# Singleton bypass

# Technical working paper: Non-Aboriginal Heritage Assessment Report

Roads and Maritime Services | November 2019



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# **Singleton bypass** Technical working paper: Surface and Groundwater assessment

Roads and Maritime Services | November 2019

Prepared by AECOM Australia Pty Ltd and Roads and Maritime Services

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# Approval and authorisation

Title	Singleton Bypass. Technical working paper: Socio-economic impact assessment
Accepted on behalf of NSW Roads and Maritime Services by:	Joel Rosendahl Project Development Manager
Signed:	
Dated:	

#### **Document status**

Document status	Date	Prepared by	Reviewed by
Final Rev 0	15-Nov-19	Darran Jordan	Susan Lampard

### **Executive summary**

AECOM Australia Pty Ltd (AECOM) was engaged by New South Wales (NSW) Roads and Maritime Services (Roads and Maritime) to prepare a non-Aboriginal heritage assessment report to inform the Review of Environmental Factors (REF) being prepared for the Singleton Bypass Proposal. Roads and Maritime proposes to upgrade the New England Highway to bypass Singleton (the proposal) and have identified a preferred option that will involve building a new section of highway to the south, west and north-west of Singleton's Central Business District (CBD). This new section of highway will be approximately nine kilometres in length.

Searches of the relevant historical registers identified a total of five previously recorded sites within the proposal area. These were the items Coke Ovens (I45), Former Pumping Station (I21), Bebeah (I120), The Woolpack Inn (I151) and the Singleton Hunter River Underbridge (SRA844).

Archaeological survey of the proposal area was undertaken over six days from 26 March to 29 March 2018, 3 April 2018 and 31 October 2018. All survey was conducted on foot, with a total of 31 transects completed over the course of the survey, with targeted inspections of known heritage items. An additional historical site was identified during the current survey (Great Northern Railway section).

Based on the results of the archaeological survey and research, the results of known heritage listings within and surrounding the proposal area and the significance and impact assessments of identified historical heritage items, the proposal would result in the following impacts:

- Coke Ovens (I45): the proposal would not involve works within the curtilage of the item
- Great Northern Railway section (unlisted): the proposal would result in moderate direct impacts to the southern-most section of the item
- Singleton Hunter River Underbridge (SRA844): the proposal would not involve works within the curtilage of the item
- Former Pumping Station (I21): the proposal would involve the removal of the item
- Bebeah (I120): the proposal would not involve direct impacts to the features cited as contributing to the heritage significance of the item, although works are proposed within the curtilage of the item
- The Woolpack Inn (I151) the proposal would not involve direct impacts to the features cited as contributing to the heritage significance of the Woolpack Inn item, although works are proposed within the curtilage of the item.

The following recommendations were made to avoid or protect heritage values and to minimise or mitigate heritage impacts.

#### **General Recommendations**

- A heritage management plan should be produced to manage the identified heritage items in relation to the proposed works
- Works proposed in proximity to heritage items should be undertaken in accordance with the relevant vibration criteria for heritage structures
- The plan should define any protectionary fencing required to delineate safe working areas and/or no-go areas in relation to heritage protection
- A toolbox presentation should be held with all staff and contractors prior to the commencement of works to make them aware of their responsibilities with regard to avoiding heritage impacts
- Singleton Council should be informed of the proposed impacts to heritage items and their records relating to the corresponding LEP listings should be updated accordingly
- If unexpected finds are encountered during works the unexpected finds procedures should be followed.

#### **Further Works**

- An archival recording of the Former Pumping Station (I21) will be prepared prior to the removal of the item
- The recording will be prepared in accordance with guidelines published by the Heritage Division, Department of Premier & Cabinet. Prior to ground disturbance impacts at the Former Pumping Station (I21), a permit under Section 140 of the Heritage Act 1977 would be obtained given the potential for archaeological relics at this location.

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# Terms and acronyms used in this technical working paper

Term / Acronym	Description	
ARTC	Australian Rail Track Corporation	
EIA	Environmental impact assessment	
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW). Provides the legislative framework for land use planning and development assessment in NSW	
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.	
GNR	Geographical Name Register	
GSV	Ground Surface Visibility	
ISEPP	State Environmental Planning Policy (Infrastructure) 2007	
LGA	Local Government Area	
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.	
NPW Act	National Parks and Wildlife Act 1974 (NSW)	
NSW	New South Wales	
NSW Roads and Maritime Services	Roads and Maritime	
PACHCI	Roads and Maritime Services <i>Procedure for Aboriginal Cultural Heritage</i> <i>Consultation and Investigation</i>	
Roads and Maritime	NSW Roads and Maritime Services	
REF	Review of Environmental Factors	
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.	
WRC	Water Resources Commission	

# 1 Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by New South Wales (NSW) Roads and Maritime Services (Roads and Maritime) to prepare a non-Aboriginal heritage assessment report to inform the Review of Environmental Factors (REF) being prepared for the Singleton Bypass Proposal. Roads and Maritime proposes to upgrade the New England Highway to bypass Singleton (the proposal) and has identified a preferred option that will involve building a new nine kilometre long section of highway to the west of Singleton (see Figure 1).

#### 1.1 Description of proposal

Roads and Maritime proposes to build a bypass at Singleton. Key features of the proposal include:

- About eight kilometres of new highway (the bypass) with a single lane in each direction
- Connection with the New England Highway at the southern end of the bypass (the southern connection) including a southbound entry ramp and northbound exit ramp
- A 55 metre long bridge over the bypass at the southern connection
- A 1.7 kilometre long bridge over the Main North railway line, the Doughboy Hollow and Hunter River floodplain, Army Camp Road and Putty Road (bridge over the floodplain)
- Connection to Putty Road including a northbound entry ramp and southbound exit ramp (the Putty Road connection)
- A 40 metre long bridge over the entry ramp at the Putty Road connection
- A 100 metre long bridge over Rose Point floodway
- A 205 metre long bridge over the Hunter River
- A 40 metre long bridge over the New England Highway west of the existing Main North railway line overbridge (known as Gowrie Gates)
- Connection with the New England Highway at Gowrie Gates consisting of a southbound entry ramp and northbound exit ramp. The northbound exit ramp would connect to the New England Highway via a new roundabout intersection at Maison Dieu Road
- A 1.7 kilometre northbound climbing lane between Gowrie Gates and the northern connection
- Connection at Magpie Street providing access to the nearby industrial area (the northern connection) consisting of a southbound entry ramp, southbound exit ramp and northbound entry ramp
- A 60 metre long bridge over the bypass at the northern connection.

#### 1.2 Proposal area

The regional context of the proposal area is shown on Figure 1-1 and proposal area is detailed on Figure 1-2. The proposal area comprises a linear corridor of variable width (about 100 to 800 metres), with a total length of about nine kilometres. The proposed bypass, as indicated on Figure 1-2, departs the New England Highway near Newington Lane, south of Singleton, before heading west across the Hunter River's right bank floodplain, crossing the Main North railway line and Putty Road. From Putty Road, the bypass continues north over the Hunter River, immediately upstream of the heritage-listed Singleton Hunter River Underbridge, before crossing the New England Highway west of Gowrie Gates and rejoining the highway on McDougalls Hill. More broadly, the proposal area is situated in the lower Hunter region 1, approximately 70 kilometres northwest of Newcastle's CBD and 40 kilometres southeast of Muswellbrook.

The proposal area falls wholly within the boundaries of the Singleton Local Government Area (Singleton LGA) and cross-cuts the parishes of Wittingham (County of Northumberland) and Darlington (County of Durham). From south to north, traversed suburbs include Whittingham, Glenridding, Gowrie, McDougalls Hill and Rixs Creek. Parks and reserves in the surrounding area, include: Rose Point Park, adjacent to the Hunter River; Gowrie; James White and Alroy Parks,

<sup>&</sup>lt;sup>1</sup> As defined by the Australian Bureau of Statistics (2018)

north of the Main North railway line underpass; and McDougalls Reserve in Singleton Heights. The Hunter River, which bisects the proposal area on an east-west axis, is the only named watercourse within the proposal area.

#### 1.3 Scope of current assessment

Potential impacts to historical cultural heritage values as a result of the proposal are being assessed in accordance with the NSW Heritage Branch's guidelines: *Assessing Heritage Significance* (NSW Heritage Office, 2001), *Levels of Heritage Significance* (NSW Heritage Office, 2008) and *Statements of Heritage Impact* (NSW Heritage Office, 2002).

This assessment has been undertaken with reference to *The Burra Charter* (the Australia ICOMOS Charter for Places of Cultural Significance) (Australia ICOMOS, 2013), *Assessing Significance for Historical Archaeological Sites and 'Relics'* (NSW Heritage Branch, 2009) and *Heritage Curtilages* (NSW Heritage Office & NSW Department of Urban Affairs and Planning, 1996a).

#### 1.4 Assessment objectives

The overarching objectives of the current assessment were as follows:

- To identify the non-Aboriginal heritage values of the proposal area using a combination of background research and survey
- To provide an appropriate management strategy for the identified historical cultural heritage values of the proposal area
- To compile a non-Aboriginal heritage assessment report in accordance with Heritage Branch's guidelines.

#### 1.5 Limitations

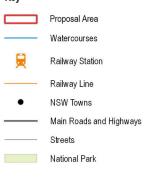
Limited access was available during the survey, with no access to some privately owned properties. Desktop assessment was undertaken of these areas to inform the likelihood of heritage being present or absent. This report has been compiled based on the presently available data and may need to be supplemented once full access has been attained. Vegetation cover also reduced Ground Surface Visibility (GSV) at the time of this inspection.

Predictions have been made within this report about the probability of subsurface archaeological materials occurring within the proposal area and subject to physical disturbance, based on the land use history of specific areas, surface indications and environmental contexts. However, it is possible that materials may occur in areas without surface indications and in any environmental context.

#### 1.6 Project team and report authorship

Overall management of the historical heritage assessment was the responsibility of AECOM Principal archaeologist Dr Darran Jordan. He authored this report (with inputs from senior archaeologist Dr Andrew McLaren) and participated in the archaeological survey. Dr Andrew McLaren also participated in the survey. Property access for the survey was facilitated by AECOM communication and engagement specialist Skye Jamieson. Dr Susan Lampard (Principal European Heritage Specialist, AECOM) and Geordie Oakes (Principal Archaeologist, AECOM) provided internal technical and quality assurance input and review of this report. Administrative support was provided by Zoe Cox, Graduate Environmental Planner.







