

Picton Road upgrade between Nepean River and Almond Street, Wilton

Review of Environmental Factors

Appendix F

Non-Aboriginal Heritage
Assessment

F



Picton Road upgrade between Nepean River and Almond Street, Wilton: Non-Aboriginal Heritage Impact Assessment

FINAL REPORT

Prepared for GHD Pty Ltd

22 January 2024

Biosis offices

NEW SOUTH WALES

Albury

Phone: (02) 6069 9200
Email: albury@biosis.com.au

Newcastle

Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney

Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Western Sydney

Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Wollongong

Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

VICTORIA

Ballarat

Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Melbourne

Phone: (03) 8686 4800
Email: melbourne@biosis.com.au

Wangaratta

Phone: (03) 5718 6900
Email: wangaratta@biosis.com.au

Document information

Report to: GHD Pty Ltd

Prepared by: Crystal Garabedian
Ashley Bridge
Nathan Windram
Charlotte Allen

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Glossary

BP	Before present
BGL	Below Ground Level
Biosis	Biosis Pty Ltd
c.	Circa
CBD	Central Business District
CMP	Conservation Management Plan
DA	Development Application
DCP	Development Control Plan
DP	Deposited Plan
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GHD	GHD Pty Ltd
Heritage NSW	Heritage NSW, Department of Planning and Environment
Heritage Act	<i>Heritage Act 1977</i>
Proposal	Picton Road upgrade between Nepean River and Almond Street, Wilton
Proposal site	The area that would be required to construct and operate the proposal, and includes the location of construction worksites and operational infrastructure as assessed in the REF
LEP	Local Environmental Plan
NSW	New South Wales
REF	Review of Environmental Factors
SHI	State Heritage Inventory
SHR	State Heritage Register
Study area	The proposal site plus a buffer of 1 kilometre. Lot 1 DP 1018965, Lot 1 DP 1288665, Lot 1 DP 744620, Lot 15 DP 656868, Lot 16 DP 251051, Lot 20 DP 251051, Lot 20 DP 253157, Lot 21 DP 253157, Lot 22 DP 253157, Lot 102 DP 1232553, Lot 103 DP 1232553, Lot 183 DP 280010, Lot 184 DP 280010, Lot 210 DP 735556, Lot 211 DP 735556, Lot 301 DP 1184442, Lot 302 DP 1184442 and Lot 303 DP 1184442.
The assessment	Non-Aboriginal heritage assessment
Transport	Transport for NSW
WGA DCP	<i>Wilton Growth Area Development Control Plan 2021</i>
WDCP	<i>Wollondilly Development Control Plan 2016</i>
WSEPP	<i>State Environmental Planning Policy (Precincts – Western Parkland City) 2021</i>

Executive summary

Assessment overview

Purpose and approach

This report summarises the non-Aboriginal heritage impact assessment for the proposed Picton Road upgrade proposed by Transport for NSW (Transport), between the Nepean River and Almond Street in Wilton, New South Wales (NSW) (the proposal). The proposal includes upgrading the Picton Road interchange with the M31 Hume Motorway.

The proposal site, defined as the area of physical impact for the proposal, and the wider study area for this assessment, defined as a one-kilometre buffer area surrounding the proposal site, are located within the Wilton region in NSW. The proposal site is about 35 kilometres north-west of the Wollongong central business district (CBD) (Figure 1-1).

The proposal is subject to assessment in the form of a Review of Environmental Factors (REF) under Division 5.1 of *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report has been prepared to assess the potential impacts of constructing and operating the proposal on non-Aboriginal heritage objects, places and items. Identified heritage constraints were considered during the design of the proposal, with an emphasis on avoiding impacts where feasible.

The assessment has been undertaken in accordance with relevant guidelines, in particular:

- *Assessing Heritage Significance, Assessing Significance for Historical Archaeological Sites and 'Relics'*.¹
- *The Burra Charter*.²
- *Guidelines for preparing a statement of heritage impact*.³

Key features of the existing environment

Significant heritage values identified within the study area include:

- Five locally listed heritage items – Cottage (Item no. I275), St Luke's Anglican Church (Item no. I276), Upper Nepean Scheme – Upper Canal (Item no. I16) (State significant), Upper Nepean Scheme – Pheasants Nest Weir (Item no. I278), Cottage (Item no. I279) and Aboriginal Shelter Sites (Item no. I285).
- Two State listed heritage items – Wilton Park (Item no. I277 and State Heritage Register (SHR) no. 00257) and the Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (SHR no. 01373).
- One item listed on the Section 170 WaterNSW Heritage and Conservation Register – Upper Nepean Scheme (including Upper Canal and Prospect Reservoir) (Item no. 4580004).

Of these, one heritage item, the Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (SHR no. 01373, Upper Nepean Scheme – Upper Canal (Wollondilly LEP Item no. I16) and Section 170 WaterNSW Heritage and Conservation Register item no. 4580004) is located within the proposal site (about 90 metres below ground level (BGL)). Two locally listed heritage items, Cottage (Item no. I275) and St Luke's Anglican

¹ Heritage Office 2001

² Australia ICOMOS 2013

³ Department of Planning and Environment 2023

Church (Item no. I276), are located within 50 metres of the proposal site. The remainder of the identified heritage items are located within the wider study area.

No areas of non-Aboriginal archaeological potential were identified during this assessment.

Assessment conclusions and recommendations

Construction impacts

Key findings

Potential impacts during construction of the proposal include visual impacts to all items and potential vibration impacts to Cottage (Item no. I275) and St Luke's Anglican Church (Item no. I276).

Recommended approach to mitigation and management

The following are recommended for works prior to and during construction:

Recommendation 1 Review of detailed design plans

The analysis, mitigation measures and recommendations of this report are based on concept design plans. When the 100% detailed design plans are complete, a heritage specialist should review the final design with regard to this report and undertake a consistency assessment to ensure the final design is acceptable in terms of heritage outcomes. Should designs or construction methodology change between the 100% detailed design stage and the Approved For Construction drawings, a heritage specialist should complete a consistency assessment to ensure the changes do not result in significant changes.

Should any changes occur during this period which warrant significant alterations to the proposal or proposal site, a further assessment and justification in the form of a Statement of Heritage Impact (SoHI) will be required for any heritage items impacted.

Recommendation 2 Adhere to all mitigation measures in this assessment

This report contains several recommended mitigation measures (Table 27), which are required to be adhered to in order to be compliant with the Heritage Act, Heritage NSW, Department of Planning and Environment (Heritage NSW) guidelines and best practice and protect heritage values. Transport must ensure that all construction/operational specific measures are completed prior to relevant works being completed.

Operational impacts

Key findings

Potential impacts during operation include limited indirect visual impacts to the curtilages of the following heritage items:

- Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (Item no. 01373, Item no. I16, Item no. 4580004) and Upper Nepean Scheme - Pheasants Nest Weir (Item no. I278).
- Cottage (Item no. I275).
- St Luke's Anglican Church (Item no. I276).
- Cottage (Item no. I279).
- Aboriginal Shelter Sites (Item no. I285).

There is no potential for indirect visual impacts to Wilton Park / Wilton Park - stables, coachhouse, water tanks, stallion boxes and covered yards (SHR Item no. 00257, LEP Item no. I277) during operation of the proposal.

Recommended approach to mitigation and management

Visual impacts may be largely mitigated through design, with the land within the proposal site post construction expected to function in the same way as it currently does. As the proposal would be visually similar to the existing road alignment, the works are considered to be sympathetic to heritage items and values.

1 Introduction

1.1 The proposal

Transport for NSW (Transport) proposes to upgrade Picton Road between the Nepean River and Almond Street in Wilton, NSW (the proposal). The proposal includes upgrading the section of Picton Road from about 1.3 kilometres east of the bridge over the Nepean River to about 200 metres east of Almond Street, including the M31 Hume Motorway interchange.

The proposal forms the western section of the broader Picton Road upgrade, which involves upgrading about 30 kilometres of Picton Road between the Nepean River and the M1 Princes Motorway.

The proposal is subject to assessment by a Review of Environmental Factors (REF) under Division 5.1 of *Environmental Planning and Assessment Act 1979* (EP&A Act). For the purposes of these works, Transport is the proponent and the determining authority under Division 5.1 of the EP&A Act.

1.1.1 Proposal location

The proposal is located in Wilton, in the Wollondilly local government area (LGA). The proposal site, shown in Figure 1-1 and Figure 1-2, comprises the area that would be required to construct and operate the proposal, including ancillary facilities and operational infrastructure. These figures have been provided by Transport and are consistent with the figures in the REF.

1.1.2 Key features of the proposal

Key features of the proposal include:

- widening and upgrading Picton Road for a distance of about five kilometres between the Nepean River and Almond Street to provide:
 - a minimum of two 3.5 metre-wide traffic lanes in each direction with a central median, increasing to three traffic lanes in each direction approximately between the Wilton Park Road and Aerodrome Drive intersection and the Pembroke Parade and Greenway Parade intersection.
 - three-metre-wide shoulders on the left lane side in each direction.
- upgrading the existing Picton Road and M31 Hume Motorway interchange into a diverging diamond layout, including:
 - removing the existing Picton Road bridge and constructing two new bridges over the M31 Hume Motorway.
 - upgrading and realigning on and off ramp connections with the M31 Hume Motorway to suit the new interchange layout and to allow free flow of traffic between Picton Road and the M31 Hume Motorway.
 - providing a new four-metre-wide shared user path along the southern bridge.
 - removing the existing traffic signals on Picton Road and installing new traffic signals with more efficient phasing and more traffic capacity.
- new and upgraded shared paths on Picton Road, including underpasses under the southbound on ramp connections to the M31 Hume Motorway and an overpass of the northbound off ramp connection from the M31 Hume Motorway, located:

- adjacent to the westbound slow lane of the proposal from the western extent to around 420 metres west of Almond Street to connect with planned active transport infrastructure to be delivered as part of the South East Wilton development.
- adjacent to the eastbound slow lane between Aerodrome Drive and the western extent of the proposal and between Pembroke Parade / Greenway Parade and Almond Street.
- reconfiguring the existing Picton Road intersections with Wilton Park Road, Aerodrome Drive, Janderra Lane and Almond Street into left in, left out only (the timing of delivery of the reconfigured Almond Street intersection is subject to confirmation of timeframes for delivery of other road works planned at the intersection as outlined in section 1.1.3 and chapter 3 of the REF).
- integration with new traffic signals and widening roadworks constructed in 2023 at the intersection of Picton Road and Pembroke Parade and Greenway Parade.
- adjusting the posted speed from the western extent of the proposal, through the interchange and to the east of Pembroke Parade to 60 kilometres per hour (km/h).

Ancillary work and construction activities associated with the proposal would include:

- property works including acquisition and adjustment to existing accesses and fencing.
- civil earthworks and drainage works.
- construction and adjustment of retaining walls, road pavement, and water quality devices.
- tie-in work to adjoining sections of Picton Road, M31 Hume Motorway and other local roads.
- installing and adjusting roadside furniture and delineation, such as safety barriers, kerb and gutter, fencing, lighting, signage, noise treatment and pavement markings.
- installing new intelligent transport systems including, but not limited to, closed circuit television and variable message signs.
- protecting, adjusting and relocating existing utilities and associated structures.
- landscaping and rehabilitation of disturbed areas.
- adjustment and provision of noise treatments, including at-property works and noise mounds, as required.
- establishment of temporary ancillary facilities to support construction including compound sites, site offices, stockpiles, access tracks, turning bays, median crossovers on the M31 Hume Motorway and laydown areas.
- Site preparation works, including vegetation clearing and grubbing, site fencing, temporary drainage measures, traffic management, and implementation of environmental management measures.

An overview of the proposal is provided in Figure 1-2. Further information is provided in chapter 3 of the REF.

1.2 Purpose of the report

This report has been prepared to assess the potential impacts of constructing and operating the proposal on non-Aboriginal heritage places and items.

The non-Aboriginal heritage assessment ('the assessment') considers the study area (described in section 4.1.1), which includes the proposal site shown in Figure 1-2. The proposal site is the area that would be subject

to direct disturbance during construction and includes the proposed location of the proposal's permanent operational infrastructure.

1.2.1 Scope of assessment

The assessment has been undertaken and this report has been prepared in accordance with current heritage guidelines including:

- *Assessing Heritage Significance, Assessing Significance for Historical Archaeological Sites and 'Relics'*.⁴
- the *Burra Charter*.⁵
- *Guidelines for preparing a statement of heritage impact*.⁶

This report seeks to identify if any heritage places, items or relics exist within the study area. The heritage significance of these heritage items has been investigated and assessed to determine the most appropriate management strategy where the proposal has the potential to impact on these items.

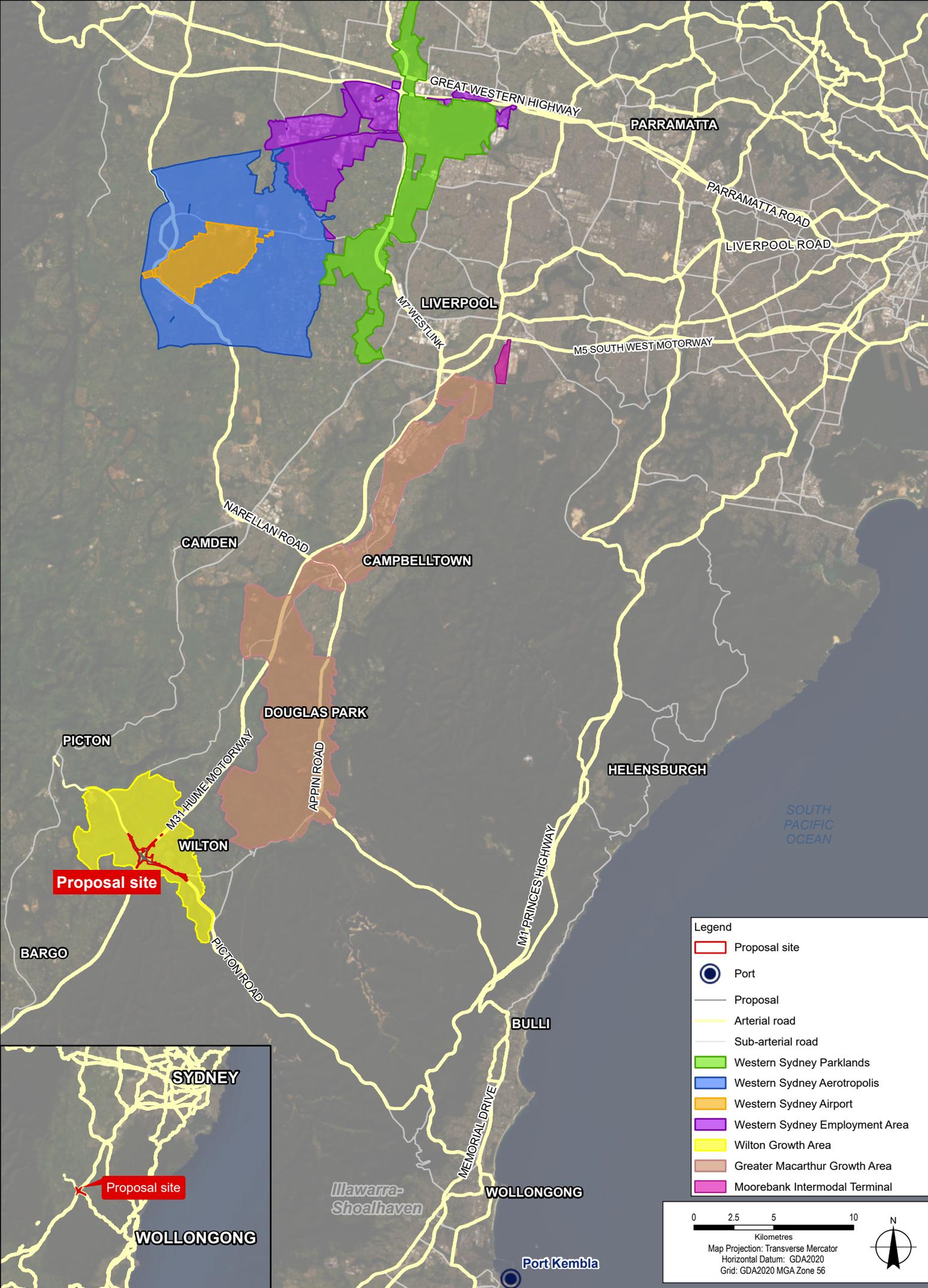
The following is a summary of the major objectives of the assessment:

- Identify and assess the heritage values associated with the proposal site and the study area. The assessment aims to achieve this objective by providing a summary of the principal historical influences that have contributed to creating the present-day built environment of the study area using resources already available and some limited new research.
- Assess the potential impacts of the construction and operation of the proposal on the significance of non-Aboriginal heritage places and items within the proposal site and the study area.
- Identify sites and features within the study area which are already recognised for their heritage value through statutory and non-statutory heritage listings.
- Recommend measures to avoid or mitigate potential impacts on the heritage significance of the listed and potential heritage items within the proposal site and study area.

⁴ Heritage Office 2001

⁵ Australia ICOMOS 2013

⁶ Department of Planning and Environment 2023



Legend

- Proposal site
- Port
- Proposal
- Arterial road
- Sub-arterial road
- Western Sydney Parklands
- Western Sydney Aerotropolis
- Western Sydney Airport
- Western Sydney Employment Area
- Wilton Growth Area
- Greater Macarthur Growth Area
- Moorebank Intermodal Terminal

0 2.5 5 10
Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

Figure 1-1 - Location of the proposal site

Data source: Earthstar GeographicsNSW SS-SDS, Topographic base data, 2023; Transport network - TINSW, 2023. Created by:akidea N:
 \AU\Wollongong\Projects\23\12560200\GIS\Maps\12560200_PictonRoad_Stage1_Concept\Design\12560200_REF_B_aprx\12560200_REF\001_ProposalLocation_A4P.Print date: 25 Oct

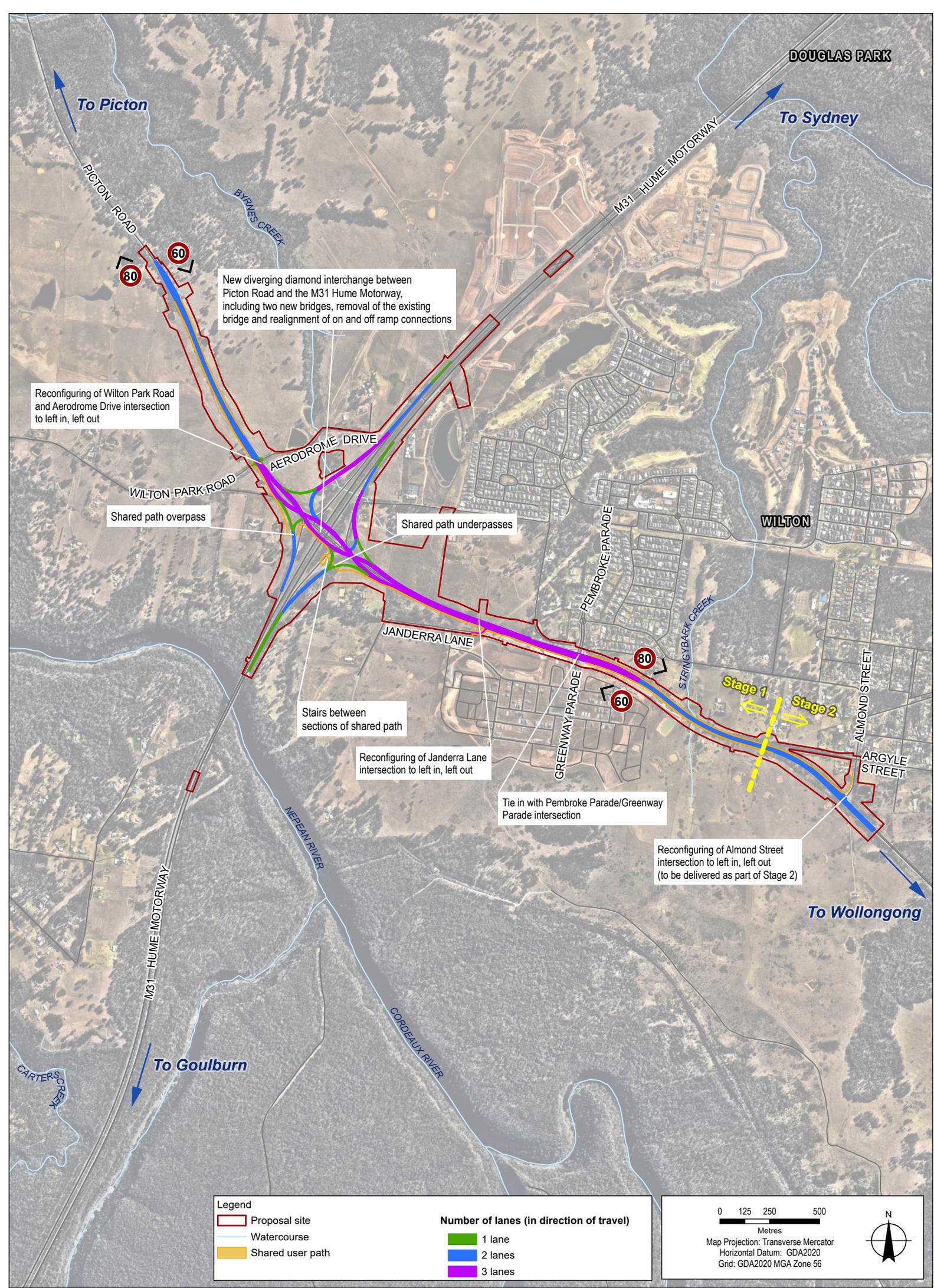


Figure 1-2 - The proposal

Data source: Nearmap WMS Server; NSW SS-SDS, Topographic base data, 2023. Created by: akidea
 N:\AU\Wollongong\Projects\2312560200\GIS\Maps\12560200_PictonRoad_Stage1_Concept\Design\12560200_REF_B.aprx
 12560200_REFX017_TheProposal_A4P. Print date: 12 Dec

2 Statutory and planning / policy framework

In NSW cultural heritage is managed in a three-tiered system: National, State and local. Certain sites and items may require management under all three systems or only under one or two. The following discussion outlines the various levels of protection and approvals that may be required for projects with the potential to affect cultural heritage in NSW.

2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Act 1999* (EPBC Act) is the national Act protecting the natural and cultural environment. The EPBC Act is administered by the Australian Department of Climate Change, Energy, the Environment and Water. The EPBC Act establishes two heritage lists for the management of the natural and cultural environment:

- The National Heritage List contains items which have been assessed to be of outstanding significance and define ‘critical moments in our development as a nation’.⁷
- The Commonwealth Heritage List contains items which are natural and cultural heritage places that are on Commonwealth land, in Commonwealth waters or are owned or managed by the Commonwealth. A place or item on the Commonwealth Heritage List has been assessed as possessing ‘significant’ heritage value.⁸

A search of the above lists did not yield any results associated with the proposal site or the study area.

