



Plate 37 Location of *Upgrade 3.20*; looking 230°.

PB25

This site is on the LHS of the road on a very gently undulating ridge crest. The site is an existing area of cleared and graded gutter and batter area measuring c. 15 x 4 m; it is highly disturbed. The site would require some clearance and levelling.

Upgrade 3.21

At this site it is proposed to modify (lower) the road (Plate 38). The site is on a summit of a gently undulating crest. The whole area in which impacts would occur is highly disturbed by previous road works.



Plate 38 Location of *Upgrade 3.21*; looking east.

PB26

This site is on the LHS of the road on a very gently undulating ridge crest (Plate 39). The site is an existing area of cleared and graded gutter and property entrance measuring c. 25 x 5 m; it is highly disturbed.



Plate 39 Location of *PB26*; looking 50°.

PB27

This site is on the LHS of the road on a narrow, very gently undulating ridge crest (Plate 40). The site is an existing area of cleared and graded gutter measuring c. 20 x 6 m; it is highly disturbed. Minor clearing and levelling would be required.



Plate 40 Location of *PB27*; looking 100°.

PB28

This site is on the LHS of the road on a narrow, very gently undulating ridge crest (Plate 41). The site is an existing area of cleared and graded gutter measuring c. 20 x 8 m; it is highly disturbed. Some clearing and levelling would be required.



Plate 41 Location of *PB28*; looking 90°.

Upgrade 3.22

At this site it is proposed to level the RHS and fill to level the LHS (Plate 42). The site is on a moderately undulating crest. The area in which impacts would occur is highly disturbed by previous road works.



Plate 42 Location of *Upgrade 3.22*; looking 240°.

Upgrade 3.23

At this site it is proposed to remove the RHS and c. ten trees (Plate 43). The site is on a moderately undulating crest. The area in which impacts would occur is relatively undisturbed.



Plate 43 Location of *Upgrade 3.23*; looking 230°.

Upgrade 3.24

At this site it is proposed to remove c. fifteen trees on the RHS and level (Plate 44). The site is on a very gently undulating crest. The area in which impacts would occur is relatively undisturbed.



Plate 44 Location of *Upgrade 3.24*; looking 80°.

PB29

This site is on the RHS of the road in a very gently undulating ridge crest (Plate 45). The site is an existing area of cleared and graded area with a property entrance measuring c. 30 x 5 m; it is highly disturbed.



Plate 45 Location of *PB29*; looking 150°.

PB30

This site is on the RHS of the road on a slight summit of a very gently undulating ridge crest (Plate 46). The site is an existing area of cleared and graded area associated with a driveway measuring c. 30 x 8 m; it is highly disturbed.



Plate 46 Location of *PB30*; looking 100°.

PB31

This site is at the intersection of Aarons Pass and Perke Roads on a very gently undulating ridge crest (Plate 47). The site is an existing cleared and graded area; it is highly disturbed. Some clearance and levelling would be required.



Plate 47 Location of *PB31*; looking 70°.

PB32

This site is on the LHS of the road on a gently undulating ridge crest (Plate 48). The site is an existing cleared and graded area measuring c. 25 x 4 m; it is highly disturbed. Some levelling would be required.



Plate 48 Location of *PB32*; looking 20°.

PB33

This site is on the RHS of the road on a very gently undulating ridge crest (Plate 49). The site is an existing cleared and graded gutter area measuring c. 25 x 4 m; it is disturbed. Some clearing and levelling would be required.



Plate 49 Location of *PB33*; looking 20°.

PB34

This site is on the LHS of the road on a very gently undulating ridge crest (Plate 50). The site is an existing cleared and graded area measuring c. 30 x 4 m; it is highly disturbed. Minor clearing and levelling would be required.



Plate 50 Location of *PB34*; looking 200°.

Upgrade 3.25

At this site it is proposed to remove c. six trees and level on the LHS corner (Plate 51). The site is on a gently undulating crest. The area in which impacts would occur is disturbed.



Plate 51 Location of *Upgrade 3.25*; looking south.

Upgrade 3.26

At this site it is proposed to fill and level the LHS corner (Plate 52). The site is on the break of slope of a gently undulating crest. The area in which impacts would occur is cleared and graded; it is highly disturbed.



Plate 52 Location of *Upgrade 3.26*; looking 150°.

Upgrade 3.27

At this site it is proposed to remove c. four trees and level the LHS corner (Plate 53). The site is on a simple slope of moderate gradient. The area in which impacts would occur is relatively undisturbed.



Plate 53 Location of *Upgrade 3.27*; looking 170°.

PB35

This site is on the LHS of the road on a simple slope. The site is an existing cleared and graded area measuring, c. 20 x 4 m; it is highly disturbed. Some clearing and levelling would be required.

Upgrade 3.28

At this site it is proposed to widen the road and culvert. The site is on a simple slope. It is cut and benched (highly disturbed).

PB36

This site is on the LHS of the road on a gentle simple slope (Plate 54). The site is an existing cleared and graded area measuring c. 30 x 4 m; it is highly disturbed. Some clearing and levelling would be required.



Plate 54 Location of *PB36*; looking 220°.

PB37

This site is on the LHS of the road on a gentle simple slope (Plate 55). The site is an existing cleared and graded area (property entrance) measuring c. 15 x 4 m; it is highly disturbed.



Plate 55 Location of *PB37*; looking 100°.

PB38

This site is on the LHS of the road on a very gentle simple slope (Plate 56). The site is an existing cleared and graded area measuring c. 40 x 4 m; it is highly disturbed. Some levelling would be required.



Plate 56 Location of *PB38*; looking 100°.

