14

Aboriginal Heritage

This chapter outlines the Aboriginal heritage significance of the Tillegra Dam project area. An assessment of the impacts of the Project on Aboriginal heritage is provided. Discussion is largely based on the specialist Aboriginal heritage investigation undertaken for the Project which is documented in Working Paper M Aboriginal Heritage.

14.1 Introduction

As with the contemporary heritage investigations, the Aboriginal heritage investigations also proceeded in two stages.

14.2 Historical context

It is generally accepted that the earliest Aboriginal habitation of Australia dates back at least 60,000 years. Dates for the earliest habitation of specific regions are generally less precise but in general terms Aboriginal people have occupied the entire continent for many thousands of years.

Early relations between the local Aboriginal people and the incoming European settlers in the early 19th century were relatively peaceful. Some of the settlers employed Aboriginal people to help clear properties. Captain Thomas Cook who was the commandant for the area north of Newcastle was, on many occasions, an advocate for the Aboriginal people of the area and doubtless contributed to ongoing good relations.

In the early 1830s, Dr E McKellar McKinlay, a resident of Dungog, undertook a census of Aboriginal people living in the Williams valley and recorded approximately 230 individuals.

Aboriginal groups were distributed through the district in local groups known as 'Nurra'. Specific groups were recorded in places such as Burnt Gully Creek, Dungog and at Tillegra. Brock (cited in Koettig 1986) notes that Aboriginal campsites were known (near the Dungog showgrounds and rifle range) and that plenty of kangaroos, wallabies, possums and other game were hunted in the area by Aboriginal groups using tools crafted from locally sourced stone material. Shelters or 'mia mias' were constructed using bark sheets against a log or by placing bushes along a large tree.

As long as the old ways of life largely persisted the Aboriginal people seem to have been well off and healthy. Their diet consisted largely of possums, wallabies, birds and fish. It was said that hunting was a big part in the life of the men of the group. The spread of white settlement had a great impact on the ability of the local people to gain access to previously abundant resources and Aboriginal population numbers began to dwindle from the 1840s.

The Aboriginal people with modern day association with the Project area are the Gingai clan of the Wonnarua people. Discussions with local residents who have collected stories also suggest Gingai (or Gringhi) people were the group living in the area in the early 19th century.

There was considerable interest amongst the new settlers in the continuing ceremonial life of the local inhabitants. McKinlay and others recorded details of ceremonies such as a 'bumbat' or initiation ceremony although, as Bennett (no date) notes, it is unlikely that they would have been allowed to witness all of the ceremony or its most important elements. People were called to the ceremony from surrounding groups by a messenger. The safe passage of such individuals between tribal lands was always assured and they were generally well known. It is recorded that in this region messengers did not carry message sticks but instead wore a red-coloured net around the forehead when summoning groups for particularly important occasions such as a bumbat.

McKinlay records around 200 individuals gathering for a bumbat, painted in red, white and yellow ochre and fully armed. He also notes that a large tree was deeply carved to mark the location of the place so that future generations would know that a bumbat had occurred. The ceremonial area itself was

> a circle of eighty to ninety feet in diameter … dug or scratched, on a level piece of ground, leaving space of four or five feet undisturbed to enter the circle by. In the centre of this circle there was a fire of moderate dimensions and attended by one of the men.

There are local stories of such 'bora grounds' in the hills above the Project area and at Burnt Gully behind the Dungog hospital. No known sites exist within the Project area.

The burial practices of the Gringai seem to have focused on group burial grounds or cemeteries. People were carried, sometimes for miles, to be buried in these special places. Important men of the tribe were given more elaborate burials than lesser individuals, women and children. McKinlay (in Bennett no date:9) records the following description of an important man's burial in the Dungog area:

> The body was doubled up, heels to hips and face to knees, and the arms folded. It was then wrapped in sheets of ti-tee secured by cords of string-bark fibre. A hole was dug in easy soil in a well shaded locality, about two feet deep and circular. The body was dropped in sideways and after a stone hatchet and a club were placed beside it the grave was filled in and the ceremonies ended.

He also described 'violent' grief associated with such ceremonies.

The evidence of local oral history and early European historic records helps to build a picture of the complex and well-organised lifestyle of the Gringai people.

14.3 Previous archaeological evidence

Limited archaeological investigation had been undertaken in the broader Project area prior to this environmental assessment. An overview of the sub-region undertaken as part of a broad scale study of the Hunter Valley (Koettig 1984) provides a contextual overview.

The study adopted the strategy of driving the area, focusing on areas next to creeks and rivers in order to identify potential survey areas. The strategy aimed to include a sample of differing landforms including larger and smaller valleys as wells as hillslopes and ridges. Nine sample survey areas were

inspected on foot. The assessment of a greater portion of the landscape was impeded by the overall poor ground visibility within the region. A total of 42 artefact scatter sites, 42 isolated artefacts and two scarred trees were recorded. The materials used for artefacts varied at most sites with indurated mudstone and silcrete common. Most artefacts were smaller than five centimetres and around 40 per cent of sites included artefacts with some evidence of use, wear or retouch (Koettig 1984:24-25).

