the salvage excavation and that the area to be salvaged is fenced in consultation with the Archaeologist prior to the commencement of those construction activities.
5. Prior to the commencement of early works activity (e.g. fencing, minor clearing, establishing site compounds etc) a construction heritage site map identifying conserved sites (excluded from impact) and sites to be salvaged must be prepared. The construction heritage site map should be prepared to the satisfaction of the RTA.
6. Prior to commencing substantial construction activities an Aboriginal heritage management plan must be prepared and approved by the RTA.
7. All employees, contractors, subcontractors and agents carrying out construction activities (e.g. fencing, minor clearing, establishing site compounds etc) must undertake a Project induction (including the distribution of a construction heritage site map) to ensure that they have an understanding and are aware of the Aboriginal heritage issues affecting the activity.
8. Prior to the proposed commencement of activities relating to this management policy the RTA Hume Highway Office must be notified prior to the proposed commencement date of those activities.

Protection and management of sites excluded from impacts

9. All sites listed in section 9.1 are excluded from impact.
10. All excluded archaeological sites in the construction corridor must be fenced in consultation with the Archaeologist prior to the commencement of construction activities (e.g. fencing, minor clearing, establishing site compounds etc).
11. All excluded cultural places in the construction corridor must be fenced in consultation with the relevant knowledge holder(s) prior to the commencement of construction activities (e.g. fencing, minor clearing, establishing site compounds etc).
12. All excluded cultural places and archaeological sites located outside of the construction corridor must be identified on construction maps and are not to be impacted.

Cultural places, sites and objects to be impacted

13. The cultural place and archaeological sites identified as being impacted by construction activities are listed in sections 9.2, 9.3, 9.4 and 9.5. The impacts authorised by this management policy are those listed in sections 9.2, 9.3, 9.4 and 9.5 unless otherwise agreed in writing by the RTA.

Human Remains

14. This management policy does not authorise any damage of human remains.
15. If potential human remains are disturbed the Proponent must follow the procedures outlined in section 9.8 below.

Salvage Activities

16. The archaeological salvage excavation must be carried out in accordance with the methodology specified in Appendix D of this report.
17. Archaeological testing (as a component of salvage) must be carried out in accordance with the research design methodology used previously to undertake the test excavations at TA14 to TA17.
18. The surface collection of Aboriginal objects must be carried out in accordance with the methodology described in Appendix D of this report.

Involvement of Aboriginal groups and/or individuals

19. Opportunity must be provided to the approved applicants from the local Aboriginal community to be involved in the following activities:
    a. assist with the salvage excavation as outlined in section 9.3
    b. assist with the surface collection of objects outlined in section 9.4

Salvaged Aboriginal objects

20. Any salvaged Aboriginal objects must be relocated as soon as practicable to a temporary storage location pending discussions with the RTA, Aboriginal stakeholders and the DECC in relation to a permanent storage location or reburial.
21. In the event that a suitable storage location or reburial area cannot be identified the Proponent must request in writing that DECC identify a suitable storage location or reburial area.
22. If reburial occurs, pursuant to s.91 of the *National Parks and Wildlife Act 1974* the location of each reburial area must be notified in writing to the DECC as soon as practicable after reburial occurs.

Reporting requirements

23. A written salvage report about the salvage works must be provided to the RTA. The report must include:
    a. details of the nature and type of Aboriginal objects disturbed or moved at each salvage area;
    b. a detailed description of the methods of excavation and collection used;
    c. a detailed plan of each salvage area;
    d. any proposed ongoing consultation with or involvement of representatives of local Aboriginal groups in relation to the salvage work.
24. The salvage report must be provided to the RTA within six months or otherwise agreed to after the conclusion of all salvage activities.
25. Unless otherwise agreed with the Hume Highway Manager, any culturally sensitive or restricted information identified by representatives of local Aboriginal groups or individuals which is relevant to the salvage report must be detailed in a separate report provided to the RTA. The separate report must describe:
    a. the culturally sensitive or restricted information that is relevant to the project;
    b. any restrictions on access to that information (e.g. for gender related cultural reasons or due to a risk of damage to a particularly significant Aboriginal object or site).
26. Any separate report that is prepared must be provided to the RTA at the same time as the salvage report.
27. Provision of copies of reports to Aboriginal stakeholders.
28. Unless otherwise agreed with the Hume Highway Manager, the Proponent must provide a copy of each report provided to the RTA to each registered local Aboriginal group or individual as soon as practicable after each report is provided to the RTA.