PB39

This site is on either the LHS or RHS of the road on a very gentle simple slope. The site is an existing cleared and graded area used for farm access; both sides of the road are highly disturbed. Some levelling may be required.

PB40

This site is on either the LHS (Plate 57) or RHs of the road on a very gentle simple slope. The site is an existing cleared and graded area; both sides of the road are highly disturbed. Some levelling may be required.



Plate 57 Location of *PB40* (LHS); looking 190°.

Upgrade 3.29

At this site some work may be required to the culvert (Plate 58). The site is on a drainage depression.



Plate 58 Location of *Upgrade 3.29*; looking 50°.

Upgrade 3.30

At this site the causeway requires replacement (Plate 59). The site is on a drainage depression.



Plate 59 Location of *Upgrade 3.30*; looking 60°.

PB41

This site is on either the LHS or RHS of the road on a flat (Plate 60). The site is an existing cleared and graded area; both sides of the road are highly disturbed. Some levelling may be required.



Plate 60 Location of *PB41*; looking 20°.

PB42

This site is on the RHS of the road on a flat (Plate 61). The site is an existing cleared and graded area; the area is highly disturbed. Some levelling may be required.



Plate 61 Location of *PB42*; looking 70°.

Upgrade 3.30

At this site the causeway may require replacement. The site is on a drainage depression.

4. DESCRIPTION OF THE AREA

In this section of the report the subject area is defined and described further.

4.1 Location and Physical Setting

The subject area is located in the Mid-Western Regional and Bathurst Regional Shires.

The survey area, and survey locations are shown in Figure 2. The length of Aarons Pass Road in which impacts would occur measures c. 20 kilometres. The road follows an elevated ridge crest and the majority of proposed impacts would occur on crest landform elements.

The district in which the wind farm and Aarons Pass Road are located is on the eastern edge of the Lachlan Fold Belt and is underlain by sedimentary and granite rock. The majority of the road traverses conglomerate, and loose pebbles were frequently encountered.

The site is in the upper catchment of the Macquarie-Bogan River systems.

The area is in the South Western Slopes Biogeographic Region (far northern corner). The South Western Slopes botanical region is an intensively and extensively disturbed area of NSW. Given a combination of mainly flat to undulating country, fertile soils and reliable rainfall, European settlement proceeded rapidly between 1829 and 1845. This led to large scale modification of the landscape for cropping and grazing of domestic stock over the next 100 years (Burrows 1999).

The road corridor is largely cleared, although in some areas, regrowth is present.

4.2 Summary

From a perspective of Aboriginal land use, the surveyed area can be characterised as a marginal woodland resource zone. The plateau would have possessed limited biodiversity and a general lack of water. Accordingly, such country is likely to have been utilised by Aboriginal people for a limited range of activities which may have included hunting and gathering and travel through country. Such activities are likely to have resulted in very low to negligible levels of artefact discard. The nature of stone artefacts discarded can be expected to have been correspondingly limited in terms of artefact diversity and complexity.

5. ABORIGINAL HERITAGE CONTEXT

Aboriginal people have occupied Australia for at least 40,000 years and possibly as long as 60,000 years (Mulvaney and Kamminga 1999: 2). By 35,000 years before present (BP) all major environmental zones in Australia, including periglacial environments of Tasmania, were occupied (Mulvaney and Kamminga 1999: 114).

South-eastern Australia has been occupied since the late Pleistocene (Attenbrow 2004: 72; Boot 1996: 288; Lampert 1971: 9). The dated occupational sequence in the Sydney region extends back 30,000 years (JMcD CHM 2005: 3; and see Stockton and Holland 1974). Further to the south, Lampert (1971: 9) and Boot (1996: 288) have reported Pleistocene dates for occupation of the south coast and its hinterland, which extend back to ca. 20,000 years BP.

At the time of early occupation, Australia experienced moderate temperatures. However, between 25,000 and 12,000 years BP (a period called the Last Glacial Maximum), dry and either intensely hot or cold temperatures prevailed over the continent (Mulvaney and Kamminga 1999: 114). At this time, the mean monthly temperatures on land were 6 - 10°C lower; in southern Australia coldness, drought and winds acted to change the vegetation structure from forests to grass and shrublands (Mulvaney and Kamminga 1999: 115-116).

During the Last Glacial Maximum at about 24 - 22,000 years ago, sea levels fell to about 130 m below present levels and, accordingly, the continent was correspondingly larger. With the cessation of glacial conditions, temperatures rose with a concomitant rise in sea levels. By c. 6000 BP sea levels had more or less stabilised to their current position. With the changes in climate during the Holocene, Aboriginal occupants had to deal not only with reduced landmass, but changing hydrological systems and vegetation; forests again inhabited the grass and shrublands of the Late Glacial Maximum. As Mulvaney and Kamminga (1999: 120) have remarked:

When humans arrived on Sahul's shores and dispersed across the continent, they faced a continual series of environmental challenges that persisted throughout the Pleistocene. The adaptability and endurance in colonising Sahul is one of humankind's inspiring epics.

A basic chronological sequence of human occupation in south-east Australia is the Eastern Regional Sequence, proposed by McCarthy (1964), and more recently refined by Lampert (1971: 68), Stockton and Holland (1974: 53), Attenbrow (2004: 72) and McDonald (1994; 2008a). McCarthy's (1964) three-phased sequence extends from the Pleistocene through to the late Holocene, and is based on observed changes over time in stone artefact assemblages. The phases identified by McCarthy were the Capertian, the Bondaian and Eloueran (the latter being the most recent). Later researchers such as Lampert (1971: 64) at Burrill Lake, and others, have found a general agreement with McCarthy's sequence. However, the sequence has undergone revision (Lampert 1971: 68). At Upper Mangrove Creek Catchment (UMCC), Attenbrow (2004: 72) identified four cultural phases based on changes in artefact typology and raw material in the stone artefact assemblages from four radiocarbon dated sites. These changes were considered with reference to other studies conducted in the south-east in defining the phases and assigning dates to them.