Data Sources: 1. Roads, Railway, Parks, Drainage, Localities: StreetPro Australia © 2014, Pritey Bowes Software 2. PhotoMap imagery under licence: Nearmap™ 2017

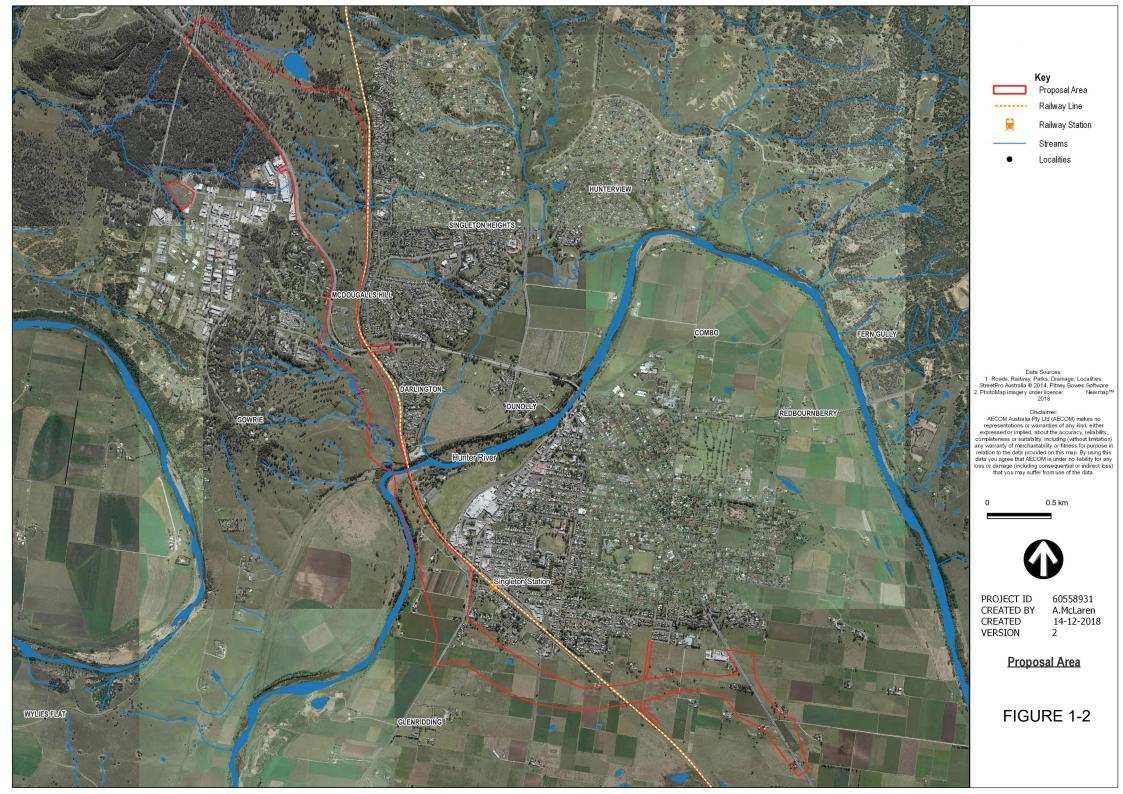
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**Regional Context** 

FIGURE 1-1



#### 2.1 Commonwealth Legislation

#### 2.1.1 Environment Protection and Biodiversity Act 1999

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) took effect on 16 July 2000. Under Part 9 of the EPBC Act, any action that is likely to have a significant impact on a matter of National Environmental Significance may only progress with approval of the Commonwealth Minister for Environment and Energy. An action is defined as a project, development, undertaking, activity, series of activities, or alteration. An action will also require approval if:

- It is undertaken on Commonwealth land and will have or is likely to have a significant impact
- It is undertaken outside Commonwealth land and will have or is likely to have a significant impact on the environment on Commonwealth land
- It is undertaken by the Commonwealth and will have or is likely to have a significant impact.

The EPBC Act defines 'environment' as incorporating both natural and cultural environments and therefore includes Aboriginal heritage. Under the Act, protected heritage items are listed on the National Heritage List (items of significance to the nation) or the Commonwealth Heritage List (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate (RNE), which was closed in 2007 and is no longer a statutory list. Statutory references to the RNE in the EPBC Act were removed on 19 February 2012. However, the RNE remains an archive of over 13,000 heritage places throughout Australia.

Searches of the National Heritage List, Commonwealth Heritage List and RNE were undertaken with no relevant heritage listings identified.

#### 2.2 State Legislation

#### 2.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979 (EP&A Act),* administered by the Department of Planning, Industry and Environment (DPIE), requires that consideration be given to environmental impacts as part of the land use planning process in NSW. In NSW, environmental impacts are interpreted as including impacts to Aboriginal and non-Aboriginal (ie., European) cultural heritage.

Clause 94 of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. As the proposal is for the purpose of a road and is to be carried out by Roads and Maritime, development consent is not required. The proposal is to be assessed and determined under Part 5, Division 5.1 of the EP&A Act, with this assessment informing the REF being prepared for the proposal.

#### 2.2.2 State Environmental Planning Policy (Infrastructure) 2007

SEPPs are environmental planning instruments which address planning issues within the State. SEPPs often make the Planning Minister the consent authority for the types of development they relate to. Clause 14 of ISEPP 2007 applies to infrastructure developments carried out by, or on behalf of, a public authority if the development is likely to impact a local heritage item or heritage conservation area (other than a heritage item that is also a State heritage item). Under ISEPP 2007, a public authority, or person/s acting on behalf of a public authority, must not carry out a development to which this clause applies, unless an assessment of the proposed impact has been prepared and forwarded to the local government of the area for comment. Comments received within 21 days must be taken into consideration.

#### 2.2.3 The Heritage Act 1977

The Heritage Act 1977 (Heritage Act) was enacted to conserve the environmental heritage of NSW. Under section 32, places, buildings, works, relics, moveable objects or precincts of heritage significance are protected by means of either Interim Heritage Orders (IHOs) or by listing on the State Heritage Register (SHR). Items that are assessed as having State heritage significance can be listed on the SHR by the Minister on the recommendation of the Heritage Council.

Archaeological relics (any relics that are buried) are protected by the provisions of section 139. Under this section it is illegal to disturb or excavate any land knowing or suspecting that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed. In such cases, an excavation permit under section 140 is required. Note that no formal listing is required for archaeological relics; they are automatically protected if they are of local significance or higher.

A relic is defined in the Heritage Act as any artefact, object or material evidence which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and which is of State or local heritage significance. The Act also defines the different types of heritage items, namely: places, buildings, works, relics, moveable objects and precincts. Works, as differentiated from relics, comprise items such as roads, drains and culverts. Under the NSW Heritage Act, works need to be assessed for heritage significance to ascertain appropriate mitigation measures if impacts are proposed, but are not subject to section 140 and do not require a permit to be obtained.

Proposals to alter, damage, move or destroy places, buildings, works, relics, moveable objects or precincts protected by an IHO or listed on the SHR require an approval under section 60. Demolition of whole buildings will not normally be approved except under certain conditions (section 63). Some of the sites listed on the SHR or on LEPs may either be 'relics' or have relics associated with them. In such cases, a section 60 approval is also required for any disturbance to relics associated with a listed item.

Under Section 170 of the Heritage Act, NSW government agencies are required to maintain a register of heritage assets. The register places obligations on the agencies, but not on non-government proponents, beyond their responsibility to assess the impact on surrounding heritage items.

#### 2.3 Local Government

#### 2.3.1 Singleton Local Environmental Plan 2013

Clause 5.10 of the Singleton Local Environmental Plan 2013 (Singleton LEP 2013) provides specific provisions for the protection of heritage items, heritage conservation areas, archaeological sites, Aboriginal objects and Aboriginal places of heritage significance within the Singleton LGA, defined in the LEP as follows:

- A *heritage item* means a building, work, place, relic, tree, object or archaeological site, the location and nature of which is described in Schedule 5 of the LEP
- A heritage conservation area means an area of land of heritage significance:
  - shown on the Heritage Map as a heritage conservation area
  - the location and nature of which is described in Schedule 5 of the LEP, and includes any heritage items situated on or within that area.

Under Section 2 of Clause 5.10 of the Singleton LEP 2013, development consent is required for any of the following:

a) demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):

(i) a heritage item(ii) an Aboriginal object

(iii) a building, work, relic or tree within a heritage conservation area

- b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item
- c) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed
- d) disturbing or excavating an Aboriginal place of heritage significance
- e) erecting a building on land:
  - (i) on which a heritage item is located or that is within a heritage conservation area, or
  - (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance
- f) subdividing land:
  - (i) on which a heritage item is located or that is within a heritage conservation area, or
  - (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.

Schedule 5 of the Singleton LEP 2013 provides a list of heritage items, conservation areas and archaeological sites within the Singleton LGA. Items listed on it that are within the bounds of the proposal area are outlined in Section 6. These include Coke Ovens (I45), Former Pumping Station (I21), Bebeah (I120) and The Woolpack Inn (I151). Historical context relevant to these items is included in Section 5.

This chapter describes the methodology used in preparing this technical working paper, including heritage register searches, field survey of the proposal area and significance assessment criteria.

This assessment has followed the NSW Heritage Division publications *Assessing Significance for Historical Archaeological Sites and Relics* (NSW Heritage Branch, 2009), and *Statements of Heritage Impact* (NSW Heritage Office, 2002).

#### 3.1 Register Searches and Background Research

The assessment of non-Aboriginal heritage has included the following tasks to address relevant aspects of the NSW Heritage Branch guidelines:

A search of relevant historic heritage registers has been conducted, including:

- World Heritage List (World Heritage Committee, UNESCO)
- National Heritage List (Australian Heritage Council)
- Commonwealth Heritage List (Australian Heritage Council)
- NSW State Heritage Register (Heritage, Department of Premier & Cabinet)
- NSW State Heritage Inventory (Heritage, Department of Premier & Cabinet)
- NSW section 170 Heritage and Conservation Registers (hereafter referred to as S170 Registers) compiled by Roads and Maritime, Sydney Water, Sydney Trains and Transport for NSW and other government agencies as relevant
- Singleton Local Environment Plan 2013
- Register of the National Estate (Australian Heritage Council) (non-statutory).

It has also included:

- A review of historic materials, such as historical parish maps and plans, to determine the historic context of the proposal area and to identify any potential for archaeological heritage items
- Mapped historic heritage listings have been assessed to ascertain properties within the proposal area with possible direct and indirect impacts during construction and operation of the project
- For construction, it is anticipated that direct impacts may include ground disturbance and indirect impacts may include vibration or settlement generated by construction activity
- For operation, it is anticipated that direct impacts and indirect impacts may include the visual presence of permanent features
- Available heritage listing information has been compiled of the potentially impacted listings, including past photographs, where available
- Field surveys of the identified properties have been carried out to the extent that access limitations allowed
- During the surveys, areas of potential heritage value have been investigated to look for historic heritage outside the recorded listing locations that may be impacted by the proposed works
- Existing background information has been updated with field survey results
- Statements of Heritage Impact (SOHIs) have been produced for the identified heritage sites considering direct and indirect impacts during construction and operation.

The results of the non-Aboriginal heritage investigations and assessment have been documented in this report, including identification of mitigation and management measures to address direct and indirect impact on heritage items.