Notification and reporting about incidents that breach this management policy

29. Incident reporting requirements in accordance with the Project Approval is to include Aboriginal heritage.
30. Where the Environmental Representative (ER) or the RTA reasonably suspects that an incident has occurred that contravenes the management policy presented here the Proponent must prepare a written report within 5 days detailing that incident. The report must describe
    a. the nature of the incident
    b. the notification of the ER, and specialist where required
    c. the nature and location of relevant Aboriginal sites and/ or PADs, with reference to and provision of maps and photographs where appropriate
    d. the impact of the incident on Aboriginal sites and/ or PADs, with the appropriate specialist input where required
    e. the measures which have been taken or will be taken to prevent a reoccurrence of the incident.

Report about completed work

31. The Alliance must prepare a report relating to Aboriginal cultural heritage activities undertaken for the project. The report must detail:
    a. a short summary of the report for inclusion on AHIMS;

b. any ongoing consultation with or involvement of local Aboriginal groups in relation to this project;
c. how any excluded Aboriginal objects or sites were managed during construction;
d. the effectiveness of salvage activities and mitigation measures that were implemented and;
e. the effectiveness of any management plan which was in place.

9.8 Procedures for Handling Human Remains

- **Note that Project Approvals do not include the destruction of Aboriginal remains**

This section outlines the procedure for handling human remains in accordance with the Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the *Heritage Act 1977* (NSW Heritage Office 1998) and the Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS 1997). In the event that construction activity reveals possible human skeletal material (remains), the following procedure is to be followed:

1. as soon as remains are exposed, all work is to halt at that location immediately and the Project Environmental Manager on site is to be immediately notified to allow assessment and management;
2. Project Environmental Manager on site to notify Environmental Representative, RTA Hume Highway Manager and RTA Senior Environmental Officer (South West region)
3. contact police;
4. contact DECC's Environment line on 131 555 and the Heritage Office on (02) 9873 8500;
5. a physical or forensic anthropologist should inspect the remains in situ, and make a determination of ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or forensic);
    i. if the remains are identified as forensic the area is deemed as crime scene; or
    ii. if the remains are identified as Aboriginal, the site is to be secured and DECC and all Aboriginal stakeholders are to be notified in writing; or
    iii. if the remains are identified as non-Aboriginal (historical) remains, the site is to be secured and the Heritage Office is to be contacted.

The above process functions only to appropriately identify the remains and secure the site. From this time, the management of the area and remains is to be determined through one of the following means:

A. If the remains are identified forensic matter liaison with the police; or
B. If the remains are identified as Aboriginal liaison with the RTA, the Department of Planning (DoP), the DECC and Aboriginal stakeholders; or
C. If the remains are identified as non-Aboriginal (historical) liaison with the RTA, the DoP and the Heritage Office; or
D. If the remains are identified as not being human then work can recommence once the appropriate clearances have been given.

9.9 Procedure for proposed changes to Approved Projects

A proposed change to the Approved Project (such as an alteration of the current alignment, the location of ancillary facilities) within the project corridor may result in a:

- Reduced impact to Aboriginal cultural heritage; or an
- Increased impact to Aboriginal cultural heritage.

Note: the use of the word impact in this section is defined as an impact on the significance of Aboriginal cultural heritage rather than simply an increased physical impact.