Attenbrow (2004: 72-75) identified the following broad sequence of change in the Upper Mangrove Creek catchment:

- Phase 1 (Capertian): ca. 11,200 – ca. 5,000 years BP: Assemblages consist primarily of flakes, cores and flakes pieces. Implements include amorphous flakes with retouch/usewear, dentated saws and small numbers of backed artefacts. Fine grained siliceous stone and quartz dominate assemblages.

- Phase 2 (Early Bondaian): ca. 5,000 – ca. 2,800 years BP: Backed artefacts become more archaeologically visible and ground-edge implements appear at ca. 4,000 years BP. Fine grained siliceous stone and quartz dominate assemblages.
- Phase 3 (Middle Bondaian): ca. 2,800 - ca. 1,600 years BP: Backed artefacts reach a peak in abundance. During this time quartz dominates assemblages.
- Phase 4 (Late Bondaian): ca. 1,600 years BP through to just after European occupation: Backed artefacts are rare, bipolar artefacts and ground-edge implements continue to increase in abundance; quartz continues to dominate raw material categories.

Regional, and sometimes local, variations in the assemblages of each phase of the regional sequence have been identified and, furthermore, each phase has been found to begin at slightly different times in different regions (Attenbrow 2004: 219). She argues that these differences are possibly due to local environmental conditions and local responses to climatic change, as well as to regional variations in social organisation, territoriality and subsistence patterns. In consideration of the absence of detailed archaeological investigation of the study area, extrapolating the evidence from elsewhere for use in this research necessarily requires caution.

While supporting the general sequence of change, archaeological enquiry undertaken since McCarthy proposed his regional sequence now considers the behavioural and demographic implications of observed change. Much attention has also been given to explaining phenomena such as the timing of initial site occupation and other indicators, such as changes in artefact numbers in sites. A picture of apparent intensity of site occupation during the mid to late Holocene has been explained in terms of a corresponding population increase (Hughes and Lampert 1982), and this notion has gained currency in the literature (see, however, Hiscock 1981, 1986; Attenbrow 1987, 2004; Boot 1996, 2002). Attenbrow (2002: 21; 2004) has devoted considerable attention to this issue, and concludes that distinguishing between behavioural (such as changes in technology or mobility patterns), and geomorphological and demographic change to account for observed changes in the archaeological record, is not straightforward. She argues that answers to these questions are still unresolved, and that at this time it is not known how populations may have grown or changed from the time of initial occupation.

5.1 Wiradjuri Country

The study area is situated within land which today is seen as having traditionally been occupied by the Wiradjuri peoples. This attribution of group relationship was made by Tindale (1974) based on notions of affiliation due to a shared language throughout a broadly distributed Aboriginal population. The Wiradjuri inhabited a widespread area which extended from the Great Dividing Range, west to the Macquarie, Lachlan and the Murrumbidgee rivers (Coe 1989). In so doing, their country encompassed three distinct geosystems: the tablelands in the east, the central western slopes, and to the west, the south-west plains.

Aboriginal occupation in the Darling Basin, which encompasses part of the Wiradjuri territory to the west, has been dated to 40,000 years (Haglund 1985). Closer to the study area, the earliest dated occupation in the immediate region being just over 7,000 years BP at Granites 2 shelter, about 50 km north-east of Manildra (Pearson 1981). A similar date was derived from the dating of the skeletal remains of a male individual found in a cave near Cowra (Pardoe and Webb 1986).

The early explorers and settlers noted considerable variation in the numbers of Aborigines that would gather for food procurement in the area during the different months of the year (Haglund 1985). The major rivers and associated tributaries were the focus of livelihood and supplied a variety of consistent and plentiful food including fish, water fowl and shellfish. On August 22, 1817, John Oxley, the first European to travel up the Macquarie River from the Wellington Valley, observed ‘an abundance of fish and emus ... swans and ducks’ as well as very large mussels growing among the reeds in many stretches of the river (Oxley 1820).

Riverine resources were supplemented with kangaroos and emus. According to Thomas Mitchell, Surveyor-General of the Colony of NSW, possums formed a significant part of people's diet, as well as being used for making warm winter cloaks, arm bands and other items of clothing. Mitchell, who conducted several expeditions into the area in the 1830s and 1840s, wrote that possums were found in the hollow trunks of upper branches of tall trees which were climbed by cutting notches into the trunks.

Vegetable foods formed a significant part of the diet. The Wiradjuri exploited daisy yams (*Microseis scapigera*) and a range of other roots and tubers, including lily and orchid tubers and Kurrajong roots (*Brachychiton populneum*) (Gott 1983, White 1986: 57-58). Kurrajong and Acacia seeds would be ground for flour, as would certain grass seeds, such as oat grass or kangaroo grass (*Themeda australis*).

Numerous studies have been undertaken, both in an academic and consultancy context, in the broader region of the Western Slopes and adjoining plains region of NSW. Consideration of a predictive model of site type and site location within a geographical context relevant to the study area can be made through recourse to these previous studies. From this a contextual and relevant assessment of the archaeological potential of the study area can be formed.