#### 3.2 Field survey methodology

Archaeological survey of the proposal area was undertaken over six days, from 26 March to 29 March 2018, 3 April 2018 and 31 October 2018, with the survey team comprising two archaeologists from AECOM. All survey was conducted on foot, with a total of 31 transects completed over the course of the survey (see Figure 3-1). All accessible portions of the proposal area were comprehensively sampled during the survey, with additional focus on previously recorded historic heritage sites. The location of each transect completed during survey, including start and end points, was recorded using handheld differential GPS units, with associated transect data entered directly into the same unit upon the completion of each transect. All known and newly identified historic sites and items found during the survey were recorded and comprehensively photographed.

#### 3.3 Significance Assessment

In order to understand how the proposed development will impact on a heritage item, it is essential to understand why an item is significant. An assessment of significance is undertaken to explain why a particular site is important and to enable the appropriate site management and curtilage to be determined. Cultural significance is defined in the Australia ICOMOS Charter for the conservation of places of Cultural Significance (the Burra Charter) as meaning "aesthetic, historic, scientific or social value for past, present or future generations" (Article 1.1). Cultural significance may be derived from a place's fabric, association with a person or event, or for its research potential. The significance of a place is not fixed for all time, and what is of significance to us now may change as similar items are located, more historical research is undertaken and community tastes change.

The process of linking this assessment with a site's historical context has been developed through the NSW Heritage Management System and is outlined in the guideline Assessing Heritage Significance, part of the NSW Heritage Manual (Heritage Branch, Department of Planning 2001). The Assessing Heritage Significance guidelines establish seven evaluation criteria (which reflect four categories of significance and whether a place is rare or representative) under which a place can be evaluated in the context of State or local historical themes. Similarly, a heritage item can be significant at a local level (i.e. to the people living in the vicinity of the item), at a State level (i.e. to all people living within NSW) or be significant to the country as a whole and be of National or Commonwealth significance.

This project uses the NSW heritage significance criteria, which are:

**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).

The site must show evidence of significant human activity or maintains or shows the continuity of historical process or activity. An item is excluded if it has been so altered that it can no longer provide evidence of association.

**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 to area).

The site must show evidence of significant human occupation. An item is excluded if it has been so altered that it can no longer provide evidence of association.

**Criterion (c)** – an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).

An item can be excluded on the grounds that it has lost its design or technical integrity or its landmark qualities have been more than temporarily degraded.

**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.

This criterion does not cover importance for reasons of amenity or retention in preference to the proposed alternative.

**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). Significance under this criterion must have the potential to yield new or further substantial information.

Guidelines for exclusion include that the information would be irrelevant or only contains information already available in other sources.

**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). The site must show evidence of the element/function etc. proposed to be rare.

**Criterion (g)** – an item is important in demonstrating the principal characteristics of a class of NSW's:

- cultural or natural places; or
- cultural or natural environments.

An item is excluded under this criterion if it is a poor example or has lost the range of characteristics of a type.

#### 3.4 Statement of Heritage Impact

The *Heritage Act 1977* and the Singleton LEP 2013 establish mechanisms for dealing with development impacts through the identification of heritage items that may be affected. A key component of such assessments is the Statement of Heritage Impact (SoHI). A SoHI provides a structured examination and assessment of the impacts of a proposed development or activity upon known and potential heritage items. The key components of a SoHI are:

- The identification of the potential heritage resource, which may or may not be listed in statutory instruments
- Assessment of the significance of the item
- Assessment of the impact of the proposed development, work, or activity upon the item
- Recommendations for avoiding or mitigating impacts to the item.

The applicable standards for the preparation of a SoHI are:

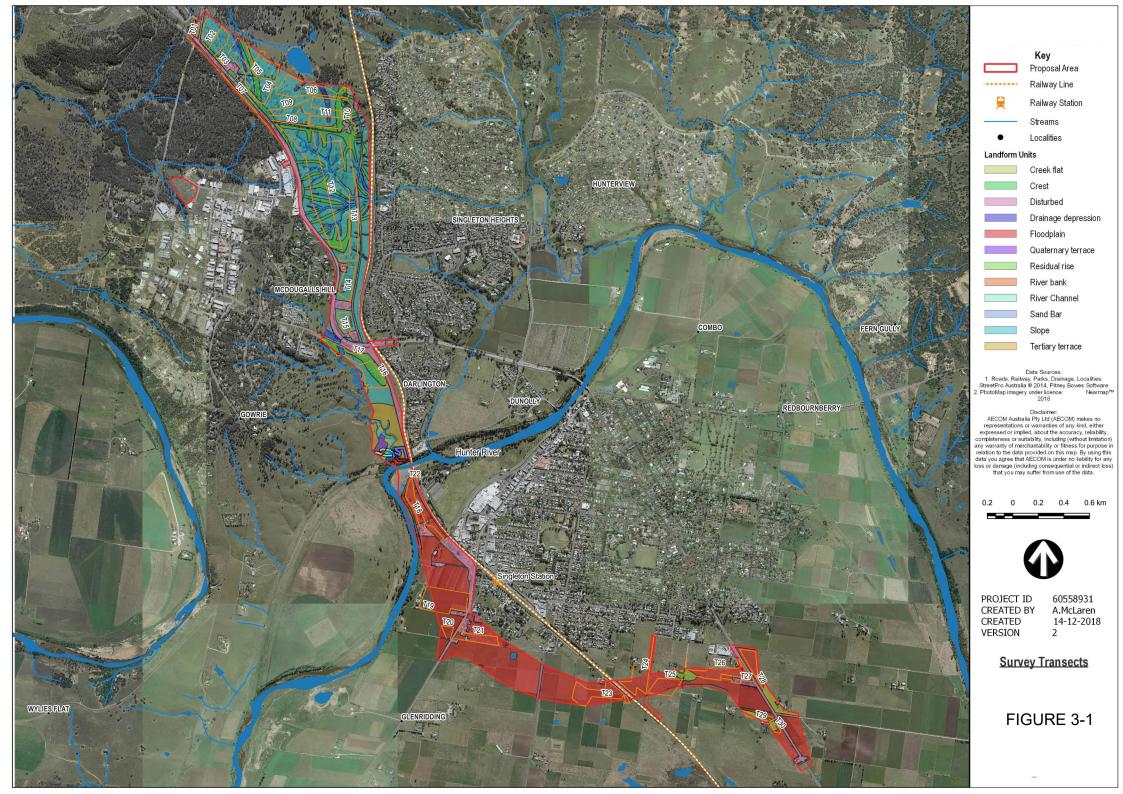
- The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance (Australia ICOMOS, 2013)
- *NSW Heritage Manual* (NSW Heritage Office & NSW Department of Urban Affairs and Planning, 1996b)
- Statements of heritage impact (NSW Heritage Office, 2002). The NSW Heritage Manual provides a model format for the structure of a SoHI. These guidelines also include prompts for questions to be addressed within a SoHI.

The objective of a SoHI is to evaluate and explain how the proposed development, rehabilitation or land use change will affect the value of the heritage item and/or place. A SoHI should also address how the heritage value of the item/place can be conserved or maintained, or preferably enhanced by the proposed works.

The NSW Heritage Office (2002) Statements of Heritage Impact guidelines pose a series of questions as prompts to aid in the consideration of impacts due to proposed works. The guideline format lists questions that are posed and addressed. The series of questions of greatest relevance to the proposed works should be applied to the relevant a heritage item. Statements of Heritage Impact (2002) stipulates that the minimum supporting information required for an item of local significance is a Statement of Significance and a Conservation Policy.

#### 3.5 Grading of Significant Components

As different elements of an item can have a different contribution to its heritage significance, it is useful to define which elements are of significance and which may detract from its significance. The NSW Heritage Division (NSW Heritage Office, 2001:11) use the grading criteria of Exceptional, High, Moderate, Little and Intrusive in relation to fabric and condition.



## 4 Proposed Works

#### 4.1 Construction activities

Activities may vary to suit the construction staging plans, which would be determined by the construction contractor. The proposal is anticipated to involve the following general work methodologies and sequencing:

- Site establishment work including set up of ancillary facilities and compound areas
- Utility adjustments
- Building demolition
- Vegetation clearing
- Earthworks and drainage
- Bridge construction including approaches
- Pavement construction including local roads
- Landscaping and finishing work
- Removal of ancillary facilities and site rehabilitation.

#### 4.1.1 Work methodology

Construction activities would be guided by a construction environmental management plan (CEMP) to ensure work is carried out to Roads and Maritime specifications within the specified work area. Detailed work methodologies would be determined during detailed design and construction planning.

#### 5.1 Introduction

The following section provides a brief overview of the history of the proposal area.

#### 5.2 Early European Exploration

The Hunter region was initially identified as an area of rich resources in 1797 when Lieutenant John Shortland found coal at the mouth of the Hunter's River, as it was then known. A convict settlement was established at the mouth of the river in 1801 to gather coal and timber and burn shells for lime (Hunter, 2010: 6).

The 1810s saw increased pressure on land around Sydney, especially following several years of drought. The farmers on the Hawkesbury River around Windsor petitioned Governor Macquarie to allow exploration inland. In 1819, Macquarie authorised men to find an overland route into what is now known as the Hunter Valley. The leader of this party, Windsor chief constable John Howe, stated it was the best pasture he had seen since leaving England. Confirmation of the overland route was undertaken in 1820 (Hunter, 2010: 7). Macquarie rewarded the men in this second party with land grants around the area now known as Singleton.

Land was quickly surveyed and by 1823 grants along rivers and creeks had been issued, but settlement occurred at a slower pace. A traveller in 1827 said that the area was inhabited by single shepherds with their flocks (Hunter, 2010:8). Known historical industry developments were associated with mining and farming. William Longworth was employed by the Bowman family to sink a shaft to test for coal in 1847. Longworth's report that the coal was not of sufficient quality to warrant mining led to the closure of the shaft soon after (Noble, n.d.).

European settlement in the general Singleton area commenced in the late 1820s. Early land development was associated with wheat cropping, tobacco production, dairy farming and timber cropping. From the 1870s onwards the land was predominantly cleared and has been used since for both mining and grazing activities, which have significantly affected the physical environment of the area (Whitelaw, 1971).

#### 5.3 Early Coal Industry

A coal pit was opened at Rixs Creek in 1860, where reportedly two men were employed during winter and one during summer (The Sydney Morning Herald, 1866). Coal from the mine was sold to Singleton "at 10/- a ton at the pit or 17/6 delivered at Singleton". Described in 1869 as "one of the most promising industries in the neighbourhood of Singleton", the distance from the mine to the railway terminus was cited as limiting the coal mine from competing with others located closer to Newcastle (Jervis, 1953). As a result the coal was predominantly sold "to the supply of household wants of the people of Singleton and that of the steam engines in the neighbourhood" during this period (The Sydney Morning Herald, 1866). The coal itself was described as burning "with great brilliance and free from that disagreeable colour which has so much contributed to prevent the more general introduction of colonial coal into our parlours and drawing-rooms" (The Maitland Mercury and Hunter River General Advertiser, 1863). In 1866 a reporter interviewed some of the customers and stated: "they speak very highly of it as being all that can be desired as a household coal" (The Sydney Morning Herald, 1866). An example of coal from the area was even exhibited at the Paris Universal Exhibition in 1867, where it was stated to be of good quality (The Sydney Morning Herald, 1867).

