BULLI SEAM OPERATIONS

APPENDIX H
NON-ABORIGINAL HERITAGE ASSESSMENT

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BULLI SEAM OPERATIONS
NON-ABORIGINAL HERITAGE ASSESSMENT
(STATEMENT OF HERITAGE IMPACT)

A REPORT FOR
ILLAWARRA COAL HOLDINGS PTY LTD

BY
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1. INTRODUCTION

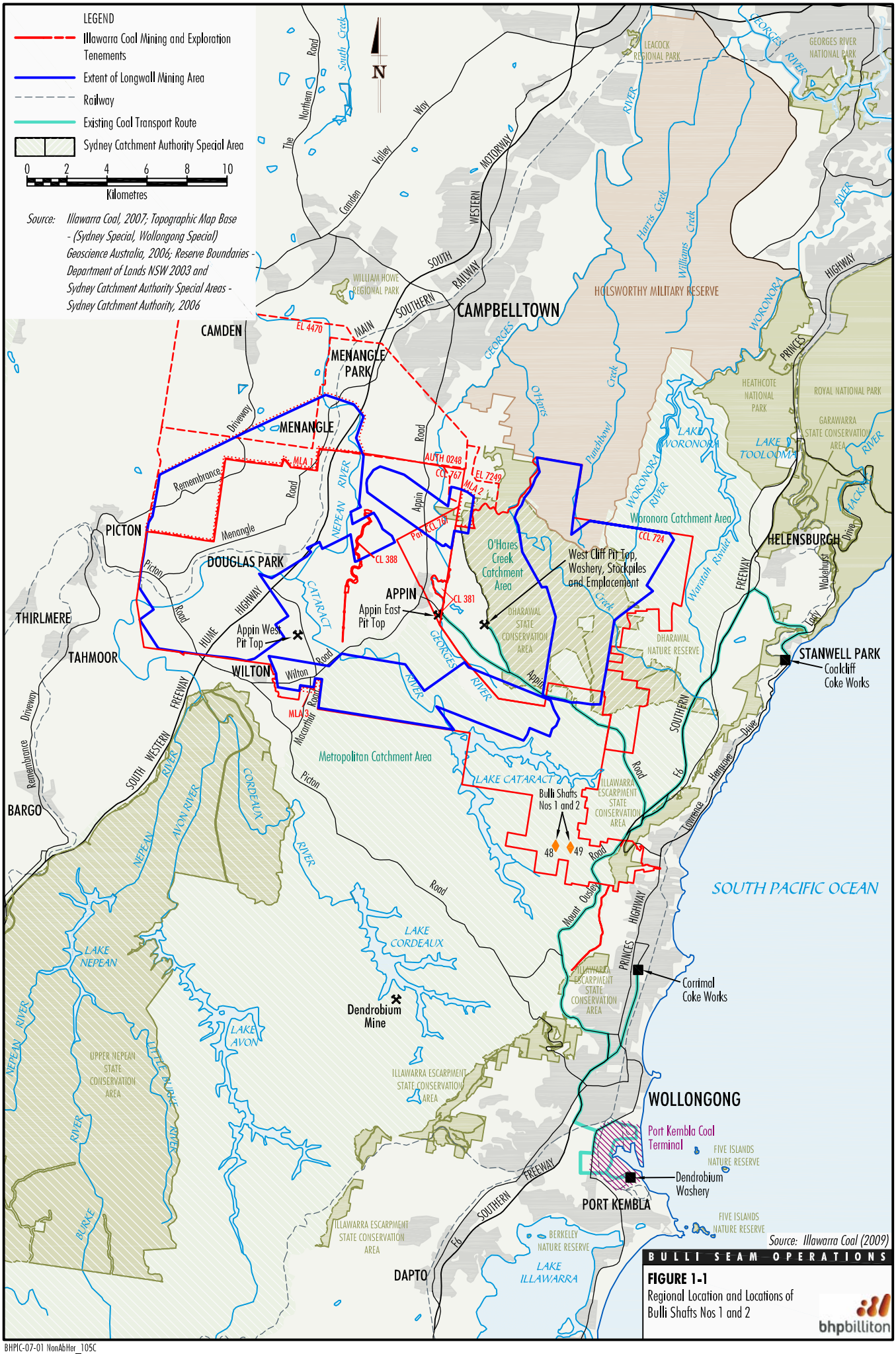
1.1 Background

Heritage Management Consultants Pty Ltd was commissioned by Illawarra Coal Holdings Pty Ltd (ICHPL) to conduct a Non-Aboriginal Heritage Assessment for the proposed Bulli Seam Operations (the Project).

ICHPL owns and operates the Appin Mine and West Cliff Colliery located approximately 25 kilometres (km) north-west of Wollongong in the southern coalfield of New South Wales (NSW) (Figure 1-1).

ICHPL is seeking approval under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for the continuation and further development of the Appin and West Cliff mining operations. The Project would (if approved) extend the current life of the Appin Mine and West Cliff Colliery by 30 years and would include the following main activities:

- continued development of underground mining operations within existing coal leases and new mining leases to facilitate a total run-of-mine (ROM) coal production rate of up to 10.5 million tonnes per annum (Mtpa);
- on-going exploration activities within existing exploration tenements;
- upgrade of the existing West Cliff Washery to support the increased ROM coal production;
- continued mine gas drainage and capture for beneficial utilisation at the West Cliff Ventilation Air Methane Project and Appin-Tower Power Project;
- continued generation of electricity by the existing Appin-Tower Power Project (owned and operated by Energy Development Limited) utilising coal bed methane drained from the Bulli Seam;
- upgrade of existing surface facilities and supporting infrastructure (e.g. service boreholes, ventilation shafts, gas drainage equipment, waste water treatment and waste water disposal);
- continued and expanded placement of coal wash at the West Cliff Coal Wash Emplacement;
- continued road transport of ROM coal from the Appin East pit top to the West Cliff Washery;
- continued road transport of ROM coal from Appin East pit top and West Cliff pit top via the public road network to the Dendrobium Washery at Port Kembla;
- continued road transport of product coal from the West Cliff Washery via the public road network to BlueScope Steelworks, Port Kembla Coal Terminal, Corrimal and Coalcliff coke works and other customers;



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- on-going surface monitoring and rehabilitation (including rehabilitation of mine related infrastructure areas that are no longer required) and remediation of subsidence effects; and
- other associated minor infrastructure, plant, equipment and activities.

A detailed description of the Project is provided in Section 2 in the Main Report of the Environmental Assessment (EA).

On 18 August 2008, the Director-General of the NSW Department of Planning (DoP) issued Environmental Assessment Requirements (EARs) for the Project under Part 3A of the EP&A Act. The EARs stated that the EA prepared for the Project should include:

> *Heritage – including the potential Aboriginal and Non-Aboriginal heritage impacts of the Project.*

The EARs also made reference to the following two guidelines of relevance to non-Aboriginal heritage:

- NSW Heritage Manual (NSW Heritage Office and NSW Department of Urban Affairs and Planning [DUAP]); and
- Burra Charter (The Australian International Council on Monuments and Sites [ICOMOS] charter for places of cultural significance).

This Non-Aboriginal Heritage Assessment has been prepared in accordance with the EARs.

As outlined in the document *Statements of Heritage Impact* (NSW Heritage Office and DUAP, 2002) the NSW Heritage Council requests that every development proposal that requires Heritage Council consideration, be accompanied by a Statement of Heritage Impact (SOHI). A SOHI, together with supporting information, addresses (NSW Heritage Office and DUAP, 2002):

- why the item is of heritage significance;
- what impact the proposed works will have on that significance;
- what measures are proposed to mitigate any potential negative impacts; and
- why more sympathetic solutions are not viable.

Such a SOHI is provided below.

1.2 Authorship

The research, field recording and assessment for the SOHI have been undertaken by Dr Michael Pearson of:

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Dr Pearson has over 30 years of experience in heritage management and assessment and is a member of *Australia ICOMOS*; the *Australian Society for Historical Archaeology*; and the *Professional Historians Association* (NSW) *Australian Mining History*. He is Adjunct Professor in Cultural Heritage Management at the University of Canberra.

1.3 Acknowledgements

The assistance of the following people is gratefully acknowledged:

- Martin Cooper, Wollondilly Shire Council (WSC);
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- Paul Ryan; and
- Matthew Tyrrell.

2. HISTORICAL OVERVIEW

This section presents a historical overview of early European settlement (Section 2.1), development of key buildings and townships (Section 2.2), transportation and water management infrastructure (Section 2.3), and coal mining (Section 2.4) within the Project area and surrounds.

Heritage items within, or in close proximity to, the Project extent of longwall mining area or potentially affected by Project surface development are highlighted where relevant in **bold** below.

Figure 1-1 shows the extent of longwall mining area for the Project.

2.1 Early European Settlement[1]

The area in which the settlements of Camden and Menangle were established had a very long involvement in the story of European settlement in NSW. A supply of cattle was brought to the new colony from the Cape of Good Hope with the First Fleet in January 1788, and by as early as July 1788 two bulls and four cows had strayed from the Government herd. The cattle moved slowly southwest, and finding good grazing land began to reproduce. The earliest explorers into the area, Tench, Dawes and Worgan in 1790, claimed to have reached the headwaters of the Nepean, but did not comment on the cattle (Tench 1979: 174-5).

Exploration parties led by Governor Hunter in 1795 and 1796 found abundant wild cattle near Campbelltown, and the area became known as the 'Cowpastures'. Hunter was impressed with the quality of the soil, timber and water in the district.

In 1802 Francis Barrallier explored the area, and botanist George Caley mapped the Cowpastures and camped at Menangle. The area became a Government Reserve for the purpose of raising stock, and the first residence for constables minding cattle called 'Cowpastures House' was completed in early 1805 at Elderslie, near the ford crossing of the Nepean River near the present Narellan (Mylrea 2000; Sidman 1995: 5). Government stockyards were established at The Oaks, Picton and Cawdor in about 1818 (Mathias nd: 11).

During a visit to Britain during which he publicized the prospects for an Australian wool industry, John Macarthur was promised a land grant to encourage his pastoral endeavours, and on his return in 1805 he was granted 5,000 acres and fellow lobbyist Walter Davidson 2,000 acres at Cowpastures (Massy 1990: 27-28; Hardie & Pratt 1958: 89). Macarthur named his land on the banks of the Nepean *Camden Park*.

[1] This history draws in part on earlier work in the district, including Biosis Research 2006; Navin Officer 2006; and other sources as referenced.

Davidson later sold his grant, which he had named *Manangle*, to Macarthur who absorbed it into *Camden Park*. Macarthur made the first export of saleable wool to Britain when he dispatched 245 lbs in 1807 (Massy 1990: 30-32). Elizabeth Macarthur became de facto stud master of the flock during her husband's nine year absence following the Rum Rebellion (1808-1817). She introduced the first systematic breeding programs with the maintenance of good stud records, while John Macarthur handled the marketing in Britain after about 1811, and corresponded on the needs of the market (Massy 1990: 40-41).

When Governor Macquarie visited the area in 1810, he chose the site of Liverpool and named the district around present-day Campbelltown *Airds* after the family estate of his wife Elizabeth (an estate situated near the village of Appin in Scotland where Elizabeth was born). Between 1810 and 1820, most of the land made available was of a size deemed suitable for farming.

By 1811, there were 107 settlers in the district. Continuing expansion of the frontier to the south-west and the extent of local development suggested the need for centralised services and for a staging post to accommodate through-traffic. The road from Liverpool to Appin was surveyed by government surveyor James Meehan in 1815, and he probably reserved the town site that became Campbelltown at the same time. Campbelltown, named by Governor Macquarie in 1820 in honour of his wife's maiden name (Campbell), became a centre on the main route to the south-west grazing plains. The road also linked with the road through Appin to the Illawarra. The town of Camden was not established until the 1830s.

The farms surrounding Campbelltown engaged mainly in mixed farming, growing crops and grazing animals, supplying the Sydney markets. The larger holdings focused on the grazing of sheep and cattle. The growing of fruit and grapes for wine was common, though many of the vineyards were destroyed in the 1890s. From the 1840s to 1880s Campbelltown prospered from the production and milling of wheat (represented by the mill at Mount Gilead), initially on small holdings by the river, then on larger blocks, until floods and stem rot in the 1860s ravaged the crops. Grain production had ceased by the 1880s. Ploughlands and crop marks from wheat cropping are reported at Windmill Hill, Appin (Mathias nd: 12).

2.2 Development within the Study Area

Menangle

A later development on the **Camden Park Estate** was a series of dairies set up in the late nineteenth century, one of which, **Dairy No. 4**, is within the area under study. The Macarthurs also set up a small private village on this land in the late nineteenth century and named it Menangle after the original grant.

Camden Park Estate made application for a school in 1849, and a church school was established. The locality was initially known as Riversford, which later changed to Menangle. Pressure for a public school culminated in 1869-71 when a public school was opened, with an enrolment of 43 pupils. New school buildings were erected in 1906 (Menangle School 1961).

The construction of **St James Anglican Church** commenced at Menangle in 1876, as part of the **Camden Park Estate**, and the church was handed to the Diocesan Property Trust in 1923. The chancery sanctuary and tower were built to the design of John Sulman in 1898, to harmoniously blend with the earlier section of the church built to Horbury Hunt's design. The organ in the church was built in 1876 in London and purchased by Mrs Elizabeth Macarthur-Onslow for the church in 1902 (Parish of Camden 1975; Hawkey 1976.).

The **Menangle Railway Station** was built on the new line south from Sydney in 1863, and became a focus for village development. The **Camden Park Estate Central Creamery** was built by the Macarthurs adjacent to the railway station in 1898, as part of their development of a dairying industry. The Creamery initially separated milk for the sweet cream trade in Sydney, and from 1929 became the Depot for receiving whole milk for city distribution. The **Camden Park Rotolactor** was built near the Creamery in 1952, an innovative design that automated components of the milking process, and operated until 1983.

St Patrick's Catholic Church was built in 1895 to service the local Catholic community. The **Menangle Store**, built in 1904, to the design of the prominent architect firm Sulman and Power, acted as a buying agent for all provisions, stores, seed, fertiliser and fuels used on *Camden Park* right up to the 1970s, and, having a liquor license, was a centre for community gatherings. Sulman and Power also designed the 1895 **Menangle Gate Lodge** for *Camden Park*, west of Menangle on Woodbridge Road, one of a pair, the other being located at the northern end of the property, and **Gilbulla**, a large homestead built for Major-General the Hon. J.W. Macarthur-Onslow as a home for his family.

During the late nineteenth and early twentieth centuries a range of cottages were built at Menangle for those working in the various *Camden Park* enterprises. Many of these survive and are proposed by WSC for heritage listing individually and as part of the **Menangle Conservation Area** (see Attachment A).

Appin

Macquarie named Appin after his wife's birthplace in Scotland, and made the first land grant there, of 1000 acres, to Deputy Commissary General William Broughton in April 1811. At the same time John Kennedy (Broughton's brother-in-law) was granted 200 acres at *Teston Farm* (Browne 1949: 70; Whitaker 2005: 6). Broughton named his new holding *Lachlan Vale* after the governor. The following year Macquarie gave 400 acres to Andrew Hume (*Hume Mount*), and in all six settlers were given grants in the district in 1811-1812, and another 22 were made in 1815-1816 (Whitaker 2005: 6). Andrew Hume's sons, John and Hamilton, undertook local exploration in the area from Picton south to Moss Vale in 1814, and as far as Goulburn Plains in 1816. Hamilton Hume was granted 300 acres at Appin for this work, which he named '*Brookdale'*, and in 1824 the Hume and Hovell expedition to Port Phillip left from this property on the Appin Road north of the village, near where the **Hume and Hovell Monument** now stands. The Hume Monument was erected in 1924 by the Royal Australian Historical Society to commemorate Hume's 1824 expedition (Parramatta & District Historical Society 1967).

The arrival of settlers in the region around Appin and new competition for resources began to restrict the freedom of movement of the Dharawal Aboriginal occupants from around 1813, made worse by severe drought in 1814 and 1816. By 1814 large numbers of displaced Aboriginal people had begun to congregate in the Appin area in search of food and other resources. They resorted to gathering maize crops as they ripened. In May 1814 three members of the Veteran Company militia fired on a group gathering corn and killed an Aboriginal boy. The Aboriginal men in the party attacked the militia members before they had time to reload, killing one of them. The survivors gathered local settlers and returned, killing a woman and two children while they slept. The next day the Aborigines retaliated, killing a male and female stockkeeper (Liston 1988: 19; McGill 1994, quoted in Biosis Research 2007).

Continuing trouble, with killings on both sides, resulted in Governor Macquarie sending a punitive military expedition in 1816. On 17 April 1816 the military found and pursued a group of Aborigines, and fourteen Aboriginal men, women and children were shot or driven over a cliff to their deaths, in an event known as the 'Appin Massacre'. The exact site of the massacre is not known, but it was on Broughton's land near Appin (Liston 1988: 19-23; Whitaker 2005: 11-12). Further information on Aboriginal heritage in the Project area is provided in the Aboriginal Cultural Heritage Assessment completed by Biosis Research (Appendix G of the EA).

The village of Appin was formally surveyed by surveyor Walker Davidson in 1834 (Whitaker 2005: 22). Grain was a major crop in the district from the 1820s, and mills were built at *Mount Gilead* near Menangle by Thomas Rose in 1836, and at *Windmill Hill* near Appin by Edward Larkin in 1846. Following the collapse of wheat in the region due to rust in the 1870s, dairying became a major landuse in the Appin area, introduced by Edward Hume Woodhouse, owner of *Mount Gilead* from 1867. The production of cream and oaten hay were primary landuses around Appin until about 1917, the cream being treated in a butter factory at Appin until 1898, thereafter being sent to the **Camden Park Estate Central Creamery** at Menangle (Whitaker 2005: 30-31). After 1917 milk was sent raw to the Dairy Farmers Co-Operative Milk Company in Sydney, by cart to Campbelltown then by train (Percival 1992: 29). The last dairy in Appin, Morrison Brothers Dairy located on Brooks Point Road (formerly *Teston*) closed in 2003 (Whitaker 2005: 32). Orcharding was a later development, peaking in the 1950s.

Douglas Park

Douglas Park was named after Arthur Douglass, the eight year old son of Dr Henry Gratin Douglass, who was granted 800 acres there in 1822. Dr Douglass came to Australia in 1821 and was the doctor in charge of the Parramatta Female Factory (the industrial prison housing female convicts). Douglass died in 1865 and was buried at St John's Church, Camden. Arthur Douglass named his estate Hoare Town and to fulfil the terms of the land grant lived there for three years with his mother (Mylrea 2000: 12, Wrigley 1988: 8). As the Hoare Town land grant was sold and sub-divided the area became known as Douglass's Park. This became Douglas Park, a name officially adopted by council in September 1904. (Sidman 1995: 53).

The second land grant in the area of Douglas Park was to Jean Baptiste Lehimaz De Arrietta (also known as D'arriete) on 9 July 1822. Governor Thomas Brisbane granted De Arrietta, a Spaniard, 2000 acres of land. The land was known as **Morton Park** (also Morton Park Estate) and was bounded to the northwest by the extensive land grants of John McArthur, to the west by Harris Creek, to the east by the Nepean River and to the southwest by the 320 acres granted to Arthur Douglass (Mylrea 2000: 10-12). Spaniards Hill, on the western side of Harris Creek, was named for Arrietta, and was the site of the first school in Douglas Park, a Catholic school established in1862 (Douglas Park Public School 1983: 10).

Notes accompanying the Colonial Secretary's papers describe De Arrietta as a native of Spain who arrived in Sydney as a free settler on the *Duke of York* in 1821 (Colonial Secretary papers microfiche). It was also noted that De Arrietta was in Spain during the Peninsular War helping the British Army with stores and some spying. He went to England, asked for payment and was promised a grant of land if he came to NSW. The land grant was made to him in consideration of the amount of capital he brought to the country and to foster his intention to cultivate the vine (Sidman 1995: 8).

The conditions of the land grant were that the land not be sold or alienated for the period of five years and that he took 20 convicts to assist with the clearing and farming (Mylrea 2000: 8-9). Arrietta grew tobacco, but the crop was a failure, and he began to sell off his land by the 1830s (Wrigley 1988: 8).

In 1831 Samuel Terry, a former convict, bought up the land. In 1865 Ellen Rozetta Hughes (Terry's niece) and her husband J. Hughes built the existing *Morton Park* homestead. Ellen Rozetta Hughes married Franklin McMullen after her husband's death in 1868, and retained the property of **Morton Park** as well as other land holdings in the area. The homestead was renamed **Mountbatten** in the 1940s, after Lord Louis Mountbatten, but reverted to *Morton Park* in the 1980s.

In 1834-5 Sir Thomas Mitchell, Surveyor-General, acquired 3810 acres (1524 hectares) south of Douglas Park, with a frontage on the Nepean opposite Morton Park. Mitchell built a homestead on the land in 1842, after he returned from four years abroad. The Mitchell family occupied the house, named **Parkhall**, in 1845. Dr Richard Jenkins bought the property in 1860, and renamed it *Nepean Towers*. After Jenkin's death in 1883 the property was sold to John Wetherell, then in 1904 the land was subdivided and half the land went to the Missionaries of the Sacred Heart, who changed the name of the mansion to **St Mary's Towers**, the name it is still known by (Proudfoot 1977: 65).

The small village of Douglas Park grew up near Morton Park. The Post Office at Douglas Park was opened in 1860, and the railway reached there in 1863, the station opening in 1869. The telephone line was extended from Campbelltown to Douglas Park in 1904.

Wilton/Razorback

In 1822 Major Henry Colden Antill was granted 2,000 acres at Stonequarry Creek by Governor Macquarie. He called the property 'Wilton Cottage' and later 'Jarvisfield' after Macquarie's estate on the Isle of Mull which had in turn been named in memory of Macquarie's first wife, Jane Jarvis. The private village of Picton developed on Antill land before becoming a government town laid out in 1845.

The homestead complex of Jarvisfield, on the outskirts of Picton, is now a golf course, but the Antill property is represented by the surviving **Razorback Inn**, built in about 1850 on four acres sold by H.C. Antill to Oliver Whiting, ex-convict and servant of the Antill family. Another part of Jarvisfield in the study area is **Berkeley Lodge**, originally known as Rose Cottage Farm, or Farrington Lodge, the home of Dr. MacDonald, who was Clerk of Petty Sessions by at least 1841. Soon afterwards, William Berkeley Campbell was living there, having arrived to tutor the Antill children. The Razorback area was occupied in conjunction with the opening up of the Picton area, as the main road south then crossed the Razorback Range.

Wilton was on another road to the southern tablelands, and its development was influenced by the establishment of Thomas Mitchell's Parkhall (see under 'Douglas Park' above), the village being laid out in the late nineteenth century. **Wilton Park,** an area previously owned by colonial poet Charles Tompson, was bought by Samuel Hordern, of the Sydney merchant family, in the 1880s, and became the centre for Hordern's horse breeding, while Retford Park in Bowral, bought in 1887, was used to breed Jersey and Ayrshire cattle. The stables group at Wilton Park was built about 1892, the property becoming one of the leading horse breeding studs in Australia.

2.3 Transportation and Water Infrastructure

In October 1811, Macquarie proposed the construction of a road from Sydney to Liverpool. By 1814, this road had been constructed and soon extended to Appin (Liston 1988: 10). It was little more than a dirt track but was to become an important communication corridor to the area. Campbelltown became a cross roads for movements to Sydney, Appin, Illawarra, Picton, Narellan, Camden, Penrith and Nattai. Before the South Coast Railway linked the Wollongong to Sydney in 1887, Appin was a staging post for people travelling to the Illawarra, either by road or by train to Campbelltown (after 1858) or **Menangle Railway Station** (after 1863) then on by road.

The main southern road through the study area, which became the general line for the later Hume Highway, took a route over the Razorback, not recommended by Surveyor-General Mitchell, along the line of what is now Remembrance Drive. Mitchell's preferred route through Menangle was more-or-less revived for the Hume Freeway in the 1980s. **Wooden Mileposts** from 1926 remain along the road (one is near the Razorback Road/ Remembrance Drive junction).

The history of roads to the coast from Appin is a little more confused in the histories. Charles Throsby cut a rough track, regarded as unsuitable for cattle and wagons, from Appin to Bulli in 1815. A slightly better road from Appin to the Illawarra was initially a droving track marked by Cornelius O'Brien in 1821, and is probably the route shown on Surveyor-General Mitchell's 1834 map of the colony, that ended near Bulli (though Whitaker [2005: 14] claims O'Brien's track was via Mount Kiera). A new road was commenced by Mitchell in 1834 which ran from Appin through Broughton's Pass to Mount Kiera. The O'Brien's route appears to have been upgraded in 1838, after the discovery of a route down Bulli Pass to the coast, and became the favoured route from Campbelltown to the Illawarra. A daily mail service operated from Campbelltown to Wollongong via Appin and Bulli from 1838 (Whitaker 2005: 18).

The first section of the southern railway, from Redfern to Parramatta, was completed towards the end of 1855 and was extended to Campbelltown by May 1858, and Menangle in 1863. The railway reached Goulburn in 1869 with some substantial bridge constructions along the way but from 1858-1869 Campbelltown was the effective terminus. There were no established towns on the line. The line to Campbelltown was electrified in 1968. The line continues to be an important link for the development of the area for country and urban movements. Access to the railway line determined the viability of the **Maldon Cement Works** from 1948.

The Upper Canal, Upper Nepean Water Supply Scheme

By 1867 the Sydney water supply was in a precarious position, and a number of possible schemes were investigated. The Upper Nepean River was selected. The scheme was staged, with:

- a weir to be built at Pheasant's Nest just below the junction of the Avon and Cordeaux Rivers, a portion of the flow to be directed by tunnel (**Nepean Tunnel**) to connect with the Cataract River;
- a similar weir at Broughton's Pass (**Broughtons Pass Weir**) on the Cataract River to receive the water from Pheasant's Nest Weir, and from there to be directed into the 36 mile long **Upper Canal**, consisting of tunnels, open canals and aqueducts;
- a storage reservoir at Prospect, the end of the **Upper Canal**;
- a five-mile canal from Prospect to Guildford (now Pipe Head Reservoir) (the Lower Canal); and
- then iron pipelines to distribution reservoirs at Potts Hill and Crown Street (Aird 1961: 15-16).

The **Upper Nepean Scheme** commenced in 1880, and was completed in 1888 at a cost of £2,076,313. A temporary relief for Sydney was provided during construction by the Hudsons' temporary scheme, which built dams on side tributaries of the **Upper Canal** to provide temporary water flow to Prospect Reservoir, a scheme completed in 1886. The temporary dams were dismantled after the main scheme was completed (Aird 1961: 18-19).

From 1888, water was also supplied to Campbelltown from the scheme (Campbelltown City Council 1998:14).

The initial Upper Nepean Scheme was estimated to meet the requirements of a Sydney population of 540,000, but by 1902 the population had reached 523,000, and a severe drought was impacting on the water level in Prospect Reservoir, dropping it below the level of the Lower Canal and requiring construction of pumps to deliver water into the Canal. A new enquiry was held to find an augmented water supply. The solution was to build a dam at the Cataract River, and this was authorised in 1902, foundations were in place by the end of 1903, and the **Cataract Dam** was completed at the end of 1907 (Aird 1961: 26-27).

Because the rainfall from 1907 to 1911 was unusually low, the need for back-up storage became evident, and in 1911 the Board selected a site for a dam on the Cordeaux River. However, rainfall increased over subsequent years, and planning for the new dam was put on hold until 1918. At that time it was decided to proceed also with dams on the Avon and Nepean Rivers, in sequence. Cordeaux Dam was completed in 1926. Avon Dam was commenced in 1921 and completed in 1926 soon after the Cordeaux, and the Nepean Dam (Warragamba) was commenced in 1925, and completed in 1935 (Aird 1961: 28-30).

Care and maintenance of the **Upper Canal** in particular, was in the hands of inspectors and maintenance men. They were housed along the Canal in cottages, owned and maintained by the Sydney Water Board. Initially, the men walked or used horses to patrol the length of the Canal assigned to them. By the late 1890s, a gradual process of adding roadways along the Canals was under way. During the cooler months when demand for water was lower and requirements could be supplied from water impounded at Prospect, repairs and maintenance were carried out on the **Upper Canal**. The sides were regularly cleaned, and, by the 1900s, some lengths were being relined (Higginbotham *et al*.1992:10-41; see also Aird 1961).

The **Upper Canal** of the Nepean Water Supply Scheme, which passes through parts of the study area, was built of a variety of materials and section profiles depending upon the nature of the country through which it was passing. Where the ground was soft, the Canal was 'V'-shaped and the sides were pitched with shale or sandstone slabs. In other sections, a 'U'-shape was utilised and the sides were walled with sandstone masonry, or, if cut into solid rock left unlined. Where the Canal crossed creeks or large depressions, such as Woodhouse and Nepean's Creeks, the water was carried across in wrought iron inverted syphons resting on stone piers. As well as bridges constructed over major roads, 'occupation bridges' were erected to allow property owners with land severed by the Canal access between parts of their holdings (Higginbotham *et al*. 1992: Navin Officer 2006).

2.4 Coal Mining

Coal deposits in the Illawarra, near Coalcliff, were first documented by George Bass in 1797. The extension of the seams to the Appin area was recognised in the proclamation of the State Coal Mine Reserve in November 1926, a reserve that encompasses the present West Cliff Colliery site, where mining commenced in 1976. The Appin Colliery commenced operations in 1962. Both mines have experienced change over time, and it is not considered that either has elements that are of substantial heritage significance.

Bulli Colliery commenced operations in 1859, supplying export coal to Shanghai by August of 1863. In 1925 ***Bulli No. 1 Shaft*** was commissioned and retained its role as the main upcast shaft until mine closure in 1987. (Note: The information in this section is drawn from Sheldrill Pty Ltd, 2008. *Bulli Colliery; Bulli Colliery shafts Nos 1, 2, 3 & 4, A review*.) Bulli No.1 Shaft was reported as being the first coal mining shaft in Australia to be concrete lined and the first in the world to utilise the method where the concrete falls direct from the mixer at the surface to the bottom for the total depth. Two lines of wooden boxes, each having a cross section of 64 square inches (413 square centimeters [cm^2]), conveyed some 250 tons of cement from collar to shaft lining (Illawarra Merc. 24/07/1925).

On 14 January 1939, a bushfire ignited and subsequently destroyed the headgear and winding plant. It was replaced by a brick and steel structure (Mines Department, 1939). This apparently refers to the existing reinforced concrete and brick superstructure, complete with engine house (now defunct) and cage (still on site). Circa 1955/56 the original 98" Sirocco fan was replaced with the 157" Aerex axial flow fan from the Nebo Mine. This time frame is supported by several BHP Engineering drawings relating to the installation and dated 1955 and the fact that the two Nebo Calyx shafts were commissioned in 1955/56.

Due to deterioration caused by water and damage suffered during an earth tremor in April 1961 a 30' (9.14 metres [m]) section, some 70' (21.34m) above the Bulli Seam, was lined with 15'-6" (4.72m) diameter steel casing. In 1963 the shaft was relined by Cram and Sons Pty Ltd to 15' (4.57m) diameter with 6" (150 millimetres [mm]) of concrete.

In 1985, still equipped with the 157" Aerex axial flow fan from Nebo Colliery, it was the main source of ventilation for the colliery. The shaft was decommissioned in 1987, capped by BHP and a Certificate of Inspection as being "sealed to satisfaction" issued by the Department of Mineral Resources in March, 1988.

Australian Iron & Steel Ltd purchased the mine from the liquidators of the Bulli Colliery and Coke Works in 1936. 1940 saw the ***Bulli No. 2 Shaft*** commissioned as a downcast shaft however the sinking headframe still remains in place. The site was the location of a main 33/3.6kV substation supplying power to the underground workings via suspended cables within the shaft and the No.1 shaft site. It would appear that this may also have been the entry point for the machinery and equipment when the mine was mechanised in the 1950s. The shaft appears to have been repaired prior to the commencement of the sinking of No. 3 Shaft on 21 January 1964. The shaft was decommissioned in 1987, capped by BHP and approved by the Department of Minerals in 1988.

Bulli No. 3 Shaft was completed in 1964 and was initially intended as an upcast shaft to provide ventilation to the workings north of the 300' fault in ML6. Although equipped with a fan it is doubtful that it ever acted in its intended role. Upon cessation of production in 1987 the shaft was still equipped with this fan. This was also the proposed site of a new pit top to be established during 1983/4. Only conceptual plans were ever developed. The shaft was decommissioned in 1987, capped by BHP and approved by the Department of Minerals in 1988.

The sinking of Bulli No. 4 Shaft was aborted at 18m depth in 1985 with the decision to cease production at the mine. The shaft was backfilled and the site abandoned.

The Bulli Colliery closed in May 1987. Bulli Colliery entries were sealed and approved in 1988. In 2004 the pit top site was sold and subsequently the rehabilitation of the pit top sites was completed in 2005. Following the rehabilitation of the powerlines from Greenhills to Mt Ousley road it has been decided that the 23 km of redundant power lines from Mt Ousley road to the Bulli ventilation shaft sites undergo assessment for rehabilitation.

3. HERITAGE ITEMS POTENTIALLY AFFECTED BY THE PROJECT

Many items within the Project extent of longwall mining and surrounds have been previously listed in the Wollondilly Local Environment Plan (Wollondilly LEP). More have been identified for consideration in a review of the Wollondilly LEP in early 2009. These have been inspected, at least externally, as part of this Non-Aboriginal Heritage Assessment.

Table 3-1 lists the items with recognised heritage significance located within the Project extent of longwall mining area and surrounds and relevant heritage register listings (e.g. State Heritage Inventory Database [SHI DB]). No LEP listed items are located in the North Cliff area.

Table 3-1
Identified Heritage Items within 600m of the Project Extent of Longwall Mining Area[1]

Item Number	Item Name and Address	Heritage Register	Map Coordinates (MGA)	Summary of Heritage Significance[2]
Menangle				
1	Menangle Rail Bridge and Viaduct, Nepean River, Menangle	• State Heritage Register Listing No. 01047. SHI DB No. 5012102. • Menangle Viaduct, Wollondilly LEP. SHI DB No. 2690059. • Wollondilly Heritage Study. • Menangle Underbridge, S.170 State Agency Heritage Register, State Rail Authority. SHI DB No. 4440315, 4440500. • Register of the National Estate No. 3284.	291900E 6222450N	1863, first large iron bridge in NSW and rare type, oldest bridge on rail system, of landscape value and historical association with economic development of southern part of colony. State and national significance.
2	Menangle Weir, Nepean River, Menangle	• Sydney REP No. 20 - Hawkesbury-Nepean River. SHI DB No. 3032.	291850E 6222420N	Significant locally as an intact example of a simple weir structure for agricultural purposes, built in response to Upper Nepean Water Scheme taking water from the river upstream in 1886.
3	Menangle Railway Station Group, Station Street, Menangle	• State Heritage Register No. 01191. SHI DB No. 5012101. • State Rail Authority Section 170 Register, 4440267. • Wollondilly LEP. SHI DB No. 2690060 ('Railway Station'). • Wollondilly Heritage Study. WO0060.	291980E 6221610N	One of the earliest station complexes to survive in the state, and of important design. State and national significance in conjunction with Menangle rail bridge.
4	Menangle Store 57 Menangle Street, Menangle	• Wollondilly LEP. SHI DB No. 2690090. • Wollondilly Heritage Study.	291480E 6221400N	Local historical significance as the only 20th century store in Menangle Village, serving local farmers and the Camden Park Estate. Unusual in the state as an unusual example of a "Federation Arts & Crafts" style shop. Aesthetic significance as landmark in Menangle.

Table 3-1 (Continued)
Identified Heritage Items within 600m of the Project Extent of Longwall Mining Area[1]

Item Number	Item Name and Address	Heritage Register	Map Coordinates (MGA)	Summary of Heritage Significance[2]
Menangle (Continued)				
5	Elizabeth Macarthur Agricultural Institute (formerly Camden Park Estate) [part] Woodbridge Road, Elizabeth Macarthur Avenue, Menangle.	• State Heritage Register No. 00341. SHI DB No. 5045133 (Camden Park). • State Heritage Register No. 01697. SHI DB No. 5051536 (Camden Park Estate and Belgenny Farm). • Wollondilly LEP. SHI DB No. 2690002 (Elizabeth Macarthur Agricultural Institute). • Wollondilly Heritage Study. • S.170 State Agency Heritage Register (Dept of Agriculture). • Sydney REP No. 20 - Hawkesbury-Nepean River. • Register of the National Estate No. 3249.	289400E 6222500N	State and national social, historic, scientific and aesthetic significance. The oldest surviving sheep stud in Australia. Only parts of the place are in the Project area.
6	Menangle Gate Lodge (Camden Park) 46 Woodbridge Road, Menangle	• State Heritage Register No. 2690098 (part of Camden Park Estate). • Wollondilly LEP. SHI DB No. 3040024, 2690098. • Wollondilly Heritage Study. • S.170 State Agency Heritage Register (Dept of Agriculture).	290650E 6221710N	Local and regional historical significance as one of the pair of gate lodges built for the Camden Park Estate. Aesthetic significance as an attractive and largely intact example of an "Arts and Crafts" style estate cottage in an attractive rural setting.
7	Dairy No. 4 (Camden Park) EMAI Woodbridge Road, Menangle	• State Heritage Register No. 00341. SHI DB No. 5045133 (Camden Park). • State Heritage Register No. 01697. SHI DB No. 5051536 (Camden Park Estate and Belgenny Farm). • Wollondilly LEP. SHI DB No. 2690002 (Elizabeth Macarthur Agricultural Institute) 3040025 (Dairy No. 4). • Wollondilly Heritage Study. • S.170 State Agency Heritage Register (Dept of Agriculture). • Sydney REP No. 20 - Hawkesbury-Nepean River. • Register of the National Estate No. 3249.	290200E 6221820N	Locally historically significant in illustrating the changing nature of dairying activities on the Camden Park Estate in the late 19th and early 20th centuries. A landmark feature of aesthetic value.
8	Camden Park Estate Central Creamery Station Street, Menangle	• Wollondilly LEP. SHI DB No. 2690294 and 2690729. • Wollondilly Heritage Study.	291960E 6221710N	Regionally significant as evidence of the scale of dairying activities carried out to supply Sydney's needs in the latter part of the 19th century and in the 20th century, and for its associations with the Camden Park Estate.
9	Camden Park Rotolactor Station Street, Menangle	• Wollondilly LEP. SHI DB No. 2690295. • Wollondilly Heritage Study.	291910E 6221710N	State historical significance as evidence of the post-WWII mechanised phase of dairying activity in the Sydney Region, being the second facility of this type and scale in the world.