Koettig noted that findings were consistent with previous studies that had shown that the sparsity of sites recorded in the region does not tally with the evidence that relatively large numbers of Aboriginal people are likely to have inhabited the area (Koettig 1984:26). She suggests that a major factor in explaining this is the lack of areas with suitable ground surface exposure where artefacts would be expected to occur.

Another study in the vicinity of the Project area provides further information about the difficulties of locating sites. One kilometre west of the Williams River, Kuskie (2002) undertook a study of a proposed sewerage scheme within Dungog Shire. The study included a survey area of approximately 37.8 hectares in total. Within this area, 19 'environmentally discrete survey areas' were inspected but visibility was impeded by vegetation.

A re-examination of earlier predictive modelling suggested that the poor visibility could not entirely account for not locating any evidence within creek landform areas. Kuskie (2002) therefore concluded that there was low potential rather than a moderate potential for medium to high density sites in close proximity to higher order watercourses (in this case Stony and Wallaroo Creeks). He noted that there was still potential for low density artefact occurrences throughout these landforms. He also suggested that greater densities of occupation evidence might be expected in association with the Williams River Valley approximately one kilometre to the east.

A desktop assessment of Aboriginal sites within the whole Dungog Shire noted that although a total of only 10 sites were recorded at that time, they were present across various landform areas and represented a wide variety of site types including burials, stone arrangements, scarred and carved trees as well as artefact scatters and grinding grooves (Koettig 1986). The location of ceremonial as well as habitation sites is further testimony to the fact that Aboriginal occupation of the area must have been relatively intense and was certainly not limited to transient use. As a consequence of the low numbers of sites and their distribution across a wide area, it was not possible to provide any firm predictions about site type location.

14.4 AHIMS search results and Stage 1 assessment

Aboriginal Heritage Information Management System

The Aboriginal Heritage Information Management System (AHIMS) is a database of recorded Aboriginal sites within NSW. A search of the DECC AHIMS sites database for sites within the Dungog LGA provided a list of 33 site features.

The features are listed as one art site, 13 artefact sites, three burials, one ceremonial site, two shell deposit features (associated with middens), two 'earth mounds' (sometimes recorded at midden sites or other areas of deposit), three grinding groove sites, seven scarred trees and one area of potential archaeological deposit (PAD).

None of the site features or Aboriginal objects on AHIMS are recorded within the Project area.

Stage 1 Aboriginal heritage assessment

A Stage 1 heritage assessment was undertaken as part of the Preliminary Environmental Assessment (PEA). A total of nine survey units were inspected on foot totalling approximately 175 hectares. In general, the visibility across the Project area was extremely poor. In most areas heavy grass cover reduced effective survey coverage to less than five per cent.

No Aboriginal archaeological sites were recorded during this survey. One small piece (<20 millimetres) of silcrete was found eroding out of the banks of a tributary of Native Dog Creek west of Tillegra Reserve. It is likely this is a by-product of artefact flaking. In any case the silcrete piece provides evidence of human activity as it is not stone that is naturally occurring in this location.

In view of the poor ground surface visibility and no sites being recorded, the survey itself did not assist in refining a predictive model for the Project area. A different strategy for better assessing the extent, nature and significance of any archaeological resource was required. It was recommended that a more in-depth geomorphological assessment, focusing on the archaeological potential of the area, should be undertaken and reviewed in conjunction with previous archaeological assessments, local history and survey results to direct a targeted sub-surface testing program.

14.5 Stage 2 assessment

14.5.1 Assessment approach

The Stage 1 Aboriginal heritage assessment (Cultural Heritage Connections 2007) identified ground surface visibility as a severe limitation on locating archaeological evidence in the Project area. It was therefore recommended that subsurface testing be undertaken in the area as part of a strategy to identify the Aboriginal archaeological potential of the Project area and the potential impacts of the Project on the cultural heritage resource. As a result, the scope of works for the detailed environmental assessment was designed to provide information about the extent and nature of archaeological sites and areas of archaeological potential that included:

- analysis of geomorphology and post-depositional processes
- additional consultation with the Aboriginal community
- archaeological testing
- further analysis of potential impacts.

Testing for the Stage 2 Aboriginal heritage assessment was designed to provide information that would not have been available by further detailed survey of the area due to the extensive ground coverage and likelihood of buried areas of archaeological potential. This testing was not intended to provide a complete coverage or comprehensive salvage of objects potentially subject to impact by the Project. Rather, the testing was intended to provide information to the archaeologists to allow primary impacts to be identified and enable formulation of a set of recommendations for the ongoing management of the archaeological and heritage resources in the Project area in the context of the Project.