To ensure consistency with the Approved Project and this document any change in the overall impact on Aboriginal cultural heritage will need to be considered. The process to determine consistency is outlined in section 9.9.1 below.

Where a proposed change to the Approved Project occurs outside of the project corridor considered for the environmental assessment further heritage assessment will be required to determine if there would be an impact on Aboriginal cultural heritage and whether this represents a modification to the Approved Project (outlined below).

9.9.1 Changes in heritage impact

Where the Proponent seeks to make a change to the design and construction of the Approved Project which changes the assessed impact on Aboriginal cultural heritage, as detailed in sections 9.1-9.5 of this document, the Proponent will need to prepare an assessment of the new impacts of this work in consultation with the appointed Archaeologist. The continued involvement of the Aboriginal stakeholders in this process is outlined in section 9.10.

The RTA is responsible for determining whether a proposed change is consistent with the Approved Project. The decision as to whether a change is consistent or inconsistent with the Approved Project will be documented. This process is explained below.

- New impacts consistent with previously identified impacts

If a proposed change to the Approved Project is considered to have a neutral or lesser significant impact on Aboriginal cultural heritage than that identified in this document it would be considered a consistent impact.

If the proposed change is considered to be consistent with the Approved Project the RTA may approve the change with no requirements to seek further approval from the Minister for Planning. However, in certain circumstances, further consultation with Aboriginal stakeholders may still be required (see section 9.10 below).

- New impacts inconsistent with previously identified impacts

If a proposed change to the Approved Project is considered to have a more significant impact on Aboriginal cultural heritage than that identified in the environmental assessment it would be considered an inconsistent impact.

If the proposed change is considered inconsistent with the assessed impact on Aboriginal cultural heritage, as detailed in sections 9.1-9.5 of this document, the RTA would require an amendment to the mitigation measures agreed in this report. If this proposed change is considered inconsistent with the Approved Project the RTA would require a modification of the Minister's approval (the Approved Project) from the Minister for Planning. Further consultation with Aboriginal stakeholders will be undertaken (see 9.10 below).

9.10 Process for continued consultation with Aboriginal stakeholders

The extent to which the RTA will continue to consult with Aboriginal stakeholders is dependent upon the level of impact and whether the area was assessed as part of the environmental assessment. The types of potential impacts are identified as reduced impacts, increased impacts or unknown impacts.

a) Neutral or reduced impact
If as a result of alterations to the project design a previously identified impact to an Aboriginal heritage item is reduced then no further consultation is required.

If as a result of alterations to the project design an impact to a conserved Aboriginal heritage item [section 9.1] is proposed that results in a reduced impact on the overall heritage significance of the study area (i.e. the cumulative impact is reduced), then further consultation with Aboriginal stakeholders will be undertaken. This consultation may entail a phone call and phone log of comments received or the provision of a report for comment (10 working days).

b) Increased Impact
Where as a result of alterations to the project design an impact on Aboriginal heritage is considered to be greater than identified by the Approved Project further consultation will be undertaken. This consultation will either entail a phone call and phone log of comments received or the provision of a report for comment (10 working days).

c) Unknown impacts: Assessment process
Where a proposed change is an area located outside of the project corridor assessed as part of the Approved Project the impact on Aboriginal cultural heritage is considered to be unknown. This area would require preliminary assessment to determine any impacts upon Aboriginal heritage. This assessment should be provided to the RTA Hume Highway Office for review. Should no impacts be identified then no consultation with Aboriginal stakeholders is required. Should potential impacts be identified consultation with Aboriginal stakeholders will be undertaken. This consultation will entail the provision of a report for stakeholder comment (10 working days) detailing the impacts and mitigation strategies proposed.

