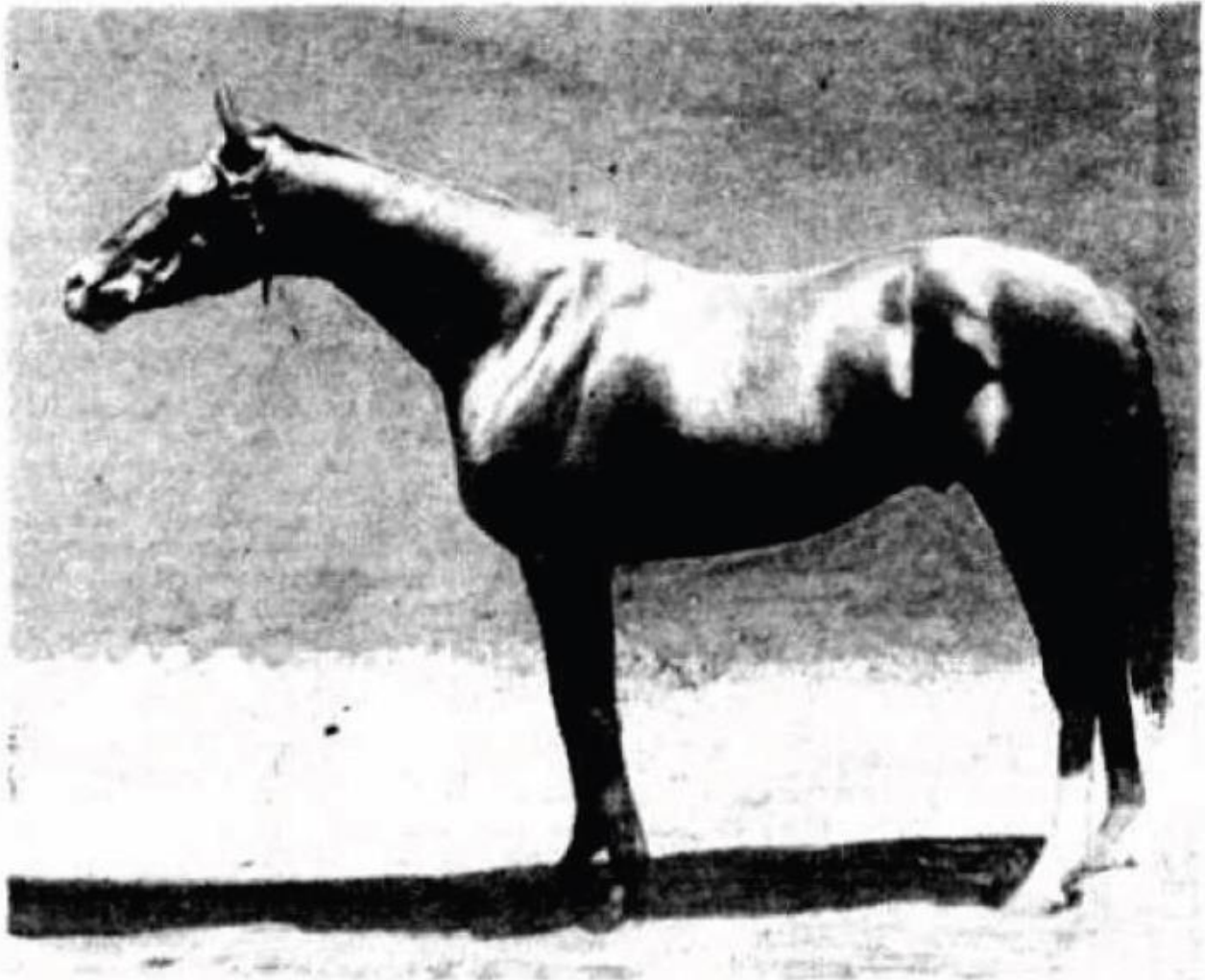


Bylong Coal Project

Heritage Review

Report prepared for Planning Assessment Commission

May 2017



HALL MARK, after his first season at the stud at Tarwyn Park.

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Report Register

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17-0035	1	Final Report	18 May 2017

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Cover image: Hall Mark, 1933 Melbourne Cup winner. (Source: *Australasian*, Saturday 13 February 1937)

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1.0 Introduction

1.1 Project Background

In March 2017 the Planning Assessment Commission (PAC), Department of Planning and Environment (DPE), commissioned GML Heritage Pty Ltd (GML) to provide advice with regard to specific heritage matters as part of the PAC's review of the Bylong Coal Project (SSD 14_6367).

The Bylong Coal Project entails the proposed construction of mining infrastructure to facilitate open cut and underground extraction of up to 6.5 million tonnes of coal for a period of 25 years. The project applicant is KEPCO Bylong Australia Pty Ltd.

The scope of works included provision of independent advice on the following heritage matters:

- the impacts of the proposed Bylong coal mine on the heritage values associated with Iron Tank and the Tarwyn Park property, including natural sequence farming, thoroughbred horse breeding and cattle breeding history; and
- the eligibility of Iron Tank and Tarwyn Park as items of state heritage significance under the New South Wales heritage assessment criteria.

This report responds to correspondence dated 15 December 2016 from the former Minister for Heritage the Hon. Mark Speakman to the Hon. Rob Stokes (former Minister for Planning), requesting that the PAC's terms of reference include a requirement to complete an independent assessment of the heritage significance of the Tarwyn Park properties as part of its consideration.¹ The Terms of Reference dated 9 January 2017 issued by the Minister for Planning to the PAC under Section 23D of the *Environment Planning and Assessment Act 1979*, clauses 268R and 268V of the *Environment Planning and Assessment Regulation 2000*, includes the following requirement related to heritage:

- *The impacts on heritage values associated with the Tarwyn Park Property, including natural sequence farming.*²

1.2 Documentation Reviewed

The preparation of this advice report has included the review of the following documentation:

- Bylong Coal Project Environmental Impact Statement Historic Heritage Impact Assessment, prepared by AECOM, for Hansen Bailey Environmental Consultants, 20 April 2015;
- correspondence from Ms Katrina Stankowski, Acting Manager, Conservation, Heritage Division, Office of Environment and Heritage, to Mr Stephen O'Donoghue, A/Director Resource Assessments, Department of Planning and Environment, re 'Heritage Division comments on State Significant Development Application 6367—Bylong Coal Project', 11 November 2015;
- request to the Planning Assessment Commission Bylong Coal Project, Section 23D of the *Environmental Planning and Assessment Act 1979*, Clauses 268R and 268V of the Environmental Planning and Assessment Regulation 2000 from the Hon. Rob Stokes MP, Minister for Planning, 9 January 2017;
- Department of Planning and Environment's State Significant Development Assessment: Bylong Coal Project (SSD-6367), March 2017;

GML Heritage

- submissions and documentation from the Office of Environment and Heritage—Heritage Division;
- State Heritage Register Nomination Form, Tarwyn Park Homestead and stables, and its associated property Tarwyn Park and Iron Tank;
- National Trust Bylong Landscape Conservation Area, August 2013; and
- Heritage Council of NSW, Historical Themes 2001.

1.3 Methodology and Limitations

Preparation of this advice has involved the review of the documentation listed above, and additional targeted historical research focused and limited consultation on natural sequence farming, horse breeding and cattle breeding at Tarwyn Park and Iron Tank.

A site inspection was conducted by Sharon Veale and Minna Muhlen-Schulte of GML Heritage on 20 April 2017. During the site inspection, various buildings that comprise Tarwyn Park and Iron Tank were inspected. Select areas where natural sequence farming (NSF) are evident were also inspected.

With regard to the project scope, work undertaken for this report has involved the investigation of significance and assessment according to the NSW heritage management system and its guidelines. Towards the investigation of cultural significance, the broader historical context of Tarwyn Park and Iron Tank has been considered, as has its history and fabric. As part of this heritage assessment for Tarwyn Park and Iron Tank, GML reviewed the State Heritage Register Nomination that was submitted to the NSW Heritage Division and the assessment by AECOM for Hansen Bailey set out in Section 8: Significance Assessment of the *Historic Heritage Impact Assessment Report*.

No detailed investigation of the social values of Tarwyn Park and Iron Tank has been undertaken. Consideration of the area's Aboriginal history and heritage was not within the scope of this assessment.

Consultation was undertaken with members of the Rylstone and District Historical Society, Dr Sarah Mika from the University of New England.

1.4 Location and Description

The property known as Tarwyn Park and Iron Tank comprises the land area described as Lot 1 and 2 DP 1094509 and Lot 9 and 10 DP 755420 is located at 401 Bylong Road, Upper Bylong, NSW, within the Mid-Western Local Government Area.

The land area is zoned RU1-Primary Production (pub.2012-08-10). It is identified as Strategic Agricultural Land covered variously by Biophysical Strategic Agricultural Land (pub. 2013-10-04) and the Critical Industry Cluster (Equine) (pub. 2014-01-28).

The property is not listed on Schedule 5 in the *Mid-Western Regional Local Environmental Plan 2012* as an item of environmental heritage.



Figure 1.1 Location of Tarwyn Park property in the Bylong Valley. (Source: Google Maps with GML overlay)

2.0 Historical Overview



Figure 2.1 'Convicts building the road over the Blue Mountains, N.S.W' by Charles Rodius, 1833. (Source: National Library of Australia)



Figure 2.2 William Lee. (Source: 'Bylong Valley, 1884–1984, Centenary of Education')



Figure 2.3 Remains of the Lee Family Homestation. (Source: 'Bylong Valley, 1884–1984, Centenary of Education')

2.1 Introduction

As the NSW colony expanded in the early nineteenth century, the need for good quality grazing areas increased. The settlement of Central Western NSW began after the crossing of the Blue Mountains in 1813 by Gregory Blaxland, William Charles Wentworth and William Lawson. Lawson's subsequent expeditions with James Blackman helped open the rich pastoral lands around Mudgee.³ In 1821, on Lawson's first journey to Mudgee he was accompanied by former convict William Lee. Lee, along with John Tindale, also a former convict servant, were among the first settlers in the Bylong Valley.⁴ Their legacy and descendants are responsible for the early association of Bylong Valley with high quality cattle and horses.

2.2 William Lee (1794–1870)

Son of convict Sarah Smith and William Pantoney, alias Panton, William Lee (known as William Pantoney Junior for several years), was born on Norfolk Island.⁵ He was reputedly one of the first Europeans to settle in Bylong, arriving there possibly as early as 1825.⁶ Lee was recommended by road maker William Cox as a suitable settler and was granted government cattle and 134 acres at Kelso, making him one of the first settlers of Bathurst in 1818. This grant was later increased by Governor Thomas Brisbane to 300 acres.⁷ Lee became known for discovering good pastoral land and introducing cattle into the area.

Land title records show a portion of land at Bylong granted to Lee on 6 May 1829.⁸ This comprised of 2,000 acres bordered by Dry Creek which is now known as Bylong Creek (Figure 3). The Lee's homestead 'Homestation' was built on this site and dates to 1848. Located near the junction of Bylong Valley Way and Upper Bylong Road, the remains of 'Homestation' are still extant.

Lee was described as a 'silent and proud' man with 'great energy and spirit'. He is considered a 'true pioneer'.⁹ He was a prominent figure in early Bathurst and sat in the first NSW Legislative Assembly as member for Roxburgh between 1856–1859. He died at Kelso on in November 1870. He had four daughters and six sons, John, Thomas, William and George occupied stations throughout NSW.¹⁰

2.3 John Tindale (1790–1857)

John Tindale was transported to NSW in 1812. Tindale helped build the first road over the Blue Mountains with William Cox in 1814. He was given his freedom in 1816 for this work and acquired land at Kelso, Bathurst, spreading to Rylstone before being granted 2000 acres at Bylong by Sir Thomas Brisbane in 1825. Land title records date this grant in Bylong to 15 December 1829. This land was southwest of William Lee's parcel, on the opposite side of the Bylong River.

Tindale's eldest son, John Richard Tindale, was promised a land grant in 1830 but did not occupy it until 1832. The Tindale homestead 'Sunnyside' was completed in 1864.¹¹ The building may have been in construction as early as the 1840s as records suggest John Richard Tindale applied for assigned convict servants in 1837.¹² When John Richard Tindale died in 1872 his five sons were running extensive holdings in the Bylong region including 'Torrie Lodge', 'Barragan', 'Wigelmar', 'Talooby' and 'Widden.'¹³ With their landholdings in NSW, the second generation of Tindales had become prosperous members of colonial society. Demonstrating their societal prominence, the portraits of John and Mary Tindale, now held in the collection of National Portrait Gallery (Figures 2.4 and 2.5), were painted by Maurice Felton (1803–1842). Felton was a trained surgeon, who, for a time, was regarded as the foremost portraitist in the colony. He received innumerable commissions and enjoyed the friendship of Conrad Martens and Alexander Brodie Spark.¹⁴



Figure 2.3 Portrait of John Richard Tindale (John Tindale's eldest son), 1841, by Maurice Felton. (Source: National Portrait Gallery Australia)



Figure 2.5 Portrait of May Tindale, 1841, by Maurice Felton. (Source: National Portrait Gallery Australia)

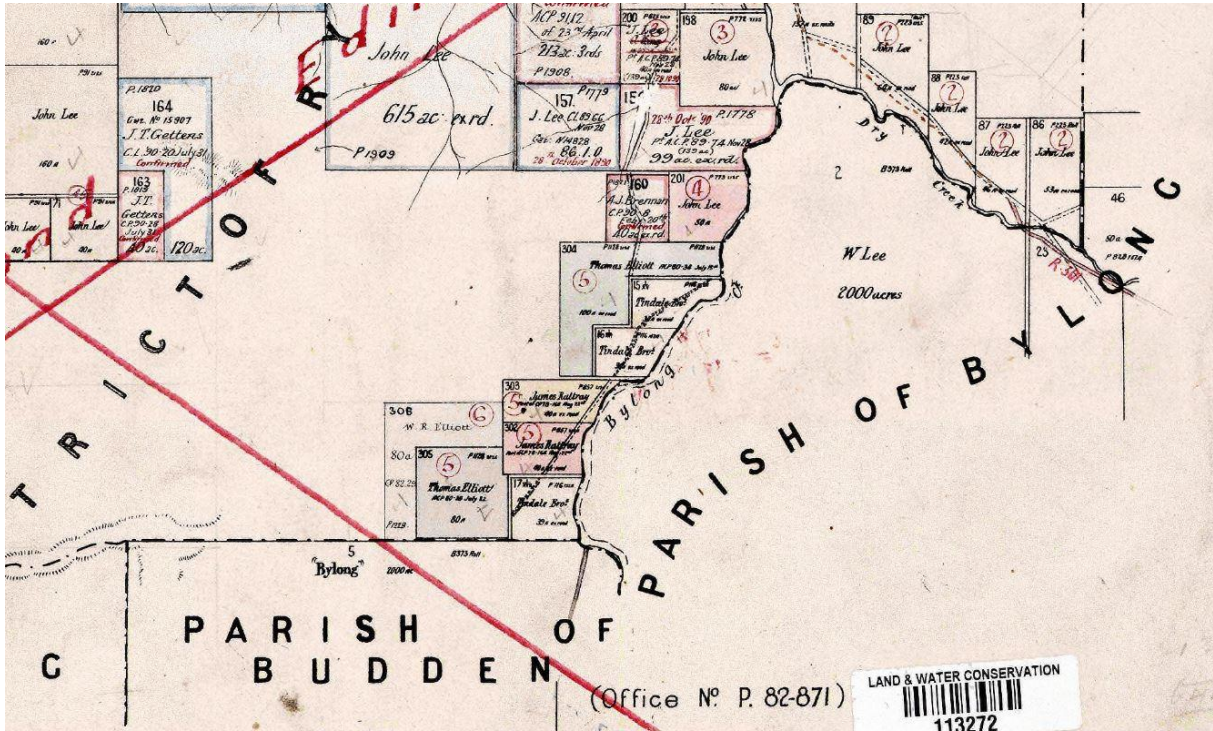


Figure 2.6 1883 Coggan Parish Map showing the land holdings of Lee family in Bylong. (Source: Land Titles Office)