2.2 NSW Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) provides for the conservation of environmental heritage of NSW. Environmental heritage is broadly defined under Section 4 of the Heritage Act as consisting of: ‘those places, buildings, works, relics, moveable objects, and precincts, of State or Local heritage significance’. The Heritage Act is administered by the Heritage Council of NSW, under delegation by the Heritage Division, Heritage NSW.

The Heritage Act protects known heritage items (such as standing structures) and items that may not be immediately obvious (such as potential archaeological remains or ‘relics’). Different parts of the Heritage Act deal with different situations and types of heritage. The Heritage Act provides several mechanisms by which items and places of heritage significance may be protected.

2.2.1 State Heritage Register

Protection of items of State significance is by nomination and listing on the State Heritage Register (SHR) created under Part 3A of the Heritage Act. The Register came into effect on 2 April 1999. The Register was established under the *Heritage Amendment Act 1998*. It replaces the earlier system of Permanent Conservation Orders as a means for protecting items with State significance.

A permit under Section 60 of the Heritage Act is required for works on a site listed on the SHR, except for that work which complies with the conditions for exemptions to the requirement for obtaining a permit. Details of which minor works are exempted from the requirements to submit a Section 60 Application can be

⁷ ‘About National Heritage’ <http://www.environment.gov.au/heritage/about/national/index.html>

⁸ ‘Commonwealth Heritage List Criteria’ <http://www.environment.gov.au/heritage/about/commonwealth/criteria.html>

found in the Guideline ‘Standard Exemptions for Works requiring Heritage Council Approval’.⁹ These exemptions came into force on 17 June 2022 and replace all previous exemptions.

There is one item within (about 90 metres below ground level, BGL) the proposal site listed on the SHR, and one item in the study area listed on the SHR. These are detailed below in Table 1 and identified in Figure 2. Full details on the significance of the items are presented in section 5.1.

Table 1 Items of State heritage significance listed on the State Heritage Register within study area

Item name	Item no.	Address/Property description	Spatial relation to study area	LGA
Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)	01373	Prospect NSW 2148	Within the proposal site , in the southern section (noting that this portion of the heritage item is located subsurface, about 90 metres BGL)	Blacktown, Fairfield, Liverpool, Camden, Campbelltown, Wollondilly.
Wilton Park	00257	Wilton Park Road, Wilton NSW 2571	Within the study area, about 1.2 kilometres from the proposal site	Wollondilly

2.2.2 Archaeological relics

Section 139 of the Heritage Act protects archaeological ‘relics’ from being ‘exposed, moved, damaged or destroyed’ by the disturbance or excavation of land. This protection extends to the situation where a person has ‘reasonable cause to suspect’ that archaeological remains (i.e. deposits) may be affected by the disturbance or excavation of the land. This section applies to all land in NSW that is not included on the SHR.

Amendments to the Heritage Act made in 2009 changed the definition of an archaeological ‘relic’ under the Act. A ‘relic’ is defined by the Heritage Act as:

Any deposit, object or material evidence:

(a) Which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and

(b) Which is of State or Local significance.

It should be noted that not all remains that would be considered archaeological are relics under the NSW Heritage Act. Advice given in the Archaeological Significance Assessment Guidelines is that a ‘relic’ would be viewed as a chattel and it is stated that,

In practice, an important historical archaeological site will be likely to contain a range of different elements as vestiges and remnants of the past. Such sites will include ‘relics’ of significance in the form of deposits, artefacts, objects and usually also other material evidence from demolished buildings, works or former structures which provide evidence of prior occupations but may not be “relics”.¹⁰

If a relic, including shipwrecks in NSW waters (that is rivers, harbours, lakes and enclosed bays), is located the discoverer is required to notify the NSW Heritage Council.

Section 139 of the Heritage Act requires any person who knows or has reasonable cause to suspect that their proposed works will expose or disturb a ‘relic’ to first obtain an Excavation Permit from the Heritage Council of NSW (pursuant to Section 140 of the Act), unless there is an applicable exception (pursuant to Section 139(4)). Excavation permits are issued by the Heritage Council of NSW in accordance with Sections

⁹ (‘Standard Exemptions for Works requiring Heritage Council Approval’, 2022)

¹⁰ NSW Heritage Branch, Department of Planning 2009, p.7

60 or 140 of the Heritage Act. It is an offence to disturb or excavate land to discover, expose or move a relic without obtaining a permit. Excavation permits are usually issued subject to a range of conditions. These conditions will relate to matters such as reporting requirements and artefact cataloguing, storage and curation.

Exceptions under Section 139(4) to the standard Section 140 process exist for applications that meet the appropriate criterion. The Section 139(4) self-assessment provides an argument for an exception from the requirement to obtain a Section 140 permit and reflects the nature of the impact and the significance of the relics or potential relics being impacted upon.

Work must cease in the affected area if it has been determined an exception is appropriate and substantial intact archaeological relics of state or local significance not identified in the archaeological assessment or statement required by this exception are unexpectedly discovered during the course of the development. The Heritage Office must be notified in writing in accordance with Section 146 of the Heritage Act. Depending on the nature of the discovery, additional assessment and, possibly, an excavation permit may be required prior to the recommencement of excavation in the affected area.

2.2.3 Section 170 Heritage and Conservation Registers

Section 170 of the Heritage Act requires that culturally significant items or places managed or owned by Government agencies are listed on departmental Heritage and Conservation Register. Information on these registers has been prepared in accordance with Heritage NSW guidelines.

Statutory obligations for archaeological sites that are listed on a Section 170 Register include notification to the Heritage Council in addition to relic's provision obligations.

There is one item located within the proposal site that is entered on a State government instrumentality Section 170 Register (Table 2). No other Section 170 Register items were identified on any other State agency register during background research.

Table 2 Items listed on a WaterNSW Section 170 Heritage and Conservation Register within the proposal site

Item name	Item no.	Location	Register	Spatial relation to study area	LGA
Upper Nepean Scheme (including Upper Canal and Prospect Reservoir)	4580004	From Pheasants Nest to Prospect Reservoir, Prospect NSW 2148	WaterNSW Section 170 Heritage and Conservation Register	Within the proposal site , below Picton Road in the eastern section (noting that this portion of the heritage item is located subsurface, about 90 metres BGL)	Multiple

2.3 Environmental Planning and Assessment Act 1979

2.3.1 State Environmental Planning Policy (Precincts – Western Parkland City) 2021

State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (WSEPP) contains a schedule of heritage items by the controls in the instrument. These items contain State or regional environmental planning significance.

There is one heritage item listed in the WSEPP located within the study area (Figure 2) as detailed in Table 3.

Table 3 Items listed on the WSEPP within the study area

Item name	Item no.	Location	Spatial relation to study area	LGA
Cottage	I275	1090 Argyle Street Wilton (Lot 32 DP814280)	Within the study area, about 25 metres from the proposal site at Almond Street	Wollondilly

2.3.2 Wollondilly Local Environmental Plan 2011

The *Wollondilly Local Environmental Plan 2011* (LEP) contains a schedule (Schedule 5) of heritage items that are managed by the controls in the instrument. Heritage items within the study area are identified below in Figure 2, and items listed on the Wollondilly LEP are detailed in Table 4. Full details on the significance of the items are provided in section 5.1.

Table 4 Items listed on the Wollondilly Local Environmental Plan 2011 within the study area

Item name	Item no.	Location	Relation to study area	Level of significance
Upper Nepean Scheme – Upper Canal	I16	Appin NSW 2560	Within the proposal site , in the southern section (noting that this portion of the heritage item is located subsurface, about 90 metres BGL)	State
Upper Nepean Scheme – Pheasants Nest Weir	I278	Nepean River	Within the study area, about 1.4 kilometres to the south-west of the proposal site	Local
St Luke’s Anglican Church	I276	1095 Argyle Street, Wilton (Lot 1 DP1236516)	Within the study area, approximately 63 meters from the proposal site at Argyle Street	Local
Wilton Park - — stables, coachhouse, water tanks, stallion boxes and covered yards	I277	370 Wilton Park Road, Wilton (Lot 8 DP243079)	Within the study area, about 660 metres west of the proposal site	Local
Cottage	I279	180 Wilton Park Road, Wilton (Lot 105 DP794081)	Within the study area, about 950 metres west of the proposal site and 345 metres north of the Nepean River	Local
Aboriginal Shelter Sites	I285	Fairway Drive (Lot 1, DP 270536)	Within the study area, about 615 metres north-east of the proposal site at its closest point	Local

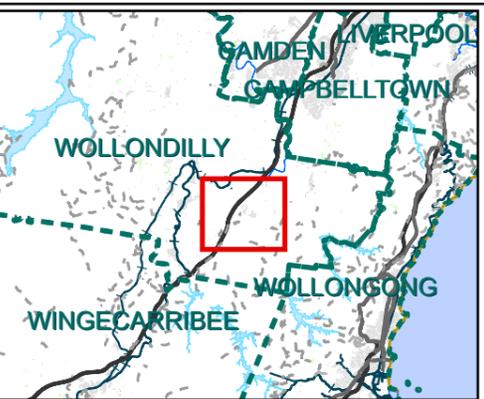
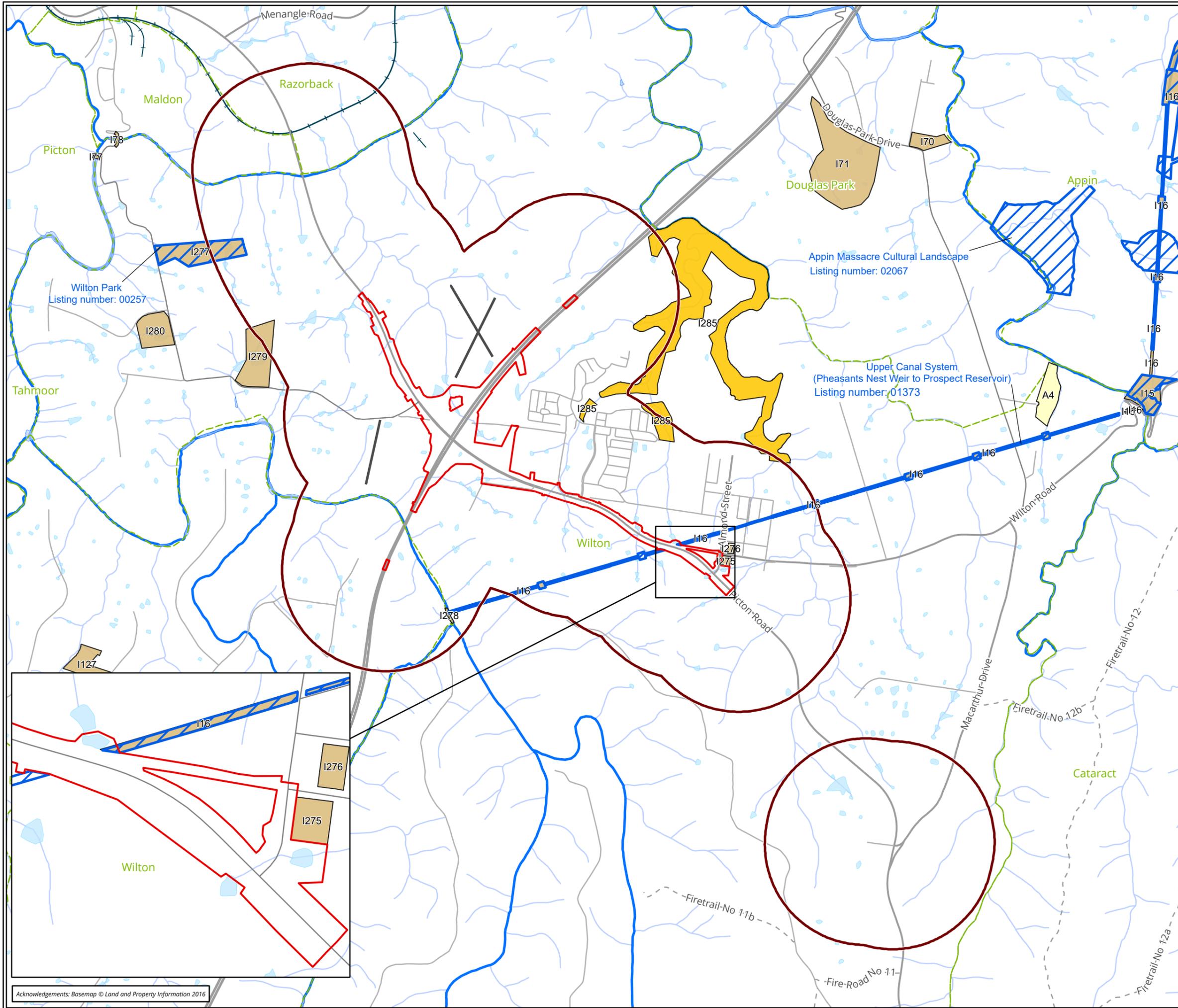
2.4 Summary of heritage listings

A summary of heritage listings within and adjacent to the study area is presented in Table 5 and Figure 2. Please note that some heritage items listed below will be present across multiple rows, as they relate to each type of statutory listing.

Table 5 Summary of heritage listings within the study area (searches conducted in July 2022)

Item	Site number	Site name	Address/Property description	Spatial relationship to the proposal site	Listings	Significance
Items located within the proposal site						
Upper Canal System/Scheme	01373	Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)	Prospect NSW 2148.	Within the proposal site , in the southern section (noting that this portion of the heritage item is located subsurface, about 90 metres BGL)	SHR	State
	116	Upper Nepean Scheme – Upper Canal	Appin NSW 2560	Within the proposal site , in the southern section (noting that this portion of the heritage item is located subsurface, about 90 metres BGL)	Wollondilly LEP	State
	4580004	Upper Nepean Scheme (including Upper Canal and Prospect Reservoir)	From Pheasants Nest to Prospect Reservoir, Prospect NSW 2148	Within the proposal site , in the southern section (noting that this portion of the heritage item is located subsurface, about 90 metres BGL)	Section 170 WaterNSW Heritage and Conservation Register	Not specified in listing
Items within the broader study area						
Upper Nepean Scheme – Pheasants Nest Weir	1278	Upper Nepean Scheme – Pheasants Nest Weir	Nepean River	Within the study area, about 1.4 kilometres to the south-west of the proposal site	Wollondilly LEP	Local
Cottage	1275	Cottage	1090 Argyle Street Wilton (Lot 32 DP814280)	Within the study area, directly adjacent to the proposal site, in Argyle Street (about 25 metres from the proposal site)	WSEPP	Local
Wilton Park	00257	Wilton Park	Wilton Park Road, Wilton NSW 2571	Within the study area, about 1.2 kilometres from the proposal site	SHR	State

Item	Site number	Site name	Address/Property description	Spatial relationship to the proposal site	Listings	Significance
	I277	Wilton Park - — stables, coachhouse, water tanks, stallion boxes and covered yards	370 Wilton Park Road (Lot 8 DP243079), Wilton		Wollondilly LEP	State
St Luke's Anglican Church	I276	St Luke's Anglican Church	1095 Argyle Street (Lot 1 DP1236516), Wilton	Within the study area, about 63 metres from the proposal site at Argyle Street	Wollondilly LEP	Local
Cottage	I279	Cottage	180 Wilton Park Road, Wilton (Lot 105 DP794081)	Within the study area, about 950 metres west of the proposal site and 345 metres north of the Nepean River	Wollondilly LEP	Local
Aboriginal Shelter Sites	I285	Aboriginal Shelter Sites	Fairway Drive (Lot 1, DP 270536)	Within the study area, about 615 metres north-east of the proposal site at its closest point	Wollondilly LEP	Local



- Legend**
- Study area
 - Proposal site
 - State heritage item
- Local Environmental Plan**
- Item - Aboriginal
 - Item - Archaeological
 - Item - General

Figure 2 Heritage items in the vicinity of the study area

0 500 1,000
Metres

Scale: 1:35,000@ A3
Coordinate System:
GDA 1994 MGA Zone 56



Matter: 37295, Date: 10 August 2023,
Drawn by: JB, Checked by: JM, Last edited by: jbeckius
Location: P:\37200s\37295\Mapping\
37295_PictonRd_HHA Layout: 37295_HHA_F3_Heritageltems

Acknowledgements: Basemap © Land and Property Information 2016

3 Historical context

Historical research has been undertaken to identify the land use history of the study area, to isolate key phases in its history, and to identify the location of any built heritage or archaeological resources which may be associated with the study area. The historical research places the study area within the township of Wilton, a suburb within the County of Camden.

3.1 Topography and resources

The study area is located within the Sydney Basin of NSW and is underlain by the horizontal bedded sequence of rocks of the Ashfield shale, member of the Wianamatta Group. This geologic unit is underlain by the Mittagong Formation, consisting of interbedded shale, laminate and fine medium grained quartz sandstone. The Mittagong formation overlies the middle Triassic Hawkesbury Sandstone, comprised of medium to coarse grained quartz sandstone with minor shale or laminate bands.¹¹

The Ashfield Shale is confined to the upper slopes of spurs with the Hawkesbury Sandstone being located along the lower slopes and gullies. Sandstone is present in lower slope contexts and as steep cliff edges long the course of Allens and Clements Creeks and their associated tributaries and provides good resources for rock art, grinding grooves and rock shelter sites. It has also historically been widely used for farming and agricultural purposes.

The study area is underlain by the Lucas Heights, Blacktown and Luddenham soil landscapes, which are predominantly residual landscapes. These soil types typically contain extensive farming and agricultural practices due to their loamy, nutrient rich soils. Small portions of the study area contain erosional landscapes, which would have seen less historical land use as a result. Hydrology within the study area consists of several first and second-order tributaries of Byrnes Creek, Allens Creek, and Stringybark Creek, which are all tributaries of the Nepean River. These water sources would have provided an abundance of resources to people in the region.

3.2 Aboriginal past

It is generally accepted that Aboriginal peoples have inhabited Australia for at least 65,000 years and possessed a distinctive stone tool assemblage. Dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken.¹² The timing for the human occupation of the Sydney Basin is still uncertain. Whilst there is some possible evidence for occupation of the region around 40,000 years ago, the earliest undisputed radiocarbon date from the region comes from a rock shelter site north of Penrith on the Nepean, known as Shaws Creek K2, which has been dated to 14,700 ±250 before present (BP).¹³ This site is along the Nepean River. To the south, along the coast just north of Shellharbour the site of Bass Point has been dated at 17,101 ±750 BP.¹⁴ Closer to the study area on the Woronora Plateau the oldest date for Aboriginal occupation so far recorded is 2200 ±70 BP at Mill Creek 11.¹⁵ Such a 'young' date is more likely a reflection of conditions of archaeological site preservation and sporadic

¹¹ Hazelton et al. 1990

¹² Flood 1999

¹³ Attenbrow 2010

¹⁴ Flood 1999

¹⁵ Koettig 1985

archaeological excavation, than actual evidence of the presence or absence of an Aboriginal population prior to this time.

Our knowledge of Aboriginal people and their land-use patterns and lifestyles prior to European contact is mainly reliant on documents written by non-Aboriginal people. The inherent bias of the class and cultures of these authors necessarily affect such documents. They were also often describing a culture that they did not fully understand, a culture that was in a heightened state of disruption given the arrival of settlers and disease. However, early written records can be used in conjunction with archaeological information and surviving oral histories from members of the Aboriginal community to gain a picture of Aboriginal life in the region. The study area is recognised as being within the traditional lands described as Wodi Wodi. The traditional Wodi Wodi boundary extended from around Stanwell Park to the Shoalhaven River, and as far inland as Picton, Moss Vale and Marulan. The Wodi Wodi spoke the Dharawal language, however Dharawal (Tharawal) was not a word they had heard of or used themselves.¹⁶

The arrival of settlers in the region and new competition for resources began to restrict the freedom of movement of Aboriginal hunter-gatherer inhabitants from the early 1800s. European expansion along the Cumberland Plain was swift and soon there had been considerable loss of traditional lands to agriculture. This led to violence and conflict between Europeans and Aboriginal people as both groups sought to compete for the same resources. In the Cowpastures region, conflict began following the murder of an Aboriginal woman and her children, which resulted in violent clashes between several Aboriginal men and European settlers between 1814 and 1816.¹⁷ The violence had escalated by 1816 following the outlaw proclamation by Macquarie, resulting in the massacre of 14 Aboriginal people hiding at Appin.¹⁸ This event is known as the 'Appin Massacre' and is regarded as a pivotal part of the history of the destruction of the Aboriginal people in the region. This site is about 21.5 kilometres east of the proposal site. An Aboriginal Cultural Heritage Assessment has been prepared for the proposal, separate to this report, which expands on the history of Aboriginal people throughout the proposal site and study area.

3.3 County of Camden – historical development

3.3.1 Early exploration of Camden (1795–1805)

Following the arrival of Governor Philip and the First Fleet in 1788, Camden, along with the Cumberland Plain, was quickly sighted as desirable land. By the late-18th century, the population of the burgeoning colony had grown to 2,500. Settlements quickly expanded out from the coast further inland, springing up at Prospect, Toongabbie, and Castle Hill, along with the larger, better supported settlement of Windsor. Farming of the Cumberland Plain first took place at Parramatta, expanding into the Hawkesbury in the late 1790s, and taking greater hold there with the establishment of settlements laid out under Governor Macquarie. These settlements included Wilberforce, Pitt Town, Windsor, Richmond, and Castlereagh.¹⁹

The early exploration of the Camden area began in 1795. Cattle of the Sydney Cove settlement were lost soon after arrival in 1788. Years elapsed before various rumours of the herd's whereabouts reached the colonial administration. Henry Hacking was sent out to what is now the Camden area by Governor Hunter, along with a small party, to ascertain the truth of these rumours.²⁰ The results of the investigation led Governor Hunter to travel to the area himself to see the cattle and the country that they were in, which he did in November 1795. It was at this time that the area was nicknamed the Cowpastures, and it is marked as such in a map drawn by

¹⁶ Tindale 1974

¹⁷ Liston 1988

¹⁸ Liston 1988

¹⁹ Department of Urban Affairs and Planning 1996

²⁰ Wrigley 2001

Hunter in 1796 (Photo 1). A full survey of the area was ordered by Hunter.²¹ The explorer Francis Barallier visited the area in late 1802, noting the richness and fertility of the countryside. Some of the colonial gentries were also attracted to see this area, along with Governor King, who visited in 1803.²² It was in this way that the area gained its reputation as a fertile land that was good for pastoralism.²³



Photo 1 New South Wales sketch of the settlements 1796, drawn by Governor J. Hunter, with Cowpastures indicated by the red arrow (Source: State Library NSW Cb 79/7)

3.3.2 Early development of the Camden region (1805–1880s)

The Cumberland Plain was mostly granted as grazing land, held in estates, and the Camden region was no exception to this. First granted as Camden Park to John Macarthur in 1805, it was used for cow pastures.²⁴ Macarthur’s business and property expanded greatly between 1805 and the late 1830s, growing from 5,000 acres to 28,000 acres, primarily supported by wool, making it the primary industry in the area.²⁵ The town of Camden was founded privately in the 1830s, competing with the government-founded town of Narellan.²⁶ Macarthur was asked, at the suggestion of the Surveyor General, Sir Thomas Mitchell, to surrender about 320 acres of his land, so that the initial settlement might be built on it. Macarthur declined, reluctantly as he feared that the establishment of a town in this area would threaten the security of his established estate. Two years after his death, in 1836, his sons surveyed the township, and offered it for sale,

²¹ Wrigley 2001

²² Wrigley 2001

²³ Wrigley 2001, p. 9

²⁴ Wrigley 2001

²⁵ Wrigley 2001, p. 10

²⁶ Department of Urban Affairs and Planning 1996, pp. 24

with the primary sales being held in 1840 and 1841. The initial land release was 100 allotments, each on half an acre of land.²⁷ This was when the town of Camden came into being. Places were set aside for a church and a hotel, and the establishment of a courthouse soon followed. Roads had been established to the area before the town was founded. The Sydney to Liverpool Road was built in 1814 and was extended to Appin soon after. In 1815, the Appin to Campbelltown route was established; however, it was poorly made, and could not withstand weather variability. The alternative was the Cowpastures Road, running further west.²⁸

It is possible that the site on which Campbelltown was to be built was set aside in 1815, but it was not until 1820 that Governor Macquarie approved the location. Although applications were made in 1821, no land was allocated until 1827, and none released until 1831. Despite this, Campbelltown was a major gateway to the south from 1822 onwards, with the establishment of a road south to the Illawarra, allowing access to the southern inland districts.²⁹ At Camden in 1827, the Cowpasture Bridge was built, and a new road through William Hovel's property linked the Cowpastures Road to Campbelltown. Soon after the 1831 land release, Campbelltown became firmly established in the local area. By 1858, the railway had opened to Campbelltown, further establishing access to the area. In 1882, a branch line was established to Camden, solving some of the issues that the area had until that point with transportation of goods, such as dairy.

