

**AN ARCHAEOLOGICAL SURVEY OF
LOTS 1 AND 2 DP 1226992
No 16 TORRENS ROAD
GUNNEDAH
NORTHWEST NSW**

**A REPORT
PREPARED FOR
MACKELLAR EQUIPMENT HIRE PTY LTD
'COSTALOT'
16 TORRENS ROAD
GUNNEDAH
NSW 2380**

BY

**PATRICK GAYNOR
PO BOX 814
GUNNEDAH NSW 2380
PH 0408 465 075**

JULY 2020

Summary

An archaeological survey of Lots 1 and 2 DP 1226992 No 16 Torrens Road, Parish of Gunnedah, County of Pottenger was undertaken on the 14th July 2020 at the request of Mr. Brendan Mackellar of Mackellar Equipment Hire Pty Ltd of Gunnedah, NSW.

The survey was undertaken by the author in company with Ms. Tracy Wortley who was representing the Red Chief LALC. Tracy and the author discussed the method of how to do the survey and also the results obtained and the recommendations. Prior to the survey beginning, Mr. Bruce Mackellar pointed out the white survey pegs at the 4 corners of each Lot and the boundary lines between Lots 2 and 3 and 2 and 1. According to the contour lines on the Emerald Hill Topographic 1:25,000 Map, this area is very flat and could be described as floodplain country.

A search of the AHIMS register for Aboriginal relics returned a nil result for Lots 1 and 2 (see Appendix 2 on page 31). The closest recorded scarred trees were adjacent to Mathias Road about 200 metres to the north of these Lots. The nearest recorded stone artefacts were found in 1984 by Haglund near the Namoi River about 3.5 km north of Costalot. The predictive model generated for this survey report from recorded sites and past surveys from around the Gunnedah/Boggabri area, suggested it was unlikely that stone artefacts would be found in this survey but there was a chance that scarred trees may be present.

The survey of the two Lots, which collectively added up to 28272 square metres (as noted from Map 3) found that many areas of Lot 1 contained buildings and had other areas top-dressed with a fine blackish gravel. There were however, areas on the eastern side of the Lot 1 that had bare ground, which gave a good indication of soil type and associated stones. Towards the south of this Lot were a number of mature trees that were inspected for scars but none were present. No stone artefacts were sighted in this Lot.

Lot 2 was more open but contained a 20 metre heavily grassed area on the western boundary. There was a large area in the centre that was top-dressed with the same material as in Lot 1. It did however; contain a wide area of reasonably bare ground on the east side, as was the case in Lot 1. Local stone seen here was totally unsuitable for making stone artefacts or use as a grindstone. No stone artefacts were sighted.

Although all the ground that was not covered by buildings was surveyed on foot, overall effective coverage was estimated at only 7.53% when working on the amount of bare ground seen, but what was seen gave no indication that stone artefacts would be found or made here and supports data obtained from other surveys around Gunnedah and that is that stone artefacts are seldom seen on country situated away from the river. It also points to the fact that scarred trees, although sometimes seen up to 1 km away from a river or stream, are usually found much closer to the river as is the case in the many Travelling Stock Reserves (TSRs) between Gunnedah and Boggabri.

Recommendations

As no Aboriginal Relics were sighted in this survey, in conjunction with the representatives of the Red Chief LALC, the following recommendations can be made:

That all development be allowed to proceed but there is always with the provision that if Aboriginal relics are uncovered in the course of the development, then the Department of Planning, Industry and Environment in Dubbo and the local Red Chief Local Aboriginal Land Council be informed, who will then decide on what course of action is to be taken.

CONTENTS

1. Introduction	5
1.1 Background to the Survey.....	5
1.2 The Location of the Survey Area.....	5
1.3 The Archaeological Brief.....	9
2 The Environmental Context	9
2.1 Topography and soils.....	9
2.2 Geology.....	9
2.3 Vegetation.....	9
2.4 Fauna.....	10
3 Aboriginal Consultation	10
4 Previous Archaeological Research	10
4.1 Recorded Sites.....	10
4.2 Previous Surveys.....	10
4.3 The Predictive Model	14
5 The Survey Strategy	15
5.1. The Survey.....	15
5.2. Effective Coverage.....	17
6 Results of the Survey	17
7 Discussion.....	17
8. Recommendations.....	17
9 Bibliography.....	18
List of Maps	
Figure 1 Map Indicating the Location of Gunnedah.....	6
Figure 2 Map Indicating the Location of the survey area.....	7
Figure 3 Location of Lots 1 and 2.....	8
List of Tables	
Table 2.1 List of Plants observed.....	9
Table 4.1 List of Recorded Aboriginal Sites	10
Table 5.1 Effective Coverage Table	16
Photographic Record.....	20
Photo 1 The NW corner of Lot 2	20
Photo 2 The SW corner of Lot 2	20
Photo 3 The drain separating Lots 2 and 3	20
Photo 4 Bare ground on east side of Lot 2	21
Photo 5 Diagonally from SE to NW corner in Lot 2.....	21
Photo 6 A small tree in Lot 2	21
Photo 7 Boundary line between Lots 2 and 1	22
Photo 8 Two self sown trees in Lot 2.....	22
Photo 9 Looking south towards the SE corner of Lot 1.....	22

Photo 10	Gravelled and concreted area between sheds in Lot 1	23
Photo 11	Looking west towards the main storage shed.....	23
Photo 12	Planted trees east of the sheds.....	23
Photo 13	Looking east towards bare area on the eastern edge of lot 1	24
Photo 14	Looking south from the NE corner of Lot 1	24
Photo 15	looking west from the SE corner of Lot 1	24
Photo 16	Looking north from the SE corner of Lot 1	25
Photo 17	Looking north from the entrance area to the office	25
Photo18	The Caretaker's cottage.....	25
Appendix 1	Glossary of geological and archaeological technical terms	26
Appendix 2	Results of the search for Aboriginal sites on the AHIMS	
	Register in both the survey area and an extended area	31
Appendix 3	Letter from the Red Chief LALC	34

1 Introduction

An archaeological survey of Lots 1 and 2 DP 1226992 No 16 Torrens Road, Parish of Gunnedah, County of Pottenger was undertaken on the 14th July 2020 at the request of Mr. Brendan Mackellar of Mackellar Equipment Hire Pty Ltd of Gunnedah, NSW.