14.5.2 Methodology

Selection of testing locations

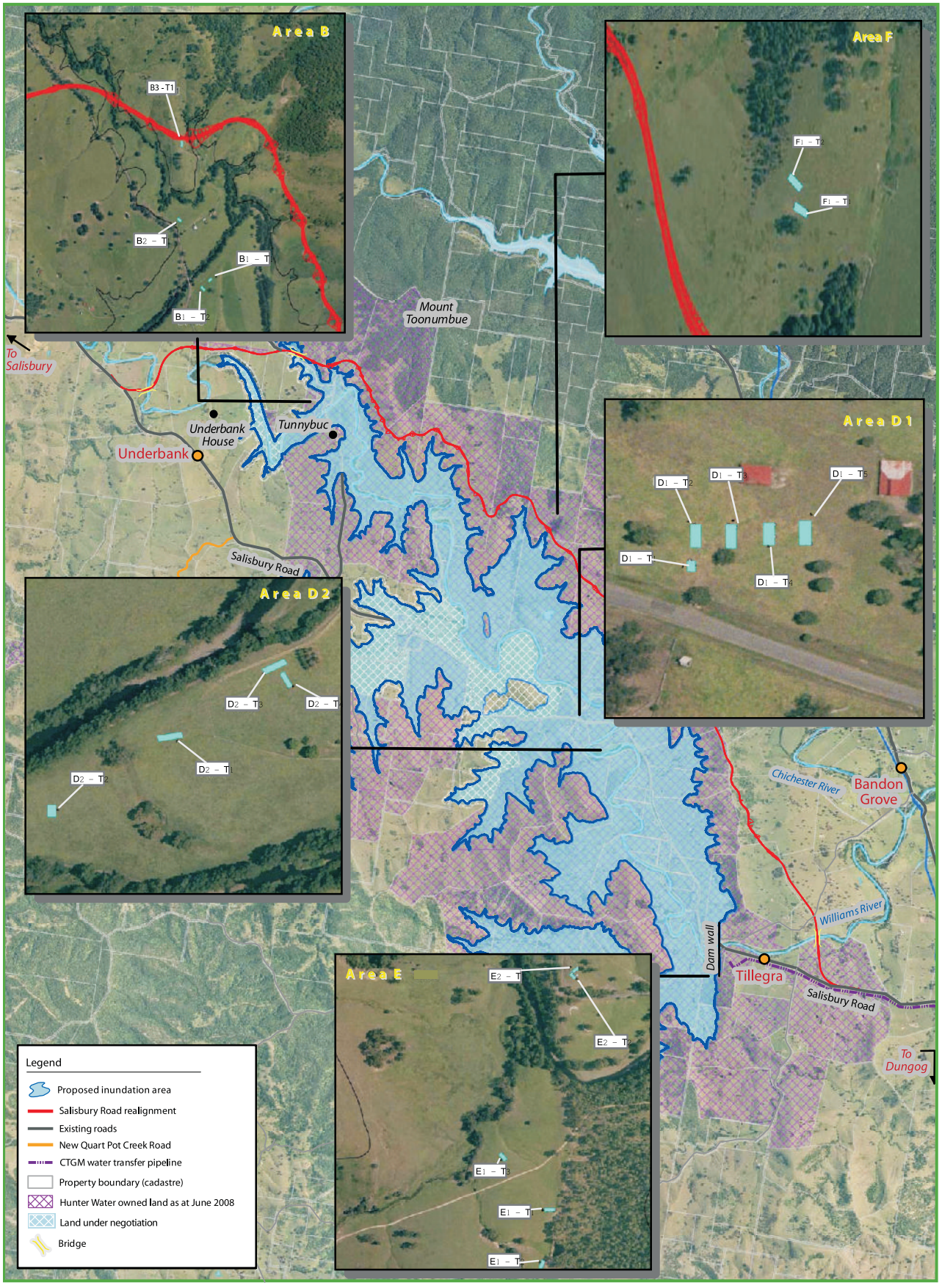
A geomorphological assessment was undertaken in order to identify areas with potential for retaining archaeological material. Five discrete areas were identified by Mitchell (2008) as being archaeologically sensitive on the basis of the following criteria:

- having lower angle slopes
- being in close proximity to water
- being above the average flood levels.

The following descriptions of each area are taken from Mitchell (2008).

Area A	The left bank slip-off slope of the meander appears to have a lower slope angle than usual and may have provided reasonable ground for a campsite and/or have been used as a short-cut across the river bend.
Area B	The junction of Tillegra Creek and the Williams River is likely to have been the site of a large waterhole during Aboriginal times and may have low gradient benches suitable for camp sites. Subsurface testing on any higher benches on the right bank of both the river and Tillegra Creek was suggested.
Area C	The junction of Quart Pot Creek and the Williams River is likely to have originally had a large waterhole and to retain higher benches on the floodplain.
Area D	Three low benches occur on the floodplain north of Salisbury Road. These features do not appear to be true terraces and it is possible that each of them have been disturbed by 20th century floods. However surface testing and excavation of a deep backhoe pit was recommended to check the stratigraphy of the alluvial sequence. South of Salisbury Road the river meander defines a long ridge (spur) with a gentle gradient. It was recommended that testing should be conducted along the length of this ridge and should include observations on any low saddle that exists on the ridge where Aboriginal people may have taken a 'short-cut' across the meander.
Area E	Three targets were suggested within this area: • the dam site itself would require closer examination as it would be totally modified by construction work. Although the steep slopes and rock outcrops in this area are not likely to contain any Aboriginal sites • two low benches that occur on the floodplain of the un-named right bank tributary just upstream of the dam site should be tested as for Area D • the saddle across the meander loop north of the tributary junction should be tested for the same reasons as the saddle in Area D.