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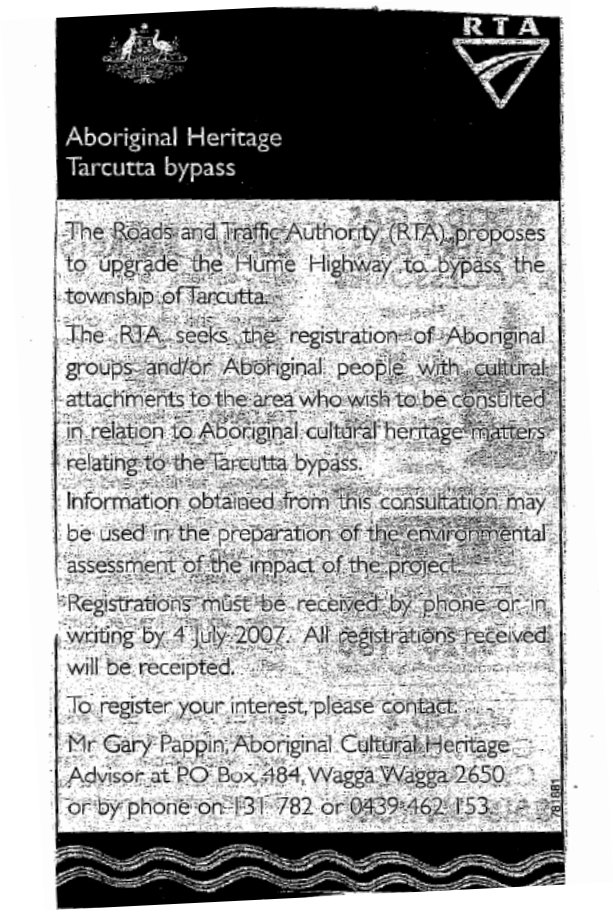
Appendix A Advertisement for Stakeholders

The RTA placed the following advertisements inviting stakeholders to register their interest for the Tarcutta town bypass project. Details of where they were advertised and the dates they appeared are provided in the table below.



Aboriginal Heritage
Tarcutta bypass

The Roads and Traffic Authority (RTA) proposes to upgrade the Hume Highway to bypass the township of Tarcutta.

The RTA seeks the registration of Aboriginal groups and/or Aboriginal people with cultural attachments to the area who wish to be consulted in relation to Aboriginal cultural heritage matters relating to the Tarcutta bypass.

Information obtained from this consultation may be used in the preparation of the environmental assessment of the impact of the project.

Registrations must be received by phone or in writing by 4 July 2007. All registrations received will be receipted.

To register your interest, please contact:

Mr Gary Pappin, Aboriginal Cultural Heritage Advisor at PO Box 484, Wagga Wagga 2650 or by phone on 131 782 or 0439 462 153.

Advertisement placed in:

Print Media	Date
The Daily Advertiser (Wagga)	23 June 2007
Eastern Riverina Chronicle	20 June 2007
Koori Mail	20 June 2007
National Indigenous Times	28 June 2007
Deadly Vibe	6 July 2007
In Vibe	6 July 2007

Note the closing date in the above advertisement is 4 July. This is more than 10 working days after first appearance of the advertisement in the Koori Mail. The closing date in subsequent advertisements was at least 10 days after publication.

Appendix B Aboriginal Stakeholder Comments

(No stakeholder comments have been received during the consultation process.)

Appendix C Place Sheets

Appendix deleted from public document.

Appendix D Research Design of Tarcutta Bypass

Methodology

Research Aims

The main aims of the proposed salvage excavation program are:

- To salvage representative samples of identified archaeological activity areas, landforms and/or archaeological resources at key locations along the Tarcutta bypass prior to development impact.
- Analysis of the salvaged archaeological material to gain and conserve knowledge and understanding of the scientific and cultural information exhibited by the activities associated with the Aboriginal heritage from the Tarcutta area.
- Use the excavation results to gain insight into the subsurface archaeology of the adjacent areas not being impacted by the highway construction (i.e. sites outside the construction corridor). This will allow an increase in future educational opportunities and a more informed management of Tarcutta's Aboriginal heritage.