1.1 Background to the Survey

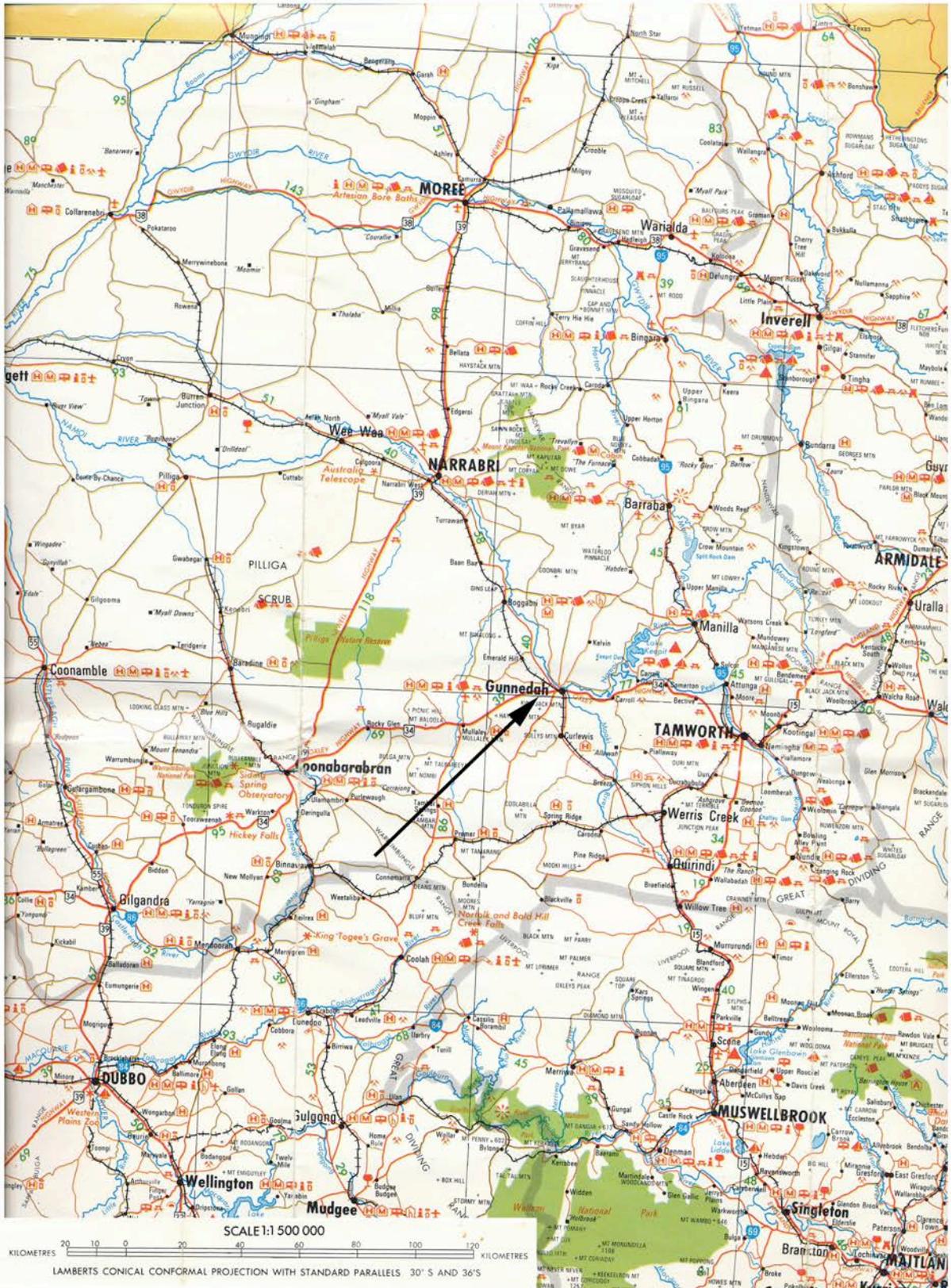
The survey area was originally farming land when the property was called ‘Roslyn’ (see Map 2) before being purchased by the Mackellar organisation and the name changed to Costalot. It is very flat land and would be designated as floodplain in topographic terms. According to past archaeological surveys, Aboriginal artefacts are seldom found on this type of country except for scarred trees that could be up to a km from a stream. This area then would be unlikely to contain stone artefacts and if any were originally present they would be scattered and broken by agricultural equipment (see Gaynor 2004), added to that stock hooves can break stone artefacts. The nearest stone artefacts found near here in the past were recorded on the Namoi River about 3.5 km NW of Costalot (see Haglund 1984). There is a slight chance however, that a scarred tree could be present due to two being found near the Boggabri Road just north of Costalot in 2012 (see Gaynor 2012a).

Archaeologically, the survey area falls within the area designated by Tindale (1974) as belonging to the Gamilaroi tribal or dialectical group and is within the Land Council Zone of the Red Chief Local Aboriginal Land Council, based in Gunnedah. According to a survey in 2002, the Gunnedah area has an abundant of scarred trees in the travelling stock reserves (TSRs) between Gunnedah and Boggabri, but other types of Aboriginal relics are not so plentiful. This survey of public lands was part of the 2002 Aboriginal Cultural Heritage Assessment of the Brigalow Belt South for the Resource and Conservation Assessment Council (RCAC) of the NSW Government (see Purcell 2002). A current search of the AHIMS register of the areas of Lots 1 and 2, DP 1226992, returned a nil result for Aboriginal relics on or near each Lot (see results in Appendix 2 on page 31). A search of the AHIMS register in 2012 for a nearby survey of an extended area with a 50 metre buffer, returned a result of 6 entries in the area bounded by the AMG readings of 230000-236000 E, 6560000-65740000. However the first 3 entries listed are a duplicate of 1 entry while the last three were for scarred trees. The closest of those scarred trees was in the 4 mile reserve on the Boaggabri Road which is approximately 3 km to the north west of this survey area. That registration is really for 7 scarred trees in that area according to the 2002 Aboriginal Cultural Heritage Assessment of the Brigalow Belt South but only one has been listed in the Register. In 2012 a survey on Maihias Road just north of Costalot found two scarred trees adjacent to the Gunnedah/Boggabri Road (see Gaynor 20012a:11). These were registered with the AHIMS register as Torrens Road ST1 and ST2. These scarred trees are the closest recorded Aboriginal artefacts to Lots 1 and 2.

1.2 The Location of the Survey Area

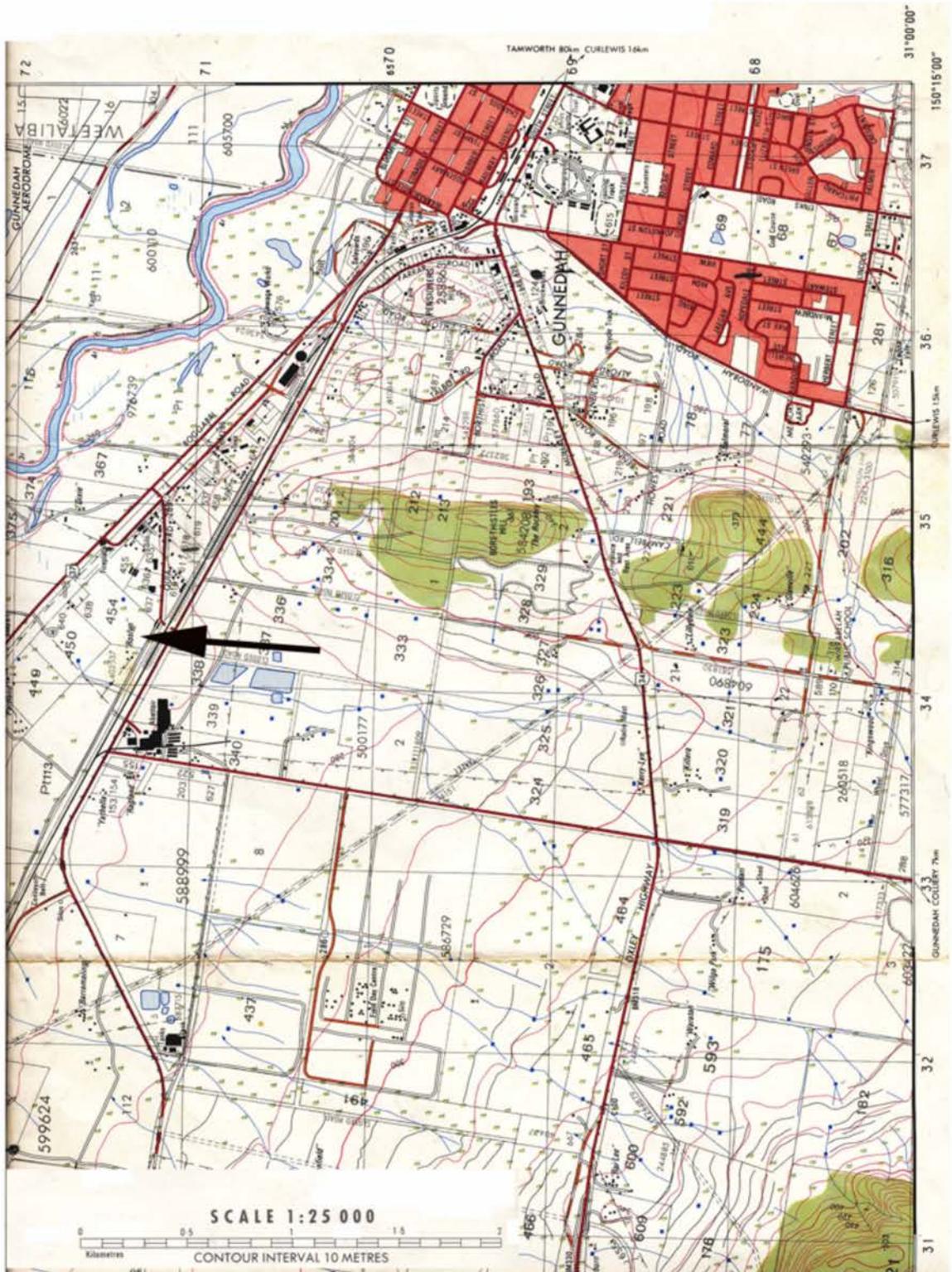
The survey area is located about 3.25 km west of the outskirts of Gunnedah in Northwest NSW. To get to Costalot, you take the Quia Road on the left from the Boggabri Road, and turn right into Torrens Road on the right side of the Quia Road just before it goes into the viaduct under the North West railway line from Gunnedah to Boggabri. Costalot is about 250 metres on the right hand side of Torrens Road and has a large sign next to the entrance. The two Lots surveyed were the first two Lots after entering Costalot with the Caretakers cottage in the front of Lot 1. A paved road runs the length of the eastern boundary of each Lot (see Maps 1, 2 and 3 on pages 6, 7 and 8).