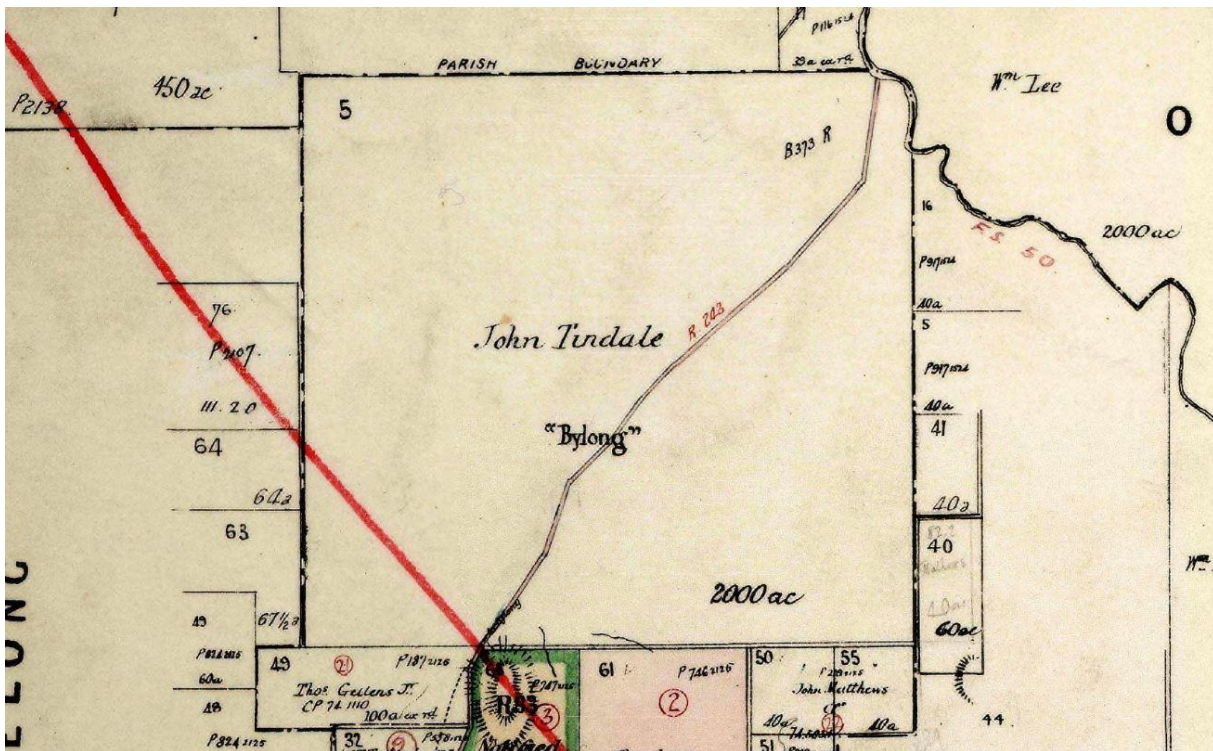
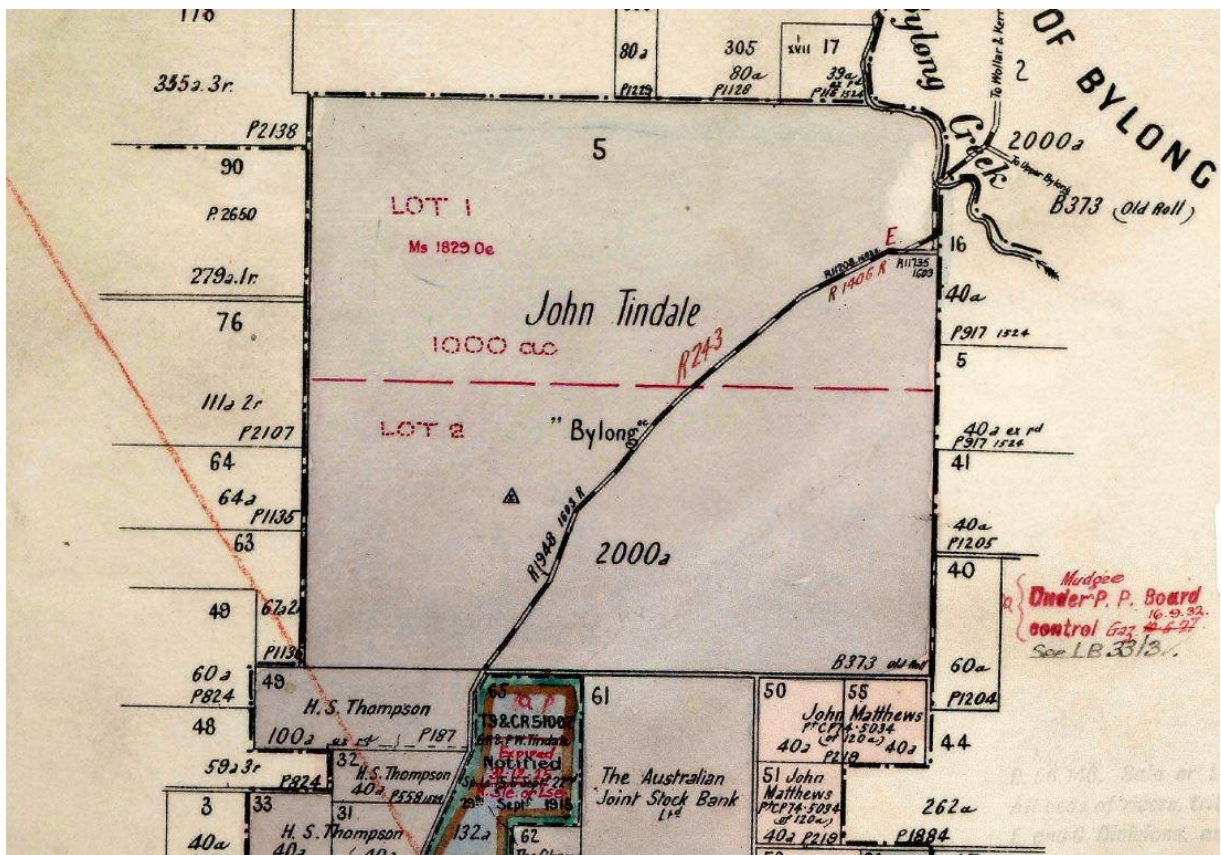
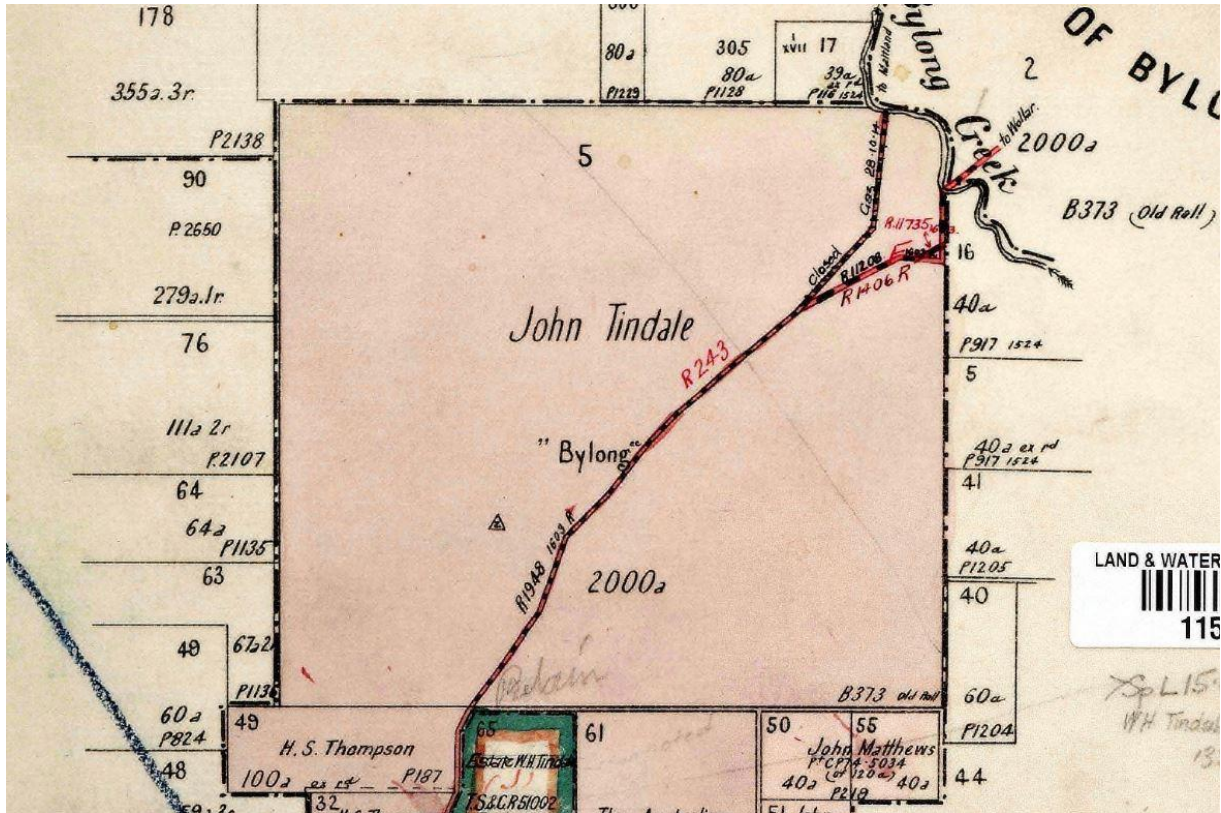


Figure 2.7 1883 Budden Parish Map depicting John Tindale's land grant bordering the Lee family holding in Bylong. (Source: Land Titles Office)



Figures 2.8–2.9 1911 Budden Parish Map (above) and 1920 Budden Parish Map (below) showing the acquisition of land by HS Thompson which he named 'Tarwyn Park'. (Source: Land Titles Office)

THE CHEAPEST & BEST LUCERNE LAND OFFERING IN THE STATE

BYLONG DAIRY FARMS

*Situated on the Head Waters of the Hunter Rr, in the famous Bylong Valley
For many years the Home of the "Lee Blood" Short horns.*

DISTANCE BY RAIL-30 MILES from RYLSTONE. The PROPERTY LIES APPROXIMATELY MIDWAY BETWEEN MUDGEE & MUSWELLBROOK

Proposed Railway recently surveyed runs through the Property connecting with Muswellbrook.

Post & Telegraph Conventions
2 Churches
Public School & Store.

AREA 5804 ACRES FREEHOLD

Torrens Title

*Safe Country
with fine soil
- Sited
- Fertile*

*where Agents
is a better
Country*

TRI-WEEKLY MAIL
From RYLSTONE
(MOTOR SERVICE)

Cheese Factory
established
in 1880
is now in the hands of
REGULAR MONTHLY PAYMENTS
FOR THEIR MILK SUPPLY

Lucerne Lands
BIG MONEY IN
LUCERNE SOLE
BUDEN
RICH DAIRYING & PIG REARING
COUNTRY

PRICES :
From **£7 to £12**
Per Acre
(Torrens Title)

LIBERAL TERMS
under Section 89
Government Savings Bank Act
1906.
Rural Bank Certificates issued.

A. McILLUREE & CO.
STOCK & PROPERTY SALESMEN
56 HUNTER STREET SYDNEY.

AGENTS PLEASE NOTE -
1906 Commission on Sales will be paid
to the Agent attending Purchasers.