Pearson (1981) conducted a comprehensive study of the upper Macquarie region in relation to his PhD dissertation. In addition to carrying out extensive research of historical sources and reviewing ethnographic data, Pearson (1981) excavated three rock shelters and compiled information about other known archaeological sites in his study area. He determined that the Wiradjuri functioned primarily in small groups of variable size, dependent on the season. These groups were comprised of immediate relations, the smallest being the basic family unit, but groupings could coalesce to form a collective band of between 80-150 people during feasting in times of plentiful food, or for ceremony.

Between them, in smaller groups of up to 20 people, they exploited the resources of a common territory which had a radius of up to 65 km, but which was generally centred on a particular home base location that possessed a reliable watercourse (Pearson 1981). Pearson (1981) suggests that there may have been three distinct band territories in the local region, centred on Bathurst, Wellington and Mudgee/Rylstone. From this it may be deduced that the proposal area is likely to have been one locale within the range of a single Wiradjuri band. However, given the generally ephemeral nature of the local catchments and creek lines, the locus of that bands' place of habitation would be closer to a more permanent source of water such as, for example, the Cudgegong River.

Pearson (1981) developed a pattern of Aboriginal occupation through the analysis of site location attributes in relation to just over 40 recorded open campsites within four sample areas in the region. He found that archaeological sites could be grouped into two main types, occupation sites, and non-occupation sites, the latter including scarred or carved trees, ceremonial sites, grinding grooves and burial sites. Through analysis of the location of these sites he proposed the following model for the prediction of site location (Pearson 1981):

- The distance of sites from water ranged from 10 to 500 m. However larger sites were generally located nearer to water (Pearson's average distance from water being 90 m);
- Both good soil drainage and views over watercourses were important site location factors;
- Level ground, shelter from prevailing winds, and elevation above cold air (Pearson's average elevation being 9.1 m) also influenced site location;
- The majority of sites were situated in places that would originally have been comprised of open woodlands in order to source adequate fuel;

- Burial sites and grinding grooves were located as close to habitation as possible. However, grinding grooves occur only where there is suitable outcropping sandstone, and burial sites are generally found in areas where soils are of sufficient depth and penetrability for the purposes of interment;
- Ceremonial sites such as earth rings were situated away from campsites;
- Similarly, stone arrangements were also located away from campsites, in isolated places, and were more likely to be located on small hills or knolls, although they can also occur on flat land;
- Scarred or carved trees were distributed with no obvious patterning other than their proximity to watercourses, and in areas more frequently used for camps;
- Quarry sites were located where known outcrops of serviceable stone were reasonably accessible;
- Pearson suggests that Aboriginal campsites were rarely used for longer than three nights, and that sites with evidence of extensive archaeological deposit probably represent accumulations of material over a series of short visits.

5.2 Material Evidence

A search of the NSW Office of Environment and Heritage (OEH) Aboriginal Heritage Management Information System has been conducted for this project on the 21 June 2013 (AHIMS #103981). The search area encompassed eastings 747000 – 763000, and northings 6354000 – 6363000 (GDA).

One previously recorded Aboriginal object site is listed on the AHIMS register for the site search area. This site, AHIMS Site ID 36-6-0794 (*Aarons Pass 1*) is located outside the Project area (discussed below in Section 5.3).

The AHIMS register only includes sites which have been reported to the NSW OEH. Accordingly, this search cannot be considered to be an actual or exhaustive inventory of Aboriginal sites situated within the local area. Generally, sites are only recorded during targeted surveys undertaken in either development or research contexts. It can be expected that additional sites will be present within the local area, but that to date, they have not been recorded and/or reported to NSW OEH.

The most common Aboriginal object recordings in the region are distributions of stone artefacts. Rare site types include rock shelters, scarred trees, quarry and procurement sites, burials, stone arrangements, carved trees and traditional story or other ceremonial places. The distribution of each site type is related at least in part to variance in topography and ground surface geology.

5.3 Predictive Model of Site Type and Location

There has been very little previous archaeological work conducted in the local area. The most comprehensive and recent work is that undertaken in respect of the proposed Crudine Ridge Wind Farm in 2012; this work is discussed further below (Dibden 2012).

Dominic Steele (2003) conducted a linear assessment along the Castlereagh Highway. It is noted that the landscape is not equivalent to that of the current survey area, being lower in elevation and consisting of rolling hilly country, compared to the elevated plateau of Aarons Pass Rd. No Aboriginal object sites were recorded. However, one area of potential archaeological sensitivity was identified. The area was located adjacent to Crudine Creek and assessed to possess moderate Aboriginal archaeological sensitivity. It was predicted that the locality may have been subject in the past to short-term but repeated visitation by people moving to and from more desirable camping locations and that the archaeological evidence potentially associated with this watercourse is likely to occur in the form of low-density distributions of flaked stone artefacts

related to successive short-term camping stopovers where limited foraging, site maintenance activities (such as stone knapping), and artefact discard occurred. This site has not been excavated.

OzArk EHM (2010) conducted an assessment of a section of the Castlereagh Highway realignment works near to the eastern end of Aarons Pass Road. During test excavation, AHIMS Site ID 36-6-0794 (*Aarons Pass 1*) was found to not contain either surface or subsurface artefacts. While OzArk EHM (2010: 29) recommended that this site be removed from AHIMS, this has not been done. Excavation was also recorded at *Aarons Pass 2 (AP2)*, located on the lower slopes of a ridge saddle, and near to what was considered to be a possible spring. AP2 was characterized as forming as a result of many different knapping events of a period of time. Milky quartz dominated the assessmblage. Artefact distribution across the site was found to be highly variable.