MAP 1 LOCATION OF GUNNEDAH



ADAPTED FROM A TOURING MAP OF NSW

MAP 2 LOCATION OF COSTALOT



ADAPTED FROM THE EMERALD HILL 1:25,000 TOPOGRAPHIC MAP

1.3 The Archaeological Brief

The survey was to be undertaken in association with a representative of the Red Chief Local Aboriginal Land Council. Mr Brendon Mackellar supplied a map showing the exact location of the Lots (see Map 3 on page 8) while Mr. Bruce Mackellar showed us the surveyors pegs outlining both block's boundaries on the day of the survey plus the boundary lines between Lots 2 and 3 and 1 and 2.

2 The Environmental Context

2.1. Topography and soils

This area is fairly flat and slopes gently to the north towards the river. According to the Emerald Hill Topographic Map, this area lies between the 280 and 270 metre ASL contours with the banks of the Namoi River situated just below the 260 metre mark to the north. The Namoi River at this point is about 1.25 kilometre away to the north at the nearest point. From what bare ground that could be seen, the soil is mainly dark cracking floodplain type. Over the years there may have some soil wash in sections from soil further to the south as that is the direction that water would flow from.

2.2 Geology

According to the Manilla 1:250,000 Geological Sheet, the survey site is situated on alluvium of clay, sand, silt, and gravel south of the Namoi River. According to the Gunnedah Coalfields (South) Geology sheet of 1996, the Blackjack Formations joins it on the southside. That formation contains sandstone, shale, conglomerate, chert, coal and limestone (Tamworth Geological sheet). To the southeast is the Porcupine Formation which contains lithic sandstone, conglomerate, shale and limestone (Tamworth Geological sheet). All these areas would have been available as stone sources for Aboriginal knappers in the past as well as from the gravel beds of the Namoi river which from experience carries an assortment of pebbles that may have been used as stone sources. There did not appear to be any rounded cobbles on any of the bare ground of Lots 1 or 2.

2.3. Vegetation

Species identification for this report was undertaken with the assistance of the following references: Plants of Western New South Wales by Cunningham et al:1981, A Field Guide to Weeds by Lamp & Collet, Crop Weeds by Wilding, Barnett and Amor. Plants observed and identified during the survey were:

TABLE 2.1 - LIST OF PLANTS OBSERVED

White Box (<i>Eucalyptus albens</i>)	Sticky beaks or coblers peg (<i>Bidens pilosa</i>)
Bimble Box (<i>Eucalyptus populnea</i>)	Johnsons grass (<i>Sorghum halepense</i>)
Ironbark (planted) (<i>Eucalyptus fibrosa</i>)	Marshmallow (<i>Malva parviflora</i>)
False Castor Oil Plant (<i>Datura ferox</i>)	Lambs tomgue (<i>Plantago lanceolata</i>)
Spear grass (<i>Stipa</i> sp.)	Roly-poly (<i>Salsola kali</i>)
Umbrella Grass (<i>Chloris truncate</i>)	Galvanized burr (<i>Slerorolaena birchii</i>)
Khaki weed (<i>Aternanthera pungeris</i>)	Patersons curse (<i>Euchium plantagineum</i>)
Milk Thistle (<i>Lactuca serriola</i>)	Wallaby grass (<i>Danthonia</i> sp.)
River Oak (planted) (<i>Casuarina cunninghamiana</i>)	Wild turnip (<i>Rapistrum rugosum</i>)
Clover (<i>Trifolium glomeratum</i>)	Shepherds Purse (<i>Capsella bursa-pastoris</i>)

This list is not exclusive as there were a few others present that I was unable to identify or that I just missed seeing. There were a few rows of planted Eucalypt trees of various ages present of which some I was not able to identify plus there was one smooth barked Eucalypt in Lot 2 that did not appear to have been planted there and I failed to pin point its exact species.

2.4 Fauna

No fauna were sighted on the survey, but being about 700 metres from the river, there were probably plenty of gulars, white cockatoos and corellas that pass that way of a morning and back in the evening to roose further to the east.

3 Aboriginal Consultation

Initial contact was made with Ms Brenda Porter of the Red Chief Local Aboriginal Land Council prior to the survey and she appointed Ms Tracey Wortley to represent the Red Chief Local Aboriginal Land on the survey (usually a second representative is required by the Red Chief LALC to do surveys but a second representative could not be found after one had pulled out on the morning of the survey. While at the Red Chief Office I had a conversation with Aboriginal Elder Mr. Greg Griffith who remarked after I told him where I was going, that he was unaware of any Aboriginal artefacts in that area. After arriving at the job and viewing the area to be surveyed, Tracey Wortley and I discussed the best method to do the survey and on completion, the result.

4 Previous Archaeological Research

4.1 Recorded sites

As already mentioned, a 2012 search of the Department of Environment and Conservation's AHIMS Aboriginal Sites Register on the Emerald Hill1: 25,000 Topographical map between 56 230000 and 236000 East and 6568000 and 6574000 North revealed that there were 6 Aboriginal Sites listed. However a closer a look at the first three entries revealed they were all the same except for the registered number.

The following table is a list of those sites.

Table 4.1 List of Recorded Aboriginal Sites.

Site No.	Site name	Map Co-ordinates	Site Type
29-4-0036	Naomi River/CWR	56232750E, 6573750N	Open site with scarred tree
29-4-0037	Namoi River/CWR	56232750E, 6573750N	Open site with scarred tree
29-4-0047	Naomi River/CWR	56232750E, 6573750N	Open site with scarred tree
29-4-0067	4 mile TSR 1-7	56232693E, 6573548N	Scarred tree
29-4-0083	Bluevale rd ST1	56234645E, 6573276N	Scarred tree
29-4-0086	Bluevale rd ST2	56234658E, 6573320N	Scarred tree

NOTE: I was involved with registering the last three entries. The 4 mile TSR contains 7 scarred trees but only one was found to be in the register.

4.2 Previous Surveys

Haglund 1984a

Haglund was able to locate three Aboriginal sites in surveying a haul road for the Vickery Joint Coal Venture in 1984. The sites were all associated with the Namoi River. A scatter of stone artefacts and a scarred tree were located on a high

terrace above flood level on the Namoi River (this is the site recorded as 20-4-0036 - Namoi river/CWR). The other site located was also a scatter of stone artefacts at a nearby lagoon, but this seems to have been missed in the AHIMS register while the other artefact scatter and scarred tree have been recorded three times. This site is about 3.5 km northwest of this survey area.

Haglund 1984b

Haglund surveyed a second haul road from Trunk Road 72 (now the Kamilaroi Highway) to the load loader on the northwest railway line and the area to be impacted by the coal loader and stockpiling of coal for the Vickery Joint Coal Venture in 1984. No sites were located in the survey for the haul road. The coal loader is approximately 650 metres southwest of this survey area.

Haglund 1985

Haglund excavated one previously recorded Aboriginal site and one potential site near the Namoi River as part of the investigation of areas associated with the Victory Joint Coal Mining Venture. The excavation of the potential site was unsuccessful in locating stone artefacts. The excavation of the existing site recovered a few artefacts from the surface and subsurface areas but these according to Haglund, were of poor quality (they were mostly fragmented) and any analysis that was attempted, was not of much value.

Appleton 1999

Appleton carried out a survey of an area of 763 ha that was going to be impacted upon by the Whitehaven open cut coal mine which is situated about 25 km north-west of Gunnedah. Appleton located three sites. He found 15 stone artefacts in an area of 25 by 15 metres that he suggested was a knapping floor as all the artefacts were of one raw material. He described these artefacts as pale cherty artefacts. Number two site was an isolated 'cherty mudstone' stone artefact. Number three site was a scarred grey box tree whose scar reached to the ground which he suggested raised some doubts as to its Aboriginal origin although the top of the scar looked like a typical Aboriginal type (Appleton's photo suggested that it was probably of Aboriginal origin - personal opinion).

Gaynor 2002.

Gaynor in company with Red Chief Local Aboriginal Land Council Representatives Mr. Les Fields and Mr. Wayne Martin carried out surveys in the Red Chief Local Aboriginal Land Council's area as part of the Aboriginal Cultural Heritage Assessment of the NSW Western Regional Assessments Brigalow Belt South Bioregion (Stage 2). This assessment looked at available areas that were types of landforms that were expected to be connected with Aboriginal Cultural Heritage (Purcell 2002:8). This survey found numerous scarred trees in Travelling Stock Reserves between Gunnedah and Boggabri. These stock reserves all had access to the Namoi River. Several of these scarred trees were located in a TSR about 8 km northwest of this survey area. These scarred trees were recorded as '4 Mile' TSR (west side) or (east side) scarred trees. The haul road from the Vickery coal mine had effectively cut this reserve into two parts and so now there is an east and west section. Seven scarred trees were recorded on the eastern section and two in the western section. All scars were located on White Box trees.