Figure 2.10 Advertising for dairy farms at Bylong c1910 when the Lee holdings began to be subdivided. (Source: 'Bylong Valley, 1884-1984, Centenary of Education')

2.4 Bylong Cattle and Horse Breeding

The history of Bylong is associated with the production of fine Shorthorn cattle, as well as thoroughbred and champion racehorses. According to the *Country Life Stock and Station Journal*, William Lee's 'success as a stock breeder is written in broad letters on hundreds of cattle stations, in the stud book and on the Turf Records of Australia'.¹⁵ The legacy of his stud Shorthorn and thoroughbred horses 'became a household word in colonial Australia'.¹⁶ Lee maintained the herd as a pure breed until his death when it was equally divided among his sons.¹⁷

The first Tindale homestead, Sunnyside, was built in the 1840s. Sunnyside was renowned for thoroughbred stud breeding and was 'one of the first to import horses for the racing sport'.¹⁸ Other Tindale holdings became 'well known in the colony, breeding Shorthorn cattle, selling bulls in Queensland and other interstate markets'.¹⁹

As land was further subdivided in the 1870s, the fertile Bylong Valley supported dairy farming with a cheese factory established in the town and butter factories at neighbouring Rylstone, Olinda and Cudgong.²⁰ Land for the factory was bought from the Lee family in 1909 by Sydney Resident Mr W.H. Macillree.²¹ The factory was located to the northern edge of Tarwyn Park near the remnants of Renfrew Park house from 1900. In the 1920s, further subdivision of John Lee's former estate was sold off as dairy and Lucerne farms.²²

2.4.1 Cattle Breeding

Road maker William Cox was one of the first Shorthorn cattle breeders in Australia. Stock were imported from Durham in England; however, the venture was a not successful in his lifetime.²³ Cox's sons also went onto import pure Shorthorns into the colony. It was William Lee who earned the reputation in NSW and across Australia for his herds. Despite the risks of stud breeding in the isolated Bylong Valley, where bushrangers and cattle rustlers threatened stock, Lee is credited with the success in spreading them:

*... over the surface of Australia. There were ... Lee shorthorn cattle in the first overland mob which went to Victoria. The first big mobs to be sent by sea to Brisbane belonged to Lee and Mocatta. In 1865, there were Lee bred animals too, in the great drove which the Jardines took to Cape York.*²⁴

By the mid-1850s:

*[s]o many cattle had Lee blood in them by this time that there was scarcely an old-fashioned shorthorn stud in New South Wales or Queensland which was not influenced by their operations, but the three which were, perhaps, fondest of Lee cattle were Messrs. Chisolm, Robert McIntyre and Baylis senior.*²⁵

The 'Bylong herds' were soon held in high regard, and featured in journal and newspaper articles which also credit the Tindale grandsons' prosperity and talent as breeders and their association with the Lee herds:

*Two of the largest and most important land-holders in this district are Mess'rs William and Anthony Tindale ... These gentlemen are both extensive breeders of bulls, and some very good horses especially Mr William, who was one of the judges at the last Muswellbrook Show.*²⁶

In 1875, reporting from J Tindale's property in the Bylong Valley in the *Town and Country Journal*, 500 to 600 cattle were seen in mobs. Many were noted to be purebred 'Durhams'. The cattle had been bred with 'great care and attention' over 20 to 25 years with 'Lee' bulls. Noting that it would have taken more

than two days to look well through the herd, the journalist spent a day amongst them and recorded the following observations of the stock:

The 'quality' to be found in this lot of cattle is very great; the number of exceedingly good cows and heifers being larger than is usually met with in a herd of the size; and any one accustomed to the stock will see the beautiful quality, fine head and horn, and general type, so well known as belonging to the Lee cattle, cropping up continually; beside which, size symmetry, small bone, and the best beef carrying points are certainly prominent among their characteristics. The yearling heifers give promise of doing great credit to their dams; and I don't wish to see a better looking crop of calves, all being of capital colours. Several white cows and heifers struck me as being very good.²⁷

Turning his attention to Lee, writing as 'Clydesdale', the journalist asks: 'who has not heard of the far-famed "Lee" cattle?' He notes that the question is easily answered by the word 'nobody'.

Descendants of the Lee family continued to breed fine stock and from the 1930s imported bulls from England including 'Napoleon', a bull bred by Queen Victoria at the Windsor Stud Farm. Other pastoral families such as the Hall brothers used the Lee sires 'to improve the nation's fledgling beef herd which was comprised of primarily wild, Zebu-infused "run-out" animals, being originally imported from the Cape Province in South Africa.'²⁸ By the early twentieth century 'Bylong was said to claim the biggest herd of pure Shorthorns in the world.'²⁹

2.4.2 Horse Breeding

Of William Lee's seven sons, four became notable horse breeders. One of the most highly regarded was James, known as John Lee. John continued to breed Shorthorn cattle but also established a horse stud in the 1800s in Bylong using English blood lines. As early as 1866, a racehorse named 'Bylong' won the first Australian Jockey Club Metropolitan in Randwick (see Figure 2.12).³⁰ 'Bylong' was sired by Lee's famous horse Sir Hercules whose skeleton is now on display at the Australian Museum as a representation of the importance of horses and horsemanship to Australian history.³¹ John's thoroughbred breeding contributed to four of the 19 bloodhorse families now listed in the Australian Stud Book.³² His obituary notes that 'he was a member of a family whose name will be always identified with the early settlement of the British race in Australia, and especially with the pioneering days of New South Wales.'³³

Part of Lee's Bylong estate was advertised for sale in 1908 as a 'property admirable adapted for cattle-fattening and breeding high class stud cattle and horses, and is a chance for graziers, stud breeders, capitalists, and speculators, to obtain the property for subdivision.'³⁴ In 1918, Herbert Thompson purchased part of the Lee estate and named it Tarwyn Park. The Thompson family had been bloodhorse breeding before the advent of the 1878 Australian Stud Book, with operations in the Widden Valley operating since 1854. Sires used had come from John Lee in the Bylong Valley and the Cox family at Rawdon and Fernhill.

Under Herbert Thompson, Tarwyn Park quickly became a stud renowned for producing champion horses between 1927–1939. From the stallion 'Heroic', 29 winners were produced including 1933 Melbourne Cup winner Hall Mark (see Figures 2.15 and 2.16) and 1930s champion Nuffield. The *Muswellbrook Chronicle* described it as:

*One of the most famous thoroughbred studs in Australia ... A fine chain of wells provides a good water supply, and the standard of Lucerne in its paddocks is exceptionally high. Every conceivable modern improvement has been installed and the accommodation for the stock is on the most up-to-date lines.*³⁵

Reflecting the Thompsons considerable reputation and status, they commissioned Mudgee based architect, Harold Robert Hardwick (1866–1935) (Australian Institute of Architects [AIA]), to design Tawryn Park homestead and stables. Initially practising in Sydney, Hardwick returned to his home town in 1898. As the only registered architect in the area he developed a strong architectural practice and became well known locally and

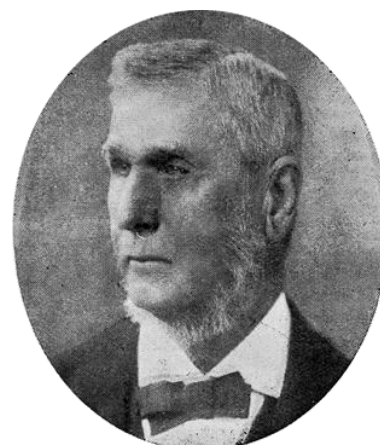
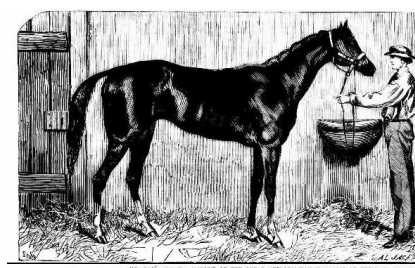


Figure 2.11 James (John) Lee, 1831–1921. (Source: Australian Dictionary of Biography)



SEE PAGE 35.]

THE RACE HORSE BYLONG.
This colt is the property of Mr. E. Lee. He is a son of Sir Hercules, out of Marchioness (Pacha's dam), and has proved himself to be worthy of his renowned sire, whose stock have won more than their share of honours at the late Randwick meeting. Though beaten by The Barb in the Australian Derby, Bylong came out better in the longer races, winning the Great Metropolitan Stakes with ease, in the shortest time in which the two miles have been done in the colony, beating Yattenden and Tim Whiffler. He also won the Forced Handicap, on the last day of the races.

Figure 2.12 The racehorse Bylong, depicted in the *Illustrated Sydney News*, Saturday 15 September 1866. (Source: National Library of Australia)



Figure 2.13 Racehorse owner Leslie Barnett, amateur rider Dennis Allen and horse breeder Herbert Thompson talking together at a race course, New South Wales, c1930s. (Source: National Library of Australia)



Figure 2.14 Buried at Tarwyn Park: Rain Lover, Melbourne Cup Winner in 1968 and 1969. (Source: Australian Racing Collection)

more broadly within the Central West region. He designed many churches, commercial buildings and private dwellings including Kandos Anglican Church 1921, Broughton Private Hospital in 1925, several buildings at Mudgee Hospital in 1910 and Warrungungyah, Ilford, for Walter Sydney Suttor in 1910.³⁶ He has been described as ‘the architect who has impacted the most strongly on Mudgee and district’ by local historian Mr John Broadley, who has researched and written about Hardwick’s life and career.³⁷

After the Second World War Thompson continued as one of ‘Australia’s leading breeders’³⁸ and restricted his operations to the Tarwyn Park Stud. In 1955, Herbert Thompson died and the family’s horse stud operations were reduced at Bylong and then sold. From the 1950s, Dan Buffier bred champion racehorses at neighbouring property at Wingarra, persuaded to move there by stud manager Cec Frost who ‘maintained that Bylong area had no peer as producer of good stock.’³⁹ The neighbouring Widden Stud in the Hunter Valley continues to operate as ‘one of the oldest family owned studs in the world’ with seventh generation descendants of the Thompson family still breeding commercial thoroughbreds and champion racehorses.⁴⁰

After the Thompson era at Tarwyn Park, the property’s renown for horsebreeding was eclipsed by larger thoroughbred breeding studs. Subsequent owners of the property, Thomas Langhorne Fleming (1953) and Harold John Arthur Howes (1961), are listed as graziers.

It was not until Peter Andrews acquired Tarwyn Park in 1973 that the property’s association with horse breeding was revived. Under Andrews’ ownership thoroughbred horse breeding continued and a new system of land and water management practices were introduced, known today as natural sequence farming. The Andrews’ family relocated to Tarwyn Park from South Australia bringing with them several horses, including Rain Lover.⁴¹ Notable horses buried at Tarwyn Park include Rain Lover (winner of 1968 and 1969 Melbourne Cups) (see Figure 2.14), Eloisa and a possible third horse near the current entry gates. Identification of the burials has been unsuccessful in determining precisely which remains are linked to each horse.



Figure 2.15 Hall Mark winning the Melbourne Cup, 7 November 1938. (Source: State Library of Victoria)

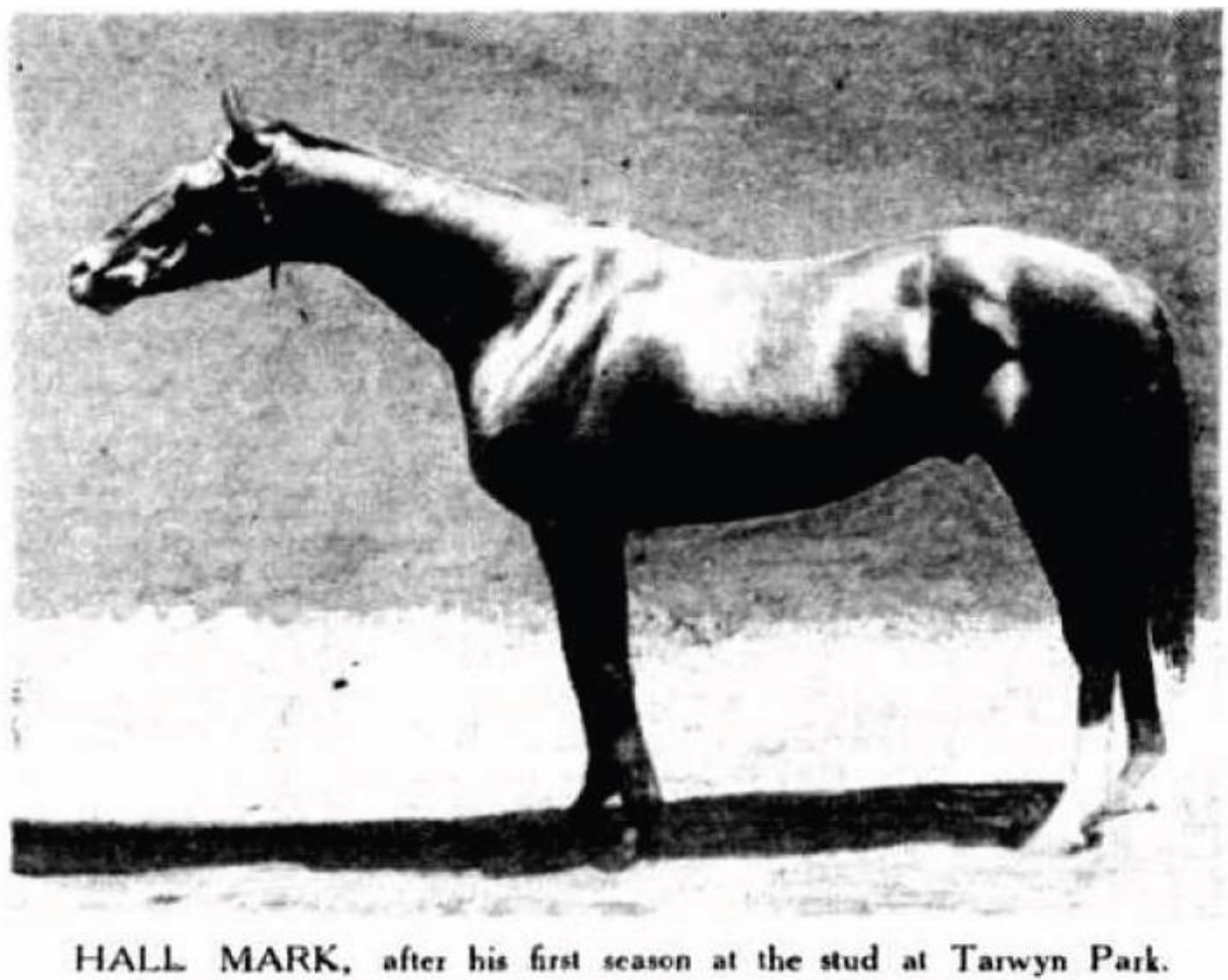


Figure 2.16 Hall Mark, 1933 Melbourne Cup winner. (Source: Australasian, Saturday 13 February 1937)



Figure 2.17 Aerial photo of Tarwyn Park and neighbouring lots 1998. (Source: NSW Land and Property courtesy of KEPCO)

2.4.3 Natural Sequence Farming and the Andrews Family

In 1973, Mr Peter Andrews OAM purchased Tarwyn Park, a 1190-hectare property. Primarily a horse breeder, Andrews began exploring agricultural methods to improve the quality and productivity of the land. According to interviews with Andrews, he found the land in disrepair with salt surfacing on parts of the floodplain, degraded soils and pasture unable to produce yield effectively.⁴² To address these conditions, he began trying to manipulate hydrological and biogeochemical processes to restore the landscape (see Figures 2.18 and 2.20). His aim was not to recreate the pre-European settlement landscape but restore natural processes that would enable productive farming.⁴³ This approach to agriculture was named by Andrews as 'Natural Sequence Farming' (NSF). The principles include:

- Reintroduction of a natural valley flow pattern, reconnecting the stream to its floodplain, which would reintroduce a more natural hydrological and fertility cycle to that landscape. Prior to European settlement many of Australia's smaller water ways were characterised as a 'chain of ponds' which flow intermittently. Through agricultural land use and erosion this system had decayed. NSF aims to restore the 'chain of ponds.'⁴⁴
- The regrowth of the natural fluvial pattern through a managed succession of the vegetation, so that nutrients and biomass harvested on the floodplain can be redistributed throughout the property and through the stock.⁴⁵

To test his theories about improved animal health, Andrews measured the growth and performance of thoroughbred racehorses. There has since been considerable interest and coverage of the method online, in the mainstream media especially through the ABC's *Australian Story*, in citizen science publications as well as some peer reviewed literature that has explored the impact and application of the method beyond Tarwyn Park. There are also high-profile proponents of NSF including Gerry Harvey, Former Governor General Major-General Michael Jeffery, TV presenter Don Bourke, Professor David Goldney of Charles Sturt University and former Deputy Prime Minister John Anderson.