The proprietor of the Rixs Creek mine in 1869 was James Singleton, and it was stated that he had spent a total of 1000 pounds on the works for the mine (Jervis, 1953). Other coal mines at Rixs Creek included William Longworth's Whodathoughtit mine for steaming coal, opened in the 1870s following his return to the area after a stint in the gold fields, and the New Park coal mine opened in 1881 by a syndicate formed by Dr Richard Read (Noble, n.d.).

By 1885 more pits and shafts had been opened in the area. The Nowland Brothers' Coal Pit consisted of a single tunnel "fifty or sixty yards in length" with a tramway built along it "up which a horse draws the coal in a trolly". On the northern side of the railway line and "a little higher up" from the Nowland Brothers' Coal Pit a shaft had been excavated by Mr. William Cunneen. It was described as "a perpendicular shaft of about thirty feet sunk, and have met brackish water, which, no doubt, will prove considerably inconvenient to them, but there are no signs of coal yet" (Cornstalk, 1885).

The syndicate formed by Dr Richard Read that had opened the New Park mine in 1881 also opened the Rixs Creek Coke Ovens (Noble, n.d.). A battery of coke ovens were built at Rixs Creek in the 1880s; these later had a second battery of ovens constructed around 1900. Both batteries were cited as being visually discernible in the area. The coke produced at the ovens was described in 1890 as "the best available" (Armstrong, 1983). A major business in the area, the remnant coke ovens and associated works (now long disused) have since been listed in the Singleton LEP (2013).

#### 5.4 Historical Land Use

European settlement of the greater Singleton area can be traced to the opening decades of the 19th century, with John Howe's pioneering expeditions to the Hunter Valley in 1819 and 1820 opening the area up for free settlement. At this time, the greater Singleton area was known as "Saint Patrick's Plains", so named because Howe's 1820 expedition reached the Hunter River on 15 March, two days before Saint Patrick's Day (17 March). Howe, for his part, was quick to stress the agricultural potential of the plains bordering the Hunter River, informing Governor Macquarie in March 1820 that his party's journey from Saint Patrick's Plains to "Wallis Plains" (Maitland) had seen them traverse "as fine a country as imagination can form... fit for cultivation and equally so for grazing" (Howe, 1820 in Dunn, 2016: 61). Howe's belief in the agricultural potential of the Hunter River floodplain was shared by naval surgeon and author Peter Cunningham, who described Saint Patrick's Plains in 1827 as comprising "above two thousand acres of the most fertile soil, the greater portion naturally clear of timber" and as containing natural grasses "of the most luxuriant description" (Cunningham, 1828: 143).

Between 1821 and 1825, 283 land grants totalling 369,351 acres were made along the Hunter River (Singleton Historical Society, 1991: 2). Rapid settlement of the Wallis and St Patrick's Plains districts was facilitated by the prodigious surveying efforts of Henry Dangar, who in 1822, was instructed to carry out a survey of the Hunter River and to make allocations for setters along its lower branches, as far north as St Patrick's Plains (Singleton Historical Society, 1995: 17). For their part in discovering a route to the Hunter Valley, Howe and all of the free men in his party, which included Benjamin Singleton, George Loder Jnr, Andrew Loder, Daniel Phillips, Thomas Dargin Jnr and Phillip Thorley, received land grants in the greater Singleton area. Howe received a grant of 700 acres (21.3.1823, "Rebournberry"), Singleton 200 acres (31.3.1821), Dargin 100 acres (30.01.1824), Andrew Loder 100 acres (01.02.1825), George Loder 200 acres, Thorley 100 acres (31.3.1821, "Mount Thorley") and Phillips 100 acres (31.3.1821, "Glenfield") (Singleton Historical Society, 1991: 3; 1995: 12-16).

Examination of early parish maps indicates that the majority of land within the proposal area formed part of land grants issued to, or properties purchased by, members of the McDougall family (ie, Andrew McDougall Snr., James Taylor McDougall, Alexander McDougall and Andrew McDougall Jnr.), with grazier, auctioneer, innkeeper and prospector John Rotton another prominent landholder (Singleton Family History Society, 1989: 57-58, 76). Records indicate that Andrew, James and Alexander McDougall each received land grants of 900 acres on 13 May 1823, with Andrew and James naming their properties "Kelso" and "Dunolly" respectively (Singleton Family History Society, 1989). John Rotton received his grant of 1,040 acres, which he named "Newington", on 3 April 1822 (Singleton Historical Society, 1991: 3).

The pastoral industry, Whitelaw (1971) notes, was the first industry to be established on St Patrick's Plains, with many of the district's earliest settlers grazing sheep and/or cattle driven overland from Richmond and Windsor. The first crops to be sown in the area, meanwhile, were "wheat, maize and other grains", with early landholders sometimes selling but predominantly keeping their crops for

personal consumption (Whitelaw, 1971: 7). Mills soon appeared, with early examples including those established by Benjamin Singleton, William Kingston, James Mudie and Phillip Thorley (Whitelaw, 1971: 8). Other early agricultural pursuits included tobacco and wine grapes, with the former comprising a particularly important and successful industry in the district (Whitelaw, 1971: 8). Dairying is reported to have been established in several parts of the district by 1860, with the industry's steady expansion over time prompting the opening of several creameries in the 1890s. By November 1898, there were 360 registered dairies in the district, with milking herds ranging in size from eight to 86 cows (Singleton Historical Society, 1995: 25).

While the European settlement of St Patrick's Plains commenced soon after the district's "discovery" by Howe and his team, the present day township of Singleton was essentially founded in 1836, when Benjamin Singleton received the deeds for his 200 acre land grant adjacent to the Hunter River, which was to be called "Singleton". Containing a natural ford over the Hunter River, known locally as "Singleton's Ford", Singleton first took up residence on his grant in 1823, improving it over time through the construction of a residence, an inn (the "Barley Mow") and the area's first flour mill (Singleton Historical Society, 1995: 10-11). In January 1836, 103 quarter acre allotments were offered for sale in the intended town of Singleton, with 45 subsequently sold at an average price of £33.13.5 (Single Historical History, 1995: 5). It was around this time that Singleton donated a portion of his land, now known as Burkedin Park, for the establishment of a market square for the town. In 1841, Singleton, at his own expense, built a court house on his land, modelling it on one previously erected at Whittingham (Singleton Historical Society, 1991: 5). Despite his early successes, ensuing years saw Singleton struggle financially and he died on 3 May 1853 (Whitelaw, 1971: 11).

In 1863, the Great Northern Railway was extended from Black Creek (Branxton) to Singleton, ushering in a new era of prosperity for the town (Whitelaw, 1971: 12). Singleton remained the railhead until 1869, when the railway was extended to Muswellbrook. Although first mooted in 1861, the municipality of Singleton wasn't officially proclaimed until 1866 (Singleton Historical Society, 1995: 33-34). Singleton's first official post office was built several years later, in 1878, with its predecessor located at Darlington (Singleton Historical Society, 1995: 12). The informal track used to access the area developed over time into the Great Northern Road. In August 1928 it was gazetted as part of state highway 9, which was then renamed the New England Highway in 1933. It is currently part of the national highway route that links Sydney and Brisbane (Department of Main Roads, 1952).

#### 5.5 The Tramway and Great Northern Railway

In 1863 talk of a tramway for the Rixs Creek area was being discussed in local print media. It was an enterprise designed to ease the transportation of coal from the Rixs Creek mine, with the suggestion that "when the railway is extended to Falbrook, this mine could be easily connected with the Great Northern Railway, by means of a short tramway about two miles in length." Not only that but the author of the article went on to state: "we have no doubt that Mr. Campbell, the spirited proprietor of the land on which the coal-mine is situated, will do something of the sort which would be of immense benefit to the whole of his property" (The Maitland Mercury and Hunter River General Advertiser, 1863).

By 1869 a petition was being signed in the district to request Government permission to construct a tramway between the Rixs Creek coal mines and the Great Northern Railway (later also referred to as the Main North railway line). The petition was instigated by Mr Elliot (the lessee of the mines) and Edward Campbell (owner of the land where both mines and proposed tramway were situated). A small portion of the proposed tramway route passed through Government land, with the entire route measuring approximately "one and three-quarters of a mile in length" (being around 2.8 kilometres) (The Maitland Mercury and Hunter River General Advertiser, 1869).

By 1870 the Government was in the process of constructing a railway siding four miles from Singleton station, connecting to the Great Northern Railway. This siding was accessible from a section of road located approximately two miles (3.2 kilometres) from the Rixs Creek Colliery. Mr Elliot and Edward Campbell were still planning a tramway for direct connection, as the demand for coal from Rixs Creek had increased. From the two men they had originally employed at the mine in

1860, numbers had increased to between 20 and 30 men, with lessee Mr Elliot stating "he could find steady employment for ten more good and steady miners" (The Newcastle Chronicle, 1870).

By 1874 Edward Campbell announced his intention to build the tramway, estimated to require a length of 1.75 miles (2.8 kilometres) and likely to cost around £20,000 to construct across the Grunbalong Estate, being land owned by Campbell. It was stated as uncertain as to whether the cost would be incurred by Campbell personally or if he intended to form a company to carry out the enterprise, with newspaper speculation predicting: "if Mr Campbell should decide to form a company for carrying on the enterprise, we have not the slightest doubt but that the shares would be rapidly taken up, the investment being in every sense a most excellent one, with large dividends looming in the immediate future" (The Maitland Mercury and Hunter River General Advertiser, 1874).



Figure 5-1 Detail of the 1929 Parish Map of Darlington (NSW Land & Property Information, 2018)

The tramway petitioned for in 1869 was eventually built between the coal pits area (close to the coke ovens) and Rixs Creek Station. The tramway was in operation from at least 1887 (Singleton Argus, 1887), its extent shown on the 1912 and 1923 Parish Maps of Darlington, extending across a 50 acre block then owned by S. Noble, reaching the Alexander Gardner owned land parcel where the Coke Ovens were situated, labelled as 'Tramway'. After the tramway fell into disuse its rails were removed. In 2012 AECOM identified remnants of the tramway, consisting of a raised linear earth mound corridor marking its original route (AECOM Australia Pty Ltd, 2012). The tracks were not present on the identified section and there were no visible signs of historic material on the surface. The remnant alignment consisted of the built up, mounded area that the tracks had previously been mounted on (AECOM Australia Pty Ltd, 2012).