The further scientific aim of the salvage excavation program would be to determine the subsurface integrity, extent, spatial distribution and nature of the cultural deposits in varying landscapes and the specific types of associated archaeological/cultural activities.

- Determining the integrity of the deposit involves assessing the degree of disturbance which is present.
- Determining the extent of the sites and/or activity areas involves identifying the boundaries associated with the identified archaeological deposit.
- Assessing the spatial distribution involves identifying the presence/absence of archaeological material across identified land forms (e.g. crest, slope, creek flat).
- The nature of the site refers to the type of activities indicated by the artefactual material (e.g. primary production, domestic knapping, hunting camps). The goal would be to retrieve entire assemblages from specific activities if such activities were present.
- Retrieved assemblages would be compared with the results from other relevant archaeological projects (e.g. Hume Highway duplication) in order to assess significance.

The archaeological program proposed in this research design will salvage the significant archaeology, but equally important is the aim to use this information to bring the Aboriginal story back to the forefront of knowledge. Furthermore as part of the archaeological program, KNC will continue to bolster the recovered archaeological information with geomorphic data designed to offer a glimpse of the physical stage and timeline associated with the cultural story. It is envisioned that this complete archaeological program will be the foundation for the area's future cultural, educational and management opportunities.

Conservation is a primary goal of all Aboriginal heritage management. All archaeological excavation undertaken during the proposed program will be restricted to the actual construction corridor (construction clearing area) associated with the impacted sites. The construction corridor includes the actual roadwork and all associated impacts such as support vehicle tracks or drainage works.

Archaeological Salvage Areas

Salvage excavation will focus on three primary areas (outlined in sections 8 and 9):

- T10
- T15
- T18

Salvage excavation of T10, T15 and T18 will focus on the extraction of collections of artefacts related to activity areas. In practice this means undertaking large open area excavation on the order of 150-300m^2.

T10

T10 is a large artefact scatter located on a raised mound adjacent to the Tarcutta Creek floodplain. The site is located approximately one kilometre north of Tarcutta on the west side of the highway within the [redacted] property. Artefacts are scattered across the mound and the site covers an area of around 12,000m^2. Several quartz artefacts were recorded during the field survey including a fine quality (few internal flaws) quartz flake (20mm x 15mm x 10mm) and a fine quality bipolar core (25mm x 20mm x 12mm). The topography of the site is similar to T9. The site likely represents the margins of Aboriginal occupation along the floodplain. More concentrated cultural activity is more probable near the creek, but flood events have severely displaced the archaeology. T10 is spatially linked to artefact scatter T11 and scarred trees T1 and T2. T10 is in good condition with only limited erosion impacting the subsurface and represents good archaeological research potential. The soils show signs of deflation, but not evidence of significant colluvial flux which indicates that an intact (if somewhat compressed) subsurface soil layer has survived across T10.

T15

T15 is a large artefact scatter located on the eastern edge of the Crown Reserve approximately 30m west of the Hume Highway and just north of the Keajura Creek crossing and south of Mates Gully Road. Large portions of the Crown Reserve are covered in artefacts (cf. cultural place 5) with T15 representing one such concentration demarcated by Keajura Creek to the south and a drainage channel to the north. Most of the site sits above the 240m contour and below the 250m contour. Over 50 quartz artefacts have been identified at T15 during field survey. Most artefacts were debitage but some blades and cores were also recorded.

Artefacts were distributed over 500m^2 but concentrated in a 150m^2 area. Erosion has impacted the edges around the steeper slopes, but the majority of the site appears in good condition with little subsurface disturbance. The site is representative of sites within the reserve and is significant both for archaeological reasons and cultural reasons.