In 2006, Andrews published *Back from the Brink* describing the restoration of Tarwyn Park. Describing his experiments with NSF and the implementation of channels along contour lines combined with links to pits of organic and household waste, Andrews notes:

By the 1980s, I felt I'd gone a long way towards re-creating the ancient Australian landscape at Tarwyn Park. Instead of an eroded gully, the creek now consisted of a series of stepped ponds, elevated above the surrounding land as all creeks used to be. Water in the creek no longer rushed down an eroded gully but moved slowly across the paddocks in contour channels, from where it soaked into the soil and filled up the inground water storages that sustained the paddocks in dry times. The property was rich in biodiversity. Everywhere, weeds grew alongside the grass.

None of this would have meant anything, however, if it hadn't produced results. But it had. The soil was fertile and productive; the salinity problem had been beaten; my horses were exceptionally healthy; and, thanks to the inground water below, the land could grow green grass in a drought. My experiment had been a success.⁴⁶

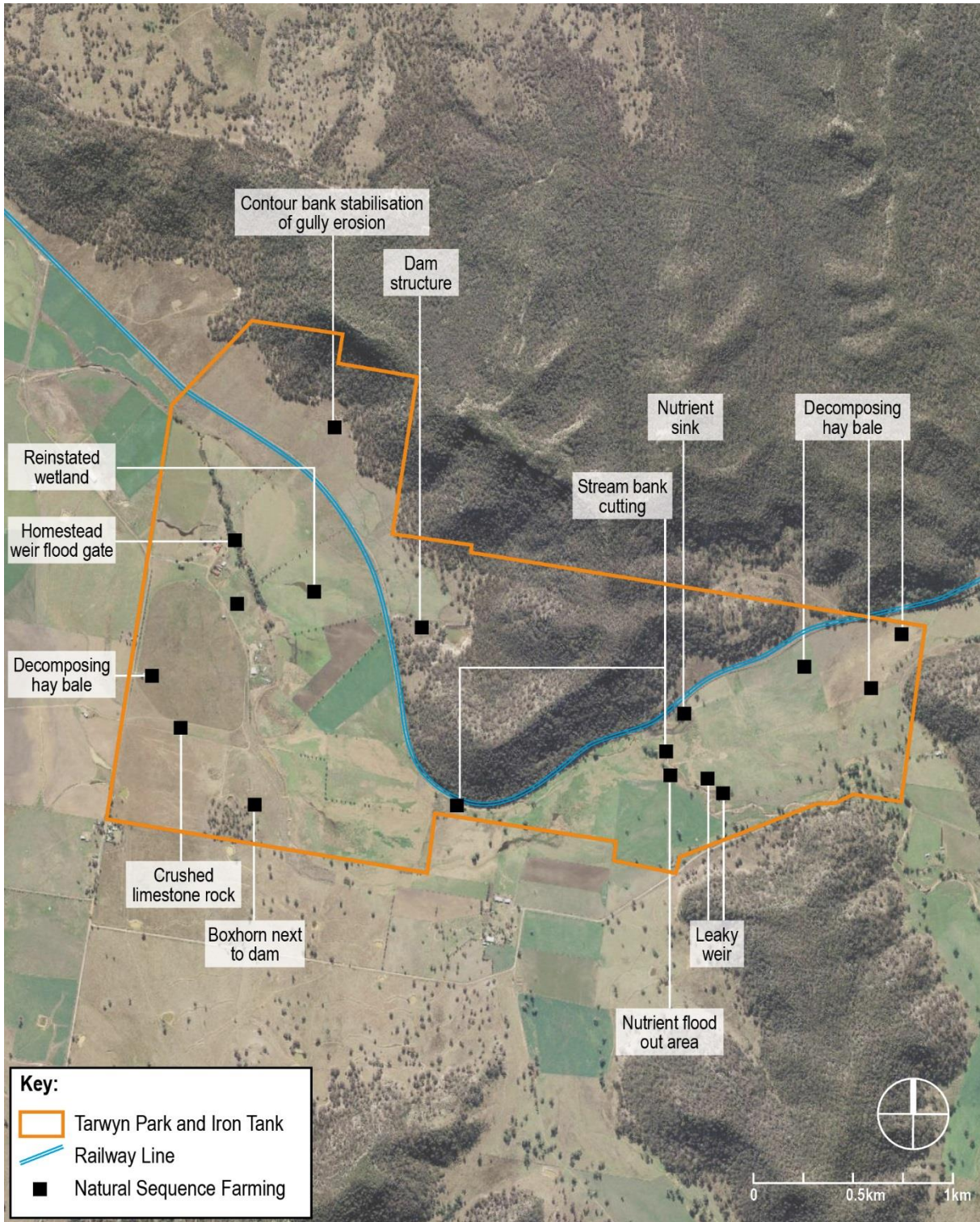


Figure 2.18 Features of natural sequence farming at Tarwyn Park. (Source: Natural Sequence Farming locations provided by KEPCO with GML overlay)

2.4.4 CSIRO Assessment of Impacts of Natural Sequence Farming at Tarwyn Park

One of the most significant published assessments of NSF is a 2002 CSIRO report commissioned by the then Deputy Prime Minister John Anderson. The report analysed the economic and ecological impact of Andrews' NSF scheme, as well as its applicability to wider areas in Australia. The terms of reference for the expert panel included:

- a description of NSF as implemented at Tarwyn Park;
- a determination regarding the environmental and agricultural issues that the NSF addresses;
- a description of the changes that occurred at Tarwyn Park as a result of the implementation of the NSF on the basis of professional judgement, and existing data and documents; and
- consideration of the extent to which NSF could be implemented elsewhere, with similar results to those achieved at Tarwyn Park.⁴⁷

The expert panel for the assessment was comprised of Dr William Young, CSIRO Land and Water-fluvial geomorphology, surface water hydrology, biogeochemistry; Mr Ray Evans, Salient Solutions-hydrogeology, dryland salinity; Dr Jon Olley, CSIRO Land and Water-fluvial geomorphology, biogeochemistry; Mr Nick Milham, NSW Agriculture-agricultural economics; Professor Alistair Robertson, Charles Sturt University-landscape ecology, biogeochemistry; and Dr Chris Smith, CSIRO Land and Water-agricultural systems, recognised that major issues in soil health and water were addressed by the scheme including:

- elevated salt export;
- salt intrusion into the root zone of floodplain soils;
- channel erosion;
- hillslope erosion;
- low functional diversity of pastures;
- poor nutrient retention in plant-soil system; and
- unnatural surface-groundwater hydrology.

The CSIRO panel advised that in terms of biomass production Tarwyn Park was made more productive and sustainable than its former state and therefore economic productivity was improved. Pasture yield and reliability was close to irrigated enterprises in the region but with lower costs. This is attributed to the fact that the scheme relies on artificial water stores beneath the land surface instead of more expensive surface irrigation. According to anecdotal evidence provided to the panel, Tarwyn Park yielded twice the amount of Lucerne harvest than dryland farms in the area.

The assessments had to rely on changes that have occurred at Tarwyn based on qualitative data rather than quantitative analysis as there was little data documented of productivity prior to the scheme.

2.4.5 Wider Application and Reach of Natural Sequence Farming

*Even if he's only 10 per cent right—and I think he's probably 90 per cent right—this will change the face of land management in Australia forever, no question.*⁴⁸ Don Burke

The CSIRO panel concluded that NSF was sustainable and effective for Tarwyn Park and could be applied in other areas if there were similar landscapes where fresh groundwater is held in floodplain sediments and there is a system of a 'chain of ponds.'⁴⁹

In 2015, businessman and farmer Tony Coote applied NSF principles at Mulloon Creek in Bungendore, NSW, and reported a significant improvement in productivity and water quality. He commented, 'We've got fish back in the stream that have only been seen in the upper reaches of national parks, people thought they had disappeared.'⁵⁰ Following Tony Coote's trial, 15 other local landholders have taken on the scheme over a total of 15,000 hectares of land. The results of their trial are currently being documented by scientists. In 2016, the Mulloon Creek Natural Farms' use of NSF was recognised by the United Nations as one of five sustainable projects in the world.⁵¹

Other areas in Australia have adopted the scheme and received government and private sector funding to implement it including Quirindi and Liddell in NSW, Blackwood Basin in Western Australia and Gumlu in Queensland. Some preliminary findings of these projects and landscape rehydration projects using NSF principles have been tabled in a 2015 peer reviewed science publication.⁵²

Case studies and NSF impacts presented include:

- Barramul, Widden Valley, NSW—Increase in stream pool depths with water storage volumes quadrupled and improved aquatic habitat and soil organic matter.
- Mulloon Creek, Bungendore, NSW—Tony Cootes' research projects mentioned above. Early evidence has suggested reinstatement of chain-of-ponds system, land 'banking' water during higher flows.
- Spring Creek, West Wyalong, NSW—NSF interventions have worked to reconnect Spring Creek and its floodplain, reducing erosion by dissipating the water flow in the key riparian zones.
- Jillamatong, Braidwood, NSW—Farm productivity improved using restored 'chain of ponds' system, soil organic matter increase, recycling of local nutrients and increased biodiversity.
- Gunningrah, Bombala, NSW—Dependency on rainfall reduced by managing water flow through the landscape, pasture growing periods increased and continuity of streamflow within and downstream of farm.
- Tallawang, Willow Tree, NSW—Intervention works to address erosion and soil quality, overall landscape hydrology improved with NSF techniques helping retain water for plants and stock, increased levels of soil organic matter.
- Gumlu, Rocky Ponds Creek, via Bowen, Queensland—Removal of bore water and aquifers has seen improved production, 75 per cent reduction in salinity, 70 per cent reduction in water needed, 85 per cent reduction in pesticide use, 20 per cent less artificial fertiliser and a 30 per cent reduction in the use of herbicides which runoff onto the Great Barrier Reef Marine Area.
- Mulwaree River catchment area, Goulburn, NSW—Reinstatement of chain-of-ponds across multiple farming property, increase in biodiverse vegetation to support land restoration and grazing management.

2.4.6 Criticism of Natural Sequence Farming

Andrews' method has drawn criticism from some Australian agricultural scientists who believe the techniques work against proven conventions of production and land management practices and are lacking in scientific data.⁵³ Andrews' aversion to using fertilisers, as well as the encouragement of weeds to increase soil biodiversity, is considered particularly problematic. There has also been critique of Andrews' methods of slowing the water through the landscape and its relationship to salinity.⁵⁴



Figure 2.19 Example of natural sequence farming at Mulloon Creek Natural Farms. Blackberry vines, rocks and haystacks form a leaky weir. (Source: ABC/Mulloon Institute)

2.4.7 Sale of Tarwyn Park

In 1999, Stuart Andrews took over Tarwyn Park from his father Peter Andrews. In 2010, Korean Mining Company KEPCO acquired authorisations for 10,317 ha in the Bylong Valley to develop a new open cut and underground coal mine. Land acquisitions began in 2011.

In 2011, Peter Andrews was awarded the Order of Australia Medal for 'service to conservation and the environment through the development and promotion of sustainable farming practices.'⁵⁵

Stuart Andrews sold Tarwyn Park and Iron Tank to KEPCO in 2014. Both properties were leased back to Andrews family until 2016. Stuart Andrews continued the methods of NSF on the property up until this time. On 30 August 2016, an estimated 400 people gathered at Tarwyn Park to call on the NSW government to issue an interim heritage order to leave the property intact.⁵⁶

In 2017, KEPCO engaged Associate Professor Darren Ryder and Dr Sarah Mika at University of New England to conduct a monitoring program of NSF at Tarwyn Park including a literature review of soil hydrology research, design of a rehabilitation program of the soil at Tarwyn Park after the mine development and a comparative scientific analysis of NSF as an agricultural management system

GML Heritage

alongside other methods that may be applied in this landscape. The study was reviewing a 'snapshot' of Tarwyn Park's contemporary conditions and does not include historical data of the site. At the time of writing, University of New England's findings were not finalised (Rolls, R, Ryder, D, Mika, S, Vincent, B and Smith, R 2017, 'Evaluating soil hydrology techniques for rehabilitating landscapes from mining to agricultural production: a review', report to Worley Parsons, University of New England, Armidale).

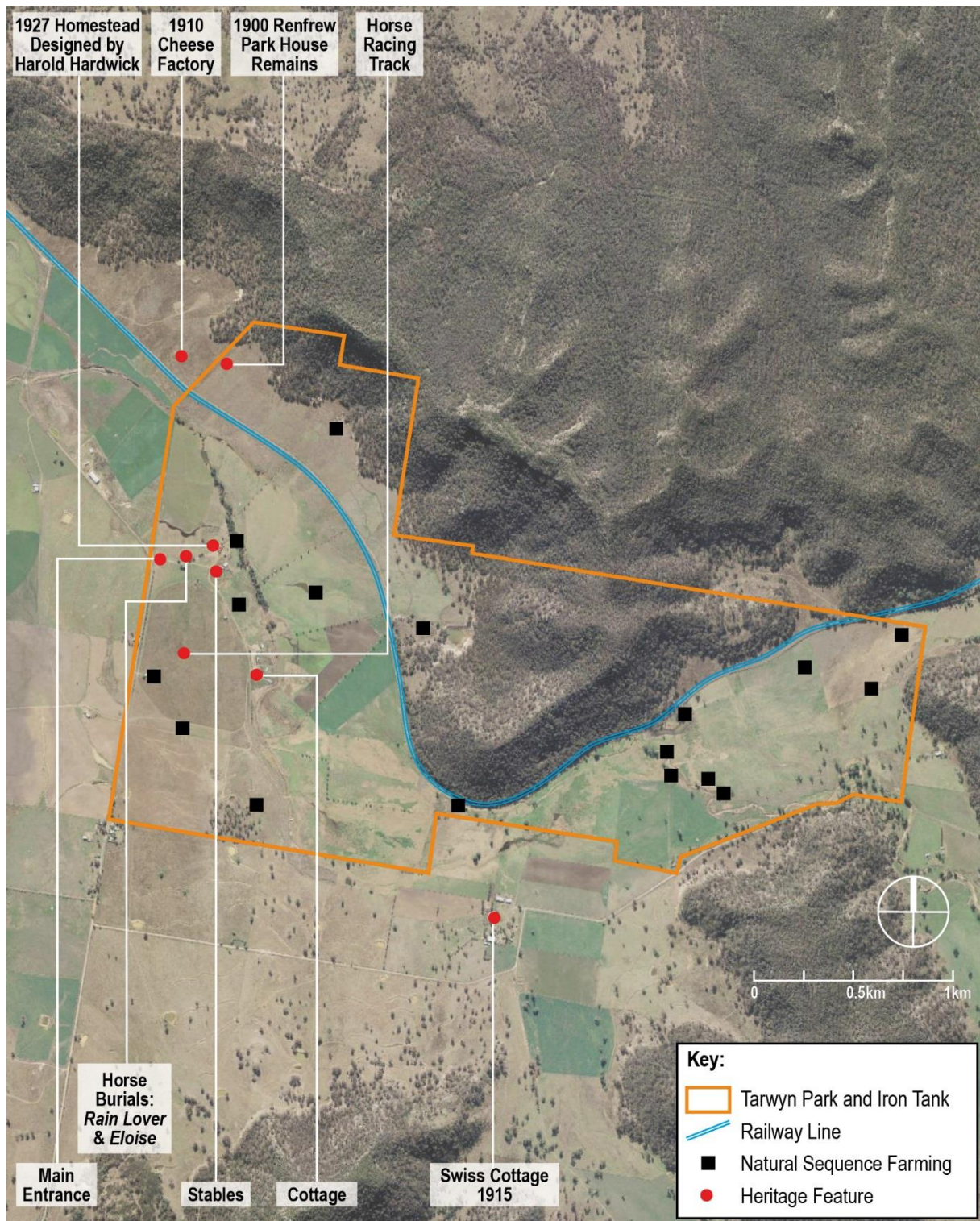


Figure 2.20 Tarwyn Park with heritage and Natural Sequence Farming features marked. (Source: Six Maps with GML overlay)

3.0 Comparative Historical Analysis

3.1 NSW Historic Themes

The *NSW Heritage Manual* identifies a specific set of 35 ‘Historical Themes relevant to New South Wales’ within which the heritage values of the place can be examined. The themes are not strictly chronological or defined by dates; more than one theme can be in evidence at a place at one time. The NSW State Themes correlate with the Australian historical themes. Although the state historical themes are general and heritage items are likely to relate to more than one theme, they facilitate an understanding of the historical context of a heritage item. Below is a discussion of themes most relevant to the European history of the Bylong Valley and Tarwyn Park.