This section of the Great Northern Railway was utilised to transport both goods and people to and from the area between 1869 (when it was extended from Singleton to Muswellbrook) and 1952 (Whitelaw, 1971). The full extent of the Great Northern Railway started in Sydney and eventually was extended north to the town of Wallangarra on the Queensland border, with the Main North railway line carrying freight and passengers between Sydney and Maitland. It remains an active and important piece of transport infrastructure in NSW. Between 1869 and 1952 it was an important piece of historic infrastructure that connected the goods, produce and people of the area to external markets and places. Industries in the area during that period included farms (dairy and pastoral), coal mines, stores and the coke ovens. The Rixs Creek platform was opened in 1885 to service the Great Northern Railway and was in use up until the closure of the platform in November 1938. The 1930 Local Appendix lists it as station number N23A and states that it consisted of a platform only (there were no other station structures). The platform did not have permanent staff and was used

only infrequently (New South Wales Government Railways, 1930). It is shown on the 1929 parish map of Darlington as being located in the rail corridor next to a 58 acre lot owned by F. L. Mackay. In December 1952 this section of the Great Northern Railway was deviated slightly (approximately 90 metres further to the east), with the disused platform located on the original alignment (Bozier, 2012). The rails have since been removed from the original section of rail corridor but the remnant corridor (used since as a vehicle track) still contains cuttings and raised linear mounded areas that attest to its previous use (Bozier, 2012).

#### 5.6 Water and Power Developments

Singleton Council targeted the improvement of existing features and the development of new services as their primary objective in the early 1900s. This included the development of their own Council Chambers, commencing in 1909 with the purchase of appropriate land at the corner of George and Macquarie Streets. Other services included bridges, roads, causeways and other rural improvements, but of greatest importance were the establishment and improvement of two key services - water and power (Singleton Historical Society, 1995:35).

On Saturday 23 January 1909 the first sod was turned, ceremonially commencing work, on the pumping station that was to provide water to serve the needs of the residents in the town. Alderman H McFadden, Mayor of Singleton, was the master of ceremonies at the event, which "took place on the river bank at a spot immediately opposite the South Singleton Council Chambers". It also featured "an acceptable programme of musical items gratuitously contributed by the Singleton Town Band" (Singleton Argus, 1909). The announcement of the completion of construction works followed towards the end of that same year, in The Daily Telegraph on Thursday 16 December 1909. The article stated that the pumping station:

"consists of a well sunk on the river bank close to the railway bridge, from which the water is pumped to a service reservoir situated on a hill about 800 ft above the town, from which it gravitates into the mains, giving a pressure of 90lb per square inch. The water is naturally filtered before pumping, and upon the erection of the softening plant, which is under order, it will be pumped from the well through the softener, where it will be chemically treated, and after filtration gravitate into the storage reservoir. The result of a week's trial pumping test has proved that the inflow into the well will provide a practically inexhaustible supply of water" (The Daily Telegraph, 1909).

One of the key problems to face the pumping station however was one that challenged all of Singleton at periodic intervals, namely the flooding of the Hunter River. Since the opening of the pumping station in late 1909 up until 2001 there were a total of 18 flood events that exceeded the minor flood level of 10 metres at the Dunolly Bridge gauge. In May 1913 the height was measured at 14.17 metres, with water measured at two to three feet (0.6 to 0.9 metres) deep in some streets in the lower parts of Singleton. Floods had occurred before this as well, the one in 1893 had seen some residents drowned, a man's house swept away ("the house sailed down the stream like Noah's ark") and railway carriages completely covered at Elgin Street Station in Maitland. Singleton was reported to have been under water for 48 hours during the 1893 flood, all of which prompted the question as to why the pumping station had been positioned so close to the Hunter River, as the flooding of the Hunter River regularly caused massive erosion along its banks (Singleton Historical Society, 2001:8-13).

By Tuesday 6 October 1914 the buffer between the pumping station and the Hunter River had all but vanished. It was estimated that "115 out of 170 feet" (approximately 35 out of 50 metres) "which originally separated the site from the river, had been washed away as the result of one flood" leaving the pumping station in a "dangerous state". Although recriminations were made that "attention had been drawn to the unsuitability of the site when, four years ago, the Department first began the work" it was generally agreed that moving the pumping station to the other side of the river would be too expensive, so river bank protection works were proposed instead, with the costs to be split with the Railway Commissioners, who were responsible for the Hunter River Underbridge crossing adjacent to the pumping station location. "We have expert officers and competent workmen and will do the work to the best of our knowledge and ability" the Minister of the Works Department assured,

with a report commissioned "as to whether the proposed scheme would be successful" to be produced prior to any river bank protection works commencing (The Maitland Daily Mercury, 1914). The report was produced by Government Water Engineer C F Blain, who stated that if the remaining bank was battered to a suitable slope and grassed, further erosion could be avoided. He also noted that should further demand for water be required in Singleton in the future, this could be supplied by drawing water directly from the Hunter River (Singleton Argus, 1923).

Following the report being issued, willow trees were planted along the bank of the Hunter River in proximity to the pumping station in order to protect the bank in that area from suffering further erosion. By 1920 the Mayor stated that "they are now growing well, and he proposed planting more... The willows were sprouting well, and he would strengthen the bank further by anchoring dead trees and logs there, bringing the top of the bank down on them". Alderman Searl agreed, stating: "if this were followed up possibly grass would grow there and make quite a firm bank" (Singleton Argus, 1920).

In 1921 plans were approved for an auxiliary water supply to be formed by a suction pipe going directly from the pump well to the river, with a stop valve to be fixed on the pipe to "prevent water coming to the well when the river was in an unsuitable condition". This plan also included with it measures to halt further bank erosion, which consisted of battering "the perpendicular portion of the bank opposite the pumping station" and adding "turf or fascines" (being a bundle of bound rods used in construction to strengthen embankment sides) if required. A further measure was "planting willows along the toe of the bank" (The Maitland Weekly Mercury, 1921a).

Also in 1921, the waterworks engineer at the pumping station suggested to Council that a temporary supply of electricity be provided to the town via the installation of an oil engine and dynamo. His suggestion was to install these at the pumping station and run the power in conjunction with the water supply machinery, stating: "this would secure economy in running costs, and there seems to be no apparent reason why such an installation should not be successful in supplying a satisfactory street lighting service" (The Maitland Weekly Mercury, 1921b). Electric street lights were introduced to Singleton in 1923 (Singleton Historical Society, 1995:35).

The task of operating the pumping station was both difficult and dangerous, as was attested by an accident that occurred there in 1916. The engine room assistant Bert Hughes was operating the machinery when his hand got caught. His fingers were drawn "into a revolving cog wheel. The crushing sustained resulted in the loss of the first joint of the second finger, the whole of the third finger, and the smashing of the nail on the little finger" (The Maitland Weekly Mercury, 1916).

In 1933 tenders were sought for the installation of an unattended pumping unit at the pumping station, described as "an automatic electric contrivance, to enable the pumping to be done through the night in order to keep off the peak loading" (Singleton Argus, 1933). The building at the pumping station was extended and the new pumping unit installed in 1934 (Singleton Argus, 1934).

#### 5.7 Singleton Floods

The greater Singleton area, as documented in numerous research and consultancy-based investigations (eg Cameron McNamara Consultants, 1984; Geary & Erskine, 1984; Paterson Consultants, 2011; Singleton Historical Society, 2001), has a long history of flooding, which has impacted areas with erosion, including at the Former Pumping Station location. The first flood for which there is definite data occurred in 1818, two years before Howe's successful second expedition to the Hunter (O'Hara, 2001: 11). Flood event data compiled by Paterson Consultants (2011: 24-28, Table 2) indicate nine 'major' flood events2 since 1910, with the largest occurring in February 1955. The 1955 flood, which inundated the bulk of the town, led to the passing of the Hunter Valley Flood Mitigation Act (1956) and the completion of a host of major and minor flood mitigation schemes along the Hunter River and its tributaries (Erskine, 1990, 1992). Physical flood risk management works at Singleton consisted principally of the levee system constructed between 1964 and 1984 (Paterson Consultants, 2011: 15). This levee, the southernmost portion of which extends into the

<sup>&</sup>lt;sup>2</sup> le., those with peak gauge heights in excess of 13 m

proposal area, was designed to provide protection up to the 1955 flood level, with a freeboard allowance of 0.3 metres. The "Pilot Channel" constructed immediately upstream of the Hunter River Underbridge in the central portion of the proposal area is also of note here. Built by the Water Resources Commission (WRC) between 1960 and 1961, the overarching objective of this river training work was to relieve erosion pressure on the southern bank of the Hunter River through a realignment of the main river channel (Cameron McNamara, 1984: 8-5; Bill Paterson, pers. comm., February 2018). The original design concept for the Pilot Channel also included a diversion weir on the Hunter River, which was intended to force flow into the pilot cut and to encourage, through increased erosion, the establishment of a larger stable cross-section (Cameron McNamara, 1984: 8-5). However, the diversion weir was never constructed and the scheme is considered to have been a largely unsuccessful venture.

Recent flood hazard mapping for Singleton and environs, prepared by Paterson Consultants (2011), indicates that the majority of the Hunter River floodplain within the proposal area has been assessed as a high flood hazard area. Archaeologically, this is a particularly important observation given that landscapes prone to flooding may have washed away or buried archaeological materials and features if they were there, or did not attract historical development in those areas once diagnosed due to the high flood risk.

#### 5.8 Coal Mining

As with many of the Hunter Valley's major towns and cities (eg Maitland, Newcastle and Muswellbrook), the coal mining industry remains to this day a cornerstone of the local economy. Around Singleton itself, coal was discovered as early as 1830, with a "valuable stratum of coal" identified on George Yeoman's 60 acre land grant in the area now known as Combo (Singleton Historical Society, 1995: 29). However, it wasn't until the closing decades of the 19th century that the coal mining industry really established itself as one of the wider district's economic mainstays, with at least 16 mines in operation around this time (Singleton Historical Society, 1995: 30). The opening decades of the 20th century saw the industry continue to slowly expand, with the next major growth spurt occurring at the end of World War II as a result of a dramatic increase in electricity demand. At this time, there was a distinct shift of emphasis from underground operations to open cut mining, with the latter facilitating the recovery of larger quantities of coal in a safer, quicker and cheaper manner (Singleton Historical Society, 1995: 31).