The general locations of these areas are shown in Figure 14.1.



14.1 ABORIGINAL ARCHAEOLOGICAL ASSESSMENT TESTING AREAS

A flexible approach was taken during fieldwork to target as many of the suggested areas as possible while also covering areas identified as high potential impact. Suggestions for locations for test trenches were also offered by the Aboriginal representatives in the field and these were included in the testing where possible.

Areas A and C were not tested as part of the assessment. Area A was of a similar landform to other areas tested (Areas B and D). As a major aim was to provide information about a variety of landform areas it was decided to focus testing efforts elsewhere. Area C was inspected during the testing program, but much of the area has been disturbed by a farmhouse, dairy sheds and related activity at the site. While it is still considered likely that archaeological deposit may remain in this area, the disturbance and proximity to a currently operating dairy reduced the area's suitability for testing as part of the Stage 2 assessment.

Excavation methods and artefact recording

The majority of the testing was undertaken using a backhoe with a mud (flat-blade) bucket. A claw bucket was used on the first day of testing. Turf was removed by machine to form a trench. The exposed area was then examined for evidence of artefacts or other archaeological features. The following methods were employed:

- where the depth of deposit and terrain allowed, trenches were excavated in 10 centimetre spits
- the scraped area and associated spoil areas were examined after each pass for evidence of artefacts or other archaeological features
- deposits were sample sieved (6.5 millimetre sieves) to allow for further retrieval of any material present
- testing of areas was concluded when sterile soils layers were reached or it was otherwise concluded there was no potential for archaeological material to be preserved below the level reached
- all trench locations were recorded using a hand-held GPS
- all trenches were photographed and final depths recorded
- archaeological material recovered was retained in plastic clip-lock bags and labelled with the provenance details including date, excavation trench and spit
- a standard site recording form was used for each excavated spit; details recorded included site name, date, site recorder, spit number and depth, test trench number, description of finds, description of soil and depth of excavation
- at the conclusion of testing each trench was backfilled with the remaining spoil and where present turf was relaid.

The methodology included provision for hand excavation and 100 per cent sieving of any potential archaeological features such as hearths or knapping floors uncovered during mechanical testing. Where deemed necessary by the excavation director, testing also included smaller deep trenches to examine the soil profile.

All artefacts retrieved during fieldwork were cleaned, individually analysed and relevant attribute information was entered into a database for analysis.

14.6 Stakeholder consultation

14.6.1 Consultation prior to the environmental assessment

Prior to the Stage 1 Aboriginal heritage assessment, HWC wrote to several local Aboriginal land councils in the surrounding area advising each of the project and then commenced more detailed consultation with the Karuah LALC. The decision was taken to commence Aboriginal consultation with the Karuah LALC for the preliminary stage of the assessment while central issues were being identified and undertake broader consultation in accordance with the DECC consultation procedure during the full environmental assessment.

As part of the Stage 1 Aboriginal heritage assessment, members of the community were invited to contribute knowledge of any specific heritage items or special places in and around the Project area. Additional consultation about Aboriginal sites was undertaken with the TDCRG cemetery subcommittee and the DHS as part of the broader consultation process.

Representatives of the Karuah LALC were involved in the field assessment and a draft report provided for their comment. The LALC was contacted in December 2007 and invited to provide written comments on the draft Stage 1 report. A representative of the LALC advised that they were satisfied with findings and recommendations of the report and did not wish to supply written comments. A copy of the final version of the report was sent to the LALC for their records.

14.6.2 Stage 2 Aboriginal archaeological assessment

The Stage 2 Aboriginal archaeological assessment was undertaken in partnership with relevant local Aboriginal community representative organisations as identified through consultation undertaken in accordance with the requirements of the DECC *Interim Community Consultation Requirements for Applicants* (2005). Notification of the Project seeking Expressions of Interest from relevant Aboriginal parties was placed in various print media including the Dungog Chronicle, the Newcastle Herald and HWC's *The News About Tillegra Dam* newsletter.

The aim of the notification was to provide the opportunity for individuals and organisations to contribute cultural knowledge comment on the assessment methodology and be involved in the Project's general cultural heritage assessment. The advised closing date for registrations was 21 December 2007.

Written notification (by way of a letter) was also provided to the following organisations in December 2007:

- Department of Environment and Climate Change
- NSW Department of Aboriginal Affairs
- NSW Aboriginal Land Council
- NSW Native Title Services
- Karuah LALC
- Dungog Shire Council.

The following organisations registered as interested parties as a result of the notifications:

- Upper Hunter Wonnarua Council Inc
- Lower Hunter Wonnarua Council
- Karuah LALC.

Two community members also registered as interested parties

Research methodology

The proposed methodology for undertaking the subsurface testing was provided to all registered parties and the DECC on 31 January 2008. A copy of the Stage 1 Aboriginal heritage assessment was also provided. Comments on the methodology were requested by 18 February 2008. A written response was received from the DECC which endorsed the methodology as an adequate initial subsurface investigation. No other written responses were received.