Table 3.1 Historical Themes relating to Bylong Valley and Tarwyn Park.

Australian Theme	NSW Theme	Bylong Valley
Peopling Australia	Convict	Settlement of Bylong Valley by John Tindale and William Lee (born on Norfolk Island), former convict servants.
Developing local, regional and national economies	Exploration	John Tindale and William Lee as road makers with William Cox building the first road across the Blue Mountains in 1814. William Lee’s role in first exploration of pastoral lands of Mid-Western NSW including accompanying William Lawson on the first expedition to Mudgee in 1821.
	Agriculture	Activities in the Bylong Valley associated with cultivation of pastoral lands and animal rearing of particularly Shorthorn cattle by the Lee and Tindale families and bloodhorse lines of champion racehorses.
	Pastoralism	Pastoral landscapes of Bylong Valley that supported pioneer Shorthorn cattle studs run by Tindale and Lee. Tarwyn Park and stables as a leading horse stud for the first half of the twentieth century under Herbert Thompson. Architect, Harold Hardwick’s 1920s homestead and stables as an addition to the network of largely nineteenth-century homesteads in the region.
	Science	Peter Andrews’ Natural Sequence Farming as an experimental land management system aimed at soil conservation, rehabilitation and increasing productivity.
Marking the phases of life	Persons	Activities and associations of Tarwyn Park and Bylong with prominent families of Tindale, Lee, Thompsons and Andrews.

3.2 Comparative Historical Analysis of Cattle Breeding, Horse Breeding and Land Management Practices

The following section discusses the broader history of each area of study in this report with specific regard to horse and cattle breeding, and natural sequence farming.

3.2.1 Pastoralism

As the early colony expanded there was need for more expansive open, grassed areas for grazing. Only limited land grants and grazing permits were allocated to individual settlers within the boundary of the limits of settlement. Settlement in mid-western New South Wales began soon after the crossing of the Blue Mountains in 1813 by William Lawson, William Charles Wentworth and Gregory Blaxland.⁵⁷ A government station was established at Bathurst from 1815 and first settlers such as William Tindale and John Lee were granted holdings at Kelso.

Governor Darling's redefinition of the boundaries of the settlement in 1826 took in the Central Tableland, further expanding it for settlement. By the 1850s pastoral stations, especially of sheep, occupied the region. Sons of well-connected colonial families took up land along the river flats and constructed the early homesteads in using convict labour; Robert Lowe (1783–1832), Richard Rouse (1774–1852), roadmaker William Cox (1764–1837) and Nicholas Paget Bayly (1814–1879) all stations and homesteads surrounding Mudgee.⁵⁸ These settlers also moved into the remote and inaccessible parts of the region such as Nullo Mountain and Widden Valley because it was identified as prime land for bloodhorse breeding.

In the late nineteenth century, the Closer Settlement scheme led to smaller farms being broken up from pastoral stations. However, the pioneer cattle studs that survived the 1840s were considered to reach their peak between 1860–1880 in NSW. Four studs of note dating from this period include the Cox studs at Fernhill and Menar, William Lee's stud at Woodlands, Robert Lowe's stud at Wilbetree in Mudgee and George Bowman's property Archerfield.⁵⁹ These settlers continued to breed cattle using the best bulls from England despite the price and risk of their remote stations subject to bushrangers and cattle rustlers.

Towards the turn of the century, dairy farms also developed in the region close to towns such as the cheese factory established in Bylong and butter factories at neighbouring Rylstone, Olinda and Cudgegong.

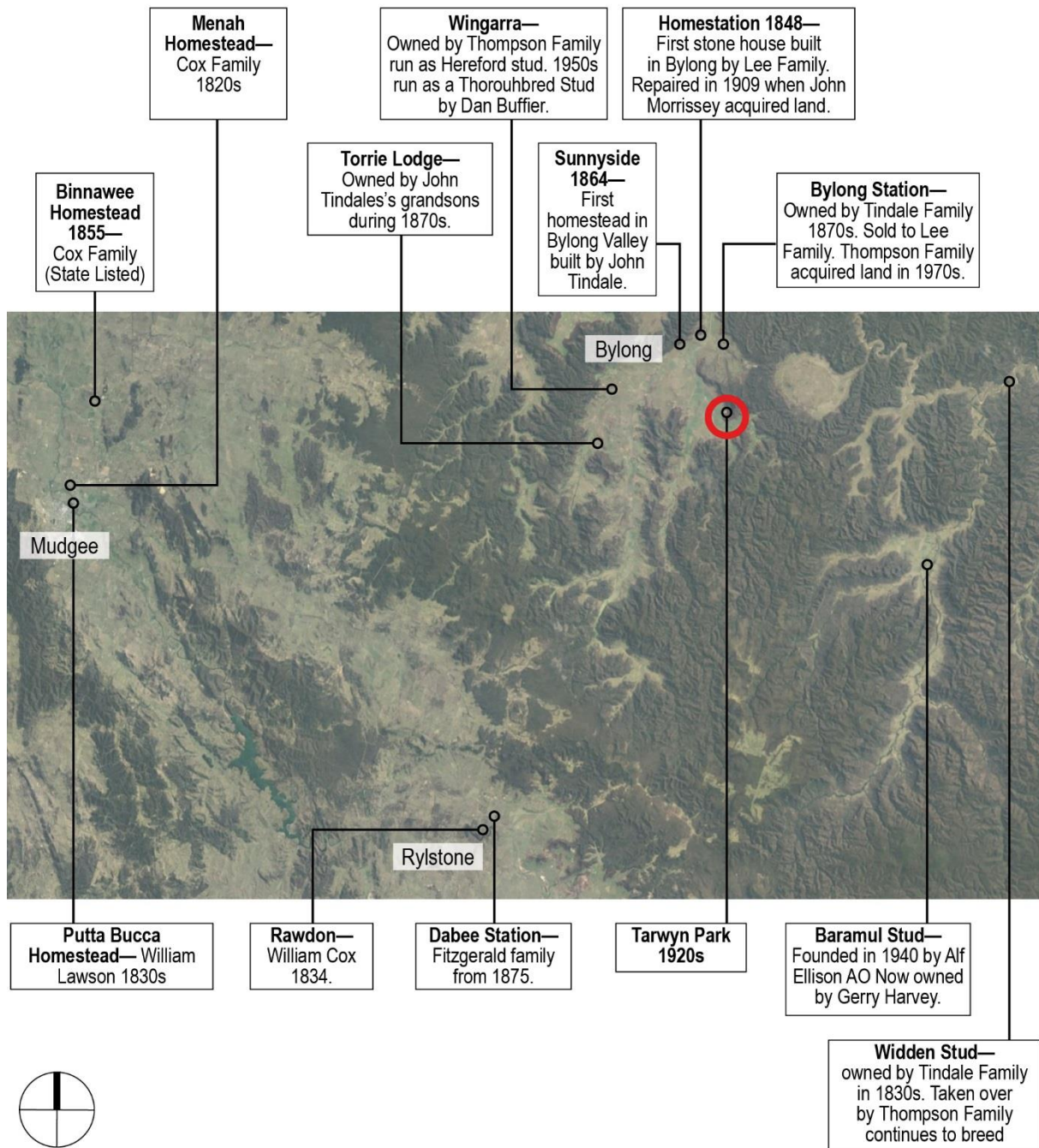


Figure 3.1 Location of surrounding historic homesteads and stations. (Source: SIX Maps, Rylstone and District Historical Society, with GML overlay)

3.2.2 Horse Breeding

In the late 1790s, the colony began importing English-bred horses, including the stallion Rockingham, from the Cape Colony to improve the stock of horses in Australia. A bloodhorse, 'Washington', was imported from America in 1802 accompanied by a mare and signalling the beginning of 19 early colonial horse families now listed in the Australian Stud Book. Arab horses were imported via India and were the predominant breed at the first Australian race meeting in Hyde Park in 1810.⁶⁰

The following year, the racing calendar for the second day of events includes owners the early settlers Bayly and D'Arcy Wentworth. William Wentworth and William Lawson were also avid supporters of the early race meetings. The opening of the Blue Mountains allowed settlers following in their wake to acquire horses from wild brumby herds that had strayed outside the colony. These horses were then used to diversify stock of horses for use on stations and at races.

When Sir Thomas Brisbane succeeded Macquarie as Governor he put an end to the Hyde Park race events but later became patron of the Australian Turf Club in 1825. The first studs were established by Charles Smith at Doonside, D'Arcy Wentworth at Homebush and John McArthur at Camden. John Oxley's farm and stud Kirkham at Camden was also an important horse stud and held the English stallion 'Bachelor' as early as 1830. The site is one of only two horse studs listed on the NSW State Heritage Register.⁶¹ Bungarabee homestead and farm, Doonside, which is associated with Charles Smith is also listed on the State Heritage Register, as an archaeological site.

The Australian Jockey Club was established in 1842, holding meetings and races in Homebush until it moved to Randwick in 1860. The club 'has remained the most powerful club in Australian racing'⁶² and administered the Australian Stud Book since its first publication in 1878. Significantly, the Thompson and Lee families in Bylong are attributed with making contributions to the bloodlines before the advent of the Australian Stud Book.

Around the Mudgee region, horse breeding and racing was associated with high profile settler families. William Lawson and his land manager Nicholas Paget Bayly bred horses across the Lawson holdings. The first race meeting was held in the land behind Lawson's Putta Bucca Homestead in 1842, with later events at his other properties Menah and Oakfield. Henry Bayly, son-in-law of William Lawson, went on to establish the renowned horse stud Bayly Park. The Rouse family of Guntawang and Biraganbil were also well known for their bloodhorse and the branded 'crooked R' on their stock, which was mythologised in Banjo Paterson's *A Bushman's Song*.⁶³ The Cox family also bred horses at Mulgoa and Rawdon near Rylstone.

The Thompson family's holdings in Rylstone, Bylong and Widden Valley have a long association in the area. The Thompson's English stallion Lochiel became a leading sire of champion progeny from 1897 to 1906 prior to their ownership of Tarwyn Park. The Widden Stud states that the 'strength of the early Thompson owned studs was evidenced by the 1917 Inglis Yearling Catalogue which featured 375 youngsters, 115 (31%) of them bred by members of the Thompson family.'⁶⁴

3.2.3 Australian Land Management Systems

Over the past 200 years in Australia, European land management practices have adapted and invented solutions to cope with challenges associated with erosion, salinity, drought, overgrazing, weed infestation and feral animals. Some restorative methods have attracted considerable interest due to their ingenuity, unconventional techniques.

In 1938, NSW was the first Australian state to introduce a *Soil Conservation Act* and the first organisation, the Soil Conservation Service, to manage the threats and degradation to the land.⁶⁵ Two years later a soil conservation program was established at Cowra Research Station by Sam Clayton. Awareness of the devastation of landscapes became acute in regions such as the Hunter Valley where the loss of timber combined with overgrazing led ‘the worst land and riverbank erosion in Australia. In 1948, it was estimated that the total soil loss from erosion in the Hunter Valley was in excess of 765,000 cubic metres annually.’⁶⁶

In 1954, the first book on Keyline farming was published by farmer and former mining engineer PA Yeomans. Yeomans’ system was the outcome of 15 years of experimentation on the land. Yeomans was motivated by the limitations of conventional soil conservation methods at the time. The method aims to map the contours of the land to understand the ‘keypoints’ and control rain water runoff. Key features are ‘deep soil ripping’ and dams that take advantage of the natural topography. Yeomans argued that cultivating the land according to this pattern helped control flood irrigation, allowing water to be retained but also improved soil nutrition and prevented erosion.⁶⁷ In 2013, Yeomans’ farm ‘Yobarnie’ in Richmond, NSW, was listed on the State Heritage Inventory:

*Yobarnie was one of the properties (the other was Nevallan) on which the Keyline system of soil improvement, erosion control, water storage, cultivation and irrigation on undulating topography was first developed and demonstrated from the mid-1940s. This design approach has since been adopted by farmers in almost every country in the world. These properties are associated with Percival A Yeomans (1905–84), inventor of the Keyline system. Yeomans was the first contemporary Western agriculturalist to take a whole-system approach to sustainable design and management of the landscape. The cultural landscape resulting from this technical achievement is itself aesthetically distinctive and pleasing. The property is held in high esteem by the permaculture and sustainable agricultural community. Yobarnie (with Nevallan) is unique in its ability to demonstrate the principles of the Keyline system of agriculture, on the site where this system was first developed, trialled and demonstrated.*⁶⁸

In the 1960s, Tasmanian Bill Mollison began experimenting with ideas about creating stable agricultural systems. Mollison developed a system that was based on sustainability and self-sufficiency. He advocated for a multi-crop of perennial trees, shrubs, vegetables, weeds, fungi and roots which cultivated food and species suited to the local growing conditions. In 1974, he published *Permaculture One* with David Holmgren and founded the Permaculture Institute in 1978. The ideas of permaculture were quickly adopted in other parts of the world.