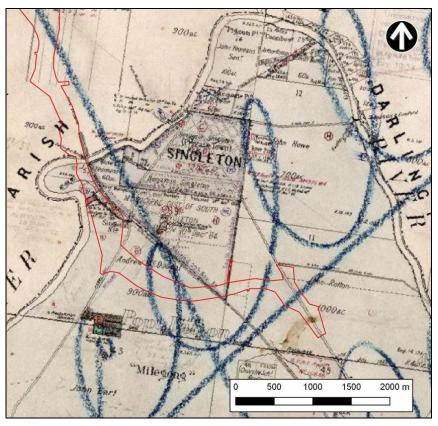


Figure 5-2 Georeferenced excerpt of 1897 parish map for the Parish of Whittingham, approximate position of proposal area in red (NSW Land & Property Information, 2018)

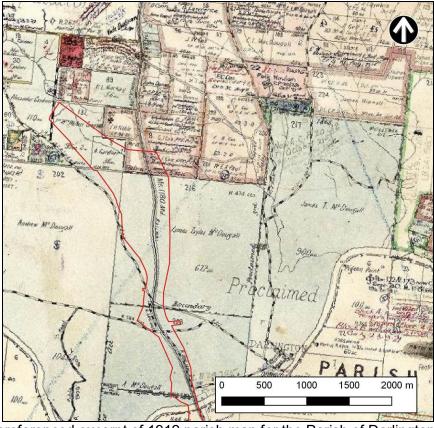


Figure 5-3 Georeferenced excerpt of 1912 parish map for the Parish of Darlington, approximate position of proposal area in red (NSW Land & Property Information, 2018)

#### 5.9 Land Disturbance

European settlement in the general Singleton area commenced in the late 1820s. Early land development was associated with wheat cropping, tobacco production, dairy farming and timber cropping. From the 1870s onwards the land was predominantly used for mining activities and stock grazing. Much of the surface soil in the local area has been disturbed as a result of native vegetation clearance. Sheet and gully erosion has resulted in some areas from clearing and subsequent grazing activities. This has been exacerbated by the highly erosional nature of the soils in the area. Sheet erosion is generally evident on lower slopes. This has resulted in the loss of topsoil, particularly across the lower to mid-slope sections, which collect water runoff from higher ground during times of rain. Stream bank erosion and gullying are evident along drainage lines. The construction of dams, in conjunction with both grazing and mining activities, have significantly altered the previous drainage regimes in the vicinity of the proposal area.

Alongside field observations and available documentary sources, historical aerial photographs provide an avenue for assessing the nature and extent of post-European settlement land use activities and ground disturbance across the proposal area. Aerials from 1949, 1963, 1975, 1984, 1994, 2004, 2009 and 2017, provided in Appendix A, indicate a range of activities and associated ground surface impacts. Those of particular relevance to the current investigation include:

- Extensive native vegetation clearance pre- and post-1949
- Railway and road construction
- Residential and commercial development
- Pastoral activities, including fencing and the construction of multiple farm dams
- Utility installation
- Light vehicle track construction / use
- Intensive cropping on the Hunter River floodplain
- Severe erosion (sheet, gully and creek bank).

To varying degrees, all of the above-cited land use activities and associated ground impacts are relevant to the survival, integrity and identification of archaeological evidence within the proposal area. Key implications for the current archaeological investigation include:

- The destruction, in grossly disturbed areas, of any pre-existing historical archaeological deposits
- The disturbance of pre-existing archaeological deposits through both direct (eg earthworks) and indirect (eg erosion) means, resulting in a loss of archaeological integrity
- An increase, in areas affected by erosion, of archaeological site visibility.

#### 6.1 Introduction

As discussed in Section 2, Commonwealth, State and local Governments maintain inventories of items of historical significance within each jurisdiction. The following section discusses listed heritage items within the proposal area.

#### 6.2 Heritage Register Searches

AECOM undertook a search of relevant heritage inventories on 22 March 2018. Table 6-1 summarises the heritage items within the proposal area that were listed on heritage inventories at the time of this assessment. The listed items are shown on Figure 7-1 and Figure 7-2.

Register	Items within Proposal Area	Item ID	Significance
Commonwealth Heritage List	N/A	N/A	N/A
National Heritage List	N/A	N/A	N/A
Register of the National Estate	N/A	N/A	N/A
NSW State Heritage Register	N/A	N/A	N/A
NSW State Heritage	Former Pumping Station	14346	Local
Inventory (compiling LEP listings)	Bebeah	1530354 and 14429	Local
	The Woolpack Inn	1530182	Local
S170 Registers	N/A	N/A	N/A
Singleton Shire Council	Coke Ovens	145	Local
LEP 2013	Former Pumping Station	l21	Local
	Bebeah	l120	Local
	The Woolpack Inn	I151	Local
State Rail Authority of NSW Heritage and Conservation Register (superseded)	Singleton Hunter River Underbridge	SRA844	Local

 Table 6-1
 Heritage Items Identified in register searches

Listed items that were not located within the bounds of the proposal area, but were in close proximity, were also considered in relation to this assessment, for both direct and indirect impacts. The closest listed item located outside the proposal area was Ardersier (I118), a locally significant item listed in Schedule 5 of the Singleton LEP 2013. Although its curtilage was immediately adjacent to the proposal area, no direct or indirect impacts were assessed as likely to occur to Ardersier or any of the other listed items in the area surrounding the proposal area.

Further information on the listed items identified in Table 6-1 that are likely to be subjected to impacts is included in Sections 7 and 8 along with the survey inspection results for each of these locations.

#### 7.1 Aims and Objectives

The overarching aim of the archaeological survey undertaken for this assessment was to identify and record any historic sites within the proposal area. Specific nested objectives were as follows:

- To confirm the location of, and reassess all registered historic sites within and immediately adjacent to the proposal area
- To survey accessible sections of the proposal area and undertake desktop assessments of those areas that were inaccessible
- To identify areas that, irrespective of the presence or absence of surface sites, had the potential to contain subsurface historic archaeological deposits
- To provide sufficient data to facilitate the development of an appropriate management strategy for the known and potential historic archaeological resource of the proposal area.

#### 7.2 Survey Strategy

Survey of the proposal area was undertaken over six days, from 26 to 29 March, on 3 April 2018 and 31 October 2018, conducted on foot over a total of 31 transects (see Figure 3-1). The survey strategy developed for this assessment was informed by the following factors:

- The number (n = 40) of landholders affected by the proposal, with several indicating prior to survey that they were unwilling to grant access to their properties and others unable to be contacted to authorise access
- 2. The presence of areas of previously recorded historic sites with defined curtilages
- 3. Generally poor Ground Surface Visibility (GSV) conditions across the Hunter River floodplain.

Ultimately, in consideration of the above, it was decided that the current survey would attempt a comprehensive survey of all accessible portions of the proposal area3, with a particular focus on areas of enhanced archaeological visibility and the known locations of previously recorded historic heritage sites.

#### 7.3 Results

The sites recorded during survey (including those that had been previously registered) are summarised in the table below and described in detail in the following sections, along with details of their heritage significance and an assessment in relation to the proposed impacts. The sites that were identified as having heritage significance are presented in Table 7-1 in order of moving from north to south across the proposal area.

Item	Listing	Significance
Coke Ovens	Singleton LEP 2013	Local
Great Northern Railway section	Not Listed	Local
Singleton Hunter River Underbridge	State Rail Authority of NSW Heritage and Conservation Register	Local

Table 7-1	Historic sites within the proposal area
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<sup>&</sup>lt;sup>3</sup> Excluding the Hunter River's active channel

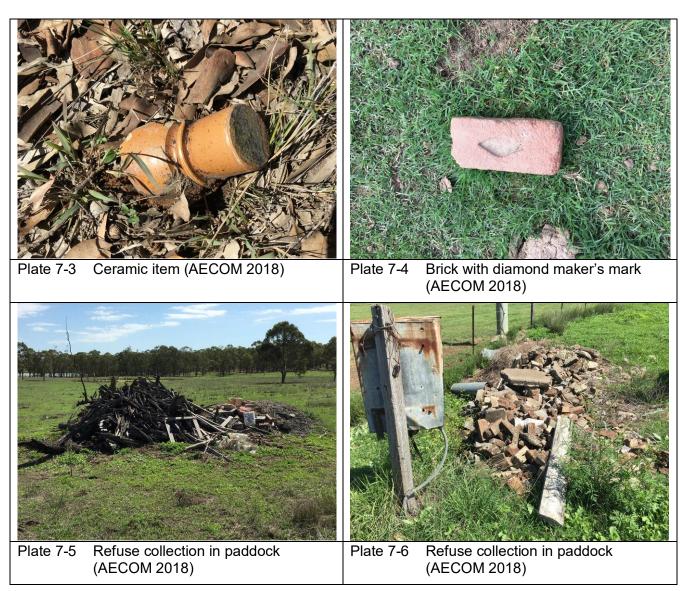
Item	Listing	Significance
Former Pumping Station	Singleton LEP 2013	Local
Bebeah	Singleton LEP 2013	Local
The Woolpack Inn	Singleton LEP 2013	Local

In addition to the historic sites identified in Table 7-1, other observations were made during the inspection. These areas were assessed as not having heritage significance (which is why they are not defined as sites within Table 7-1). Scatters of glass, ceramic and brick material and landscape modification were observed across the proposal area. Although presenting evidence of use and change throughout the wider area, these finds were not identified as having heritage significance when examined in relation to the NSW heritage significance criteria. This was due to the fact that the items were representative of multiple periods mixed together without context. As the artefacts lacked provenance they were unable to provide archaeological context or research potential. A brief description of them is included here for completeness.

Scatters of material were identified across the proposal area during the survey, with a variety of material evidenced. In the northern portion of the proposal area in a paddock on the eastern side of the intersection with the New England Highway and Rixs Creek Lane a scatter of broken glass, ceramic and brick was identified. Further isolated examples of glass, brick and ceramic were identified moving southeast across the proposal area. These scattered fragments, including glass and ceramics, were determined to be either modern examples of opportunistic discard, located in disturbed areas without specific historical association, or isolated fragments without historical context. They also included refuse piles associated with farming work (see Plate 7-1 to Plate 7-6).



Plate 7-1 Scatter of ceramic and glass (AECOM 2018) Plate 7-2 Scatter of glass fragments (AECOM 2018)



Landscape modifications were also present across the proposal area, in a variety of forms. Historical tree marking was noted in the form of cuts made by a steel instrument (located at 326177 E 6398361 N). Whether these were survey marks or the personal markings of a past land holder could not be determined (see Plate 7-7 and Plate 7-8).