Local government soon followed the establishment of Camden, with the Camden-Narellan-Campbelltown-Picton District Council established in 1843. Owing to the lack of public funds available for work, and the lack of urban development, the council soon failed and was dissolved after a few years. It was not until 1883 that the notion of a local council again began to gain momentum with a meeting of citizens, and because of the action, the Municipality of Camden was incorporated in February of 1889.³⁰

Up to the 1880s, the main produce of the Appin-Campbelltown district was wheat, maize, barley and oats. Crops gradually diminished over this time due to lack of soil replenishment, and the increasing impact of 'rust' disease. By the 1800s wheat production had come to a substantial halt, and was replaced by the raising of cattle, sheep and pigs, with the production of hay. Milking cattle was introduced into the area in the 1870s and in the following decades dairying became a dominant regional industry. By 1905, there were eighty to ninety dairies in the Campbelltown region.³¹ The farming of cattle and sheep occurred on many properties in the later 1800s and the early 1900s.

3.3.3 Development of Wilton (1834–present)

The earliest land grants in the Wilton district were issued in 1834 to Sir Thomas Mitchell. The development of the Wilton district was likely influenced after Mitchell was issued 3,800 acres located in Douglas Park in 1835, where he established his property and residence, 'Park hall' in 1842.³² A town plan was surveyed in 1842, and lots sold in 1844. In 1855 the village of Wilton was officially declared a town as the population had increased to such a number as to warrant this designation.³³ Within the same year, a land grant for 800 acres located to the south of the study area was issued to John Archer Broughton and formed the 'Hanging Rock' property (Photo 2). This property lies across from the 'Erins Vale' property. The original landowner is identified as David Chalmers and C.W. Wall, the acquisition of this land probably dates to the mid-1850s.³⁴ Wilton Park, previously owned by colonial poet Charles Tompson, was purchased in the 1880s by Samuel Hordern, grandson of the founder and the builder of the Palace Emporium, Brickfield Hill, Sydney.³⁵ A stables group at

²⁷ <http://www.camdenhistory.org.au/>, viewed 09/03/2018

²⁸ Biosis Pty Ltd 2010

²⁹ Biosis Pty Ltd 2010

³⁰ Wrigley 2001

³¹ Bayley 1965

³² St Mary's Towers Retreat Centre n.d.

³³ Kayandel Archaeological Services 2014

³⁴ Steel 1904

³⁵ State Heritage Inventory n.d.

Wilton Park was established by Hordern in 1891, and soon became the centre for the Hordern's horse breeding, becoming one of the leading horse breeding studs in Australia.³⁶

In 1871 a public school was built within the town, along with a post office in 1872, the school however was closed in 1948 due to a lack of student enrolments.³⁷ Population growth was attributed to the high influx of workers for the Upper Nepean water supply scheme. One of the first engineering feats for this scheme was the construction of a tunnel about eight kilometres long which passed underneath Wilton and joins weirs at Pheasant's Nest and Broughton Pass (see section 3.3.4 for further details). There are several air vents located within Wilton, and these are the only indicators of its existence.³⁸

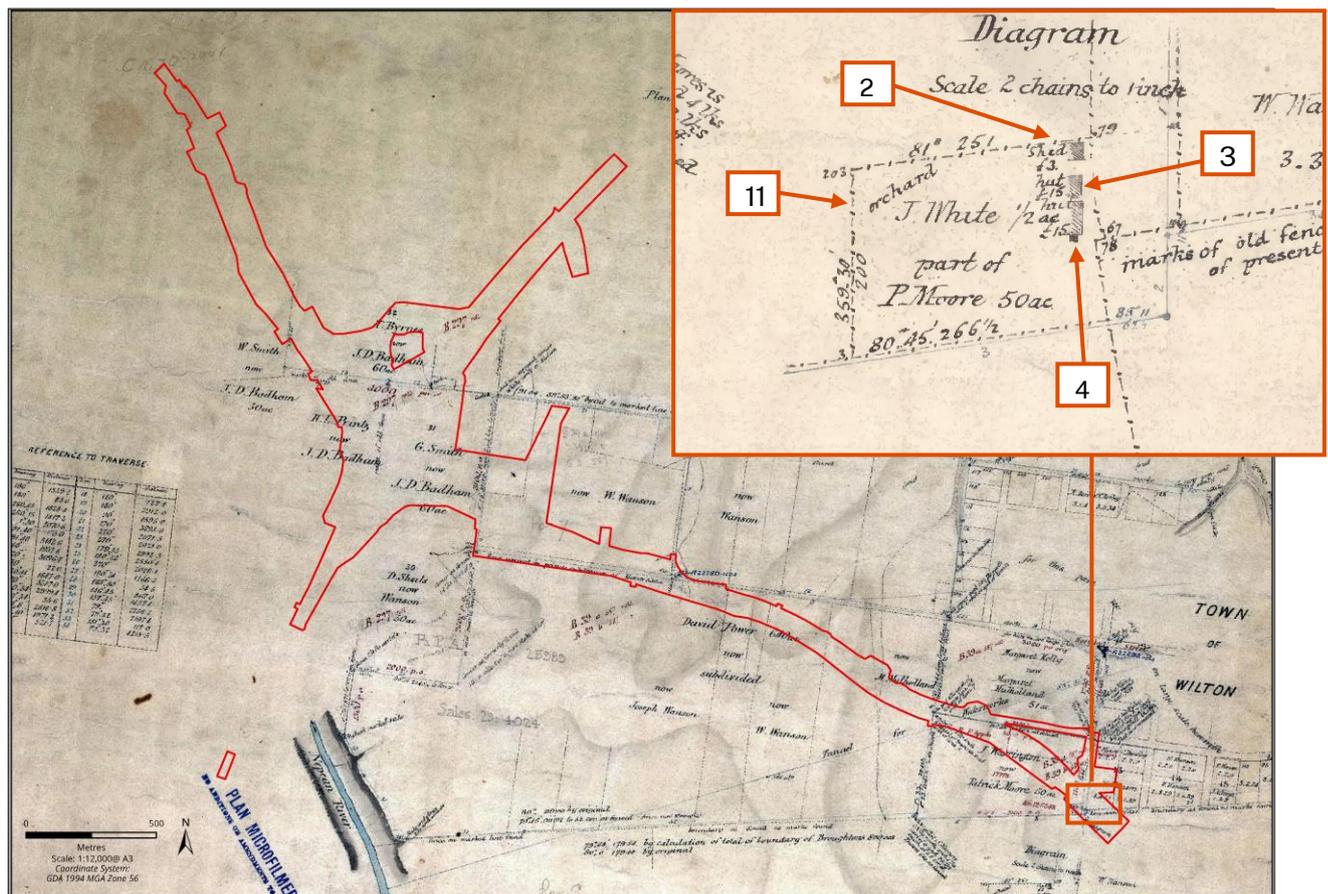


Photo 2 Plan of town of Wilton dated to 1914, proposal site shown in red, showing the boundary fencing [1], shed [2] and huts [3] [4] (Source: Source: NSW Land Registry Services, Crown plan 1070.2041)

By the early 1900s, the land within the town had been divided into several smaller lots (Photo 2 and Photo 3). Belonging to James Warrington and transferred into the ownership of Patrick Moore, large portions of the southern part of the proposal site lie within this 50-acre lot. The proposal site intersects this lot in the south-east corner, where it appears an area has been subdivided for an occupant and marked with a fence line [1]. The land was occupied by J. White and has three structures within it, including a shed [2], and two huts [3] [4]. Across from this property, was a lot owned by William Wanson. Within the north-east corner of the property owned by Patrick Moore, were two structures, a hut [5] and a shed [6].

³⁶ State Heritage Inventory n.d.

³⁷ Kayandel Archaeological Services 2014

³⁸ Navin Officer Heritage Consultants 1992

In the eastern portion of the study area at the junction of Almond Street and Argyle Street, is the Cottage (Item: I275) [8], and across from this, also on Argyle Street, is St Luke's Anglican Church (Item: I276) [9] (Photo 3). St Luke's was built in 1902 when builder Mr T.P. Latter secured a contract for constructing a new Anglican church upon two acres of land.³⁹ The land was gifted to the Church of England by Mrs Richard Lewis of Camden, and Mrs Charles Wonson of Wilton, and was designed to be of dark coloured bricks with Gothic heads on door and window openings.⁴⁰

³⁹ State Heritage Inventory & Heritage NSW n.d.

⁴⁰ 'Wilton', 1902

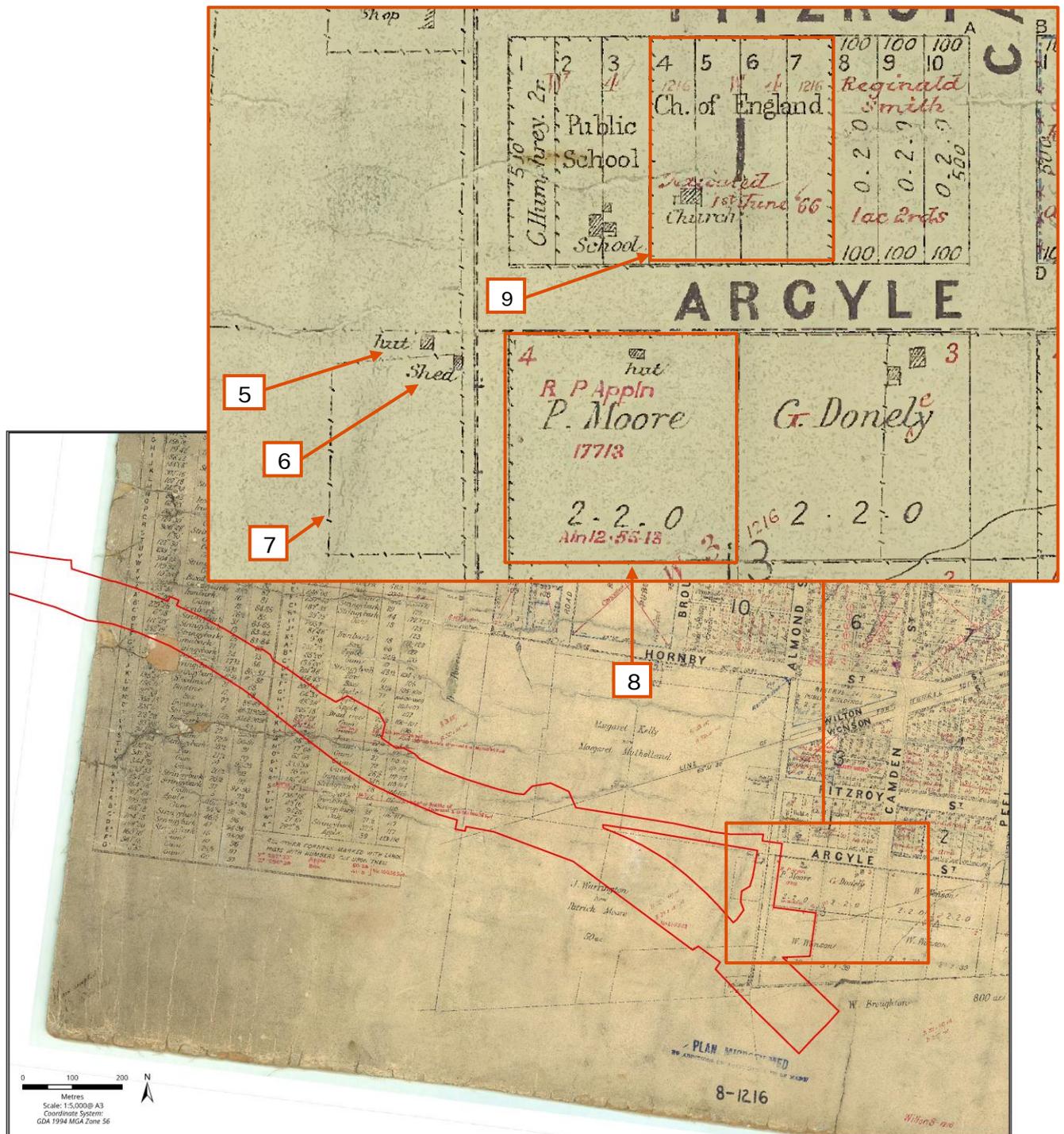


Photo 3 Plan of town of Wilton dated to 1914, proposal site shown in red, showing the hut [5], shed [6], boundary fencing [7] Cottage (Item: I275) [8], and St Luke's Anglican Church (Item: I276) [9] (Source: Source: NSW Land Registry Services, Crown plan W8.1216)

Historical aerial imagery allows for modern developments within the proposal site and the study area to be identified. A historical aerial image dated to 1975 shows that extensive large vegetation clearance had occurred within the proposal site and a major dirt road can be clearly discerned transecting the western portion and Hornby Street, can be seen transecting the central portion (Photo 4). A large, shed structure can be seen in the central portion of the proposal site, along with another large, shed structure in the east. Located throughout the proposal site and the study area are dams and boundary fence lines within various properties.



Photo 4 Aerial photograph dated to 1975 showing southern portion of the proposal site, indicated by the red boundary (Source: NSW Spatial Services)

An aerial image dated to 1978 shows further development within the proposal site, with the most notable change being the construction of Picton Road (Photo 5). Additional dams exist throughout the proposal site and a large shed structure has been built in the eastern portion.



Photo 5 Aerial photograph dated to 1978 showing southern portion of the proposal site, indicated by the red boundary (Source: NSW Spatial Services)

An aerial image dated to 2005 shows that Picton Road has been further developed, appearing more defined and having been extended (Photo 6). Two residential buildings have been constructed within the proposal site, one on the northern side of Picton Road, and another on the southern side.



Photo 6 Aerial photograph dated to 2005 showing southern portion of the proposal site, indicated by the red boundary (Source: NSW Spatial Services)

3.3.4 The Upper Canal (1888–present)

The Upper Canal System, the easement and heritage curtilage for which transects the southern portion of the proposal site, forms a part of the Upper Nepean Scheme, constructed between 1880 and 1888, and supplying water to Sydney from 1888 to the present day. The Upper Canal moves water which is stored in the catchment dams of the Upper Nepean (Cataract, Cordeaux, Avon and Nepean) to the Prospect Reservoir, which is the major water source for much of metropolitan Sydney. The system has not undergone a great deal of change since its construction, except for maintenance and improvements necessary for its function.⁴¹

The Upper Nepean Scheme was originally conceived in the 1860s, when a commission into Sydney’s water supply was appointed, involving John Smith (Professor of Physics, Sydney University), Edward Moriarty (Engineer in Chief, Harbours, and Rivers), Phillip Adams (Deputy Surveyor-General), Francis Grundy (Civil Engineer) and Thomas Moore. In 1869, the recommendation was given by the commission that the Upper Nepean Scheme be undertaken.⁴² The works were not immediately undertaken; however, six years later, with the continual growth of Sydney’s population, the government decided to seek an independent opinion, bringing Mr W. Clark, an eminent civil engineer, to the colony from England. Clark’s assessment was similar to that of the commission, and in 1877 he recommended that the Upper Nepean Scheme would provide the best capacity for future development, while also supplying water at the least expensive rate.⁴³

⁴¹ <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4580004> viewed 09/03/2018

⁴² Henry 1939

⁴³ Henry 1939

During the construction of the Scheme, Sydney experienced multiple dry seasons, and the water supply from the Botany Swamps, the primary source of water, were running low. During this time, in 1885, the government accepted a proposal from the Hudson Brothers engineering firm (later Clyde Engineering). The proposal involved the construction of a series of temporary cast iron flumes supported by timber trestles to bridge the gaps and creeks over which the canal had not yet been constructed to supply water to the Botany Swamps. The "Hudson Emergency Scheme" began operation in 1886 and functioned until the completion of the Upper Nepean Scheme in 1888, whereupon it was deconstructed and sold.⁴⁴

A Crown plan for the Upper Canal System shows that the owners and occupiers of the lots within which an underground portion of the Upper Canal existed were Patrick Moore and William Mulholland (Photo 7). From 1918 to 1926 Wilton was home to many workers on the construction of the Cordeaux Dam, a catchment dam that formed part of the Upper Nepean Scheme. During this period, a light railway from Douglas Park to the Nepean River passed through Wilton carrying supplies.

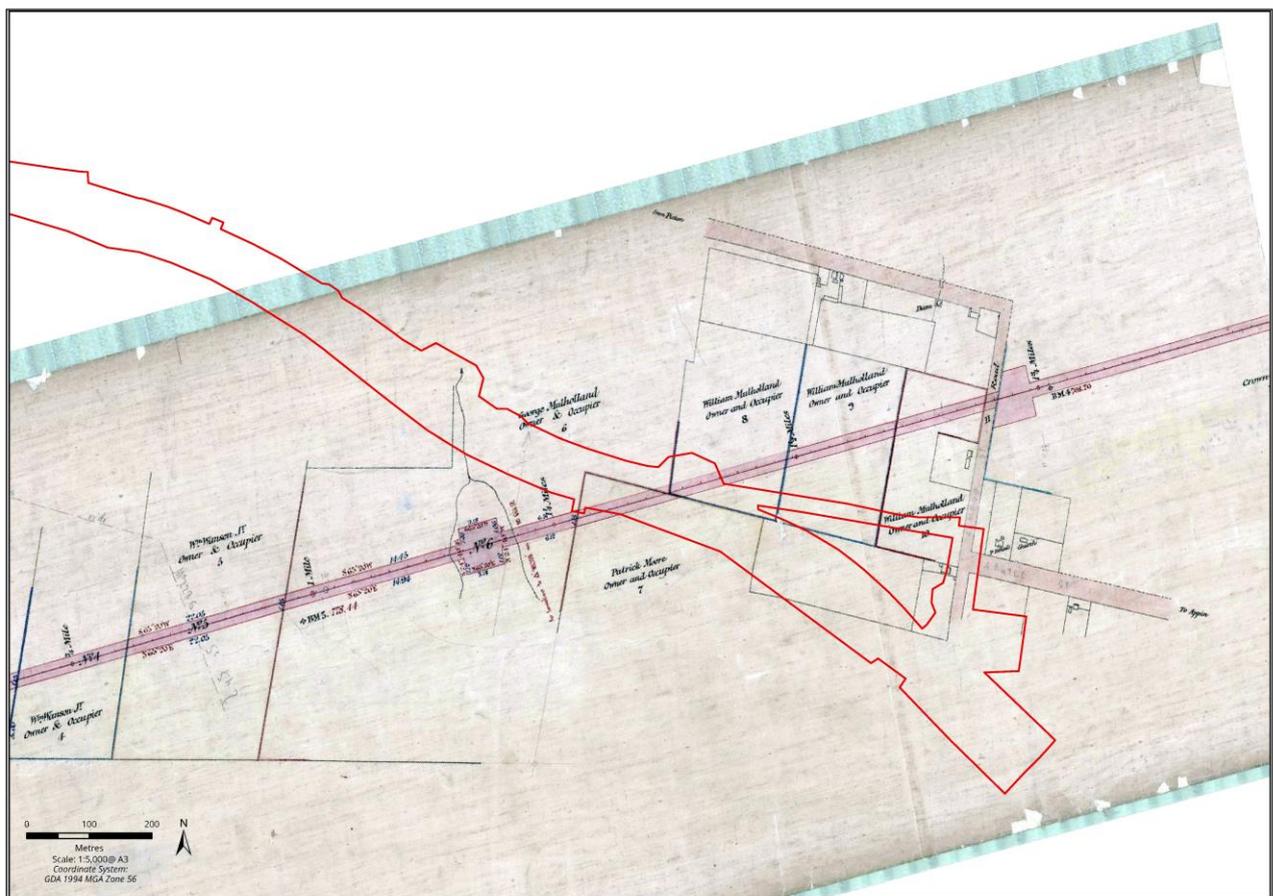


Photo 7 Plan of town of Wilton dated to 1893, proposal site shown in red (Source: Source: NSW Land Registry Services, Crown plan 287.3000)

The Nepean System itself, as well as the Upper Canal System, are listed in the State Heritage Inventory, as well as on national lists, as significant examples of 19th-century canal construction and hydraulic engineering. It is particularly unique in that it only uses gravity to feed water through the system.⁴⁵ After the Nepean and Cataract Tunnels, the Upper Canal System drops a total of 50 metres BGL over 54 kilometres, or 0.1%

⁴⁴ <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageltemDetails.aspx?ID=4580004> viewed 29/03/2017

⁴⁵ <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageltemDetails.aspx?ID=1280006> viewed 09/03/2018

grade.⁴⁶ The Upper Canal and its associated components have been comprehensively described in the heritage study and Conservation Management Plan (CMP) prepared by Higginbotham & Associates.⁴⁷

The Upper Canal itself is a mixture of tunnels, canals, and aqueducts extending from Pheasants Nest Weir to Prospect Reservoir. It is about 64 kilometres long in total. The construction of the canals varied based on the terrain. Some sections were cut straight into bedrock, where the bedrock was appropriate. Others were cut in a V-shape and lined with either sandstone or shale blocks. These are particularly present where the underlying ground is softer. In other areas, the canal is a U-shape, and lined with sandstone masonry.⁴⁸ Tunnels are either lined with bricks or unlined; once again, this is dependent on the underlying geology of the area. Unreinforced concrete was also utilised along some stretches, forming trapezoidal-shaped canal cross-sections running through soft ground.⁴⁹

After its construction was completed, the Upper Canal was subject to constant change, improvement, and maintenance, continuing to the present day. Initially, the area surrounding the Canal, and much of the Upper Nepean Scheme, was largely rural. Men were assigned cottages along its length to patrol allotments of roughly eight kilometres and see to any maintenance required. This scheme was phased out in the 1970s in favour of mobile maintenance teams.⁵⁰ A part of this reason was the expansion of Sydney, which continues to this day. From the 1940s and 1950s onwards, the Upper Canal was no longer in a rural setting. Housing developments were edging ever closer, and issues began to appear in the system, particularly related to drainage and the inability of the historic drainage systems to cope. Increased urbanism has led to other problems, such as vandalism, and traffic accidents, which impact on the water quality of the Canal.⁵¹

3.3.4.1 Section One – The Upper Canal

The Upper Nepean Scheme includes, among other items, the Upper Canal, Prospect Reservoir, and the Lower Canal. Originally, these elements were divided up into one or more maintenance sections. There are 11 sections within the Upper Canal, each section comprises a variable number of precincts. The precincts were determined based on the location of groups of items in proximity. The Upper Canal commences by tunnel from Pheasants Nest Weir on the Nepean River. The Pheasants Nest weir was planned and constructed on the Nepean River, below the confluence of the Nepean River and the Cordeaux River, during the 1870s and 80s. The construction created diversion works which were designed to supply water from a broad catchment area into the Upper Canal and the Sydney water supply.