Dibden (2012) surveyed a development corridor measuring 52 kilometres long by approximately 200 metres wide (c. 1040.96 hectares), in respect of the proposed Crudine Ridge Wind Farm. At the time of the survey, ground exposure was reasonably high, particularly in the south. The geomorphological context was found to be eroded in the majority of areas (except for drainage lines which were both eroded and aggraded). Where ground surfaces were breached, exposures usually presented a relatively complete view of archaeological visibility (i.e. the potential artefact bearing context). In the majority of areas archaeological visibility was usually estimated to be c. 90 per cent. Ground exposures encountered are estimated to have measured c. 51.0369 hectares in area. Of that area, archaeological visibility is estimated to have been c. 45.5929 hectares. Effective Survey Coverage (ESC) is calculated to have been 4.4% of the surveyed area.

During the survey, 44 Aboriginal object locales with stone artefacts were recorded (Dibden 2012). All artefact locales were calculated to be very low density artefact distributions (taking into consideration ground exposure and archaeological visibility). Generally, the artefact locales were considered to be representative of the artefact distribution and density within the entire Survey Unit in which they were found. That is, they formed part of the very low density 'background scatter' which is present across the landscape. The behavioural context of their deposition (or discard) would seem to be spatially unfocused. However, some locales did seem to be more discrete and, furthermore, these were tethered to particular areas. It was found that there was some tendency for these locales to be on the eastern side of the plateau and, also, to be associated with springs.

Most artefacts were made from tuff (sometimes referred to as indurated mudstone) (Dibden 2012). Minor frequencies of other materials occurred, including quartz, quartzite, chert and silcrete. It was considered highly probably that quartz was under-represented in the recordings. In some Survey Units quartz background was high and, accordingly, detecting artefacts made from that material was difficult under survey conditions. The majority of artefacts were flakes, flake fragments and other debitage such as cores. However, numerous retouched artefacts and flakes with usewear were recorded, indicating some complexity in artefact related activities. All artefact locales were highly disturbed, primarily by erosional process likely to be initiated by agricultural activities, intensive grazing and so on. The majority were located on skeletal lithosols and they did not have the potential to contain archaeological deposit.

In summary, stone artefact scatters are the most common site type found within the region (Navin Officer Heritage Consultants 2005). Koettig (1985) found that larger and more complex sites are likely to occur in association with permanent watercourses, while sparse artefact scatters and evidence of intermittent and infrequent occupation will be located on landforms which are removed from permanent water sources, such as ridge tops or lower order ephemeral creeks. While this assertion was based on limited survey and analysis, it is possible that it is, nevertheless, generally correct.

The type of sites known to occur in the region and the potential for their presence within the survey area are listed as follows:

Stone Artefacts

Stone artefacts are found either on the ground surface and/or in subsurface contexts. Stone artefacts will be widely distributed across the landscape in a virtual continuum, with significant variations in density in relation to different environmental factors. Artefact density and site complexity is expected to be greater near reliable water and the confluence of a number of different resource zones. The detection of artefacts during a surface survey depends on whether or not the potential archaeological bearing soil profile is visible. Given the environmental context of the survey area, stone artefacts are predicted to be present in very low to negligible densities.

Grinding Grooves

Grinding grooves are found in rock surfaces and result from the manufacture and maintenance of ground edge tools. Grinding grooves are only found on sedimentary rocks such as sandstone. Given the absence of suitable rock exposures in the survey area grinding groove sites are unlikely to be present.

Burials sites

The potential for burials to be present in the survey area is considered to be low given the high levels of previous disturbance related to agriculture and road works.

Rock Shelter Sites

Rock shelters sites are unlikely to be present in the survey area given the absence of large vertical stone outcrops.

Scarred and Carved Trees

Scarred and carved trees result from either domestic or ceremonial bark removal. Carved trees associated with burial grounds and other ceremonial places have been recorded in the wider region. In an Aboriginal land use context this site type would most likely have been situated on flat or low gradient landform units in areas suitable for either habitation and/or ceremonial purposes.

Bark removal by European people through the entire historic period and by natural processes such as fire blistering and branch fall make the identification of scarring from a causal point of view very difficult. Accordingly, given the propensity for trees to bear scarring from natural causes their positive identification is impossible unless culturally specific variables such as stone hatchet cut marks or incised designs are evident and rigorous criteria in regard to tree species/age/size and its specific characteristics in regard to regrowth is adopted.

The likelihood of trees bearing cultural scarring remaining extant and in situ is low given events such as land clearance and bushfires. Generally scarred trees will only survive if they have been carefully protected (such as the trees associated with Yuranigh's grave at Molong where successive generations of European landholders have actively cared for them).

Scarred trees are a relatively uncommon site type in the region. However, there is potential for this site type to be present if trees of adequate age are present.

Stone Quarry and Procurement Sites

A lithic quarry is the location of an exploited stone source (Hiscock & Mitchell 1993:32). Sites will only be located where exposures of a stone type suitable for use in artefact manufacture occur. Quarries are rare site types in the region. Within the survey area itself the underlying geology is shale, none of which is suited to the manufacture of artefacts. However, quartz seams in the shale may well have been exploited locally.

Ceremonial Grounds

In south-eastern Australia ceremonial grounds were used in maturity rites associated with the initiation of youths. Bora grounds generally consisted of one or more circular rings defined by mounded earth, sand and/or rocks. This is a rare site type given the nature of the materials used in their construction; agricultural practices and land clearing is likely to remove surface evidence of these places. The identification of ceremonial grounds is often dependent on Aboriginal oral tradition and historical records. This site type is unlikely to be present in the survey area.