Table 3-1 (Continued)
Identified Heritage Items within 600m of the Project Extent of Longwall Mining Area

Item Number	Item Name and Address	Heritage Register	Map Coordinates (MGA)	Summary of Heritage Significance[2]
Menangle (Continued)				
10	St James Anglican Church 131 Menangle Road, Menangle	• Wollondilly LEP. SHI DB No. 2690091. • Register of the National Estate No. 3301.	291630E 6221200N	Significant in the State as an unusual and particularly fine example of a small country church of great architectural integrity and quality. Historical associations with the Macarthur family, and of local landscape significance.
11	St Patricks Catholic Church 119 Menangle Road, Menangle	• Wollondilly LEP. SHI DB No. 2690097. • Wollondilly Heritage Study.	291490E 6221320N	Local social and historic significance through its associations with the Roman Catholic community in the Menangle area since 1895, and aesthetic contribution to Menangle landscape.
12	Gilbulla (Anglican Conference Centre) 710 Morton Park, Road Menangle	• Wollondilly LEP. SHI DB No. 2690092. • Wollondilly Heritage Study.	292100E 6220160N	Locally and regionally significant for its associations Macarthur family and as an outstanding example of a Federation Arts and Crafts residence on a grand scale.
13	Bungalow 92 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690727).	Centred around 291480E 6221400N	Local significance architecturally and as part of the important early 20th century building stock making up Menangle's cultural landscape.
14	Bungalow 151 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690726).	Centred around 291480E 6221400N	As above
15	Bungalow 106 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690722).	Centred around 291480E 6221400N	As above
16	Bungalow 96 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690728).	Centred around 291480E 6221400N	As above
17	Cottage 124 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690723).	Centred around 291480E 6221400N	As above
18	Cottage 102 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690721).	Centred around 291480E 6221400N	As above
19	Cottage 138 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690725).	Centred around 291480E 6221400N	Regional significance for its association with the Elizabeth Macarthur Institute and the former Camden Park Estate dairies and as an important component of the historic cultural landscape of Menangle and Camden.

Table 3-1 (Continued)
Identified Heritage Items within 600m of the Project Extent of Longwall Mining Area

Item Number	Item Name and Address	Heritage Register	Map Coordinates (MGA)	Summary of Heritage Significance[2]
Menangle (Continued)				
20	Cottage 128 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690724).	Centred around 291480E 6221400N	Local significance architecturally and as part of the important late 19th century building stock making up Menangle's cultural landscape.
21	Dairy Cottage 2 Station Street, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690730).	291980E 6221340N	Local significance for associations with the Camden Park Estate Central Creamery, as evidence of purpose-built worker's housing associated with the Creamery, and an important component of the historic cultural landscape of Menangle.
22	Dairy Cottage 65 Woodbridge Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690731).	290830E 6221450N	As above.
23	EMI Cottage 29 50 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690719).	Centred around 291480E 6221400N	Regional significance for its association with the Elizabeth Macarthur Institute and the former Camden Park Estate dairies and as an important component of the historic cultural landscape of Menangle and Camden.
24	House 100 Menangle Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690725).	Centred around 291480E 6221400N	Local significance architecturally and as part of the important late 19th century building stock making up Menangle's cultural landscape.
25	Menangle Conservation Area Menangle Road Menangle (includes items 4, 10, 11, 13-20, 23 and 24)	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690277).	Centred around 291480E 6221400N	State significance as an unusually intact example of a rural service centre of this period and in particular, one that is associated with the dairying industry; has local & regional aesthetic significance as a cultural landscape entity. Historical associations with the Macarthur family and the Camden Park Estate.
26	Slab Hut 40 Carrolls Road, Menangle	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690718).	289030E 6219520N	Local significance as a remnant of the early settlement and as a locally rare example of the slab hut.
27	The Pines Menangle Road, Menangle Park	Not heritage listed, but see Proudfoot, H. 1977. *Colonial Buildings: Macarthur Growth Centre*. Macarthur Development Board (page 51).	291890E 6223070N	Locally significant as a very good, late example of the classical Colonial stone house.

Table 3-1 (Continued)
Identified Heritage Items within 600m of the Project Extent of Longwall Mining Area

Item Number	Item Name and Address	Heritage Register	Map Coordinates (MGA)	Summary of Heritage Significance[2]
Douglas Park				
28	Mountbatten Group (formerly Morton Park) 655 Menangle Street, (Off Duggan Street) Douglas Park	• Wollondilly LEP. SHI DB No. 2690085, 2690086, 2690087, 2690088. • Wollondilly Heritage Study.	289860E 6215600N	Regionally significant because of its historical associations with the early settlement of the Douglas Park area; its aesthetic significance as a collection of important architecture and as a landmark.
29	St Mary's Towers (formerly Parkhall) 415 Douglas Road Mt Kiewa Road, Douglas Park	• Wollondilly LEP. SHI DB No. 2690278, 2690089. • Wollondilly Heritage Study. • Register of the National Estate No. 3305.	289060E 6212420N	State significance through associations with the early settlement and Sir Thomas Mitchell; aesthetically significant architecture.
30	Railway Cottage 3 Camden Road, Douglas Park	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690714).	289050E 6215150N	Local significance as the only surviving example of a residence associated with the construction of the southern rail line in Douglas Park.
31	Warrangunyah 670 Menangle Road, Douglas Park	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690716).	289320E 6216950N	Local and regional significance as an outstanding example of a late Victorian period gentleman's country homestead.
Wilton				
32	Wilton Park (Wilton Park Stables) Wilton Park Road, Maldon	• State Heritage Register Listing No. 00257. SHI DB No. 5045546. • Wollondilly LEP. SHI DB No 2690190. • Wollondilly Heritage Study 1992. • Register of the National Estate No. 3304.	282560E 6211650N	State historical significance as Samuel Hordern's thoroughbred horse stud, with fine ensemble of the rural architecture with aesthetic significance.
33	Cottage 180 Wilton Park Road, Wilton	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690791).	283140E 6210460N	Local significance as a particularly good example of a 19th century pastoral cottage.
34	Kedron 305 Wilton Park Road Wilton	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690797).	282380E 6211050N	Regional significance as an exceptional example of a Federation period homestead.
35	Nepean Tunnel and above ground structures	• State Heritage Register No. 01373 (as 'Upper Canal System [Prospect Reservoir]'). SHI DB No. 5051481. • S.170 State Agency Heritage Register. • Wollondilly LEP. SHI DB No. 2690008. • Wollondilly Heritage Study.	288150E 6209160N to 290500E 6209790N	State historical significance as part of Sydney's water scheme of the 1880s and an excellent example of 19th century hydraulic engineering, including tunnels and the use of gravity to feed water along the canal.
36	Broughtons Pass Weir Wilton Road Wilton	• State Heritage Register No. 01373 (as 'Upper Canal System [Prospect Reservoir]') SHI DB No. 5051481. • S.170 State Agency Heritage Register. • Wollondilly LEP. SHI DB No. 2690008. • Wollondilly Heritage Study.	292016E 6210280N	State historical significance as part of Sydney's water scheme of the 1880s and an excellent example of 19th century hydraulic engineering, including the use of gravity to feed water along the canal.

Table 3-1 (Continued)
Identified Heritage Items within 600m of the Project Extent of Longwall Mining Area

Item Number	Item Name and Address	Heritage Register	Map Coordinates (MGA)	Summary of Heritage Significance[2]
Wilton (Continued)				
37	Stone Ruin 45 Whitticase Lane, Douglas Park	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690717). • Wollondilly Heritage Study Review.	291030E 6210210N	Locally significant as a stone ruin historically associated with Sir Thomas Mitchell's tenant farmers.
Appin				
38	Upper Nepean Water Supply System Canal	• State Heritage Register No. 01373 (as 'Upper Canal System [Prospect Reservoir']). SHI DB No. 5051481. • S.170 State Agency Heritage Register. • Wollondilly LEP. SHI DB No. 2690008. • Wollondilly Heritage Study.	292980E 6215010N to 293340E 6217090N	State historical significance as part of Sydney's water scheme of the 1880s and an excellent example of 19th century hydraulic engineering, including the use of gravity to feed water along the canal.
39	Hume and Hovell Monument Appin Road, Appin	• None.	296510E 6218720N	A monument of Local significance marking the homestead of Hamilton Hume and the starting point of Hume and Hovell's exploratory trip to Port Phillip.
40	Beulah Appin Road, Appin	• State Heritage Register No. 00368. • Campbelltown LEP. SHI DB No. 5045426.	294790E 6219820N	State significance as an entire cultural landscape containing early colonial structures - homestead group and stone bridge - remnant 19th century farm and garden layout, an octagonal pavilion or summer house as a major focal element and a remnant spotted gum (*Corymbia maculata*) forest as a result of early conservation planning.
41	Cataract Dam Cataract River, Appin	• State Heritage Register No. 01359. • SHI DB No. 5051469. • S.170 State Agency Heritage Register. • Wollondilly LEP. SHI DB No. 2690211. • Wollondilly Heritage Study.	297750E 6206190N	State significance for its unusual design and construction, historical place in water schemes in Australia, and landmark values.
Razorback				
42	Wooden milepost, Razorback Road/ Remembrance Drive Junction, Razorback	• Wollondilly LEP. SHI DB No. 2690158. • Wollondilly Heritage Study.	284100E 6218300N	Locally and regionally significant as a now rare road marker of the original Great South Road.
43	Homestead ruins and trees 40 Mount Hercules Road, Razorback	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690880).	285280E 6219080N	Locally of scientific significance as an undisturbed archaeological site of a19th century rural residence.

Table 3-1 (Continued)
Identified Heritage Items within 600m of the Project Extent of Longwall Mining Area

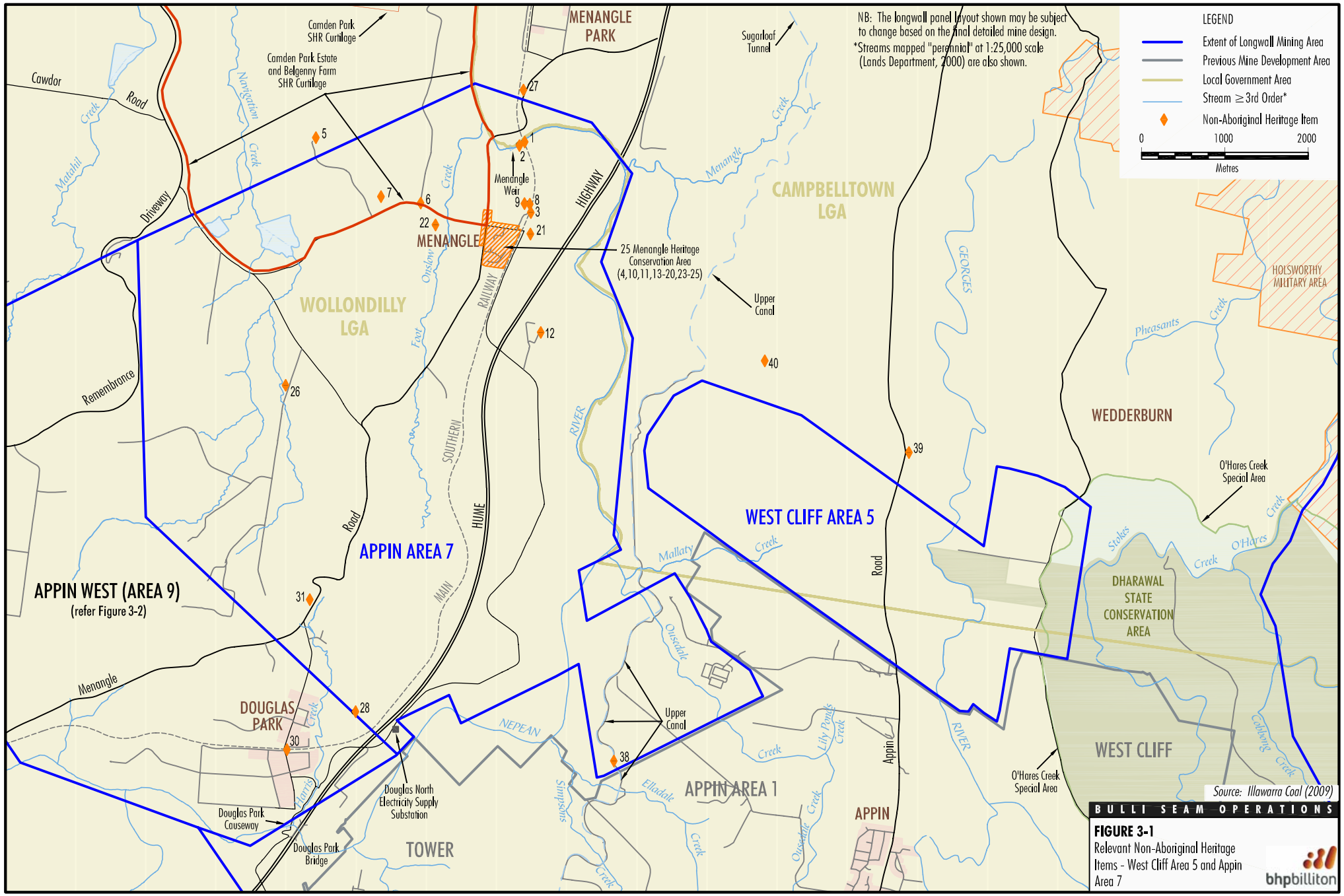
Item Number	Item Name and Address	Heritage Register	Map Coordinates (MGA)	Summary of Heritage Significance[2]
Razorback (Continued)				
44	Razorback Inn Remembrance Way, Picton	• Wollondilly LEP. SHI DB No. 2690150. • Wollondilly Heritage Study 1992.	282030E 6217200N	Local significance in providing evidence of the nature of early settlement in the area and the importance of the early road link to the south, associations with early convict settlers and the prominent Antill family, and as a typical building of its type.
45	Berkeley Lodge 1545 Remembrance Way, Picton	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690348).	282180E 6217100N	Example of an extended and well-maintained 19th century homestead. Local significance.
Maldon				
46	Maldon Cement Works Maldon Bridge Road, Maldon	• Draft revision of Wollondilly LEP, 2009. • (SHI DB No. 2690142).	282000E 62137000N	Regionally historical significant as evidence of the growth of the Sydney urban area and its influence on the growth of the Wollondilly area, and as an example post-WWII industrial operations on a large scale.
47	Maldon suspension bridge Wilton Park Road, Maldon	• Wollondilly LEP. SHI DB No. 2690196. • Wollondilly Heritage Study 1992.	281860E 6212910N	Regionally significant as an example of an unusual bridge design.

[1] See Figure 1-1 for the Project extent of longwall mining area.
[2] For a complete description of the listed heritage significance of each item refer to Attachment A.

The locations of the items described in Table 3-1 are shown on Figures 3-1 to 3-3.

Full citations and photographs of each of the identified items summarized in Table 3-1 are provided in Attachment A.

There are a number of LEP listed heritage items located in the general proximity of the Project extent of longwall mining area (but greater than 600m from the longwall extents). Structures can potentially experience horizontal movements up to large distances away from extracted longwalls. These movements are known as far-field horizontal movements, which have been observed at distances of up to approximately 2,000 m from extracted longwalls. Far-field horizontal movements tend to be bodily movements towards the extracted goaf area, and are accompanied by low levels of strain. The risk of impact to these items from Project related activities is expected to be extremely low (MSEC, 2009). A more detailed discussion of far-field horizontal movements is provided in the Subsidence Assessment report (Appendix A of the EA).



Source: Illawarra Coal (2009)

BULLI SEAM OPERATIONS

FIGURE 3-1
Relevant Non-Aboriginal Heritage Items - West Cliff Area 5 and Appin Area 7

bhpbilliton

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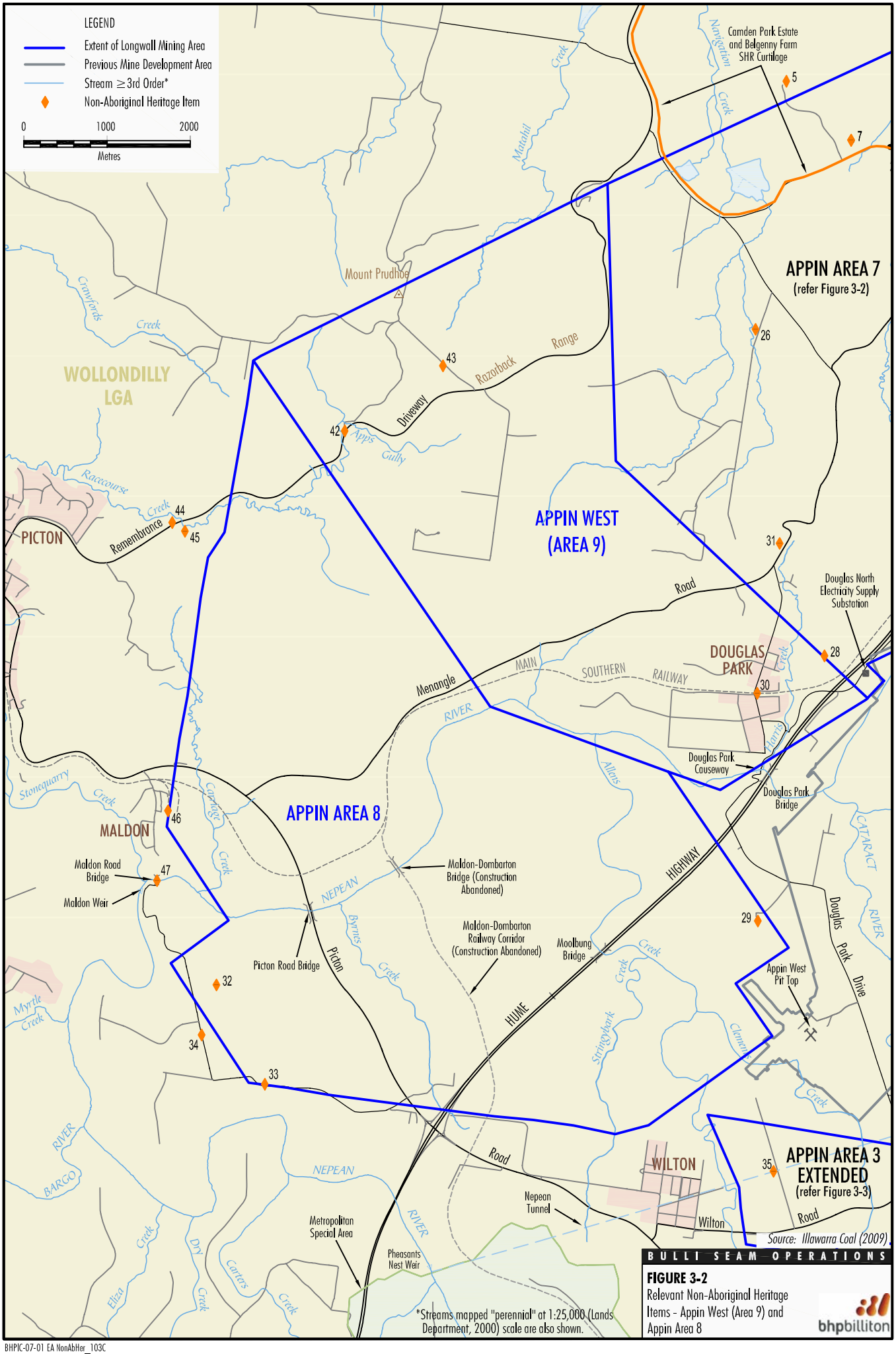
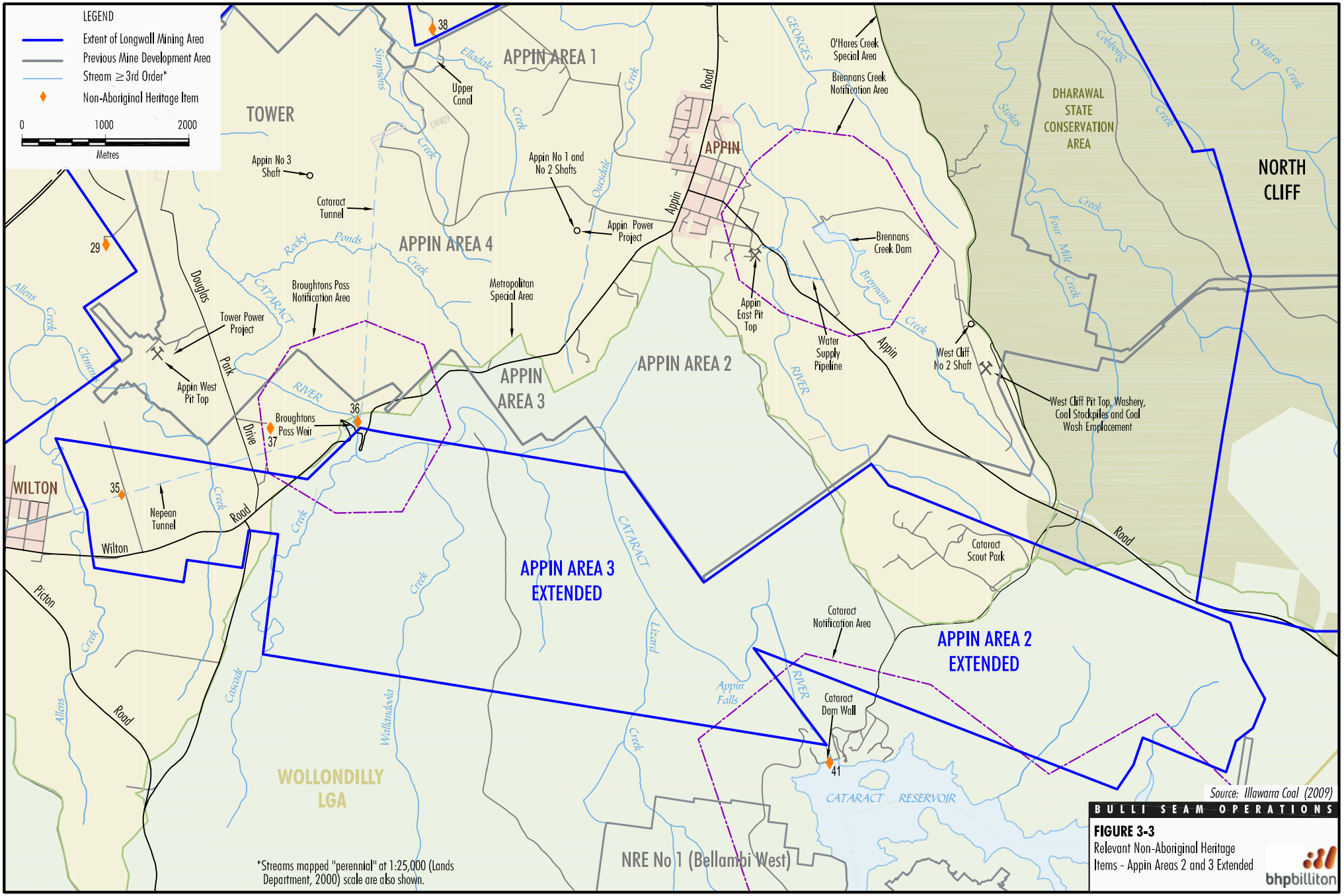


BULLI SEAM OPERATIONS

FIGURE 3-2
Relevant Non-Aboriginal Heritage Items - Appin West (Area 9) and Appin Area 8

bhpbilliton

BHPIC-07-01 EA NonAbHer_103C



BHPIC-07-01 EA NonAbHer_104C

It is expected that there would be no impact to these items from Project related activities, however, they are listed below for completeness:

- Jarvisfield, Picton;
- Mt Gilead and Mill;
- Northampton Dale Group;
- Windmill Hill/Middle Farm, Appin (already assessed—Longwall 209 & buffer);
- Appin Village items;
- Camden Park Homestead;
- Menangle Park House;
- Barrigal Monument, Camden Park;
- Belgenny Farm and Cottage;
- Camden Park Orchard Cottages (Hamlet Cottages) and orchard;
- Elladale;
- Maldon Weir;
- Kings Falls Bridge; and
- Stone Cottages, 380 Douglas Park Road, Douglas Park.

In addition, Table 3-2 provides a summary of the listed heritage items located at the Old Bulli Shafts, which would be rehabilitated as a component of the Project.

Table 3-2
Identified Heritage Items at the Old Bulli Shafts

Item Number	Item Name	Heritage Register	Map Coordinates (MGA)	Summary of Heritage Significance[1]
48	Bulli No.1 Shaft	• Wollongong LEP and Illawarra REP. SHI DB No. 19139.	302760E 6200660N	Regionally significant as archaeological evidence.
49	Bulli No.2 Shaft	• Wollongong LEP and Illawarra REP. SHI DB No. 2700804. • Wollongong Heritage Study.	303489E 6200589N	Regionally significant as archaeological evidence.

[1] Summary only - for a complete description of the listed heritage significance of each item refer to Attachment A.

The Bulli No. 1 Shaft is located approximately 3.3km west of the Illawarra Escarpment and approximately 1km off the Sydney Catchment Authority (SCA) Fire Road #7C.

The Bulli No. 2 Shaft is situated approximately 2.6km west of the Illawarra Escarpment and immediately adjacent to SCA Fire Road #7C.

The location of Bulli Shaft Nos. 1 and 2 are provided on Figure 1-1. Both Bulli shafts are within lands controlled by the SCA (Metropolitan Special Area).

The heritage values at Bulli No.1 Shaft relate to the concrete base pads for the fan drive house and electrical switchgear, the concrete brick fan drift leading to the collar with its square concrete structure onto which is built a circular tower of brick/reinforced concrete/brick construction.

The heritage values at Bulli No.2 Shaft relate to the original sinking headframe, the remains of the winder mechanism and the original switch yard foundation slab.

Bulli No. 3 and 4 Shafts are not assessed as having heritage significance and are not considered further in this Report.

4. STATEMENT OF HERITAGE IMPACT

4.1 Aspects of the Proposal that Could Potentially Impact Heritage Values

The potential impacts on non-Aboriginal heritage arising from the Project are primarily related to indirect impacts associated with subsidence of the ground surface following longwall extraction of coal (consideration of alternative mining methods is provided in Section 7 in the Main Report of the EA). However, the decommissioning and removal of Bulli Shaft Nos. 1 and 2 structures (Figure 1-1) (i.e. direct surface works) would also potentially impact on heritage values in the Project Application area (see below).

Extraction of coal by longwall mining methods results in the vertical and horizontal movement of the land surface. The land surface movements are generically referred to as subsidence effects. The type and magnitude of the subsidence effects is dependant on a range of variables (e.g. mine geometry, topography and geology). Discussion of the development and propagation of subsidence effects above and adjacent to mined longwall panels and the potential impacts of mine subsidence on man made structures at the surface is provided in detail in the Subsidence Assessment (MSEC, 2009) which is included in Appendix A of the EA.

In summary, masonry structures are most likely to be damaged by movement and localised strains associated with subsidence, the impacts potentially ranging from minor cracking to substantial cracking of walls, as well as damage to internal services and building structural elements. Timber structures are generally less sensitive to damage than masonry structures.

Table 4-1 provides a classification of repair categories with respect to potential damage to building structures that have been adopted by MSEC and are based on relevant Australian Standards and international subsidence related building damage criteria (refer Appendix A of the EA).

An analysis of the sensitivity of the heritage listed buildings and the potential likelihood of mine subsidence causing damage that requires repair has been completed by MSEC for the Project extent of longwall mining (Appendix A of the EA). The results of this analysis indicate that (prior to detailed mine design and/or implementation of specific mitigation and management measures) three initial categories of repair requirement likelihood have been identified for the heritage buildings identified in Table 3-1. The initial repair likelihood categories are summarised in Table 4-2.

MSEC's analysis indicates that most heritage listed buildings in the Project extent of longwall mining area and surrounds would have some likelihood of damage (e.g. cracking) that requires some repair works. The potential for damage occurring that requires repair increases with the relative size of the structure, as well as for construction type (i.e. masonry is more sensitive than timber or fibro).

Table 4-1
Classification Based on the Extent of Repairs

Repair Category	Extent of Repairs
Nil	No repairs required.
R0 Adjustment	One or more of the following, where the damage does not require the removal or replacement of any external or internal claddings or linings: • Door, window or gate jams or swings, or • Movement of cornices, or • Movement at external or internal expansion joints.
R1 Very Minor Repair	One or more of the following, where the damage can be repaired by filling, patching or painting without the removal or replacement of any external or internal brickwork, claddings or linings: • Cracks in brick mortar only, or isolated cracked, broken, or loose bricks in the external façade, or • Cracks or movement < 5 mm in width in any external or internal wall claddings, linings, or finish, or • Isolated cracked, loose, or drummy floor or wall tiles, or • Minor repairs to any services or gutters.
R2 Minor Repair	One or more of the following, where the damage affects a small proportion of external or internal claddings or linings, but does not affect the integrity of external brickwork or structural elements: • Continuous cracking in bricks < 5 mm in width in one or more locations in the total external façade, or • Slippage along the damp proof course of 2 to 5 mm anywhere in the total external façade, or • Cracks or movement ≤ 5 mm in width in any external or internal wall claddings, linings, finish, or • Several cracked, loose or drummy floor or wall tiles, or • Replacement of any services.
R3 Substantial Repair	One or more of the following, where the damage requires the removal or replacement of a large proportion of external or internal claddings or linings, or affects the integrity of the external brickwork or structural elements: • Continuous cracking in bricks of 5 to 15 mm in width in one or more locations in the total external façade, or • Slippage along the damp proof course of 5 to 15 mm anywhere in the total external façade, or • Loss of bearing to isolated walls, piers, columns, or other load-bearing elements, or • Loss of stability of building elements.
R4 Extensive Repair	One or more of the following, where the damage requires the removal or replacement of a large proportion of external brickwork, or the replacement or repair of structural elements: • Continuous cracking in bricks > 15 mm in width in one or more locations in the total external façade, or • Slippage along the damp proof course of 15 mm or greater anywhere in the total external façade, or • Re-levelling of building.
R5 Re-build	Extensive damage to house that requires it to be re-built as the cost of repair is greater than the cost of replacement.

Source: MSEC, 2009.

Table 4-2
Initial Likelihood of Repair Being Required - Buildings

Likelihood of Repair Ranking	Repair Category (refer Table 4-1)	Likelihood
1	R0	90-95%
	R1 or R2	3-10%
	R3 or R4	1%
	R5	<0.1%
2	R0	80-85%
	R1 or R2	10-15%
	R3 or R4	3-5%
	R5	<0.5%
3	R0	70-75%
	R1 or R2	15-20%
	R3 or R4	7-12%
	R5	<0.5%

After: MSEC, 2009.

Further detailed subsidence assessment and site-specific structural assessments for each listed heritage item potentially impacted by the Project would be undertaken as a component of the Extraction Plan (EP) process[2], once the detailed design of longwall layouts and engineering management measures has been completed (refer Section 4.2).

Table 4-3 presents MSEC's analysis of potential subsidence effects of the Project based on the EA Base Plan Longwalls presented in Section 2 in the Main Report of the EA. MSEC assessed the likelihood of repair being required (Table 4-2) for the buildings and relevant items listed in Table 3-1.

It is ICHPL's general subsidence management philosophy that all occupied buildings are maintained in a safe condition during subsidence. Subject to the outcomes of site-specific subsidence and structural assessments, mitigation or management measures would be applied to minimise damage to occupied heritage buildings to ensure the safety and serviceability of the structures is not compromised. The implementation of ongoing subsidence monitoring and management/mitigation measures to maintain occupant safety would also limit the potential for significant damage to occupied heritage buildings.

In order to minimise potential impacts to buildings of higher heritage significance in the Project extent of longwall mining area, it is recommended that, subject to the outcomes of site-specific subsidence and structural assessments, mitigation or management measures should be applied where required to minimise damage to state and/or national significance heritage buildings. Table 4-4 provides initial recommendations for the management of the more significant heritage listed buildings of relevance to the Project. These initial recommendations would be reviewed and, where required, amended following the completion of structural assessments and individual SOHI for these items as a component of the EP process, as described in Section 4.2.

2 In accordance with the precedent set by the Metropolitan Coal Project Approval, it is envisaged that the previous Mining Lease requirement for preparation of a Subsidence Management Plan prior to mining would be replaced by a requirement to prepare an Extraction Plan for the Project. Further discussion of the detail that would be provided in the Extraction plan is provided in Section 7.3.1 in the Main Report of the EA.

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Table 4-3
Potential Impacts/Initial Likelihood of Repair Ranking for Heritage Buildings and Recommended Mitigation/Management Action

Item Number	Heritage Item (Significance Level[2])	Structure Type	Location with Respect to Base Plan Longwalls	Potential Maximum Predicted Subsidence (mm/m)	Potential Maximum Predicted Tilt (mm/m)	Potential Maximum Predicted Radius of Hogging Curvature (km)	Potential Maximum Predicted Radius of Sagging Curvature (km)	Initial Likelihood of Repair Ranking[1] (comment)	Additional Control - Mitigation/ Management
Menangle									
3	Menangle Railway Station Group (part) (State/National)	Brick	Goaf - over longwalls	1600	8	11	7	**3**	Structural assessment required. Develop built feature management plan (BFMP) in consultation with the Mine Subsidence Board (MSB) and heritage specialist. Record, monitor and where necessary repair.
3	Menangle Railway Station Group (part) (State/National)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	As above.
4	Menangle Store (Local/State in part)	Brick and Timber	Goaf - over longwalls	1600	8	11	7	**3**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
5	Elizabeth Macarthur Agricultural Institute (formerly Camden Park Estate [Part] (State/National)	House and cottages (brick assumed)	Solid Coal - ~80m to ~650m from nearest longwall	<200	<1	>75	-	**1**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
5	Elizabeth Macarthur Agricultural Institute (formerly Camden Park Estate) [Part] (State/National)	Landscape	Solid Coal/Goaf - over longwalls	1600	8	11	7	**N/A** (Minor surface cracking. Significant impacts unlikely)	No mitigation required. Apply MSB standards to recording, monitoring and repair.
6	Menangle Gate Lodge (Camden Park) (Local/Regional)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.

Table 4-3 (Continued)
Potential Impacts/Initial Likelihood of Repair Ranking for Heritage Buildings and Recommended Mitigation/Management Action

Item Number	Heritage Item (Significance Level[2])	Structure Type	Location with Respect to Base Plan Longwalls	Potential Maximum Predicted Subsidence (mm/m)	Potential Maximum Predicted Tilt (mm/m)	Potential Maximum Predicted Radius of Hogging Curvature (km)	Potential Maximum Predicted Radius of Sagging Curvature (km)	Initial Likelihood of Repair Ranking[1] (comment)	Additional Control - Mitigation/ Management
Menangle (Continued)									
7	Dairy No. 4 (Camden Park) (Local)	Brick and weatherboard	Goaf - over longwalls	1600	8	11	7	**3**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
8	Camden Park Estate Central Creamery (Regional)	Brick (2 storey)	Goaf - over longwalls	1600	8	11	7	**3**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
9	Camden Park Rotolactor (State)	Concrete and cladding	Goaf - over longwalls	1600	8	11	7	**3**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
10	St James Anglican Church (State)	Brick (2-3 storey)	Goaf - over longwalls	1600	8	11	7	**3** (If unmitigated damage likely to be highly visible)	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
11	St Patrick's Catholic Church (Local)	Brick (2 storey)	Goaf - over longwalls	1600	8	11	7	**3** (If unmitigated damage likely to be highly visible)	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
12	Gilbulla (Anglican Conference Centre) (Local/Regional)	Brick (2-3 storey)	Goaf - over longwalls	1600	8	11	7	**3** (If unmitigated damage likely to be highly visible)	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.

Table 4-3 (Continued)
Potential Impacts/Initial Likelihood of Repair Ranking for Heritage Buildings and Recommended Mitigation/Management Action

Item Number	Heritage Item (Significance Level[2])	Structure Type	Location with Respect to Base Plan Longwalls	Potential Maximum Predicted Subsidence (mm/m)	Potential Maximum Predicted Tilt (mm/m)	Potential Maximum Predicted Radius of Hogging Curvature (km)	Potential Maximum Predicted Radius of Sagging Curvature (km)	Initial Likelihood of Repair Ranking[1] (comment)	Additional Control - Mitigation/ Management
Menangle (Continued)									
13	Bungalow 92 Menangle Road, Menangle (Local)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
14	Bungalow 151 Menangle Road, Menangle (Local)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
15	Bungalow 106 Menangle Road, Menangle (Local)	Brick	Goaf - over longwalls	1600	8	11	7	**3** (If unmitigated damage likely to be highly visible)	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair. More difficult to repair than weatherboard.
16	Bungalow 96 Menangle Road, Menangle (Local)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
17	Cottage 124 Menangle Road, Menangle (Local)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.