Open Day

A 'Heritage Open Day' was held at Munni House on 5 March 2008. This incorporated both contemporary and Aboriginal heritage. Representatives from HWC, the DHS and heritage consultants CHC and ERM facilitated the open day.

Around 15 people attended the open day providing the heritage consultants with the opportunity to hear first hand a range of stories about people and places in the area. A number of local community members provided access to historic photographs, plans, maps and associated records for inclusion in the historical analysis of the Project.

Consultation about Aboriginal sites was undertaken with members of the DHS. A representative of the Wonnarua people attended the open day to discuss the Project with the archaeologist and representatives of HWC. The representative was provided with information about the Project and asked if they could give some thought to recommending individuals who may have information about the area and would be willing to participate in the oral history project.

Field assessment

As part of the Stage 2 Aboriginal heritage assessment, HWC also offered two paid positions to interested Aboriginal representatives to assist the heritage consultants with their field investigations. Two applications were received, one from a Wonn 1 site officer and the other from the Lower Hunter Wonnarua Council.

In addition to the above, HWC invited interested parties who were not offered a funded position as a field assistant the opportunity to continue to participate in the fieldwork through the provision of escorted tours of the work sites. No responses to this offer were received.

During the course of the field investigations, numerous fruitful discussions were had relating to the broad Project area and the likely presence of evidence of past Aboriginal occupation. The participating individuals contributed to decision-making relating to the nature and location of testing trenches and the archaeologists accommodated requests for testing of particular areas.

It was also agreed by all parties that in some matters archaeological importance and cultural importance may differ. The archaeologists encouraged the Aboriginal participants to think about contributing as broadly as possible to the Project by providing information relating to the cultural significance of the area, either through comments to the archaeologist or more generally as part of HWC's community consultation process.

Reporting and assessment

All registered interested parties were provided with a copy of the draft Aboriginal heritage assessment report on 4 June 2008. Interested parties were also contacted by telephone in the proceeding week to follow up on comments. An initial period of two weeks was given for comment on the draft report and no requests for an extension of time were received. One written response and one verbal response were received by 23 June 2008.

Consultation outcomes

The written response from the Wonn 1 site officer considered that more time could have been allowed for consultation with the Aboriginal community and indicated that further consultation should be undertaken. The officer was in general agreement with the findings of the report.

14.7 Results of assessment

14.7.1 Subsurface investigations

Subsurface investigations were undertaken between 31 March and 4 April 2008 to provide further information on the likely presence of surface or sub-surface archaeological material in areas that would be subject to impact by the Project across a variety of landforms. A total of 34 artefacts were retrieved from eight separate sites. The locations of these sites are shown in Figure 14.2. Site records of the excavated trenches are provided in Working Paper M.

Area B

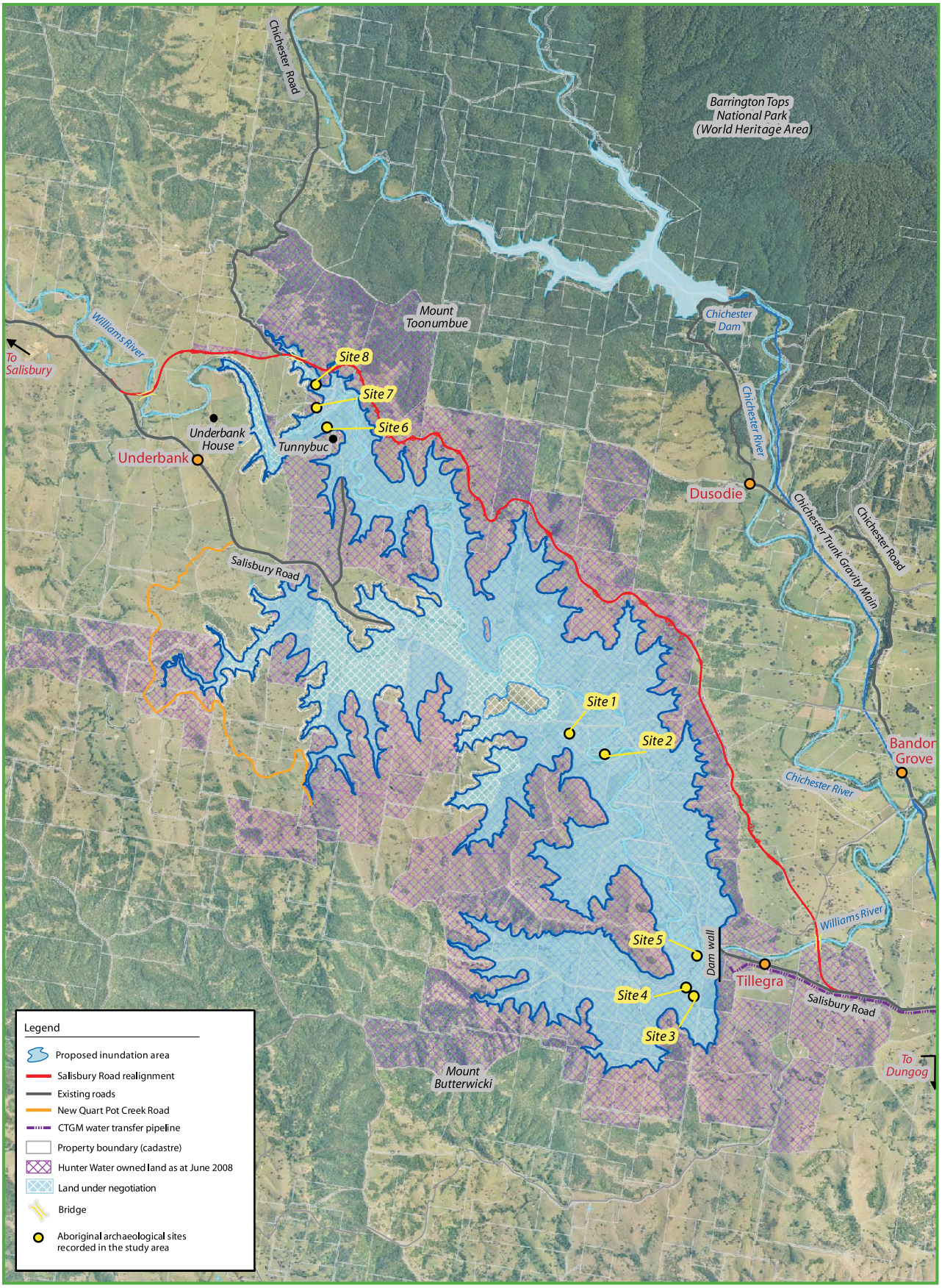
Testing was undertaken in Area B in the vicinity of the junction of Tillegra Creek and the Williams River. Three test areas were established on the flat above the floodplain near the waterhole. These included a site on the right bank of the river (Area B1), on a terrace on the right bank of Tillegra Creek (Area B2) and on the left bank of the creek in the very elevated area above the confluence (Area B3).