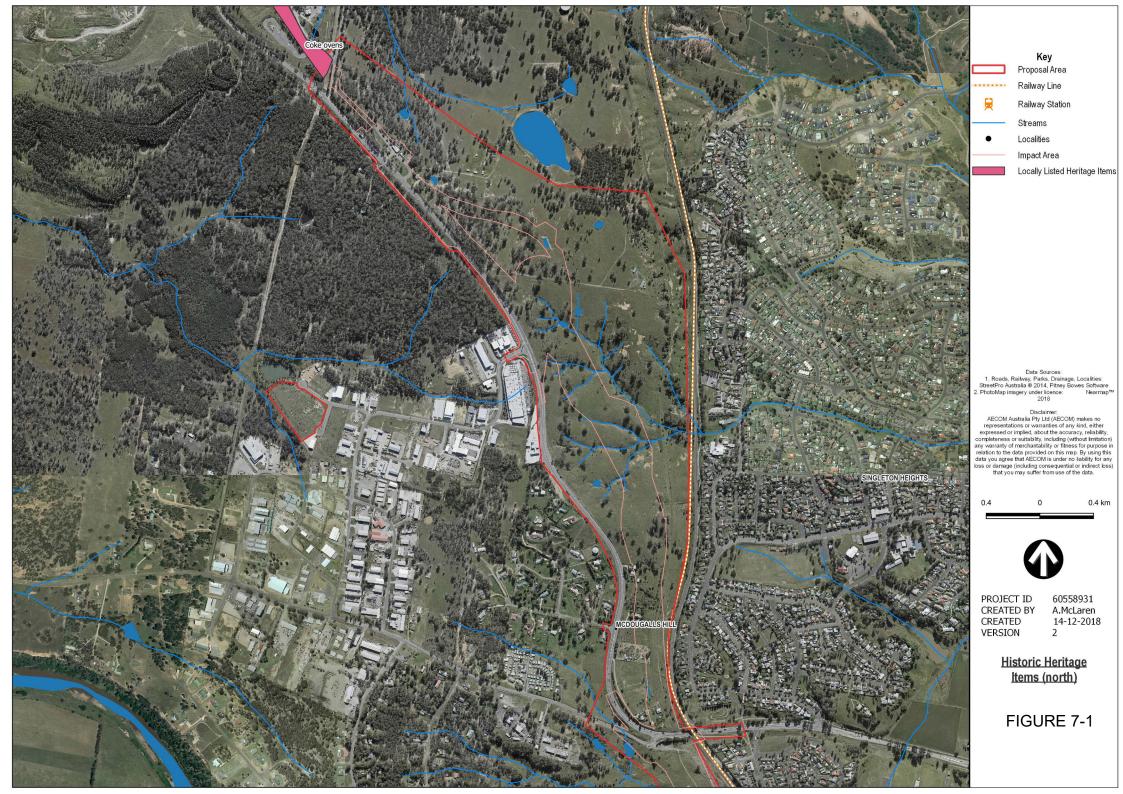


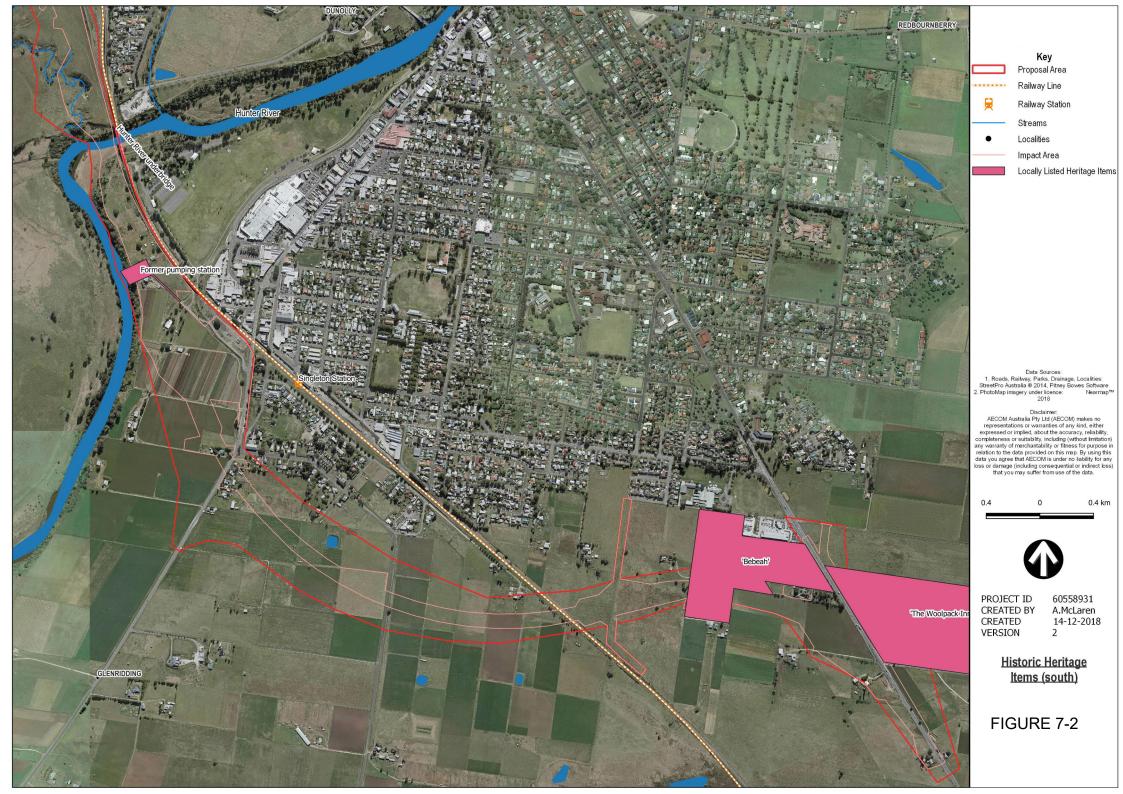
Plate 7-7 Tree with metal implement cuts, view Plat west (AECOM 2018)

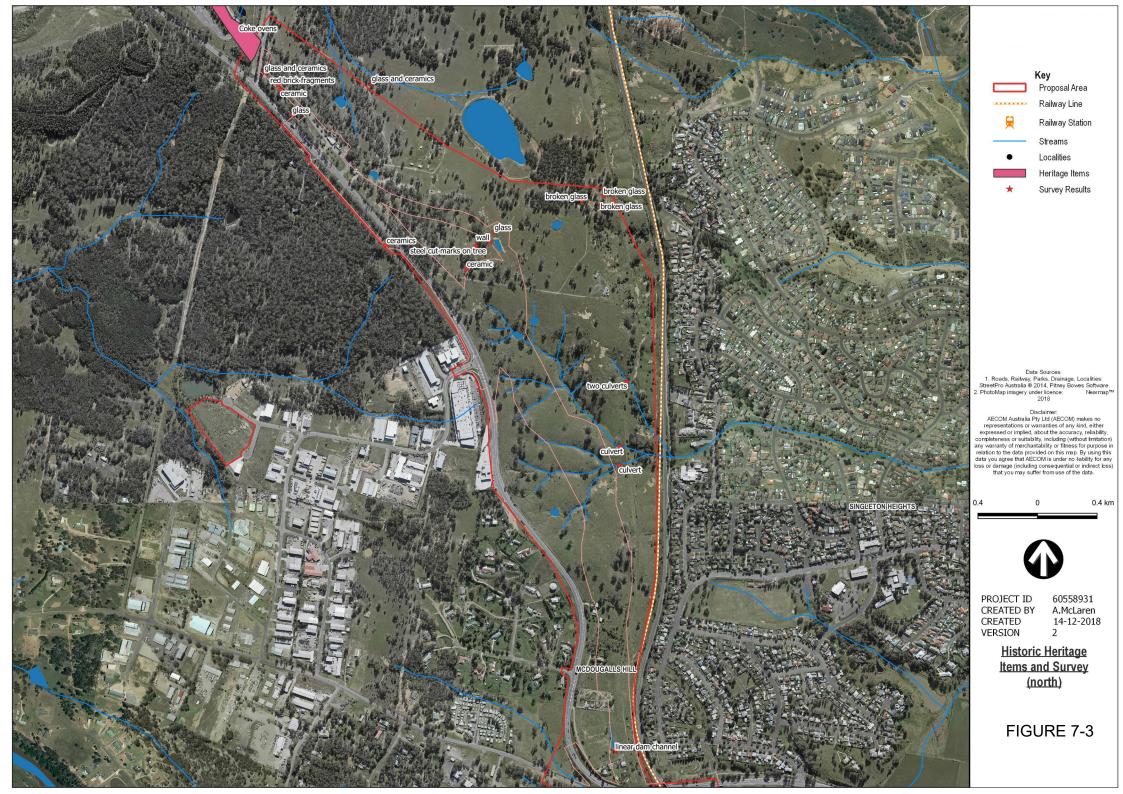
Plate 7-8 Tree with metal implement cuts, view east (AECOM 2018)

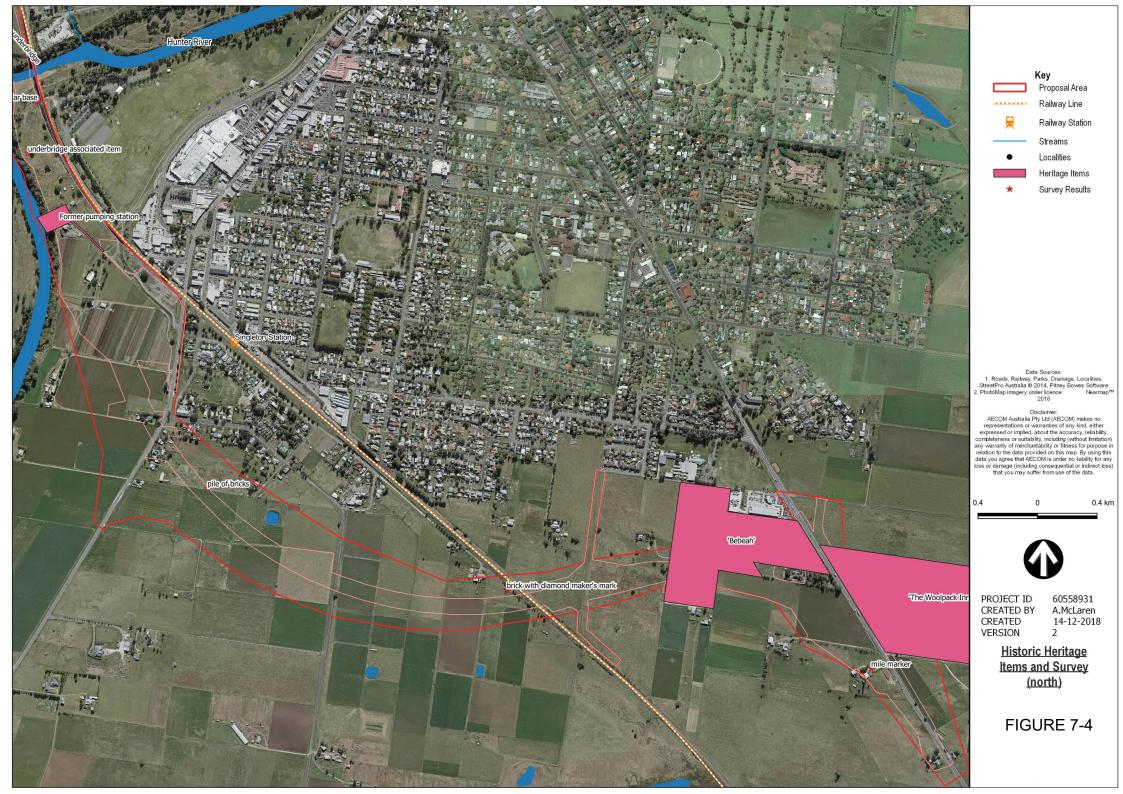
Dams were a regular feature across the landscape, including one unusually shaped linear dam, approximately 90 metres long with a channel seven metres wide (see Plate 7-9). No specific historical significance was identified with this or any of the other dams encountered during the survey, but they were noted as physical examples of landscape modification associated with the farming and stock grazing traditions that have shaped the geography of the proposal area since the 1820s. A mile marker was also identified at 329917 E 6393581 N, but it was in an out of context location, having been reappropriated for decorative use within a suburban garden. Figures 7 to 10 show both listed items and those identified during survey.