This nine day survey with the Red Chief LALC representatives in 2002, covered State Forests, TSRs, and roadways. In all, 88 sites were located that consisted of 15 stone artefact scatters (all associated with well defined watercourses), 2 isolated stone artefacts and 71 scarred trees (these were mostly White Box trees but a few were River Red Gums). All stone artefacts were located in State Forests and none in TSRs or flood plain country. Raw materials of stone artefacts noted in the Red Chief LALC territory survey were quartz, quartzite, chert, jasper, chalcedony and petrified wood. The few grindstones found were all sandstone based.

Gaynor 2004.

Experiments, carried out by Gaynor over a three year period (using 200 specially made stone artefacts of various sizes and raw materials and farming implements commonly used after tractors were introduced in the 1920/30s) have special significance for this survey. Gaynor's results revealed that stone artefacts were dispersed between 2.2 and 26.8 metres in distance and a spread of up to 4 metres in width from the original one metre position, at the end of the three years of normal broadacre cultivation using the common circular method of cultivation. Size of artefacts had little to do with the distance travelled in some cases, as it was observed that some artefacts became encased in large clods of dirt and were then moved by the cultivating implement as if they were a large artefact. As all this survey area has been cultivated in the past, it would be expected that any stone artefacts found in that area would not be in their original position. If we use the figures obtain by Gaynor to estimate the spread over 30 years after cultivation, then artefacts would be spread from 22 to 268 metres from their original position if the traditional circular way of cultivation was carried out. The results from this experiment suggests that any artefact found in the survey area that had been cultivated would not be in-situ.

Hamm 2005

Hamm located 30 open stone artefact scatters (of which 81% had less than 5 artefacts in them), 26 isolated stone artefacts and four scarred trees in the Leard Forest area. Some of the area surveyed by Hamm are near Rhyolite hills that have chalcedony and agate associated with them (personal observations). Aborigines extensively used the chalcedony in that area (personal observations). Rhyolite however outcrops do not occur in the Gunnedah area.

Appleton 2005

Appleton surveyed an area 15 km east of Boggabri and closer to Gunnedah than the survey by Hamm. He located four stone artefact sites associated with Gins Gully on the proposed haul road for a coal mine plus another artefact scatter and a scarred tree in the survey area that are not at present under threat from the mine development. Only a scatter of four artefacts and an isolated stone artefact would have to be salvaged so the development could proceed.

Appleton 2007

An archaeological survey of Lot 2 DP 848920 was undertaken by John Appleton of Archaeological Surveys & Reports Pty Ltd in 2007. This area is on the south side of Gunnedah township and was on old farming land, which was being subdivided for housing blocks. It was all sloping land running up to ridges in the south with a large gully running through the centre. After an extensive search, no Aboriginal artefacts were located. It was about 3 km southeast of this survey. The majority of stones sighted were sandstone.

Umwelt Pty Ltd 2008

In 2005 and 2006, Gaynor under contract to Umwelt, carried out two surveys near the Gunnedah Shire Waste Management Facility on the Quia Road west of Gunnedah. These were in connection with areas that Primary Energy Pty Ltd had wanted to build an Ethanol Plant on. The first area of 11.78 ha was 5.5 km west of the town that was later deemed unsuitable for logistic reasons but no artefacts were found in this survey. The second area of 39 ha was 7.10 km west of the town but the first survey and second survey areas were all part of the 410 acre old farm of Barramilga and was on the western side of the Waste Management Facility. These areas were old farming land according to former owners and neighbours. No Aboriginal artefacts were sighted in this survey either. They were between 2 to 3 km southwest of this survey area. That ethanol plant did not eventuate.

Gaynor 2011a

Gaynor under contact to the DPI and in association with members of the Red Chief LALC and Gunida Gunyah Aboriginal Corporation recorded two artefact scatters, one set of grinding grooves and one scarred tree on the east end of the Broadwater part of the Namoi River off the Bluevale Road and opposite the Gulligal Lagoon TSR on the south side of the river. The scatters were registered as Broadwater 1 and 2. Cherts of various colours were the dominant stone material, but basalt, petrified wood, jasper, chalcedony and quartz were also present. These scatters were large and were probably just one big site but the lack of visibility prevented this from being verified. One scatter measured 100 by 17 metres while the other was 56 by 10 metres. The scatters were 150 metres apart.

The grinding grooves were on the edge of the river in an area of 180 by 80 cm. There were 18 grinding grooves observed, with the largest being 49 mm long and the shortest 20 mm. It appeared they were all been used for axe grinding. There may have been more present under the water, as the water was not clear enough to determine this. We were not able to determine the rock's raw material, but it did not appear to be sandstone. A later inspection of the area in 2012 determined there was at least one grinding groove below the water level. The whole area is bounded by coarse conglomerate (which may have been a stone source for making stone artefacts). The smoother area with the grinding grooves on it was below the conglomerate section of the outcrop. The scarred tree recorded as Broadwater ST1 was dead and its species was not able to be determined. The tree and scar, however, have survived floods in the past and the tree is in no danger of falling down. It is about 10 metres from the waters edge. The scar is shield shaped and measured 740 by 25 cm. This whole area is about 23 km to the northwest of the survey area.

Gaynor 2011b

A survey of the property 'Marshmead' on the Wandobah Road near Gunnedah was carried out in January 2011 in preparation for a rural subdivision. All the land sloped towards the east and Blackjack Creek. The survey was carried out in four sections or units corresponding to paddock size combinations. All paddocks had been extensively cultivated in the past, according to a previous owner. A portion of the south paddock (the largest) was surveyed with a vehicle and sampled at intervals but all the other paddocks were surveyed on foot. Visibility was a problem in most paddocks but there were bare areas in all paddocks that had excellent visibility. Effective coverage was 4% while visibility ranged from zero to 100%. No outcrops of lithic sandstone were sighted. Only one stone artefact was found. This was a large mudstone retouched blade-like flake. It would not have been in situ as the area where it was found was in the middle of a former cultivation paddock. Investigations of the local raw material revealed that it was not a local raw material. No other Aboriginal artefacts were sighted in the survey. This area is about 3 km south of the survey area.

Gaynor 2012a

A survey of an unformed section of Mathias Road, two kilometres west of the Gunnedah saleyards was carried out in March 2012. A preliminary search of the general area revealed two large Bimble Box trees with shield type scars on them. These two trees were within 700 metres of the Namoi River and both were situated off the line of the road. Both were recorded for the AHIMS register. This area is just north of the survey area. The survey did not discover any further scarred trees or any stone artefacts. The land was prone to flooding and was very wet in a few lower areas at the time of the survey in May 2012. Note that this road was incorrectly called Torrens Road in the survey report but should have been Mathias Road. The scarred trees are registered as Torrens Road Scarred Trees 1 and 2 in the AHIMS register but have the right AMG locations in the registration and so can easily be found but they are not near Torrens Road.

Gaynor 2012b

A survey of a proposed extension to an existing blue metal quarry on Melville Hill between Marys Mount and Mullaley in the Gunnedah District was carried in 2012. The whole surface area was covered in small to medium sized fractured basalt. Ground visibility ranged from zero to 100% with effective visibility being calculated at 8% overall. No sign of any pre-mechanical quarrying was observed and no stone artefacts of any material were found. One White Box tree with an elongated scar measuring 2.25 metres in length and thought to be of Aboriginal origin was discovered on the lower northern slope. This tree was situated very close to a fence running east west and was north of the present quarry. It was deemed to be outside the actual northern boundary of the proposed expansion. Melville Hill is about 18 km west of this survey area

Gaynor 2013

An archaeological survey of a proposed rural subdivision on the property 'Lillydale' on Hunts Road near Gunnedah (being Lot 323, DP 755503, Parish of Gunnedah, County of Pottenger) was undertaken on the 5th of July 2013 at the request of W. Hinton and J Minahan of Gunnedah, NSW. Perusal of the result obtained from the AHIMS search for registered Aboriginal relics, the geology of the area and some previous archaeological surveys suggested that it was unlikely that stone artefacts, art, grinding grooves, hearths or axes would be present, but there was a slight possibility that scarred trees and grinding grooves could be present.