Table 4-3 (Continued)
Potential Impacts/Initial Likelihood of Repair Ranking for Heritage Buildings and Recommended Mitigation/Management Action

Item Number	Heritage Item (Significance Level[2])	Structure Type	Location with Respect to Base Plan Longwalls	Potential Maximum Predicted Subsidence (mm/m)	Potential Maximum Predicted Tilt (mm/m)	Potential Maximum Predicted Radius of Hogging Curvature (km)	Potential Maximum Predicted Radius of Sagging Curvature (km)	Initial Likelihood of Repair Ranking[1] (comment)	Additional Control - Mitigation/ Management
Menangle (Continued)									
18	Cottage 102 Menangle Road, Menangle (Local)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
19	Cottage 138 Menangle Road, Menangle (Regional)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
20	Cottage 128 Menangle Road, Menangle (Local)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
21	Dairy Cottage 2 Station Street, Menangle (Local)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
22	Dairy Cottage 65 Woodbridge Road, Menangle (Local)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
23	EMI Cottage 29 50 Menangle Road, Menangle (Regional)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.

Table 4-3 (Continued)
Potential Impacts/Initial Likelihood of Repair Ranking for Heritage Buildings and Recommended Mitigation/Management Action

Item Number	Heritage Item (Significance Level[2])	Structure Type	Location with Respect to Base Plan Longwalls	Potential Maximum Predicted Subsidence (mm/m)	Potential Maximum Predicted Tilt (mm/m)	Potential Maximum Predicted Radius of Hogging Curvature (km)	Potential Maximum Predicted Radius of Sagging Curvature (km)	Initial Likelihood of Repair Ranking[1] (comment)	Additional Control - Mitigation/ Management
Menangle (Continued)									
24	House 100 Menangle Road, Menangle (Local)	Brick	Goaf - over longwalls	1600	8	11	7	**3** (If unmitigated damage likely to be highly visible)	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair. More difficult to repair than weatherboard.
25	Menangle Conservation Area (State)	Varies	Goaf - over longwalls	N/A	N/A	N/A	N/A	**2-3**	Implement management solutions for each component heritage listed building (items 4, 10, 11, 13-20, 23 and 24). Refer also Table 4-4 for preliminary recommendations to maintain heritage values for relevant higher heritage significance buildings.
26	Slab Hut 40 Carrolls Road, Menangle (Local)	Timber clad	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
27	The Pines Menangle Road, Menangle Park (Local)	Stone	Solid coal - 650m to nearest longwall	<20	<0.5	>150	>150	**N/A** (None expected)	No mitigation required. Apply MSB standards to recording, monitoring and repair.
Douglas Park									
28	Mountbatten Group (formerly Morton Park) (Regional)	Brick/stone	Solid coal - ~240m to nearest longwall	<20	<0.5	>150	-	**1**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.

Table 4-3 (Continued)
Potential Impacts/Initial Likelihood of Repair Ranking for Heritage Buildings and Recommended Mitigation/Management Action

Item Number	Heritage Item (Significance Level[2])	Structure Type	Location with Respect to Base Plan Longwalls	Potential Maximum Predicted Subsidence (mm/m)	Potential Maximum Predicted Tilt (mm/m)	Potential Maximum Predicted Radius of Hogging Curvature (km)	Potential Maximum Predicted Radius of Sagging Curvature (km)	Initial Likelihood of Repair Ranking[1] (comment)	Additional Control - Mitigation/ Management
Douglas Park (Continued)									
29	St Mary's Towers (formerly Parkhall) (State)	Stone (2-3 storey)	Goaf – over longwalls	<300	<3	>25	-	**3** (If unmitigated damage likely to be highly visible)	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
30	Railway Cottage 3 Camden Road, Douglas Park (Local)	Weatherboard	Goaf - over longwalls	1600	8	11	7	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
31	Warrangunyah (Local/Regional)	Brick	Goaf – over longwalls	<1000	<4	>15	>15	**3**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
Wilton									
32	Wilton Park (Wilton Park Stables) (State)	Brick	Goaf – over longwalls	<700	<3	>30	>30	**2**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
33	Cottage 180 Wilton Park Road, Wilton (Local)	Weatherboard	Solid coal - ~220m to nearest longwall	<50	<0.5	>150	-	**1**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.
34	Kedron (Regional)	Brick	Solid coal - ~220m to nearest longwall	<20	<0.5	>150	-	**1**	Structural assessment required. Develop BFMP in consultation with the MSB and heritage specialist. Record, monitor and where necessary repair.

Table 4-3 (Continued)
Potential Impacts/Initial Likelihood of Repair Ranking for Heritage Buildings and Recommended Mitigation/Management Action

Item Number	Heritage Item (Significance Level[2])	Structure Type	Location with Respect to Base Plan Longwalls	Potential Maximum Predicted Subsidence (mm/m)	Potential Maximum Predicted Tilt (mm/m)	Potential Maximum Predicted Radius of Hogging Curvature (km)	Potential Maximum Predicted Radius of Sagging Curvature (km)	Initial Likelihood of Repair Ranking[1] (comment)	Additional Control - Mitigation/ Management
Wilton (Continued)									
37	Stone Ruin 45 Whitticase Lane, Douglas Park (Local)	Stone	Solid coal - 550m from nearest longwall	<20	<0.5	>150	>150	**N/A** (None expected)	None
Appin									
39	Hume and Hovell Monument Appin Road, Appin (Local)	Stone monument	Solid coal - ~410m to nearest longwall	<20	<0.5	>150	-	**N/A** (None expected)	None.
40	Beulah (State)	Stone	Solid coal - 650m from nearest longwall	<20	<0.5	>150	>150	**N/A** (None expected)	No mitigation required. Apply MSB standards to recording, monitoring and repair.
Razorback									
42	Wooden milepost Razorback Road Remembrance Drive Junction (Local/Regional)	Wooden post	Goaf - over longwalls	1600	8	11	7	**N/A** (None expected)	None.
43	Homestead ruins and trees 40 Mount Hercules Road, Razorback (Local)	Ruins and trees	Goaf - over longwalls	1600	8	11	7	**N/A** (None expected)	None.

Table 4-3 (Continued)
Potential Impacts/Initial Likelihood of Repair Ranking for Heritage Buildings and Recommended Mitigation/Management Action

Item Number	Heritage Item (Significance Level[2])	Structure Type	Location with Respect to Base Plan Longwalls	Potential Maximum Predicted Subsidence (mm/m)	Potential Maximum Predicted Tilt (mm/m)	Potential Maximum Predicted Radius of Hogging Curvature (km)	Potential Maximum Predicted Radius of Sagging Curvature (km)	Initial Likelihood of Repair Ranking[1] (comment)	Additional Control - Mitigation/ Management
Razorback (Continued)									
44	Razorback Inn Remembrance Way, Picton (Local)	Stone	Solid coal - 700m from nearest longwall	<20	<0.5	>150	>150	**N/A** (None expected)	No mitigation required. Apply MSB standards to recording, monitoring and repair.
45	Berkeley Lodge 1545 Remembrance Way, Picton (Local)	Stone	Solid coal - 550m from nearest longwall	<20	<0.5	>150	>150	**N/A** (None expected)	No mitigation required. Apply MSB standards to recording, monitoring and repair.
Maldon									
46	Maldon Cement Works (Regional)	Industrial- iron clad sheds, silos	Solid Coal - ~60m to over~300m to nearest longwall	<100	<1	>150	-	**Detailed assessment required**	Structural assessment required. Management Plan required.

After: MSEC, 2009 (Appendix A of the EA)

[1] Refer Tables 4-1 and 4-2.

[2] Summary only - for a complete description of the listed heritage significance of each item refer to Attachment A.

Table 4-4
Relevant Higher Heritage Significance Buildings
Preliminary Recommendations to Maintain Heritage Values

Item Number	Heritage Item	Heritage Significance Level[1]	Structure Type	Condition	Preliminary Recommendations to Maintain Heritage Values (to be reviewed following detailed structural assessment and preparation of SOHI)
Menangle					
3	Menangle Railway Station Group	State/National	Brick/ Weatherboard	Fair	• Maintain structural stability and serviceability. • Minimise damage to external brickwork to repairable cracks in original walls. • Avoid damage to any key aspects of the heritage fabric that cannot be readily restored without loss of heritage values in the event of damage. • Avoid damage to services that may require substantial works to the heritage fabric to repair or replace. • Document the heritage values of the item and complete a detailed Statement of Heritage Impact for the management of mine subsidence effects with input from a Conservation Architect and Structural Engineer. • Manage any other key features of the heritage fabric that may be identified in the Statement of Heritage Impact investigations appropriately to maintain heritage values.
4	Menangle Store	Local/State in part	Brick/Timber	Poor to Fair	• Maintain structural stability and serviceability. • Minimise damage to external brickwork to repairable cracks. • Minimise damage to external timber upper floor so that shingle cladding is retained. • Avoid damage to any key aspects of the heritage fabric that cannot be readily restored without loss of heritage values in the event of damage. • Avoid damage to services that may require substantial works to the heritage fabric to repair or replace. • Avoid substantial damage to underground cistern in yard, and identify repair and remediation action should existing damage be worsened. • Document the heritage values of the item and complete a detailed Statement of Heritage Impact for the management of mine subsidence effects with input from a Conservation Architect and Structural Engineer. • Manage any other key features of the heritage fabric that may be identified in the Statement of Heritage Impact investigations appropriately to maintain heritage values.

Table 4-4 (Continued)
Relevant Higher Heritage Significance Buildings
Preliminary Recommendations to Maintain Heritage Values

Item Number	Heritage Item	Heritage Significance Level[1]	Structure Type	Condition	Preliminary Recommendations to Maintain Heritage Values (to be reviewed following detailed structural assessment and preparation of SOHI)
Menangle (Continued)					
5	Elizabeth Macarthur Agricultural Institute (formerly Camden Park Estate [Part])	State/National	House and cottages (brick assumed)	Varies	• Maintain structural stability and serviceability of built elements with heritage values. • Minimise damage to external brickwork to cracks in a small number of bricks only and any continuous cracking to be limited to the mortar only. • Avoid damage to any key aspects of the heritage fabric that cannot be readily restored without loss of heritage values in the event of damage. • Avoid damage to services that may require substantial works to the heritage fabric to repair or replace. • Document the heritage values of the item and complete a detailed Statement of Heritage Impact for the management of mine subsidence effects with input from a Conservation Architect and Structural Engineer. • Manage any other key features of the heritage fabric that may be identified in the Statement of Heritage Impact investigations appropriately to maintain heritage values.
9	Camden Park Rotolactor	State	Concrete and cladding	Very poor	• Monitor structural stability and introduce stabilization propping if required. • Document the heritage values of the item and complete a detailed Statement of Heritage Impact for the management of mine subsidence effects with input from a Conservation Architect and Structural Engineer.
10	St James Anglican Church	State	Brick (2-3 storey)	Good	• Maintain structural stability and serviceability. • Minimise damage to external brickwork to cracks in a small number of bricks only and any continuous cracking to be limited to the mortar only. • Avoid damage to leadlight windows, timber panelling and other key aspects of the heritage fabric that cannot be readily restored without loss of heritage values in the event of damage. • Avoid damage to services that may require substantial works to the heritage fabric to repair or replace. • Document the heritage values of the item and complete a detailed Statement of Heritage Impact for the management of mine subsidence effects with input from a Conservation Architect and Structural Engineer. • Manage any other key features of the heritage fabric that may be identified in the Statement of Heritage Impact investigations appropriately to maintain heritage values.

Table 4-4 (Continued)
Relevant Higher Heritage Significance Buildings
Preliminary Recommendations to Maintain Heritage Values

Item Number	Heritage Item	Heritage Significance Level[1]	Structure Type	Condition	Preliminary Recommendations to Maintain Heritage Values (to be reviewed following detailed structural assessment and preparation of SOHI)
Douglas Park					
29	St Mary's Towers (formerly Parkhall)	State	Stone (2-3 storey)	Good	• Maintain structural stability and serviceability. • Minimise damage to external brickwork and stonework to cracks in a small number of stones/bricks only and any continuous cracking to be limited to the mortar only. • Avoid damage to any key aspects of the heritage fabric that cannot be readily restored without loss of heritage values in the event of damage (such as brick detailing and stone carving, leadlight windows etc). • Avoid damage to services that may require substantial works to the heritage fabric to repair or replace. • Document the heritage values of the item and complete a detailed Statement of Heritage Impact for the management of mine subsidence effects with input from a Conservation Architect and Structural Engineer. • Manage any other key features of the heritage fabric that may be identified in the Statement of Heritage Impact investigations appropriately to maintain heritage values.
Wilton					
32	Wilton Park (Wilton Park Stables)	State	Brick	Good	• Maintain structural stability and serviceability. • Minimise damage to external brickwork to cracks in a small number of bricks only and any continuous cracking to be limited to the mortar only. • Avoid damage to any key aspects of the heritage fabric that cannot be readily restored without loss of heritage values in the event of damage. • Avoid damage to services that may require substantial works to the heritage fabric to repair or replace. • Document the heritage values of the item and complete a detailed Statement of Heritage Impact for the management of mine subsidence effects with input from a Conservation Architect and Structural Engineer. • Manage any other key features of the heritage fabric that may be identified in the Statement of Heritage Impact investigations appropriately to maintain heritage values.

[1] Summary only - for a complete description of the listed heritage significance of each item refer to Attachment A.

The implementation of mitigation measures may involve pre-mining measures, such as bracing/strengthening or repair of fragile or poorly maintained components prior to subsidence occurring, to reduce the risk of damage occurring.

In the case of major infrastructure heritage items that provide services to the wider community there is an obligation to maintain public safety and infrastructure security. The development of responses to potential impacts for these items would be subject to other processes focusing on these priorities. Protection of the heritage values of these infrastructure items would be an issue integrated into the subsidence management and response planning process. Table 4-5 details the major infrastructure items that are of heritage significance and recommended heritage management measures for these structures.

Table 4-5
Potential Impacts on Major Infrastructure with Heritage Values and Recommended Management Outcomes

Item Number	Heritage Item (significance level[1])	Type	Potential Impact	Preliminary Mitigation/Management Summary	Recommended Outcome
Menangle					
1	Menangle Rail Bridge and Viaduct Nepean River, Menangle (State/National)	Bridge	Potential for upsidence, closure and differential far-field movements. Cosmetic damage. Structural assessment required for development of mitigation and/or repairs.	Management plan for infrastructure protection required - heritage protection to be integrated. Advice of a specialist Conservation Architect to be obtained with respect to any engineering works.	Maintain serviceability and safety. Minimise impact on heritage values in accordance with the management plan.
2	Menangle Weir Nepean River, Menangle (Local)	Weir (stone)	Potential for upsidence, closure and differential far-field movements. Cosmetic damage or leakage. Crest level may be altered. Detailed assessment required for development of mitigation and/or repairs.	Management plan for infrastructure protection required - heritage protection to be integrated. Advice of a specialist Conservation Architect to be obtained with respect to any engineering works.	Maintain serviceability and safety. Minimise impact on heritage values in accordance with the management plan.
Wilton					
35	Nepean Tunnel and above ground structures (State)	Tunnel	Potential for cracking and tunnel instability due to differential subsidence movements.	Management plan for infrastructure protection required - heritage protection to be integrated. Advice of a specialist Conservation Architect to be obtained with respect to any engineering works.	Maintain serviceability and safety. Minimise impact on heritage values in accordance with the management plan.
36	Broughtons Pass Weir Wilton Road, Wilton (State)	Weir (stone/ brick)	Potential for cracking and leakage due to differential subsidence movements and differential far-field horizontal movement.	Management plan for infrastructure protection required - heritage protection to be integrated. Management to account for existing subsidence damage.	Maintain serviceability and safety. Minimise impact on heritage values in accordance with the management plan.
Appin					
38	Upper Nepean Water Supply System (State)	Canal	Potential for cracking and leakage due to differential subsidence movements. Cosmetic damage through to block wall damage	Management plan for infrastructure protection required - heritage protection to be integrated. Mined beneath before. Advice of a specialist Conservation Architect to be obtained with respect to any engineering works.	Maintain serviceability and safety. Minimise impact on heritage values in accordance with the management plan.

Table 4-5 (Continued)
Potential Impacts on Major Infrastructure with Heritage Values and Recommended Management Outcomes

Item Number	Heritage Item (significance level[1])	Type	Potential Impact	Preliminary Mitigation/Management Summary	Recommended Outcome
Appin (Continued)					
41	Cataract Dam Cataract River, Appin (State)	Dam (stone)	Potential far-field horizontal movement.	Management plan for infrastructure protection required - heritage protection to be integrated.	Maintain serviceability and safety. Minimise impact on heritage values in accordance with the management plan.
Maldon					
47	Maldon suspension bridge Wilton Park Road, Maldon (Regional)	Bridge	Potential far-field horizontal movement.	Management plan for infrastructure protection required - heritage protection to be integrated. Complicated by redundancy of the infrastructure. Advice of a specialist Conservation Architect to be obtained with respect to any engineering works.	Maintain serviceability and safety. Minimise impact on heritage values in accordance with the management plan.

After: MSEC, 2009 (Appendix A of the EA).

[1] Summary only - for a complete description of the listed heritage significance of each item refer to Attachment A.

Further details on potential mitigation measures that could be applied, depending on the outcomes of detailed mine design and associated detailed subsidence predictions and structural assessments in the EP process are provided in Section 4.2 below.

Bulli Shaft Sites

The Bulli Colliery shaft sites are to be rehabilitated as part of the Project. The history of the shafts is described in Section 2 above. (Note: The information in this section is drawn from Sheldrill Pty Ltd, 2008. *Bulli Colliery; Bulli Colliery shafts Nos 1, 2, 3 & 4, A review*, report for BHP Billiton Illawarra Coal.)

The fan, metal fan ducting, drive house and electrical switchgear have been removed at Bulli No. 1 Shaft, leaving just the concrete base pads *in situ*. The concrete brick fan drift leading to the collar remains in place with access prevented by a concrete brick seal at the outbye end and another at the shaft collar. The collar is topped by a square concrete structure onto which is built a circular tower of brick/reinforced concrete/brick construction, estimated to be 9m in height and some 5m in diameter.

At Bulli No. 1 Shaft the *Appin Mine Closure Plan* (Cardno Forbes Rigby 2006) recommends the demolition and removal of all steel frames and shaft seal, concrete foundations and brick structures (only if recommended by heritage assessment); filling of the shaft and remediation and re-profiling of the site. While this action is recommended by the existing Closure Plan, ICHPL would undertake further consultation with the SCA to determine if the heritage listed components can be protected and conserved in-situ (Section 4.2).

At Bulli No. 2 Shaft, the original sinking headframe (surrounded by a chain mesh fence), the remains of the winder mechanism and the original switch yard foundation slab are the most obvious remnants. The earthing grid was located during a search for the power line stanchions in early 2007, as it was not immediately noticeable amongst the brush. The shaft was capped in 1988 but not filled. The switchyard and substation building are assumed to have been removed in the late 1980s.

At Bulli No. 2 Shaft the *Appin Mine Closure Plan* (Cardno Forbes Rigby 2006) recommends the demolition and removal of the steel frame (if approved by authorities) and shaft seal, concrete foundations; filling of the shaft and remediation and re-profiling of the site. While this action is recommended by the existing Closure Plan, ICHPL would undertake further consultation with the SCA to determine if the heritage listed components can be protected and conserved in-situ (Section 4.2).

4.2 Measures to be Taken to Minimise Impacts

As described in Section 4.1, an assessment of the likelihood of heritage buildings requiring repair has been undertaken by MSEC for the items in the Project extent of longwall mining area and surrounds (Table 4-3).

This assessment is based on the EA Base Plan Longwalls presented in Section 2 in the Main Report of the EA. As explained in the EA, alternative mine extraction and longwall layouts are expected to be developed over the life of the Project. Therefore, the above MSEC analysis is considered to be conservative, on the basis that it estimates the potential maximum subsidence, tilt and curvature assuming any potential reasonable longwall arrangement.

Further subsidence assessment and (where required) site-specific structural assessments and documentation of heritage values would be undertaken as a component of the EP process, once the detailed design of longwall layouts and mine engineering has been completed.

This would involve the following steps (as part of the EP process):

- A detailed subsidence assessment for each heritage listed structure on the basis of the final mine layout.
- For items that are of regional, state and/or national heritage significance or are occupied a detailed structural assessment would be undertaken, to determine the structure's sensitivity to the subsidence predicted for the final mine layout.
- All heritage items would be recorded and documented in detail to the standard required by the Heritage Branch (according to their heritage significance), prior to undermining.
- For heritage items of state and/or national significance that may be adversely affected by the Project, ICHPL would complete an individual SOHI.

  According to the sensitivity and heritage values of the various sub-components of the listed item, where required, ICHPL would design and implement pre-mining management or mitigation measures for the item in consultation with the owner, utilizing the subsidence assessment and structural assessment findings and where relevant input from a Conservation Architect and/or Structural Engineer.

Options to manage or mitigate potential impacts on the heritage values would include the implementation of engineering measures (e.g. bracing/strengthening) on the advice of a suitably qualified Structural Engineer and Conservation Architect.

In the case that the heritage values cannot feasibly (either economically or technically) be maintained using engineering mitigation measures for items of state and/or national significance, adjustment to the mine plan would be considered to achieve the same. Informing that decision would be the management context and condition of the place, and the likelihood of long term conservation being achieved.

- Where relevant, for occupied heritage items of local and regional significance, ICHPL would design and implement management or mitigation measures in consultation with the owner to maintain safety and serviceability, utilizing the subsidence assessment and structural assessment findings.

The results of the above would be detailed in BFMPs for local and regional heritage items, and in addition, individual SOHIs for state and/or national heritage items, for approval by Government as a component of the EP.

The Conservation Architect and Structural Engineer would, where relevant, advise ICHPL on the following aspects during the preparation of BFMPs for items of local and regional significance and SOHIs for items of state and/or national significance:

- Identification of individual components or features of the heritage item that may be more robust and hence can tolerate greater subsidence effects (e.g. sturdy exterior walls), and conversely components or features that are at higher risk of damage due to their state of repair or construction (e.g. existing deteriorated render).
- The types of damage to the heritage fabric that can be repaired without loss of heritage values (e.g. cracks in internal painted masonry walls).
- Consideration of the risk of damage to individual components or features of the heritage item with the predicted subsidence effects, and whether stabilisation methods are available to readily reduce the risk of subsidence damage to that component or feature.
- Where engineering mitigation measures are to be implemented, the potential for the engineering measures to adversely affect heritage values and methods to minimise such impacts.
- The suitability of pre-mining repairs that could be undertaken to stabilise existing unstable or poorly maintained building elements, to reduce the risk of damage during mine subsidence.
- Repair methods that should be adopted for various components of the heritage item (e.g. methods for repair of cracked render, mortar, brick or stone work, internal plaster) such that heritage values are conserved in the event of subsidence damage.

- For items of state and/or national significance, a protocol for the ongoing monitoring, management, documentation and repair of subsidence impacts during mine subsidence that is appropriate for various components or features of the item, and its potential sensitivity to subsidence impacts.

The following discussion provides a summary of the management measures and processes that could be considered for service infrastructure items, and buildings that, on the basis of the assessment, potentially have a higher risk of damage occurring or repairs being required, that could adversely affect heritage values. A summary of the general subsidence management and monitoring processes that would be implemented for all heritage buildings that are subject to Project subsidence effects and recommended management measures for the Bulli Shaft sites are also provided.

Service Infrastructure Items

A number of items listed in Table 4-5, are important infrastructure items, and require structural assessments and the development of management plans to carry out assessment of specific risks, risk assessments with the infrastructure owners, and to design specific mitigation and response actions. The focus of this planning would be on issues of public safety and infrastructure security.

In addition, all state agencies have an obligation to manage the heritage values of their assets, so the protection, mitigation and repair of the heritage values of the items would be integrated into the wider impact management planning via a Heritage Management Plan.

It is envisaged that the development of detailed engineering structural assessments and Heritage Management Plans would be undertaken as part of the EP process in consultation with the infrastructure owner/managers and other relevant authorities (e.g. Heritage Council) to the satisfaction of the DoP.

This approach has been successfully adopted for the management of the Upper Nepean Water Supply System canal which has been undermined by previous ICHPL longwalls, and as part of the Longwall 409 SMP (not yet mined).

Additional Comments on Management of Specific Heritage Buildings

The state significant Camden Park Rotolactor is in very poor condition, and is not actively managed or conserved. The interior of the structure is dangerous to enter, as the ceiling and some equipment and roof members have totally or partially collapsed. It is recommended that pre-mining recording of cracking in the concrete lower walls and external columns, and monitoring of movement during and after mining be undertaken, and any observed subsidence induced damage be considered in conjunction with the owner and in consultation with the WSC. However, it is unlikely that repairs would be warranted, given its current condition.

Menangle Conservation Area is being recommended for State Heritage Listing by WSC in its 2009 revision of the LEP. The Menangle Conservation Area incorporates a range of buildings individually identified as having local, regional or state heritage values, these being items 4, 10, 11, 13-20, 23 and 24 (refer Figure 3-1 and Table 4-3).

While many of these items are individually of local significance, as a group (along with historical associations, the layout of the village, grouping of buildings, landscaping features and architectural character of the buildings) contribute to a whole which has a higher level of significance than its individual parts (i.e. state significance).

The recommended measures for the management of high significance buildings such as the St James Anglican Church (Table 4-4) would maintain the key contribution of these items to the heritage values of the Menangle Conservation Area. Local and regional heritage value buildings in the Menangle Conservation Area would be managed in accordance with the general measures to maintain safety and serviceability that are described above and in Section 4.1 and, if required, would be repaired sympathetically with their heritage values. It is not anticipated that Project mine subsidence would have an adverse impact on aspects of the Menangle Conservation Area such as the layout of the village, grouping of buildings and landscaping features, or on the architectural character of buildings if these measures are applied where required.

For individual items assessed as being of state and/or national heritage significance (whether recognised on the State Heritage Register or not), it is recommended that following finalisation of the mine plan, a detailed subsidence assessment and structural assessment is undertaken, and pre-mining mitigation or management measures are undertaken, if necessary, to maintain heritage values as described in Table 4-4.

This could be achieved by pre-mining repair and strengthening of unstable or fragile components of the structure to withstand predicted subsidence movements, and monitoring and repair such that heritage values are conserved in the event of subsidence damage.

In the case that it is not feasible (either economically or technically) to implement management or mitigation measures to maintain the heritage values of a state and/or national heritage significance item, adjustments to the mine plan would be considered to achieve the same. Informing that decision would be the management context and condition of the place, and the likelihood of long term conservation being achieved. The items where this level of management may particularly need to be considered as a component of the EP process are:

- St James Anglican Church, Menangle;
- St Mary's Towers (formerly Parkhall), Douglas Park; and
- Wilton Park Stables, Wilton.

While they are of lesser heritage significance, the Camden Park Estate Creamery, Gilbulla (Anglican Conference Centre) and St Patrick's Catholic Church (of regional, local/regional and local significance respectively) are also larger multistorey brick buildings. Subject to the outcomes of the detailed subsidence and structural assessments, these items may also require more detailed consideration of the potential implementation of mitigation or management measures during the EP process, due to their size and construction.

Where structural works are proposed as a mitigation measure, the advice of a Conservation Architect is required, to manage any impacts to heritage values from such works.

Locally significant heritage items (outside of the Menangle Conservation Area) would not warrant consideration of extensive management measures on the basis of the heritage values, however, occupied buildings would be managed to maintain safety of the structures and hence would be managed to ensure the safety and serviceability of the structures is not compromised. For all locally significant heritage items, pre-mining recording, monitoring during and after mining, and post-settlement repairs in accordance with the MSB requirements is recommended as the appropriate approach to conserve heritage values.

This approach is generally consistent with the *Mine Subsidence Compensation Act 1961* (MSC Act), as described below.

General Management Measures for all Heritage Buildings Being Subsided

The MSC Act is administered by the MSB. The MSB is a state government organisation funded by levies paid by coal mining companies. In accordance with the Act, the MSB provides compensation or repair services for man-made property improvements that are damaged by mine subsidence.

The MSB deals directly with the property owner in relation to the repair and management of property subsidence affects. However, where subsidence impacts are likely to affect an identified heritage item, ICHPL would arrange, with the owner's agreement, a pre-mining inspection and structural assessment of the building/structure.

On the basis of the pre-mining inspection and structural assessment results, a subsidence monitoring programme would be developed for the item in consultation with the owner. Subject to the nature of predicted subsidence effects, consultation with the owner and the heritage values of the item, this may include:

- Installing a suitable number of measuring/monitoring devices (e.g. crack width gauges) at suitable locations in the building to monitor for changes to the building.
- Installation of a survey monitoring grid around the site. If installed, survey monitoring grids would be read at regular intervals and ICHPL would distribute the periodic survey data to the owners and the MSB.
- A geotechnical investigation of the soils in the immediate vicinity of the item, where a geotechnical consultant would either excavate or auger test holes in order to sample the soils and strata that the structure is founded on. This would enable laboratory testing to be carried out to determine the soil properties and gain further insight to the ground conditions at the site.

ICHPL would co-ordinate the pre-mining inspection and structural assessment in consultation with the MSB. A record of the pre-mining inspection and structural assessment would be provided to the MSB and the owners.

ICHPL would also co-ordinate the installation and regular reading of any applicable subsidence/damage monitoring and distribute the data collected to the owners and the MSB.

In the event that review of the site specific subsidence assessment and structural assessment identify the requirement for the implementation of pre-mining engineering mitigation measures, such measures would be implemented in consultation with the MSB and the property owner. Where structural works are proposed as a mitigation measure, the advice of a Conservation Architect is required to manage any impacts to heritage values from such works.

If requested by the owner, a MSB officer would inspect the heritage item approximately one month prior to the commencement of mining to compile a MSB pre-mining condition report. The purpose of the inspection is to record the condition of the item before mining commences. The MSB would provide the property owner with a copy of the pre-mining inspection report.

ICHPL would provide notification to the property owner and Picton office of the MSB once mining is complete. If subsidence effects do impact the property, such impacts can be expected to occur within twelve months after the longwall face has passed under/adjacent or subsequent longwalls have passed adjacent to the property. ICHPL would continue to carry out subsidence survey monitoring at the property and distribute this information to the Picton Office of the MSB and the owners to assess the most appropriate time for the commencement of repairs to subsidence impacts.

If subsidence impacts have occurred, the property owner would liaise with the MSB staff and lodge a MSB claim form requesting repair of the subsidence damage in accordance with the MSB procedures.

On receiving notification, the MSB would inspect the property and determine any works necessary to repair subsidence damage. The MSB's pre-mining inspection report and relevant previous inspection reports and structural assessments would be used as a basis for comparison with the pre-subsidence condition.

Where repairs are to be undertaken, the MSB would arrange and pay for suitable contractors to complete repair works, in consultation with the property owner. In some cases the advice of a Conservation Architect may need to be obtained, where repair is beyond what might be regarded as simple maintenance.

The Bulli Shaft Sites

Given the regional heritage significance of the two Bulli Shaft items with identified regional heritage values (Bulli Nos.1 and No.2 Shafts), it is recommended that the heritage components remain on the sites and are not rehabilitated/removed, unless unresolvable public safety issues dictate their removal.

In the event that the items are retained, ICHPL and the SCA should liaise on the development of a Conservation Management Plan for the long-term conservation of the heritage listed items.

Should conservation of either or both of these items not prove to be feasible or prudent, full recording to the standard required by the Heritage Branch for items of regional significance should be carried out prior to removal of all or part of the items.

4.3 Statement of Heritage Impacts

The potential heritage impacts of the Project on items with heritage values are outlined in Tables 4-3 and 4-5 and in Section 4.1.

Forty-nine items with heritage values have been identified with the Project extent of longwall mining area and surrounds, including items on existing local government and state government heritage registers and lists, or proposed for inclusion during future amendments to those lists.

Actions are recommended as a component of the EP process to minimise potential adverse affects on heritage values, including recommendations for the management of state and/or national significance heritage items.

Measures to monitor and repair any damage that might occur are also outlined in Section 4.2. Such actions are consistent with those required by the MSB for buildings and structures impacted by mining.

These proposed management and mitigation measures are related to the level of potential risk of repairs being required on the basis of a conservative assessment by MSEC. Recommendations have been provided that should be adopted to minimise potential impacts on heritage values, once site-specific subsidence assessments and structural assessments have been conducted on the basis of the final mine design.

5 CONCLUSIONS

Tables 4-3 and 4-5 indicate the potential impacts of the Project on specific heritage items. Of the 49 items identified as having heritage values and potentially impacted by the Project, seven are major infrastructure items (Table 4-5) that require broader impact planning that should incorporate heritage considerations (three of these are specific components of the Upper Nepean Water Scheme).

Eight of the remaining 42 items are expected to experience no impacts. For the remaining 34 items, recommendations are provided that can be addressed as a component of the EP process, following completion of site-specific subsidence and structural assessments.

For a number of state and/or national heritage items it is recommended that individual SOHIs be completed as a component of the EP process. Where required for these sites, engineering measures (e.g. bracing/strengthening) would be employed based on the advice of a suitably qualified Structural Engineer and Conservation Architect to conserve heritage values. In the case that it is not feasible (either economically or technically) to implement management or mitigation measures to maintain the heritage values of a state and/or national heritage significance item, adjustments to the mine plan would be considered to achieve the same. Informing that decision would be the management context and condition of the place, and the likelihood of long term conservation being achieved. The items where this level of management may particularly need to be considered as a component of the EP process are:

- St James Anglican Church, Menangle;
- St Mary's Towers (formerly Parkhall), Douglas Park; and
- Wilton Park Stables, Wilton.

Where engineering mitigation measures are to be implemented, the advice of a specialist Conservation Architect would be obtained to minimise the potential for the engineering measures to adversely affect heritage values.

Of the four Bulli Shafts, two have been assessed in the Wollongong LEP/Illawarra REP as having regional significance, and the significant components should remain after rehabilitation of the sites unless unresolvable public safety issues dictate their removal.

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ATTACHMENT A

CITATIONS FOR RELEVANT ITEMS OF HERITAGE SIGNIFICANCE

ATTACHMENT A

CITATIONS FOR RELEVANT ITEMS OF HERITAGE SIGNIFICANCE

TABLE OF CONTENTS

1 MENANGLE RAIL BRIDGE OVER NEPEAN RIVER

1.1 Location

Main Southern railway, Menangle Road, Menangle.

The listing boundary is the area on which the bridge is located including abutments, supports, embankments and approaches and an area described by a line approximately 50 metres (m) from the bridge in all directions.

1.2 Heritage Listing Status

State Heritage Register Listing No. 01047. State Heritage Inventory Database (SHI DB) No. 5012102.

Menangle Viaduct, Wollondilly Local Environmental Plan (Wollondilly LEP).
SHI DB No. 2690059.

Wollondilly Heritage Study.

Menangle Underbridge, S.170 State Agency Heritage Register, State Rail Authority.
SHI DB No. 4440315, 4440500.

Register of the National Estate No. 3284.

1.3 History

The 1863 Menangle Rail Bridge is the first large iron rail bridge erected in New South Wales (NSW), whereas the first large rail bridge, an 8-span stone arch viaduct, was opened at Lewisham in 1855.

When John Whitton planned the railway extension from Campbelltown to Picton, he was under pressure from government to keep costs low by using as much local material as possible. A metal girder design had been proposed by contractors Peto, Brassey and Betts but Whitton substituted a timber bridge made from ironbark and other strong hardwoods, and a relatively short 151 m (496 feet), low level crossing.

However the flood of 1860, some 18.3 m (60 feet) above the proposed rail level, caused him to design a high level, large span bridge, flanked by long timber approach viaducts, a total of 582 m (1,909 feet). It was a massive structure for its time, comprising 5,909 cubic yards of masonry, 1,089 cubic yards of brickwork and 936 tons of wrought iron for a total cost of 94,562 pounds.

The iron superstructure was manufactured in England at the Canada Works, Birkenhead (opposite Liverpool) and shipped out in December 1861. One ship arrived in Sydney in April 1862 but the other was wrecked at the entrance to the Mersey River. However, the replacement ironwork was delivered to Sydney in December 1862.

Construction of the stone (quarried locally) abutments and piers were completed in October 1862 and the iron bridge was assembled ready for service by June 1863. Load testing, by three locomotives in full steam, followed and the line to Picton was opened on 1 July 1863.

The use of a continuous superstructure was technically significant because the analysis of such structures was a relatively new, sophisticated procedure. Also, it showed that Whitton and Fowler (London) appreciated the structural benefits that a continuous girder over three spans offered compared to three simply-supported spans.

The principal modification to the structure has been the building of the intermediate piers in 1907 which, by halving the original spans, greatly increased the load capacity of the bridge such that it is still in service carrying modern heavy, fast rail traffic. The original iron bridge was flanked by timber viaducts which were replaced by steel girders in 1923. In 1993 Consulting Engineers, Dames & Moore of North Sydney, recommended a number of actions for a general refurbishment of the main bridge, some minor repairs, cleaning up and painting, maintenance to the bearings and the like, but no major changes.

The sister bridge to the Menangle Bridge was the Victoria Bridge over the Nepean River at Penrith. Their sizes and design were such that they were featured in an international text book Modern Examples of Road and Railway Bridges by William H Maw and James Dredge, London, 1872.

LEP Citation

To cross the Nepean River at Menangle, the contractors for the Southern Railway, Messrs. Peto, Brassey & Betts, submitted a design for a three-span box-girder bridge to carry two railway lines. Their original proposal was considered too expensive, but the 1860 flood rose 60ft above normal river level and it was considered necessary to construct the larger bridge. Tenders were let for masonry in June, 1860, and for the iron work in December, 1860. The ironwork was fabricated at the Canada Works (Sir M. Peto) in Birkenhead (England) and shipped into two vessels which sailed in December, 1961. The first, with the middle span, arrived in April 1982, but the other was wrecked on the Mersey in January, 1862. The replacement spans arrived in October and December, 1862. Sandstone for the piers was quarried; construction of these was completed in October, 1862, and ironwork was erected by June, 1863. After testing, the bridge was opened as part of the extension of the Southern Railway from North Menangle to Picton on July 1st, 1863.

Various modifications have been made over time to accommodate rail traffic needs. A derailment of goods train wagons in 1976 damaged northern masonry piers, which were subsequently demolished.