The Cordeaux River catchment area became a part of a series of protected reserves in 1880, 1915 and 1923. The southern portion of the proposal site transects the curtilage of section one (part 1) of the Upper Canal System (Figure 2 and Photo 8), comprising the Nepean Tunnel. This portion of the heritage item is located subsurface, about 90 metres BGL. An air shaft is also located approximately 80 metres south-west of the proposal site. The easement component of the heritage item, located above the tunnel, does not include any built fabric visible from the ground surface; however, it comprises of the heritage curtilage for the canal.⁵² The easement is located within the proposal site, in the southern section.

⁴⁶ Sydney Catchment Authority 2013

⁴⁷ Edward Higginbotham & Associates 2002

⁴⁸ Edward Higginbotham & Associates 2002

⁴⁹ Sydney Catchment Authority 2013

⁵⁰ Sydney Catchment Authority 2013

⁵¹ AMBS 2012

⁵² Edward Higginbotham & Associates 2002

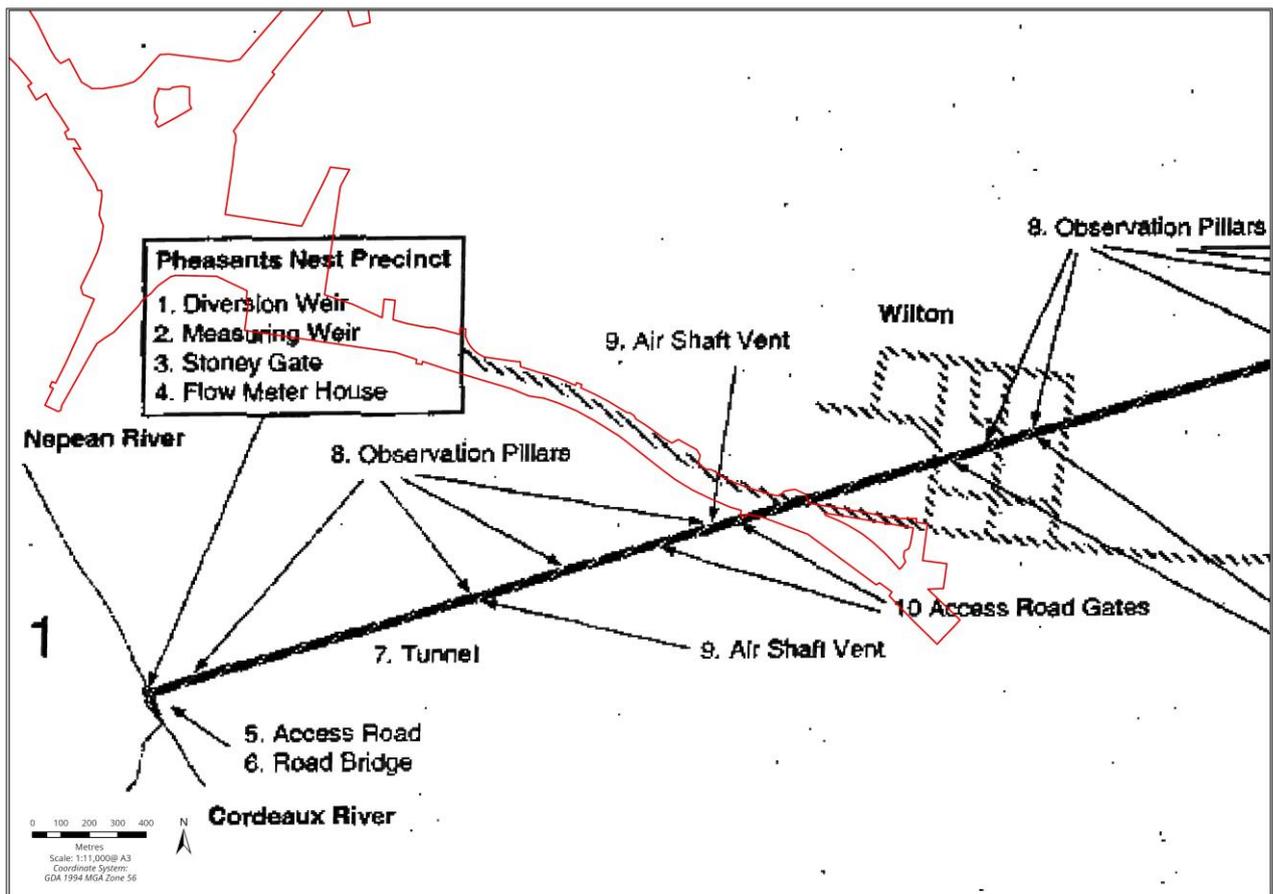


Photo 8 Section one (part 1) of the Upper Canal System; the start of the Upper Canal is actually located at Pheasants nest weir, seven kilometres west of Cataract River, not shown on the diagram (Source: Edward Higginbotham & Associates 1992)

3.3.5 Modern development North of Wilton to the Nepean River (1975–present)

Aerial images dated to 1975 show that extensive large vegetation clearance has occurred within the central portion of the proposal site and a major dirt road can be clearly discerned transecting the western portion (Photo 9 and Photo 10). Much of the proposal site and the study area has been developed for agricultural purposes, with large vegetation existing in the northern portion approaching the Nepean River.



Photo 9 Aerial photograph dated to 1975 showing northern portion of the proposal site, indicated by the red boundary (Source: NSW Spatial Services)



Photo 10 Aerial photograph dated to 1975 showing central portion of the proposal site, indicated by the red boundary (Source: NSW Spatial Services)

Aerial images dated to 1978 show the initial stages of the development of Picton Road, for which significant portions of farmland have been cleared (Photo 11 and Photo 12).

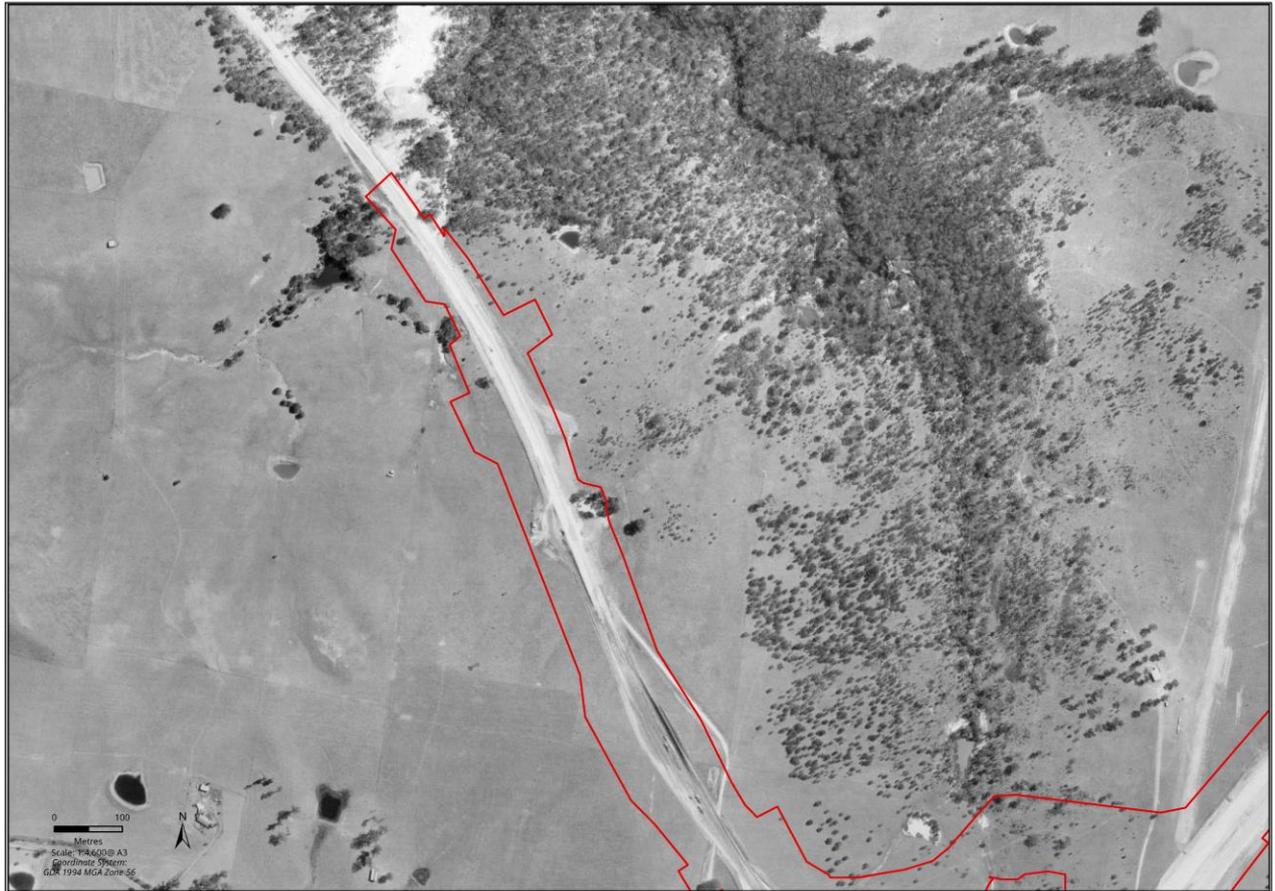


Photo 11 Aerial photograph dated to 1978 showing northern portion of the proposal site, indicated by the red boundary (Source: NSW Spatial Services)



Photo 12 Aerial photograph dated to 1978 showing central portion of the proposal site, indicated by the red boundary (Source: NSW Spatial Services)

Aerial images dated to 2005 show the established Picton Road (Photo 13 and Photo 14). A bridge in the south of the study area has been constructed over the Nepean River (not shown on Photo 13 and Photo 14). Limited other changes in the built fabric located within the study area have occurred during this time.



Photo 13 Aerial photograph dated to 2005 showing northern portion of the proposal site, indicated by the red boundary (Source: NSW Spatial Services)



Photo 14 Aerial photograph dated to 2005 showing central portion of the proposal site, indicated by the red boundary (Source: NSW Spatial Services)

3.4 Chronology of the study area

Based upon the historical research presented the chronology of development within and around the study area is presented in Table 6.

Table 6 List of built elements within the study area

No.	Building	Possible date of construction	Possible date of demolition
Within the proposal site			
1	Boundary fencing	Pre-1914 (see Photo 2)	Pre-1975
2	Shed	Pre-1914 (see Photo 2)	Pre-1975
3	Hut	Pre-1914 (see Photo 2)	Pre-1975
4	Hut	Pre-1914 (see Photo 2)	Pre-1975
5	Hut	Pre-1914 (see Photo 3)	Pre-1975
6	Shed	Pre-1914 (see Photo 3)	Pre-1975
Within the broader study area			
7	Boundary fencing	Pre-1914 (see Photo 3)	Pre-1975

No.	Building	Possible date of construction	Possible date of demolition
8	Cottage (Item: I275)	Pre-1914 (see Photo 3)	-
9	St Luke's Anglican Church (Item: I276)	Pre-1914 (see Photo 3)	-

3.5 Research themes

Contextual analysis is undertaken in order to provide a history of a particular site within the wider history of the region. This allows researchers to gauge how typical or unique the history of a particular site is. This is usually ascertained by gaining an understanding of the history of a site in relation to the broad historical themes characterising Australia at the time. Such themes have been established by the Australian Heritage Commission (AHC) and the Heritage Office (former) and are outlined in synoptic form in Historical Themes.⁵³

There are 38 State historical themes, which have been developed for NSW, as well as nine National historical themes. These broader themes are usually referred to when developing sub-themes for a local area to ensure they complement the overall thematic framework for the broader region. A review of the contextual history in conjunction with the local historical thematic history has identified seven historical NSW themes which relate to the history of the study area. This is summarised in Table 7.

Table 7 Identified historical themes for the study area

Australian theme	NSW theme	Local theme
Developing local, regional and national economies	Agriculture	Activities relating to the cultivation and rearing of plant and animal species, usually for commercial purposes, can include aquaculture.
	Transport	Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements.
Developing Australia's cultural life	Pastoralism	Activities associated with the breeding, raising, processing and distribution of livestock for human use.
	Domestic life	Activities associated with creating, maintaining, living in and working around houses and institutions.
Peopling Australia	Aboriginal cultures and interactions with other cultures	Activities associated with maintaining, developing, experiencing and remembering Aboriginal cultural identities and practises, past and present; with demonstrating distinctive ways of life; and with interactions demonstrating race relations.
Building settlements, towns and cities	Utilities	Activities associated with the provision of services, especially on a communal basis.
	Towns, suburbs and villages	Activities associated with creating, planning and managing urban functions, landscapes and lifestyles in towns, suburbs and villages.

⁵³ NSW Heritage Council 2001

4 Methodology

4.1 Methodology

4.1.1 Study area

The study area is defined as a one kilometre buffer surrounding the proposal site. The study area contains a mixture of private and public land, roads, and waterways. The study area is presented in Figure 3 and Figure 4.

The study area also included an additional buffer of one kilometre around Alkoomie Place, as this area was initially investigated as a turn around area for construction vehicles. However, it is noted that this area is no longer included in the proposal site.

4.1.2 Main tasks

The assessment involved the following main tasks:

- Task 1 – Historic heritage research
 - Background research was undertaken to inform the field investigation in Task 2. The research comprised a review of the following:
 - Heritage databases, including the State Heritage Register, Commonwealth Heritage List, National Heritage List, Register of National Estate, Transport Asset Holding Entity Section 170 Register, *WSEPP* and the Wollondilly LEP, to confirm the known listed heritage items within and surrounding the proposal site (section 2).
 - Local studies, historical maps, aerial imagery, and land titles to compile a history of the study area and identified heritage items and inform the significance assessment (task 3) (section 3).
 - Previous assessments and publications to establish the local and regional character of historical land use (section 3).
- Task 2 – Field investigation
 - Biosis conducted a historical heritage field investigation (one archaeologist over one day) focussed on the proposal site to understand the streetscape/landscape in and around the proposal site, identify/confirm known heritage items, and any potential heritage items that may be present (section 5.2). This included an assessment of:
 - The surrounding streetscape and visual relationships with adjacent heritage items.
 - Archaeological potential.
 - Disturbance, which assisted with predictive modelling for areas of archaeological potential and the significance assessment.
- Task 3 – Significance and impact assessment
 - An assessment of significance was undertaken for any heritage items identified within or close to the proposal site in accordance with *Assessing Heritage Significance*.
 - Potential impacts on identified heritage was assessed in accordance with relevant guidelines and requirements noted above, including *Statements of Heritage Impact* (section 6 and 7).

- Best practice and additional mitigation and management measures were recommended to protect the significance of identified heritage items and areas of archaeological potential (within or close to the proposal site) in accordance with relevant guidelines and the Heritage Act (section 8).
- Biosis reviewed and advised on any proposal-specific design responses to avoid, minimise or mitigate impacts on non-Aboriginal heritage values (section 8).
- Task 4 – Prepare assessment report (Non-Aboriginal (historic) heritage working paper)
 - The present assessment was prepared to summarise the results of tasks 1 to 3.

As part of this assessment, a number of legislative guidelines, policies and documents were followed to ensure adherence and compliance; they are as follows:

- *Assessing Heritage Significance*.⁵⁴
- *Guidelines for preparing a statement of heritage impact*.⁵⁵
- *Historical Archaeology Code of Practice*.⁵⁶
- *Assessing Significance for Historical Archaeological Sites and Relics*.⁵⁷
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (the Burra Charter).⁵⁸
- *PN 285 GA01 Cultural Heritage Guidelines*.⁵⁹
- Heritage Act.
- EPBC Act.
- WSEPP.
- Wollondilly LEP.

Full details on legislative drivers and why they have been applied can be found in sections 2, 6 and 7 of this report.

⁵⁴ Heritage Office 2001

⁵⁵ Department of Planning and Environment 2023

⁵⁶ Heritage Office & Department of Planning 2006

⁵⁷ NSW Heritage Branch, Department of Planning 2009

⁵⁸ Australia ICOMOS 2013

⁵⁹ Roads and Maritime Services, now Transport for NSW, 2015

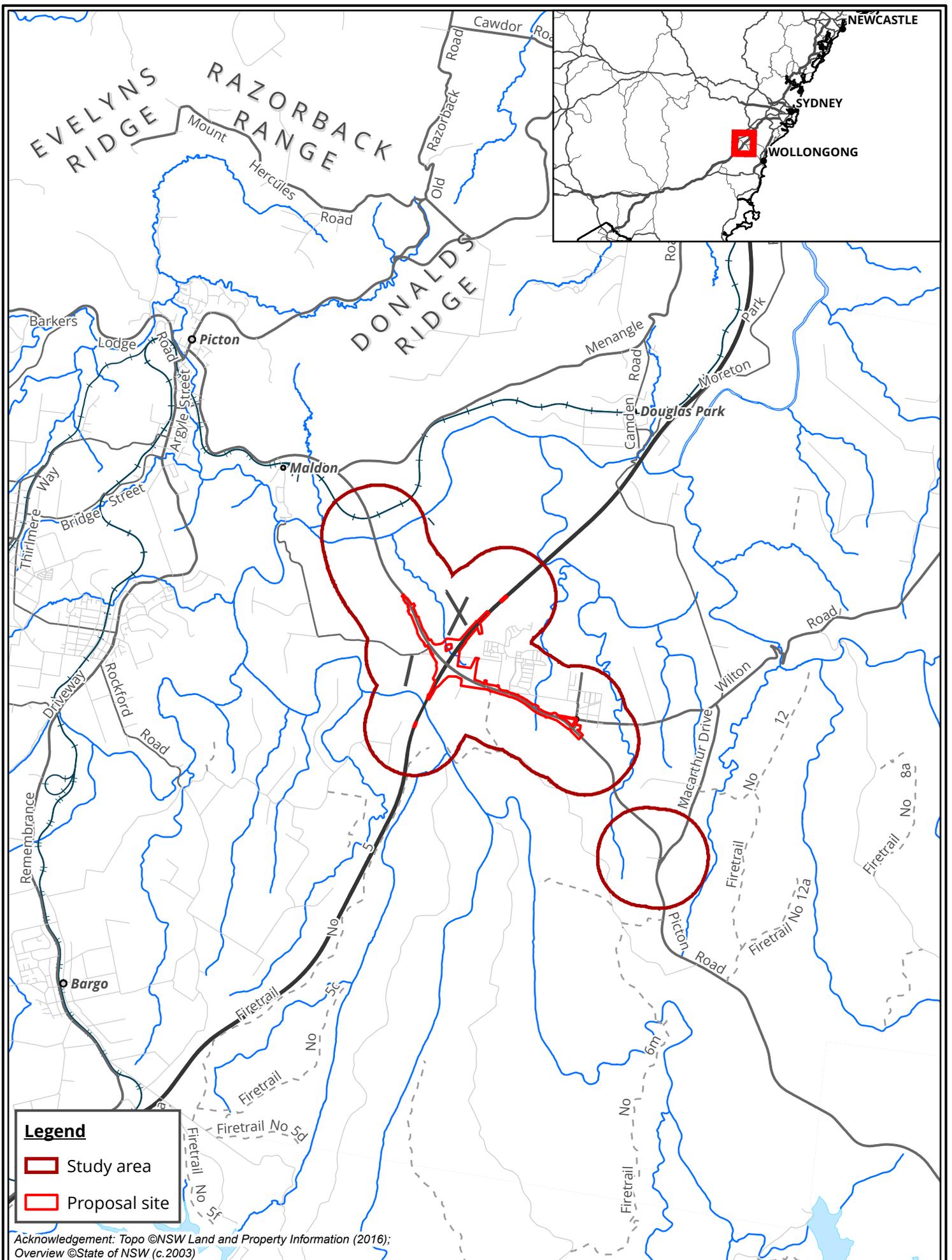
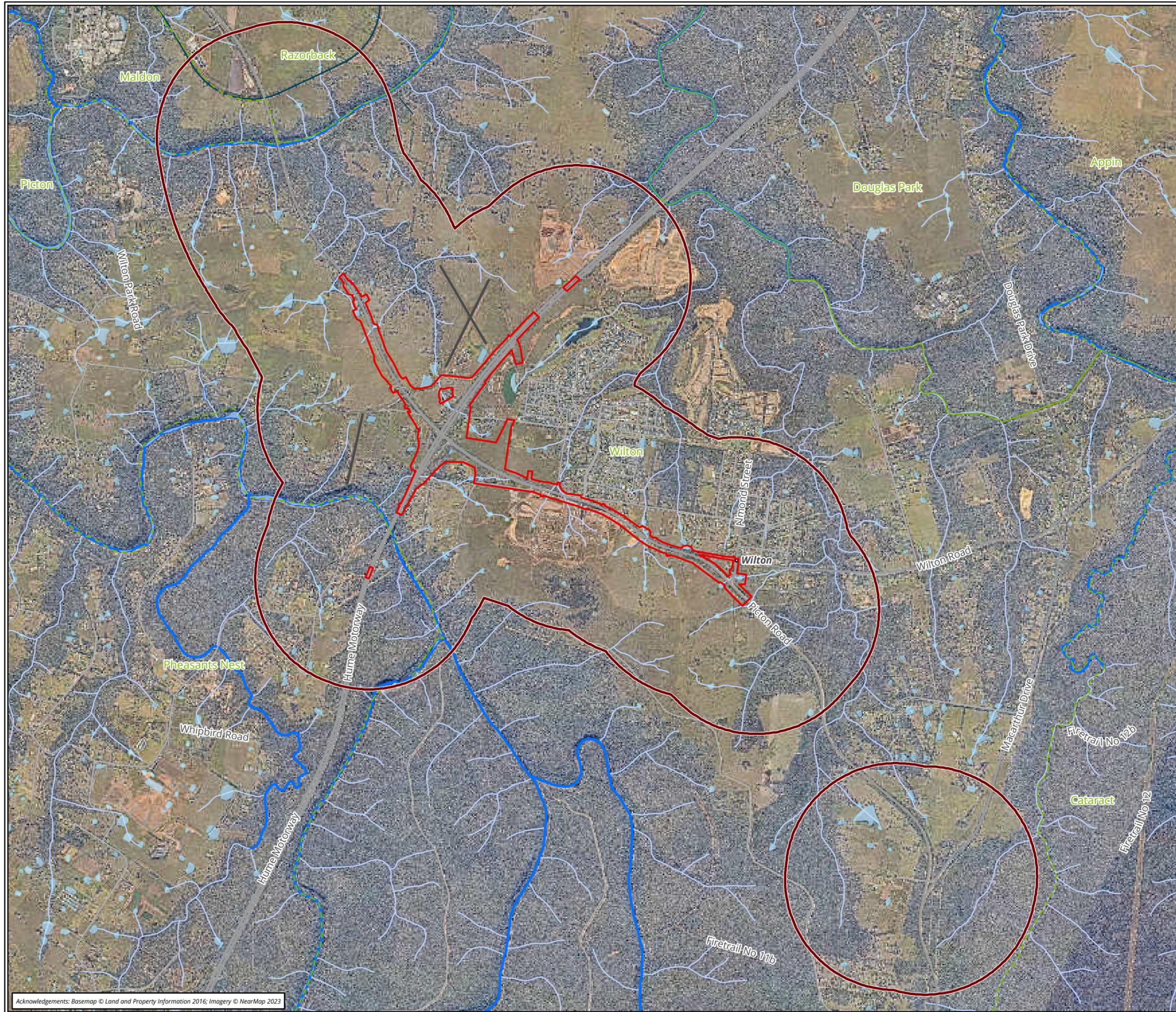