6. EUROPEAN HERITAGE CONTEXT

6.1 Alienation of Lands Within the Colony of New South Wales

When New South Wales was settled as a British Colony in 1788 all lands became the property of the Crown. A major component of the colonial process was the creation and maintenance of spatial order (Jeans 1966: 205). The alienation of land was controlled at the discretion of the colonial government, initially under direction of the Colonial Office in London. Grants, in the first instance, were offered to officers and civil servants as both reward and incentive to relocate. This was later extended after Governor Phillip was instructed to grant land for farming to discharged soldiers, free settlers and convicts who had served their term (Shaw 1970: 11).

As the population and demand for land increased, measures were adopted by both the government and settlers to enable the spread of settlement and an increase in agricultural production. With a further increase in the population of settlers and livestock numbers after 1800, the demand for land continued to grow.

In 1822, J. T. Bigge filed his Report to the Commissioner of Inquiry into the State of the Colony of New South Wales. Bigge had been dispatched to the Colony in 1819 by the British government to determine, among other things, if the Colony was achieving its aims as a penal settlement and to consider its development and commercial viability. Bigge recommended an increase in land grants, but stipulated that such grants should only be made to those who could contribute to an increase in pastoral production (Molony 1988: 45). Assigned convict labour was intended to assist with the maintenance of pastoral properties granted under such a system.

Governor Macquarie continued to grant land to cater for the needs of increasing livestock numbers. Although alienation was not permitted without survey, nevertheless, by 1821, about 340,000 acres of land grants could not be located as their issue had outpaced the ability of surveyors to accurately determine their placement (Perry 1965: 44). The three-man survey department was not able to cope with the demands made on it, and the number of uncompleted surveys of lands located beyond the immediate vicinity of Sydney began to mount. The ability to meet the demand for land became even more difficult, when in 1826, the administration of Sir Ralph Darling temporarily restricted land grants to the initial nineteen counties that had been created around Sydney. This area became known as the ‘Limits of Location’, and extended from Kempsey in the north, to Batemans Bay in the south, while its western boundary terminated at Wellington (Ellis 1997: 27, Gibbney 1989: 17-19).

In order to allow occupation of new lands, satisfy demand and maintain some control on the spread of settlement, in 1827, the government introduced ‘tickets of occupation’ to allow graziers rights over the lands they occupied (Carter 1994: 9-10). These were replaced in 1828 by grazing licenses. From that time, through a variety of means, there was a spread of both official and unofficial settlement, and Crown Lands began to be broken up into smaller portions.

Grants and sales, either directly or at auction, permitted the alienation of land. However, demand outstripped supply. ‘Squatters’ began to occupy large tracts of land outside the settled districts beyond the control of the colonial government (Cannon 1988: 9; Carter 1994: 10-12). In order to wrest back control, various regulations were introduced to allow land to be leased or licensed for a fee to depasture stock. Sales as a result of improvements to land occurred later, along with sales at auction for a set minimum price per acre. However, for many prospective landowners insufficient capital restricted their access to available lands, so that the majority of fertile lands remained in the hands of a wealthy few.

By 1850, settlement had spread throughout New South Wales and Victoria (Shaw 1970: 45), and at that time, 3,000 squatters had the use of over 70 million acres of Crown Land (Jeans 1966:

212). It was during this period that political support increased for small rural landholders. Support came from a number of groups, including:

- land owners seeking to restrict the squatters and capitalise on their own investments;
- tenant farmers seeking access to rural land;
- successful gold-miners with capital to invest in land;
- independent shopkeepers who resented the squatters use of Sydney wholesalers; and
- agitated politicians fearful of the growing power of the ‘squattocracy’.

In 1861, Sir John Robertson, the Minister of Lands, introduced legislation (Crown Lands Occupation Act 1861 and Crown Lands Alienation Act 1861) to allow selection of land by any person under certain conditions, at a set price of one pound per acre. One quarter of the purchase price was required with the balance deferred as long as certain conditions were met. This legislation set minimum and maximum sizes for portions as well as orientation and boundary proportions. Selection could also take place prior to survey. The intention of this legislation was to allow access to land on fair and easy terms and promote closer settlement throughout the colony. Despite these intentions, the legislation failed in that loopholes and indiscriminate practices allowed the original landholders to maintain control of much of their original ‘runs’ (Carter 1994: 21). By 1874 ‘... deserted farms are everywhere visible to the traveller ...’ (Jeans 1972: 213). Nevertheless, the policy of closer settlement continued and by the 1890s large land holdings had gradually given way to a myriad of smaller farms. As a result of World War I, the first half of the twentieth century saw Soldier Settlement land programs in place throughout Australia.

The modern landscape not only reflects a sequence of occupation and activity through a number of phases of ownership, improved technology and changing farm management practices, but evidence of the legislative and administrative controls governing alienation and land use.

6.2 Local History

By 1813 the colony’s livestock herd, pastured on overstocked plains surrounding Sydney, had increased to some 26,000 head of cattle and 74,000 sheep. With drought and plagues of caterpillars further reducing feed, stock owners grew anxious to secure more grazing land and attention was drawn to what may lie inland of the Great Dividing Range. Following an expedition in 1813 by Lawson, Wentworth and Blaxland, who sighted good grazing grounds west of the range, Governor Macquarie instructed surveyor Evans to follow Lawson's marked route and explore further inland. In so doing, Evans became the first European to reach the western side of the Great Dividing Range, surveying to the Macquarie River and beyond the area of present-day Bathurst (McDonald 1968: 1-3).

Further encouraged by Evan’s report of excellent grazing land to the west, Macquarie commissioned William Cox and a team of convicts to construct a road across the range. Remarkably, despite numerous areas of precipitous terrain, this task was achieved in less than six months. Thereafter, settlers began populating the area, bringing their livestock to graze on the open western plains. In 1816 Macquarie visited the newly opened district, at which time he selected the site for the township that became known as Bathurst (McDonald 1968: 3).