1.4 Description

Since 1907, when intermediate piers were built in the middle of the 3 original 49.4 m (162 feet) spans, the bridge has been 6 x 24.2 m (79.3 feet) spans. Between the original stone abutments, these additional brick piers alternate with the original stone piers.

The superstructure consists of two massive, wrought iron, cellular (box) girders, continuous from abutment to abutment, no breaks at the piers. These 3.8 m (12.5 feet) deep girders are at 7.8 m (25.5 feet) centres which allows for double track between them, supported on a series of closely spaced cross girders.

On the outer surfaces of the girders there are pairs of curved angle iron suggesting the inclusion of an arch. These are purely decorative.

At the Sydney end, one of the ornamental tops to a pier was demolished by a derailment in 1976. The iron bridge received only localised superficial damage but the stonework was not replaced, thereby leaving the cellular cross section of the girder exposed.

Physical condition is good.

LEP Description

The viaduct is a three span box-girder rail bridge on four sandstone piers (24.4 x 6.1m at the base and 15.8 x 3.6m at top). Three spans of 60.3m, 7.8m apart and 3.9m deep, consist of two wrought iron box-girders sitting on expansion rollers and weighing 1080 tons, which in turn support girders supporting railway lines laid inside them. Ornamental masonry survives on southern end.

Although the bridge was constructed for two lines of railway, this was not used originally. After testing, one line was removed and not replaced until 1892. In order to support the weight of larger locomotives, additional piers were constructed to support the iron spans in the centre of each, and completed in 1907. Approach viaducts were renewed in steel in August, 1923. Further strengthening was carried out in 1930 for larger locomotives. Ornamental masonry piers on the northern end were demolished above rail level after they were severely damaged in the 1976 derailment.

1.5 Statement of Significance

From State Heritage Inventory Database

State Heritage Register Statement of Significance

The Menangle Rail Bridge constructed in 1863 over the Nepean River is one of the most historic bridges in Australia because (a) it was the first large iron bridge in NSW and the largest bridge until the 1889 Hawkesbury River Bridge (b) it has a dominant appearance in a rural landscape (c) it shares in the enormous benefits, social and commercial, that the Main South Railway has made to NSW in 140 years and (d) it was a technically advanced design for its time and received international recognition in 1872.

The Menangle and Victoria Bridges are the only bridges of their type in NSW. They are excellent examples of heavy duty, wrought iron girder bridges continuous over three spans. Apart from the inclusion of the intermediate piers in 1907, the 1863 Menangle Bridge retains most of its original fabric.

The Menangle rail bridge constructed in 1863 is the oldest surviving bridge on the State rail system and is of the highest significance in the development of railway technology in the State. It is an excellent example of early bridge construction. The bridge is one of two identical bridges constructed for the NSW Railways, the other being over the Nepean River at Penrith. The Penrith Bridge was opened in 1867 but has been used for road traffic since 1907.

The Menangle rail bridge is typical of British bridge engineering of the 1860s, the iron spans having been fully imported. Additional supporting piers were later erected under the spans so that heavier engines could be used on the main south line. The bridge is of national, if not international, significance as there are few such bridges still in use in the United Kingdom.
Date Significance Updated: 16 Apr 03

LEP Statement of Significance

The Menangle Railway Viaduct has important historical associations with the initial stages and subsequent growth of the Main Southern Railway Line. It is the oldest surviving rail bridge on the line and in the State. (The first in the State was at Lewisham, and has since been demolished.) Modifications to the bridge reflect changes in the type of traffic on the line and the bridge remains in everyday use for all trains en route to Goulburn, and the south.

1.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The 1863 Menangle Rail Bridge over the Nepean River is one of the most historic bridges in Australia. It was the first large iron bridge in NSW and the largest bridge until the 1889 Hawkesbury River Bridge.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The bridge has a dominant appearance in a rural landscape, partly obscured by excessive growth of adjacent trees. The Menangle Railway Viaduct has local significance as an excellent and early example of civil engineering and as a local landmark.

Criterion D: an item has strong or special associations with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

The Main South Railway has been an enormous benefit to the social and commercial development of the southern quarter of NSW for 140 years, and this bridge, part of the original railway construction, has shared in the significance of that contribution.

Criterion E: an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

The 3-span continuous girder design was, for the 1860s, a technically sophisticated deign that was noted in an international 1872 text book. The cellular construction, whereby the top and bottom parts of the girders are made in the form of two boxes or cells, was a recent development for resisting lateral buckling arising from the famous experiments by Fairfairn and Hodgkinson for the 1849 Britannia Bridge in Wales.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

The Menangle and Victoria Bridges are the only bridges of their type in NSW.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments.

The Menangle and Victoria Bridges are excellent examples of heavy duty, wrought iron girder bridges continuous over three spans.

1.7 Photos

Menangle Rail Bridge
Photo: M. Pearson 2008

Menangle Rail bridge from Menangle Weir.
Photo: M. Pearson 2008

2 MENANGLE WEIR – BELOW RAIL BRIDGE

2.1 Location

Nepean River, Menangle.

2.2 Heritage Listing Status

Sydney Regional Environmental Plan (REP) No. 20 - Hawkesbury-Nepean River.

SHI DB No. 3032.

2.3 History

No detail in SHI DB.

Menangle Weir and others on the Nepean River are claimed to have been built to maintain the riparian rights of local landholders following the completion of the Upper Nepean Water Scheme in 1886 (Campbelltown Council web site).

2.4 Description

No detail in SHI DB.

The weir is a stone barrier across the Nepean River, situated between the Menangle Rail Bridge and a natural rock bar over which the river runs in a series of rapids and waterfalls. The stone weir is approximately a metre in height above the natural bar, and impounds a large shallow pondage that extends up the river some 1.5 kilometres (km) beyond the bridge.

2.5 Statement of Significance

There is no State Heritage Inventory statement of significance.

The following statement arises from this 2009 study:

The Menangle Weir is significant locally as an intact example of a simple weir structure for agricultural purposes. The Weir is also of local historical significance, as it was built to ensure water access by local landowners at the time the Upper Nepean Water Scheme was taking water from the river upstream.

2.6 Significance against Criteria

NSW State Heritage Register Criteria

The following statement arises from this 2009 study:

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Weir is of local historical significance, as it was built to ensure water access by local landowners at the time the Upper Nepean Water Scheme was taking water from the river upstream.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The Menangle Weir is significant locally as an intact example of a simple weir structure for agricultural purposes.

2.7 Photos

Menangle Weir from north bank
Photo: M. Pearson 2008

Menangle Weir from north bank
Photo: M. Pearson 2008

3 MENANGLE RAILWAY STATION GROUP

3.1 Location

Station Street, Menangle.

The listing boundary extends along the outside of the down track commencing at the northern end of the platforms. At the south end of the station the boundary crosses the tracks below the platform to take in the sidings adjacent to the entry and parking area, extending across the entrance drive approximately 30m to the south of the buildings. It then extends north along the rear property boundary, behind the night officers residence and then returning east to meet the tracks at the end of the platforms.

3.2 Heritage Listing Status

State Heritage Register No. 01191. SHI DB No. 5012101.

State Rail Authority Section 170 Register, 4440267.

Wollondilly LEP. SHI DB No. 2690060 ('Railway Station').

Wollondilly Heritage Study. WO0060.

3.3 History

Built in 1864 on the Great Southern Railway Line at South Menangle, the station is one of the earliest in the district and pre-dates the construction of the Picton Loop Line and the Picton-Mittagong loop line. The construction of the rail line opened new markets to local farmers and businesses as well as allowing the influx of goods from other areas, including Sydney. The coming of the railway resulted in the social and economic growth of the region and ventures such as the Menangle Creamery were dependent upon it for the transport of their product.

3.4 Description

Buildings	Station building/residence - type 1, 1863 WC block - brick, 1863.
Structures	Platform face - brick, up side only, 1863.

A small, single storeyed building complex of painted brick and weatherboard components. The earliest buildings (in the centre of the group) include a square, planned, hipped roofed residence with central 4-flued chimney flanked by a pair of hipped roofed station buildings which front onto the main platform. The two wings are linked to each other by a skillion roofed verandah. All of these buildings are of painted brickwork with timber-framed sash windows (a mix of 4 x 12 pane sashes) and 4 panelled doors.

Later additions (generally of weatherboards) with a mix of hipped and gabled roofs have been added to the north, south and west of the original buildings. The station is said to retain an early cast-iron platform weighing machine by "W.T. Avery", London and Birmingham.

The complex appears in fair condition externally, but the interior is sealed and internal condition could not be assessed (2008).

Condition fair.

3.5 Statement of Significance

From State Heritage Inventory Database

State Heritage Register Citation

Menangle station group is one of the earliest station complexes to survive in the state. It is a combination station building and residence which has had substantial additions. Although the second platform and building have been demolished for a new platform the remaining up buildings and platform are of very high significance in the development of railway buildings. Significant features of this building are its lack of awning to the platform, the unusual planning of the building with detached wings, room for porters, no waiting room and the asymmetrical elevations. The remaining structures are of national significance in conjunction with the railway underbridge listed separately.

Wollondilly LEP Citation

Menangle Railway Station is significant through its historical associations as one part of the early stage of development of the Main Southern Railway Line. The location of the station at South Menangle also encouraged the growth of the southern village at the expense of the settlement on the northern side of the river.

The station also has aesthetic significance as a good typical representative example of a small 19th century country railway station building of the combined 'residence and station offices' type. This significance is enhanced by the high degree of intactness of the buildings form and fabric, including such features as the early platform weighing machine.

Additionally, the station has aesthetic significance as a notable and attractive landmark in views both to and from the adjacent Menangle Village.

3.6 Significance against Criteria

NSW State Heritage Register Criteria

State Heritage Register Citation

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

Menangle Railway Station is significant through its historical associations as one part of the early stage of development of the Main Southern Railway Line. The location of the station at South Menangle also encouraged the growth of the southern village at the expense of the settlement on the northern side of the river.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The station also has aesthetic significance as a good typical representative example of a small 19th century country railway station building of the combined 'residence and station offices' type. Additionally, the station has aesthetic significance as a notable and attractive landmark in views both to and from the adjacent Menangle Village.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as historically rare. This item is assessed as scientifically rare. This item is assessed as architecturally rare. This item is assessed as socially rare.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments.

The station is a good typical representative example of a small 19th century country railway station building of the combined 'residence and station offices' type.

3.7 Photos

Menangle Railway Station
Photo: M. Pearson 2008

4 MENANGLE STORE

4.1 Location

57 Menangle Road, Menangle (Lot 8, DP 531899).

4.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690090.

Wollondilly Heritage Study.

4.3 History

Built c1904, the store has noted similarities to *Gilbulla* (see Section 12) so it may be Sulman and Power design. It has been used by the Camden Park Estate right up to the 1970s as its buying agent for all provisions, stores, seed, fertiliser and fuels used on the farm. The store has always had a licence and served the village and the rural hinterland. It contains original ovens where the bread was baked and a coolroom for the butcher shop which provided for farmers when Menangle was more remote from Sydney. It continues to serve the community and is a tourist attraction.

4.4 Description

A two storey commercial building with "Federation Arts and Crafts" detailing located on the major intersection in Menangle Village. The main gabled roof (covering the whole of the second storey) is punctuated by an over-sized, twin-gabled porch with shingled gable ends and balustrade and turned timber posts. Tall, rendered chimneys with decorative strapwork also break the roof line in an asymmetrical arrangement. The ground level is brick with a timber framed second floor.

Inside there is a coolroom and bakers oven. The shelving in the current store is modern. A weatherboard building with shingled gable ends and corrugated iron roof to the east is identified as a former barn. A domed brick well is sunk into the back yard, and may be contributing to rising damp problems in the building.

At street level the face brickwork has been painted and alterations have been made to door/window openings.

Extension to south (fronting Menangle St); alteration of windows to main frontage; external steel stair to first floor on east elevation. Corrugated iron roof.

The building is in poor to fair condition, with rising and falling damp problems, and general interior decay.

4.5 Statement of Significance

From State Heritage Inventory Database

The Menangle Store has historical significance as the only 20th century store in Menangle Village and through its role in serving farmers in the rural hinterland and in provisioning the Camden Park Estate. It has links with the Macarthur family who sponsored the store. The building is unusual in the State as a particularly fine and relatively unusual freestanding example of a "Federation Arts and Crafts" style commercial shop. This significance is enhanced by the degree to which the building retains its original form and detailing.

In addition, the store has aesthetic significance as a landmark effectively marking the centre of Menangle village.

4.6 Significance against Criteria

NSW State Heritage Register Criteria

State Heritage Register Citation

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Menangle Store has historical significance as the only 20th century store in Menangle Village and through its role in serving farmers in the rural hinterland and in provisioning the Camden Park Estate. It has links with the Macarthur family who sponsored the store.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

It has links with the Macarthur family who sponsored the store, and was linked to the fortunes of the Camden Park Estate.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The building is unusual in the State as a particularly fine and relatively unusual freestanding example of a "Federation Arts and Crafts" style commercial shop. This significance is enhanced by the degree to which the building retains its original form and detailing.

In addition, the store has aesthetic significance as a landmark effectively marking the centre of Menangle village.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

The store's historical links to the large Camden Park Estate and the Macarthurs provide uncommon aspects in the context of the State's history.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments.

The building is unusual in the State as a particularly fine and relatively unusual freestanding example of a "Federation Arts and Crafts" style commercial shop. This significance is enhanced by the degree to which the building retains its original form and detailing.

4.7 Photos

Menangle Store
Photo: M. Pearson 2008

Menangle Store 'barn' to east
Photo: M. Pearson 2008

5 ELIZABETH MACARTHUR AGRICULTURAL INSTITUTE (FORMERLY CAMDEN PARK ESTATE)

5.1 Location

Woodbridge Road, Elizabeth Macarthur Avenue, Menangle (only a small part of the estate is within the study area for this report).

5.2 Heritage Listing Status

State Heritage Register No. 00341. SHI DB No. 5045133 (Camden Park).

State Heritage Register No. 01697. SHI DB No. 5051536 (Camden Park Estate and Belgenny Farm).

Wollondilly LEP. SHI DB No. 2690002 (or 2690800?) (Elizabeth Macarthur Agricultural Institute [EMAI]).

Wollondilly Heritage Study.

S.170 State Agency Heritage Register (Dept of Agriculture).

Sydney REP No. 20 - Hawkesbury-Nepean River.

Register of the National Estate No. 3249.

5.3 History

State Heritage Register Citation (No. 00341)

John Gould Veitch, esteemed English nurseryman described Camden Park on a visit in 1864: "Camden Park, the Seat of Sir William Macarthur, November 17, 1864 - Sir William Macarthur, who is now almost as well known in Europe as in Australia, is a most enthusiastic amateur in horticulture. Camden Park is situated in the centre of an estate of 30,000 acres of fine arable and pasture land. It is 40 miles from Sydney and easily accessible by rail, the station of Mena(n)gle being within 4 miles of the house. Camden House stands on an elevation of some 200 feet. The approach to it is poor, and not in keeping with the other portion of the grounds. The gardens are extensive and kept in good order. The collection of plants and fruits at Camden is by far the best I have seen in the colony. No means here have been spared to obtain the best varieties in each class. Even our (Veitch's) most recent strawberries are thriving here. The garden is divided into two parts, and is under the superintendence of two gardeners. That in immediate connection with the house is laid out in lawns and shrubberies, with an orange grove, the picture of health and luxuriance, and two greenhouses for the purpose of propagation, attached. Here may be found many rare plants. All the Californian and Japanese coniferae are doing well."

Veitch goes on to list many choice species of climbers including Bougainvillea spp., shrubs including oleander, lilac, rhododendrons and azaleas, roses 'in great perfection', trees including Magnolia spp., Chinese elm, Strawberry tree (Arbutus), and flowers, including annuals.

"A few of the specimens of coniferae (conifers) and of evergreen shrubs here are the largest in the colony. *Thuja aurea* is the largest I have seen, and measures 7' each way. *Araucaria bidwillii* (Bunya pine) is undoubtedly the finest in cultivation. It forms a beautiful pyramid of the darkest green glossy foliage, 40' high by 35' through. *Cedrus deodara* (Himalayan cedar), *Pinus halepensis* (Aleppo pine), *Ficus indica* (fig) and *Magnolia grandiflora* (evergreen magnolia or bull bay) are fine trees."

"The lower garden is devoted chiefly to vegetables and fruit, but also contains a number of flowering shrubs, and a large collection of bulbs. There is almost every variety of obtainable fruit suitable to the climate. Fruit is so plentiful that large herds of pigs are fed on it. Sir William has devoted special attention to bulbs. His collection contains numerous hybrids raised by himself, and the best imported varieties of hyacinth, tulip, crocus, anemone, ranunculus, alstroemeria, amaryllis, gladiolus, lily, iris etc."

"Camden Park is famed for its wine. Extensive vineyards are under cultivation. The principal grapes grown are those from Germany. The wine is made by men from the Rhenish wine districts."

"Mr Ferguson's Nursery is situated near the village of Camden. Mr F. learnt his business at Chatsworth and other large English gardens. He was then for several years in charge of Sir William Macarthur's establishment"(Morris, 1994).

The estate and Macarthur family were instrumental in establishing the Australian wine industry. Camden Park became world-renowned for the quality of its wine. Camden Park played a vital role in the fledgling Australian wine industry through its importation and distribution of vine cuttings throughout NSW and the Barossa Valley of SA. By 1853 Camden Park listed some 33 grape varieties for sale. By 1841 William & James were producing more than 5000 gallons and that vintage won Gold Medals in England. In 1844 24,000 vine cuttings were sent from Camden Park to Adelaide, setting South Australia on a path to becoming an internationally acclaimed wine growing district (Everett, 2004). Camden Park became world-renowned for the quality of its wine and by 1845 was producing around 10,000 gallons per annum as a serious vineyard and one of the most highly regarded in the colony and with quite a reputation overseas (Everett, 2004).

Wollondilly LEP Citation

The history of Camden Park and its founders, the Macarthur family, is well known and documented. During the last century they created at Camden an effective rural estate based on the British model. The chief focus was the mansion, designed by John Verge and completed in 1835. It is surrounded by extensive gardens and to the south were vineyards and a winery, to the north was the plant nursery established by William Macarthur and one of the chief centres of horticulture in 19th century Australia. Large orchards and plantations of economic species, such as olive and cork were located to the east adjacent to the Nepean River, and nearby were irrigated paddocks developed by James Macarthur. The extensive grazing lands, known as the Cowpastures carried the celebrated flocks of merino sheep as well as horses and cattle. Along the main drives much new planting was introduced to evoke the character of a British estate. Olive trees lined the drive while great belts of exotic species edged the river meadows.

Vistas were established through the landscape to church spires, a windmill, and natural prominences. Towards the end of the 19th century, the area adjoining a lagoon to the north of the plant nursery was restored as the pleasure grounds, which were in existence by 1824. Gate lodges designed by Sir John Sulman were built at the head of the Camden and Menangle drives. Dotted around the estate are groups of cottages, forming hamlets accommodating the numerous farm workers. The two chief groups are located overlooking the former plant nursery and the former orchard. The centre of the agricultural operation was located adjacent to the original cottage, on a ridge to the south west of the mansion. Known as Old Belgenny, the Belgenny Farm Group was well established when visited by Robert Scott of Glendon, Hunter Valley, during the 1820s. His sketch plan establishes that the buildings existing north and west of the courtyard were extant circa 1826. The group has been amended and extended during the ensuing years and is a most significant example of rural evolution, all of the key buildings being based on advanced British prototypes. During this century, the Estate was reorganised for dairying purposes. Numerous dairy buildings and eventually, in the 1950s, the Rotolactor, demonstrate the built manifestations of this pursuit. During the 1970s, the majority of the estate was sold to Talga Pty. Ltd. for suburban development. Approximately 1,000 acres around the mansion was retained by a member of the Macarthur family. Talga Pty. Ltd. failed, and the northern portions of the Talga Pty. Ltd. holdings were purchased by the NSW government in 1976. The southern portion of the Talga Pty. Ltd. holdings remained in private ownership until purchased by EMAI in 1984.

5.4 Description

State Heritage Register Citations (abstracted for those components in study area)

Camden Park Estate is a significant area of open space on the Nepean River system to the south-east of the town of Camden. As a man-modified cultural landscape it contains extensive cultural features (of heritage value), such as:

- tree lined river meadows (on flood plains);
- tree lined driveways;
- the relic orchard site; and
- extensive productive pastures.

Many structures and building groups are located on various parts of the estate. The major items are listed below.

Gate Lodges

The estate had a number of gate lodges mostly in Federation style, some of which survive and are of relevance to this study (refer to Section 6). The former lodge at Menangle, and two lodges on Remembrance Driveway (former Hume Highway/ Great Southern Road) are remaining examples. Designed by Sir John Sulman, built at the head of the Camden and the Menangle Farm estate drives.

The estate is the relatively intact 400 acre core of a once huge (30,000 acre) colonial land grant, still being actively farmed by descendents of the same, Macarthur Family, which established it. The SHR listing area is surrounded by another core remnant of the original family estate, which in 1975 the NSW Department of Agriculture purchased. The Department has managed this 1,583 hectares, now called the EMAI, since then for research purposes.

The township of Menangle (location of a former Macarthur Dairy and Factory and the famous 'rotolactor'), retains a number of estate buildings, including a cottage, a duplex and the Menangle Workshop (former Dairy building).

Landscape Zones in the Study Area

The following landscape zones fall entirely within the Project extent of longwall mining area.

Zone 1 - Menangle Paddock

Menangle Paddock is open and expansive in character. It is a group of cleared, arable fields, gently sloping around Foot-Onslow Creek. Significant structures include a Sulman-designed gatehouse on Woodbridge Road; a row of cottages, a post office, the Department of Agriculture buildings and associated plantings along Menangle Road. This architectural edge marries the zone visually to Menangle Village.

Planting within the zone occurs in a linear fashion. Willows delineate the creek, Lombardy poplars line one of the access roads and a privet hedge forms part of the southern perimeter. Similar hedging is located in the adjacent Rotolactor property.

Zone 2 - Exposed Hills

Flanking Woodbridge Road to the south of the Estate are steeply rounded grassy hillsides, almost entirely cleared of tree cover, save for one Olive tree on "One Tree Hill". A few scattered *Eucalyptus crebra*, a prominent feature of exotic plantings associated with Dairy No. 4 and is visible from Menangle. Zone 2 is the only example on site of exposed hills viewed against the skyline and semi-replanting on the lower slopes retains the bare character of the hilltops.

Zone 14 - Cummin's Flat

Hawkey’s Dam, a shallow damming of Navigation Creek enclosed on the east and west by hills and on its perimeter by tree planting to prevent wind evaporation is a working example of Keyline practice. Perimeter planting carried out in 1960-61 include *Casuarina glauca, Eucalyptus grandus, E. maculata, E. moluccana, E.sideroxylon rosea, E. tereticonis, Pinus radiata* and *Populus nigra italica*.

Cummin’s Flat is very open, flat and grassy with glimpses of water to be viewed through the trees and reflections of Flooded Gums in the northern part of the dam. Cummin’s Flat is susceptible to evaporation and when the water volume is low, the flat is used for grazing.

The southern portions of landscape zones 3, 4, 5, 6, 7, 13 and 15 are also on the margins of the Project extent of longwall mining area. Section 5.8 includes extracts from the State Heritage Register identifying the landscape zones within the curtilage area.

Zone 3 - Ridgetop

Due to Ridgetop's height, its strong north-south axis and the steepness of the adjacent slopes, Ridgetop forms the dominant geomorphological and visual backbone of the site. The extensive views to the east and west across the property to neighbouring countryside, Menangle village and to the ridges in the middle and far distance gives an understanding of the site's regional landscape context. It has undergone only partial clearing and presents a sparse, yet fairly continuous cover of narrow leaved ironbark (*Eucalyptus crebra*).

Zone 4 - Top Paddock

Top Paddock comprises of steep slopes and minor ridgelines to the west of the main ridge. The two valleys are nearly bare of vegetation. The three ridges have been only partly cleared and retain a fairly generous cover of *Eucalyptus crebra* on the upper slopes. The lower slopes have been replaced by grey box (*E. moluccana*) and forest red gum (*E. tereticornis*) and she oak (*Casuarina glauca*) in areas of high soil salinity or impeded drainage. Top paddock is presently used for grazing and these steep slopes offer broad views downslope to Navigation Creek Valley. The character of this zone has changed since the completion of the Agricultural Research Station, however this site is visually contained within the landscape and is not too apparent beyond this catchment.

Zone 5 - East Slopes

Overlooking the Nepean Plain and river to the east, these vegetated pastoral East Slopes are very steep. Visual quality of this area is lessened by overhead transmission lines and the Department of Agriculture security fencing. The dominant species is again narrow leaved ironbark (*Eucalyptus crebra*).

Zone 6 - Nepean Plain

Zone 6 is fairly flat land and has been completely cleared of tree cover and the only significant feature is the slight depression towards Menangle Pond. The adjacent mining operations and associated clearing are highly visible.

Zone 7 - Mining Lands

As a result from Menangle Sand and Soil mining operations, the original land profile has been lowered and the river banks have been destabilised. Zone 7 was almost completely cleared of indigenous vegetation until rehabilitation, however weed growth has appeared and the natural river character has been lost. Without control, the river bank vegetation and visual qualities may be completely lost.

Zone 13 - Navigation Creek Valley

This is a broad, fairly flat, alluvial and flood-prone valley extending approximately north-south the length of the Estate, exhibiting erosion near the creek head to the south. In its northern extent it is open and pastoral in character, and largely bare of vegetation except for some she oaks (*Casuarina glauca*) along the creek. To the south, vegetation is diverse with *Angophora* hybrids and *Pimelea* spp.

Zone 15 - West Expanse

This West Expanse is flanked by the Hume Highway and Finns Road to the west of the Estate and has broad views across the site to the central ridge. Zone 15 is a hilly and pastoral terrain and comprises a fairly sparse canopy cover of *Eucalyptus crebra* and *E. moluccanna*, and open woodland of *Casuarina glauca*.

Wollondilly LEP Citation

The EMAI is the current name of the property now owned by the NSW State Government, which was formerly known as Camden Park. EMAI was purchased as the remnant of the Camden Park Estate when Talga Pty Ltd failed. EMAI along with the 1,000 acres of Camden Park Estate still owned by the descendants of John and Elizabeth Macarthur are the remnants of the original property.

EMAI includes the Laboratory Complex and associated buildings which commenced construction in 1987, the Menangle Gate Lodge (former), Orchard site, Workmen's Cottages, Estate Cottages, Barrigal (Macquarie) Monument, Cemetery, Dairy No 8, Dairy No 9, Dairy No 4, Dairy No 2, Macarthur's original Bloodline Sheep Flock, Cottage Monument and Belgenny Farm Complex (which includes the Belgenny Cottage, Dovecote, Community Hall, Bell, Creamery, Stables, Granary, Slaughter House, Carpenter's Shop, Mill, Engine Room, Well, Fuel Shed, Blacksmith's Shop, Sheep Shed, Piggery, Workmen's cottages as well as several secondary buildings and structures that form the complete set of farm buildings). Each of the places listed above (excluding the Laboratory Complex and associated completed since 1987) has a separate State Heritage Inventory record.

5.5 Statement of Significance

From State Heritage Inventory Database

State Heritage Register Citation

The Camden Park Estate is of social, historic, scientific and aesthetic significance to NSW and Australia. It shows a high degree of technical and creative excellence being a rare, and still relatively intact, example of a model rural estate of the early 19th century (continuing to serve this function until the 1950s). It is the oldest pastoral sheep stud in Australia.

The estate's considerable social and historic significance is also due to its ability to demonstrate the way of life, tastes, customs and functions of a 19th - early 20th century rural establishment. From its establishment the site was a particularly fine example of a colonial rural estate and served as a prototype for other 19th century estates. The intactness of the site's structures and their landscape settings enhances its role as a relatively unique survivor and as a site of archaeological and scientific importance (LEP/Heritage Study).

The site also has significance thorough its historical associations with the Macarthur family - from its establishment by John and Elizabeth Macarthur in the early 19th century to the present day Macarthur-Stanham family - this relationship shown in both landscape and structures and being well documented and researched.

By the 1830s the estate of 28,000 acres included the greatest and most advanced mixed farm in NSW, at a time when Australian wools had almost ousted continental wools from British usage and the British manufacturers had a vast ascendancy in the world's woollen markets (Camden Park Estate, 1965).

Its extensive grounds planted in the tradition of 19th century English landscape parks holds a major botanical collection and its large, exceptional collection of rural buildings is especially important because of both the quality and rarity of the group.

The Camden Park orchard site and cottages area contains the remnants of an early commercial and scientific horticultural collection which was established by William Macarthur and made a contribution to commercial horticulture in NSW and other colonies such as South Australia. The cottages are an integral part of the orchard complex which continued to function commercially for 150 years and are important 19th century elements of the landscape.

Camden Park played a vital role in the fledgling Australian wine industry through its importation and distribution of vine cuttings throughout NSW and the Barossa Valley of SA. By 1853 Camden Park listed some 33 grape varieties for sale. By 1841 William & James were producing more than 5000 gallons and that vintage won Gold Medals in England. In 1844 24,000 vine cuttings were sent from Camden Park to Adelaide, setting South Australia on a path to becoming an internationally acclaimed wine growing district (Everett, 2004). Camden Park became world-renowned for the quality of its wine and by 1845 was producing around 10,000 gallons per annum as a serious vineyard and one of the most highly regarded in the colony and with quite a reputation overseas (Everett, 2004).

James & William Macarthur managed the estate with great enterprise, importing expert workers: Australia's first skilled wool-sorter from Silesia, shepherds from Scotland, vignerons from Nassau and dairymen from Dorset. They installed the first irrigation plant in Australia in 1830 and the first sheep wash and wool press. After changes of soil and climate in 1849 dictated sale of their merino stud, wheat was the staple until the mid 1860s. But rust and labour shortage led to a change to mixed farming - sheep and cattle fattening, mixed grains, wine, horses for India until 1857, and Australia's largest plant and tree nursery. The 2000 specimens of plants, shrubs and trees included the country's premier collections of domestic orchids and camellias, both of which William Macarthur was one of the first to introduce into Australia.

Two vineyards were planted in 1830 and 1841 and produced up to 16000 gallons a year including choice vintages, with as much as 30000 gallons in cellar sometimes. In 1832 the estate exported the first Australian brandy, and had 8 vintage and fortified wines varying from Muscat to Riesling at the Paris Exhibition of 1861. Also in the 1830s William Macarthur pioneered processes of drying fruit, "with which the British Isles were unacquainted". In 1857 Camden Park had a variety of all normal species of orchard fruits and nuts, 56 varieties of apple including cider making types, 31 kinds of pear, 23 citrus fruit varieties including Navel oranges, 16 table grapes apart from 32 wine varieties. Apricots, plums, cherries, quinces, figs, chestnuts, almonds and strawberries were also grown on the estate (Camden Park Estate, 1965).

The Camden Park garden and nursery is historically important as part of the original Macarthur family Camden estate. The garden is significant for its demonstration of the early 19th century estate garden design, including the following: The use of a hill site to take advantage of the views; the use of plantings to enframe views; and the planting of trees with ornamental form, demonstrating the influence of the early 19th century horticultural movement.

The area has historical significance as the original Macarthur nursery renowned for the introduction and propagation of exotic plants in early Australia. Significant features include the following: the area of olive and plumbago shrubbery; the brick edged gravel carriage loop; structured vistas from the house entrance and garden entrance; specimen plants of Araucarias and camellias reputed to be the oldest in Australia; well blended later additions of herbaceous beds and rose garden; and ruins of the gardener's lodge, potting sheds and hothouses from the original nursery period (Register of the National Estate, 1978).

Finally the estate is of major landscape and environmental significance as a significant area of open space lining the Nepean River with landmark landscape features including the tree lined river meadows, ridge top Belgenny Farm Group, the driveways and the relic orchard and plantations site on the flood plain north-east of the mansion.

- Rare - historic and aesthetic values;
- Representative - historic, aesthetic and scientific values; and
- Associative values - historic and aesthetic.

Camden Park House is of historic and aesthetic significance as one of the finest of the nation's early 19th century country homesteads. More particularly it is an outstanding exemplar of Australia's Colonial Regency style of architecture, this significance being enhanced by the quality of the design and craftsmanship and the degree to which it has retained important original fabric and features. The building is generally regarded as one of architect John Verge's finest achievements. The house's historic significance is also due in large measure to its role as the home of the Macarthur family from the days of John and Elizabeth, through a direct line of descendents to the present (State Heritage Inventory Public Presentation report, modified Stuart Read, 09/2004).

Wollondilly LEP Citation

Camden Park is of social, historical, scientific and aesthetic significance to the state and nation. It shows a high degree of technical and creative excellence being a rare, and still relatively intact, example of a model rural estate of the early 19th century (continuing to serve this function till the 1950s). It is the oldest pastoral sheep stud in Australia. Its extensive grounds planted in the tradition of 19th century English landscapes holds a major botanical collection and its large, exceptional collection of rural buildings is especially important because of both the quality and rarity of the group. The Estate's considerable social and historical significance is also due to its ability to demonstrate the way of life, tastes, customs and functions of a 19th - early 20th century rural establishment. From its establishment the site was a particularly fine example of a colonial rural estate and served as a prototype for other 19th century estates. The intactness of the site's structures and their settings enhances its role as a relatively unique survivor and as a site of archaeological and scientific importance. The site also has significance through its historical associations with the Macarthur family - from its establishment by John and Elizabeth Macarthur in the early 19th century to the present day - this relationship shown in both landscape and structures and being well documented and researched. Finally the estate is of major landscape and environmental significance as a significant area of open space lining the Nepean River with landmark landscape features including the tree-lined river meadows, ridge-top Belgenny Farm Group, the driveways and relic orchard site.

5.6 Significance against Criteria

NSW State Heritage Register Criteria (No. 00341)

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

EMAI is historically significant at a State level because it shows evidence of significant human activity in the agricultural industries and shows the continuity of that activity over the bulk of the non-Aboriginal history of NSW. It is representative since it has attributes typical of a particular way of life, and is outstanding because of its integrity, setting, condition and size. It contains elements that are at the same time rare because it provides evidence of a defunct way of life and agricultural practices, as well as being scarce examples of their type and showing unusually accurate evidence of significant human activities. As a significant cultural landscape the property demonstrates overlays of the continual pattern of human use and occupation associated with the evolution of rural life in this State.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

Aesthetically the property has strong visual and sensory appeal arising from its various landscape settings, the quality of its vernacular agricultural buildings and the continuing presence of farm animals. The buildings are aesthetically distinctive and have landmark qualities while the Macarthur family cemetery is a prominently sited graveyard with strong visual links to other important points within the Camden Park Estate and emotive qualities arising from its garden setting and historic atmosphere. The farm buildings are both rare and representative from an aesthetic viewpoint since they demonstrate distinctive attributes in their form and composition as well as demonstrating technical excellence and innovation for their period.

Criterion D: an item has strong or special associations with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

EMAI is socially significant at a State level because it is held in high esteem by significant groups within the contemporary community of NSW. Elements of the property including Belgenny Farm, the Macarthur family cemetery and adjoining lands have special cultural, social, spiritual, aesthetic and educational values and associations which set it apart from other sites. It is both representative as an optimal example of its type and rare because of its scarcity value and the unusual accuracy of the evidence it displays.

Criterion E: an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

EMAI satisfies all the Inclusion Guidelines for technical and research significance since it has yielded and has the potential to yield substantial historical, cultural, technical and archaeological information about the history of agriculture in this State and the lives and occupations of the people who worked there. As such it is an important reference site and shows evidence of past technologies at a representative and rare level. The property can have a useful research and educational role in helping us to understand our agricultural heritage.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

The property includes elements that are thought to be the oldest surviving items of their type some dating back to 1805.