Artefacts were retrieved from all three areas, although at a very low density. Two artefacts, both of hornfels, were retrieved from the excavated trench in Area B1. This site was recorded as Tillegra 6. One artefact was recovered from the excavated trench in Area B2 (Tillegra 7) and another single artefact was retrieved from the excavated trench in Area B3 (Tillegra 8).

Area D

Two discrete areas were excavated as part of Area D. Area D1 was an elevated bench above the floodplain of the Williams River adjacent to Munni House. The area offers elevated position and access to the river as demonstrated by the use of a swimming hole and a locally known still existing passage to the river used in historic times. A total of fourteen trenches were excavated in Area D1 and trenches D1-T2, D1-T3, D1-T4, D1-T5 all contained artefacts. These trenches were all sufficiently close together to warrant being listed as one site designated as Tillegra 1. In total, this site contained 21 artefacts. The most common raw material type was hornfels (15 artefacts) with basalt, silcrete and another fine-grained siliceous (FGS) stone also present. Artefact types included flakes and cores.

Area D2 was located south of Salisbury Road and south of Munni Bridge. The area traverses a long spur defined by a river meander. It was identified that the low saddle of the spur could have been used as a crossing point to avoid the river meander. It is also potentially a campsite with some areas of easy access via a lower gradient to the river itself. The opposite river bank in this area is a sheer rock face in places where the river has been contained by bedrock outcrop.



14.2 ABORIGINAL ARCHAEOLOGICAL SITES RECORDED IN THE STUDY AREA

Four trenches were excavated in Area D2. Excavation of trench D2-T1 was terminated when a deposit of rounded river cobbles was reached. The deposit indicated that this area had once been part of a previous riverbed and that the river had meandered through time. Trench D2-T2 was excavated on the existing floodplain and revealed a homogeneous moderately compact fine-grained dark brown alluvial deposit. Occasional small river pebbles appeared in the clayey silt at around 700mm depth. No artefacts were recovered. Two artefacts (both hornfels tools) were retrieved from trench D2-T4 (Tillegra 2).

Area E

Five trenches in two discrete locations were excavated in Area E. Three trenches (E1-T1, E1-T2, E1-T3) were excavated on the terraces above an unnamed tributary creek near its confluence with the Williams River close to the proposed dam wall site. Two trenches (E2-T1, E2-T2) were excavated on a raised saddle landform above Salisbury Road.

One hornfel flake was retrieved from E1-T1 (Tillegra 3), with five artefacts being found in trench E1-T3 (Tillegra 4). Only one flaked artefact was found in trench E2-T1 (Tillegra 5).

Area F

This area is located on an elevated ridge/saddle landform in the vicinity of the new section of Salisbury Road near the north eastern part of the inundation area. Two trenches were excavated in this area but no artefacts were recovered.

14.7.2 Description and assessment of identified sites

A total of 20 trenches of varying lengths between 10 and 20 metres were excavated across representative landforms. Eight separate site locations containing flaked stone artefacts were recorded during the testing. The majority of the artefacts (68 per cent) were recovered from site Tillegra 1 adjacent to Munni House. Table 14.1 lists the artefacts recovered while their associated locations are shown in Figure 14.2.