In 1986, a significant land management movement emerged with the advent of Landcare. Formed by a group of farmers at St Arnaud in Victoria, it then became a movement across Australia. The foundational principle of the movement is that people within an area work together to confront a challenge, such as pests or land degradation. There are currently 5400 Landcare groups registered in Australia.⁶⁹

Recently, Australian farmers have been exploring holistic farming such as integrated pest management and rotational grazing. In 2010, Martin Royds was recognised with the Australian Diversification Farmer of the Year award for his property Jillamatong near Braidwood, NSW. Over 15 years Royds used a combination of Peter Andrews’ natural sequence farming, biological farming, biodynamics and Landcare to improve the productivity, economic yield and the social impact of his farm.⁷⁰

3.3 Comparable Listed Heritage Items

Tarwyn Park and Iron Tank are not listed on as a Heritage Item in Schedule 5 of the *Mid-Western Regional Local Environment Plan 2012*. However relevant items in the region that are significant at a local or state level have been listed below.

Items of Local Significance in Mid-Western Regional Local Environment Plan

- Homesteads— approximately 27 homesteads.
- Stables—three horse stables all located in Mudgee:
 - ‘Bleak House’, house and stables, 5–7 Lawson Street;
 - police station and stables, 82 Market Street; and
 - old stables (now house), 146 Market Street.
- Studs—five studs, including:
 - ‘Wandu’, Limosin Stud in Piambong;
 - Barramul Stud in Baerami;
 - Holbrook Stud in Baerami;
 - Dalmar Stud in Bengalla; and
 - Woodlands Stud (originally William Lee’s holdings).

State Significant Homesteads in Mid-Western Region

In the Mid-Western Local Government Area one homestead is listed on the State Heritage Inventory listed: 1855 Binnawee Homestead and Outbuildings (SHR 01780), established by William Cox’s son, George Cox. In total on the State Heritage Register there are 34 homesteads listed in NSW with state significance.

State Significant Horse Studs and Stables in NSW

In NSW State Significant Horse Studs and Stables include:

- Kirkham Stables and Precinct, Camden (SHR 01411).
- Big Stable Newmarket, Randwick (SHR 00388).
- Lee-holme Horse Stud Exercise Yard, Penrith (SHR 3490021)
- Albion Hotel, 3 adjoining shops & stables, Braidwood (SHR 00304)
- Arcola - house, stables, garden, fence, Grafton (SHR 00388)
- Conservatorium of Music - Government House Stables, Governor’s Stables (SHR 01849)
- Cintra - House, Garden and Stables, Maitland (SHR 01892)

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- Coppabella Blacksmith Shop, Stables and Burial Plot, Rosewood (SHR 00620)
- Duntryleague with Lodge, Park, Gates, Stables, Orange (SHR 00318)
- Glenalvon and Stables, Campbelltown (SHR 00004)
- Perth House and Stables, Parramatta (SHR 00155)
- Post Office & Stables, Maitland (SHR 00494)
- Shubra Hall, including stables and garden, Croydon (SHR 01939)
- St. Matthew's Anglican Church, Rectory, Stables & Cemetery, Windsor (SHR 00015)
- Stables at rear of Police Station, Windsor (SHR 01018)
- Warbys Barn & Warbys Stables Campbelltown (SHR 00497)

State Significant Research Farms in NSW

In NSW State Significant Research Farms include:

- Grantham Poultry Research Station (former), Seven Hills (SHR 01382).
- Yobarnie Keyline Farm, Richmond (SHR 01382)

3.4 Landscape Conservation Area

The National Trust Register registered Bylong Valley as a Landscape Conservation Area on 28 August 2013 for its significance as prime agricultural land and as a rural landscape of exceptional scenic value.⁷¹

The listing also recognises the following aspects of the landscape:

- Aboriginal cultural heritage of the Wiradjuri, Gamileroi and Wonnarua language groups, identifying 343 sites detailed in a 1981 survey of the area and as evidence for the area as a major trading route;
- the exploration of the Goulburn River in 1822 by Lieutenant William Lawson, land acquisition by Surveyor Henry Dangar and subsequent settlement patterns of the 1830s;
- Baerami town and Baerami Creek Shale Mines;
- Kerrabee town and its historic importance as a resting place for stock men between Denman and Holbrook and the drover route to Kanenia; and
- Tarwyn Park and the development of natural sequence farming by Peter Andrews.

The National Trust also lists two items that fall within the Bylong Coal Project Boundary area:

- St Stephen's Anglican Church and Cemetery (1876), Bylong Valley Way; and
- Our Lady of the Sacred Heart Catholic Church and Cemetery (1915), Upper Bylong.

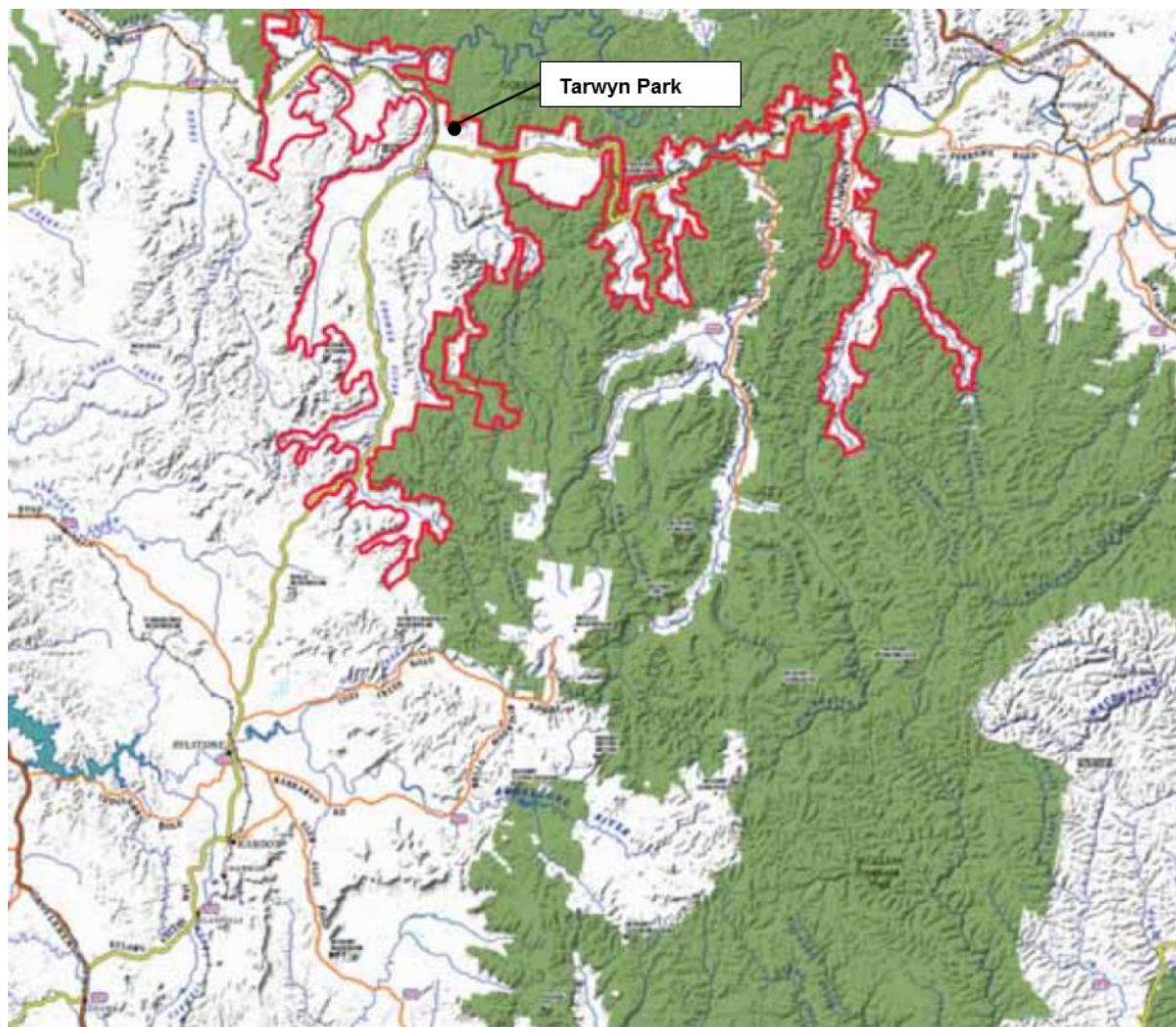


Figure 3.2 NSW National Trust Bylong Landscape Conservation Area listed in August 2013 showing the location of Tarwyn Park.
(Source: NSW National Trust with GML overlay)

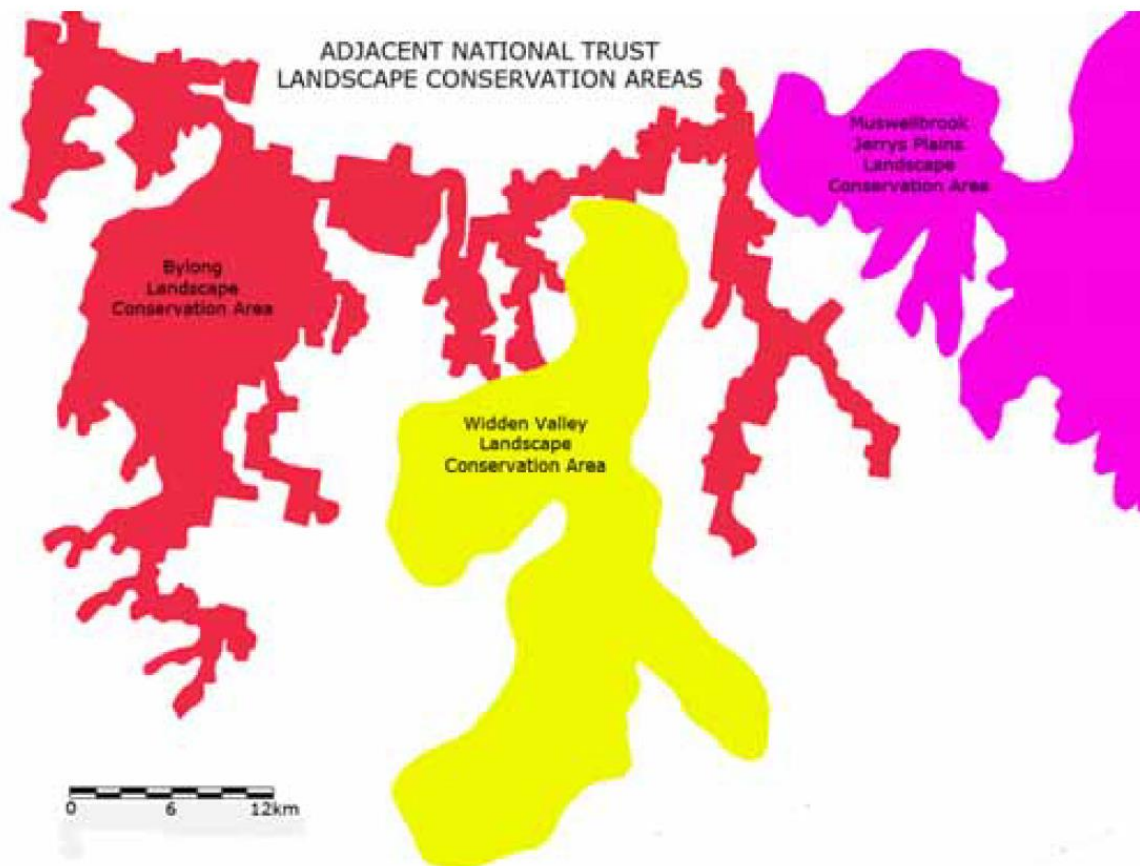


Figure 3.3 Adjacent National Trust landscape conservation areas. (Source: NSW National Trust)