Bibliography

Camden Park Estate P/L 1995. *Camden Park Estate 1795-1965.*

Morris, Colleen, 1994. *Through English Eyes, extracts from the journal of John Gould Veitch during a trip to the Australian colonies.*

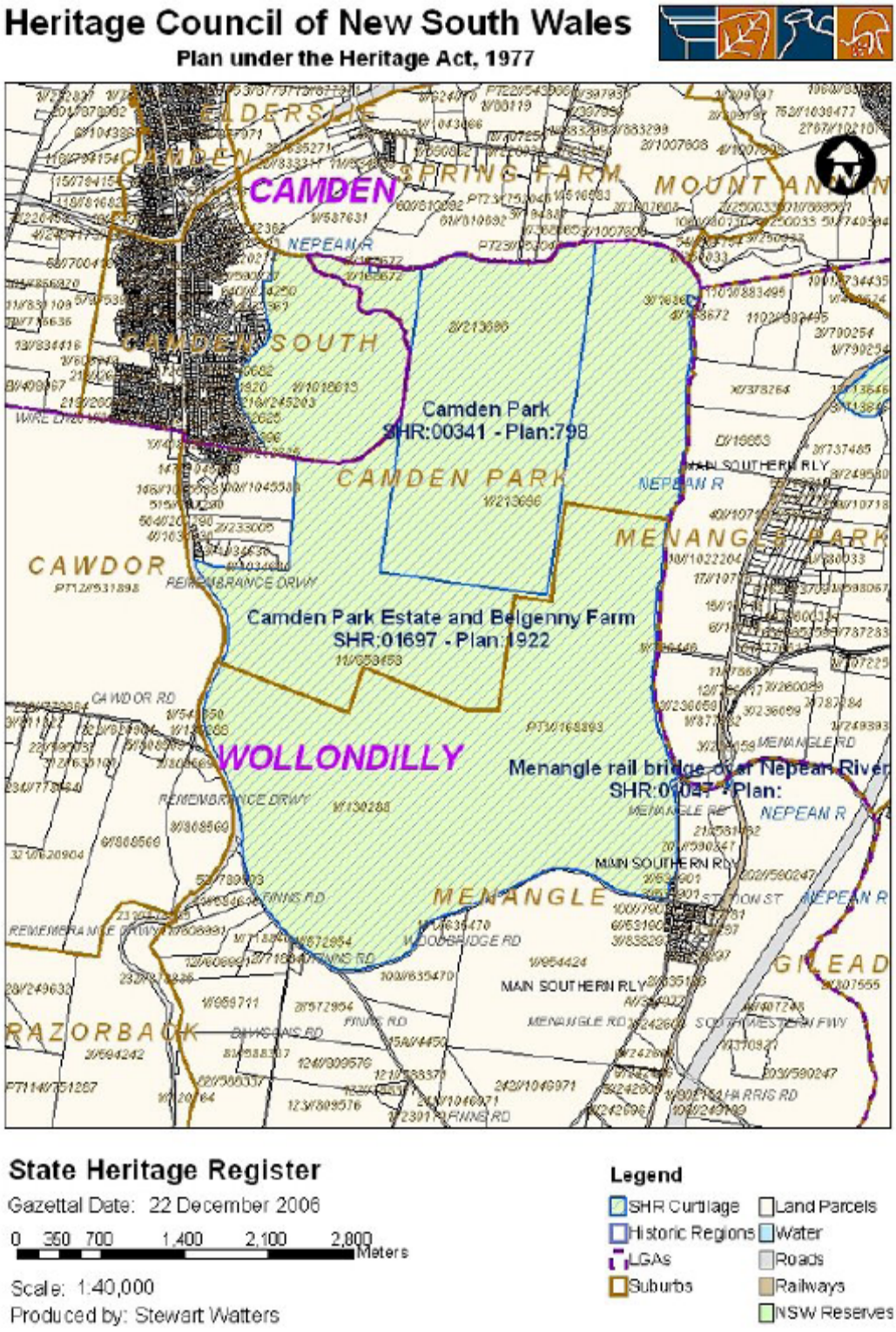
Everett, David. 2004. 'Frere's Vineyard - Vine Pedigree X', in *Macarthur News.*

5.7 Photos

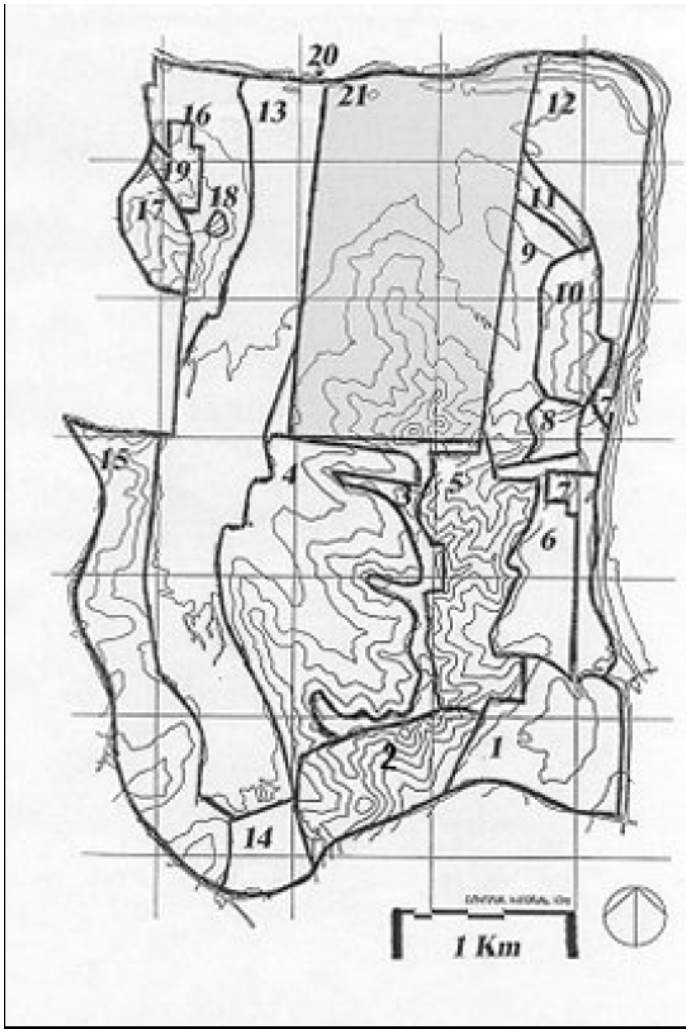
Camden Park Gatehouse

Camden Park Dairy No. 4.

5.8 Relevant State Heritage Register Diagrams



Curtilage Boundaries



Landscape Zones

6 MENANGLE GATE LODGE (CAMDEN PARK)

6.1 Location

46 Woodbridge Road, Menangle (Cottage 27 EMI) (Lot 1, DP 1067320).

6.2 Heritage Listing Status

State Heritage Register No. 2690098 (part of Camden Park Estate).

Wollondilly LEP. SHI DB No. 3040024, 2690098.

Wollondilly Heritage Study.

S.170 State Agency Heritage Register (Dept of Agriculture).

6.3 History

One of a pair of gate lodges to design of Sulman and Power for Mrs Macarthur-Onslow in 1895 as part of the Camden Park Estate. It is now used as a residence within the EMAI. See EMAI record (Section 5) for general history.

6.4 Description

Single storey weatherboard cottage with hipped and gabled tiled roof and brick chimneys, one of which has a decorative patterned brick base. Gables have timber battening and the north gable covers a small porch with timber lattice work and frieze, while the eastern gable projects on brackets. Beneath the east gable is a corbelled bay window with a small pane panel at the top. Doors have small pane transom lights. The three panel, half-glazed front door is off a small porch at the south east corner. On the gables are plaques bearing (different) coats of arms and the mottos "FESTINA LENTE" (to the east) and "FIDE ET OPERA" (to the north). One of these plaques was moved from the gate lodge at the other entry to Camden Park. The property still retains a large part of the original picket fence but this is being renewed.

Fibro extension to rear (south west), original verandah flooring replaced (20/11/90), fibro replaced on northern lattice enclosed porch, roof retiled and, fence renewed.

One of a pair of gate lodges to design of Sulman and Power for Mrs Macarthur-Onslow in 1895 as part of the Camden Park Estate. It is now used as a residence within the EMAI.

6.5 Statement of Significance

From State Heritage Inventory Database

Menangle Gate Lodge has historical significance as one of the pair of gate lodges built by the Macarthur-Onslows for the Camden Park Estate and which today (together with the lodge at the entrance near Camden) provides evidence of the former extent of the Estate (one of the most significant colonial properties in Australia) as well as demonstrating the architectural embellishments thought appropriate to large estates in the late 19th century. The building also has aesthetic significance as an attractive and largely intact example of a "Arts and Crafts" style estate cottage in the region and also for its associations with the architectural firm of Sulman & Power, which designed many buildings on the Estate and in the adjacent Menangle Village. The cottage's aesthetic qualities are further enhanced by its attractive rural setting and siting adjacent to the remains of the original Estate gates and driveway.

6.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

Menangle Gate Lodge has historical significance as one of the pair of gate lodges built by the Macarthur-Onslows for the Camden Park Estate and which today (together with the lodge at the entrance near Camden) provides evidence of the former extent of the Estate (one of the most significant colonial properties in Australia) as well as demonstrating the architectural embellishments thought appropriate to large estates in the late 19th century.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The building also has aesthetic significance as an attractive and largely intact example of a "Arts and Crafts" style estate cottage in the region and also for its associations with the architectural firm of Sulman & Power which designed many buildings on the Estate and in the adjacent Menangle Village. The cottage's aesthetic qualities are further enhanced by its attractive rural setting and siting adjacent to the remains of the original Estate gates and driveway.

Criterion D: an item has strong or special associations with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

The building in an example of the work of Sulman & Power.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare statewide.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

Menangle Gate Lodge is an outstanding example of late 19th century gatehouses associated with large country estates.

6.7 Photos

Menangle (Camden Park) Gate Lodge
Photo: M. Pearson 2008

Menangle (Camden Park) Gate Lodge, detail of crest
Photo: M. Pearson 2008

7 DAIRY NO. 4 (CAMDEN PARK)

7.1 Location

EMAI Woodbridge Road, Menangle.

7.2 Heritage Listing Status

Part of the Camden Park registered area.

State Heritage Register No. 00341. SHI DB No. 5045133 (Camden Park).

State Heritage Register No. 01697. SHI DB No. 5051536 (Camden Park Estate and Belgenny Farm).

Wollondilly LEP. SHI DB No. 2690002 (EMAI) 3040025 (Dairy No. 4).

Wollondilly Heritage Study.

S.170 State Agency Heritage Register (Dept of Agriculture).

Sydney REP No. 20 - Hawkesbury-Nepean River.

Register of the National Estate No. 3249.

7.3 History

The cottage was built in the later 19th century.

7.4 Description

The group of buildings consists of an estate cottage, feed sheds and silos. The cottage is a single storey dwelling with a galvanised iron roof and weatherboard walls with asbestos cement additions and infill.

The Dairy is of brick with galvanised iron roof, internal has been modified to incorporate a set of cattle yards for under-cover research work.

Feed Stalls are of timber and galvanised iron roof, some internal structure remains.
Silos are twin concrete towers.

Addition of shed 1990s. Derelict.

7.5 Statement of Significance

From State Heritage Inventory Database

The group of buildings at Dairy No 4 illustrates the changing nature of dairying activities and the importance of milk production on the Estate in the late 19th and early 20th centuries
A landmark feature of aesthetic value.

7.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The group of buildings at Dairy No 4 illustrates the changing nature of dairying activities and the importance of milk production on the Estate in the late 19th and early 20th centuries.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

Significant as a landmark feature as viewed from the township of Menangle.

7.7 Photos

Dairy No. 4 Camden Park
Photo: M. Pearson 2008

8 CAMDEN PARK ESTATE CENTRAL CREAMERY

8.1 Location

Stevens Road off Station Street, Menangle.

8.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690294 (and 2690729).

Wollondilly Heritage Study.

8.3 History

The creamery was built in 1898 by the Camden Park Estate. It initially separated milk for the sweet cream trade in Sydney. With the creation of the Milk Board in 1929 it became the Depot for receiving milk for city distribution.

It is now used as a junk storage shed and the boilers, ammonia compressor, refrigeration units have been removed.

8.4 Description

The creamery consists of two buildings connected to the main railway line by its own siding. One building is a two storey brick structure now painted white and with a terracotta tiled roof. The other single storey structure has corrugated iron walls and roof with interesting detailing. Two corrugated iron railway sheds are located adjacent to the former rail sidings serving the creamery.

The complex is in poor condition with deteriorated roof elements, water penetration and wall cracking.

8.5 Statement of Significance

From State Heritage Inventory Database

The Camden Park Estate Central Creamery is significant as evidence of the scale of dairying activities carried out to supply Sydney's needs in the latter part of the 19th century and in the 20th century. It has associations with the Camden Park Estate and is part of a network of sites which provides a range of physical evidence of the commercial dairying industry in the Sydney Region. With the removal much of its equipment in recent times, it has lost the ability to demonstrate the operations of a creamery of this period but it is the most substantial and intact creamery building in the Wollondilly LGA.

8.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Camden Park Estate Central Creamery is significant as evidence of the scale of dairying activities carried out to supply Sydney's needs in the latter part of the 19th century and in the 20th century. It has associations with the Camden Park Estate and is part of a network of sites which provides a range of physical evidence of the commercial dairying industry in the Sydney Region.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

It has associations with the Camden Park Estate and the Macarthur family prominent in the development of this part of the State.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

The creamery is a surviving example of a now uncommon type, large regional creameries, reflecting a now-past form of dairying once common in the State.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

With the removal much of its equipment in recent times, it has lost the ability to demonstrate the operations of a creamery of this period but it is the most substantial and intact creamery building in the Wollondilly LGA.

8.7 Photos

Camden Park Estate Central Creamery main building western side.
Photo: M. Pearson 2008

Camden Park Estate Central Creamery main building, eastern side (siding).
Photo: M. Pearson 2008

Camden Park Estate Central Creamery siding sheds.
Photo: M. Pearson 2008

9 CAMDEN PARK ROTOLACTOR

9.1 Location

Station Street, Menangle.

9.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690295.

Wollondilly Heritage Study.

9.3 History

The first stages of the rotolactor with the platform holding 50 cows at a time, were opened in 1952 after 3 years of planning and construction.

It was the second facility of this type and scale in the world and attracted many visitors, especially school children. The facility ceased operation in 1983.

Source: Andrea Oehm, 'Wollondilly Shire Council Heritage Study Review, 2690295', 2006.

9.4 Description

Built as a rotating milking platform associated with intensive feed lots housing approximately 2,000 cows. Built of rustless cladding materials on circular concrete walls. Vacant since 1983, and now in very poor condition with collapsing roof cladding and rotting roof structure.

Very poor condition.

9.5 Statement of Significance

From State Heritage Inventory Database

The Camden Park Rotolactor provides evidence of the post WWII phase of dairying activity in the Sydney Region. It represents the final advance in the mechanisation of commercial dairy farming in Australia and was the second facility of this type and scale in the world. Together with a range of physical evidence which survives in close proximity to Camden Park Estate, it is significant because of the opportunity it provides to interpret the history of dairy farming and production in the region for a period encompassing over 150 years of development.

9.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Camden Park Rotolactor provides evidence of the post WWII phase of dairying activity in the Sydney Region. It represents the final advance in the mechanisation of commercial dairy farming in Australia and was the second facility of this type and scale in the world. Together with a range of physical evidence which survives in close proximity to Camden Park Estate, it is significant because of the opportunity it provides to interpret the history of dairy farming and production in the region for a period encompassing over 150 years of development.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

It represents the final advance in the mechanisation of commercial dairy farming in Australia and was the second facility of this type and scale in the world.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

The Rotolactor is a rare example of the early mechanisation of dairying in Australia.

9.7 Photos

Rotolactor, Menangle.
Photo: M. Pearson 2008.

Rotolactor showing collapsing roof structure.
Photo: M. Pearson 2008

10 ST JAMES ANGLICAN CHURCH, MENANGLE

10.1 Location

131 Menangle Road, Menangle (Lot 1, DP 306367).

10.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690091.

Register of the National Estate No. 3301.

10.3 History

The Macarthur-Onslow family set aside a hectare of land overlooking the Menangle Village as the site for a church. Fund-raising to cover the cost of building was based on the sale of local eggs, with Captain Onslow donating the bulk of eggs sold. The nave and side porch built to J. Horbury Hunt's design in 1876 is typical of his work. The utilitarian design was a direct descendent of his Church of the Good Shepherd, a design intended to fulfil the basic needs of any country parish quickly. It was enlivened by the artful use of decorative brickwork, the characteristic Hunt massing and ostentatious buttressing. It was erected by contractor Mr Macbeth of Campbelltown and builder Mr C. Furner of Camden to replace earlier timber church-school. The chancel and tower were added in 1898 at the behest of Mrs Elizabeth Macarthur-Onslow of Camden Park, in memory of her husband and parents. Designed by Sir John Sulman the marriage of Hunt's earlier church with Sulman's addition is so successful that the tower and chancel are often mistaken for Hunt's work.

10.4 Description

A small picturesque church of face brick work with a mixture of slate and asbestos tiled roofs.

The southern nave, erected first to the design of John Horbury Hunt, has a steeply pitched gabled roof (with bellcast) and a small gable-roofed entrance porch on the western side. The windows are lancet headed and the building's corners are marked by modest brick buttresses. The blind arch on the south wall marks the location for which later additions were planned.

At the north end of the building are a large square tower with a pyramidal roof, a semi-circular apse and a skillion roofed porch and vestry all designed by Sir John Sulman (and added in 1896). The massing and detailing of these elements is particularly fine with features of interest including the smaller circular tower on the north-west corner, the rose window above the western porch and the gable roofed "dormers" which punctuate the roof of the main tower and enliven its silhouette.

The interior of the building has fine polished oak panelling. The roof was replaced in the 1990s.

The trees which surround the church and line the driveway are distinctive and include, tall eucalypts, bunya pines and olive trees.

Good condition, with minor cracking in the nave-end.

10.5 Statement of Significance

From State Heritage Inventory Database

St James Church, Menangle, is recognised within the state as an unusual and particularly fine example of a small country church of great architectural integrity, this significance being enhanced by the building's high degree of intactness and quality of workmanship. It also has considerable significance as an important landmark by virtue of its form and siting on a prominent rise in the village and the surrounding screen of trees. This provides a romantic silhouette which is seen by travellers on the Southern Railway and from rural roads in the vicinity.

The Church has historical significance through its links with the Macarthur-Onslow family of "Camden Park" and "Gilbulla"; its associations with two leading architects, J Horbury Hunt and Sir John Sulman; and, its more general association with the life and development of Menangle Village.

10.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Church has historical significance through its links with the Macarthur-Onslow family of "Camden Park" and "Gilbulla"; its associations with two leading architects, J Horbury Hunt and Sir John Sulman; and, its more general association with the life and development of Menangle Village.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

The Church has historical significance through its links with the Macarthur-Onslow family of "Camden Park" and "Gilbulla"; its associations with two leading architects, J Horbury Hunt and Sir John Sulman.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

St James Church, Menangle, is recognised within the state as an unusual and particularly fine example of a small country church of great architectural integrity, this significance being enhanced by the building's high degree of intactness and quality of workmanship.

It also has considerable significance as an important landmark by virtue of its form and siting on a prominent rise in the village and the surrounding screen of trees. This provides a romantic silhouette which is seen by travellers on the Southern Railway and from rural roads in the vicinity.

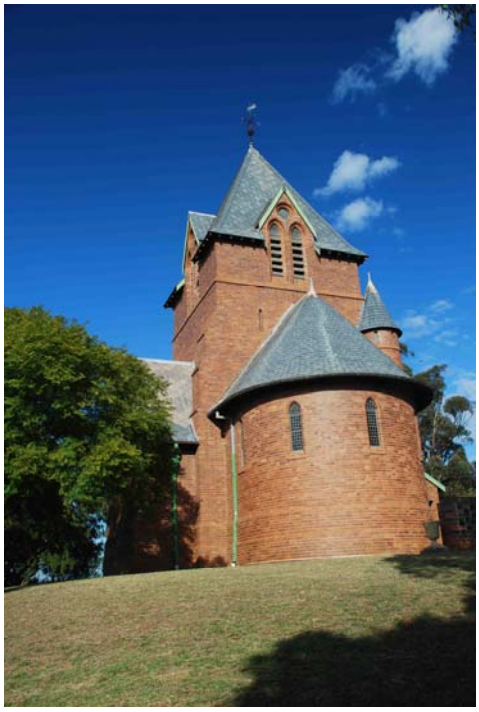
Criterion D: an item has strong or special associations with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

The church is associated with the life and development of Menangle Village.

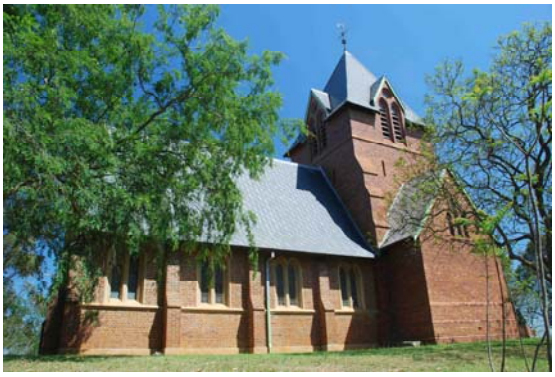
Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

St James Church, Menangle, is recognised within the state as an unusual and particularly fine example of a small country church of great architectural integrity, this significance being enhanced by the building's high degree of intactness and quality of workmanship.

10.7 Photos



St James' Church, Menangle
Photo: M. Pearson 2008



St James' Church, Menangle
Photo: M. Pearson 2008

11 ST PATRICK'S CATHOLIC CHURCH, MENANGLE

11.1 Location

119 Menangle Street, Menangle (Lot 100, DP 790213).

11.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690097.

Wollondilly Heritage Study.

11.3 History

Built 1895 to design of R.T. Dennehy of Sydney. It relates to a period of economic and social growth in the village and coincides with the change in pastoral activities in the area from sheep to dairying.

11.4 Description

A simply detailed red face brickwork church building with steeply gabled roof clad with terracotta tiles. The apex of both east and west gables are surmounted by a small timber cross.

The western front to Menangle Road has a shallow lancet-arched porch with brick relief-work decoration below a trio of small louvred, lancet headed ventilators in the head of the gable. The corners of the building and north and south walls are marked by simple brickwork buttresses.

The ledged and boarded entrance doors feature decorative cast iron hinges.

The church building is set in a large open site below the hill on which St James' is sited. Rose plantings are currently maintained in the grounds (2008). Water tanks are located against walls (c.2006) for garden watering.

Good condition.

11.5 Statement of Significance

From State Heritage Inventory Database

St Patrick's Catholic Church has local social and historic significance through its associations with the Roman Catholic community in the Menangle area since 1895. The church also contributes to the stock of late 19th and early 20th century buildings which give the present Menangle Village much of its character, particularly those lining Menangle Road. It is a well maintained, typical example of a "Simplified Gothic Revival" country church of its time.

11.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

St Patrick's Church has local social and historic significance through its associations with the Roman Catholic community in the Menangle area since 1895. The church also contributes to the stock of late 19th and early 20th century buildings which give the present Menangle Village much of its character, particularly those lining Menangle Road.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

It is a well maintained, typical example of a "Simplified Gothic Revival" country church of its time.

Criterion D: an item has strong or special associations with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

St Patrick's Church has local social and historic significance through its associations with the Roman Catholic community in the Menangle area since 1895.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

It is a well maintained, typical example of a "Simplified Gothic Revival" country church of its time.

11.7 Photos

St Patrick's Church, Menangle
Photo: M. Pearson 2008

12 GILBULLA (ANGLICAN CONFERENCE CENTRE)

12.1 Location

710 Moreton Park Road, Menangle (Lot 1, DP 370921).

12.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690092.

Wollondilly Heritage Study.

12.3 History

Gilbulla was part of the Macarthur estates from the early years of the 19th century. From 1818 there was a small cottage on the property which was situated near an early Cobb & Co coaching route south. By the 1890s the cottage had been demolished to make way for a more imposing residence, the present Main House built by Major-General the Hon. J.W. Macarthur-Onslow as a home for his family. In 1932 he exchanged house with his unmarried sister, Sibella, who was then living at nearby Camden Park. She was the last Macarthur occupant of the house and was known as "The Lady of the Manor of Menangle". Sibella had wide community interests and worked actively for her 'causes' which included support for the Kimberley Plan for Jewish colonisation in Australia and Red Cross Activities. After her death in 1943, Gilbulla became one of the Red Cross's rehabilitation centres and during this occupation the Long House was constructed. In 1949 the Church of England acquired the house and present grounds from Camden Park Estate as a conference and retreat house which was also a memorial to the wartime work of the clergy of the Church of England, particularly the chaplains during WWII. Sydney clergy at the time provided the labour to build a log chapel. Local timber was used with the bark intact for all except the east wall which is plate glass, and the interior was furnished simply. Additional conference facilities were added in 1978 and a new dining wing in 1981.

Art & Architecture, Vol 1 No 3, 1904.

Miss Rook, Church House, 14 October, 1965.

Proudfoot, Helen, Campbelltown, Camden, Appin Survey.

JRC Planning Services, Wollondilly Heritage Study, WO0092, 1992.

Macarthur Region Heritage Study, Ref No. 90, 1985.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690092, 2006.

12.4 Description

An imposing two storey Federation Arts and Crafts residence set in extensive landscaped grounds. Gilbulla carries on the aesthetic tradition of eccentric country residences established by John Horbury Hunt with "Saumarez" (Armidale) and Booloombimba (Armidale). Horbury Hunt and Sulman became the chief proponents of the Arts and Crafts movement in Australia, both of them being heavily influenced by the work of Frank Lloyd Wright in America, and took the style to its apogee in NSW. The main house at Gilbulla comprises:

- a single storey, slate roofed verandah to the east, north and (part of) the west elevations supported on truncated columns;
- gabled and half gabled slate roofs with numerous tall chimneys finished with roughcast render;
- half-timbering detail to main north and east gables;
- projecting first floor balcony above ground floor porch to north elevation with truncated turned timber columns and timber shingles (similar to the Menangle Village Store);
- larger first floor balcony to east (garden front) elevation; and
- parapetted projecting bays to east and west elevations (with black edging contrasting with white roughcast render).

The building is characterised by asymmetrical massing punctuated by a variety of rendered chimneys with decorative terra cotta pots. The use of organic materials, such as timber shingling, provides a strong contrast the roughcast finishes and the variety of materials and finishes combine in an overall picture book eccentricity that is typical of both the Arts and Crafts style and the work of Sulman. The site also contains a gate house, dairies and a number of outbuildings, also in the Arts and Crafts style.

The Main House appears to be in good condition.

The Main House has been extended to provide dining facilities. The complex as a whole consists of buildings of different forms, components, materials and styles.

The landscape values of Gilbulla are identified in *Colonial Landscapes of the Cumberland Plain and Camden NSW*, Morris and Britton for the Heritage Council, 1997.

12.5 Statement of Significance

From State Heritage Inventory Database (as amended in draft 2009 LEP)

"Gilbulla" is significant through its associations with the initial pastoral expansion of the area ("Wild Cattle" were reputedly found in the vicinity). It has significant links with the Macarthur family extending back to its establishment as part of John Macarthur's estates in the initial decades of the 19th century. In the final years of the century it became home to the Macarthur-Onslows maintaining the family association for another four decades.

Gilbulla has additional significance arising from its various subsequent roles as a Red Cross centre during WWII and as an Anglican conference and retreat centre which commemorates the role of chaplains during the War. The Main House is an outstanding example of a Federation Arts and Crafts residence on a grand scale. Designed by the notable architect Sir John Sulman, it is part of an important group of Sulman designed buildings around Menangle and represents a body of work on a par with the work of John Horbury Hunt.

12.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

Gilbulla" is significant through its associations with the initial pastoral expansion of the area ("Wild Cattle" were reputedly found in the vicinity). It has significant links with the Macarthur family extending back to its establishment as part of John Macarthur's estates in the initial decades of the 19th century. In the final years of the century it became home to the Macarthur-Onslows maintaining the family association for another four decades.

Gilbulla has additional significance arising from its various subsequent roles as a Red Cross centre during WWII and as an Anglican conference and retreat centre which commemorates the role of chaplains during the War.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

Gilbulla has State significance through its association with the Macarthur family and the establishment of their Camden and Menangle estate. The site has additional significance through its association with the architect Sir John Sulman.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

Gilbulla has state significance as an outstanding example of a Federation Arts and Crafts residence on a grand scale. Designed by the notable architect Sir John Sulman, it is part of an important group of Sulman designed buildings around Menangle and represents a body of work on a par with the work of John Horbury Hunt.

Criterion D: an item has strong or special associations with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

Gilbulla has regional significance for its role in the social, economic and pastoral development of Menangle and Camden.

Criterion E: an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

Gilbulla has state significance for its ability to provide information about the layout, design and construction of a grand 19th century home and farm complex. The site has high archaeological potential and provides insights into life over a period of more than a century.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare statewide.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

Gilbulla is an outstanding representative example of Federation Arts and Crafts residences on a grand scale.

12.7 Photos

Gilbulla Homestead.
Photo: M. Pearson 2008

13 BUNGALOW, 92 MENANGLE ROAD, MENANGLE

13.1 Location

92 Menangle Road, Menangle (Lot A, DP 940830).

13.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No. 2690727.

13.3 History

Early Menangle was a lightly populated parish of some 50 farms centred on the Nepean River. The creation of the village in the 1850s and 1860s was primarily the result of developments in communication: a road-bridge over the Nepean (1855-56); a rail bridge (1863) bringing with it construction gangs; a railway station and finally two inns serving both the railways gangs and the surrounding farms. By 1866 100 people were living in the village, on both sides of the river.

Farming was initially dominated by sheep but gave way to dairy cattle after the opening of the railway. The railway line became the commercial focus of the village and the growing dairy industry and the historic character of the village, as we see it today, is largely a reflection of the railway-related development that took place in the late 19th and early 20th centuries.

The Macarthurs of Camden Park patronised the village, which was also home to a number of their estate workers. Their considerable wealth helped the village to grow and the Macarthurs were directly responsible for many of the fine buildings in Menangle, including St James's Church (both the original 1876 Horbury Hunt building and the Sulman addition in 1898), the present General Store, the Camden Estate Central Creamery and eventually the Rotolactor, which brought modern technology to the local dairy industry. The General Store was initially used by the Camden Park Estate as its buying agent for all provisions, stores, seeds, fuel etc and it was only with the dwindling of the Estate and the Macarthur's iron grip on the district that it began to function as a general store for the village.

Built in 1915.

13.4 Description

A typical transitional bungalow addressing the main road from an elevated position. Key features: multiple offset gabled form; imitation half-timbered gablet detail; louvred gablet ventilator; timber framed construction with weatherboard cladding; asymmetric massing and fenestration; window hoods with decorative timber brackets; skillion return verandah; varied roof line; elevated position set back from road.

Poor condition.

13.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

92 Menangle Road has local significance as a good and locally rare example of an early 20th century bungalow reflecting the transitional period between the Edwardian California Bungalow idioms. It is part of the important early 20th century building stock of Menangle is an important component of the historic cultural landscape of the village.

13.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

It is part of the important early 20th century building stock of Menangle is an important component of the historic cultural landscape of the village.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

92 Menangle Road has local significance as a good and locally rare example of an early 20th century bungalow reflecting the transitional period between the Edwardian California Bungalow idioms. It is part of the important early 20th century building stock of Menangle is an important component of the historic cultural landscape of the village.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

92 Menangle Road is a good representative example of early 20th century transitional bungalows.

13.7 Photos

92 Menangle Road, Menangle.
Photo: M. Pearson

14 BUNGALOW, 151 MENANGLE ROAD, MENANGLE

14.1 Location

151 Menangle Road, Menangle (Lot 1, DP 838297).

14.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690726.

14.3 History

See history for 92 Menangle Road citation above.

14.4 Description

A typical transitional bungalow addressing the main road from an elevated position. Key features: multiple offset gabled form; imitation half-timbered gablet detail; louvred gablet ventilator; timber framed construction with weatherboard cladding; asymmetric massing and fenestration; window hoods with decorative timber brackets; skillion return verandah; varied roof line; elevated position set back from road.

Excellent condition.

14.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

151 Menangle Road has local significance as a good and locally rare example of an early 20th century bungalow reflecting the transitional period between the Edwardian California Bungalow idioms. It is part of the important early 20th century building stock of Menangle is an important component of the historic cultural landscape of the village.

14.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

It is part of the important early 20th century building stock of Menangle is an important component of the historic cultural landscape of the village.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

151 Menangle Road has local significance as a good and locally rare example of an early 20th century bungalow reflecting the transitional period between the Edwardian California Bungalow idioms. It is part of the important early 20th century building stock of Menangle is an important component of the historic cultural landscape of the village.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

151 Menangle Road is a good representative example of early 20th century transitional bungalows.

14.7 Photos

151 Menangle Road, Menangle.
Photo: M. Pearson

15 BUNGALOW, 106 MENANGLE ROAD, MENANGLE

15.1 Location

106 Menangle Road, Menangle (Lot B, DP 322713).

15.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690722.

15.3 History

See history for 92 Menangle Road citation above.

Built c. 1920.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

15.4 Description

A good local example of the California Bungalow type. Key features: prominent street-facing offset double gables; offset sid-facing gabled bay (a later extension); imitation half timbered gable detail; masonry construction with liver facebrick to all elevations; entry porch with timber posts supported on masonry piers with rendered capping; painted masonry sills; bracketed eaves and narrow eaves overhang; bracketed window framed with timber purlins; asymmetric form, massing and fenestration; single masonry chimney with rough cast render finish.

Excellent condition.

15.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

106 Menangle Road has local significance as a good example of a California Bungalow, a building type that is rare in both Menangle and the Wollondilly LGA. It is representative of early 20th century development in Menangle and the growth of the village during that period, precipitated by the development of the Macarthur estate dairies.

15.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

It is representative of early 20th century development in Menangle and the growth of the village during that period, precipitated by the development of the Macarthur estate dairies.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

106 Menangle Road has local significance as a good example of a California Bungalow, a building type that is rare in both Menangle and the Wollondilly Shire.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare locally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

106 Menangle Road is a good representative example of the California Bungalow idiom and early 20th century transitional bungalows.

15.7 Photos

106 Menangle Road, Menangle.
Photo: M. Pearson

16 BUNGALOW, 96 MENANGLE ROAD, MENANGLE

16.1 Location

96 Menangle Road, Menangle (Lot 1, DP 305932).

16.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690728.

16.3 History

See history for 92 Menangle Road citation above.

Built c.1915.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

16.4 Description

A typical transitional bungalow addressing the main road from an elevated position. Key features: multiple offset gabled form; imitation half-timbered gablet detail; louvred gablet ventilator; timber framed construction with weatherboard cladding; asymmetric massing and fenestration; window hoods with decorative timber brackets; skillion return verandah; varied roof line; elevated position set back from road.

Excellent condition.

16.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

96 Menangle Road has local significance as a good and locally rare example of an early 20th century bungalow reflecting the transitional period between the Edwardian California Bungalow idioms. It is part of the important early 20th century building stock of Menangle is an important component of the historic cultural landscape of the village.

16.6 Significance against criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

It is part of the important early 20th century building stock of Menangle is an important component of the historic cultural landscape of the village.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

96 Menangle Road has local significance as a good and locally rare example of an early 20th century bungalow reflecting the transitional period between the Edwardian California Bungalow idioms. It is part of the important early 20th century building stock of Menangle is an important component of the historic cultural landscape of the village.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare locally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

96 Menangle Road is a good representative example of early 20th century transitional bungalows.

16.7 Photos

96 Menangle Road, Menangle.
Photo: M. Pearson

17 COTTAGE, 124 MENANGLE ROAD, MENANGLE

17.1 Location

124 Menangle Road, Menangle (Lot 1, DP 979893).

17.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690723.

17.3 History

See history for 92 Menangle Road citation above.

Built c.1880.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

17.4 Description

A typical late Victorian period timber cottage. Key features: moderately pitched half-hipped roof with corrugated iron cladding; decorative gablet bargeboards; half-bullnose verandah to front on turned timber posts; timber framed construction with weatherboard cladding; symmetrical fenestration to main elevation with central panelled door flanked by paired windows; timber framed and sashed double-hung windows; paired masonry chimneys with corbelled capping; single storey; overall modesty of scale and form; skillion addition to rear.

Fair condition.

17.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

124 Menangle Road has local significance as a good example of a late 19th century dwelling. It is typical of the small timber cottages that characterised Menangle in the mid to late 19th century and is an important component of the historic cultural landscape of Menangle.

17.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

124 Menangle Road is typical of the small timber cottages that characterised Menangle in the mid to late 19th century and is an important component of the historic cultural landscape of Menangle.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

124 Menangle Road has local significance as a good example of a late 19th century dwelling. It is typical of the small timber cottages that characterised Menangle in the mid to late 19th century and is an important component of the historic cultural landscape of Menangle.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

124 Menangle Road is a good representative example of late 19th century cottages in a rural setting.

17.7 Photos

124 Menangle Road, Menangle.
Photo: M. Pearson

18 COTTAGE, 102 MENANGLE ROAD, MENANGLE

18.1 Location

102 Menangle Road, Menangle (Lot A, DP 322713).

18.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690721.

18.3 History

See history for 92 Menangle Road citation above.

Built c.1870.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

18.4 Description

A typical mid 19th century timber cottage. Key features: steeply pitched half-hipped roof with ridge line oriented parallel to road; skillion verandah on squared timber posts; timber framed construction with weatherboard cladding; single externally expressed brick chimney; symmetrical fenestration with central front door flanked by paired windows; timber framed and sashed double-hung windows; single storey; simplicity and modesty of form; setback in heavily wooded garden.

Good condition.

18.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

102 Menangle Road has local significance as a good example of a mid 19th century dwelling. It is typical of the small timber cottages that characterised Menangle in the mid to late 19th century and is an important component of the historic cultural landscape of Menangle.

18.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

102 Menangle Road is typical of the small timber cottages that characterised Menangle in the mid to late 19th century and is an important component of the historic cultural landscape of Menangle.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

102 Menangle Road has local significance as a good example of a mid 19th century dwelling. It is typical of the small timber cottages that characterised Menangle in the mid to late 19th century and is an important component of the historic cultural landscape of Menangle.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

102 Menangle Road is a good representative example of mid 19th century rural cottages.

18.7 Photos

102 Menangle Road, Menangle.
Photo: M. Pearson

19 COTTAGE, 138 MENANGLE ROAD, MENANGLE

19.1 Location

138 Menangle Road, Menangle (Lot A, DP 963033).

19.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690725.

19.3 History

See history for 92 Menangle Road citation above.

Built c.1910.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

19.4 Description

A typical turn of the century bungalow with Arts and Crafts embellishment. Key features: steeply pitched hipped roof with offset street facing gabled bay; asymmetric form and massing; timber framed construction with fibro and weatherboard cladding; imitation shingled gable detailing; timber framed and sashed casement windows; window hoods supported on timber brackets; skillion verandah to front with turned timber posts; off-set side facing gable; setback from street; single storey; modest scale and form; fretted timber barge boards.

Good condition.

19.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

138 Menangle Road has regional significance through its association with the EMAI and the former Camden Park Estate dairies. It is one of a group of similar dairy cottages, all reflecting the Arts and Crafts tradition prevalent at the time, making up the dairying establishment of the Camden Park Estate. It is a good example of its type and an important component of the historic cultural landscape of Menangle and Camden.

19.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

138 Menangle Road has regional significance through its association with the EMAI and the former Camden Park Estate dairies. It is one of a group of similar dairy cottages, all reflecting the Arts and Crafts tradition prevalent at the time, making up the dairying establishment of the Camden Park Estate. It is a good example of its type and an important component of the historic cultural landscape of Menangle and Camden.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

138 Menangle Road is one of a group of similar dairy cottages, all reflecting the Arts and Crafts tradition prevalent at the time, making up the dairying establishment of the Camden Park Estate. It is a good example of its type and an important component of the historic cultural landscape of Menangle and Camden.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare locally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

138 Menangle Road is a good representative example of early 20th century dairy cottages.

19.7 Photos

138 Menangle Road, Menangle.
Photo: M. Pearson

20 COTTAGE, 128 MENANGLE ROAD, MENANGLE

20.1 Location

128 Menangle Road, Menangle (Lot B, DP 398310).

20.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690724.