The survey was carried out in two sections corresponding to the two major paddocks on the property. There was an abundance of rounded pebbles on the surface and also below the surface as indicated on the banks of the two dams and some contour banks that were encountered. There was also an occasional bench of solid rock on the surface. Ground visibility ranged from zero to 100% with effective visibility being calculated at 19% overall. No stone artefacts of any material were found. Nearly all trees encountered appeared to have grown since the property was initially cleared as only a couple of large old trees were sighted in the survey. None of these trees bore scars of any description. There were no watercourses noted in the property. This county is very unlike the present survey area as stone sources being basically sandstone based. No Aboriginal artefacts were located. It is about 3.25 km south of the present survey area.

4.3 The Predictive Model

A knowledge of the local geology, the previous archaeology carried out around Gunnedah and adjacent areas, and the listing from the Department of Planning Industry and Environment's Aboriginal Heritage Information Management System (AHIMS), allows some predictions to be made in relation to the type of Aboriginal relics that may be encountered at the survey area. It could be reasonably expected that:

- 1) According to the other surveys conducted in the Gunnedah area, the raw materials used by Aboriginal people in this area for stone tool production were based on quartz, chert, petrified wood, jasper, chalcedony and quartzite, so if

any stone artefacts are found, they probably would be based on one or more of these raw materials. However as this land is all old cultivation country, any stone artefacts sighted would not be in their original position (see Gaynor 2004).

- 2) As previously mentioned the surveys done in the preparation for the Brigalow Belt South Report, no artefact scatters were found on flood plains, but Haglund in 1984, had found some very close to the Namoi River. It would then seem unlikely that stone artefacts would be located here some 700 metres from the River.
- 3) Art sites should not be present as the Tamworth Geological Sheet suggests there are no geological outcrops or shelters in the area suitable for art anywhere near the survey area.
- 4) Grinding groves are usually found along Creeks and Rivers where suitable rocks are exposed. No such rocks are in this vicinity according to the Tamworth or Manilla geological maps. However, Mullers or portions of these top grindstones could be present on areas where suitable grass seeds may have previously grown. These mullers if found would most likely be made of sandstone, as sandstone is available in the hills around Gunnedah according to the Tamworth Geological Sheet, Appleton's 2007 survey and Gaynor's 2013 survey on Lilydale.
- 5) Scarred or carved trees could be present as this area in the corridor where many are found between Gunnedah and Boggabri. As there were scarred trees nearby, all other trees in and adjacent to the survey area will be inspected, be they alive or dead, still standing or fallen.
- 6) Cooking hearths if originally present, would have been destroyed by grazing or farming.
- 7) Axe material would probably not be present as axes are now fairly rare around the Gunnedah town area (personal observations).

5. The Survey Strategy

After being shown each Lot's parameters by Mr Bruce Mackellar, it was decided to survey Lot 2 first as it was the more open Lot, being devoid of buildings and more likely to have stone artefacts on it if they were ever present than Lot 1, that had many buildings on it and looked to be subject to much vehicle traffic. Each Lot was to be surveyed around the edges first and then by walking in a criss-cross grid method all the ground was to be covered. This however, was hindered in Lot 1 by the buildings present.

5.1 The Survey

Lot 2 (8572 square metres - recorded from the Lot map)

This survey began at the north-west corner where about a 20 metre wide grassed area containing a row of planted trees running south was present (see photos 1 and 2 on page 20). This 20 metre strip ran the full length of the Lot on the west side. The vegetation here was long and rank and contained a long Stipa type grass (minus seed, making it hard to identify further) plus a few weeds such as Patersons Curse, False Castor Oil plant, Khaki weed and Roly Poly. There was no bare ground present. The survey then followed a drain eastward, which was the boundary between Lots 2 and 3. There was some vegetation growing along the drain but the ground away from it was covered in a fine blackish imported gravel (see photo 3 on page 20). Bare ground was finally found on the eastern edge of this Lot adjacent to the tarred road running north/south.

In this eastern end, there was a mixture of loose imported gravel and a few stones that looked to be the natural material lying about (see photo 4 on page 21). West of here all the ground was covered in the fine blackish imported gravel. The

survey continued south along this eastern edge and any natural occurring stone was looked at for signs of being modified but none were found. The material itself was coarse and quite unsuitable for making stone artefacts. The survey moved south to the SE corner and then continued south along the boundary with Lot 1, where a good general view of Lot 2 was to be had with small dumps of gravel, concrete blocks that were marking the boundary between Lots 1 and 2 were seen. There was also a small stream of water from recent rain in the centre (see photo 5 on page 21). The survey then continued to criss-cross the Lot moving from east to west and back again. Most of this area was top dressed with the fine black gravel (see photo 6 on page 21). The survey of this Lot ended up in the southwest corner where there was a row of planted Ironbark trees along the boundary with Lot 1, a drain and a patch of long grass (see photo 7 on page 22).

This Lot contained two isolated trees that appeared to have grown on their own accord and not planted (see photo 8 on page 22). Both were Eucalyptus species (one smooth barked and one rough barked). This then ended the survey of Lot 2 which only had about 6% that had not been top dressed with gravel to aid traffic mobility in wet weather or had a covering of thick vegetation. Those bare patches observed however, were enough to give us a good indication of the type of local stone in the area. No artefacts were sighted in Lot 2 and the natural stone sighted would be unsuitable for making stone artefacts.

Lot 1 (19700 square metre - recorded from the Lot map)

This survey began on the northwest corner where the grassed strip seen in Lot 2 which contained a row of planted trees continued south towards the front of the property (see photo 9 on page 22). Visibility was better in the northwest corner beneath the trees but very little stone was seen. The survey then continued east between the main sheds, which had very little bare ground present (see photo 10 on page 23). Further east away from the sheds the area was all top-dressed with the fine blackish gravel and no bare ground was visible (see photo 11 on page 23). Further east was a row of planted Eucalypt trees with employee's vehicles parked alongside them (see photo 12 on page 23). There was some bare ground beneath the trees but nothing of interest was found there.

The next bare ground was encountered on the eastern edge of the Lot. This, as in the neighbouring Lot 2, gave us a good indication of what the bare ground was originally like across the whole Lot (see photo 13 on page 24). The survey continued south along the eastern boundary, which had patches of bare ground (see photo 14 on page 24). Stone here was similar to that found in Lot 1 and unsuitable for making into stone artefacts. The rank vegetation vanished at the SE corner being replaced by bare ground and very short vegetation that had recently been mowed. Further east was the yard surrounding the Caretaker's cottage with many exotic trees and shrubs present (see photo 15 on page 24). There were good areas of bare ground here in the SE corner to inspect but nothing of interest was found. Also present were a number of mature trees (see photo 16 on page 25) but none contained Aboriginal type scarring.

The survey continued west to the front of the Lot and the Caretaker's cottage and its yard and the gravelled entrance to the office and associated sheds areas. There was no bare ground to inspect here. The row of planted trees on the west had little or no bare ground beneath them (see photo 17 on page 25). The survey ended by inspecting the front yard of the caretaker's cottage. There was a little gravel here but nothing of interest (see photo 18 on page 25). It was estimated that about 8% of this Lot had bare ground.

5.2 Effective coverage

The following table as requested by the NSW Department of Planning and Environment depicts the approximate area covered and the average visibility together with the effective coverage.

TABLE 5.1 EFFECTIVE COVERAGE

Survey No.			Total area	Coverage (%)	Area covered	Average visibility	Effective coverage	
LOT 1			19700	100	19700	8	1576	
LOT 2			8572	100	8572	6	514.32	
TOTAL	Area of each Lot	As found on Map 3	28272 (sq. metres)	100	28272		2090.32	7.4% Effective coverage

6. Results of the Survey

All areas that were bare ground, gravelled surfaced or covered in vegetation and not covered by buildings, were surveyed on foot and no Aboriginal stone artefacts or scarred trees were sighted.

7. Discussion

The predictive model suggested there was only a slight chance that Aboriginal stone artefacts including stone axes and mullers would be found on this survey area and none were found. The effective ground visibility was only 7.4%, but what bare ground was seen did not contain any stone that could be deemed useful in making stone artefacts. No art, grinding grooves or hearths were found as was predicted in the model. The model suggested that scarred trees could be present and although there were a number of what appeared to be self sown trees in both Lots, none contained any scarring of any type. The survey results then has added to the archaeological data gathered from around Gunnedah in the past and it has further confirmed that there have been no Aboriginal stone artefacts sighted on this type of floodplain type land. No stone artefacts were found on the nearby survey on Mathias Road in 2012 and this suggests that this area was not visited by Aboriginal people to any extent in the past except once or twice to obtain bark for making Coolamons or Shields off mature trees as was found adjacent to the Boggabri Road below Cosalot in 2012.