Figure 3 Location of the study area



- Legend**
- Study area
 - Proposal site

Figure 4 Study area detail



Metres
 Scale: 1:32,000@ A3
 Coordinate System:
 GDA 1994 MGA Zone 56



Matter: 37295, Date: 19 September 2023,
 Drawn by: JB, Checked by: JM, Last edited by: jtownsend
 Location: P:\37200s\37295\Mapping\
 37295_PictonRd_HHA, Layout: 37295_HHA_F5_StudyArea

4.2 Investigation of study area

A physical inspection (survey) of the proposal site and study area was undertaken by Biosis in February 2023. The principal aims of the survey were to identify any heritage values associated with the proposal site and the study area, with initial database searches focusing on the proposal site and a one-kilometre buffer area around the confirmed proposal site. The proposal site forms the focus for the assessment, extending to any view corridors of nearby heritage items, confirmed during field investigations.

This methodology included the assessment of any listed or unlisted heritage items, 'Places' or built elements. 'Heritage items' can be buildings, structures, places, relics, or other works of historical, aesthetic, social, technical/research or natural heritage significance. 'Places' include conservation areas, sites, precincts, gardens, landscapes, and areas of archaeological potential.

4.2.1 Survey

The physical inspection was conducted in accordance with the requirements of *Assessing Heritage Significance*.⁶⁰ It was completed on 28 February 2023 by Heritage Consultant Ashley Bridge and Graduate Heritage Consultant Nathan Windram. It involved the pedestrian survey of listed heritage items within, or directly adjacent to the proposal site, as well as non-heritage listed structures within the proposal site and study area to determine their heritage significance, if any. Additionally, lines of sight and visual relationships with the proposal site and study area were also considered.

The results of the survey are described in section 5.2.

4.3 Construction assessment methodology

4.3.1 Assessing impacts to heritage

The discussion of potential impacts to heritage can be centred upon a series of questions which must be answered as part of a SoHI which frame the nature of impact to a heritage item. As this report assesses impacts to non-Aboriginal heritage, it must include a SoHI. The Heritage Manual guideline – *Statements of Heritage Impact* includes a series of questions in relation to indicate the criterion which must be answered.⁶¹ While there are several items within the proposal site, the development will not demolish, change the use of or add to the items, subdivide, repaint, re-roof, fire upgrade, add new services, require new landscape works and features, remove or replace trees or add additional signage to the items. Therefore, the most appropriate assessment is through the questions relating to 'new development adjacent to a heritage item'.⁶²

1. *How is the impact of the new development on the heritage significance of the item or area to be minimised?*
2. *Why is the new development required to be adjacent to a heritage item?*
3. *How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?*
4. *How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?*
5. *Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they rejected?*

⁶⁰ (Heritage Office 2001)

⁶¹ (Heritage Office & DUAP 1996)

⁶² Heritage Office & DUAP 1996

6. *Is the new development sympathetic to the heritage item? In what way (e.g. form, siting, proportions, design)?*
7. *Will the additions visually dominate the heritage item? How has this been minimised?*
8. *Will the public, and users of the item, still be able to view and appreciate its significance?*

Based upon the discussion of impacts to heritage items, impact to these items can be quantified under three main categories: direct impacts, indirect impacts, and no impact. These impacts are dependent on the proposed impacts, nature of the heritage item and its associated curtilage.

Direct impacts

Direct impacts are where the completion of a proposed development will result in a physical loss or alteration to a heritage item, which will impact the heritage value or significance of the place. Direct impacts can be divided into whole or partial impacts. Whole impacts essentially will result in the removal of a heritage item as a result of the development, whereas partial impacts normally constitute impacts to a curtilage or partial removal of heritage values. For the purposes of this assessment, potential direct impacts to heritage items have been placed into the following categories:

- Direct (physical) impacts – whole: caused by removing or altering the item or fabric of heritage significance or excavating in areas of the proposal site where the potential for significant archaeology is anticipated. This would have an impact on the heritage item (as a whole), resulting in the complete physical loss of significance attributed to the item.
- Direct (physical) impacts – partial: where the proposal would have the potential for a partial impact on an item which could result in the loss or reduction in heritage significance. The degree of impact through partial impacts is dependent on the nature and setting of a heritage item. Typically, these are minor impacts to a small proportion of a curtilage of an item or works occurring within the curtilage of a heritage item which may impact on its setting (i.e. gardens and plantings).

Indirect impacts

Indirect impacts to a heritage item relate to alterations to the environment or setting of a heritage item which could result in a loss of heritage value. This may include permanent or temporary visual impacts caused during construction of the development. Indirect impacts can diminish the significance of an item through altering its relationship to its surroundings; this in turn can impact its ability to be appreciated for its historical, functional, or aesthetic values. For the purposes of this assessment, potential indirect impacts to heritage items have been placed into the following categories:

- Indirect impacts – visual: caused by the proposal obscuring lines of sight to a heritage item or altering the setting of an item, during construction and/or operation.
- Indirect impacts – noise and vibration: caused by noise or vibrations associated with the removal or development of adjacent structures/infrastructure during construction. Also, could be caused by removing adjoining structures within or outside the proposal site.

For the proposal, the potential for vibrational impacts is assessed by the Noise and Vibration Impact Assessment, which forms an appendix to the REF.

No impact

This is where a project would not constitute a measurable direct or indirect impact to the heritage item.

4.4 Operational assessment methodology

4.4.1 Assessing impacts to heritage

Impacts to heritage during operation of a new development can be centred upon a series of questions which must be answered as part of a SoHI and frame the nature of impact to a heritage item. The same questions that apply to construction (see section 4.3.1) apply to the assessment of potential impacts during operation.⁶³

Based upon the discussion of potential impacts to heritage items, impact to these items can be qualified under two main categories: indirect impacts and no impacts. These kinds of impacts are dependent on the proposed impacts, nature of the heritage item and its associated curtilage.

Indirect impacts

Indirect impacts to a heritage item relate to alterations to the environment or setting of a heritage item which can result in a loss of heritage value. This may include permanent or temporary visual impacts caused after the completion of the development. Indirect impacts can diminish the significance of an item through altering its relationship to its surroundings; this in turn can impact its ability to be appreciated for its historical, functional, or aesthetic values.

No impact

This is where a project would not constitute a measurable direct or indirect impact to the heritage item.

4.5 Limitations and assumptions

4.5.1 Assumptions

The significance assessments included in this report are a combination of both facts and interpretation of those facts in accordance with a standard set of assessment criteria. It is possible that another professional may interpret the historical facts and physical evidence in a different way.

4.5.2 Limitations

This report is based on historical research and field surveys. It is possible that further historical research or the emergence of new historical sources may support different interpretations of the evidence in this report. While the area was surveyed by Biosis in 2023, 13 properties were not accessible at the time of the field survey due to access not being provided by the private land owner. While no direct inspections were possible for these properties, photos were taken from the property boundary where possible. Of these 13 inaccessible properties, one property (Lot 211 DP 735556) was contained within the proposal site, and the rest within the wider study area. Based on this and historical context research, it is considered that the risk of these properties having unlisted heritage items or places that could be impacted by the proposal is low; however, further assessment via an additional survey would be required to confirm this.

⁶³ Heritage Office & DUAP 1996

5 Existing environment

The proposal site contains one heritage item (the Upper Canal System, located 90 metres BGL of the proposal site, crossing under Picton Road). The wider study area contains an additional five listed heritage items (one item is subject to two listings). This assessment has not identified any new information which would alter the assessment of heritage significance of these items, nor did it identify any unlisted heritage items as part of the assessment.

Table 8 provides a summary of heritage listed items within the proposal site and study area, with these items also shown in Figure 2.

Table 8 Summary of heritage listings within the study area

Listing number	Listed heritage item/s	Spatial relationship to proposal site or study area	Listing type/database	Significance
Items located within the proposal site				
01373	Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)	Within the proposal site , in the southern section (noting that this portion of the heritage item is located subsurface, about 90 metres BGL and an air shaft located approximately 80 metres southwest of the proposal boundary)	SHR	State
I16	Upper Nepean Scheme – Upper Canal	Within the proposal site , in the southern section (noting that this portion of the heritage item is located subsurface, about 90 metres BGL and an air shaft located approximately 80 metres southwest of the proposal boundary)	Wollondilly LEP	State
4580004	Upper Nepean Scheme (including Upper Canal and Prospect Reservoir)	Within the proposal site , in the southern section (noting that this portion of the heritage item is located subsurface, about 90 metres BGL and an air shaft located approximately 80 metres southwest of the proposal boundary)	Section 170 WaterNSW Heritage and Conservation Register	Not specified in listing
Items within the broader study area				
I278	Upper Nepean Scheme-- Pheasants Nest Weir	Within the study area, about 1.4 kilometres south-west	Wollondilly LEP 2011	Local
I275	Cottage	Within the study area, about 25 metres from the proposal site the proposal site, in Argyle Street	SSEPP, WSEPP	Local

Listing number	Listed heritage item/s	Spatial relationship to proposal site or study area	Listing type/database	Significance
00257	Wilton Park	Within the study area, about 1.2 kilometres from the proposal site	SHR	State
1277	Wilton Park - — stables, coachhouse, water tanks, stallion boxes and covered yards	Within the study area, about 1.2 kilometres from the proposal site	Wollondilly LEP	State
1276	St Luke's Anglican Church	Within the study area, about 63 metres from the proposal site at Argyle Street	Wollondilly LEP	Local
1279	Cottage	Within the study area, about 950 metres west of the proposal site and 345 metres north of the Nepean River	Wollondilly LEP	Local
1285	Aboriginal Shelter Sites	Within the study area, about 615 metres north-east of the proposal site at its closest point	Wollondilly LEP	Local

5.1 Significance assessment

The archaeological significance of a site is commonly assessed in terms of historical and scientific values, particularly by what a site can tell us about past lifestyles and people. There is an accepted procedure for determining the level of significance of an archaeological site.

A detailed set of criteria for assessing the State's cultural heritage was published by the (then) NSW Heritage Office. These criteria are divided into two categories: nature of significance and comparative significance.

The NSW Heritage Office issued a more detailed set of assessment criteria to provide consistency with heritage agencies in other States and to avoid ambiguity and misinterpretation. These criteria are based on the Burra Charter. The following SHR criteria were gazetted following amendments to the Heritage Act that came into effect in April 1999:

- Criterion (a)-- an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or 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 or natural history of the local area).
- Criterion (c) - an item is important in demonstrating the 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 cultural or natural places; or cultural or natural environments; or a class of the local area's cultural or natural places; or cultural or natural environments.

The existing significance assessments and statements of heritage significance from the State Heritage Inventory for each listed heritage item are presented in the relevant sections below. Please note that all tables below are taken directly from the heritage listing and have not been modified or edited for the purpose of this report.

5.1.1 Existing significance assessments for listed heritage items within the proposal site

5.1.1.1 Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (SHR 01373, Item no. I16, Item no. 4580004, Item no. I278)

Beginning construction in 1880 and being fully commissioned into use by 1888, these listings are for the humanmade section of the Upper Nepean Scheme between Pheasants Nest Weir and Prospect Reservoir, which operates as a gravity supply. Above ground, it channels water in open canal sections, with the materials and structure types changing to suit the nature of the countryside through which it passes. In other sections it is U-shaped and lined with sandstone masonry or left unlined where the canal would cut through solid rock. Over hills and rises, tunnels were excavated and left unlined where they passed through rock and lined with brick where they cut through softer material. Over creek and other deep depressions, the water moved through wrought iron aqueducts.

The portion of the heritage item that passes beneath the proposal site is a subsurface, gravity fed tunnel which supplies and transports water through the Upper Canal System. It is located about 90 metres BGL at its shallowest point and was likely excavated and left unlined where construction passed through rock and lined with brick where they cut through softer material.⁶⁴ The ground-level easement for the Upper Canal System is taken to be part of the item's curtilage.

Table 9 Significance assessment for Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (SHR 01373)

Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (SHR 01373)	
Evaluation of significance	
Criterion A	The Upper Nepean Scheme has functioned as part of the main water supply system for Sydney since 1888. Apart from the augmentation and development in supply and other improvements, the Upper Canal and Prospect Reservoir portions of the Scheme have changed little and, in most cases, operate in essentially the same way as was originally envisaged.
Criterion B	The construction of the Upper Nepean Scheme made the big advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it to the city by means of major canals and pipelines.
Criterion C	N/A
Criterion D	N/A
Criterion E	The Upper Nepean Scheme provides detailed and varied evidence of engineering construction techniques prior to the revolution inspired by reinforced concrete construction. Although concrete was later used to improve the durability of the System, much of the earlier technology is still evident along the canal.

⁶⁴ State Heritage Inventory & Heritage NSW n.d.

Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (SHR 01373)

	It also provides extensive evidence of the evolution of engineering practice, such as the replacement of timber flumes by wrought iron flumes to be followed by concrete flumes. The early utilisation of concrete for many engineering purposes in the System, also demonstrates the growing emergence of an engineering technology based upon man-made materials. Many of the original control installations such as the 'Stone' gates, stop logs, penstocks, gate valves are still in service and continue to illustrate the technology of the time.
Criterion F	The Upper Nepean Scheme is unique in NSW, being the only extensive canal, reservoir and dam network to supply a large city and its population with fresh water from a distant source in the hinterland. This type of water supply system is also rare in Australia and only has major comparative examples in other countries.
Criterion G	N/A

Statement of significance

The Upper Canal System 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 since 1888. 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 to 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.

(Edward Higginbotham & Associates, SCA Heritage and Conservation Register, 18 December 2000)

5.1.1.2 Upper Nepean Scheme (including Upper Canal and Prospect Reservoir) (WaterNSW Section 170 4580004)

The Upper Nepean Scheme (including Upper Canal and Prospect Reservoir) was designed by Edward Orpen Moriarty, Head of the Harbours and River Branch of the NSW Public Works Department and built by the Board of Water Supply and Sewerage from 1880-1888. The main components of the scheme are the Upper Canal and Prospect Reservoir.⁶⁵

⁶⁵ <https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=4580004>

Table 10 Significance assessment for the Upper Nepean Scheme (including Upper Canal and Prospect Reservoir) (WaterNSW Section 170 4580004)

Upper Canal Scheme (including Upper Canal and Prospect Reservoir) (WaterNSW Section 170 4580004)	
Evaluation of significance	
Criterion A	The Upper Nepean Scheme has functioned as part of the main water supply system for Sydney for over 130 years, and apart from development in supply and improvements has changed little in its basic principles since the day it was completed, except for the decommissioning of the Lower Canal in the 1990s.
Criterion B	N/A
Criterion C	The Upper Nepean Scheme is an excellent example of the ingenuity of late nineteenth century hydraulic engineering, illustrating the techniques of canal building (often at extremely small grades), the progressive improvements in both pipe manufacture and pipeline construction, and the construction, even by present day standards, of a large earth fill and rock dam. The way in which it was designed to supply a large area of Sydney by gravity is particularly noteworthy.
Criterion D	N/A
Criterion E	<p>The Upper Nepean Scheme provides detailed and varied evidence of engineering construction techniques prior to the revolution inspired by reinforced concrete construction. Although concrete was later used to improve the durability of the system, much of the earlier technology is still evident along the Canal.</p> <p>It also provides extensive evidence of the evolution of engineering practice, such as the replacement of timber flumes by wrought iron flumes to be followed by concrete flumes. The early utilisation of concrete for many engineering purposes in the system, also demonstrates the growing emergence of an engineering technology based upon man-made materials.</p> <p>The Upper Nepean Scheme made the big advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it to the city by means of major canals and pipelines.</p> <p>It is highly significant that the initial Scheme, completed in 1888, lent itself to progressive development over a period of over 120 years to meet Sydney's increasing water supply needs.</p>
Criterion F	Many of the original control installations such as the stop logs, penstocks and gate valves, are still in service and continue to illustrate the technology of the time. This is extremely unusual for an item of technology.
Criterion G	Although some of the features of the Upper Nepean Scheme are used elsewhere in the water supply system, nonetheless many of the structural elements are unique to the Upper Nepean Scheme.
Statement of significance	
<p>The following statement of significance is for the Upper Nepean Scheme as a whole.</p> <p>The Upper Nepean Scheme is significant because:</p> <ul style="list-style-type: none"> * It has functioned as a unique part of the main water supply system for Sydney for over 130 years, and apart from development in supply and improvements has changed little in its basic principles since the day it was completed, except for the decommissioning of the Lower Canal in the 1990s. * It provides detailed and varied evidence of engineering construction techniques prior to the revolution inspired by reinforced concrete construction. Although concrete was later used to improve the durability of the System, much of the earlier technology is still evident along the Canal. * It also provides extensive evidence of the evolution of engineering practice, such as the replacement of timber 	

Upper Canal Scheme (including Upper Canal and Prospect Reservoir) (WaterNSW Section 170 4580004)

flumes by wrought iron flumes to be followed by concrete flumes. The early utilisation of concrete for many engineering purposes in the system, also demonstrates the growing emergence of an engineering technology based upon man-made materials.

- * The Upper Nepean Scheme made the big advance from depending on local water sources to harvesting water in upland catchment areas, storing it in major dams and transporting it to the city by means of major canals and pipelines.
- * In its scope and execution, it is a unique and excellent example of the ingenuity of late nineteenth century hydraulic engineering in Australia, illustrating the techniques of canal building (often at extremely small grades), the progressive improvements in both pipe manufacture and pipeline construction, and the construction, even by present day standards, of a large earth fill and rock dam. The way in which it was designed to supply a large area of Sydney by gravity is particularly noteworthy.
- * Of the way in which the initial Scheme completed in 1888 lent itself to progressive development over a period of over 130 years to meet Sydney's increasing water supply needs.
- * Some of the original control installations such as the stop logs, penstocks and gate valves, are still in service and continue to illustrate the technology of the time. Some have been replaced as they have stopped functioning or have become unsafe.
- * 8. The scheme possesses many elements of infrastructure which are of world and national renown in technological and engineering terms.

5.1.1.3 Upper Nepean Scheme – Upper Canal (Wollondilly LEP Item no. I16)

A local listing for the Upper Canal System, relevant to the Wollondilly LGA (see description in section 5.1.1.1).

Table 11 Significance assessment for Upper Nepean Scheme – Upper Canal (Wollondilly LEP Item no. I16)

Upper Nepean Scheme – Upper Canal (Wollondilly LEP Item no. I16)	
Evaluation of significance	
Criterion A	The Upper Nepean Water Supply Canal is of State significance as the only operational example of its type in NSW. The Canals has played an integral role in the supply of potable water to the Sydney basin for more than a century and was an outstanding feat of civil engineering for the period. The canal has further significance at a local level is its construction provided the impetus for increased growth and economic development of the area.
Criterion B	The Upper Nepean Water Supply Canal is of State significance through its association with the MSW&DB and the Department of Public Works and Services who were seminal in solving the problem of Sydney's drinking water problem in the 19th and 20th centuries.
Criterion C	The Upper Nepean Water Supply Canal is of State significance as the only operational example of its type in NSW. It represents civil engineering skills and construction techniques that are not seen elsewhere and is a significant component in the landscape of the Wollondilly.
Criterion D	The Upper Nepean Water Supply Canal is of local significance as its construction provided the impetus for further growth and economic development in the region. It is associated with "boom" period in the history of the Wollondilly.
Criterion E	The Upper Nepean Water Supply Canal is of State significance for its ability to provide insights into the construction and working of a 19th century gravity fed water supply system. It is unparalleled in its ability to demonstrate the operation of such a system and is a "working model" of 19th century civil engineering.

Upper Nepean Scheme – Upper Canal (Wollondilly LEP Item no. I16)

Criterion F	The Upper Nepean Water Supply Canal is the only operational example of its type in NSW and is therefore considered rare in a State-wide context. It is also rare in a National context.
Criterion G	The Upper Nepean Water Supply Canal is an outstanding example of civil engineering associated with the movement of water from the 19th century.

Statement of significance

SHR Number 01375. The Upper Canal System is historically significant as the scheme commenced, and progressively developed from the late 1880s 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 are considered to provide one of the world's purest sources of water for human consumption.

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.