3.5 Endnotes

- 1 The Hon. Mark Speakman to the Hon. Rob Stokes, re Heritage Assessment of Tarwyn Park and Iron Tank, Bylong Valley, 15 December 2016, DOC 16/566264.
- 2 Request to the Planning Assessment Commission Bylong Coal Project, Section 23D of the *Environment Planning and Assessment Act 1979*, the Hon. Rob Stokes MP, Minister for Planning, 9 January 2017.
- 3 Parsons, V 1967, 'Lee, William (1794–1870)', Australian Dictionary of Biography, National Centre of Biography, Australian National University, viewed 10 May 2017 <<http://adb.anu.edu.au/biography/lee-william-2346/text3061>>.
- 4 'Bylong Valley Centenary of Education 1884–1984', Centenary Booklet Committee, 1984, Centenary Booklet Committee, p 7.
- 5 Parsons, V 1967, 'Lee, William (1794–1870)', Australian Dictionary of Biography, National Centre of Biography, Australian National University, viewed 7 April 2017 <<http://adb.anu.edu.au/biography/lee-william-2346/text3061>>.
- 6 'Bylong Valley Centenary of Education 1884–1984', Centenary Booklet Committee, 1984, Centenary Booklet Committee, p 5.
- 7 Parsons, V 1967, 'Lee, William (1794–1870)', Australian Dictionary of Biography, National Centre of Biography, Australian National University, viewed 7 April 2017 <<http://adb.anu.edu.au/biography/lee-william-2346/text3061>>.
- 8 CT 9852-232, LPI NSW.
- 9 *Country Life Stock and Station Journal*, Sydney NSW, 24 April, p 25.
- 10 Parsons, V 1967, 'Lee, William (1794–1870)', Australian Dictionary of Biography, National Centre of Biography, Australian National University, viewed 7 April 2017 <<http://adb.anu.edu.au/biography/lee-william-2346/text3061>>.
- 11 Staff, WF 1999, *A History of Rylstone 1820–1988*, Rylstone, William Francis Staff, p 52.
- 12 viewed 24 April 2017.
- 13 'Bylong Valley Centenary of Education 1884–1984', Centenary Booklet Committee, 1984, Centenary Booklet Committee, p 5.
- 14 National Portrait Gallery, Maurice Felton 1803–1842, viewed 24 April 2017 <<http://www.portrait.gov.au/people/maurice-felton-1803>>.
- 15 *Country Life Stock and Station Journal*, Sydney NSW, 24 April, p 25.
- 16 'Bylong Valley Centenary of Education 1884–1984', Centenary Booklet Committee, 1984, Centenary Booklet Committee, p 9.
- 17 Oakes, GS 1923, *Kelso Church and the pioneers of the West*, Sydney, GS Oakes, p 15.
- 18 'Bylong Valley Centenary of Education 1884–1984', Centenary Booklet Committee, 1984, Centenary Booklet Committee, p 7.
- 19 'Bylong Valley Centenary of Education 1884–1984', Centenary Booklet Committee, 1984, Centenary Booklet Committee, p 7.
- 20 Staff, WF 1999, *A History of Rylstone 1820–1988*, Rylstone, William Francis Staff, p 7.
- 21 'Dairying', *The Sydney Morning Herald*, 14 July 1910, p 6.
- 22 'Bylong Estate Subdivision', *The Land*, 11 November 1921, p 14.
- 23 Ellis, MH 1932, *The beef shorthorn in Australia*, Sydney and Melbourne Publishers, p 11.
- 24 Ellis, MH 1932, *The beef shorthorn in Australia*, Sydney and Melbourne Publishers, p 95.
- 25 Ellis, MH 1932, *The beef shorthorn in Australia*, Sydney and Melbourne Publishers, p 96.
- 26 'Bylong Valley Centenary of Education 1884–1984', Centenary Booklet Committee, 1984, Centenary Booklet Committee, p 7.
- 27 'The Bylong Herds', *Australian Town and Country Journal*, Sydney NSW, 1 May 1875, p 29.
- 28 Weebollabolla Shorthorn Bulls, 'The Munro's of Weebollabolla', 2015, viewed 18 April 2017 <<http://www.weebollabolla.com.au/history>>.
- 29 Ellis, MH 1932, *The beef shorthorn in Australia*, Sydney and Melbourne Publishers, p 96.
- 30 *Sydney Illustrated News*, 1866.
- 31 Brazier, J, 'The Horse's Story: Sir Hercules 1843–1865', *Explore*, June-August 2007, Australian Museum, p 2.
- 32 'John Lee', Rylstone Historical Society, viewed 18 April 2017 <<http://www.rdhswiki.com/page/Lee%2C+John>>.
- 33 'James Lee (1831–1921)', *Pastoral Review*, 16 January 1922, p 25.
- 34 'Sale of Bylong Estate', *Australian Town and Country Journal*, 26 September 1906, p 14.
- 35 'Tarwyn Park, a Famous Stud', *Muswellbrook Chronicle NSW*, Thursday 6 April 1939, p 3.
- 36 Colonial Inn Museum, Mudgee Historical Society, Harold Hardwick, Architect of Mudgee, viewed 24 April 2017 <<https://www.mudgeemuseum.com/?i=523/mudgee-architect>>.
- 37 Colonial Inn Museum, Mudgee Historical Society, Harold Hardwick, Architect of Mudgee, viewed 24 April 2017 <<https://www.mudgeemuseum.com/?i=523/mudgee-architect>>.
- 38 Barrie, DM 1967, *Valley of champions: the story of the Widden Stud*, Cheshire, p 31.
- 39 'The Golden Slipper—A Breeder's Dream', 28 September 2005, *Logans Leaders in Australian Horse Insurance*, viewed 18 April 2017 <<http://www.logans.com.au/news.php?Cid=7&Aid=16>>.
- 40 Hunter Thoroughbred Breeders Association, viewed 19 April 2017 <<http://www.htba.com.au/our-industry>>; 'The Story of Widden', Widden Valley of Champions, Widden Stud Australia, viewed 19 April 2017 <<http://www.widden.com/>>.

- 41 AECOM Australia Pty Ltd, 'Bylong Coal Project: Historic Heritage Impact Assessment', 20 April 2015, p 20.
- 42 CSIRO Land and Water (2002), 'Expert Panel Report: The Natural Farming Sequence', report prepared for the Honourable John Anderson MP, Deputy Prime Minister of Australia, p 3.
- 43 CSIRO Land and Water (2002), 'Expert Panel Report: The Natural Farming Sequence', report prepared for the Honourable John Anderson MP, Deputy Prime Minister of Australia, p 2.
- 44 Rogers, G, and Bauer, B 2006, 'Preliminary Investigation of effects of Natural Sequence Farming (NSF) on soil organic matter levels and nutrient uptake at Baramul', Peter Hazell and Duane Norris, Proceedings of the first Natural Sequence Farming Workshop, *Natural Sequence Farming—Defining the Science and the Practice*, held at Bungendore, NSW, Australia on 31 October and 1 November 2006, p 1.
- 45 Quint, G 2013, 'National Trust Register Listing Report: Bylong Landscape Conservation Area', National Trust, p 3.
- 46 Andrews, P 2006, *Back from the Brink: How Australia's Landscape Can Be Saved*, ABC Books.
- 47 CSIRO Land and Water (2002), 'Expert Panel Report: The Natural Farming Sequence', report prepared for the Honourable John Anderson MP, Deputy Prime Minister of Australia, p 3.
- 48 Cheshire, B 2015, 'Renewed hopes Tarwyn Park's Natural Sequence Farming method will continue despite property sale', ABC News, 11 May 2015, viewed 15 March 2017 <<http://www.abc.net.au/news/2015-05-11/hopes-tarwyn-park-natural-sequence-farming-methods-to-continue/6459040>>.
- 49 CSIRO Land and Water (2002), 'Expert Panel Report: The Natural Farming Sequence', report prepared for the Honourable John Anderson MP, Deputy Prime Minister of Australia, p 2.
- 50 Cheshire, B 2015, 'Renewed hopes Tarwyn Park's Natural Sequence Farming method will continue despite property sale', ABC News, 11 May 2015, viewed 15 March 2017 <<http://www.abc.net.au/news/2015-05-11/hopes-tarwyn-park-natural-sequence-farming-methods-to-continue/6459040>>.
- 51 Locke, S 2016, 'UN recognises unique Australian farm built around Natural Sequence Farming as sustainable', ABC News, viewed 26 April 2017 <<http://www.abc.net.au/news/2016-09-16/un-recognises-mulloon-creek-natural-farms-as-sustainable/7852798>>.
- 52 Hurditch, WJ 2015, 'Sustainable water and energy management in Australia's farming landscapes', *WIT Transactions on Ecology and the Environment* 200, p 335.
- 53 'Of Droughts and Flooding Rains', Part One, 6 June 2005 and Part Two, 13 June 2005; 'Right as Rain', Part One, 6 July 2009 and Part Two, 13 July 2009, *Australian Story*, ABC.
- 54 Smith, D, 'Beware of false prophets in a scientific guise', *The Australian*, 25 October 2010, viewed 16 May 2017 <<http://www.theaustralian.com.au/opinion/beware-of-false-phrophets-in-a-scientific-guise/news-story/61c78330ab89ef38583ec2b8197d2270>>.
- 55 Thomas, A, 'Conservationist and marine photographer recognised', *ABC Local*, 26 January 2011, viewed 10 May 2017.
- 56 Foley, M, 'Mine tears at Tarwyn Park', *The Land*, 3 August 2016, viewed 11 May 2017 <<http://www.theland.com.au/story/4067022/mine-tears-at-tarwyn-park-photos/#slide=2>>.
- 57 Kass, T, 'A Thematic History of the Central West: Comprising the NSW Historical Regions of Lachlan and Central Tablelands', NSW Heritage Office, June 2003, p 40.
- 58 Staff, WF 1999, *A History of Rylstone 1820–1988*, Rylstone, William Francis Staff, p 12.
- 59 Ellis, MH 1932, *The beef shorthorn in Australia*, Sydney and Melbourne Publishers, p 92.
- 60 Pollard, J 1971, *The Pictorial History of Australian Horse Racing*, Paul Hamlyn Pty Ltd, p 12.
- 61 Kirkham Stables and Precinct, State Heritage Register item 01411 <<http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5014178>>.
- 62 Pollard, J 1971, *The Pictorial History of Australian Horse Racing*, Paul Hamlyn Pty Ltd, p 26.
- 63 Broadley, J 2010, 'Mudgee: Early Links with Racing', Colonial Inn Museum, Mudgee Historical Society, viewed 12 May 2017 <<https://www.mudgeemuseum.com/?i=518/racing-in-mudgee>>.
- 64 'The Story of Widden', viewed 15 May 2017 <<http://www.widden.com/the-stud/history/>>.
- 65 Soil Conservation, 'Year Book Australia, 1963', Australian Bureau of Statistics, 23 November 2012, viewed 12 May 2017 <<http://www.abs.gov.au/ausstats/abs@.nsf/featurearticlesbytitle/1DF2ACCC5071A76ACA2569DE00267E5A?OpenDocument>>.
- 66 Wells, K 2015, 'Australian farming and agriculture—grazing and cropping', Australian Government, <<http://www.australia.gov.au/about-australia/australian-story/austn-farming-and-agriculture>>, viewed 10 May 2017.
- 67 Yeomans, PA 1954, *The Keyline Plan*, viewed 12 May 2017 <<http://soilandhealth.org/wp-content/uploads/01aglibrary/010125yeomans/010125ch1.html>>.
- 68 Yobarnie Keyline Farm, State Heritage Inventory item 01826 <<http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5061775>>.
- 69 Landcare Australia, viewed 12 May 2017 <<https://landcareaustralia.org.au/about/our-impact/>>.

- ⁷⁰ Gocher, K, 'Braidwood Farmer looks to diversification', 21 September 2010, *ABC Rural*, viewed 12 May 2017 <<http://www.abc.net.au/site-archive/rural/content/2010/s3017816.htm>>.
- ⁷¹ National Trust Register, Listing Report, Bylong Landscape Conservation Area.

4.0 NSW Heritage Assessment

4.1 Heritage Values and Criteria

The *NSW Heritage Manual* guidelines, prepared by the NSW Heritage Office and the Department of Urban Affairs and Planning (as amended July 2002), provide the framework for the following assessment and statement of significance for Tarwyn Park and Iron Tank. These guidelines incorporate the heritage values identified in the *Australia ICOMOS Burra Charter, 2013* (the Burra Charter), into a specifically structured framework, which is currently accepted as the required format by heritage authorities in NSW.

The Burra Charter defines cultural significance as ‘aesthetic, historic, scientific, social or spiritual value for the past, present or future generations’. Cultural significance is embodied in the place itself, its fabric, its setting, its use, associations, meanings, related places and objects.

The heritage values as recognised under the Burra Charter are reflected in the NSW Heritage assessment criteria. The seven heritage criteria (Criterion A–G) serve to maintain consistency with the other Australian heritage agencies, minimise ambiguity during the assessment process, and avoid the legal misinterpretation of the completed assessments of listed items. The seven criteria are set out in Table 4.1 below.

Table 4.1 NSW Heritage Assessment Criteria.

Criterion A	An item is important in the course, or pattern, of NSW’s cultural or natural history (or the cultural and natural history of the local 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 (or the cultural and natural 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 (or the local area).
Criterion D	An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.
Criterion E	An item has potential to yield information that will contribute to an understanding of NSW’s cultural or natural history (or the cultural or natural history of the local area).
Criterion F	An item possesses uncommon, rare or endangered aspects of NSW’s cultural or natural history (or the cultural or natural history of the local area).
Criterion G	An item is important in demonstrating the principal characteristics of a class of NSW’s (or a class of the local area’s): <ul style="list-style-type: none"> • cultural or natural places; or • cultural or natural environments.

Tarwyn Park and Iron Tank is assessed against the NSW heritage assessment criteria in the table below. For a place to be considered eligible for listing on the State Heritage Register it must satisfy one or more of the assessment criteria at state level. The decision as to whether or not an item is listed on the State Heritage Register is made by the Minister for Heritage under section 32 of the *Heritage Act 1977*. Prior to any recommendation regarding listing of an item of the State Heritage Register, the Heritage Council of NSW is required to give notice of the intention to consider whether or not to recommend the listing of

an item. If the decision of the Heritage Council is to recommend listing, the Heritage Council is required to make the recommendation to the Minister as soon as possible after the notice of its decision has been provided to the local council, individuals and entities that have made submissions and by public advertisement.

Table 4.2 GML Assessment of State Heritage Significance Criteria as applied to the Subject Area.

State Heritage Significance Criteria	GML Heritage Comments
<p>Criterion A: 'It is important in the course or pattern of the cultural or natural history of NSW.'</p>	<ul style="list-style-type: none"> • Located in the Bylong Valley, Tarwyn Park and Iron Tank demonstrates the course of significant human activity associated with the colonial period pattern of endeavour, exploration and settlement in Central Western NSW from the 1820s. The history of the Bylong Valley is associated with the state's production of fine Shorthorn cattle, as well as thoroughbred and champion racehorses. • Tarwyn Park and Iron Tank is associated with the establishment and historical evolution of agriculture in the Bylong Valley through the endeavours of former convict servants and 'pioneers', William Lee and John Tindale, dating from the 1820s. The Bylong Valley, and specially the land grants of Lee and Tindale, contributed to the growth and development of Shorthorn cattle breeding in NSW and more broadly across Australia. For a period during the early twentieth century the Bylong Valley boasted the world's largest population of Shorthorn cattle. Lee and Tindale's legacy was enhanced over generations by their descendants who continued to breed cattle in NSW, and elsewhere, through the importation of fine stock including 'Napoleon', a bull bred by Queen Victoria at Windsor Stud Farm. • Tarwyn Park and the Bylong Valley are important in the state's history of thoroughbred horse breeding and horse racing by the Lee family. In 1866, 'Bylong' won the first Australian Jockey Club Metropolitan in Randwick. 'Bylong' was sired by Lee's famous horse Sir Hercules whose skeleton is now on display at the Australian Museum as a representation of the importance of horses and horsemanship to Australian history. • Tarwyn Park is important for its contribution to the history of thoroughbred horse breeding by the Thompson family from 1918, who were involved in bloodhorse breeding before the advent of the 1878 Australian Stud Book. Tarwyn Park was one of the most famous Australian studs with the most modern facilities that was renowned for producing champion horses between 1927–1939. From the stallion 'Heroic', 29 winners were produced including 1933 Melbourne Cup winner Hall Mark and 1930s champion Nuffield. Rain Lover, Melbourne Cup winner in 1968 and 1969, brought from South Australia by the Andrews' family, is buried at Tarwyn Park. The Melbourne Cup is of significance in the history of Australian horse racing. The race 'stops the nation' and is the most prestigious annual thoroughbred horserace. • Tarwyn Park and Iron Tank is important in the agricultural history of NSW as an example of a chain-of-ponds landscape where land degraded by European farming practices was 'restored' through a land management technique known as 'Natural Sequence Farming'. NSF was first developed and demonstrated at Tarwyn Park; it is now widely recognised as a sustainable land management practice and agricultural approach that has been adopted and applied to land throughout NSW and elsewhere in Australia.
<p>Criterion A—Satisfied at state level.</p>	