The following year Macquarie instructed Lieutenant John Oxley R.N, the Surveyor-General of New South Wales, to explore further to the west beyond Bathurst, in order to ascertain the course and nature of the river system which Evans had described (McDonald 1968: 3). Oxley was joined on this expedition by Surveyor Evans, as well as Botanist, Allan Cunningham and Mineralogist, William Parr. Although the party had intended to chart the course of the Lachlan River, difficult swampy conditions were encountered, so that eventually Oxley decided the party should return to Bathurst, but along the Macquarie River (Althofer 1985: 9).

Settlers and flocks of sheep immediately began to occupy the land west of the Diving Range and by 1819, the number of sheep beyond the range totaled 11,000 (Cox n.d.). It is sheep grazing which is still the dominant land use in the Pyramul and Crudine area.

Initially, it was the land around Bathurst which was occupied by the early settlers. By 1920, and with the onset of dry conditions and failing pasture, they began to look further afield for new land (Cox n.d.). Lieutenant Lawson, and others, including Aaron (of whom Aarons Pass is named), a 'native' guide, made their way north, via Sofala, then Tabrabucca Swamp and Aarons Pass, finally dropping down into the Cudgegong valley and the area now occupied by the township of Mudgee (Cox n.d.). The area (Mudgee) was considered good land and suitable for a settlement. It was George and Henry Cox and William Lawson, who brought cattle and settled. Being adjacent to the permanent waters of the Cudgegong and associated swamps, the land was likely to have been favoured country of the Aboriginal owners, and during the period of initial occupation and building, conflict with the settlers ensued (Cox n.d.).

Lawson's and Cox's properties were in effect self contained villages, and remained the only dwellings in the Mudgee area until 1833, when Mudgee as township began to develop. The site was surveyed for a village in 1836 (Pyramul Public School Centenary 1869 – 1969 n.d. [PPSC]).

The early settlement of Pyramul began with the first Crown land grant of 640 acres made in 1840 to Bathurst squatter George Suttor (PPSC), although existing paddocks and structures are shown on the purchase plan, indicating that the area had been already occupied.

The significant discovery of gold west of the Blue Mountains in 1851 occurred near to the proposal area at Hargreaves and with the opening up of the gold fields at Sofala and Hill End, large numbers of people came to the area during the 1850s (PPSC). When the alluvial gold was finished some turned to farming. According to the Pyramul Public School Centenary 1869 – 1969 (n. d.), Suttor's grant in 1840 was not the typical manner in which the land locally was developed. More typically, small parcels of land were sold at the site of Pyramul during the 1850s. In 1878 a reserve was set aside for a village at Pyramul, and given that a township did not grow, this was revoked in 1930. Nevertheless, Pyramul was once a larger village than it is currently. A review of Pyramul Public School Centenary 1869 – 1969 indicates that many of the families who currently own land in the region, have been in the area since the 1800s.

Pyramul has played a significant role in the Australian sheep industry. The sheep grown originally in Mudgee by the early settlers, were the origin of what has become known as the *Mudgee type* Merino (Swords & Bassingthwaite 1998). The plateau at Pyramul is one of a few locales in which local specialty wools have been produced. Cold high country produces finer wool and local families have been instrumental in creating a tradition of quality fine micron wool (Swords & Bassingthwaite 1998). Pyramul wool continually (and has done for a long period of time) wins the international award for the finest and best quality superfine wool.

6.3 Previously Recorded Heritage Items

Searches have been conducted for previous heritage listings in and around the survey area; these searches have included all of the relevant heritage registers for items of local through to world significance. Details of these searches are provided below.

Australian Heritage Database

This database contains information about more than 20,000 natural, historic and Indigenous places. The database includes places in:

- the World Heritage List
- the National Heritage List
- the Commonwealth Heritage list

- the Register of the National Estate and places under consideration for any one of these lists. A search of this database (13 January 2012) revealed that there are no historic items present in the survey area.

The Crudine General Cemetery is listed as an Indicative Place.

State Heritage Inventory

The *NSW heritage databases* contain over 20,000 statutorily-listed heritage items in New South Wales. This includes items protected by heritage schedules to local environmental plans (LEPs), regional environmental plans (REPs) or by the State Heritage Register.

The information is supplied by local councils and State agencies and includes basic identification details and listing information. Consequently listings should be confirmed with the responsible agency.

A search of this database was conducted on the 13th January 2012. Two items listed on the Mid-Western Regional LEP are located within the Pyramul and Crudine localities: The Catholic Cemetery at Pyramul and the Crudine school. Both items are located outside areas in which impacts are proposed.

6.4 Historical Themes

A historical theme is a way of describing a major historical event or process that has contributed to the history of NSW. Historical themes provide the background context within which the heritage significance of an item can be understood. Themes have been developed at National and State levels, but corresponding regional and local themes can also be developed to reflect a more relevant historical context for particular areas or items. A summary of themes that are applicable to the survey area are listed in the table below (Table 1).

Table 1 National, state and local historical themes applicable to the study area and surrounds.