5.1.2 Existing significance assessments for listed heritage items within the study area

5.1.2.1 Upper Nepean Scheme – Pheasants Nest Weir (Wollondilly LEP I128)

A diversion weir, built as part of the Upper Nepean Water Supply Scheme on the Upper Nepean River, with construction beginning in 1880 and reaching completion by 1888. It is an extensive system of tunnels, aqueducts, canals, reservoirs, and pipeline delivering water from the Nepean River catchment to Crown Street Reservoir in Sydney. Working in tandem with the Broughtons Pass Weir, the Pheasants Nest Weir construction diverts water from the Avon, Cordeaux, and Nepean rivers through a 7.3-kilometre tunnel into the upper canal.⁶⁶

⁶⁶ State Heritage Inventory & Heritage NSW n.d.

Table 12 Significance assessment for Upper Nepean Scheme – Pheasants Nest Weir (Wollondilly LEP I128)

Upper Nepean Scheme – Pheasants Nest Weir (Wollondilly LEP I128)	
Evaluation of significance	
Criterion A	One of the first structures of the Upper Canal, and one of the first structures for the Upper Nepean Water Supply Scheme.
Criterion B	N/A
Criterion C	Unobtrusive, pleasantly scaled structure in a picturesque setting. The retention of water at this point is of its function to divert water into the Upper Canal.
Criterion D	No social significance has been identified.
Criterion E	Provides an opportunity for the study of water flows, riparian ecology and the engineering of weir structures located in riparian contexts.
Criterion F	One of the two original diversion weirs of the Upper Nepean Water Supply Scheme. It is one of the first weirs constructed on the Nepean River.
Criterion G	It is a representative example of a concrete gravity section weir.
Statement of significance	
<p>The Pheasants Nest Weir is one of the first structures of the Upper Canal and was one of the original structures built as part of the development of Upper Nepean Water Supply Scheme. The completion of the weir and its related tunnel was a significant step in the continuing process for providing a reliable water supply for Sydney and surrounding areas. It is one of the most important engineering works of public infrastructure in Australia and demonstrates the extent of associated works which were needed to implement it. It is one of the earliest weirs on the Nepean River. The Pheasants Nest Weir continues to play an important role as a major element of the water supply system.</p>	

5.1.2.2 Cottage (SSEPP I275, WSEPP I275)

The Cottage at 1090 Argyle Street Wilton has local significance as one of the earliest surviving residences and traditional buildings in Wilton. It is regarded as a good example of a pastoral cottage and an important component of the historic cultural landscape of Wilton. The cottage makes an important contribution aesthetically, as it currently occupies a position at the entrance into Wilton. According to a family story told by the owners of the cottage in 2010, the home was a standard pattern house called Hudson Quick-Cut, popular around the 1920s.⁶⁷

Table 13 Significance assessment for Cottage (WSEPP I275)

Cottage (SSEPP I275, WSEPP I275)	
Evaluation of significance	
Criterion A	1090 Argyle Street has a local significance as one of the earliest surviving residences in Wilton and as one of a small number of surviving traditional buildings in Wilton. It is an important component of the historic cultural landscape of Wilton.
Criterion B	N/A

⁶⁷ State Heritage Inventory & Heritage NSW n.d.

Cottage (SSEPP I275, WSEPP I275)

Criterion C	The cottage makes an important contribution to the street and currently occupies a landmark position at an entrance into Wilton village. Significance is enhanced by proximity to the adjacent historic church and cemetery.
Criterion D	N/A
Criterion E	N/A
Criterion F	Rare locally.
Criterion G	A good example of a traditional cottage.

Statement of significance

1090 Argyle Street has local significance as one of the earliest surviving residences in Wilton and as one of a small number of surviving traditional buildings in Wilton. It has further significance as a good example of a pastoral cottage and is an important component of the historic cultural landscape of Wilton.

5.1.2.3 Wilton Park (SHR 00257), Wilton Park – stables, coach house, water tanks, stallion boxes, covered yards (LEP I277)

This item is listed on both the SHR and the Wollondilly LEP. An approximate date of construction is listed as 1892, the group of structures constituting the stables contain a coach-house, harness room underground water tanks, stallion boxes, a covered yard and a quadrangle, which is enclosed by three buildings, the quadrangle was originally composed of raked gravel but is now grass. The stable building faces north and contains 12 loose boxes. It is long and narrow in plan and built from 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.

The Coach house and harness room faces east, they contain a fine original harness cupboard as well as the grooms' room and feed room. The northern 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. The covered round yard is made up 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 buildings are considered to be in good condition following restoration attempts in sympathy with the original design during the 1970s.⁶⁸

The significance assessment for the SHR item takes into consideration the significance assessment from the LEP listing (Table 15), which is why there are no criterion completed in Table 14.

Table 14 Significance assessment for Wilton Park (SHR 00257)

Wilton Park (SHR 00257)	
Evaluation of significance	
Criterion A	N/A
Criterion B	N/A
Criterion C	N/A

⁶⁸ State Heritage Inventory & Heritage NSW n.d.

Wilton Park (SHR 00257)	
Criterion D	N/A
Criterion E	N/A
Criterion F	N/A
Criterion G	N/A
Statement of significance	
<p>The Wilton Park stables group, which remains much as it was when retailer 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.</p> <p>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. Of historic, architectural and aesthetic value (LEP, 1991).</p> <p>Sited on gently sloping ground in a formal composition around a central quadrangle, the buildings are fine examples of rural architecture from a time when stock breeding was an important and developing Industry (RNE, 1980).</p>	

Table 15 Significance assessment for Wilton Park – stables, coach house, water tanks, stallion boxes, covered yards (LEP I277)

Wilton Park – stables, coach house, water tanks, stallion boxes, covered yards (LEP I277)	
Evaluation of significance	
Criterion A	<p>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.</p> <p>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. Of historic, architectural and aesthetic value.</p>

Wilton Park – stables, coach house, water tanks, stallion boxes, covered yards (LEP I277)

Criterion B	The Wilton Park Stables Group has State significance through its association with Samuel Hordern and the wider Hordern family.
Criterion C	<p>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.</p> <p>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. Of historic, architectural and aesthetic value.</p>
Criterion D	N/A
Criterion E	N/A
Criterion F	This item is assessed as aesthetically rare Statewide.
Criterion G	This item is assessed as aesthetically representative Statewide.

Statement of significance

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 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.

Of historic, architectural and aesthetic value. Items of significance include the stables, coachhouse, water tanks, stallion boxes, covered yards.

5.1.2.4 St Luke's Anglican Church (Wollondilly LEP I276)

Constructed in 1902, the item is a small gothic church building of brickwork with a steeply pitched gabled roof clad with terracotta tiles. Small brickwork buttresses line the sides and a decorative band of red brickwork lines the building at windowsill height as well as framing door and window openings. The front elevation features a small cross on the top of the main gable, a circular window below and a small gable-roofed porch.

Windows and doors are generally of timber with lancet heads, the windows to the nave are awning sashes. The internal walls consist of painted brickwork, and the ceiling of timber boarding.⁶⁹

Table 16 Significance assessment for St Luke’s Anglican Church (Wollondilly LEP I276)

St Luke’s Anglican Church (Wollondilly LEP I276)	
Evaluation of significance	
Criterion A	Provides evidence of the growth and development of the village of Wilton.
Criterion B	Important association with families long settled in the surrounding rural area.
Criterion C	Landmark value, making an important contribution to the street and occupying a gateway position into the village. An attractive and well-maintained country church and atmospheric cemetery, picturesquely located, overlooking Appin Road and the valley beyond.
Criterion D	N/A
Criterion E	N/A
Criterion F	Rare locally
Criterion G	Good example of small early 20th century country parish churches in the district.
Statement of significance	
Landmark value, making an important contribution to the street and occupying a gateway position into the village. An attractive and well-maintained country church and atmospheric cemetery, picturesquely located, overlooking Appin Road and the valley beyond.	

5.1.2.5 Cottage (Wollondilly LEP I279)

The small farm cottage was constructed around 1900. The item consists of a steeply pitched hipped roof rising to a central ridge point; single masonry chimney; a bullnosed veranda to front elevation on turned timber posts with decorative timber brackets; timber framed construction with weatherboard cladding; symmetrical form and fenestration; a skillion addition to rear; and single storey. It is in good physical condition and is currently used as a private residence.⁷⁰

Table 17 Significance assessment for Cottage (Wollondilly LEP I279)

Cottage (Wollondilly LEP I279)	
Evaluation of significance	
Criterion A	Local significance as a particularly good example of 19th century pastoral cottages and as one of a small number of surviving 19 th century buildings in the Wilton area.
Criterion B	N/A
Criterion C	It is particularly charming example of the small farm cottage that once proliferated in the area and its significance is enhanced by its prominent string on the brow of a small hill.
Criterion D	N/A
Criterion E	N/A

⁶⁹ State Heritage Inventory & Heritage NSW n.d.

⁷⁰ <https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=2690791>

Cottage (Wollondilly LEP I279)

Criterion F	This item is assessed as rare locally.
Criterion G	An excellent example of late 19 th century pastoral cottages in the district.

Statement of significance

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.

5.1.2.6 Aboriginal Shelter Sites (Wollondilly LEP I285)

Amendment No. 56 to the *Wollondilly Local Environment Plan 1991* for the Wilton Parklands site identifies Aboriginal shelter sites located within the deeply incised gullies carrying Allens Creek and Stringybark Creek.⁷¹ Full details on the Aboriginal Heritage Information Management System listing information for this heritage item can be found in the Aboriginal Cultural Heritage Assessment, which forms as an appendix to the REF.

Table 18 Significance assessment for Aboriginal Shelter Sites (Wollondilly LEP I285)

Aboriginal Shelter Sites (Wollondilly LEP I285)

Evaluation of significance

Criterion A	N/A
Criterion B	N/A
Criterion C	N/A
Criterion D	Social significance for the local Aboriginal community
Criterion E	N/A
Criterion F	N//A
Criterion G	N/A

Statement of significance

An archaeological assessment was prepared as a component of the local environmental study for Amendment No. 56 to the *Wollondilly Local Environmental Plan 1991* for the Wilton Parklands site. The study identified Aboriginal shelter sites located within the deeply incised gullies carrying Allens Creek and Stringybark Creek.

5.2 Physical inspection of the study area

A physical inspection (survey) of the proposal site and study area was undertaken on 28 February 2023, attended by Ashley Bridge (Biosis, Heritage Consultant) and Nathan Windram (Biosis, Graduate Heritage Consultant). Please refer to section 4.2 for the methodology used for the physical inspection.

⁷¹ State Heritage Inventory & Heritage NSW n.d.

5.2.1 Site setting

The majority of the study area is located within a rural farmland setting. The proposal site is located mainly within the existing road reserves of Picton Road, Pembroke Parade, Aerodrome Drive, Wilton Park Road, Janderra Lane, M31 Hume Motorway, Argyle Street and Almond Street, while a small portion of the eastern part is contained within a residential/rural setting. The proposal site and areas within the study area containing built items or heritage items comprise of the following Lots/DPs (Table 19).

Table 19 Areas within the study area containing built items or heritage items

Lot/DP	Description	Heritage item
Lot 1 DP 1018965	Bounded to the south and west by Picton Road, the east by Almond Street and the north by residential properties.	None
Lot 1 DP 1236516	Bounded by Argyle Street to the south, Fitzroy Street to the north and residential properties to the west and east.	Yes – St Luke’s Anglican Church
Lot 1 DP 1288665	Bounded by Picton Road to the north and rural farmland properties to the east, west and south.	None
Lot 1 DP 744620	Bounded by Argyle Street and residential properties to the south, Almond Street to the east and residential properties to the north and west.	Yes – Upper Canal System
Lot 1 DP 270536	Bounded by Allens Creek to the north and residential/rural properties to the south, west and east.	Yes – Aboriginal shelter sites
Lot 15 DP 656868	Bounded by Hornby Street West to the north, farmland to the west, Picton Road to the south and residential properties to the east.	None
Lot 16 DP 251051	Bounded by Berwick Park Road and Picton Road to the north, the M31 Hume Motorway to the east and rural farmland to the west and Nepean River to the south.	None
Lot 20 DP 251051	Bounded by Picton Road to the north, M31 Hume Motorway to the west, Janderra Lane to the south and rural farmland to the east.	None
Lot 20 DP 253157	Bounded by Picton Road to the south, Hornby Street to the north and residential and rural farmland to the east and west.	None
Lot 21 DP 253157	Bounded by Picton Road to the south, Hornby Street to the north and residential and rural farmland to the east and west.	None
Lot 22 DP 253157	Bounded by Picton Road to the south, Hornby Street and residential properties to the north and residential and rural farmland to the east and west. Lot 1 DP 744620 runs diagonally through the eastern portion of the area.	None
Lot 32 DP 814280	Bounded by Argyle Steet to the north, Almond Street in the west and residential properties to the east and south.	Yes - Cottage
Lot 102 DP 1232553	Bounded by Picton Road to the north and rural farmland to the south, east and west.	None
Lot 103 DP 1232553	Bounded by Picton Road to the north and rural farmland to the south, east and west.	None
Lot 183 DP 280010	Bounded by Pembroke Parade to the east, Condell Park Road and	None

Lot/DP	Description	Heritage item
	Picton Road to the south, and residential properties to the north and west.	
Lot 184 DP 280010	Bounded by Pembroke Parade to the west, Hornby Street West and Picton Road to the south, and residential properties to the north and east.	None
Lot 210 DP 735556	Bounded by Condell Park Road to the north, Picton Road to the south and rural farmland properties to the east and west.	None
Lot 211 DP 735556	Bounded by Condell Park Road to the north, the M31 Hume Motorway to the west, Picton Road to the south and rural farmland properties to the east.	None
Lot 301 DP 1184442	Bounded by Condell Park Road to the south, the M31 Hume Motorway to the west and north, and residential properties to the east.	None
Lot 302 DP 1184442	Bounded by Condell Park Road to the south, the M31 Hume Motorway to the west and north, and residential properties to the east.	None
Lot 303 DP 1184442	Bounded by Condell Park Road to the south, the M31 Hume Motorway to the west and north, and residential properties to the east.	None

The proposal site is characterised by multilane arterial roads, road shoulder, dirt access roads, associated road infrastructure, paddocks, and residential housing (Table 20). It is important to analyse and describe views to and from components within a landscape to help understand how it is experienced and to understand the nature of an evolving landscape. This enables a greater understanding of what aspects of the landscape need to be conserved and protected. Significant views to, from and within the proposal site are described in this section and shown in Table 20.

Table 20 Views throughout the proposal site and the study area

Description	Photo
Views within the proposal site, along Picton Road facing east with views of the multilane road and existing development in the area	

Description	Photo
<p>Views within the study area, showing typical farmland properties, facing west towards M31 Hume Motorway</p>	
<p>Views within the study area, along Wilton Park Road facing east</p>	
<p>Views within the proposal site and study area, along Pembroke Parade facing south towards Picton Road</p>	
<p>Dirt access roads within the study area, within Lot 301 DP 1184442, facing north towards power plant and M31 Hume Motorway</p>	

5.2.2 Inspection of heritage items

The study area contains five locally listed heritage items under the Wollondilly LEP, one item from the WaterNSW Section 170 heritage register, and two items listed on the SHR (see Table 8 for full details). Views to and from each heritage item are described in this section and shown in Table 21. No new items of heritage significance were identified during the physical inspection.

Table 21 Heritage items throughout the study area

Item no.	Description	Photo
Cottage, Item no. I275	Views of Cottage facing south with Picton Road in background	
	Views of Cottage along Argyle Street, facing west towards Picton Road	
St Luke's Anglican Church, Item no. I276	Views to St Luke's and adjacent cemetery, facing north	

Item no.	Description	Photo
	Views from St Luke's and adjacent cemetery, facing south towards Picton Road	
Wilton Park, Item no. I277	Views to the heritage item from Wilton Park Road, facing east	
	Views to Picton Road and the western boundary of the heritage item from Lot 202 DP 621568, facing south-east	
Upper Canal System (Pheasants Nest Weir to Prospect Reservoir), Item no. I278	Views of the Upper Canal System easement to Picton Road, facing south-west	

Item no.	Description	Photo
	Views from the Upper Canal System easement facing away from Picton Road towards Wonson Street, facing north-east	
Cottage, Item no. I279	Views of Cottage from Wilton Park Road, facing east towards Picton Road	
	Views facing away from the Cottage, facing south to Wilton Park Road	
Aboriginal Shelter Sites, Item no. I285	Views of heritage item and Stringybark Creek, facing south towards Picton Road	

Item no.	Description	Photo
	Views of heritage item, Stringybark Creek and Greenbridge Drive, facing west towards Picton Road and the M31 Hume Motorway	

5.2.3 Built fabric assessment

Within the proposal site and study area, several structures or built elements were present. These included fence lines, electricity lines, dams, a recycling plant and numerous modern houses. Construction materials ranged from timber, brick, corrugated steel, concrete and metal. None of the built elements that were observed during the survey were considered to have heritage significance. A representative set of images for these structures has been provided below in Table 22.

Table 22 Built structures in the proposal site and study area

Lot/DP	Building description	Photo
Lot 210 DP 735556	Single storey brick veneer dwelling with tiled gable roof	
Lot 210 DP 735556	Artificial dam and views to single storey brick veneer dwelling with tiled gable roof in the adjacent lot (Lot 211 DP 735556)	

Lot/DP	Building description	Photo
Lot 302 DP 1184442	Single storey corrugated iron shed and recycle plant	
Lot 183 DP 280010	Single storey brick veneer dwelling with tiled gable roof	
Lot 16 DP 251051	Single storey brick veneer dwelling with tiled gable roof	

5.3 Archaeological assessment

The potential archaeological resource relates to the predicted level of preservation of archaeological resources within the proposal site and study area. Archaeological potential is influenced by the geographical and topographical location, the level of development, subsequent impacts, levels of onsite fill and the factors influencing preservation such as soil type. An assessment of archaeological potential has been derived from the historical analysis undertaken during the preparation of this report.

5.3.1 Archaeological resource

This section discusses the archaeological resource within the proposal site and study area. The purpose of the analysis is to outline what non-Aboriginal archaeological deposits or structures are likely to be present within the proposal site and study area and how these relate to the history of land use associated with the area.

The historical context presented in this report indicates that the study area was developed in the mid-1800s with the designation and development of the township of Wilton. Background research undertaken for the proposal identified five locally listed heritage items, two State listed heritage items and one item listed on the WaterNSW Section 170 heritage register; the curtilage of the Upper Canal System/Scheme extends into the proposal site and the remaining items are located within the broader study area (Table 8). The Upper Canal System/Scheme is listed separately on the SHR, Wollondilly LEP and the WaterNSW Section 170 heritage register. The portion of the Upper Canal System/Scheme within the proposal site is located about 90 metres BGL, with an air shaft located approximately 80 metres southwest of the proposal boundary. All listed items are still present within the current landscape or are situated about 90 metres BGL. Therefore, potential archaeological deposits within the curtilage of these items are low.

A review of Crown Plans and aerial imagery indicated that the south-eastern portion of the proposal site contained six physical structures or fence lines, constructed pre-1914 [2], [3], [4], [5], [6], [7] (refer to Table 6). Additionally, the Upper Canal System was constructed and is visible through the proposal site from 1893. The remainder of the proposal site does not contain any visible structures prior to 1970, with this area primarily used for low intensity agricultural use. Aerial imagery does not show any development within the proposal site until mid-1970s when Picton Road and residential structures were built throughout the alignment. From 1975 onwards, several houses, dams and a recycling plant were built within study area.

As a result, the only potential archaeological resource predating late-1975 in the proposal site or study area would be associated with the agricultural activities undertaken throughout the extent of the study area and the domestic activities undertaken in the south-eastern portion of the proposal site. This may consist of fence lines, post holes, agricultural marks such as plough lines, and cut and fill deposits in relation to agricultural activities, and footings and foundations, fence lines, post holes and cut and fill deposits for domestic activities.

The extant built structures in the study area were constructed between 1975 and 2010. There are no potential archaeological resources associated with these buildings, as they are still present in the study area.

5.3.2 Integrity of sub-surface deposits

The study area has been used primarily as agricultural land, with roads and subsurface infrastructure later constructed. The proposal site was primarily used as both agricultural land and residential land, with the township of Wilton present within the south-eastern portion of the proposal site. This was later impacted roads and subsurface infrastructure.

The construction and maintenance of these roads and associated subsurface infrastructure will have disturbed sub-surface deposits resulting in large areas of ground disturbance and removal of potential archaeological resources associated with agricultural and residential or domestic uses. Therefore, it is unlikely that sub-surface deposits associated with pre-1914 structures [2], [3], [4], [5], [6], [7] will remain (Table 6).

5.3.3 Research themes

Developing local, regional, and national economies – Agriculture

Based upon the historical context and documentary evidence presented within this assessment, it has been determined that if present, archaeological deposits will likely consist of fence lines, post holes and agricultural marks. These are likely to have been heavily disturbed by the construction of the roads and

residential and commercial structures throughout the proposal site and study area. It is unlikely that archaeologically significant remains associated with agricultural land use would occur or be intact within the proposal site or study area. There is no research potential present, as any remains present would not add to current knowledge that could not already be gained from existing documentary sources.

Developing local, regional, and national economies – Transport

Based upon the historical context and documentary evidence presented within this assessment it is unlikely that archaeologically significant remains associated with transport will occur within the proposal site or study area. Archaeological deposits will likely consist of cut and fill deposits, and road surfaces. As Picton Road has not been heavily modified since its completion in 1978, archaeological deposits would not exist within the road alignment. Any cut or fill deposits or road surfaces that may have existed throughout the remainder of the proposal site or study area are likely to have been heavily disturbed by the construction of more recent roads throughout the area. There is no research potential present, as any remains present would not add to current knowledge that could not already be gained from existing documentary sources.

Developing Australia's cultural life – Pastoralism

Based upon the historical context and documentary evidence presented within this assessment it is unlikely that archaeologically significant remains associated with pastoralism will occur within the study area or proposal site. Archaeological deposits associated with this theme will likely consist of post holes or agricultural marks. Both the study area and proposal site have been heavily developed since the 1970s; Picton Road in 1978 and housing developments throughout the wider extent of the study area since 2005. As a result, it is likely that any archaeological deposits that may have existed are likely to have been heavily disturbed by this development. There is no research potential present, as any remains present would not add to current knowledge that could not already be gained from existing documentary sources.

Developing Australia's cultural life – Domestic life

It is unlikely that archaeologically significant remains associated with domestic life will occur within the proposal site or study area due to its continued land use for agricultural pursuits and transport uses. While the study area encapsulates heritage items that exhibit these themes, these are outside of the proposal site and as such would not be impacted by the proposal. Archaeological deposits associated with the Cottage (Item no. I275), which is located directly adjacent to the proposal site, may include archaeological relics relating to domestic life (i.e., ceramic, glassware, household items) circa. 1910s, however these relics are unlikely to extend outside of the curtilage of the heritage item.