T18
T18 is an artefact scatter located on the west side of the Hume Highway c.1.2 kilometres south of Mates Gully Road. The site extends along the highway for about 400m and encompasses an area of c.32,000m^2. T18 is directly related to T19 on the east (opposite) side of the highway, which has artificially bisected the site. T18 is a raised landform resting above the Keajura Creek floodplain and is also associated with a swampy area (possibly archaic billabong) located along the eastern base of the site. The proximity to these water sources marks T18 potentially capable of displaying a range of occupational activities (such as various types of stone tool production linked to a domestic camping, hunting, resource processing). The soils of T18 appear stable and are similar to the profiles seen at T17. Moderate to dense grass cover has resulted in an overall low ground visibility with few surface exposures. Artefacts at T18 include medium and long sized quartz flakes (e.g. 25mm x 14mm x 5mm and 16mm x 12mm x 8mm). The site has high archaeological research potential because it contains a relatively intact soil structure, situated near prominent resources and exhibits identified archaeological materials.

Place 1 Cultural Salvage (excavation)
Salvage excavation will also be undertaken at Place 1 [redacted]. The mitigation requirement for salvage of Place 1 has been determined by the knowledge holder (see Waters Consultancy 2009). The methodology of the salvage program will be the same as outlined for sites T10, T15 and T18. However, the outright collection of artefacts will be the principle aim of the excavation program. [redacted]

Surface Collection
Construction of the Tarcutta bypass will impact several surface artefact scatters. Prior to construction surface artefacts from all known archaeological sites impacted by the project should be collected (see section 9.4) if the sites cannot be avoided. Surface collection of the impacted portions of the following sites would occur:

- T11
- T16

Field Methods
The goal of the field excavation program is to recover significant assemblages of artefacts from each salvage area which will characterise the site and offer comparable information with other sites. The field methods reflect this goal and will use a standard (comparable) methodology often used by archaeologists and one which has been previously utilised along the Hume Highway.

Combined Program
In order to achieve the most robust and comparable result, KNC advocates a combination target program and open area excavation program. The initial excavation of each salvage location (i.e. the target program) will be to lay out a series of excavation squares in transects across land formations in order to locate specific activity areas and then open area excavations will be undertaken around these initial squares yielding higher (or otherwise significant) artefact densities. The advantages of this combined program are both statistical and practical. Statistically, the target program will allow for a direct comparison with test data from other excavations undertaken along the highway where salvage excavation was not warranted. This statistically sound information will create a baseline for the region and inform future management and research studies. In addition, the geoarchaeological data covering this same extensive transect will enhance our archaeological assessment by demonstrating the relationship between Aboriginal cultural heritage and the geomorphic process (e.g. climate change). The practical side of the combined program means that we will be 1) finding and 2) salvaging the most relevant archaeological deposits impacted by the road construction. Experience has shown that the most fruitful salvage of open areas involves the need to fully assess the deposit (i.e. subsurface integrity, extent, spatial distribution and nature) in order to demonstrate that the material recovered is truly representative.

Excavation Process
The mechanics of the excavation follow the same standard approach adopted by previous successful excavation methodologies used on Hume Highway Duplication project. Excavation squares measuring 1m x 1m will be hand excavated in bulk or (where possible) stratigraphic units. Squares will be excavated until the basal layer or culturally sterile deposit is reached (past experience indicates that the depth is variable but the cultural deposit is usually contained in the upper 25-35cm). The initial excavation squares at each location will be excavated well into the sterile unit to confirm the absence of artefacts before commencing open area salvage.

Initial excavation will involve around 25-50 squares per salvage area. The precise number of squares would depend on the archaeological deposit and geology. Excavation grids (transects) will be established using AMG coordinates for each square. Squares will be placed at 15m intervals along sampling transects. The

squares in adjoining transects will be staggered (at five metre intervals) to achieve maximum sampling coverage. This approach is consistent (and directly comparable) with previous excavations.

Where salvage is required, open area excavation will follow from the results of the initial target program. It is anticipated that around 75-100 additional squares will be excavated per salvage area. Open area excavation will follow a standard cuneiform approach and expand to encompass identified activity areas. On average it is anticipated that two open areas (c. 50m^2 – 150m^2) will be salvaged per location, although where feasible an effort will be made to connect identified activity areas into a single open area.