State Heritage Significance Criteria	GML Heritage Comments
<p>Criterion B: 'It has a strong or special association with the life or works of a person, or a group of persons or importance in cultural or natural history of NSW.'</p>	<ul style="list-style-type: none"> • Tarwyn Park and Iron Tank, located within the Bylong Valley, has a special association and strong with prominent NSW 'pioneers' who established and conducted agricultural activities in the area for around 140 years (1820s–1950s). Within NSW, Tindale and Lee were highly regarded and prominent breeders of Shorthorn cattle and horses during the 1840s. • Associated with the rise of agriculture in the Central West, the Lee and Tindale families were part of the network of pastoral properties in the area established by the Lowe, Rouse, Cox and Bayly families who largely bred sheep. • William Lee is a person of note in the history of NSW. He sat in the First NSW Legislative Assembly as Member for Roxburgh between 1856–1859. John Lee contributed to four of the 19 bloodhorse families now listed in the Australian Stud Book. His racehorse named Bylong won the first Australian Jockey Club Metropolitan in Randwick in 1866. • From 1918, the Thompson family developed bloodhorse breeding at Tarwyn Park and today continue operations in the neighbouring Widden Valley. The Thompsons have a long and continuing association with the history of Australian horse breeding and are widely regarded in that industry as leaders. • Tarwyn Park has a special association with the life work of Peter Andrews, who first established Natural Sequence Farming (NSF), an inventive land management and soil hydrology technique, on Tarwyn Park. Peter Andrews is a prominent and respected advocate of the technique and was awarded a Medal of the Order of Australia (OAM) in January 2011 for outstanding achievement and services to agriculture. Tarwyn Park was the place at which Peter Andrews first introduced and demonstrated the NSF model. The property retains the ability to demonstrate the NSF system through its chain of ponds and series of cuttings, contours and structures. • Tarwyn Park is associated with the work of Harold Hardwick (Australian Institute of Architects), a well-respected local architect who designed many important civic, religious, commercial and residential buildings in the Central West of NSW.
Criterion B—Satisfied at state level.	
<p>Criterion C: 'It is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW.'</p>	<ul style="list-style-type: none"> • Set on the floor of the Bylong Valley and fringed by scenic picturesque skyline views to sandstone escarpments and vegetated slopes, the historic and evolving rural agricultural cultural landscapes associated with the properties Tarwyn Park and Iron Tank are aesthetically distinctive with positive sensory visual appeal. • In its materiality, composition and arrangement, Tarwyn Park demonstrates a well resolved architectural design and aesthetic characteristics in its complex of farm buildings including the horse stables and homestead designed by local Mudgee architect Harold Hardwick in 1927. The views and vistas from the homestead complex, seen from within and around the buildings and across the valley in all directions, contribute to the understanding and appreciation of the beauty of the natural environment. The landscape setting, views and visual connections to other places from within Tarwyn Park and Iron Tank that link to other historic places along Upper Bylong Road contribute to the understanding of the area's historical evolution as a rural village and have strong visual and sensory qualities. • Tarwyn Park demonstrates technical achievement and innovation in the development and application of Natural Sequence Farming by Peter Andrews.

State Heritage Significance Criteria	GML Heritage Comments
Criterion C—Satisfied at state level.	
<p>Criterion D: 'It has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons.'</p>	<ul style="list-style-type: none"> • This assessment has not considered social values with regard to community or cultural groups. • There are associations with the horse breeding and racing communities; however, the nature, extent and strength of these social attachments has not been researched. • As an of example of NSF, Tarwyn Park and Iron Tank is held in high esteem by proponents as a key reference site for its ability to demonstrate a restorative soil hydrology process and land management system. • There are notable and continuing attachments amongst proponents of NSF; this is represented through social media, publications, events and other educational activities. • There is demonstrable local community attachment to Tarwyn Park which is evidenced by the community's interest in the stables and the horse burials on site.
Criterion D—Likely to meet threshold at a local level. Evidence to suggest that it may meet threshold at state level.	
<p>Criterion E: 'It has potential to yield information that will contribute to an understanding of the cultural or natural history of NSW.'</p>	<ul style="list-style-type: none"> • The known and potential historical archaeological evidence associated with a continuing history of European occupation and management has through research and investigation the ability to yield information about domestic life and consumption patterns, agricultural practices and industrial and technical innovation through time. • The areas of NSF within the Tarwyn Park and Iron Tank properties have attributes of a significant land management process, technique and philosophy. • The distinctive cultural landscape associated with NSF infrastructure, variously comprising a leaky weir, stream bank and vegetation growth, represent the key characteristics of the NSF method applied to a natural environment. NSF is no longer practised at Tarwyn Park and Iron Tank, yet the properties still retain the potential to yield new information. Through programmatic research and monitoring this information may contribute to an understanding of the transformative processes associated with NSF on the natural environment. This could contribute to an understanding of NSF's potential to contribute to the development of sustainable land management systems and economic development and agricultural productivity within NSW.
Criterion E—Criteria satisfied at state level.	
<p>Criterion F: 'It possesses uncommon, rare or endangered aspects of the cultural or natural history of NSW.'</p>	<ul style="list-style-type: none"> • Based on research to date, Tarwyn Park is an uncommon example of a rural homestead and stables complex by well-known Mudgee-based architect, Harold Hardwick. • As the first demonstration site associated with NSF established by Peter Andrews within the Bylong Valley, Tarwyn Park and Iron Tank does possess evidence of NSF in this location. • NSF has been implemented at several other sites since it was first established at Tarwyn Park; given this, the NSF infrastructure evident at Tarwyn Park and Iron Tank is not considered to process uncommon, rare or endangered evidence of significant human activity at state level.
Criterion F—Does not meet criterion at state level.	

State Heritage Significance Criteria	GML Heritage Comments
<p>Criterion G: 'It is important in demonstrating the principal characteristics of a class of cultural or natural places/environments in NSW.'</p>	<ul style="list-style-type: none"> • With its topographical features, soil and chain of ponds, Tarwyn Park and Iron Tank is representative of an historic evolving rural landscape that was modified by Europeans and which has been used continuously for agricultural activities since colonisation. The properties retain the ability to demonstrate important aspects this class of historic cultural landscape including that associated with cattle breeding, horsebreeding and NSF and the environmental impacts of European occupation and land use. • Tarwyn Park and Iron Tank is considered to demonstrate the principal characteristics of a class of the state's natural or cultural places at local level.
<p>Criterion G—Criteria satisfied at local level.</p>	

5.0 Impacts on Heritage Values

The following table outlines the potential impacts of the Bylong Coal Project on identified features at Tarwyn Park specifically horse breeding, cattle and natural sequence farming as well as the surrounding rural cultural landscape of Bylong Valley.

Table 5.1 Potential Impacts of the Bylong Coal Project on Tarwyn Park.

Heritage Feature	Impact
Bylong Valley Historic Cultural Landscape (including Tarwyn Park and Iron Tank)	<ul style="list-style-type: none"> • Impact on the historic and evolving rural agricultural landscape of the Bylong Valley with historic land grants located adjacent to water courses throughout the alluvial and river valleys, with complexes of agricultural buildings, both domestic and agricultural, set in open grazing landscapes. • Impact on the research potential associated with the historical archaeological evidence associated with human occupation and agricultural activities since colonisation.
Bylong National Trust Landscape Conservation Area	<ul style="list-style-type: none"> • Direct impact to the natural landscape, aesthetic value of views and vistas (Goulburn River National Park) to the north of Tarwyn Park that is part of the Bylong Conservation Area.
Tarwyn Park Driveway and Entrance	<ul style="list-style-type: none"> • Direct impacts to historic driveway and entrance to Tarwyn Park that is a key element of the functional rural industrial landscape that retains the ability to demonstrate historic patterns of movement across the land. • Adverse material impact to driveway's connection to Upper Bylong Road and on historic land use and layout/pattern of use and circulation between the properties, including patterns of movement within the properties and relationships to other items in the Bylong Valley including the church and post office. • Direct impact that will adversely impact physical evidence associated with Tarwyn Park's historic association with the Melbourne Cup evidenced by the burial at the entry to Tarwyn Park of Rain Lover (winner of 1968 and 1969 Melbourne Cups). Adverse impact on physical evidence associated with thoroughbred horse breeding though proposed removal of other horse burials including Eloisa and a possible third horse near the current entry gates.

Heritage Feature	Impact
Tarwyn Park	<ul style="list-style-type: none"> • Adverse impact on the historic setting and agricultural cultural landscape pattern associated with Tarwyn Park homestead and stables and Iron Tank. • Mine infrastructure will give rise to a material impact on the surrounding rural agricultural landscape setting associated with the homestead complex. • Detrimental visual impacts to views to and from the homestead complex. Visual impacts to the setting of homestead's associated aesthetic, historic and social cultural values of the locality and its wider setting due to haul roads and surrounding open cut mines. • Blasting and blast-related operations will give rise to aural impacts on the rural agricultural setting and sensory qualities of the cultural landscape. Blasting activity will impact the ability to appreciate the historic agricultural values and that associated ambient sounds. • Some subsidence impacts on farm structures considered likely. Depending on the nature and extent of these impacts they could be material and adverse and further impact the ability of the property to demonstrate its cultural significance related to agricultural land use. • Impact on the research potential associated with the historical archaeological evidence associated with Tarwyn Park.
Tarwyn Park Stables	<ul style="list-style-type: none"> • Impact on historic use of Tarwyn Park as thoroughbred horse stud and stables in early twentieth century and connection to network of studs in the Bylong and Widden Valleys and around Mudgee. • Likely positive impacts associated with adaptive re-use of stables for mine accommodation. Though it is noted that the proposed adaptive reuse may necessitate the removal of significance historic fabric which may give rise to a material impact on significance.
Equine Facilities	<ul style="list-style-type: none"> • Direct impact on other equine facilities within the Bylong Valley which will more broadly impact on the significant pattern of use associated with horse breeding.
Natural Sequence Farming	<ul style="list-style-type: none"> • Direct impact on a section of the alluvial floodplain by access road and mine infrastructure including haul road and bore fields. This will materially impact on the historic patterns use and management of land and water. • Material impact on NSF infrastructure through the removal of NSF features (crushed limestone, hay bale and boxthorn vegetation) in southwest corner of the property where Eastern Open Cut Mine is proposed.
Renfrew Park Remains (1900)	<ul style="list-style-type: none"> • Renfrew Park remanent on the outside border of Tarwyn Park where Eastern Open Cut mine area is proposed. Adverse impact on cultural significance through the proposed removal as the ability to demonstrate the historic agricultural land use pattern in this area of the Bylong Valley will be lost.
Cheese Factory Remains (1910)	<ul style="list-style-type: none"> • The remains Cheese Factory on the border of Tarwyn Park will be directly impacted as it is proposed for removal. This will impact the significance of the Bylong Valley's historic patterns of agricultural use in the area.

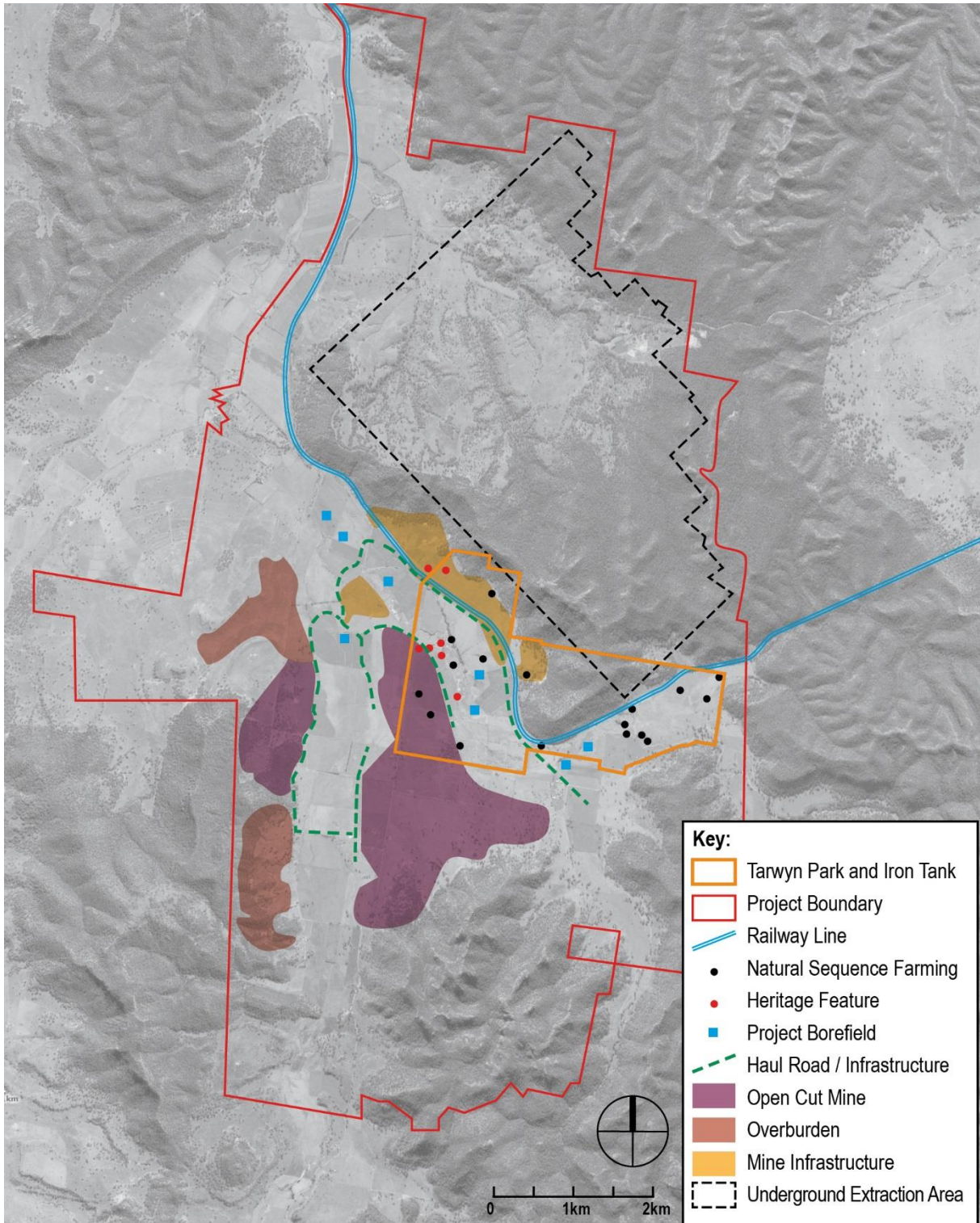


Figure 4.1 Bylong Coal Project Layout overlaid on Tarwyn Park. (Source: KEPCO Bylong Coal Project Boundary with GML overlay)