Australian Theme	NSW Theme	Local Theme
Peopling Australia	Aboriginal cultures and interactions with other cultures	Day-to-day life
		Mythological and ceremonial
		Natural resources
		Contact period
Developing local, regional and national economies	Agriculture	Fencing
		Sheds
		Pasture
		Water provision
		Farmsteads
		Shearing
		Machinery
	Commerce	Banking
		Trade routes
		Shops
		Inns
	Communication	Postal services
		Telephone and telegraph services
		Newspapers
		Transport networks
	Environment – cultural	Tree plantings

Australian Theme	NSW Theme	Local Theme
	landscape	Picnic areas
		Fishing spots
	Events	Floods
	Exploration	Camp sites
		Exploration routes
		Water sources
	Industry	Mills
		Shearing sheds
		Workshops
		Transport networks
		Mines
		Quarries
		Lime kilns
		Miners' camps
		Processing plants
	Pastoralism	Pastoral homesteads
		Sheds and yards
		Travelling stock reserves
		Fencing and boundaries
		Pastoral workers' camps
	Water sources	
	Technology	Communication networks
	Transport	Railways
Early roads		
Private tracks		
Coaches and teamsters		
Bridges		
Building settlements, towns and cities	Towns, suburbs and villages	Town plan
		Neighbourhoods
	Land tenure	Fencing and other boundary markers
	Utilities	Water distribution
		Garbage disposal
		Sewage/septic systems
		Provision of electricity
		Bridges
	Culverts	
	Accommodation	Inns and hostels
		Domestic residences
		Temporary encampments
		Homesteads
Humpies		
Developing Australia's cultural life	Domestic life	Domestic artefact scatters
		Residences
		Food preparation
		Gardens
		Domesticated animals
	Leisure	Show grounds
		Picnic/camping areas
		Racecourse
		Scenic lookouts
		Town halls

Australian Theme	NSW Theme	Local Theme
		Tourism
	Religion	Churches
	Social institutions	Public hall
		Social groups/associations
	Sport	Sports grounds
		Sports teams
Marking the phases of life	Birth and death	Graves
	Persons	Individual monuments
		Significant individuals/families
		Place names

6.5 Predictive Statement

The historical theme of direct relevance to this project is Agriculture and Pastoralism (see Table 1). The land in and around the survey area has been used by Europeans for agricultural purposes for over 180 years. Sheep grazing has been the primary industry during that period, however, cattle grazing and the growing of crops have also been undertaken. However, given that the survey area is a road corridor, the potential for items associated with the theme of Agriculture and Pastoralism to be present is low.

Summary

There is some limited possibility that potential heritage items might be present within the survey area. The themes that such items are most likely to be associated are transport and agriculture/pastoralism. The location of such items is difficult to predict. It should be noted that while there is some potential for such items to occur, this does not necessarily indicate that any items which may be present will be of sufficient significance to warrant heritage listing.

7. FIELD SURVEY RESULTS

In accordance with the OEI *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*, the purpose of a field survey is to record the material traces and evidence of Aboriginal land use that are:

- Visible at or on the ground surface, or
 - Exposed in section or visible as features (e.g. rock shelters with rock-art),
- and to identify those areas where it can be inferred that, although not visible, material traces have a high likelihood of being present under the ground surface (DECCW 2010a: 12).

The field survey strategy, and results, are set out in this section of the report.

7.1 Sampling Strategy and Methods

The archaeological survey entailed a pedestrian traverse survey which was undertaken by two people on 1 July 2013.

The field survey was aimed at locating Aboriginal objects, areas and places, and European heritage items within the survey area located along Aarons Pass Rd. An assessment was also made of prior land disturbance, survey coverage variables (ground exposure and archaeological visibility) and the potential archaeological sensitivity of the land. The entire area of each individual proposed impact area was inspected. All trees were inspected for evidence of Aboriginal scarring. The field survey was reasonably comprehensive.

7.2 Survey Results, Analysis and Discussion

At the time of the field survey ground exposure was reasonably high. The geomorphological context was found to be eroded in the majority of areas. Where ground surfaces were breached, exposures usually presented a relatively complete view of archaeological visibility (i.e. the potential artefact bearing context). In the majority of areas archaeological visibility was usually estimated to be high.

No Aboriginal heritage items were recorded. Furthermore, all impact areas are assessed to be of very low archaeological potential.

7.3 Impact Assessment

The absence of recorded artefact locales in the proposed activity area is believed to be a reasonably accurate result. The proposed impact areas are located in landforms and terrain which is highly amorphous and generally undifferentiated in character. During the field survey, no landforms (or areas within landforms), were identified that are likely to have been significant environmental focal points that Aboriginal people would have habitually occupied and, hence, which would result in high density concentrations of artefacts. In addition, biodiversity is assessed to be relatively low, and water sources are generally ephemeral. Accordingly, Aboriginal use of this landscape is predicted to have been sparse, of low intensity, and restricted to a limited range of activities; - movement through country, hunting and gathering forays and so on. These types of activities would have resulted in artefact discard which is patchy and very low density in distribution.

The survey results confirm the predictions of very low density artefact distribution. Accordingly, it is concluded that the proposed impacts to the archaeological resource can be considered to be of correspondingly very low significance.

7.4 Survey Results – European

No European heritage items are present in the proposed impact areas. This result is not considered to be unusual, given that the survey area is a road corridor.

8. RECOMMENDATIONS

The following recommendations are made on the basis of:

- A consideration of the Part 3A amendment to the Environmental Planning and Assessment Act.
 - The results of the investigation as documented in this report.
 - Consideration of the impact assessment conducted in this survey.
 - Consideration of the type of development proposed and the nature of proposed impacts.
1. No areas have been identified to warrant further archaeological investigation such as subsurface test excavation. Based on a consideration of the predictive model applicable to the environmental context in which impacts are proposed, sub-surface Aboriginal objects with potential conservation values (the trigger for conducting subsurface testing) are not predicted to have a high probability of being present (*cf.* NSW DECCW 2010: 24). The environmental contexts in which the impacts are proposed contain eroded and disturbed soils as a result of high levels of previous disturbance.
 2. It is recommended that there are no heritage constraints in regard to the survey area along Aarons Pass Rd.

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