20.3 History

See history for 92 Menangle Road citation above.

Built c.1880.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

20.4 Description

A typical late Victorian period timber cottage. Key features: moderately pitched half-hipped roof with corrugated iron cladding; decorative gablet bargeboards; half-bullnose verandah to front on turned timber posts; timber framed construction with weatherboard cladding; symmetrical fenestration to main elevation with central panelled door flanked by paired windows; timber framed and sashed double-hung windows; paired masonry chimneys with corbelled capping; single storey; overall modesty of scale and form; skillion addition to rear.

Fair condition.

20.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

128 Menangle Road has local significance as a good example of a late 19th century dwelling. It is typical of the small timber cottages that characterised Menangle in the mid to late 19th century and is an important component of the historic cultural landscape of Menangle.

20.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

128 Menangle Road is typical of the small timber cottages that characterised Menangle in the mid to late 19th century and is an important component of the historic cultural landscape of Menangle.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

102 Menangle Road is a good representative example of late 19th century rural cottages.

20.7 Photos

102 Menangle Road, Menangle.
Photo: M. Pearson

21 DAIRY COTTAGE, 2 STATION STREET, MENANGLE

21.1 Location

2 Station Street, Menangle (Camden Park Estate Central Creamery) (Lot 202, DP 590247).

21.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690730.

21.3 History

The creamery was built in 1898 by the Camden Park Estate. It initially separated milk for the sweet cream trade in Sydney. With the creation of the Milk Board in 1929 it became the Depot for receiving milk for city distribution. It is now used as a junk storage shed and the boilers, ammonia compressor and refrigeration units have been removed. It is likely that other residences in Menangle were also associated with the Creamery, but this, 65 Woodbridge Rd and 27 Station St are the only securely identified Creamery houses.

Andrea Oehm, Thematic History Wollondilly Shire Council Heritage Study Review, 2006.

21.4 Description

A typical early 20th century dairy cottage based on the bungalow tradition. Key features: moderately pitched hipped roof with projecting gabled bay; skillion verandah; timber framed construction with weatherboard cladding; asymmetric form; timber framed and sashed double-hung windows; window hoods on timber brackets; single masonry chimney; single storey; modest scale and form with little embellishment; set back from street in heavily wooded garden.

21.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

The Dairy Cottage has local significance as a good example of an early 20th century dairy cottage associated with the operation of the Camden Park Estate Central Creamery. Along with the Manager's Cottage at 27 Station St it is the only visible evidence of purpose-built worker's housing associated with the Creamery. It is an important component of the historic cultural landscape of Menangle.

21.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Dairy Cottage has local significance as a good example of an early 20th century dairy cottage associated with the operation of the Camden Park Estate Central Creamery. Along with the Manager's Cottage at 27 Station St it is the only visible evidence of purpose-built worker's housing associated with the Creamery. It is an important component of the historic cultural landscape of Menangle.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare locally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or Cultural or natural environments;

The Dairy Cottage is a good representative example of early 20th century worker's housing associated with a large dairying operation.

21.7 Photos

2 Station Road, Menangle.
Photo: M. Pearson

22 DAIRY COTTAGE, 65 WOODBRIDGE ROAD, MENANGLE

22.1 Location

65 Woodbridge Road, Menangle (Camden Park Estate) (Lot 1, DP 954424).

22.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690731.

22.3 History

The creamery was built in 1898 by the Camden Park Estate. It initially separated milk for the sweet cream trade in Sydney. With the creation of the Milk Board in 1929 it became the Depot for receiving milk for city distribution. It is now used as a junk storage shed and the boilers, ammonia compressor and refrigeration units have been removed. It is likely that other residences in Menangle were also associated with the Creamery, but this, 2 Station St and 27 Station St are the only securely identified Creamery houses.

Built c.1910.

Andrea Oehm, Thematic History Wollondilly Shire Council Heritage Study Review, 2006.

22.4 Description

A typical early 20th century dairy cottage based on the bungalow tradition. Key features: moderately pitched hipped roof with projecting gabled bay; skillion verandah; timber framed construction with weatherboard cladding; asymmetric form; timber framed and sashed double-hung windows; window hoods on timber brackets; single masonry chimney; single storey; modest scale and form with little embellishment; pastoral setting.

22.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

The Dairy Cottage has local significance as a good example of an early 20th century dairy cottage associated with the operation of the Camden Park Estate Central Creamery. Along with the Manager's Cottage at 2 and 27 Station St it is the only visible evidence of purpose-built worker's housing associated with the Creamery. It is an important component of the historic cultural landscape of Menangle.

22.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Dairy Cottage has local significance as a good example of an early 20th century dairy cottage associated with the operation of the Camden Park Estate Central Creamery. Along with the Manager's Cottage at 2 and 27 Station St it is the only visible evidence of purpose-built worker's housing associated with the Creamery. It is an important component of the historic cultural landscape of Menangle.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare locally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The Dairy Cottage is a good representative example of early 20th century worker's housing associated with a large dairying operation.

22.7 Photos

65 Woodbridge Road, Menangle.
Photo: M. Pearson

23 EMI COTTAGE 29

23.1 Location

50 Menangle Road, Menangle (Lot 1, DP 1067320). EMAI, Camden Park.

23.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690719.

23.3 History

"The history of Camden Park and its founders, the Macarthur family, is well known and documented. During the last century they created at Camden an effective rural estate based on the British model.

The chief focus was the mansion, designed by John Verge and completed in 1835. It is surrounded by extensive gardens; to the south were vineyards and a winery, and to the north was the plant nursery established by William Macarthur, and one of the chief centres of horticulture in 19th century Australia. Large orchards and plantations of economic species, such as olive and cork were located to the east adjacent to the Nepean River, and nearby were irrigated paddocks developed by James Macarthur. The extensive grazing lands, known as the Cowpastures carried the celebrated flocks of merino sheep as well as horses and cattle.

Along the main drives much new planting was introduced to evoke the character of a British estate. Olive trees lined the drive while great belts of exotic species edged the river meadows. Vistas were established through the landscape to church spires, a windmill, and natural promenances. Towards the end of the 19th century, the area adjoining a lagoon to the north of the plant nursery was restored as the pleasure grounds, which were in existence by 1824.

Gate lodges designed by Sir John Sulman were built at the head of the Camden and Menangle drives.

Dotted around the estate are groups of cottages, forming hamlets accommodating the numerous farm workers. The two chief groups are located overlooking the former plant nursery and the former orchard.

The centre of the agricultural operation was located adjacent to the original cottage, on a ridge to the south west of the mansion. Known as Old Belgenney, the Belgenny Farm Group was well established when visited by Robert Scott of Glendon, Hunter Valley, during the 1820's. His sketch plan establishes that the buildings existing north and west of the courtyard were extant circa 1826. The group has been amended and extended during the ensuing years and is a most significant example of rural evolution, all of the key buildings being based on advanced British prototypes.

The estate extended to Menangle, which formed the commercial hub of the estate and became the residential centre of the estate workers. In the early 20th century, the Estate was reorganised for dairying purposes. Numerous dairy buildings and eventually, in the 1950s, the Rotolactor, demonstrate the built manifestations of this pursuit. Some 30 cottages were erected to house dairy workers, from the early 20th century through to the 1960s and most of these were eventually absorbed into the EMAI before being on-sold for private residences. During the 1970s, the majority of the estate was sold to Talga Pty. Ltd. for suburban development. Approximately 1,000 acres around the mansion was retained by a member of the Macarthur family. Talga Pty. Ltd. failed, and the northern portions of the Talga Pty. Ltd. holdings were purchased by the NSW government. The southern portion of the Talga Pty. Ltd. holdings is currently in private ownership."

(Extract from Report by H. Tanner and Associates, 1983).

Built c.1910.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

23.4 Description

A typical turn of the century bungalow with Arts and Crafts embellishment. Key features: steeply pitched hipped roof with offset street facing gabled bay; asymmetric form and massing; timber framed construction with fibro and weatherboard cladding; imitation half-timbered detailing; timber framed and sashed casement windows; window hoods supported on timber brackets; skillion verandah to front with weatherboard enclosure; off-set side facing gable; setback from street; single storey; modest scale and form.

Fair condition.

23.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

Cottage 29 has regional significance through its association with the EMAI and the former Camden Park Estate dairies. It is one of a group of similar dairy cottages, all reflecting the Arts and Crafts tradition prevalent at the time, making up the dairying establishment of the Camden Park Estate. It is a good example of its type and an important component of the historic cultural landscape of Menangle and Camden.

23.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

Cottage 29 has regional significance through its association with the EMAI and the former Camden Park Estate dairies. It is one of a group of similar dairy cottages, all reflecting the Arts and Crafts tradition prevalent at the time, making up the dairying establishment of the Camden Park Estate. It is a good example of its type and an important component of the historic cultural landscape of Menangle and Camden.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

Cottage 29 is one of a group of similar dairy cottages, all reflecting the Arts and Crafts tradition prevalent at the time, making up the dairying establishment of the Camden Park Estate. It is a good example of its type and an important component of the historic cultural landscape of Menangle and Camden.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare locally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

Cottage 29 is a good representative example of the Camden Park Estate cottages and of early 20th century dwellings.

23.7 Photos

50 Menangle Road, Menangle.
Photo: M. Pearson

24 HOUSE, 100 MENANGLE ROAD, MENANGLE

24.1 Location

100 Menangle Road, Menangle (Lot 1, DP 587187).

24.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690725.

24.3 History

See history for 92 Menangle Road citation above.

Built c.1910.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

24.4 Description

A substantial dwelling and typical of the late 19th century, reflecting the particular character of Menangle. Key features: moderately pitched half-hipped roof with central gabled portico; roof extends to form skillion verandah to front elevation only; masonry construction with face brick to all elevations; verandah supported on turned timber posts; symmetrical fenestration; timber sashed and framed double-hung four-paned windows; single masonry chimney with rough cast render, centrally located; set back from street in heavily landscaped grounds; single storey. Currently forms a semi-detached cottage pair with 98 Menangle Road.

Excellent condition.

24.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

100 Menangle Road has local significance as a good example of a late 19th century dwelling. It is typical of the Arts and Crafts influenced buildings that make most of Menangle's historic building stock and is an important component of the historic cultural landscape of Menangle.

24.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

100 Menangle Road has local significance as a good example of a late 19th century dwelling. It is typical of the Arts and Crafts influenced buildings that make most of Menangle's historic building stock and is an important component of the historic cultural landscape of Menangle.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

100 Menangle Road is typical of the Arts and Crafts influenced buildings that make most of Menangle's historic building stock and is an important component of the historic cultural landscape of Menangle.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

100 Menangle Road is an excellent representative example of late 19th century housing in Menangle.

24.7 Photos

100 Menangle Road, Menangle.
Photo: M. Pearson

25 MENANGLE CONSERVATION AREA

25.1 Location

Menangle Road and Woodridge Road/Station Street, Menangle.

25.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690277.

25.3 History

Early Menangle was a lightly populated parish of some 50 farms centred on the Nepean River. The creation of the village in the 1850s and 1860s was primarily the result of developments in communication: a road-bridge over the Nepean (1855-56); a rail bridge (1863) bringing with it construction gangs; a railway station and finally two inns serving both the railways gangs and the surrounding farms. By 1866 100 people were living in the village, on both sides of the river.

Farming was initially dominated by sheep but gave way to dairy cattle after the opening of the railway. The railway line became the commercial focus of the village and the growing dairy industry and the historic character of the village, as we see it today, is largely a reflection of the railway-related development that took place in the late 19th and early 20th centuries.

The Macarthurs of Camden Park patronised the village, which was also home to a number of their estate workers. Their considerable wealth helped the village to grow and the Macarthurs were directly responsible for many of the fine buildings in Menangle, including St James's Church (both the original 1876 Horbury Hunt building and the Sulman addition in 1898), the present General Store, the Camden Estate Central Creamery and eventually the Rotolactor, which brought modern technology to the local dairy industry. The General Store was initially used by the Camden Park Estate as its buying agent for all provisions, stores, seeds, fuel etc and it was only with the dwindling of the Estate and the Macarthur's iron grip on the district that it began to function as a general store for the village.

The Macarthurs of nearby Camden Park patronised the Village which was home to a number of their estate workers. They paid for St James's church, Horbury Hunt's nave in 1876, Sulman's chancel and steeple in 1898, and in the 20th century they built the present General Store (used by the Estate as its buying agent for all provisions, stores, seeds fuel, etc.), the Camden Estate Central Creamery and ultimately the Rotolactor, which brought modern technology to local dairying.

Sources:

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

Bayley, W.A, History of Campbelltown, 1976.

JRC Planning Services, Macarthur Regional Environmental Study. Environmental Heritage. Working Paper No.3, 1986.

Sommerville, J., & Travis Partners Pty Ltd, Menangle Village Development Guidelines, February, 1991.

JRC Planning Services, Wollondilly Heritage Study, WO0277, 1992.

25.4 Description

Menangle Village is laid out around the crossroad of Menangle Road and Woodbridge Road/Station Street with most of the early cottages fronting Menangle Road. Block sizes vary but a frontage of 14 -15m is most common. The relationship of the street layout and the topography is an important one with most development spread along a low north-south running ridge giving views over lower surrounding farmland. The visual centre of the village is marked by a prominent knoll (slightly southeast of the main residential area) on which is situated St James' Church. This strikingly designed church with its picturesque tower, is the most notable component in views of the village from all surrounding areas. The knoll also features a "perforated screen" of trees around the church which is in turn encircled by open grass land before reaching the residential development along Menangle Road and Station Street. Street landscaping is of a simple nature with grassed verges and a random mix of trees including brush box, pepper trees and various Eucalypts. The significant features of the village include:

- the overall street and building layout;
- a group of important non-residential buildings including St James' Church, the General Store, St Patrick's Church, the Community Hall and the Public School;
- the Railway Station buildings, the former Camden Park Rotolactor and Creamery structures (Gilbulla and the former Camden Park Gate Lodge are located outside the village centre and are documented separately in the inventory but they are linked to the history of development of the village through their associations with the Macarthur family); and
- the informally arranged early landscaping features - notably mature trees and remnant hedging on both public and private land.

The architectural character of the residential buildings in the village is quite diverse with a mix of size and form, period, style and materials. Early 20th century buildings however, predominate.

The significant early residential buildings include:

- 40 Carrolls Road.
- 50, 80, 92, 96, 98, 100, 102, 106, 119, 122, 124, 125, 128, 131, 135, 138, 149 and 151 Menangle Road.

- 8, 10, 12, 14, 16, 27, 28 Station St and the dairy cottage on the corner of Station St and Menangle Roads.
- 46 Woodbridge Road.
- Lot 201 DP 590247 end of Stephen St (adjacent to Creamery and rotolactor site).

25.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

Menangle Village has remained essentially contained within the settlement boundaries formed by village development by the second decade of the 20th century. As such it is an unusually intact example of a rural service centre of this period and in particular, one that is associated with the dairying industry when new technologies were being introduced to transport and process dairy products and when new dairying techniques were introduced in the form of the Rotolactor. The location of the village reflects the strong influence of major road and rail construction activities on town development in the Region.

It also has local and regional aesthetic significance as a discrete landscape entity and notable landmark, with its cross streets lined with houses elevated above the surrounding farmlands and the whole village itself being visually dominated by St James' Church on the small rise in the centre of the settlement.

The village also has associational significance through its links with the Macarthur family and the Camden Park Estate, this being most clearly expressed in the major commercial, ecclesiastical and industrial buildings of the General Store, St James' Church, the Creamery and the Rotolactor as well as Estate workers' housing.

The village is also an important social entity with a strong sense of community and sense of place to a degree not reached in the other towns and villages of Wollondilly.

25.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

Menangle Village has remained essentially contained within the settlement boundaries formed by village development by the second decade of the 20th century. As such it is an unusually intact example of a rural service centre of this period and in particular, one that is associated with the dairying industry when new technologies were being introduced to transport and process dairy products and when new dairying techniques were introduced in the form of the Rotolactor. The location of the village reflects the strong influence of major road and rail construction activities on town development in the Region.

It also has local and regional aesthetic significance as a discrete landscape entity and notable landmark, with its cross streets lined with houses elevated above the surrounding farmlands and the whole village itself being visually dominated by St James' Church on the small rise in the centre of the settlement.

The village also has associational significance through its links with the Macarthur family and the Camden Park Estate, this being most clearly expressed in the major commercial, ecclesiastical and industrial buildings of the General Store, St James' Church, the Creamery and the Rotolactor as well as Estate workers' housing.

The village is also an important social entity with a strong sense of community and sense of place to a degree not reached in the other towns and villages of Wollondilly.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

Menangle Village has State significance through its close association with the Macarthur and Onslow families, who were instrumental in establishing the village and keeping it economically viable through financial support and the provision of jobs on their Camden Park Estate and the nearby Creamery.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

Menangle village has local and regional aesthetic significance as a discrete landscape entity and notable landmark, with its cross streets lined with houses elevated above the surrounding farmlands and the whole village itself being visually dominated by St James' Church on the small rise in the centre of the settlement.

Criterion D: an item has strong or special associations with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

Menangle Village has State significance through its ability to demonstrate the social development of a small village from the early 19th century through to the present day with the 19th century core of the village remaining intact.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare statewide.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

Menangle Village is an outstanding representative example of an intact 19th century estate village.

25.7 Photos

Menangle Conservation Area viewed from the west.
Photo: M. Pearson

26 SLAB HUT

26.1 Location

40 Carrolls Road, Menangle (Lot 123, DP 809576).

26.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690718.

26.3 History

See history for 92 Menangle Road citation above.

Built c.1850.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690722. 2006.

26.4 Description

A typical mid-19th century slab hut, most likely erected as a shepherd's hut as part of the Macarthur operations in the area. Key features: steeply pitched gabled roof; skillion verandah; timber framed construction with vertical sawn slab cladding; symmetrical and minimal fenestration; small timber framed windows; overall simplicity of form and modesty of scale.

Good condition. The roof has been replaced within the last 5 years.

26.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

The Slab Hut has local significance as a remnant of the earliest settlement of the Menangle area and is indicative of the crude housing available to the first settlers and workers on the Macarthur estate. It is a locally rare example of the slab hut, a building type that once typified stockmen's and shepherd's huts in the region, but whose ephemeral nature has resulted in the loss of most of them.

26.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Slab Hut has local significance as a remnant of the earliest settlement of the Menangle area and is indicative of the crude housing available to the first settlers and workers on the Macarthur estate. It is a locally rare example of the slab hat, a building type that once typified stockmen's and shepherd's huts in the region, but whose ephemeral nature has resulted in the loss of most of them.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare regionally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The Slab Hut is an excellent representative example of mid-19th century pastoral dwellings.

26.7 Photos

40 Carrolls Road, Menangle.
Photo: M. Pearson

40 Carrolls Road, Menangle.
Photo: M. Pearson

27 THE PINES

27.1 Location

Menangle Road, Menangle Park.

27.2 Heritage Listing Status

No heritage listing.

See Proudfoot, H. 1977. *Colonial Buildings: Macarthur Growth Centre*. Macarthur Development Board, page 51.

27.3 History

A sandstone residence built by Edward John Edrop about 1870.

27.4 Description

A very good, late example of the classical Colonial stone house, with symmetrical façade with French doors opening to the front verandah, a slate roof and two rear wings enclosing a small grassed courtyard.

27.5 Statement of Significance

A very good, late example of the classical Colonial stone house (local significance).

27.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

A very good, late example of the classical Colonial stone house.

27.7 Photos

The Pines, Menangle Park. Google Earth image

28 MOUNTBATTEN GROUP (FORMERLY MORTON PARK)

28.1 Location

655 Menangle Street, Off Duggan Street, Douglas Park (Lot A, DP 421426; Lot1, DP 576136).

28.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690085, 2690086, 2690087, 2690088.

Wollondilly Heritage Study.

28.3 History

The original grant of 2000 acres was made in 1821 to Jean Baptiste Lehemaz de Arriete, a Spaniard who arrived in NSW as a free settler, with the intention of growing vines. He planted tobacco instead, the crop failed and the convicts escaped. He also had his convicts build the original cottage in which he resided and which was later extended to the current homestead, but Arrietta sold his land by the 1830s. The property has been used for pastoral activities since that time and has had a number of owners. Morton Park was renamed *Mountbatten* in the 1940s, after Lord Louis Mountbatten, and part of the property reverted to the name *Morton Park* in the 1980s. In recent years it has been used as boarding house and then a riding school. At one stage it was acquired by the Macarthur Development Board but it is now privately owned.

Mountbatten House

The original cottage was built on the original c1821 grant of 2000 acres to Jean Baptiste Lehemaz de Arriete. The mid-Victorian main house was built by a later owner.

28.4 Description

The Group consists of:

- the Main House and Garden (WO0086);
- a Stone Chapel (WO0087); and
- the Garden Building (WO0088).

There are also outbuildings and a silo associated with the farming activities.

The complex is on two separate land holdings, the chapel being on ‘Mountbatten’ under separate ownership from the homestead, cottage and garden which are on ‘Morton Park’.

The Mountbatten group is located west of the F4 Freeway and east of the township of Douglas Park. The mature trees which have survived from the original garden planting and the early driveway form a distinctive vegetation group which is clearly visible from the freeway and screen the farm buildings. From Douglas Park however, the farm buildings which form a cluster on top of a knoll, are distinctive.

Mountbatten House

A single storey Colonial verandahed homestead of rendered brick with French windows opening onto the verandah. The former kitchen, now a billiard room creates a courtyard with the house which is enclosed by Moorish style iron gates at the open end. The former kitchen is constructed of stone and has two ovens set into the wall. The original cottage stands alone in an extended form at the back of the house.

The house was substantially modernised to accommodate post-war uses.

Chapel

A small stone chapel with a high circular window at each end. No longer used.

Garden Building

A small round brick garden building without windows.

Condition good.

28.5 Statement of Significance

From State Heritage Inventory Database

The Group

The Morton Park property (formerly Mountbatten) is significant because of its historical associations with the early settlement of the Douglas Park area and because of its unusual association with the convict era through its original owner, d'Arietta, and its convict labour force. The property has aesthetic significance as a landmark created by the planting and building cluster on a knoll which is highly visible from the surrounding area.

Morton Park House

Morton Park House provides evidence of early and subsequent settlement phases in the area generally, and more particularly of associations with the development of country estates. The house is also of local and regional aesthetic significance as a fine example of a substantial early residence, and more particularly as a good and relatively intact representation of a Georgian country homestead, this significance enhanced by the buildings's retention of much of its original fabric and features.

Chapel

The former Chapel building has regional historic significance generally as part of this important early homestead complex, and more particularly as a rare example of a private family chapel.

Aesthetically, the building is also locally significant as an interesting representative of the early stone buildings of the area generally and ecclesiastical buildings in particular. Its simplicity of form and detailing befit the nature of its original use, but its significance has been adversely affected by the building's extensive alterations and additions, change of use and deterioration / destruction of original fabric and features.

Garden building

The Morton Park Garden building is of social and historic significance generally as a component of the varied group of early structures making up the Morton Park group, and more particularly as an integral component of the early garden layout. Aesthetically the building is an interesting representative of early 20th century garden structures which retains much of its original form and fabric but whose change of use and altered context have affected its expression of its original role.

Draft 2009 LEP Citation

The Mountbatten Group has local significance through its historical associations with the early settlement of the Douglas Park area and through its association with the original owner and the use of convict labour. The property has aesthetic significance and is a typical Colonial layout of formal plantings and buildings clustered on a knoll. Morton Park House provides evidence of early and subsequent settlement phases in the area generally, and more particularly of associations with the development of country estates.

The house is also of local and regional aesthetic significance as a fine example of a substantial early residence, and more particularly as a good and relatively intact representation of a Victorian Georgian Revival country homestead; this significance is enhanced by the building's retention of much of its original fabric and features. The site's significance is enhanced by a relatively intact Colonial garden setting containing a series of structures representing the development of garden layouts in NSW from the Colonial period up to the early 20th century. The site also contains a stone chapel, one of few surviving private chapels in the district. Although somewhat altered and deteriorated, the chapel nonetheless provides an additional layer of understanding and interpretation to the place and is an important component of the overall complex.

The Morton Park Garden building is of social and historic significance generally as a component of the varied group of early structures making up the Morton Park group, and more particularly as an integral component of the early garden layout. Aesthetically the building is an interesting representative of early 20th century garden structures which retains much of its original form and fabric but whose change of use and altered context have affected its expression of its original role.

Morton Park's former Chapel building has regional historic significance generally as part of this important early homestead complex, and more particularly as a rare example of a private family chapel. Aesthetically, the building is also locally significant as an interesting representative of the early stone buildings of the area generally and ecclesiastical buildings in particular. Its simplicity of form and detailing befit the nature of its original use, but its significance has been adversely affected by the building's extensive alterations and additions, change of use and deterioration/destruction of original fabric and features. Items of significance include the house, chapel, cottage, garden building and the Morton Park (formerly Mountbatten), which in 2007 was operating as a horse stud property.

28.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Mountbatten Group has local significance through its historical associations with the early settlement of the Douglas Park area and through its association with the original owner and the use of convict labour. Morton Park House provides evidence of early and subsequent settlement phases in the area generally, and more particularly of associations with the development of country estates.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

The Morton Park property (formerly Mountbatten) is significant because of its historical associations with the early settlement of the Douglas Park area and because of its unusual association with the convict era through its original owner, d'Arietta, and its convict labour force.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The property has aesthetic significance and is a typical Colonial layout of formal plantings and buildings clustered on a knoll.

28.7 Photos

Mountbatten/Morton Park. Victorian homestead top left, expanded original cottage top right, chapel left.
Photos: M. Pearson 2008

29 ST MARY'S TOWERS (FORMERLY PARKHALL)

29.1 Location

415 Douglas Park Road, Douglas Park (Lot 1, DP. 250359).

29.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690278, 2690089.

Wollondilly Heritage Study.

Register of the National Estate No. 3305.

29.3 History

The Group

In 1834-5 Sir Thomas Mitchell, Surveyor-General, acquired 3810 acres (1524ha.) of land in East Bargo (now Douglas Park), with a frontage on the Nepean. But he did not build a homestead on the land until after he returned from four years abroad in 1841. The foundation stone of Park Hall was laid in 1842 by Mitchell with his friend, Dr Charles Nicholson, and the Mitchell family occupied the house in 1845.

Five years after Mitchell's death in 1855, Park Hall was purchased by Dr Richard Jenkins, a station owner in northern NSW and since 1857, a member of the Legislative Council. Jenkins renamed the property Nepean Towers and made substantial additions and alteration to the house. He also added new outbuildings: stone stabling, wine cellars and a coachhouse (all destroyed by bush fire in 1922). During the twenty years or so that Jenkins was resident at Nepean Towers he extended the vineyards pioneered by Mitchell and established a small, unsuccessful cotton plantation. The estate became noted for its Durham Shorthorn cattle introduced and bred by Jenkins and for its lawns and gardens and the Great Avenue of trees, the pine trees at the head planted by the Duke of Edinburgh in 1868.

After Jenkins died in 1883, the property was sold to John Wetherell, who does not seem to have made any structural changes.

In 1904 the grant was subdivided, with approximately half the land and the house going to the Missionaries of the Sacred Heart. The place again changed name, to St Mary's Towers, and was used initially as a seminary for prospective priests. In 1912 the Apostolic School for boys was opened and in 1915 the foundation stone of a new school building, made of locally quarried stone, was laid, adjacent to the main house. In 1935 a further wing of classrooms and dormitories (the Jubilee Wing) was opened.

The House

Built on the 1834 grant to Sir Thomas Mitchell, Surveyor General and explorer, who laid foundation stone in 1842 for Park Hall. Is similar to the design for a villa in the "cottage style" in Francis Goodwin's "Rural Architecture" (1835) but it is a Mitchell family tradition that it is the work of London architect, Edward Blore (who was responsible, by correspondence, for the design of the new Government House in Sydney). Blore may well have drawn up plans of a modified version of the villa in an Elizabethan "manorial" style. There were many differences in detail between the pattern and the finished Park Hall: the roof line, the front door and window detailing are all different, while Park Hall's high tower at the back is a calculated addition. Work on Park Hall was supervised by architect James Hume.

Five years after Sir Thomas Mitchell's death in 1855, Park Hall was purchased by Dr Richard Jenkins, a station-owner in northern NSW and since 1857 a member of the Legislative Council. Jenkins renamed the house Nepean Towers.

Before 1864 Jenkins added an extension at the south end of the east side of the house. This contained wine cellars, with a square, low tower at the extreme south end. The architect and builder are not known. The stone stables and coach-house were probably added at the same time. All these additions were destroyed by a bush fire in 1922.

In 1873 Jenkins commissioned Edmund Blacket to add a chapel at the south-east corner and also arcading on the north and easy sides of the house. Blacket's drawings for versions of the improvements survive in the Mitchell Library and include a ground plan of the house as it was in 1873. He later embellished the new chapel with stained glass by William Macleod and, while retaining the Mitchell arms on the exterior, added his own motto over the dining-room mantelpiece.

After Jenkins died in 1883, the property was sold to John Wetherall, who does not seem to have made any structural changes.

In 1904 after the property changed hands, the house became the property of the Society of the Missionaries of the Sacred Heart and once again changed name to St Mary's Towers.

Jack R. Ian, St Mary's Towers, Douglas Park, u.p.ms., Univ. of Sydney, 1991.

Kerr, J. and Broadbent, J., Gothick Taste in the Colony of New South Wales, Sydney, 1980, pages 100,105.

29.4 Description

The Group

St Mary's Towers Group consists of the property as acquired by the Missionaries of the Sacred Heart in 1904 (1720 acres, approximately half of Mitchell's original grant of 1524ha.) It includes the main house; the Great Avenue of pine trees and the associated entry gates; the gardens, including its hedges and mature trees; the 1915 stone school building; and, the Jubilee Wing of classrooms and dormitories.

The House

A two storied residence of ashlar sandstone house with simple "Victorian Gothic" forms and detailing.

The main body of the house - the oldest section - comprises a multi-gabled building with a tall octagonal stone turret and "Victorian Tudor" chimneys punctuating the skyline. Windows are multi-paned timber framed casements with "gothick" glazing bars and hood moulds and there is some use of coloured glass.

The Mitchell coat of arms is featured on the east gable while inside there is a fine geometrical stone stair with iron balusters and several original chimney pieces.

Extensions to the southeast corner of the house in 1864 were subsequently destroyed by fire in 1922.

The small stone chapel added to the southeast corner of the building and adjacent colonnade along the east and north elevations date to 1873 and are in a more strongly "Victorian Gothic" idiom. The Chapel more particularly emulates the "English Collegiate" traditions of Oxford, Cambridge and Sydney University's Great Hall and contains some late 19th century stained glass.

The building is in generally good condition.

The landscape values of St Mary's Towers are identified in *Colonial Landscapes of the Cumberland Plain and Camden NSW*, Morris and Britton for the Heritage Council, 1997.

29.5 Statement of Significance

From State Heritage Inventory Database

The Group

St Mary's Towers Group is significant through its associations with the early settlement and patterns of pastoral and agricultural development in this part of the Sydney region. Half the initial grant remains with the core of the property to indicate the extent of the estate and complement the important structures and plantings which themselves provide evidence of the status of the estate and the aspirations of the owners in the 19th century. Though it is not known how much evidence remains of the 19th century agricultural practices such as viticulture, cotton growing and cattle breeding, the property provides an example of the changes in agriculture from the initial pastoral focus and subsequent diversification into new crops and livestock activities.

As well as the important 19th century links with important colonial figures such as Sir Thomas Mitchell and Dr Jenkins, the property has social significance through its associations with Catholic education in the State, both for the training of priests and as a school for boys.
The group has aesthetic significance which relates to not only the substantial stone buildings but to the gardens and plantings, particularly the Grand Avenue and its gates which form an axis to the Nepean River and beyond to the Razorback Range.

The House

St Mary's Towers has statewide aesthetic significance as one of the last stylistically significant houses built before the depression of the early 1840's. The possible derivation of its design from an identifiable pattern book further adds to its aesthetic and historic interest. It is considered by J. Broadbent (NT Listing Proposal, 1976) to be less of a "folly" than 'Lindesay' and more convincing than 'Carthona' (Mitchell's other house). Its architectural integrity and quality of workmanship provide evidence of a genuine attempt to recreate an old English Manor house in "a land now almost divided from the world but which may one day equal in all the arts of civilization the illustrious regions of his native country". While the gothic arcade changed the 'manorial character it represents a further phase of taste and part of the history of the house. The buildings' good physical condition and retention of much original fabric enhances its considerable aesthetic significance.

The building also has considerable social and historic significance through its associations with numerous important early figures, most notably Surveyor General, Sir Thomas Mitchell, but also Dr Richard Jenkins, a politician and farmer, and architects such as James Hume and Edmund Blacket (and possibly the English architect Edmund Blore).

29.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

St Mary's Towers Group is significant through its associations with the early settlement and patterns of pastoral and agricultural development in this part of the Sydney region. Half the initial grant remains with the core of the property to indicate the extent of the estate and complement the important structures and plantings which themselves provide evidence of the status of the estate and the aspirations of the owners in the 19th century.

As well as the important 19th century links with important colonial figures such as Sir Thomas Mitchell and Dr Jenkins, the property has social significance through its associations with Catholic education in the State, both for the training of priests and as a school for boys.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

The building also has considerable social and historic significance through its associations with numerous important early figures, most notably Surveyor General, Sir Thomas Mitchell, but also Dr Richard Jenkins, a politician and farmer, and architects such as James Hume and Edmund Blacket (and possibly the English architect Edmund Blore).

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

St Mary's Towers has statewide aesthetic significance as one of the last stylistically significant houses built before the depression of the early 1840's. The possible derivation of its design from an identifiable pattern book further adds to its aesthetic and historic interest. It is considered by J. Broadbent (NT Listing Proposal, 1976) to be less of a "folly" than 'Lindesay' and more convincing than 'Carthona' (Mitchell's other house). Its architectural integrity and quality of workmanship provide evidence of a genuine attempt to recreate an old English Manor house in "a land now almost divided from the world but which may one day equal in all the arts of civilization the illustrious regions of his native country". While the gothic arcade changed the 'manorial character it represents a further phase of taste and part of the history of the house. The buildings' good physical condition and retention of much original fabric enhances its considerable aesthetic significance.

The group has aesthetic significance which relates to not only the substantial stone buildings but to the gardens and plantings, particularly the Grand Avenue and its gates which form an axis to the Nepean River and beyond to the Razorback Range.

Criterion D: an item has strong or special associations with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

The property has social significance through its associations with Catholic education in the State, both for the training of priests and as a school for boys.

29.7 Photos

	St Mary's Towers, main building above and 1915 school wing to left. Photo: M. Pearson 2007.

30 RAILWAY COTTAGE

30.1 Location

3 Camden Road, Douglas Park (Lot 1, DP. 828396).

30.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690714.

30.3 History

All of the towns in the Wollondilly area, and Picton particularly, have relied on passing traffic for their trade and for transport routes out of the district to open new markets for produce. The Great Southern Road fulfilled this role in the first half of the 19th century and the area's principle business was tourism – catering to the needs of travellers stopping over on their way south. Despite the presence of the great arterial road linking north and south, travel was still rough, tiring and often dangerous and the economic growth of the area, whilst steady, was by no means booming. The coming of the railway would provide the first real impetus to wider settlement and business growth.

Construction of the southern line resulted in an immediate and obvious population boom - fettlers and navvies and their families took up residence in Picton and boosted school enrolments and church congregations as a result. Initially housed in tents close to the railway line, these families were the catalyst for local builders and speculative developers to start real estate development in the area. More than half of Picton's surviving 19th century building stock relates to the railway boom of the 1860s. Most of the hotels and major public buildings were built at this time as was much of the housing stock and the 1860s remain a golden decade in the history of the area.

The first line of rail from Picton, known as the Loop Line, was constructed in 1867, however, construction of the southern line had commenced some years earlier and reached Menangle and Douglas Park in 1864. Today, Menangle Station, the canopy at Douglas Park Station, the line itself, and a small group of associated residences are the only tangible reminders of the first period of regional rail construction in the area, pre-dating the construction of the Loop Line and the Picton-Mittagong Deviation that followed.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review 2690714, 2006

30.4 Description

The railway cottage on Camden Rd is located next to the rail tracks at the level crossing. Timber weatherboard and tin, by 2007 it was painted pale green, but on the railway side there are indications of earlier original paint colours on walls.

A typical but locally rare mid-19th century fettler's cottage. Key features: steeply pitched gabled roof; timber-framed balloon construction with weatherboard cladding; symmetrical fenestration; eaves overhang forming front verandah, supporting on squared timber posts; timber framed and sashed double-hung windows; single-storey; overwhelming modesty of scale and form; position in relation to railway line and road alignment.

Condition Good - recently renovated and painted.

30.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

The Railway Cottage has local significance as the only surviving example of a residence associated with the construction of the southern rail line in Douglas Park. It is a typical fettler's cottage and was once part of a larger group of similar cottages in Douglas Park. Its proximity to the rail line enhances its significance and it is an important component of the historic cultural landscape of Douglas Park.

30.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Railway Cottage has local significance as the only surviving example of a residence associated with the construction of the southern rail line in Douglas Park. It is a typical fettler's cottage and was once part of a larger group of similar cottages in Douglas Park.

30.7 Photos

3 Camden Road, Douglas Park.
Photo: M. Pearson

31 WARRAGUNYAH

31.1 Location

670 Menangle Road, Douglas Park (Lot 8, DP 246706).

31.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No: 2690716.

31.3 History

Not known. However, the building is reminiscent of the numerous country homes owned by the Hordern family throughout the Wollondilly and Wingecarribee districts.