8. Recommendations

In conjunction with the representatives of the Red Chief LALC, the following recommendations are made:

That any development be allowed to proceed but there is always with the provision that if Aboriginal relics are uncovered in the course of the development, then the Department of Planning, Industry and Environment n Dubbo and the local Red Chief Local Aboriginal Land Council be informed, who will then decide on what course of action is to be taken.

Bibliography

- Appleton, J. 1999. Open Cut Coal Mine “Whitehaven” north of Gunnedah Northern NSW. A report to R.W. Corkery & Co Pty Limited on behalf of Whitehaven Coal Mining Limited
- Appleton, J. 2005. The Archaeological Investigation for Sites of Indigenous Significance on the site of a Proposed Open Cut Coal Mine and Haul Road. East Boggabri Coal Mine, Central Western NSW . A report to R.W. Corkery & Co Pty Limited on behalf of Whitehaven Coal Mining Limited -Idemitsu Boggabri Coal Pty Ltd Joint Venture.
- Appleton, J. 2007 The Archaeological investigation for sites of Indigenous Cultural significance on Lot 2 DP848920 Lincoln Street Gunnedah, Northern NSW. A report to the Daracon Group on behalf on R Gallen.
- Cunningham, G.M., Mulham, W.E., Milthorpe, P.L. and Leigh, J.H. 1981. Plants of Western New South Wales. Soil Conservation of New South Wales. N.S.W. Govt. Printing Office. Australia.
- Emerald Hill 1:25,000 Topographic Map 8936-3S. July 2014.
- Gaynor, P. J. 1987. Kawambarai Cave: An Analysis of a Warrumbungle Stone Assemblage. B.A. Hons. Thesis. Dept. of Archaeology and Palaeoanthropology. U.N.E. Armidale. N.S.W.
- Gaynor, P. J. 1996. The Importance of Quartz in Stone artefact Assemblages. A Technological Analysis of Five Aboriginal Sites of the Coonabarabran/Warrumbungle Region. M.A. Hons. Thesis. Dept. of Archaeology and Palaeoanthropology. U.N.E. Armidale. N.S.W.
- Gaynor, P. J. 2002. The Red Chief Survey 25/3/02 - 8/4/02. A report to Mr. Phil Purcell NPWS, in connection with the Aboriginal Cultural Heritage Assessment. NSW Western Regional Assessments. Brigalow Belt South Bioregion (Stage 2).
- Gaynor, P. J. 2004. Three Seasons of Cultivating Stone Artefacts with Farming Implements in Northwest NSW. A paper given at the 2000 Australian Archaeological Association Conference in Beechworth Vic. December 2000. This paper can also be accessed at web site www.archeo.com.au
- Gaynor, P. J. 2011a. A report of the archaeological excursions to the Gulligal TSR and the scarred trees on the Old Bluevale Road near Gunnedah NSW. A report prepared for the Conservation manager (APR) NSW Department of Primary Industries.
- Gaynor, P. J. 2011b. An Archaeological survey of Lots 23, 24, 25 and 26, DP 755474 on the Wandobah Road near Gunnedah in Northwestern NSW. A report prepared for Kerry Elizabeth Pty Ltd and Plutonic Investments Pty Ltd.
- Gaynor, P. J. 2012a. An Archaeological survey of an unformed section of Torrens Road approximately 400 metres west of the Quia Road Intersection and adjacent to the Boggabri/Gunnedah. A report prepared for Mackellar Excavations, Gunnedah NSW.
- Gaynor, P. J. 2012b. An archaeological survey of the proposed extension area of the blue metal gravel pit on the property Burleith in the Marys Mount area west of Gunnedah. A report prepared for Gunnedah Quarry Products Pty Ltd Gunnedah NSW.
- Gaynor, P. J. 2013. An Archaeological survey of lot 323, DP 755503 on Hunts road near Gunnedah. A report prepared for W. Hinton and P. Minahan Gunnedah NSW
- Haglund, L. 1984a. Archaeological Survey : Coal Haulage option Red hills - Top Rocks - Trunk road 72. Gunnedah NSW . Report to Victory Joint Venture.
- Haglund, L. 1984b. Archaeological Survey of area proposed for Coal loader at Gunnedah NSW. Report to Gutteridge, Haskins and Davy Pty Ltd.

- Haglund, L. 1985. Archaeological Investigations of areas that may be affected by proposed mining of coal in the Gunnedah area, NSW. Unpublished report to the Vickery Joint Venture.
- Hamm, G. 2005. Boggabri Coal Project. Aboriginal Cultural Heritage Assessment Report. A Report to Idemitsu Boggabri Coal Pty Ltd.
- Kearey P. 1996. The New Penguin Dictionary of Geology. Penguin Books:Australia.
- Lamp, C. and Collett, F. 1999. Field Guide to Weeds in Australia. Inkata Press. Sydney.
- Manilla 1:250,000 Geological Series Sheet 1973. 1st Edition, SH 56-9
- Purcell, P. 2002. Aboriginal Cultural Heritage Assessment. NSW Western Regional Assessments. Brigalow Belt South Bioregion (Stage 2). Final Report September 2002. A Report to Resource and Conservation Assessment Council NSW Western Regional Assessments WRA 18.
- Tamworth 1:250000 Geological Series Sheet SH 56-13.
- Tindale, N.B. 1974. Aboriginal Tribes of Australia: Their Terrain, Environmental Controls, Distribution Limits and Proper Names. Australian National University Press. Canberra.
- Umwelt Pty Ltd 2008. Aboriginal Archaeological Assessment for Proposed Ethanol Bio-Refinery, Lot 11 DP 1020147, Quia Road, Gunnedah, NSW. A Report prepared for Primary Energy Pty Ltd.
- Whitten DGA and Brooks JRV 1988. The Penguin Dictionary of Geology. Penguin Books:Australia
- Wilding, J.L., Barnett, A.G., Amor, R.L 1986. Crop Weeds. Dept.of Agriculture and Rural Affairs Inkata Press, Melbourne.
- Wilson, J.M. 1994. The Use of Aboriginal Axe Quarries in the Tamworth Region and their Socio-Economic Context when Seen In Relation to the "Daruka" "Long Transfer Quarry". Unpublished Hons. Thesis. University of New England.

**PHOTOGRAPHIC RECORD
PHOTOS 1, 2 AND 3**



THE NW CORNER OF LOT 2 (FINE BLACKISH GRAVEL COVERED MOST OF LOT 2)



FROM THE SW CORNER TO THE GRASSED STRIP ON THE WESTERN EDGE OF LOT 2



**THE DRAIN SEPARATES LOTS 2 AND 3
PHOTO TAKEN FROM THE NE CORNER LOOKING WEST**

PHOTOS 4, 5 AND 6



**BARE GROUND ON THE EASTERN EDGE OF LOT 2
WITH A MIXTURE OF BROUGHT IN GRAVEL AND NATURAL STONE PRESENT**



GENERAL VIEW OF LOT 2 LOOKING DIAGONALLY FROM THE SE TO NW CORNERS.



A SMALL TREE AMONG THE TOP DRESSED LOT 2

PHOTOS 7, 8 AND 9



**THE BOUNDARY OF LOTS 1 AND 2 LOOKING EAST FROM THE SW CORNER
A ROW OF IRONBARK TREES HAVE BEEN PLANTED ALONG THE BOUNDARY**



TWO SELF SOWN TREES IN LOT 2



LOOKING NORTH INTO THE NORTHWEST CORNER OF LOT 1

PHOTOS 10, 11 AND 12



GRAVELLED AND CONCRETED AREAS BETWEEN THE MAIN SHEDS IN LOT 1



LOOKING WEST INTO THE GRAVELLED AREA IN FRONT OF THE MAIN STORAGE SHED



**THE GRAVELLED AREA AND ROW OF PLANTED TREES
EAST OF THE SHED'S AREA**

PHOTOS 13, 14 AND 15



LOOKING WEST INTO THE BARE EDGE OF THE NE CORNER OF LOT 1



LOOKING SOUTH FROM THE NE CORNER TO THE SE CORNER



**LOOKING WEST FROM THE SE CORNER
THE CARETAKER'S COTTAGE YARD IS IN THE BACKGROUND**

PHOTOS 16, 17 AND 18



**LOOKING NORTH FROM THE SE CORNER OF LOT 1
WITH SOME BARE GROUND AND SOME GRAVELLED SURFACE**



**LOOKING NORTH FROM THE ENTRANCE TO THE OFFICE AREA
THE TREES ARE NEAT THE BOUNDARY LINE**



**THE CARETAKERS COTTAGE
THERE WAS A LITTLE GRAVEL HERE BUT NOTHING OF INTEREST**

APPENDIX 1

GLOSSARY OF GEOLOGICAL AND ARCHAEOLOGICAL TECHNICAL TERMS

GLOSSARY

Unless specified otherwise, geological terms were adapted from *The Penguin Dictionary of Geology* by Whitten and Brooks 1988 and *The New Penguin Dictionary of Geology* by Philip Kearey 1996. Artefact analysis references are from Gaynor (1987, 1996) and Wilson (1995).