TABLE 14.1 ARCHAEOLOGICAL SITES AND RECOVERED ARTEFACTS

TRENCH IDENTIFIER	ARTEFACTS FOUND	SITE
B1-T1	2 hornfels artefacts	Tillegra 6
B2-T1	1 artefacts	Tillegra 7
B3-T1	1 artefacts	Tillegra 8
D1-T2, D1-T3, D1-T4, D1-T5	21 artefacts (15 hornfels artefacts, other artefacts include basalt, silcrete and another fine-grained silcrete)	Tillegra 1
D2-T4	2 artefacts	Tillegra 2
E1-T1	1 hornfels flake	Tillegra 3
E1-T3	5 artefacts including two cores	Tillegra 4
E2-T1	1 flaked artefact	Tillegra 5

Scientific significance of identified sites

The level of scientific significance of an Aboriginal site depends in large part on the content, rarity and preservation of the site. The significance of a site may be increased in situations where archaeological remains are the only source of information about the past habitation of an area when other forms of knowledge have been lost. Sites that are not necessarily rare may also have significance if they are a particularly representative example of a type and sometimes the criterion 'representativeness' will also be assessed.

There is no overall accepted threshold or grading standard for assessing the scientific significance of indigenous sites. In general an assessment is made of a site's potential for providing information. For the purposes of this assessment, a simple rating system was developed to facilitate the objective assignment of a 'score' that relates to an indicative significance level assessment.

Site contents rating

SCORE	INTERPRETATION
0	No cultural materials remaining
1	Site contains a small number (eg 0-10 artefacts) or limited range of cultural materials with no evident stratification
2	Site contains: • a larger number, but limited range of cultural materials, and/or • some intact stratified deposit
3	• a large number and diverse range of cultural materials, and/or • largely intact stratified deposit, and/or • surface spatial patterning of cultural materials that still reflect the way in which the cultural materials were laid down.

Site condition rating

SCORE	INTERPRETATION
0	Site destroyed
1	Site in a deteriorated condition with a high degree of disturbance but with some cultural materials remaining
2	Site in a fair to good condition, but with some disturbance
3	Site in an excellent condition with little or no disturbance. For surface artefact scatters this may mean that the spatial patterning of cultural material still reflects the way in which the cultural materials were laid.

Site rarity rating

Rarity refers to the regional distribution of a site type. It is assessed on whether the site type is common, occasional or rare within a given region. Current knowledge on the number of and distribution of archaeological sites in a region can change depending on the extent of previous archaeological investigation.

The rarity ratings used for archaeological sites are:

1) common occurrence
2) occasional occurrence
3) rare occurrence.

Each site location has been assessed against these criteria and the results are presented in the following table.

TABLE 14.2 SIGNIFICANCE LEVEL ASSESSMENT FOR IDENTIFIED SITES

SITE NAME	SITE CONTENTS	SITE CONDITION	RARITY	OVERALL RATING
Tillegra 1	2	2	3	Rare
Tillegra 2	1	3	2	Moderate
Tillegra 3	1	3	2	Moderate
Tillegra 4	1	3	2	Moderate
Tillegra 5	1	3	2	Moderate
Tillegra 6	1	3	2	Moderate
Tillegra 7	1	3	2	Moderate
Tillegra 8	1	3	2	Moderate

14.8 Project impacts

The Aboriginal heritage assessment identified the direct impacts of all components of the project. This includes construction impacts (dam wall, spillway, related infrastructure and the relocation of Salisbury Road); inundation impacts and potential downstream impacts due to the construction and operation of the dam. While impacts on all recorded sites cannot be stated absolutely, potential impacts have been identified in order to provide mitigation measures to mitigate any potential impacts.

Any impacts to heritage sites would be localised to items located within the Project area. The Project would not have an adverse impact on heritage items in areas surrounding the Project.

14.8.1 Construction impacts

Construction of the dam wall, spillway and related infrastructure, and realignment of Salisbury Road would involve substantial ground disturbance. This would impact directly on any Aboriginal heritage sites within affected areas.

Dam construction activities would extend some distance from the river banks and would involve stripping of alluvial deposits in preparation for construction (Dept of Commerce 2007). A large area around the proposed location of the dam wall and spillway would be subject to earthworks and considerable disturbance. This is likely to result in destruction of any sites located within the construction footprint.

Diversion of Salisbury Road would involve stripping of topsoil and constructing crossings over a number of gullies. It is likely that sites in the direct path of the road diversion would similarly be destroyed.

14.8.2 Inundation impacts

There are a number of recorded heritage sites (Tillegra 1,2,6,7,8) that would fall within the inundation area. It is difficult to identify specifically any impacts that could occur to these sites. Potential impacts on archaeological sites in a water storage environment can arise from a number of factors. These can include the initial inundation process itself, subsequent water level changes and the consequent effect of covering and uncovering of sites, and the potentially erosive effect of wind-generated waves striking the storage shoreline. These can all have an effect on the stability of deposits.

Of these potential impacts, wave-induced erosion would likely be more potentially destructive to stone artefact sites than the state of being under water. In general it has been recommended that the faster cultural resources can be inundated with water, the less wave action and sediment movement can aid erosion. In essence sites should be migrated swiftly through the zone of wave impact (O'Halloran and Spennemann 2002).