Built c. 1870.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690717, 2006.

31.4 Description

A grand and somewhat atypical country villa reflecting the economic prosperity of the mid-Victorian period. Key features: Weatherboard residence on high brick foundation walls, double-gabled facade with hipped roof behind; elevated position on hill; sweeping central stair leading to front door; elaborate verandah with central gabled portico, timber fretwork and balustrade; symmetrical massing and fenestration.

Good condition.

31.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

Local and regional significance as an outstanding example of a late Victorian period gentleman's country homestead. The unusual double-gabled form with sweeping central stair, elevated and picturesque position and high degree of ornamental detail are typical of the Romantic and Picturesque movements influencing architecture of the period. This villa occupies a prominent position in the landscape and is an important component of the historic cultural landscape of Douglas Park and its hinterland.

31.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Villa at 670 Menangle Road has local and regional significance as an outstanding example of a late Victorian period gentleman's country villa.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The Villa at 670 Menangle Road has local and regional significance as an outstanding example of a late Victorian period gentleman's country villa. Its unusual double-gabled form with sweeping central stair, elevated and picturesque position and high degree of ornamental detail are typical of the Romantic and Picturesque movements influencing architecture of the period.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare locally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The Villa is an outstanding representative example of Victorian period country villas.

31.7 Photos

Warrangunyah, 670 Menangle Road, Douglas Park.
Photo: M. Pearson

32 WILTON PARK

32.1 Location

370 Wilton Park Road, Wilton (also listed as Wilton Park Stables) (Lot 8, DP 243079).

32.2 Heritage Listing Status

State Heritage Register Listing No. 00257. SHI DB No. 5045546.

Wollondilly LEP. SHI DB No. 2690190.

Wollondilly Heritage Study 1992.

Register of the National Estate No. 3304.

32.3 History

The stables group was built about 1892 for Samuel Hordern, the grandson of the founder of the firm, and the builder of the Palace Emporium, Brickfield Hill. Although there is no definite evidence on hand, the architect for the stables group could have been Albert Bond, the Hordern family architect during the period 1876-1910.

Wilton Park became one of the leading horse breeding studs in Australia, contributing significantly to the quality of horses in the colony and producing many winners. After Samuel's death in 1909, Wilton Park remained in the Hordern family, until sold in 1927.

Hoare, R., Reynolds, P.L., Roxburgh, R, Wilton Park, Picton, manuscript in National Trust files.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690190, 2006.

32.4 Description

The stables group consists of stables, a building containing a coach-house and harness room, underground water tanks, stallion boxes, a covered yard and a quadrangle. The present house built in 1955 is not included. The stables consist of a group of structures sited on gently rising ground in a formal composition around a central quadrangle. They form an impressive vista when seen from the original main eastern approach to the property.

Three buildings of the group enclose a quadrangle which was originally of raked gravel (now grass).

The stables building, which faces north and which contains 12 loose boxes, is long and narrow in plan, built of sandstock brick, with a gable roof finished with iron ventilators and decorative fretwork barge boards. Floors vary from perforated plank floors over brick urine drains, to brick paving. In the centre, a gabled opening gives access to paddocks and rolling hills beyond.

Another similar building, facing east, contains the coach house and harness room with a fine original harness cupboard as well as the grooms' room and feed room.

The north side of the quadrangle is formed by two underground water tanks roofed with low hipped roofs and capped with iron ventilators. The original water tank and windmill have been removed.

Two detached stallion boxes, with details similar to the stables face away from the quadrangle.

The covered round yard is constructed of posts set in the earth to form a ring about 30 feet in diameter, lined internally with two layers of boarding. Encircling the post tops is a continuous, circular laminated wall plate to form a 'parasol', perforated at its apex by an iron ventilator. The collar ties radiate like spokes of a wheel from a central hub and four suspension rods link the hub and the apex. The roof of mitred corrugated iron is fixed to concentric rings of roof battens.

The present house, built in 1955, replaced the stud groom's house.

The buildings are in good condition with some restoration in the late 1970s.

The landscape values of Wilton Park are identified in *Colonial Landscapes of the Cumberland Plain and Camden NSW*, Morris and Britton for the Heritage Council, 1997.

32.5 Statement of Significance

From State Heritage Inventory Database

The Wilton Park stables group which remains much as it was when Samuel Hordern established his thoroughbred horse stud there, has historic significance because it forms a record of a significant part of the activities of a man who was a successful leader in Australian stud stockbreeding as well as a wealthy and successful businessman. The stables were built at a time when the horse was at its peak in Australian agriculture and stockbreeding was a developing skill and these buildings are fine examples of the rural architecture which developed in response to the needs of the bloodstock industry.

The stables group also has aesthetic significance derived from the fact that the individual buildings relate well to each other and to their environment. Their siting on gently rising ground in a formal composition around a central quadrangle creates an impressive vista when seen from the original main eastern approach and from Wilton Road. Individual buildings are themselves fine examples of rural architecture. In particular, the covered round yard is of rare architectural quality and an excellent example of highly skilled timber craftsmanship. (It may have been the model for the brick round yard at Retford Park, Bowral, another Hordern family property.) It also forms an interesting contrast, both visually and in form and materials, with the brick buildings of the group.

32.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Wilton Park stables group which remains much as it was when Samuel Hordern established his thoroughbred horse stud there, has historic significance because it forms a record of a significant part of the activities of a man who was a successful leader in Australian stud stockbreeding as well as a wealthy and successful businessman. The stables were built at a time when the horse was at its peak in Australian agriculture and stockbreeding was a developing skill and these buildings are fine examples of the rural architecture which developed in response to the needs of the bloodstock industry.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

The Wilton Park stables group which remains much as it was when Samuel Hordern established his thoroughbred horse stud there, has historic significance because it forms a record of a significant part of the activities of a man who was a successful leader in Australian stud stockbreeding as well as a wealthy and successful businessman.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The stables group also has aesthetic significance derived from the fact that the individual buildings relate well to each other and to their environment. Their siting on gently rising ground in a formal composition around a central quadrangle creates an impressive vista when seen from the original main eastern approach and from the Wilton Road. Individual buildings are themselves fine examples of rural architecture. In particular, the covered round yard is of rare architectural quality and an excellent example of highly skilled timber craftsmanship. (It may have been the model for the brick round yard at Retford Park, Bowral, another Hordern family property.) It also forms an interesting contrast, both visually and in form and materials, with the brick buildings of the group.

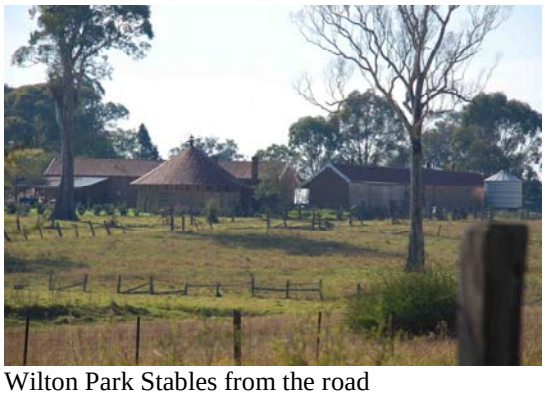
Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

The group is an uncommonly intact example of stud stabling of the period. The covered round yard is of rare architectural quality and an excellent example of highly skilled timber craftsmanship.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The group is an important intact example of stud stabling.

32.7 Photos



Wilton Park Stables from the road
Photo: M. Pearson 2008

Wilton Park Stables wing
Photo: M. Pearson 2008

Wilton Park Stables quad and water tanks
Photo: M. Pearson 2008

Wilton Park Stables round house
Photo: M. Pearson 2008

33 COTTAGE, 180 WILTON PARK ROAD

33.1 Location

180 Wilton Park Road, Wilton (Lot 105, DP 794081).

33.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No. 2690791.

33.3 History

Built c.1900.

33.4 Description

Weatherboard clad with corrugated iron roof. A particularly charming small farm cottage. Key features: steeply pitched hipped roof rising to gables, front verandah.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review 2690791, 2006.

33.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

180 Wilton Park Road has local significance as a particularly good example of 19th century pastoral cottages and as one of a small number of surviving 19th century buildings in the Wilton area. It is a particularly charming example of the small farm cottages that once proliferated in the area and its significance is enhanced by its prominent siting on the brow of a small hill.

33.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

180 Wilton Park Road has local significance as a particularly good example of 19th century pastoral cottages and as one of a small number of surviving 19th century buildings in the Wilton area.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

180 Wilton Park Road is a particularly charming example of the small farm cottages that once proliferated in the area and its significance is enhanced by its prominent siting on the brow of a small hill.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare locally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

An excellent example of late 19th century pastoral cottages in the district.

33.7 Photos

180 Wilton Park Road, Wilton.
Photo: M. Pearson 2008.

34 KEDRON

34.1 Location

305 Wilton Park Road, Wilton (Lot 2, DP 572157).

34.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP (WO 0297).

SHI DB No. 2690297.

34.3 History

Built c.1900.

34.4 Description

An exceptional Federation Queen Anne residence. Key features: complex roof form with central hipped section flanked by two offset gablets to the front; louvred timber gablet ventilator; timber infill and decorative bargeboards to roof gablets; encircling bullnosed verandah on turned timber posts with stop chamfers and decorative timber brackets; masonry construction with facebrick to all elevations and raised plaster string courses; symmetrical fenestrations featuring bay windows flanking a central panelled front door with hopper window above; multiple rendered masonry chimneys with decorative corbelling and terra cotta pots; set in mature garden.

JRC Planning Services, Wollondilly Heritage Study WO0297 1992; Andrea Oehm, Wollondilly Shire Council Heritage Study Review 26907912006.

34.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

Kedron has regional significance as an exceptional example of a Federation period homestead associated with a large and prosperous pastoral property. The main house is an outstanding example of Federation Queen Anne architecture and a locally rare example of the style.

34.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

Kedron has regional significance as an exceptional example of a Federation period homestead associated with a large and prosperous pastoral property.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

Kedron has regional significance as an exceptional example of a Federation period homestead associated with a large and prosperous pastoral property. The main house is an outstanding example of Federation Queen Anne architecture and a locally rare example of the style.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare regionally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

An outstanding example of Federation period country houses in the district.

34.7 Photos

Kedron.
Photo: M. Pearson 2008

Kedron.
Photo: M. Pearson 2008

35 NEPEAN TUNNEL AND ABOVE GROUND STRUCTURES

35.1 Location

2.4 km section between Wilton village and halfway to Broughtons Pass (288150E 6209160N to 290500E 6209790N).

35.2 Heritage Listing Status

State Heritage Register No. 01373 (as 'Upper Canal System [Prospect Reservoir]')
SHI DB No. 5051481.

S.170 State Agency Heritage Register.

Wollondilly LEP. SHI DB No. 2690008.

Wollondilly Heritage Study.

35.3 History

Built in 1880-88 after more than a decade of investigation into schemes to provide Sydney's fourth water source.

Various works of improvement have been carried out since their construction but all major components are still in constant use and continue to be an essential part of the Metropolitan Water Supply System.

35.4 Description

The Nepean Tunnel diverting water from the Pheasant's Nest Weir to the Cataract River at Broughtons Pass is part of the Upper Nepean Water Supply System. Detailed physical descriptions for each of these elements are contained in National Trust and Water Board Listings (see also citation for Upper Nepean Water Supply System). The section subject of this study is a 2.4km section east from within Wilton village. The above ground features consist of rock-built cairns, some adjacent to former air shafts, marking the route of the tunnel. The tunnel route is a cleared easement.

35.5 Statement of Significance

From State Heritage Inventory Database

State Heritage Register Citation

(Note that the Nepean Tunnel forms part of the Upper Canal system.)

The Upper Canal is significant as a major component of the Upper Nepean Scheme. As an element of this Scheme, the Canal has functioned as part of Sydney's main water supply system for over 120 years. Apart from maintenance and other improvements, the Upper Canal has changed little.

As part of this System, the Canal is associated with Edward Moriarty, Head of the Harbours and Rivers Branch of the NSW Public Works Department.

The Canal is aesthetically significant, running in a serpentine route through a rural bushland setting as an impressive landscape element with sandstone and concrete-lined edges;

The Canal is significant as it demonstrates the techniques of canal building, and evidence of engineering practice. The Canal as a whole is an excellent example of 19th century hydraulic engineering, including the use of gravity to feed water along the canal.
(BCubed Sustainability, 2/2006).

The Upper Nepean Scheme is significant because:

- In its scope and execution, it is a unique and excellent example of the ingenuity of late 19th century hydraulic engineering in Australia, in particular for its design as a gravity-fed water supply system.
- It has functioned as a unique part of the main water supply system for Sydney for over 100 years, and has changed little in its basic principles since the day it was completed.
- It represented the major engineering advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it the city by means of major canals and pipelines.
- It provides detailed and varied evidence of the engineering construction techniques prior to the revolution inspired by reinforced concrete construction, of the evolution of these techniques (such as the replacement of timber flumes with wrought iron and then concrete flumes), and of the early use of concrete for many engineering purposes in the system.
- The scheme possesses many elements of infrastructure which are of world and national renown in technological and engineering terms.
- Many of the structural elements are unique to the Upper Nepean Scheme.

Reference: Edward Higginbotham & Associates, SCA Heritage and Conservation Register.

Wollondilly LEP Citation

The Upper Nepean Water Supply System is historically significant as the scheme commenced, and progressively developed from the late 1880's to meet Sydney's Water Supply needs after supply from the Botany Swamps proved to be inadequate. The dams and other works are important examples of early Australian civil engineering and were all "State of Art" for their time. The catchment area and system is considered to provide one of the world's purest sources of water for human consumption.

35.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Upper Nepean Water Supply System is historically significant as the scheme commenced, and progressively developed from the late 1880's to meet Sydney's Water Supply needs after supply from the Botany Swamps proved to be inadequate. The dams and other works are important examples of early Australian civil engineering and were all "State of Art" for their time.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

As part of this System, the Canal is associated with Edward Moriarty, Head of the Harbours and Rivers Branch of the NSW Public Works Department.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The Canal is significant as it demonstrates the techniques of canal building, and evidence of engineering practice. The Canal as a whole is an excellent example of 19th century hydraulic engineering, including the use of gravity to feed water along the canal.

It provides detailed and varied evidence of the engineering construction techniques prior to the revolution inspired by reinforced concrete construction, of the evolution of these techniques (such as the replacement of timber flumes with wrought iron and then concrete flumes), and of the early use of concrete for many engineering purposes in the system.

35.7 Photos

Nepean Tunnel above ground structures consist of survey plinths near former air shafts (these ones at eastern side of Wilton village)

36 BROUGHTONS PASS WEIR

36.1 Location

Broughtons Pass, Wilton Road, Wilton (part of the Upper Nepean Water System).

36.2 Heritage Listing Status

State Heritage Register No. 01373 (as 'Upper Canal System [Prospect Reservoir]').
SHI DB No. 5051481.

S.170 State Agency Heritage Register.

Wollondilly LEP. SHI DB No. 2690008.

Wollondilly Heritage Study.

36.3 History

The Upper Nepean Water Scheme was built in 1880-88 after more than a decade of investigation into schemes to provide Sydney's fourth water source.

Various works of improvement have been carried out since their construction but all major components are still in constant use and continue to be an essential part of the Metropolitan Water Supply Scheme.

36.4 Description

The Broughtons Pass Weir is the transition point for water passing between the Nepean Tunnel. diverting water from the Pheasant's Nest Weir, and the Cataract Tunnel which feeds in turn into the open canal of the Upper Nepean Water Supply System at Brooks Point. Detailed physical descriptions for each of these elements are contained in National Trust and Water Board Listings. (see also citation in this report for Upper Nepean Water Supply System and Nepean Tunnel).

36.5 Statement of Significance

From State Heritage Inventory Database

State Heritage Register Citation

(Note that Broughtons Pass Weir forms part of the Upper Canal system.)

The Upper Canal is significant as a major component of the Upper Nepean Scheme. As an element of this Scheme, the Canal has functioned as part of Sydney's main water supply system for over 120 years. Apart from maintenance and other improvements, the Upper Canal has changed little.

As part of this System, the Canal is associated with Edward Moriarty, Head of the Harbours and Rivers Branch of the NSW Public Works Department.

The Canal is aesthetically significant, running in a serpentine route through a rural bushland setting as an impressive landscape element with sandstone and concrete-lined edges;

The Canal is significant as it demonstrates the techniques of canal building, and evidence of engineering practice. The Canal as a whole is an excellent example of 19th century hydraulic engineering, including the use of gravity to feed water along the canal (BCubed Sustainability, 2/2006).

The Upper Nepean Scheme is significant because:

- In its scope and execution, it is a unique and excellent example of the ingenuity of late 19th century hydraulic engineering in Australia, in particular for its design as a gravity-fed water supply system.
- It has functioned as a unique part of the main water supply system for Sydney for over 100 years, and has changed little in its basic principles since the day it was completed.
- It represented the major engineering advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it the city by means of major canals and pipelines.
- It provides detailed and varied evidence of the engineering construction techniques prior to the revolution inspired by reinforced concrete construction, of the evolution of these techniques (such as the replacement of timber flumes with wrought iron and then concrete flumes), and of the early use of concrete for many engineering purposes in the system.
- The scheme possesses many elements of infrastructure which are of world and national renown in technological and engineering terms.
- Many of the structural elements are unique to the Upper Nepean Scheme.

Reference: Edward Higginbotham & Associates, SCA Heritage and Conservation Register.

Wollondilly LEP Citation

The Upper Nepean Water Supply System is historically significant as the scheme commenced, and progressively developed from the late 1880's to meet Sydney's Water Supply needs after supply from the Botany Swamps proved to be inadequate. The dams and other works are important examples of early Australian civil engineering and were all "State of Art" for their time. The catchment area and system is considered to provide one of the world's purest sources of water for human consumption.

36.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Upper Nepean Water Supply System is historically significant as the scheme commenced, and progressively developed from the late 1880's to meet Sydney's Water Supply needs after supply from the Botany Swamps proved to be inadequate. The dams and other works are important examples of early Australian civil engineering and were all "State of Art" for their time.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

As part of this System, the Canal is associated with Edward Moriarty, Head of the Harbours and Rivers Branch of the NSW Public Works Department.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The Canal is significant as it demonstrates the techniques of canal building, and evidence of engineering practice. The Canal as a whole is an excellent example of 19th century hydraulic engineering, including the use of gravity to feed water along the canal.

It provides detailed and varied evidence of the engineering construction techniques prior to the revolution inspired by reinforced concrete construction, of the evolution of these techniques (such as the replacement of timber flumes with wrought iron and then concrete flumes), and of the early use of concrete for many engineering purposes in the system.

36.7 Photos

Broughtons Pass Weir. Google Earth image

37 STONE RUIN

37.1 Location

45 Whitticase Lane, Douglas Park.

37.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No. 2690717.

Wollondilly Heritage Study Review 2006.

37.3 History

None known but is highly likely to have been erected as housing for Sir Thomas Mitchell's tenant farmers, working on the St Marys Towers Estate, c.1840.

37.4 Description

An unusual building of coursed rubble-faced sandstone with rusticated margins. The original building was symmetrical in form with typically Georgian overtones and is most likely to have had a hipped roof. A single, substantial chimney survives, providing evidence of a double fireplace. In many respects the ruin is similar in construction and detail to the stone house at 380 Douglas Park Road (item 2690715) and links between the two are highly likely.

Ruin - appears to be generally stable but some capping would be beneficial to ensure long-term conservation.

37.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

Arguably the most substantial ruin in the Wollondilly Shire and one of a small handful of sandstone buildings of the period in the Douglas Park area. The building is likely to be associated with the provision of housing for Sir Thomas Mitchell's tenant farmers, working on the St Marys Towers Estate. The ruin has further value for its picturesque contribution to the landscape and is an important component of the historic cultural landscape of Douglas Park.

37.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

Arguably the most substantial ruin in the Wollondilly Shire and one of a small handful of sandstone buildings of the period in the Douglas Park area. The building is likely to be associated with the provision of housing for Sir Thomas Mitchell's tenant farmers, working on the St Marys Towers Estate. The ruin has further value for its picturesque contribution to the landscape and is an important component of the historic cultural landscape of Douglas Park.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

Local significance both for its aesthetic values as a former tenant farm cottage and for its current contribution to the cultural landscape as a picturesque ruin.

Criterion E: an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

The Ruin has high archaeological potential and has the ability to provide information about stone masonry techniques of the period in addition to any information gleaned from future archaeological investigation.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

This item is assessed as rare locally.

37.7 Photos

Stone Ruin, 45 Whitticase Lane, Douglas Park.
Photo Michael Pearson 2008.

38 UPPER NEPEAN WATER SUPPLY SYSTEM - CANAL

38.1 Location

Appin and Wilton.

Boundary: The Upper Canal forms a major component of the Upper Nepean Scheme, which also includes the Prospect Reservoir and the Lower Canal. The Upper Nepean Scheme supplies water from the Cataract River at Broughtons Pass to the Crown Street reservoir, a distance of 63.25 miles. The Upper Canal commences by tunnel from Pheasant's Nest Weir on the Nepean River and extends through the LGAs of Wollondilly, Liverpool, Holroyd, Fairfield, Campbelltown and Camden. The section of the canal subject of this study is 2.5km section south of the Devines Tunnel (292980E 6215010N to 293340E 6217090N) (see also citation for Nepean Tunnel).

38.2 Heritage Listing Status

State Heritage Register No. 01373 (as 'Upper Canal System [Prospect Reservoir]').
SHI DB No. 5051481.

S.170 State Agency Heritage Register.

Wollondilly LEP. SHI DB No. 2690008.

Wollondilly Heritage Study.

38.3 History

Built in 1880-88 after more than a decade of investigation into schemes to provide Sydney's fourth water source.

Various works of improvement have been carried out since their construction but all major components are still in constant use and continue to be an essential part of the Metropolitan Water Supply System.

38.4 Description

There are 3 of the 4 major storage dams in the systems in Wollondilly Shire. The dams and their main elements are:

- Cataract Dam (Wall, Valve House, Water Board Official Quarters (1910), adjacent gardens, parklands, picnic grounds, pathways and 4 cottages).
- Cordeaux Dam (Wall, Bywash and Valve Houses).
- Nepean Dam (Wall, Valve Houses).

Within Wollondilly Shire the rest of the system includes:

- Diversion Weirs below the junctions of the Nepean with the Cordeaux and Avon rivers (Pheasant's Nest Weir) and at Broughtons Pass.
- Nepean Tunnel diverting water from the Pheasant's Nest Weir to the Cataract River at Broughtons Pass.
- Upper Canal System - A system of tunnels, aqueducts and open canals collectively known as the Upper Canal, which enable water diverted through the Nepean Tunnel to flow a distance of 64km to the major distribution reservoir at Prospect. It has a capacity of 680 megalitres per day, and in addition to supplying water to Prospect Reservoir, also provides supply to a number of localities en route. Three of the tunnels: Cataract, and Devines No's 1 and 2 are in Wollondilly Shire.

The canals are lined for the most part with dry rubble masonry, elsewhere with concrete or rubble in cement.

Detailed physical descriptions for each of these elements are contained in National Trust and Water Board Listings.

An extensive system of Dams, Tunnels, Weirs, Aqueducts, Canals, Reservoirs and Pipelines delivering water from the catchment of the Nepean River to Crown Street Reservoir, a distance of just over 62 1/2 miles (108 km). Devised in 1867 by E.O. Moriarty of the PWD it consists of 24 miles Upper Canal system of open canals interspersed with 13 tunnels and covered sections, 9 wrought iron inverted siphon aqueducts and small brick aqueducts delivering water to Prospect Dam and then to Crown Street Reservoir.

38.5 Statement of Significance

From State Heritage Inventory Database

State Heritage Register Citation

The Upper Canal is significant as a major component of the Upper Nepean Scheme. As an element of this Scheme, the Canal has functioned as part of Sydney's main water supply system for over 120 years. Apart from maintenance and other improvements, the Upper Canal has changed little.

As part of this System, the Canal is associated with Edward Moriarty, Head of the Harbours and Rivers Branch of the NSW Public Works Department.

The Canal is aesthetically significant, running in a serpentine route through a rural bushland setting as an impressive landscape element with sandstone and concrete-lined edges;

The Canal is significant as it demonstrates the techniques of canal building, and evidence of engineering practice. The Canal as a whole is an excellent example of 19th century hydraulic engineering, including the use of gravity to feed water along the canal.
(BCubed Sustainability, 2/2006).

The Upper Nepean Scheme is significant because:

- In its scope and execution, it is a unique and excellent example of the ingenuity of late 19th century hydraulic engineering in Australia, in particular for its design as a gravity-fed water supply system.
- It has functioned as a unique part of the main water supply system for Sydney for over 100 years, and has changed little in its basic principles since the day it was completed.
- It represented the major engineering advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it the city by means of major canals and pipelines.
- It provides detailed and varied evidence of the engineering construction techniques prior to the revolution inspired by reinforced concrete construction, of the evolution of these techniques (such as the replacement of timber flumes with wrought iron and then concrete flumes), and of the early use of concrete for many engineering purposes in the system.
- The scheme possesses many elements of infrastructure which are of world and national renown in technological and engineering terms.
- Many of the structural elements are unique to the Upper Nepean Scheme.

Reference: Edward Higginbotham & Associates, SCA Heritage and Conservation Register; Edward Higginbotham & Associates, 2002, Conservation Management Plan for the Upper Canal, Pheasant's Nest to Prospect Reservoir

Wollondilly LEP Citation

The Upper Nepean Water Supply System is historically significant as the scheme commenced, and progressively developed from the late 1880's to meet Sydney's Water Supply needs after supply from the Botany Swamps proved to be inadequate. The dams and other works are important examples of early Australian civil engineering and were all "State of Art" for their time. The catchment area and system is considered to provide one of the world's purest sources of water for human consumption.

38.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Upper Nepean Water Supply System is historically significant as the scheme commenced, and progressively developed from the late 1880's to meet Sydney's Water Supply needs after supply from the Botany Swamps proved to be inadequate. The dams and other works are important examples of early Australian civil engineering and were all "State of Art" for their time.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

As part of this System, the Canal is associated with Edward Moriarty, Head of the Harbours and Rivers Branch of the NSW Public Works Department.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The Canal is significant as it demonstrates the techniques of canal building, and evidence of engineering practice. The Canal as a whole is an excellent example of 19th century hydraulic engineering, including the use of gravity to feed water along the canal.

It provides detailed and varied evidence of the engineering construction techniques prior to the revolution inspired by reinforced concrete construction, of the evolution of these techniques (such as the replacement of timber flumes with wrought iron and then concrete flumes), and of the early use of concrete for many engineering purposes in the system.

38.7 Photos

Upper Nepean canal, empty for maintenance.
Photo: M. Pearson 2008.

39 HUME AND HOVELL MONUMENT

39.1 Location

Appin Road, Appin (296510E, 6218720N).

39.2 Heritage Listing Status

Not listed.

39.3 History

Stone erected by the Royal Australian Historical Society in 1924 to commemorate 100 years since Hamilton Hume and William Hovell set out on their exploratory journey to Port Phillip Bay. The stone for the memorial is reputed to have been retrieved from the ruin of the Hamilton Hume's house at Brookdale Farm that stood adjacent to the monument.

39.4 Description

A simple rectangular stone block with two marble plaques inscribed:

> To Commemorate
> the Hume and Hovell Expedition
> Site of the home of
> Hamilton Hume
> Starting point of the expedition to Port Phillip
> October 2. 1824
> R.A.H.S.

A small Campbelltown City Council plaque on the side indicates that the monument is a Heritage Item of Campbelltown.

39.5 Statement of Significance

A monument marking an historic site and event: the homestead of Hamilton Hume and the starting point of Hume and Hovell's exploratory trip to Port Phillip. The monument itself is also significant as a reflection of the efforts of the RAHS to commemorate and celebrate the historical events in NSW's history.

39.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

A monument marking an historic site and event: the homestead of the Hume family and the starting point of Hume and Hovell's exploratory trip to Port Phillip. The monument itself is also significant as a reflection of the efforts of the RAHS to commemorate and celebrate the historical events in NSW's history.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

A monument marking an historic site and event: the homestead of the Hume family and the starting point of Hume and Hovell's exploratory trip to Port Phillip.

39.7 Photos

Hume and Hovell Monument.
Photo: M. Pearson 2008

Hume and Hovell Monument.
Photo: M. Pearson 2008

40 BEULAH

40.1 Location

Appin Road, Appin (Lot 23, DP 1132437) (294790E 6219820N).

40.2 Heritage Listing Status

State Heritage Register No. 00368.

Campbelltown LEP. SHI DB No. 5045426.

40.3 History

From State Heritage Register

Beulah is comprised of 4 separate lots (200 acres) granted in 1823, although the grants were promised in 1821 and may have been occupied prior to that date: Portions 71(Henry Sears, 30 ac.), 77 (Francis Rawdon Hume, 80ac.), 78 (Cornelius Ryan (O'Brien) 40ac.) and 79 (Patrick Pendergrass (50 ac.). At the time of the Commission of Inquiry in 1983, all of these four lots comprised Beulah. Portion 78 was that portion which was the subject of the inquiry and upon which the major built structures are located although the bridge, thought to have been constructed 1830-40 is on the boundary between Lots 77 and 78. Confusion as to the early history of the grant rises from the misspelling of the original grantee's name - Cornelius O'Brien - who is said to have moved to the Yass plains with members of the Hume family. Evidence presented by Beulah Investments at the Commission of Inquiry based on a Land Titles Office search argued that in 1837 portions 71 and 78 were owned by Cornelius Boland (or Connor Bowling).

If we accept that the original grantee was Cornelius O'Brien there is evidence that the place was operating as a farm in 1822. Due to the roughness of the roads Governor Macquarie arranged for his heavy baggage on a dray and a curricle to be sent back to Cornelius O'Brien's farm at Appin in his tour to the Illawarra in 1822. O'Brien also owned property at Dapto which Macquarie visited and had been responsible for constructing the road to the Illawarra from Appin with six assigned convicts. On his return, after visiting the Broughtons at Lachlan Vale, he proceeded to O'Brien's and after collecting his tandem, he noted, "I left my travelling companions Mr Meehan, Mr David Johnston and Mr O'Brien at the house of the latter, where they were engaged to dine previous to their proceeding to their respective homes." This documents the fact that a house existed on the site in 1822. It seems that the correlation between O'Brien's road-building skills and available convict labour and the construction of the bridge over Woodhouse Creek at Beulah has not been made in previous studies but is worthy of further investigation.

Historical evidence prepared by Helen Proudfoot for the Dept. of Environment and Planning in 1985 is as follows:

"Sometime between 1831 and 1839 Duncan Cameron owned the site and the main buildings were erected by that date. It was leased to Lachlan McAlister in that year for 800 pounds, indicating substantial improvements." The estate of Cameron then sold it to Helenus Scott in 1845, who sold it to John Kennedy Hume in the following year, 1846. The property was known as "Summer Hill" and consisted of 120 acres.

John Kennedy Hume was only 9 years old at the time, so it is thought that his father, Francis Rawdon Hume (brother of Hamilton Hume and co-explorer with him in the earlier years) bought the property on his behalf. It adjoins the other original grant in the area to Andrew Hume, father of Hamilton and Francis and called "Hume Mount Farm". John Kennedy Hume married Emma Johnson Clayton of Rockwood, Appin in 1873 and arranged that the property form a marriage settlement in trust for his wife. It is assumed that they lived there then.

In 1885 the name of the place was changed to Beulah. The reason is not known. J.K. Hume died in 1905 leaving the property to his wife. She died in 1920, leaving it to her daughter Ellen Clayton Hume.

Ellen Hume and Beulah were featured in "The Australian Home Beautiful" in 1934 with photographs of the garden taken by Harold Cazneaux and descriptions of the furniture belonging to the Hume family. The forest which Miss Hume treated as a private sanctuary - The Hume Sanctuary - received special attention. It was Ellen Hume's wish that her trees would be left to the nation. This forest has been variously referred to as Humewood although the accuracy of the name was disputed at the Commission of Inquiry. As it is Portion 77 granted to F.R. Hume and since that date had been in the Hume family or in trust until recent times it would seem likely to be a valid name for the forest, which was described in the inquiry as being regenerated. Evidence was also cited that according to the 1833 "NSW Calendar & Directory", Hume Wood was the estate of Andrew Hamilton Hume and therefore refers to Hume Mount Farm, or a part thereof. A photograph from 1934 indicates that the character of the spotted gum (Corymbia maculata) forest has remained constant. The garden close to the house was described as conforming to no special pattern:

"...but wanders around the house at its own sweet will, trailing after it a cloud of loveliness. All the old favourites are there: phlox and hollyhocks, larkspur, lemon-scented verbena, marigolds and lupins, cosmos so large that at a distance they look like asters, rhododendrons, Chatham Island lilies (NB: probably N.Z. renga-renga lilies, *Arthropodium cirrhatum*, Stuart Read, pers. comm.) and another kind of lily which is green with brilliant red seed pods. A little flagged path winds round to a rose pergola, and kurrajong trees shelter the flowers from the sun with their delicate and graceful leaves, although they do not monopolise all the decorative effects. Last year the ironbarks (Eucalyptus crebra) blossomed and tossed crowns of white all around the edge of the clearing."

A photograph of the garden shows a shade house on the south-east corner of the front garden, roses, a small palm (the extant *Phoenix dactylifera*/date palm?) and the encircling wooden fence with the forest beyond.

Ellen Clayton Hume died in 1936, leaving the property to the RSPCA but instructing that it provide a home for her companion and friend Sarah Papworth and her husband David. Sarah died in 1960 and David in 1967. In 1969 the property was conveyed to the RSPCA and sold to Beulah Investment P/L. It has since been neglected and left to be ransacked. Early post and rail fencing has been removed and sold for firewood. A plan of the remnant garden by John Tropman in 1983 documents the extant plant material from that time in the immediate vicinity of the house although the layout is more formal than suggested in the 1934 article. The garden has continued to deteriorate and the summerhouse has now completely collapsed (Morris & Britton, 2000, 71-72).

Homestead

Built in c 1830s on Portion 78, which appears to be grant promised 1821 to Cornelius Ryan and notified in 1831. Series of occupants then the property of 120 acres sold to John Kennedy Hume in 1846 (is thought that his father Francis purchased the property of on his behalf). Remained in Hume family until 1936, indirectly until 1967. Conveyed to the RSPCA. Sold it to "Beulah Investment" in 1971 (LEP).

Built by John Kennedy Hume in the 1830s. 19th Century outbuildings.

Remains of (later) extensive picket fence and carriage loop. The majority of these buildings on this site were built between 1835-38. They were described in contemporary descriptions in 1839 and 1840. This house and its associated buildings were purchased in August 1846 for John Kennedy Hume by his father Francis Rawson Hume whose brother was Hamilton Hume the explorer and owner of Cooma Cottage, Yass. It was owned by the Hume Family until 1969 (National Trust [NSW]).

40.4 Description

From State Heritage Register

The property is broadly rectangular running away from Appin Road on its eastern side towards the Upper Canal water supply for Sydney to its west. A driveway winds from Appin Road over Woodhouse Creek through an area of forest, pas a former dam and bore and an area of remnant formal planning layout to the homestead group with remnant plants, outbuildings and fence lines. To the north of the homestead group is a dairy. To its south-west is an octagonal summer house ruin. This was deliberately sited in an area giving both the best views and summer breezes. It has a clear relationship to the homestead group and to adjoining Meadowvale homestead group to its south-west - on axis.

On both sides of the driveway which continues west of the homestead group were cultivated paddocks - visible in a 1947 aerial photograph - patterns indicating possible former orchards or pasture improvement in this area. Dams and another area of cultivation patterns in the farm's south-west. Beulah adjoins Meadowvale to its south, another colonial farm estate and this boundary is marked by remaining post and rail fencing (Morris & Britton, 2000, figure 4.19 site plan).

The timber beam bridge over Woodhouse Creek on `Beulah' is believed to be the only example of its type in private ownership and the only one known to retain a full set of stringer girders intact. It is a rare remnant of Australia's oldest surviving form of bridge construction. It is approximately 150-200m from the homestead, negotiating a steep rocky creek. It is believed to be contemporary with the house (1830-1840). Its style of construction is not unlike that employed in some earlier bridges in the Great North Road, North of Wisemans Ferry. It consists of stone masonry abutments approximately 3m apart with hardwood stringer girders spanning that distance for a width of approximately 6m. The original decking no longer exists. The remains of some hand railing exist lying in the grass adjacent to the causeway. The invert of the creek bed is stone faced for the width of the bridge and 1.5m upstream and downstream. Downstream, it discharges into a natural rock pool formation. There is some scouring of the creek bed upstream of the paving. The abutment walls are coursed rubble stone masonry lime mortar jointed using sandstone blocks. This construction returns along the wing walls which form the sides of both approach causeways. At a distance along the causeway the mortar jointed masonry gives way to dry walling roughly coursed. At the top of the abutment walls and for a distance along the causeway walls a course of stone is recessed forming a shelf to carry a 225 square broad axed (or adzed) timber plate. At the abutments this is used to land the timber bridge stringers and along the causeway it is used to support the handrail posts. The stringers extend beyond the abutment headstock approximately 900mm along the causeway. Seven stringers 225 x 225 at 900 centres form the width of the bridge. These were originally decked with 150 x 60 hardwood planks all of which have been removed between abutments and have been replaced with a modern carriageway consisting of timber decking over railway lines as stringers occupying the centre 3m width of the bridge. The remains of a handrail lie in the grass on the South side of the wrought iron strap securing the rail to the top of the post clearly visible. The wrought iron fish plate connecting the butted ends of the side plates is also lying on the site. The remains of bolts between stringers, side plates and headstock are also in place in corroded form as are a number of wrought iron spikes and nails.

Building Material: stone masonry abutments, hardwood stringer girders.