adamellite: a medium to coarse grained, inequigranular igneous rock. Eighty percent of the rock is composed of plagioclase, orthoclase and quartz in roughly equal amounts with 10% hornblende and 10% biotite. Adamellite occurs like granite as batholiths.

alluvium: sand or silt deposited by a river, stream or creek when it is forced to drop its suspended load as the water flow is slowed down causing it to lose the energy needed for the transport of the material.

andesitic greywacke: greywacke is a very poorly sorted marine sandstone. Andesitic greywackes are so called because they contain fragments of andesite (a volcanic/igneous rock). The andesitic greywacke from the "Moore Creek Aboriginal Axe Quarry" on the property "Daruka" has had a unique geological history which makes it ideal for axe manufacture and which makes it very easy to recognise in hand specimen.

anvil: any stone showing signs of pounding, scarring, catering, staining or crushing. Anvils were used for crushing hard seeds (such as kurrajong seeds), shaping stone artefacts in readiness for hafting, and/or as a base to carry out bipolar knapping.

aplite: a fine-grained equigranular rock composed occurs mainly as dykes or sills.

argillite: a sedimentary rock, commonly a siltstone or a mudstone, which has lost its ability to cleave along its bedding due to metamorphism. Argillites can have a conchoidal fracture.

assemblage: in stone artefact analysis the term assemblage refers to all the artefacts being analysed. These may be from a single site, from a section of a site, from a number of sites.

axe: an artefact will be classed as an axe if it has been edge-ground to produce a cutting edge and is of a shape suitable for use as a hand held or hafted axe. An artefact will also be classed as an axe if it fulfils the above criteria except for the edge-grinding but displays identifiable use-wear.

axe blank: a piece of stone of a raw material, shape and size suitable for the manufacture of an axe that has undergone some modification other than grinding (flaking, hammerdressing).

background noise: naturally broken rock or gravel which may make stone artefactual material difficult to discern.

blade: a specialised flake which is either triangular or trapezoid in cross-section and which has parallel or sub-parallel lateral margins. There can be one or more dorsal ridges which are generally parallel to the long axis of the blade. Blades are generally struck from a specialised core which has been set up for the continued production of blades (see blade core). Blades by definition are more than twice as long as they are wide. The manufacture of thin blades allows a knapper to make more flakes from a single core, thus, producing more cutting edges from the same amount of raw material.

batholith: a large mass of igneous intrusive rock.

bifacial: flakes removed from two sides of a single edge.

bipolar knapping: a method of reducing stone for cutting implements by placing the parent rock (core) on another stone (anvil) and hitting the parent rock with a hammerstone. The resulting artefact does not show signs that occur with freehand knapping (such as a positive bulb of percussion) but sheer sides. It normally has platform angles of 90° or more. There may be crushing on both ends of the artefact. It is often used when the core becomes too small for effective freehand percussion or the pebble is too small for freehand percussion.

blade: a specialised flake which is either triangular or trapezoid in cross-section and which has parallel or sub-parallel lateral margins. There can be one or more dorsal ridges which are generally parallel to the long axis of the blade. Blades are generally struck from a specialised core which has been set up for the continued production of blades (see blade core). Blades by definition are more than twice as long as they are wide. The manufacture of thin blades allows a knapper to make more flakes from a single core, thus, producing more cutting edges from the same amount of raw material.

blank: a piece of stone of a raw material, shape and size suitable for the manufacture of an axe that has undergone some modification other than grinding (flaking, pecking).

bulb of force or bulb of percussion: both terms refer to a convex bulge on the ventral surface of the flake just below its platform. The bulb is caused by the passage of the force loaded into the core when the hammerstone strikes the platform. This force travels down through the raw material causing a fracture which detaches the flake from the core. Some of the force is reflected back from the surface of the flake and this forms the bulb which is recognised as the main indicator of humanly modified stone.

cherty argillite: a very fine-grained sedimentary rock which has undergone silicification.

chalcedony: a microcrystalline variety of quartz. It can be a variety of colours depending on the material it came in contact with when formed. It is usually associated with volcanic material such as basalt or rhyolite where it fills holes or vugs in the rock. As the parent rock decays, the chalcedony is set free.

colluvium: sediments transported by rain splash, wind, creep etc. Not transported by a river or creek.

contact aureole: an area of rock where there is a change in texture or mineralogy which has been brought about by contact with heat from an igneous intrusion or lava flow. In this case it is the intruding adamellite which has caused the contact metamorphism of the older sedimentary rocks.

core: a piece of raw material from which flakes have been struck. Cores will always exhibit at least one negative flake scar

cortex: the weathered surface of a rock.

deposits: the deposits in a cave are a mixture of particles derived from the roof and walls of the cave as well as water borne or wind blown matter from outside the cave. Within these deposits may be artefacts which have resulted from the human use of the cave. The terms "deposit" and "sediment" are often interchanged.

dyke: a sheet-like body of igneous rock which cuts across the bedding or structural planes of the host rock.

equigranular: containing grains of equal size.

felsic: light coloured silicate minerals such as quartz and feldspar.

flake: a piece of stone detached from a larger mass (generally termed a core) by the application of force. Attributes of whole flakes are platforms, terminations, lateral margins, a ventral and dorsal surface and a bulb of force.

flake scar: a concave surface which has resulted from the removal of a flake

flaked piece: Pieces of worked stone which do not have attributes which allow them to be called flakes or cores ie. bulbs of percussion, PFA's or platforms, but they do exhibit at least one flake scar. Therefore, while they can not be classed as cores, flakes, or even broken flakes, they can still be recognised as an artefact.

freehand percussion: in this method of flake production the core is held in one hand and the hammerstone in the other. The hammerstone is brought down close to the edge of the core with a downward and slightly outward motion. If the core has an edge angle of less than 90° a flake of stone should be detached. Flakes removed in this manner generally have a bulb of percussion and are described as conchoidal flakes.

granitic intrusions: a body of rock which forms when magma pushes up through the existing rock strata, thus intruding it. The magma subsequently cools slowly and crystallises below the surface forming what are commonly known as plutons or batholiths. Sometimes cracks in these intrusions are intruded at a later date by other molten material. These intrusions are generally narrow or sheet-like and are referred to as dykes.

grindstone/millstone: a stone exhibiting surfaces that have been smoothed and polished from being ground. It may display grooved, dished or flat surfaces. The term millstone refers to the type of grindstone which formed the basal slab or stone being ground upon for the preparation of food. Mullers were the top grindstones that were held in the hand to do the grinding. Other grindstones were used for the preparation of cutting edges on stones axes. This is known as edge-grinding.

hammerdressed: hammerdressing is a form of artefact reduction which involves impact of the hammerstone with the surface of the artefact in a manner which removes unwanted bulk by crushing rather than by flake removal. Hammerdressing is a very slow and tedious way of reduction and is generally only seen on artefacts which have a long use-life, such as an axe. Hammerdressing is usually only employed when the raw material is intractable. It is a common method of reduction in axe manufacture as intractable raw materials are the most suitable for use as chopping implements. Hammerdressing is also often used to create the groove on axes which were to be hafted.

hammerstone: a stone used to strike another piece of stone (a core) to remove flakes.

hornfels: a medium to fine-grained metamorphic rock in which all the granules are of equal size. The hornfels discussed in this report is very hard and black to grey in colour and has been derived from a metamorphosed siltstone.

in-situ: latin for "in place". In the case of an excavation recording artefacts in-situ means that the position of the artefacts was recorded prior to their removal for analysis in the laboratory. The in-situ analysis of artefacts on the other hand refers to them being analysed in the field and left where they were found.

jasper: a variety of chert which is red in colour.

metamorphism: changes brought about in rocks within the crust of the earth by heat from contact with igneous rocks (contact metamorphism), or heat and pressure from deep burial (regional metamorphism) or from directed pressure (in fault and shear zones).

motif: in reference to rock art--a single figure or design.

muller: a hand-held stone used for grinding seed on a grindstone.

negative flake scar: the scar left on the core resulting from the removal of a flake

Permo-Carboniferous: Permo-Carboniferous refers to a geological time period which spanned the Carboniferous Period (360 to 280 million years ago) and the Permian Period (280 to 245 million years ago).

petrified wood : a fine grained siliceous rock which forms when the carbon atoms in buried wood is replaced by silica.