It is unlikely that archaeologically-significant remains are present within the study area, outside of the curtilages of the existing heritage items. Archaeological deposits associated with domestic life, associated with the houses in the study area, are likely to postdate the late 1970s and will likely consist of brick or concrete foundations, concrete slab, and associated services with low research potential if present. There are no potential archaeological resources associated with these buildings as they are still present in the study area.

Peopling Australia – Aboriginal cultures and interactions with other cultures

While documentary resources examined as part of the background research did not identify any potential archaeological deposits associated with Peopling Australia – Aboriginal cultures and interactions with other cultures, it is possible that archaeological deposits associated with this theme are present within the study area. Remains may include stone artefacts, hearths, or other physical remains from Aboriginal occupation throughout the thousands of years they have been present. However, without being part of the Aboriginal culture and the productions of this culture, it is not possible for non-Aboriginal people to fully understand the meaning of site, objects, and places to Aboriginal people. The Aboriginal Cultural Heritage Assessment

undertaken by Biosis for the proposal includes the results of consultation with the Aboriginal community and results from archaeological test excavations regarding this theme.

Building settlements, towns and cities – Utilities

Based upon the historical context and documentary evidence presented within this assessment it is unlikely that archaeologically significant remains associated with utilities will occur within the study area or proposal site. Archaeological deposits associated with this theme will likely consist of cut and fill deposits, pipes and/or post holes. As majority of the built fabric present within the study and proposal site can be associated with modern developments, it is likely that any archaeological deposits would not contain historical significance.

Both the study area and proposal site have been heavily developed since the 1970s; Picton Road in 1978 and housing developments throughout the wider extent of the study area since 2005. While there is documentary evidence of pre-1914 structures throughout the south-eastern portion of the proposal site, the construction of Picton Road has likely removed or heavily disturbed any surviving archaeological deposits. There is no research potential present, as any remains present would not add to current knowledge that could not already be gained from existing documentary sources.

Building settlements, towns and cities-- Towns, suburbs and villages

The study area is located throughout the original township of Wilton, which was settled in the early 1800s and designated as a township in 1855. The parish portions located within the proposal site were used primarily for residential purposes, while the study area was primarily used for small scale farming and agricultural purposes. Crown plans and parish maps illustrate that housing, huts and sheds existed within the south-eastern portion of the proposal site, which date to pre-1914. Additionally, the Upper Canal System was constructed and the alignment of the curtilage is visible through the proposal site from 1893.

No major changes can be seen within the study area or proposal site until the 1970s, when Picton Road was constructed, and several residential properties were erected. As a result of the construction of Picton Road, all pre-1914 structures were demolished or removed. There is low potential for undisturbed archaeological material associated with residential subdivisions to be within the study area or proposal site, and it is unlikely that any remains would provide further information regarding settlements that cannot be ascertained from historical documentation.

5.3.4 Research potential

Archaeological research potential refers to the ability of archaeological evidence to provide information about a site that could not be derived from any other source, and which contributes to the archaeological significance of that site. Archaeological research potential differs from archaeological potential in that the presence of an archaeological resource (i.e., archaeological potential) does not mean that it can provide any additional information that increases our understanding of a site or the past (i.e., archaeological research potential).

The research potential of a site is also affected by the integrity of the archaeological resource within a study area. If a site is disturbed, then vital contextual information that links material evidence to a stratigraphic sequence may be missing and it may be impossible to relate material evidence to activities on a site. This is generally held to reduce the ability of an archaeological site to answer research questions.

Assessment of the research potential of a site also relates to the level of existing documentation of a site and of the nature of the research done so far (the research framework), to produce a 'knowledge' pool to which research into archaeological deposits can add.

Based on the type of historical information present within the proposal site or study area, there is low potential for undisturbed archaeological material associated with residential subdivisions; therefore, it is unlikely that any remains would provide further research potential regarding settlements that cannot be ascertained from historical documentation.

5.3.5 Summary of archaeological potential

Through an analysis of the above factors a number of assumptions have been made relating to the archaeological potential of the proposal site, these are presented in Table 23 and Figure 5.

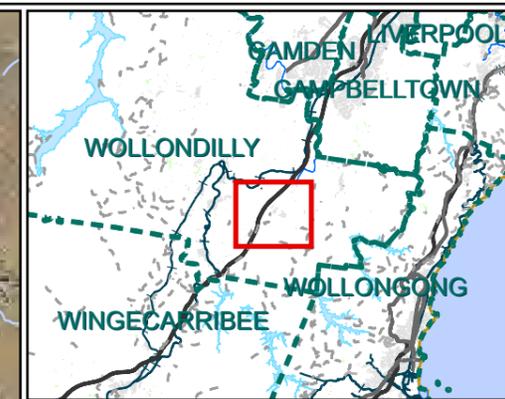
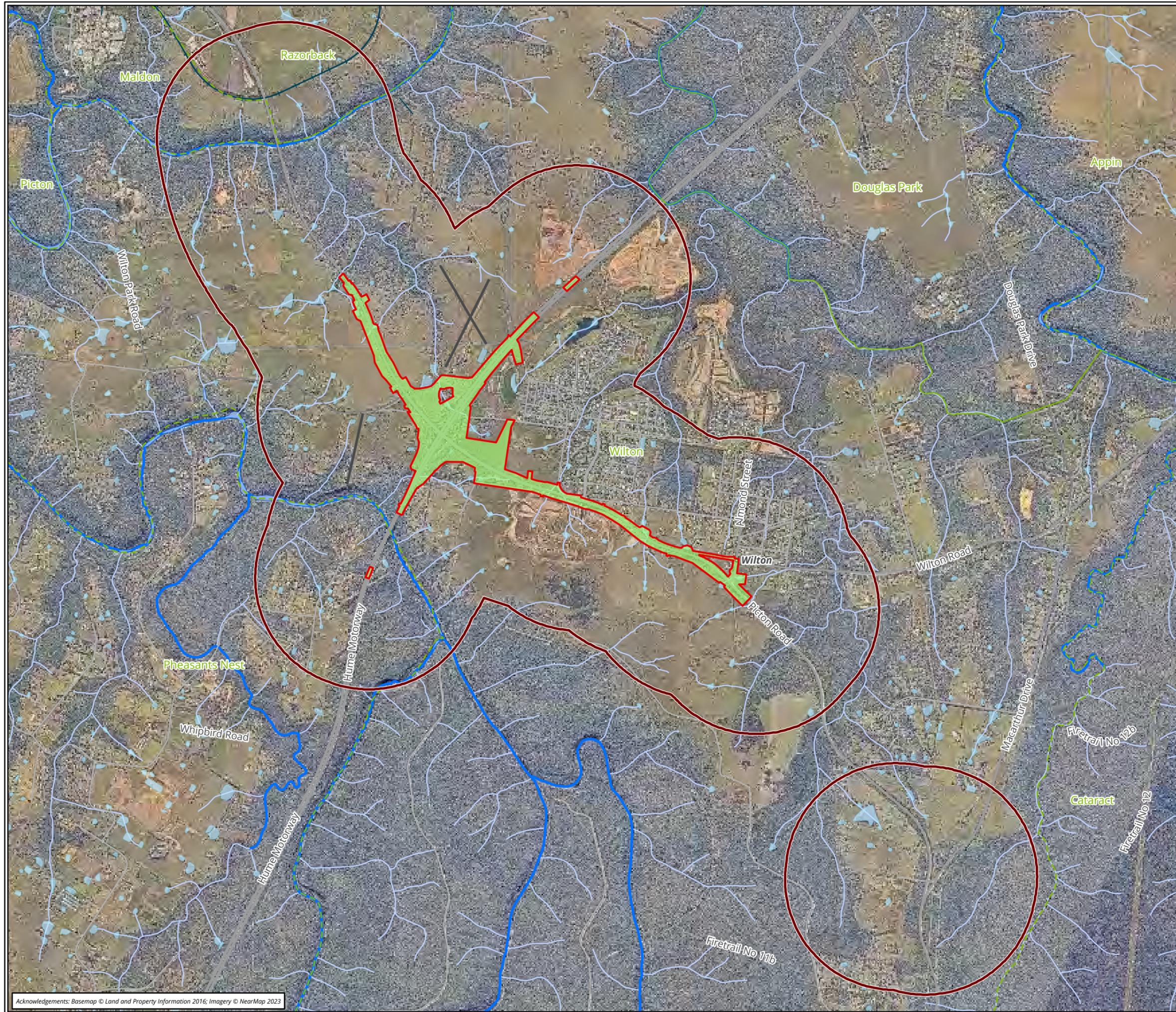
The assessment of archaeological potential has been divided into three categories:

- **High archaeological potential** – based upon the historical context and documentary evidence presented within this assessment there is a high degree of certainty that archaeologically significant remains relating to this period, theme or event will occur within the proposal site.
- **Moderate archaeological potential** – based upon the historical context and documentary evidence presented within this assessment it is probable that archaeological significant remains relating to this period, theme or event could be present within the proposal site.
- **Low archaeological potential** – based upon the historical context and documentary evidence presented within this assessment it is unlikely that archaeological significant remains relating to this period, theme or event will occur within the proposal site.

Table 23 Assessment of archaeological potential for deposits in the proposal site

Site name	Description	Probable feature(s)	Possible construction date	Possible demolition date	Archaeological potential
Low intensity agricultural land use	Evidence of agricultural or pastoral efforts	Post holes, agricultural marks	Pre-1914	-	Low
Boundary fencing [1]	Subdivision fencing separating parish portions	Post holes	Pre-1914	Pre-1975	Low
Shed [2]	Single storey shed in south-eastern portion of proposal site	Structural postholes and footings, rubbish deposits, floor surfaces and fencing postholes	Pre-1914	Pre-1975	Low
Hut [3]	Small structure in south-eastern portion of proposal site	Structural postholes, footings and foundations, rubbish deposits, floor surfaces and fencing postholes	Pre-1914	Pre-1975	Low
Hut [4]	Small structure in south-eastern portion of proposal site	Structural postholes, footings and foundations, rubbish deposits, floor surfaces and fencing postholes	Pre-1914	Pre-1975	Low

Site name	Description	Probable feature(s)	Possible construction date	Possible demolition date	Archaeological potential
Hut [5]	Small structure in south-eastern portion of proposal site	Structural postholes, footings and foundations, rubbish deposits, floor surfaces and fencing postholes	Pre-1914	Pre-1975	Low
Shed [6]	Single storey shed in south-eastern portion of proposal site	Structural postholes and footings, rubbish deposits, floor surfaces and fencing postholes	Pre-1914	Pre-1975	Low
Boundary fencing [7]	Wire fencing separating parish portions	Post holes	Pre-1914	Pre-1975	Low
Modern (post-1975) development	Single storey brick veneer dwellings with tiled gable roofs, recycling plant, artificial dams, fencing, Picton Road and other small roads, dirt roads	-	Post-1975	-	Nil



- Legend**
- Study area
 - Proposal site
 - Low archaeological potential

Figure 5 Archaeological potential within the proposal site



Metres
 Scale: 1:32,000@ A3
 Coordinate System:
 GDA 1994 MGA Zone 56



Matter: 37295, Date: 10 August 2023,
 Drawn by: JB, Checked by: JM, Last edited by: jbeckius
 Location: P:\37200s\37295\Mapping\
 37295_PictonRd_HHA, Layout: 37295_HHA_F6_ArchPot

5.3.6 Archaeological deposits

The archaeological significance of a site is commonly assessed in terms of historical and scientific values, particularly by what a site can tell us about past lifestyles and people. A detailed set of criteria for assessing the State's cultural heritage was published by the (then) NSW Heritage Office. The SHR criteria were gazetted following amendments to the Heritage Act that came into effect in April 1999.

A heritage significance assessment has been undertaken for the archaeological deposits considered to have low archaeological potential to be present within the proposal site (Table 24). The criteria used for the evaluation of heritage significance are those used for the SHR under the Heritage Act. Should any of the remains contain heritage significance, this will be signified by a cross in the relevant columns below; the use of a dash instead of a cross indicates the item did not satisfy the criteria.

Table 24 Evaluation and statements of significance for archaeological deposits within the proposal site

Site name	Significance assessment criteria							Statement of significance
	A	B	C	D	E	F	G	
Low intensity agricultural land use	-	-	-	-	-	-	-	The potential archaeological materials associated with low intensity agricultural land use including fence lines, post holes, and agricultural marks are unlikely to be an important component of or yield information that will contribute to an understanding of the cultural history of NSW or the Wilton area, nor do they hold associations with the life or works of a person(s) of importance. The potential archaeological materials are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in NSW or the Wilton area, and they do not hold a strong or special association with a community or cultural group in NSW or the Wilton area for social, cultural or spiritual reasons. The potential archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or the Wilton area's cultural history, nor do they demonstrate the principal characteristics of a class of NSW or the Wilton area's cultural places or environments. The potential archaeological materials associated with low intensity agricultural land use do not hold heritage significance at a local or State level.
Boundary fencing [1]	-	-	-	-	-	-	-	The potential archaeological materials associated with boundary fencing [1] (post holes) are unlikely to be an important component of or yield information that will contribute to an understanding of the cultural history of NSW or the Wilton area, nor do they hold associations with the life or works of a person(s) of importance. The potential archaeological materials are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in NSW or the Wilton area, and they do not hold a strong or special association with a community or cultural group in NSW or the Wilton area for social, cultural or spiritual reasons. The potential archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or the Wilton area's cultural history, nor do they demonstrate the principal characteristics of a class of NSW or the Wilton area's cultural places or environments. The potential archaeological materials associated with low intensity agricultural land use do not hold heritage significance at a local or State level.

Site name	Significance assessment criteria							Statement of significance
	A	B	C	D	E	F	G	
Shed [2]	-	-	-	-	-	-	-	The potential archaeological evidence associated with the shed [2] including structural postholes and footings, rubbish deposits, floor surfaces and post holes are unlikely to be an important component of or yield information that will contribute to an understanding of the cultural history of NSW or the Wilton area, nor do they hold associations with the life or works of a person(s) of importance. The potential archaeological materials are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in NSW or the Wilton area, and they do not hold a strong or special association with a community or cultural group in NSW or the Wilton area for social, cultural or spiritual reasons. The potential archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or the Wilton area's cultural history, nor do they demonstrate the principal characteristics of a class of NSW or the Wilton area's cultural places or environments. The potential archaeological materials associated with the shed [2] do not hold heritage significance at a local or State level.
Hut [3]	-	-	-	-	-	-	-	The potential archaeological materials associated with the hut [3] including structural postholes, footings and foundations, rubbish deposits, floor surfaces and post holes are unlikely to be an important component of or yield information that will contribute to an understanding of the cultural history of NSW or the Wilton area, nor do they hold associations with the life or works of a person(s) of importance. The potential archaeological materials are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in NSW or the Wilton area, and they do not hold a strong or special association with a community or cultural group in NSW or the Wilton area for social, cultural or spiritual reasons. The potential archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or the Wilton area's cultural history, nor do they demonstrate the principal characteristics of a class of NSW or the Wilton area's cultural places or environments. The potential archaeological materials associated with the hut [3] do not hold heritage significance at a local or State level.

Site name	Significance assessment criteria							Statement of significance
	A	B	C	D	E	F	G	
Hut [4]	-	-	-	-	-	-	-	The potential archaeological materials associated with the hut [4] including structural postholes, footings and foundations, rubbish deposits, floor surfaces and post holes are unlikely to be an important component of or yield information that will contribute to an understanding of the cultural history of NSW or the Wilton area, nor do they hold associations with the life or works of a person(s) of importance. The potential archaeological materials are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in NSW or the Wilton area, and they do not hold a strong or special association with a community or cultural group in NSW or the Wilton area for social, cultural or spiritual reasons. The potential archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or the Wilton area's cultural history, nor do they demonstrate the principal characteristics of a class of NSW or the Wilton area's cultural places or environments. The potential archaeological materials associated with the hut [4] do not hold heritage significance at a local or State level.
Hut [5]	-	-	-	-	-	-	-	The potential archaeological materials associated with the hut [5] including structural postholes, footings and foundations, rubbish deposits, floor surfaces and post holes are unlikely to be an important component of or yield information that will contribute to an understanding of the cultural history of NSW or the Wilton area, nor do they hold associations with the life or works of a person(s) of importance. The potential archaeological materials are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in NSW or the Wilton area, and they do not hold a strong or special association with a community or cultural group in NSW or the Wilton area for social, cultural or spiritual reasons. The potential archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or the Wilton area's cultural history, nor do they demonstrate the principal characteristics of a class of NSW or the Wilton area's cultural places or environments. The potential archaeological materials associated with the hut [5] do not hold heritage significance at a local or State level.

Site name	Significance assessment criteria							Statement of significance
	A	B	C	D	E	F	G	
Shed [6]	-	-	-	-	-	-	-	The potential archaeological materials associated with the shed [6] including structural postholes and footings, rubbish deposits, floor surfaces and post holes are unlikely to be an important component of or yield information that will contribute to an understanding of the cultural history of NSW or the Wilton area, nor do they hold associations with the life or works of a person(s) of importance. The potential archaeological materials are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in NSW or the Wilton area, and they do not hold a strong or special association with a community or cultural group in NSW or the Wilton area for social, cultural or spiritual reasons. The potential archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or the Wilton area's cultural history, nor do they demonstrate the principal characteristics of a class of NSW or the Wilton area's cultural places or environments. The potential archaeological materials associated with the shed [6] do not hold heritage significance at a local or State level.
Boundary fencing [7]	-	-	-	-	-	-	-	The potential archaeological materials associated with boundary fencing [1] (post holes) are not considered an important component of or will yield information that will contribute to an understanding of the cultural history of NSW or the Wilton area, nor do they hold associations with the life or works of a person(s) of importance. The potential archaeological materials are unlikely to demonstrate aesthetic characteristics or a high degree of creative or technical achievement in NSW or the Wilton area, and they do not hold a strong or special association with a community or cultural group in NSW or the Wilton area for social, cultural or spiritual reasons. The potential archaeological materials are not considered to possess uncommon, rare or endangered aspects of NSW or the Wilton area's cultural history, nor do they demonstrate the principal characteristics of a class of NSW or the Wilton area's cultural places or environments. The potential archaeological materials associated with low intensity agricultural land use do not hold heritage significance at a local or State level.

Site name	Significance assessment criteria							Statement of significance
	A	B	C	D	E	F	G	
Modern (post-1975) development	-	-	-	-	-	-	-	The modern houses within the study area and proposal site are still present and are likely to have been constructed between 1975 and 2010. The current structures are a common element in the Wollongong region and do not demonstrate aesthetic characteristics and/or a high degree of creative or technical achievement in NSW. The current modern structures in the study and impact areas are residential and commercial, which were constructed post-1970s. Picton Road, the M31 Hume Motorway and other smaller road reserves throughout the impact area were also constructed post-1970s. It is unlikely that these structures or roads, which are common throughout the Wollongong region, would have the potential to yield information that will contribute to an understanding of NSW's cultural or natural history. The current structures and roads are common throughout the Wollongong region and are not uncommon, rare or endangered aspects of the area's cultural or natural history. The structures and roads do not hold heritage significance as they are still standing or functional, were built between post-1975 and are a common feature in the Wollongong region.

6 Construction impact assessment

This section addresses the potential impacts resulting from construction of the proposal.

6.1 Assessment of potential impacts

This assessment of potential impacts identifies the level of impact that would potentially arise from the construction works for the proposal and discusses mitigation measures, which are recommended to be implemented to avoid or reduce those impacts (this can be found below and in section 8). This section of the report has been prepared in accordance with the Heritage Manual guideline *Statements of Heritage Impact*.⁷²

A discussion that outlines the potential impacts and mitigation measures for each item, and an assessment of heritage impact for heritage items located within the study area and proposal site is presented in Table 25. The questions detailed in section 4.3 are answered for each heritage item, with each line item relating to each question featured in section 4.3 (in sequential order). The last item relates to potential vibrational impacts that may impact adjacent heritage listings; the items subjected to potential vibration impacts are further discussed in the Noise and Vibration Impact Assessment, which forms an appendix to the REF.

As low to nil archaeological potential was identified as part of this inspection, no impacts to archaeology will be assessed (refer to section 5.3 for the archaeological assessment).