House and Garden

Remains of (later) extensive picket fence and carriage loop. (National Trust [NSW]). A clump of an old rose, possibly Scotch rose (*Rosa spinosissima*) is to the rear of the house (Morris & Britton, 2000, figure 4.19.11). A kurrajong (*Brachychiton populneum*), date palm (Phoenix dactylifera) and peppercorn tree (*Schinus molle* var. *areira*) are to the front/east of the house. A formal garden was/remains on the eastern side of the house and outbuildings to its west or rear. (ibid, figure 4.19.4).

A single storey, 3 bay symmetrical homestead of coursed random stone construction. Double pitched roof (now iron) and stone flagged verandah. Rear flat roofed addition has a slit window (for defensive reasons ?). Attached dairy and the picket fence have been destroyed in recent years. House, weatherboard outbuildings and the gazebo have deteriorated to ruinous state in recent years (LEP).

Built by John Kennedy Hume in the 1830s. Single storey 3 bay symmetrical homestead of coursed random stone rubble construction, stuccoed to front. Central corridor, 2 principal rooms with fireplaces, reeded or fluted chimney pieces intact (Sept, 1977), back hall, two back rooms, stone paved verandah to front returning on sides to two small corner verandah rooms, all under a double pitched hipped roof (now covered with corrugated galvanised iron).

The majority of these buildings on this site were built between 1835-38. They were described in contemporary descriptions in 1839 and 1840.

Building Material: coursed random stone rubble (stuccoed in part), reeded or fluted chimney pieces (National Trust [NSW]).

House: derelict, vandalized (National Trust [NSW]). Bridge over Woodhouse Creek: The western headstock has been damaged by termite infestation and has collapsed. The Eastern headstock has probably been damaged as is evident by inspection of the ends but collapse has not occurred. The `second' headstocks are buried and could not be inspected beyond the ends which show some evidence of termite damage. Further exploration would be required to confirm this. The top surface of the stringers shows moderate to extensive weathering forming vertical fissures typical of water damage at the interface between decking and girders. The condition of all timbers is remarkably good considering their age.

The landscape values of Beulah are identified in *Colonial Landscapes of the Cumberland Plain and Camden NSW*, Morris and Britton for the Heritage Council, 1997.

40.5 Statement of Significance

From State Heritage Register

The Beulah estate is important as an entire cultural landscape containing early colonial structures - homestead group and stone bridge - remnant 19th century farm and garden layout, an octagonal pavilion or summer house as a major focal element and a remnant spotted gum (*Corymbia maculata*) forest as a result of early conservation planning.

40.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The Beulah estate is important as an entire cultural landscape containing early colonial structures - homestead group and stone bridge - remnant 19th century farm and garden layout, an octagonal pavilion or summer house as a major focal element and a remnant spotted gum (*Corymbia maculata*) forest as a result of early conservation planning.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The Beulah estate is important as an entire cultural landscape containing early colonial structures - homestead group and stone bridge - remnant 19th century farm and garden layout, an octagonal pavilion or summer house as a major focal element and a remnant spotted gum (*Corymbia maculata*) forest as a result of early conservation planning.

40.7 Photos

Beulah. Google Earth image

41 CATARACT DAM

41.1 Location

Cataract River, Appin (297750E 6206190N).

41.2 Heritage Listing Status

State Heritage Register No. 01359.

SHI DB No. 5051469.

S.170 State Agency Heritage Register.

Wollondilly LEP. SHI DB No. 2690211.

Wollondilly Heritage Study.

41.3 History

The Upper Nepean Scheme was commenced in 1880 after it was realised that the Botany Scheme was insufficient to meet Sydney's water supply needs. The Nepean project consisted of the construction of a weir across the Nepean River to divert of the rivers, Cataract, Cordeaux, Avon and Nepean, to the Prospect Reservoir.

By 1902, the population had grown to 523,000 and a severe drought caused the water level in Prospect Reservoir to drop below the limit of gravitational flow to the canal. This drought was the worst experienced by the Water Board since its inception in 1888. The seriousness of the situation moved the Government in March 1902, to appoint a Royal Commission to inquire into and report upon the Sydney water supply system. The major finding was that a storage dam be constructed to a point just below the junction of Cataract Creek with Cataract River. The Act authorising the construction of the dam was passed in 1902, providing for a wall 48.7m high.

The dam was built by the Public Works Department and the construction contract was let to Lane and Peters. The Principal Assistant Engineer, EM DeBurgh, was given special responsibility for construction. By June 1903, much of the area to be submerged had been cleared of timber and by the end of the year the foundation excavations were in progress.

41.4 Description

The dam is built of cyclopean masonry, composed of sandstone blocks weighing from two to four and a half tons. These were quarried at the site and bedded in cement mortar. The vertical joints were filled with basalt or sandstone concrete.

The upstream face consisted of basalt concrete moulded blocks set in a cement mortar. The downstream face was of basalt concrete, 1.8m thick in the lower section and 0.9m thick in the upper section. There were two lines of 122cm diameter pipes which passed through the dam and discharged water into the river.

The flow is controlled by a Larner Johnson Needle valve. The dam wall was given a decorative finish. The upstream parapet was castellated with sandstone blocks while the top of the downstream wall was corbelled in concrete. In approximately the mid section of the dam, stands the valve house. This is finished in quarried sandstone blocks with ashlar coursing. It features a steeply pitched slate covered pipped roof topped with finials and gables at either side.

The total cost of construction was 329136 pounds ($658,272) when the dam was handed over to the Metropolitan Water Sewerage and Drainage Board.

The reservoir was filled to capacity for the first time on 13 January 1911.

However, it was realised that the spillway should be widened to avoid the risk of floodwaters overtopping the wall. This work was completed in 1915.

During the construction of the dam, extensive use was made of electricity on site, and production line techniques for the quarrying of stone blocks were used for the first time. The water from cataract is discharged into the Cataract River downstream to Broughtons Pass. From here it is diverted into the Cataract tunnel, the first of the Upper Canal structures by which it is conveyed to Prospect Reservoir.

41.5 Statement of Significance

From State Heritage Inventory Database

The Cataract Dam was completed in 1907 and is the first of the four water supply dams in the Metropolitan Catchment Area constructed between 1903 and 1936 to provide a secure water supply to satisfy the demands of industrial, commercial and residential development of metropolitan Sydney up to c.1960.

The dam wall is unique in Australia in regard to its construction, its high and straight upstream face, construction of cyclopean masonry, crest parapet, concrete valve house superstructure, and screen tower precast concrete facing blocks.

The Cataract Dam is part of a group of like structures which are the State's largest and most intact ensemble of large dams completed prior to the Snowy Mountains Hydro-Electricity Scheme.

The dam contains in-situ items of Federation era water delivery technologies developed by the Public Works Department that are unique such as the lengths of iron discharge pipes, and system of penstocks, and valve tower water inlet system.

The site of the Cataract Dam contains a number of resident maintenance men's cottages and a residence used by board members of the Water Board that collectively continue to evoke the manner in which the dam was maintained and emphasise the importance of the dam to successive generations of management of the Water Board.

The dam is a landmark that has engendered beautification works undertaken from the 1910s and again in the 1960s for the general visiting public through the picnic areas and for the management hierarchy of the Water Board in the Manor (former Official Quarters).

The setting of the dam's picnic grounds within the plantations of pine trees amidst native bushland of the catchment is one of the most attractive of the Metropolitan Dams.

The site of the Cataract Dam contains areas which with archaeological examination may reveal new information about the construction era of the dam.

The Cataract Dam is associated by sections of the wider community as an integral part of the history of water supply for metropolitan Sydney. The grounds of the dam being associated with the local and regional community as a place of passive recreation.

The four dams of the Metropolitan Catchment were completed between 1907 and 1936 and collectively represent the largest major water supply scheme undertaken in NSW in the first half of the twentieth century, and are one of the major engineering feats undertaken in Australia at any time.

The construction of the system of dams marked a natural progression from the Upper Nepean Water Supply Scheme which was inaugurated in the 1880s as the principal water supply source for metropolitan Sydney. The construction of the dams in providing for security of water supply ensured the continued industrial, commercial and residential development of metropolitan Sydney up to the 1950s.

The design and construction of the dams was principally under the one Government authority - the Water Supply and Sewerage Branch of the NSW Department of Public Works. This Branch was led at different periods by two of Australia's leading water supply engineers - Leslie A.B. Wade and Ernest M. de Burgh. The dams present a major legacy for present and future generations of the work of this Branch and the role of the Public Works Department in general played in the development of the State.

The effective long-tem management of the Metropolitan Dams by the Water Board, expressed through continuation of water supply use and on going development of the grounds for passive recreational use, represents a major episode in the history of this government department.

The completion of the dams necessitated the introduction of overseas derived forms of construction technologies that were subsequently developed as standard practice in major civil engineering works. Similarly, the technologies of water delivery required for the dams were on a scale and complexity hitherto unseen in NSW. Collectively there is no larger resource for the investigation of such pre Second World War era technologies and construction methods in NSW.

41.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Cataract Dam is located within the Upper Nepean Catchment Area which was developed with the completion of the Cataract and Nepean tunnels in 1888, as the fourth source of water supply for Sydney. The potential of the Upper Nepean Catchment Area to supply water was fully developed through the construction of four major dams between 1903 and 1936. Cataract Dam is the first of these dams to have been completed. The Upper Nepean Catchment Area continues to supply the regions of Sydney and the Illawarra, with Cataract Dam providing a supply to the Sydney, region.

Cataract Dam was the first of the major water supply/irrigation dams constructed in NSW. The completion of the dam necessitated the introduction of methods of construction hitherto unseen in NSW in regard to dam engineering. The practices of construction developed at Cataract Dam set the pattern for the completion of all subsequent dams in NSW up to the 1940s.

Up until the completion of Cordeaux Dam in 1926, the impounded water of the Cataract Catchment Area provided the main reserve source of water for domestic and industrial consumption in metropolitan Sydney, the largest city in NSW.

In providing water for metropolitan Sydney during this era the dam, in ensuring security of supply, contributed to the extensive residential, commercial and industrial development of Sydney during the first decades of the twentieth century.

Cataract Dam is one of five dams situated in the Wollondilly LGA, representing a major theme in the historical development of the area.

Criterion B: an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history;

The design and construction of Cataract Dam was undertaken by the Water Supply and Sewerage Branch and Harbour and Rivers Branch of the NSW Public Works Department. The construction of the dam necessitated the dedication of the knowledge and experience of a number of engineers employed in the branches at the time including Cecil W. Darley (NSW Inspecting Engineer in London), Leslie A.B. Wade (Principal Engineer, Water Supply and Sewerage Branch), Henry H. Dare and Ernest M. de Burgh (Supervising Engineers).

The successful completion of the dam and its continuation of use as a water supply dam are a lasting testament to the professional capabilities of the late Victorian/Edwardian era generation of engineers of the Public Works Department. The association of Thomas W. Keele with the initial dam proposal, and the subsequent problems associated with the cost and the ongoing Royal Commissions into the project was immortalised through Banjo Patterson's poem 'The Dam that Keele Built'.

The Manor was purpose built in 1910 as the quasi-private domain of the board members of the Water Board. The building and its grounds have particular associations with past identities of the Board.

The island and inlets of Lake Cataract are associated with past identities of the Water Board through memorialisation of their surnames. A well known example is Keele Island named after Thomas Keele, the president of the former Metropolitan Board of Water Supply and Sewerage at the time of the dam's construction.

The construction of Cataract Dam between the years 1903 and 1907 necessitated the employment of a large body of labourers and tradesmen who lived at the construction sites with their families. The number of residents at 'Cataract Village' was upward of 1500, a number which represents a major influx to the local, predominantly rural, population of the local area.

The ongoing maintenance and supervision of Cataract Dam has been undertaken by generations of resident maintenance men. It is a pattern of working life that is of considerable interest in regard to the history of the local area.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The wall of Cataract Dam is an engineering work imbued with a sense of high aesthetic value expressed through a well proportioned high and straight wall set within the gorge of the Cataract River.

The design and finishes of the crest house, albeit substantially reconstructed c.1953, parapet and abutments were undertaken by the Government Architect's Branch of the Department of Public Works, at that time under Walter Liberty Vernon. It exhibits stylistic traits which evoke the era of its construction and impart a park-like appearance to the dam.

The Manor, completed in 1910, is dramatically set within the platform of the cableway and quarry used in the construction of the dam. The sense of elevation and axial relationship to the wall is accentuated by the adjoining drive which is flanked by an avenue of Phoenix palms and Jacarandas and the flight of concrete and stone steps which provide the principle means of access to the wall. There is a high level of design and awareness in the planning of the grounds and the association with the Botanic Gardens in the layout and selection of species is of considerable note.

The Manor, which is constructed in stone and finished internally to a very high (almost vice-regal) standard, is complemented by four near contemporary stone workmen's family cottages and a 1920s brick resident officer's residence which are equally designed and finished to a high quality.

The dam is set within the valley of Cataract River; upstream of the dam wall there is a substantial area of native bushland characterised by the broad expanse of the pool of water bordered by the crests of the valley sides and Keele Island. Downstream of the dam wall the setting is characterised by the steeper inclines that graduate into the gorge created by the river's flow over time. This topography in times of high water level imparts a picturesque scene viewed from selective vantage points above and on the dam wall.

The adjoining hill of approach to the dam is laid out with a plantation of Monterey pines, which in juxtaposition with the paths, drives, culverts, steps and cottages impart a park-like setting.

The grounds of the dam retain a major repository of planting and design which is evocative of post 1960s urban landscape practice in the local area, and are a reflection of the requirements of evolving recreation patterns undertaken in a manner which respects former construction era landscaping patterns.

Criterion D: an item has strong or special associations with a particular community or cultural group in NSW for social, cultural or spiritual reasons;

The dam and grounds are recognised by the National Trust of Australia (NSW) as being a place which is part of the cultural environment of Australia which has aesthetic, historical, architectural, archaeological, scientific, social significance for future generations as well as for the present community of NSW.

The dam and grounds are recognised by the Heritage Council of NSW as a place which is of significance to NSW in relation to its historical, scientific, cultural, social, archaeological, natural and aesthetic values.

The dam wall is recognised by as an engineering feat of national significance by the Institution of Engineers Australia.

The dam wall and to a lesser extent the grounds are recognised on the Register of the National Estate as a place which is a component of the cultural environment of Australia that has aesthetic, historic, scientific and social significance for future generations as well as for the present day local community.

The dam and grounds are recognised by Wollondilly Shire Council as being part of the historic built environment of the local area.

The grounds of the Cataract Dam have provided a centre of recreational amenity for the region for a considerable period of time (from c.1910s). The picnic and lookout areas of the dam represent one of the major tourist destinations in the local area.

Criterion E: an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

The grounds of the dam contain a yard of valves removed from Cataract and Woronora Dams, and items of plant and machinery used during the construction and maintenance of the Upper Canal.

The hillside overlooking the dam was the site of the original construction village and retains steps and engravings cut within the rock outcrops dating from this era. The cyclopean masonry of the dam is an excellent example of this type of gravity dam construction and demonstrates the principle characteristics of this technology. The lower valve house completed in 1907 and extended in 1913 is a unique early example of its type and demonstrates the principle characteristics of the design of such structures.

The water supply system completed in 1907 retains its gallery and rising main chamber in the dam wall which demonstrate the principle characteristics of the design of such a delivery system. The grounds of the dam retain numerous tree plantings undertaken from the time of the completion of the dam and Manor in 1910. Collectively the diversity of these trees is an invaluable record of past horticultural practices. Terraces and platforms adjoining the dam abutments demarcate the location of plant used in the construction of the dam, in particular the location of the cableway head tower.

The submerged basin of the reservoir is likely to retain remnant plant and equipment used during the construction of the dam, such as cuttings and terraces of the tramway.

The site of the dam retains a number of known archaeological sites which are associated with the dam construction and later upgrading of the spillway. These sites include a large curved masonry dam on a tributary of Cataract Creek off the Appin/Bulli Road, a potential stone quarry, the formation of a roadway adjacent to the road of access, powder magazines on Keele Island and on the adjoining west abutment of the dam wall, and fireplaces, horse yard drains and powder magazines on the abutment adjoining the spillway.

The catchment area in being relatively untouched bushland in close proximity to a major urban area has a high potential for further research into natural ecosystems.

The museum and associated records and displays provide an important interpretative role in the local area for an understanding of the historical development of the Upper Nepean Catchment Area and Upper Canal.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

Cataract Dam was the first major dam situated within a large water supply catchment area constructed in NSW. Cataract Dam is the oldest large cyclopean masonry dam constructed in Australia, and is believed to have been the largest work of its kind at the time of completion in the Southern Hemisphere.

The straight cyclopean masonry wall is unique within the context of other large cyclopean masonry dams constructed in NSW. The lower valve house (completed in stages up to 1915) is the earliest and largest structure of its type constructed in NSW. The screen tower (completed in 1907) is the earliest structure of its type constructed in NSW and includes a unique water intake system. The crest house and valve tower retain unique penstock gate and operating gear (capstan connecting shafts and gate) examples of this type of machinery in NSW.

The terraces used in the construction of the dam represent the first of their type in NSW and are associated with a number of technological innovations such as the first cableways used in NSW.

The plant and equipment used in the construction was electrically driven, which was unique in NSW in regard to the date, extent of the installation and remoteness. The dam retains items of ironwork which are part of the original water delivery system which are unique in NSW in regard to their date. The building of the dam represents a unique episode in the history of NSW in being the subject of a number of Royal Commissions made into the building and cost of the project. The Commissions are likely to have influenced the method of construction of later dams.

The latter stages of the construction of Cataract Dam were completed by contractors Land and Peters. Cataract Dam is the only cyclopean masonry dam designed by the Public Works Department but completed under contract.

Cataract Dam is arguably the most decorative of all the major dams constructed in NSW in regard to its high standard of rusticated stone finishes on the crest wall, abutments and crest house, the ashlar pattern imparted by the precast concrete blocks on the straight upstream face of the wall, the unadorned functionality of the concrete facing to the inclined downstream face and lower valve house, and the setting of the high straight wall within the landscape of the Cataract River gorge.

The crest house and complementary elements such as the articulated arches on the crest wall in their innate sense of scale and composition rank with the best of all public works in NSW undertaken in the Federation era.

The four stone workmen's family cottages constructed in 1912, and the 1929 brick officer-in-charge residence, consciously sited on the hillside overlooking the dam wall, impart a village like appearance which is unique within the context of dams in NSW.

The four stone maintenance men's cottages are likely to be rare, within the context of a non-urban environment, Federation era examples of model working men's houses.

The grounds of the dam contain an early 36 inch (0.9m) diameter gate valve (manufacturer not known) which was used to regulate the outlet flow of water which is considered the only extant example of such a valve in NSW.

The upgrading works to the spillway and dam between 1981 and 1989 to make the dam meet modern day safety requirements were undertaken in consideration of the unique heritage significance of the dam in NSW ensuring no visual impact on the dam, a milestone in remedial engineering works on this scale.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The Cataract Dam is representative of a type of dam (cyclopean masonry gravity dam) constructed in NSW by the Water Supply and Sewerage Branch of the Public Works Department during the first half of the twentieth century. Key representative attributes of the dam's design and construction include the use of cyclopean masonry bedded in sandstone concrete, use of blue metal concrete facing, use of a spillway offset from the gravity wall, valve/crest houses attractively designed and finished to a high standard.

The upgrading of the valves within the dam wall and ancillary monitoring and operating equipment is representative of modern day safe operating practice.

The construction technologies used at Cataract Dam came to be the norm for all subsequent dams constructed in NSW well into the twentieth century. Key representative attributes of the dam's construction techniques include the use of cableways, the building of temporary camps to house labourers and tradesmen, building of semi permanent cottages to house salaried staff, the construction of terraced platforms for plant and machinery, mechanisms of concrete production, the construction of a purpose built road of access to transport men, supplies and materials from the nearest railhead to the construction site, the building of permanent infrastructure such as water supply for plant and men and horses, and the use of electricity to power plant and equipment.

The rehabilitation of tracts of land scarred in the construction processes employed at Cataract Dam through beautification work is representative of practices undertaken at other dams throughout NSW. Key representative attributes of this practice include utilising the former camp as a picnic area, utilising the former terraced construction platforms as picnic areas and lookouts, and utilising the former construction roads and tramway for vehicular access to the dam site and dam wall.

The practice of ongoing maintenance of the Cataract Dam wall by resident staff and workshop facilities is representative of procedures undertaken at other dams and weirs constructed prior to and after Cataract.

The provision of public amenity at the dam site is representative of the use of large water supply and irrigation dams in NSW as places for recreation by the greater community.

Cataract Dam is one of about twelve items of recognised heritage significance associated with the provision of water supply to metropolitan Sydney located in the Wollondilly LGA. This comparatively high number results from extensive tracts and sections of the Upper Nepean Catchment Area and Upper Canal and the Warragamba Catchment Area being located within this LGA.

41.7 Photos

Cataract Dam

42 WOODEN MILEPOST

42.1 Location

Razorback Road/Remembrance Drive junction, Razorback.

42.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690158.

Wollondilly Heritage Study.

42.3 History

Built in 1926.

Other timber mile-posts were located in 1984, when an inspection identified the 1 mile, 2 mile, 2.5 mile, 3 mile and 4 mile-posts. The mile-posts were 12" square, hardwood timber and the 0.5 mile posts were 7" square. They are thought to have been placed there by Camden Council in 1926-27.

The Great South Road: The centre-piece for road heritage in the area is evidence of the Great South Road, in particular the Old Razorback/Cawdor Road, where the alignment and width have not greatly altered since construction by chain gangs. Even though the stone macadamising was recently coated in hotmix, some of the post and rail fencing, stone culverts and wooden mile posts survive. One section of Cawdor Rd was the alignment of the Great South Rd which left the Cawdor Public School, climbed the north face of Mt Prudhoe and descended Apps Gully along Racehorse Creek. A major variation re-aligned the Port Phillip Road (called the Hume Hwy since 1928) early in the twentieth century and the Great South Rd lapsed into the minor Cawdor Rd. The road relics document the main road artery between Melbourne and Sydney, from the period of early exploration to the realignment and renaming in 1928, which saw the Hume Highway replace this section as the main route.

Wrigley, J, Camden Interim Heritage Study, CHS, 1985.

JRC Planning Services, Wollondilly Heritage Study, WO0158, 1992.

Andrea Oehm, Wollondilly Shire Council Heritage Study Review, 2690158, 2006.

42.4 Description

Timber mile-posts and half-mile posts remain along the Cawdor Rd/Old Razorback Rd. In this survey, "MR51" situated beside the original alignment of the Great South Rd, north-east of Picton at the base of the Razorback Range, was photographed. It is 12 inches square and made of hardwood timber with the inscription still clearly visible. No paint remains.

The milepost and adjacent fence post are now located behind a barbed wire fence. Other mile-posts and half mileposts are also known to exist.

42.5 Statement of Significance

From State Heritage Inventory Database

The timber mile post is significant because it marks the alignment of the original Great South Road. While it is part of a line of relatively recent (1920's) markers, it is evidence of the continuing importance of the Great South Road which remained a major transportation route until the minor realignments and finally the construction of the Freeway, diminished its importance. As visible reminders of the alignment, this mile post and the others which remain on Old Razorback/Cawdor Rd have significance because of their great interpretation potential. The mile-posts are also significant relics because they demonstrate a particular phase of municipal road building in the region.

42.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The timber mile post is significant because it marks the alignment of the original Great South Road. While it is part of a line of relatively recent (1920's) markers, it is evidence of the continuing importance of the Great South Road which remained a major transportation route until the minor realignments and finally the construction of the Freeway, diminished its importance.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

Timber milestones are a rare item in the landscape of NSW.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The mile-posts are also significant relics because they demonstrate a particular phase of municipal road building in the region.

42.7 Photos

Milepost at junction of Old Razorback Road and Remembrance Way, Razorback.
Photo: M .Pearson 2008.

43 HOMESTEAD RUINS AND TREES

43.1 Location

40 Mount Hercules Road, Razorback (Lot 222, DP 828453).

43.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No. 2690880.

43.3 History

No information provided for LEP.

43.4 Description

No information provided in LEP.

The site appears to be a 19th century rural residence with surrounding landmark plantings of palms and trees on a prominent ridge of the Razorback Range. The house has completely collapsed, with brick rubble, roofing iron and other remains on the ground. A partially collapsed dairy is nearby.

43.5 Statement of Significance

From State Heritage Inventory Database

No information provided (assumed reason for listing). The site is a relatively undisturbed archaeological site of a 19th century rural residence.

43.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion E: an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

The site is a relatively undisturbed archaeological site of a 19th century rural residence.

43.7 Photos

Homestead ruins and trees, 40 Mount Hercules Road, Razorback.
Photo: M. Pearson 2008.

44 RAZORBACK INN

44.1 Location

Remembrance Way, Picton.

44.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690150.

Wollondilly Heritage Study 1992.

44.3 History

Built on four acres sold by H.C. Antill to Oliver Whiting ex-convict and servant of the Antill family. It appears that the inn was completed in 1850 and a licence issued for that date. Continued to operate until Whitings moved to an inn at Picton when the railway opened. A Mr. Turner who later lived in the building found two English pennies dated 1850 under the foundations of the place when renovating it. Later used as a guest-house and residence named "Brookside", also as a restaurant. It is now used in association with the Woolshed complex for functions.

44.4 Description

From State Heritage Inventory Database

A simple, two storey stone "Colonial Georgian" building, now painted. Retains form and hipped roof line and some original sash windows. Also retains a pair of original chimneys with simple neck mouldings. A two storeyed verandah lines the front elevation but this has been extensively altered and now features modern concrete columns to ground and first floor. The main elevation is also so heavily covered with vines that its form and detailing are almost totally obscured. It has dormer windows in the rear roof and a detached former kitchen.
A large woolshed has been relocated behind the Inn and linked to a late Victorian residence which is next door to the Inn.

Rear kitchen building connected to main building with a pergola. Adjoining house to north side of one storey. Woolshed relocated to rear of building and extended with weatherboard addition along north side. New utility rooms to north side.

44.5 Statement of Significance

From State Heritage Inventory Database

Razorback Inn has local significance as an early Colonial Inn providing evidence of the nature of early settlement in the area and the importance of the early road link to the south. It is also historically significant through its associations with early convict settlers and the prominent Antill family. The building has local significance as a typical representative of an "Old Colonial Georgian" Inn, this significance being enhanced by its prominent location on a major thoroughfare but compromised by the loss of original fabric and extensive alterations.

44.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

This item is assessed as historically significant regionally.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

This item is assessed as aesthetically representative locally.

44.7 Photos

Razorback Inn.

45 BERKELEY LODGE

45.1 Location

1545 Remembrance Way, Picton.

45.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP.

SHI DB No. 2690348.

45.3 History

1545 Remembrance Drive, Razorback. The property was part of the Jarvisfield grant of 1822 to Major Henry Antill. According to local historian Jan Ross, this property was originally known as Rose Cottage Farm, or Farrington Lodge, the home of Dr. MacDonald, who was Clerk of Petty Sessions in 1841, and possibly earlier. Soon afterwards, William Berkeley Campbell was living there. He had arrived to tutor the Antill children in the early 1840s. In the 1850s he had the mail contract between Campbelltown and Picton, and grew potatoes and fruit on the property for local sale. The Campbells rented first from the Antills, and then from a Mrs. Moggeridge. Their daughter Roseanne bought Rose Cottage Farm from Mrs. Moggeridge in 1892. William Berkeley Campbell died in 1904, but two of his daughters lived in the house until their deaths in the 1930s, and the name Berkeley Lodge dates from their occupation. It then passed to Mr. & Mrs Turner, and when Rita Turner sold it to the Sheil family in 1980, she had lived there for 49 years (further ownership unknown).

45.4 Description

House with recent extensions and outbuildings

45.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

Example of an extended and well-maintained 19th century homestead.

45.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

Example of an extended and well-maintained 19th century homestead.

45.7 Photos

Berkley lodge bottom right, Razorback inn top left. Google Earth image.

46 MALDON CEMENT WORKS

46.1 Location

Maldon Bridge Road, Maldon (Lot 2, DP 216580; Lots 1 and 2, DP 231892' Lot 1, DP 608195; Lot 3, DP 748675).

46.2 Heritage Listing Status

To be considered in 2009 revision of Wollondilly LEP (WO 0142).

SHI DP No. 2690142.

46.3 History

This area had been suggested as a suitable site for cement manufacture as early as 1905, but the present site dates from September1948, when an 800,000 pound project was announced. Maldon was chosen as it was on the railway line (with limestone coming from Marulen, and coal from Medway) and was just inside the Sydney Metropolitan area and thus exempt from heavy road tax. The proximity of the Nepean River and suitability of local clay shales would also have influenced the siting.

There was a scarcity of cement in Australia in the 1940s, and with the planned construction of Warragamba Dam, supplies were needed urgently. A plant in Detroit, USA was for sale, and as it would be quicker to re-erect it than start from scratch. It was bought by the newly formed Metropolitan Portland Cement Ltd (with a Federal Government loan of $US 1,190,000). The plant arrived in Sydney in January 1949, by which time preliminary work had begun on the site, and the first cement left the plant in July 1951.

Financial difficulties saw the company taken over by the Commonwealth Portland Cement Co. in 1960; the plant was expanded in 1965, and in 1966 BHP joined to form Blue Circle Southern Cement Ltd. Further expansion in 1976 meant that some of the original buildings were demolished, but in 1978 many workers were stood down with foreign cement being dumped in Australia. Blue Circle became a subsidiary of Boral in 1987.

Apart from Warragamba Dam, Maldon cement has been used in other major projects such as the Sydney Opera House and the Sydney Harbour Tunnel. It has been a major employer for Picton, although it seems the original plant contained a lot of asbestos material and the reconstruction was a very dusty job (personal comment D. Hilder).

Staff housing was built 1949, slightly west of the plant, which still survives.

References

Featon, Bill 1948 Onwards The History of Blue Circle Southern Cement, Maldon NSW published by the company in 1995 (contains many photographs).Jan Ross series of articles in The Picton Post, February 7th –March 20th 1996.

Bayley, William, A, Wollondilly Shire History.

Peter Kabaila and Kate Holmes, Database Updating by Council Heritage Advisor and Picton Historical Society, 2007.

46.4 Description

Industrial buildings and equipment. Generally large multi-storeyed corrugated iron clad sheds, includes silo like buildings, chimneys and feeders/hoppers.

46.5 Statement of Significance

From draft 2009 revision of Wollondilly LEP

The Maldon Cement Works is evidence of the influence of the needs of the Sydney urban area and the consequent influence on the growth of the Wollondilly area. It is also an example post WWII industrial operations on a large scale.

46.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The Maldon Cement Works is evidence of the influence of the needs of the Sydney urban area and the consequent influence on the growth of the Wollondilly area. It is also an example post WWII industrial operations on a large scale.

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

It has high level representativeness of post WWII industrial operations on a large scale. Highly representative

46.7 Photos

Maldon Cement Works.
Photo: M. Pearson 2008

Maldon Cement Works.
Photo: M. Pearson 2008

47 MALDON SUSPENSION BRIDGE

47.1 Location

Wilton Park Road, Maldon.

47.2 Heritage Listing Status

Wollondilly LEP. SHI DB No. 2690196.

Wollondilly Heritage Study 1992.

47.3 History

The bridge was built in 1903 to replace Harvey's Crossing, a stone causeway situated a couple of hundred metres upstream. A bushfire in January 1939 severely damaged the bridge and the original timber towers were replaced with identical steel ones. Maldon Suspension Bridge was closed to vehicle traffic with the opening of the F5 Freeway and the new Picton Road from Wilton in 1980.

47.4 Description

The Maldon bridge differs from the normal suspension bridge in that the main cables leading from the towers are carried upwards to an anchorage in the sandstone cliffs above the bridge instead of downwards to ground level. It also has unique curved timber approaches.

The bridge is now in very poor condition.

47.5 Statement of Significance

No statement in State Heritage Inventory Database.

Maldon suspension bridge is significant as an example of an unusual bridge design.

47.6 Significance against Criteria

NSW State Heritage Register Criteria

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

Maldon suspension bridge is significant as an example of an unusual bridge design.

47.7 Photos

Maldon suspension bridge 2009.
Photo: Michael Pearson

48 BULLI SHAFT NO. 1

48.1 Location

Located approximately 3.3 km west of the Illawarra Escarpment at approximately E302760 N6200660 (MGA co-ordinates), the shaft is located some 1km off SCA Fire Road #7C.

48.2 Heritage Listing Status

Wollongong LEP and Illawarra REP. SHI DB No. 19139.

48.3 History

Bulli Colliery commenced operations in 1859, supplying export coal to Shanghai by August of 1863. In 1925 ***Bulli No. 1 Shaft*** was commissioned and retained its role as the main upcast shaft until mine closure in 1987. (Note: The information in this section is drawn from Shedrill Pty Ltd, 2008. *Bulli Colliery; Bulli Colliery shafts Nos 1, 2, 3 and 4, A review*, report for BHP Billiton Illawarra Coal.) Bulli No.1 Shaft was reported as being the first coal mining shaft in Australia to be concrete lined and the first in the world to utilise the method where the concrete falls direct from the mixer at the surface to the bottom for the total depth. Two lines of wooden boxes, each having a cross section of 64 square inches (413 square cm), conveyed some 250 tons of cement from collar to shaft lining. (Illawarra Mercury 24/07/1925).

On the 14th January 1939, a bushfire ignited and subsequently destroyed the headgear and winding plant. It was replaced by a brick and steel structure (Mines Department, 1939). This apparently refers to the existing reinforced concrete and brick superstructure, complete with engine house (now defunct) and cage (still on site). Circa 1955/56 the original 98" Sirocco fan was replaced with the 157" Aerex axial flow fan from the Nebo Mine. This time frame is supported by several BHP Engineering drawings relating to the installation and dated 1955 and the fact that the two Nebo Calyx shafts were commissioned in 1955/56.

Due to deterioration caused by water and damage suffered during an earth tremor in April 1961 a 30' (9.14m) section, some 70' (21.34m) above the Bulli Seam, was lined with 15'-6" (4.72m) diameter steel casing. In 1963 the shaft was relined by Cram and Sons Pty Ltd to 15' (4.57m) diameter with 6" (150mm) of concrete.

In 1985, still equipped with the 157" Aerex axial flow fan from Nebo Colliery, it was the main source of ventilation for the colliery. The shaft was decommissioned in 1987, capped by BHP and a Certificate of Inspection as being "sealed to satisfaction" issued by the Dept. of Mineral Resources in March, 1988.

Sources: Shedrill Pty Ltd, 2008. *Bulli Colliery; Bulli Colliery shafts Nos 1, 2, 3 and 4, A review*, report for BHP Billiton Illawarra Coal.

48.4 Description

Bulli No. 1 Shaft The fan, metal fan ducting, drive house and electrical switchgear have been removed leaving just the concrete base pads in situ. The concrete brick fan drift leading to the collar remains in place with access prevented by a concrete brick seal at the outbye end and another at the shaft collar. The collar is topped by a square concrete structure onto which is built a circular tower of brick/reinforced concrete / brick construction, estimated to be 9m in height and some 5m in diameter.

48.5 Statement of Significance

From State Heritage Inventory Database

A rare and intact fine example of a poppet head frame, displaying technology of coal mining.

48.6 Significance against Criteria

NSW State Heritage Register Criteria

From State Heritage Inventory Database

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The item has historic value.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The item has aesthetic value.

Criterion E: an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

The item has scientific, technological and archaeological value.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

The item has rarity

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The item has representative value.

48.7 Photos

No. 1 Shaft site post mine closure. (Sheldon).

No. 1 Shaft site (Cardno Forbes Rigby).

49 BULLI SHAFT NO. 2

49.1 Location

Located approximately 2.6 km west of the Illawarra Escarpment at approximately E303489 N6200589 m (MGA co-ordinates), the shaft is located immediately adjacent to SCA Fire Road #7C.

49.2 Heritage Listing Status

Wollongong LEP and Illawarra REP. SHI DB No. 2700804.

Wollongong Heritage Study.

49.3 History

Bulli Colliery commenced operations in 1859, supplying export coal to Shanghai by August of 1863. Australian Iron & Steel Ltd purchased the mine from the liquidators of the Bulli Colliery and Coke Works in 1936. 1940 saw the ***Bulli No. 2 Shaft*** commissioned as a downcast shaft however the sinking headframe still remains in place. The site was the location of a main 33/3.6kV substation supplying power to the underground workings via suspended cables within the shaft and the No1 shaft site. It would appear that this may also have been the entry point for the machinery and equipment when the mine was mechanised in the 1950s. The shaft appears to have been repaired prior to the commencement of the sinking of No. 3 Shaft on 21st Jan, 1964. The shaft was decommissioned in 1987, capped by BHP and approved by the Dept. of Minerals in 1988.

49.4 Description

At Bulli No. 2 Shaft the original sinking headframe (surrounded by a chain mesh fence), the remains of the winder mechanism and the original switch yard foundation slab are the most obvious remnants. The earthing grid was accidently located during a search for the power line stanchions early in 2007 not being immediately noticeable amongst the brush. The shaft was capped in 1988 but not filled. The switchyard and substation building are assumed to have been removed in the late 1980s. The fan evase has been removed and is now in operation in New Zealand.

49.5 Statement of Significance

From State Heritage Inventory Database

A significant mine shaft able to demonstrate past mining technology.

49.6 Significance against Criteria

NSW State Heritage Register Criteria

From State Heritage Inventory Database

Criterion A: an item is important in the course, or pattern, of NSW's cultural or natural history;

The item has historic value.

Criterion C: an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW;

The item has aesthetic value.

Criterion E: an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history;

The item has scientific, technological and archaeological value.

Criterion F: an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history;

The item has rarity

Criterion G: an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments;

The item has representative value.

49.7 Photos

Bulli No. 2 Shaft site 29/03/2006 (Sheldon)

Bulli No. 2 Shaft – Winding equipment
25/10/2006 (Sheldon)

Bulli No. 2 Shaft – Switch yard foundations
10/03/2003 (Sheldon)