% cortex: The percentage of cortex left on an artefact is an indicator of the degree of reduction of the raw material.

Phenocryst: large crystals found within a finer grained groundmass.

Pleistocene: the geological epoch which encompasses the time period from the end of the Pliocene (approximately 1.8 million years ago) to the beginning of the Holocene (10,000 years ago). The Pleistocene is the part of the Quaternary Period.

plutonic: an intruded igneous rock.

poll: in reference to an axe, preform or blank the poll is the end opposite the cutting edge.

preform: an artefact reduced to an axe shape that has not been ground and does not exhibit use-wear.

quartz: a silicate mineral which is normally colourless or white but may be any colour depending on the amount and type of impurities it contains. Quartz is very hard and when crystalline will flake with a conchoidal fracture. However, crystalline quartz is rare and most quartz breaks with a ubiquitous fracture. That is, it breaks along faults and cracks in the rock. Quartz is often found as pebbles in rivers or in conglomerates and as reefs or veins in igneous areas.

rotation: when the angle on the edge of a core becomes greater than 90 degrees the core may be rotated and a new platform initiated or the core may be discarded and another core utilised. If that particular raw material is in short supply for any reason (distance to quarry, socio-cultural reason for restriction of access) then core rotation will be utilised to increase the use-life of the core. Core rotation can be recognised on flakes by the orientation of the various flake scars on the dorsal surface of the flake. Core rotation is a method for the conservation of raw material.

scree: loose rock rubble located below outcrops.

silcrete : silcrete is formed by the cementation of rock or sediments by silica via their infiltration by silica rich waters. Thus the grain size of a silcrete can vary from very fine sand to boulders. Silcretes are more than 90% silica and when knapped they fracture though, rather than around individual

granules/inclusions held within their matrix. Because of its high silica content, fine grained silcrete is an excellent raw material for making stone artefacts.

silicification: the process by which pore spaces in rocks are infilled with silica by the movement of silica rich water through them. Silicification improves the flaking quality of raw materials.

siltstone: very fine-grained sedimentary rock formed by the deposition of silt.

termination: the termination of the flake is that part of the flake that was the last to be detached from the core. Terminations vary depending on the amount of force and the direction of force loaded into the core. Figure 4 shows the five most common termination types and the scar types that they will leave on the cores from which they are removed.



The five most common flake terminations

thinning: when making a stone axe the knapper must first shape the piece of raw material and then thin it down to the appropriate thickness. The thinning stage of axe manufacture produces flakes of stone (debitage) with distinct attributes eg. crushing on ridgelines, platform angles greater than 90° and numerous dorsal flakes scars which have been initiated from several directions.

tors: large, rounded granitic boulders. When granitic rocks are relieved of the pressure of overlying rocks they begin to expand. This causes the rock to joint (crack). Jointing results in the formation of square-sided boulders. Once exposed to chemical and mechanical weathering these square sided boulders begin to exfoliate (the outer layers peel away like the layers of an onion) this eventually leads to the formation of the rounded boulders typical of granitic areas and commonly known as tors.

unifacial: flakes removed from an edge in one direction only.

use-wear: when analysing stone artefacts they are inspected too see if they exhibit any evidence of having been used for cutting, scraping, skinning, chopping etc. All of these uses result in different kinds of damage to the edge of the stone artefact such as, polish, striations (parallel scratches) and step fracturing.

ventral surface: the ventral surface of a flake is the new surface created when the flake is removed from the core.

weathered: when referring to stone artefacts weathered refers to the degree to which exposure to the elements has caused the rock to discolour and disintegrate. The more weathered the stone the more difficult it is to identify its raw material type.

APPENDIX 2

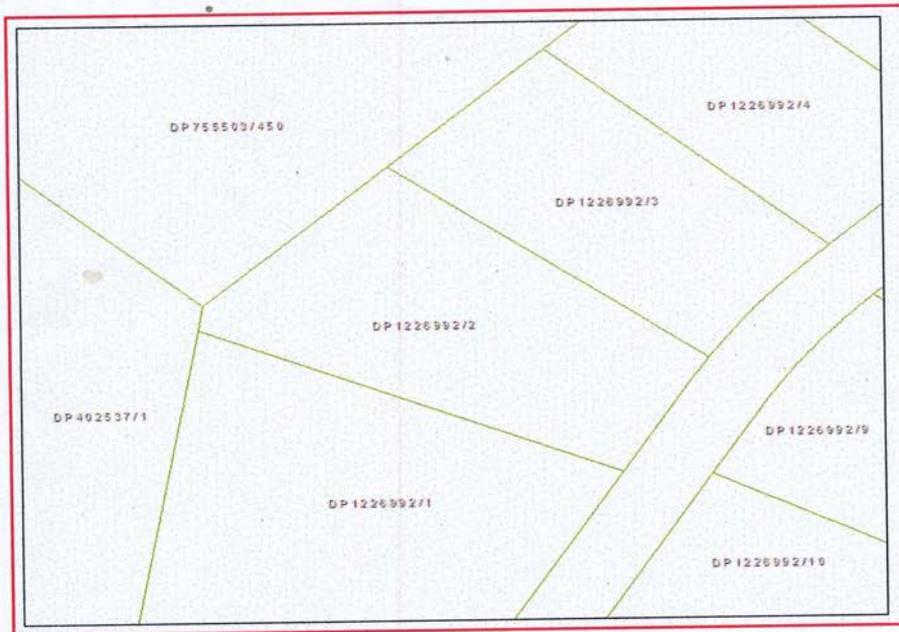
**RESULTS OF THE SEARCH
FOR ABORIGINAL SITES
ON THE AHIMS REGISTER
IN THE SURVEY AREA**

Archaeological Surveys & Salvage
P O Box 814
Gunnedah New South Wales 2380
Attention: Patrick Gaynor
Email: pjgaynor@bigpond.com
Dear Sir or Madam:

Date: 14 July 2020

AHIMS Web Service search for the following area at Lot : 2, DP:DP1226992 with a Buffer of 50 meters, conducted by Patrick Gaynor on 14 July 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

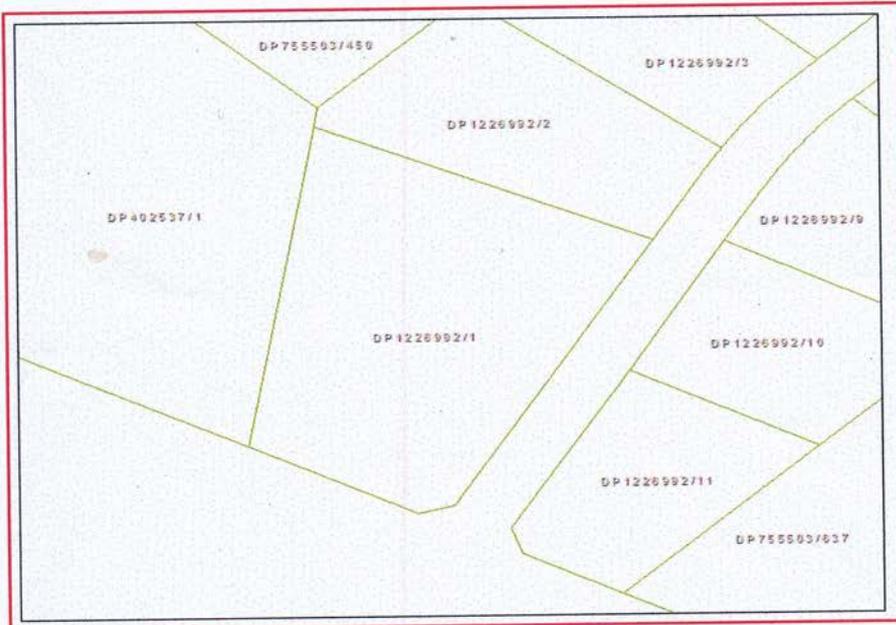
Archaeological Surveys & Salvage
P O Box 814
Gunnedah New South Wales 2380
Attention: Patrick Gaynor
Email: pjgaynor@bigpond.com

Date: 14 July 2020

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1. DP:DP1226992 with a Buffer of 50 meters. conducted by Patrick Gaynor on 14 July 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location.*

APPENDIX 3

LETTER FROM THE
RED CHIEF LOCAL
ABORIGINAL LAND COUNCIL