All of the deposit will be wet sieved on 5.0mm and 2.5mm nested sieves. All artefacts would be collected and bagged. Excavated squares will be backfilled where required (by the Proponent).

The location of each excavated square would be identified on a surveyed plan of the site. Stratigraphic sections detailing the stratigraphy and features within the excavated deposit would be drawn and all squares would be photographed. Soil and carbon samples would also be collected. The stratigraphy of all excavated areas will be fully documented and appropriate records will be archived.

Analysis

Artefacts would be analysed on a comparable level with previous analyses of excavated assemblages (KNC 2008, 2007; AMBS 2000; 2006; Jo McDonald Cultural Heritage Management 2003, 2004; Attenbrow 1981). Information derived from this analysis; in particular the identification of specific artefact types, and their distributions and associations; will be used to put together interpretations about how sites were used, where sites were located across the landscape, the age of sites, and to assess cultural heritage values. By comparing different areas it will be possible to determine whether there were differences in the kinds of activities carried out and if different activities were related to different landforms. Sufficient information will be recovered from each excavation in order to assess how people and the land work together to create a social landscape. Differences could be expected if different aspects of settlement organisation varied in relation to the landscape units as defined.

A range of stone artefacts may be present across the salvage areas and the analysis would expand accordingly to account for artefact variability. All information would be recorded in database form (MS Excel). Various types of evidence would be used to determine the kinds of activities that were carried out. A short description of the proposed analysis in outlined below.

- Field analysis would record basic data, such as material type, number, and any significant technological characteristics, such as backing or bipolar techniques; added to this would be any provenance data such as pit ID and spit number. The purpose of the field recording is twofold: 1) establish a basic recording of artefacts retrieved and 2) to allow on-going assessment of the excavation regime (e.g. whether higher stratigraphic resolution is required while digging).
- Detailed (laboratory) analysis would entail recording a larger number of characteristics for each individual artefact. These details would be recorded in matrices suitable for comparative analysis (e.g. multivariate and univariate) of the excavated assemblage on a local and regional basis.
- Lithic characteristics to be recorded cover a range of basic information but are not limited to these categories (see example below). For transparency, terms and category types would in large part be derived from Holdaway and Stern (2004).

Sample Categories		
Record Number	% Cortex	Flake Type
Pit ID	Length	Termination Type
Spit Number	Width	Core Type
Count	Thickness	Number of Scars (Core)
Raw Material	Weight	Scar Type (Core)
Colour	Modification	Shape of Flake
Quality	Reduction Type	Platform Type

- A detailed explanation and glossary would be provided with the final excavation report.
- Minimum Number of Flake (MNF) calculations formulated by Hiscock (2000, 2002) will be undertaken where applicable (although past experience indicates MNF calculations will not be required for this excavation program). The main outcomes of the analysis would be to investigate: the type of activities being carried out across the subject area; stone materials used and quantity; technology; and modification/retouch (type and quantity).

The analysis of artefacts recovered during the excavation program would be undertaken in a transparent and replicable fashion so as to permit the comparison of the entire excavated assemblage with data from other regions. This would also allow for an interpretation of the study area's archaeological significance.

Field Team

KNC directors, Dr Matthew Kelleher and Alison Nightingale, would be responsible for the salvage excavation program. Dr Matthew Kelleher would direct the excavation component of the Aboriginal archaeological assessment. Matthew has extensive experience in managing large scale archaeological excavations and research projects. Alison is the principal contact for the overall Aboriginal archaeological assessment for the Tarcutta bypass. She has over 14 years experience managing Aboriginal cultural heritage. Matthew and Alison have both been involved in the highly successful archaeological assessment for the Hume Highway Duplication Project between Mullengandra and the Sturt Highway.