⁷² Heritage Office & DUAP 1996

Table 25 Assessment of potential impacts to heritage items either within or adjacent to the study area

Heritage item	Significance	Direct impacts	Assessment
Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (Item no. 01373)	State (Item no. 01373)	<ol style="list-style-type: none"> Construction works would be contained within the proposal site and largely follow the existing alignment of Picton Road and the adjacent road reserve. The works would transect the heritage item’s curtilage (Figure). The heritage item itself is about 90 meters BGL throughout this section of the heritage curtilage. Impacts are not anticipated as the distance to the item exceeds the minimum working distances for vibration. The works in this section of the proposal site follow the existing road alignments for Picton Road and Almond Street. The works would have the potential to directly and indirectly impact the item’s curtilage as a result of construction disturbance, and the presence of equipment, cranes/other structures and fencing visible during construction. It would also have the potential to indirectly impact the airshaft located approximately 80 metres south-west of the proposal site. It should be noted that equipment associated with construction would be removed at cessation of works. In order to reduce the impacts to the heritage item’s curtilage (i.e., the easement) and the air shaft outside the proposal site, the construction area would be demarcated with fencing. These mitigation measures are consistent with the CMP for the Upper Canal system and all relevant guidelines. Limited construction works would be undertaken within the item’s curtilage (the above ground easement which crosses the proposal site). The works would not directly impact the item, as it is underground (see section 3.3.4), below the construction footprint and outside of the minimum working distances for vibration. 	Low direct and indirect (visual) impacts.
Upper Nepean Scheme – Upper Canal (Item no. I16)	State (Item no. I16)	<ol style="list-style-type: none"> Views to and from the heritage item’s curtilage would have the potential to be impacted during construction as a result of the presence of equipment, cranes and other structures. This would be a temporary impact, with the views returning to normal at cessation of works. As the heritage item itself is underground (inclusive of the air shaft), views would not be impacted as a result of the works. The proposal site does not contain any known, or potentially significant archaeological deposits as identified as part of this assessment. N/A 	
Upper Nepean Scheme (including Upper Canal and Prospect Reservoir) (Item no. 4580004)	Not specified in listing (Item no. 4580004)	<ol style="list-style-type: none"> Works within the proposal site would not visually dominate the heritage item or its curtilage. Any visual impacts would be to limited sections of the curtilage only and would be temporary, with any equipment, fencing, cranes or other structures removed at cessation of works. The visual landscape surrounding the heritage item and its curtilage would not be significantly altered by the proposal. During construction, views to and/or from the heritage item curtilage would be partially obstructed, therefore the public would not be able to view the item’s curtilage, which forms part of the Upper Canal system, in the same capacity during this time. As the heritage item itself is below ground, with the public unable to view it, the impacts to the heritage item itself would be nil. Impacts to the curtilage would be temporary for the duration of the construction. <p>The Noise and Vibration assessment for the proposal concluded that there would be no anticipated impacts from vibration during construction due to distance (vertical) from works.</p>	
Upper Nepean – scheme - Pheasants Nest Weir (Item no. I128)	Local (Item no. I128)	<ol style="list-style-type: none"> Construction works would be contained within the proposal site and follow the existing alignment of Picton Road, adjacent road reserves and small portions of properties adjacent to the road reserve. The proposal site 	
Cottage (Item no.)	Local	<ol style="list-style-type: none"> Construction works would be contained within the proposal site and follow the existing alignment of Picton Road, adjacent road reserves and small portions of properties adjacent to the road reserve. The proposal site 	Low direct and

Heritage item	Significance	Direct impacts	Assessment
I275)		<p>adjoins the southern and western portion of the heritage item's curtilage, with works in this location involving road upgrading and associated works (see section 1.11.1). Temporary impacts such as ground disturbance, the presence of equipment, cranes/other structures and fencing would be visible during construction; however, these items would be removed at cessation of works. Recommended mitigation measures to manage the potential for impacts are provided in section 8.</p> <ol style="list-style-type: none"> 2. The works in this section of the proposal site follow the existing road alignments for Picton Road, Almond Street and small portions of properties adjacent to the road reserve. Picton Road extends adjacent to the southern portion of the heritage item, while Almond Street extends along the western boundary. The works would not directly impact this item or it's curtilage. 3. The proposal currently abuts the southern and western edge of the heritage item's curtilage; however, the proposal site does not extend into the heritage curtilage, with no direct impacts occurring. The heritage item itself is located immediately adjacent to the proposal site. As a result, the heritage significance of the item would not be impacted by the works, with any potential impacts being indirect and temporary. 4. Views to and from the heritage item's curtilage would be impacted for the duration of construction at this location, as a result of ground disturbance, the presence of construction plant and equipment, and fencing. This would be a temporary impact, with the views returning to normal at cessation of works. 5. The proposal site follows the existing road alignment for Picton Road and Almond Street. No known, or potentially significant archaeological deposits have been identified as a part of the significance assessment for this heritage item. 6. N/A 7. Works within the proposal site would not visually dominate the heritage item. Any potential visual impacts would be temporary, with construction equipment and fencing removed at cessation of works. 8. The visual landscape surrounding the heritage item would not be significantly altered by the proposal. During construction, views to and/or from the heritage item (from Argyle Street, Almond Street and Picton Road) would be partially obstructed and the public would not be able to view the item in the same capacity during this time. However, these impacts would be temporary. <p>There is the potential for cosmetic damage to occur if a roller of greater than four tonnes, a large hydraulic hammer mounted to an excavator greater than 18 tonnes or vibratory pile driver are used during construction within the minimum working distances for cosmetic damage as defined by the Noise and Vibration assessment. Mitigation measures recommended by the Noise and Vibration assessment (including dilapidation surveys of the structures to determine the applicable vibration, a review of alternative equipment and construction vibration monitoring) would be implemented to minimise the potential for impacts.</p>	indirect (visual and vibrational) impacts.
Wilton Park (SHR) Wilton Park - — stables, coachhouse, water tanks, stallion	State	<ol style="list-style-type: none"> 1. Construction works would be located about 1.2 kilometres south-east of the heritage item, minimising any direct impacts to the item. Temporary impacts such as changes to line of sight as a result of the presence of construction equipment may be visible during construction. 2. N/A 3. N/A 	Low indirect (visual) temporary impacts.

Heritage item	Significance	Direct impacts	Assessment
boxes and covered yards (LEP) (SHR Item no. 00257, LEP Item no. I277)		<ol style="list-style-type: none"> 4. The visual landscape surrounding the heritage item would not be significantly altered as a part of the proposal. The public cannot view the heritage item from any part of the proposal site, therefore views to or from the heritage item would not be impacted during construction. 5. The proposal site is located about 1.2 kilometres from the heritage item and no known, or potentially significant, archaeological deposits would be impacted. 6. N/A 7. The proposal site is located about 1.2 kilometres from the heritage item and works would not visually dominate the heritage item. Any potential visual impacts would be temporary, with construction equipment removed at cessation of works. 8. The visual landscape surrounding the heritage item would not be significantly altered by the proposal. The public cannot view the heritage item from any part of the proposal site, therefore views to or from the heritage item would not be impacted by construction. <p>No impacts as a result of construction vibration are anticipated due to distance from the proposal site.</p>	
St Luke's Anglican Church (Item no. I276)	Local	<ol style="list-style-type: none"> 1. The proposal site is located about 63 metres west of the heritage item, with works following the existing alignment of Picton Road and adjacent road reserves. Temporary impacts, such as ground disturbance and the presence of equipment and fencing, would be visible during construction; however, these items would be removed at cessation of works. Recommended mitigation measures to manage the potential for impacts are provided in section 8, including fencing work areas to ensure direct impacts are minimised. 2. The works would not directly impact or transect the heritage item's curtilage. The heritage significance of the item would not be impacted by the works, with any impacts being indirect and temporary. 3. N/A 4. Views to and from the heritage item and its curtilage would have the potential to be impacted for the duration of works in the vicinity of the item. This would be a temporary impact, with the views returning to normal at cessation of works. 5. The proposal site follows the existing road alignment for Picton Road and Almond Street. No known, or potentially significant, archaeological deposits have been identified as a part of the significance assessment for this heritage item with the potential to be impacted. 6. N/A 7. Works within the proposal site would not visually dominate nor directly impact the heritage item. Any potential visual impacts would be temporary, with construction and fencing to be removed at cessation of works. 8. The visual landscape surrounding the heritage item would not be significantly altered by the proposal. During construction, views to and/or from the heritage item would be partially obstructed and the public would not be able to view the item in the same capacity during this time. However, these impacts would be temporary. <p>There is the potential for cosmetic damage to occur if a roller of greater than 18 tonnes is used during construction within the minimum working distances for cosmetic damage as defined by the Noise and Vibration assessment. Recommended mitigation measures proposed by the Noise and Vibration assessment (including</p>	Low indirect (visual and vibrational) temporary impacts.

Heritage item	Significance	Direct impacts	Assessment
Cottage (Item no. I279)	Local	<p>dilapidation surveys of the structures to determine the applicable vibration, a review of alternative equipment and construction vibration monitoring) would be implemented to minimise the potential for impacts.</p> <ol style="list-style-type: none"> 1. The proposal site is located about 950 metres east of the heritage item, therefore the impact to the heritage significance or area surrounding the heritage item is likely to be negligible. Temporary impacts such as the ground disturbance and presence of equipment and fencing may be visible during construction; however, these items would be removed at cessation of works. 2. N/A 3. The proposal would not transect the heritage item’s curtilage. The heritage significance of the item would not be impacted by the works, with any potential impacts being indirect and temporary. 4. Views to and from the heritage item’s curtilage may be impacted throughout the duration of construction through the presence of construction plant equipment and fencing. However, this would be limited given the distance to the item and a temporary impact, with the views returning to normal at cessation of works. 5. The proposal site follows the existing road alignment for Picton Road. No known, or potentially significant archaeological deposits have been identified as a part of the significance assessment for this heritage item or would be impacted as a result of the works. 6. N/A 7. The proposal would not visually dominate nor directly impact the heritage item. Any visual impacts would be temporary, with construction equipment to be removed at cessation of works. 8. The visual landscape surrounding the heritage item would not be significantly altered by the proposal. During construction, views to and/or from the heritage item would be partially obstructed. and the public would not be able to view the item in the same capacity during this time. However, these impacts would be temporary. <p>No anticipated impacts from vibrations during construction due to distance from works.</p>	<p>Low indirect (visual) temporary impacts.</p>
Aboriginal Shelter Sites (Item no. I285)	Local	<ol style="list-style-type: none"> 1. The proposal site is located about 615 metres from the closest point to the proposal site, therefore temporary impacts such as the presence of equipment and fencing are unlikely to be visible during construction. 2. The proposal, located within the proposal site, follows the existing road alignment for Picton Road. The proposal throughout this area would not directly impact this item. 3. The proposal would not transect the heritage item’s curtilage. The heritage significance of the item would not be impacted by the works, with any potential impacts being indirect and temporary. 4. Views to and from the heritage item’s curtilage may be impacted for the duration of construction in the form of indirect, temporary impacts, such as fencing, or impacts to line of sight. These would be a temporary impact, with the views returning to normal at cessation of works. 5. The proposal site follows the existing road alignment for Picton Road. No known, or potentially significant archaeological deposits have been identified within the proposal site and any significant values relating to the heritage item would not be impacted as a result of the works. 6. N/A 	<p>Low indirect (visual) temporary impacts.</p>

Heritage item	Significance	Direct impacts	Assessment
		<p>7. Works within the proposal site would not visually dominate nor directly impact the heritage item. Any potential visual impacts would be temporary, with construction equipment and fencing to be removed at cessation of works.</p> <p>8. The visual landscape surrounding the heritage item would not be significantly altered as part of the proposal. During construction, views to and/or from the heritage item would be partially obstructed, and the public would not be able to view the item in the same capacity during this time. However, these impacts would be temporary.</p> <p>No anticipated impacts from vibrations during construction due to distance from works.</p>	

6.2 Statement of heritage impact (construction)

The study area forms part of a key traffic corridor, which connects Picton and south-western Sydney to Wollongong. The proposal would be contained within the proposal site and follow the existing alignment of Picton Road, adjacent road reserves and adjacent rural properties. The Proposal involve the following (see section 1.1):

- Widening and upgrading Picton Road.
- 3.5-metre-wide traffic lanes.
- A new shared path for pedestrian and cyclists.
- A three-metre-wide shoulder in each direction.
- Adjustment of existing kerbs and improvement of existing road drainage and stormwater management infrastructure.
- Adjustment to existing utilities and street furniture.

The need and justification for the proposal is described in the REF.

A number of local and State heritage listed items or places are located within the proposal site and study area. Potential impacts to these items include visual impacts to the majority of items, and potential vibration impacts to Cottage (Item no. I275) and St Luke's Anglican Church (Item no. I276). Visual impacts would be temporary during the construction period, and all construction fencing, and machinery would be removed at the cessation of construction.

The potential for construction vibration impacts can be managed by implementing the mitigation measures recommended by the Noise and Vibration impact assessment for the REF, including a review of the proposed equipment to determine whether alternative equipment with lower vibration levels is feasible to use during construction, and undertaking dilapidation surveys. Where alternative equipment is not feasible then construction vibration monitoring is recommended prior to construction to confirm site specific construction vibration levels.

The historical context presented in this report indicates that the proposal site and study area were developed in the mid-1800s with the designation and development of the township of Wilton. A review of Crown Plans and aerial imagery indicated that the south-eastern portion of the proposal site contained six physical structures or fence lines, constructed pre-1914 [2], [3], [4], [5], [6], [7] (Table 6). Additionally, the Upper Canal System was constructed in 1893, with its curtilage visible throughout the proposal site in the south-eastern portion. The remainder of the proposal site does not contain any visible structures prior to 1970, with this area primarily used for low intensity agricultural use. Aerial imagery does not show any development within the proposal site until mid-1970s when Picton Road and residential structures were built throughout the alignment. From 1975 onwards, several houses, dams and a recycling plant were built within the proposal site and study area. There may have been possible archaeological deposits within the proposal site or study area relating to pre-1914 items or listed heritage items (i.e., fence lines, post holes, agricultural marks, cut and fill deposits and footings and foundations). However, construction and maintenance of Picton Road and associated surface and subsurface infrastructure would have disturbed or removed any archaeological deposits which may have been present.

7 Operational impact assessment

This section addresses the potential impacts resulting from the proposal at the operational stage.

7.1 Assessment of potential impacts

This assessment of potential impacts identifies the level of impact that would arise from the proposal at the operational stage and discusses mitigation measures which must be taken to avoid or reduce those impacts. This section of the report has been prepared in accordance with the Heritage Manual guideline *Statements of Heritage Impact*.⁷³

A discussion that outlines the potential impacts and mitigation measures for each item, and an assessment of heritage impact for heritage items located within the study area and proposal site is presented in Table 26.

As low to nil archaeological potential was identified as part of this inspection, no impacts to archaeology will be assessed below (see section 5.3.5 for the archaeological assessment).

⁷³ Heritage Office & DUAP 1996

Table 26 Assessment of impacts to heritage items either within or adjacent to the study area

Heritage item	Significance	Discussion	Assessment
Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (Item no. 01373)	State (Item no. 01373)	<p>No additional direct impacts beyond construction have been identified.</p>	
Upper Nepean Scheme – Upper Canal (Item no. I16)	State (Item no. I16)	<p>There is the potential for indirect visual impacts as the overall site setting and landscape would change during construction (therefore changing views during operation); however, these changes would only affect the heritage items curtilage as the item itself (inclusive of the air shaft) is located subsurface.</p>	Neutral indirect impacts.
Upper Nepean Scheme (including Upper Canal and Prospect Reservoir) (Item no. 4580004)	Not specified in listing (Item no. 4580004)	<p>The proposal would be visually similar to the current design. As the proposal is visually similar to the existing road alignment, the works are considered to be sympathetic to the heritage item and/or its curtilage.</p>	
Upper Nepean Scheme - Pheasants Nest Weir (Item no. I128)	Local (Item no. I128)	<p>No additional direct impacts beyond construction have been identified.</p>	
Cottage (Item no. I275)	Local	<p>There is the potential for indirect visual impacts as the overall site setting and landscape would change during construction (therefore changing views during operation).</p> <p>The proposal would be visually similar to the current design. As the proposal would be visually similar to the existing road alignment, the works are considered to be sympathetic to the heritage item and/or its curtilage.</p>	Low indirect (visual) impacts.

Heritage item	Significance	Discussion	Assessment
Wilton Park (SHR) Wilton Park - — stables, coachhouse, water tanks, stallion boxes and covered yards (LEP) (SHR Item no. 00257, LEP Item no. I277)	State	<p>No additional direct impacts beyond construction have been identified.</p> <p>No potential for indirect visual impacts has been identified as the item is located about 1.2 kilometres from the proposal site and the public cannot view the heritage item from any part of the proposal site.</p>	<p>Nil direct or indirect (visual) impacts.</p>
St Luke's Anglican Church (Item no. I276)	Local	<p>No additional direct impacts beyond construction have been identified.</p> <p>There is the potential for indirect visual impacts as the overall site setting and landscape would change during construction (therefore changing views during operation).</p> <p>The proposal would be visually similar to the current design. As the proposal are visually similar to the existing road alignment, the works are considered to be sympathetic to the heritage item and/or its curtilage.</p>	<p>Low indirect (visual) impacts.</p>
Cottage (Item no. I279)	Local	<p>No additional direct impacts beyond construction have been identified.</p> <p>There is the potential for indirect visual impacts as the overall site setting and landscape would change during construction (therefore changing views during operation). However, as these changes would be located about 950 metres east of the heritage item, potential impacts would be minimal.</p>	<p>Neutral indirect (visual) impacts.</p>
Aboriginal Shelter Sites (Item no. I285)	Local	<p>No additional direct impacts beyond construction have been identified.</p> <p>There is the potential for indirect visual impacts as the overall site setting and landscape would change during construction (therefore changing views during operation). However, as these changes would be located about 615 metres from the closest point to the proposal site, the potential impacts would be minimal.</p> <p>The proposal would be visually similar to the current design. As the proposal would be visually similar to the existing road alignment, the works are considered to be sympathetic to the heritage item and/or its curtilage.</p>	<p>Neutral indirect (visual) impacts.</p>

7.2 Statement of heritage impact (operations)

The study area forms part of a key traffic corridor, which connects Picton and south-western Sydney to Wollongong. The majority of potential impacts relate to construction of the proposal, with the potential impacts during operation limited to indirect impacts through changes in landscape and site setting.

The proposal site and the study area are within, and adjacent to, a number of local and State heritage listed items or Places (see section 2.4 for full details), noting that the heritage item within the proposal site is 90 metres BGL and will not be impacted as part of the proposal. The main potential for impacts to heritage items during operation would be indirect visual impacts as a result of the change in the visual context.

8 Mitigation measures and recommendations

8.1 Recommended mitigation measures

Heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of 'doing as much as necessary, as little as possible'.⁷⁴ In cases where conservation is not practical, several options for management are available, and measures to reduce or avoid additional impacts are identified as mitigation measures. Avoidance of impact to heritage items and archaeological values through the design of the development is the primary mitigation and management strategy and should be implemented where practicable.

The recommended mitigation measures to avoid and minimise the potential impacts of the proposal to non-Aboriginal heritage are presented in Table 27.

⁷⁴ (Australia ICOMOS 2013)

Table 27 Recommended mitigation measures

Section	Mitigation Measures (Environmental safeguards)	Responsibility	Timing	Reference	Source
Non-Aboriginal heritage	A Non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the Construction Environmental Management Plan (CEMP). It will provide specific drafting guidance on measures and controls to be implemented to avoid and mitigate impacts to non-Aboriginal heritage. The NAHMP will include the <i>Unexpected Heritage Items Guidelines</i> (Transport for NSW, 2015) to be followed in the event that any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered. Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design / pre-construction	Section 4.10 of QA G36 <i>Environment Protection</i>	See REF for further details
	The design and construction methodology for the proposal will continue to be refined to minimise and avoid direct impacts on non-Aboriginal heritage sites as far as reasonably practicable.	Transport for NSW / contractor	Detailed design / pre-construction	Additional safeguard	See REF for further details
	A dilapidation survey of the heritage structures associated with heritage items Cottage (Item no. I275) and St Luke's Anglican Church (Item no. I276) will be undertaken prior to construction. The outcomes of the dilapidation survey will be used to confirm the applicable vibration limits for each structure.	Contractor	Pre-construction / Construction	Additional safeguard	See REF for further details
	Protective barriers or fencing will be installed around Cottage (Item no. I275) for the duration of	Contractor	Construction	Additional safeguard	See REF for further details

Section	Mitigation Measures (Environmental safeguards)	Responsibility	Timing	Reference	Source
	works within the vicinity of the item to ensure no inadvertent harm occurs.				
Vibration impacts on heritage	Machinery will be placed with sufficient clearance from Cottage (Item no. I275) and St Luke's Anglican Church (Item no. LEP I276) and the air shaft associated with the Upper Canal System (Item no. 01373, Item no. I16, Item no. 4580004 and Item no. I128) to avoid any inadvertent harm or incidental damage from vibration as per the recommended minimum working distances for vibration intensive plant. Vibration monitoring will be undertaken for the duration of works at these locations.	Contractor	Pre-construction / Construction	Additional safeguard	Noise and Vibration Assessment Technical Working Paper' See REF for further details
Heritage interpretation	The design will include appropriate interpretation of non-Aboriginal heritage in accordance with the heritage interpretation strategy (see Table 6-22 of the REF). Heritage interpretation should be developed in accordance with the following TfNSW guidelines: <ul style="list-style-type: none"> • <i>RMS Heritage Interpretation Guideline</i> Heritage interpretation should be developed in accordance with the following Heritage NSW guidelines: <ul style="list-style-type: none"> • <i>Interpreting Heritage Places and Items Guidelines</i> • <i>Heritage Interpretation Policy</i> 	Transport for NSW / contractor	Detailed design	Additional safeguard	See REF for further details
Heritage awareness training	Non-Aboriginal heritage awareness training will be provided for all contractors and personnel prior to commencement of works to outline the	Contractor	Construction	Additional safeguard	See REF for further details

Section	Mitigation Measures (Environmental safeguards)	Responsibility	Timing	Reference	Source
	<p>identification of potential heritage items and associated procedures to be implemented in the event of the discovery of non-Aboriginal heritage materials, features or deposits (that is, unexpected finds), or the discovery of human remains.</p>				

8.2 Recommendations

These recommendations have been formulated to respond to Transports' requirements of the proposal and the significance of the heritage items and other heritage values within the proposal site and broader study area. They are guided by the Australia ICOMOS *Burra Charter* with the aim of doing as much as necessary to care for the place and make it useable and as little as possible to retain its cultural significance.⁷⁵

Recommendation 1 Review of detailed design plans

The analysis, mitigation measures and recommendations of this report are based on concept design plans. When the 100% detailed design plans are complete, a heritage specialist should review the final design with regard to this report and undertake a consistency assessment to ensure the final design is acceptable in terms of heritage outcomes. Should designs or construction methodology change between the 100% detailed design stage and the Approved For Construction drawings, a heritage specialist should complete a consistency assessment to ensure the changes do not result in significant changes.

Should any changes occur during this period which warrant significant alterations to the proposal or proposal site, further assessment and justification in the form of a SoHI will be required for any heritage items impacted.

Recommendation 2 Adhere to all mitigation measures in this assessment

This report contains several recommended mitigation measures (Table 27), which are considered to be required in order to be compliant with the Heritage Act, Heritage NSW guidelines and best practice and protect heritage values. Transport must ensure that all construction/operational specific measures are completed prior to relevant works being completed.

⁷⁵ Australia ICOMOS 2013

9 Conclusion

The proposal site forms part of a key traffic corridor, which connects Picton and south-western Sydney to Wollongong. The proposal would be contained to the proposal site. The proposal is required to meet Transport's safety requirements, and the proposal-specific objectives and strategic need described in chapter 2 of the REF.

The study area includes a number of local and State heritage listed items or Places. These include Cottage (Item no. I275); St Luke's Anglican Church (Item no. I276); Wilton Park (Item no. I277 and SHR no. 00257); Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (Item no. I278, Section 170 WaterNSW Heritage and Conservation Register Item no. 4580004 and SHR no. 01373); Cottage (Item no. I279); and Aboriginal Shelter Sites (Item no. I285). One of these items (Upper Canal System) is located about 90 metres BGL of the proposal site, with the curtilage of the item crossing the site. Two of these items (Cottage, Item no. I275; St Luke's Anglican Church, Item no. I276) are located adjacent and very close to the proposal site.

Potential impacts to these items include visual impacts to all items or their curtilage during construction, including temporary line of sight impacts, and potential vibrational impacts during construction to Cottage (Item no. I275) and St Luke's Anglican Church (Item no. I276). The main potential for impacts to heritage items during operation would be indirect visual impacts as a result of the change in the visual context. However, the proposal would be visually similar to the current design, and as such the proposal is considered to be sympathetic to the heritage items and/or their curtilages.

The potential for vibration impacts to Cottage (Item no. I275) and St Luke's Anglican Church (Item no. I276) can be managed by implementing the recommended mitigation measures. These include dilapidation surveys of the structures prior to construction to determine the applicable vibration limits for each structure and a review of the proposed equipment to determine whether alternative equipment with lower vibration levels is feasible to use during construction. Where alternative equipment is not feasible then construction vibration monitoring is recommended prior to construction to confirm site specific construction vibration levels.

This report has assessed a low potential for archaeology across the proposal site.

Ongoing review and monitoring of recommendations and mitigation measures would ensure that potential impacts to heritage continue to be minimised during ongoing design development, construction, and operation.

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