O'Halloran and Spennemann (2002) have also identified a variety of potential wave-related impacts on sites. These include:

- shoreline erosion through sediment loss
- exposure of sites and artefacts
- intermingling of site layers
- artefact transportation.

A major impact in areas of artificial water storage is related to the high water level area or the shoreline fluctuation zone. Erosion is usually greatest in this area and the movement of water can cause major disturbance such as undercutting of banks (Martin et al 1994). The storage shoreline fluctuation zone has shallower deposits on slopes and there would be less significant deposit removal by erosion. Erosion in this zone is also less likely to impact archaeological sites as the majority of the high water level zone coincides with steep ground that is either unlikely to have been a favourable camp site location and/or to have already experienced erosion sufficient to remove any traces of past occupation.

Low storage water levels cause previously inundated areas to be revealed. This can result in an increased risk to sites from erosion due to a lack of stabilising vegetation cover (O'Halloran and Spennemann 2002).

Alterations to the landscape and soil layers once inundated are unlikely to be limited to the steep slope areas, but may also include the collapse of river and creek banks and slippage of lower footslope areas. This would have potential to disturb any archaeological sites located in these areas. Impacts could include redeposition of artefacts, mingling of separate sites due to slips, and loss of stratigraphic information.

While it is not possible to precisely identify specific inundation impacts for the identified heritage sites within the inundation area (Tillegra 1,2,6,7,8). However, inundation does pose some risk to any evidence of past occupation (archaeological sites) that may be preserved within the inundation area. Although some artefacts may survive in an inundated environment, there may be some damage due to movement and water impacts. Inundation would also be likely to have the effect of disturbing the site context resulting in a loss of stratigraphic information. This, in turn, reduces the archaeological significance of the sites.

14.8.3 Potential downstream impacts

The geomorphological study (Working Paper B) noted that a consequence of the combined effects of reduced bed material mobilisation, increased chance of macrophyte colonisation, and reduced disruption to instream vegetation would be that over time the channel may become more stable with more instream vegetation. This effect was predicted to lessen with distance downstream from the dam.

The increased stability of the channel would reduce the potential for disturbance to Aboriginal sites should they occur adjacent to the channel, particularly in the section between the dam and the Chichester River confluence. Consequently, significant impacts to items of Aboriginal significance located downstream or in other areas outside the Project area are considered unlikely.

14.8.4 Potential impacts on recorded Aboriginal heritage sites

Sites Tillegra 3, 4 and 5 (Area E) are likely to be subject to impact during construction of the dam wall and spillway. The level of disturbance of depositional context to the remaining sites in the inundation area is likely to be considerable. While this cannot be predicted with absolute certainty, the risk to sites and areas of archaeological potential would warrant the implementation of some form of mitigation. These measures and management strategies to manage the Aboriginal heritage in the Project area are discussed in Section 14.6.

The archaeological assessment and subsurface testing identified areas with low or no potential to contain significant archaeological sites. No additional archaeological investigations or mitigation measures were considered necessary for low-lying areas of the floodplain adjacent to the river which would likely have experienced past disturbance from flood events. Similarly, no further investigations or mitigation measures were considered necessary for the steep (>18 per cent) slope areas. Any archaeological evidence remaining in these areas would likely be isolated artefacts or small sites and very sparsely distributed.

14.9 Mitigation and management measures

The Aboriginal heritage assessment report developed a management strategy addressing:

- recording cultural information
- communicating and preserving information
- archaeological salvage.

This is based on:

- relevant legislative requirements
- the results of the archaeological investigations documented in Working Paper M
- the available views and recommendations of the Aboriginal community organisations involved
- potential impacts.

The management and mitigation measures as listed as follows.

Recording cultural information

- Consideration would be given to undertaking further consultation about past Aboriginal cultural activity in the Project area
- Consideration would be given to the recording of oral history and information about culturally significant places.

Communicating and preserving information

- Consideration would be given to creation of a display of the artefacts recovered and the information compiled during the environmental assessment for the Project
- If undertaken, the Aboriginal community and the DECC would be consulted in relation to a suitable venue for the artefacts and information
- If required, an application would be made to the DECC for a 'Care and Control' permit (or equivalent) for any artefacts proposed to be retained in the community.

Archaeological salvage

- A suitably qualified and experienced archaeologist would be engaged to formulate a research design for archaeological salvage of a sample of archaeological sites preserved within the Project area prior to construction. This would include appropriate consideration of relevant recommendations in the Aboriginal archaeological heritage report
- Representatives of the Aboriginal community would be consulted for input into the salvage research design.

Other matters

- A copy of the Aboriginal heritage assessment report would be provided to the registered Aboriginal community groups, the Dungog Historical Society, the Dungog library, the DECC and the DECC AHIMS registrar
- The CEMP would provide for awareness training for construction personnel with regard to the possibility of encountering Aboriginal heritage material, together with legal obligations in relation to such material
- Any further consultation with the Aboriginal community would continue to be undertaken in accordance with the DECC's draft consultation guidelines.