# 8 Significance Assessments and Statements of Heritage Impact

## 8.1 Coke Ovens

### 8.1.1 Description of the Heritage Item

The item Coke Ovens (I45) is listed on the Singleton LEP 2013 as having local significance. The LEP listing curtilage for this item is approximately 48 hectares in size, crossing slightly into the proposal area at its northern extent. An inspection of this area of intersection was undertaken on 26 March 2018 and did not identify any historic heritage features associated with the listing within the bounds of the proposal area. The section within the proposal area has been subject to past disturbance in the form of vegetation clearance and works associated with the adjacent roadways; currently it is grassed and contains some regrowth plantings (see Plate 8-1 and Plate 8-2).



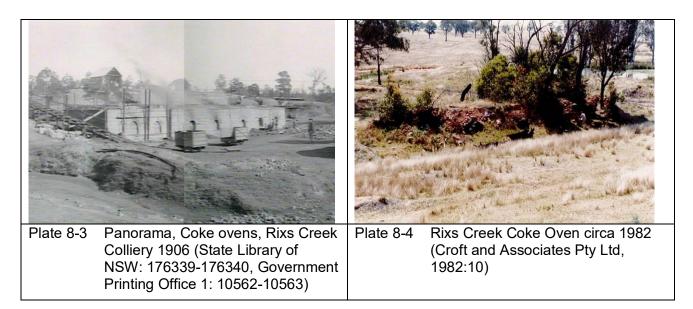
An updated condition assessment of the coke ovens and their associated features was not undertaken, as they were located beyond the bounds of the proposal area. Images from past recordings are included in Plate 8-3 to Plate 8-9.

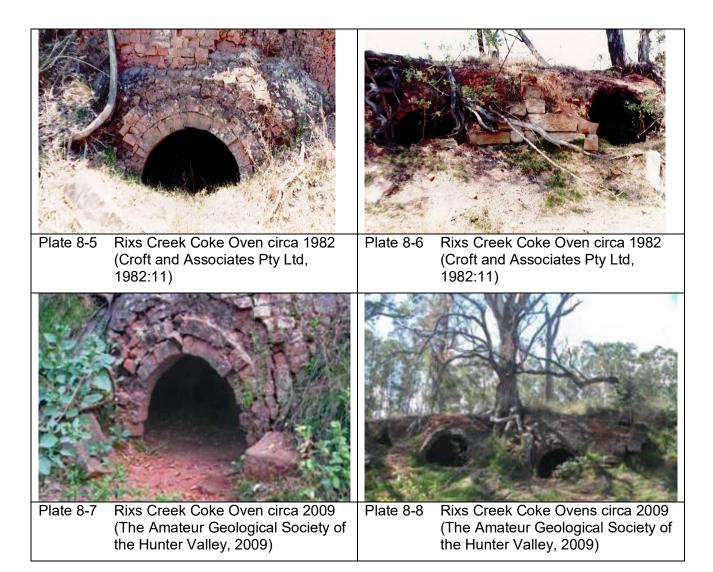
Historical photographs from 1906 show seven coke ovens in one continuous battery. Materials used to build the ovens included brick and sandstone. The 1906 photographs show the coke ovens to be situated within the larger Rixs Creek mining area, surrounded by such infrastructure as rail tracks housing trolley cars, wooden huts and earth embankments (see Plate 8-9). In 1982 the coke ovens were inspected and described as:

"two batteries of coke ovens exist on the site. One bank... consists of 26 'beehive' type ovens (13 back to back). Dome shaped with a hole in the centre top and an arched opening at the front, it is thought that these ovens were constructed in the early 1870's and were used up until 1919. The other group of ovens... is comprised of eight 'beehive' ovens and four 'arched' or 'culvert' type ovens, the latter being of a more advanced design. It is estimated these coke ovens were constructed in the mid 1880's and had ceased operation by 1905" (Croft and Associates Pty Ltd, 1982:4). The site was also described as having mine works and machinery associated with it, with the total content listed as:

"40 coke ovens in two batteries, three closed mine entrances, coal and scree dumps, the remains of a tram way, some large mullock heaps, several building and machinery foundations, and a large amount of scattered pieces of iron and machine pieces, much half-buried... the mine is sited further up the hill than the ovens and is connected by a raised embankment probably used as a tramway to carry the coal in skips from the mine entrance... There are remains of skip tracks on top of the ovens" (Croft and Associates Pty Ltd, 1982:Appendix 1).

A conservation management plan for the ovens was produced in 2007, due to their local heritage significance (Lonergan, 2007). The curtilage was not assessed in this plan, which primarily focussed on the ovens themselves. Other archaeological features associated with the ovens were noted to include dams, skip track, footings, posts and foundations. None of these features, identified on a map within the plan, were within the section of the curtilage intersected by the proposal area for this assessment. In 2009, the coke ovens were inspected and described as being overgrown by vegetation, including trees, having also undergone collapse and vandalism in some areas (The Amateur Geological Society of the Hunter Valley, 2009:7-8). In 2014 the president of the Singleton Historical Society and Museum advised that "the trees were growing through the ovens even before the present mine owned the land" (AECOM Australia Pty Ltd, 2014). Based on this information there are no known or potentially significant archaeological deposits within the portion of the item's curtilage intersected by the proposal area.





### 8.1.2 Historical Context

In 1878 Lancashire miner Thomas Longworth opened a small colliery at Rixs Creek. He died in 1884, a victim of asphyxiation following a mine collapse. The Great Cobar Mining Syndicate was formed by Dr Richard Read and acquired the Longworth interests. They then opened the New Park mine in 1881 and built a battery of coke ovens at Rixs Creek in the 1880s (Noble, n.d.). This was due to the level of demand, as it was described: "the forty large coke ovens in our midst are daily burning and demands cannot be complied with" (The Maitland Daily Mercury, 1900). The coke produced at the ovens was described in 1890 as "the best available" and both batteries were cited as being visibly discernible. The coke ovens were a major business in the area, with the output railed to Cobar, approximately 644 kilometres away (Newcastle Morning Herald and Miners' Advocate, 1941).

The Rixs Creek rail platform was opened in 1885 to service the Great Northern Railway. A tramway was also built to connect the Rixs Creek coke ovens and mining area to the railway line. This tramway was in operation from at least 1887 (Singleton Argus, 1887), its extent shown on the 1912 Parish Map of Darlington, extending across a 50 acre block that was owned by S. Noble, before reaching the Alexander Gardner owned land parcel where the coke ovens were situated. In 1920 the mines were sealed and the plant dismantled, the coke ovens ceasing production. After the coke ovens ceased production the tramway fell into disuse and its rails were removed (Newcastle Morning Herald and Miners' Advocate, 1941).

## 8.1.3 Relationship to Historic Themes

Commonwealth and NSW heritage agencies use themes as a means of categorising how a place contributed to historical events at a National, State and local level. Historical themes are a means of relating site-specific developments to broader historical patterns. The themes that apply to the coke ovens are provided in Table 8-1.

Australian Theme	NSW Theme	Local Theme
3. Economy-Developing local, regional and national economies	Mining-Activities associated with the identification, extraction, processing and distribution of mineral ores, precious stones and other such inorganic substances	None

#### Table 8-1 Historic Themes (NSW Office of Environment & Heritage, 2018)

#### 8.1.4 Significance Assessment

The assessment against the NSW Heritage Branch guidelines Assessing Heritage Significance (NSW Heritage Office, 2001) is presented in Table 8-2 below. This is an AECOM assessment as an existing one could not be located on the SHR or in the conservation management plan (which presented descriptions, photos and recommendations) (Lonergan, 2007).

Table 8-2Significance Assessment

Application of Criteria	
Historical significance SHR criteria (a)	The Coke Ovens and associated works are of local historical significance as tangible evidence of historic local industry practices linked to the mining industry, which is still an active economic force within the wider Hunter Valley area. The social institutions of the Rixs Creek community were historically strongly tied to mining and the associated coke ovens, as they were a source of work for local residents.
Historical association significance SHR criteria (b)	This item is not of historical associative significance on a State or local level.
Aesthetic significance SHR criteria (c) Social significance	This item is not of aesthetic significance on a State or local level as it does not demonstrate aesthetic characteristics or a high degree of creative or technical achievement. This item is not of social significance on a State or local level.
SHR criteria (d) Technical/Research significance SHR criteria (e)	The site has archaeological and interpretive significance with the potential to demonstrate growth and technical change in coke manufacture as well as the early developments of coal mining as a local industry practice.
<b>Rarity</b> SHR criteria (f)	This item has significance due to its rarity. There are currently only four other coke oven sites heritage listed in NSW, being Coalcliff Colliery Coke Ovens (extant and still in use circa 2000), Wollongong Coke Ovens (subsurface remains only), Newcastle Coke Ovens (subsurface remains only) and the Lithgow Blast Furnace Coke Ovens (extant). This item is the only one of its design type and era currently listed in NSW.
<b>Representativeness</b> SHR criteria (g)	This item is of representative significance as it demonstrates the principal characteristics of a coke oven site, being a site linked to mining used for the production of coke, used as a fuel in activities such as smelting iron ore in a blast furnace. The coke produced at this location was distributed as far as Cobar, approximately 644 kilometres away.

## 8.1.5 Statement of Significance

The Coke Ovens and their associated works are of local significance for their historical links, research potential, rarity and representativeness. It is has a strong association with the early mining related industry in the Rixs Creek area, and provides physical evidence of the development of local community, industry practises and manufacturing processes. It is one of five locally listed coke ovens in NSW, but is the only one listed with its design type, place and period of use. This item demonstrates the principal characteristics of a coke oven site, also having subsurface archaeological potential due to the associated works that surrounded the coke ovens during their period of operation.

## 8.1.6 Grading of Significant Components

As different elements of an item can have a different contribution to its heritage significance, it is useful to define which elements are of significance and which may detract from its significance. In the case of the coke ovens however, no heritage elements were identified within the inspected area (see Plate 8-1 and Plate 8-2). Although the proposed works are located within the curtilage of the coke ovens, there are no proposed impacts to the fabric of the heritage item. No evidence has been identified that ties the curtilage to a specific historical importance associated with the Coke Ovens.

### 8.1.7 Statement of Heritage Impact

No direct impacts are proposed within the curtilage of the coke ovens. Indirect impacts can occur from vibration caused by the movement or machinery and other construction related activity, but the distance of the physical remains to the proposal area makes this unlikely. Blasting was undertaken by Rix's Creek Colliery in 1991 in closer proximity to the Coke Ovens, with six occasions causing vibration in excess of 5.0 mm/sec, with no damage observed to any of the structures (Australian Blasting Consultants Pty Ltd, 1991). The works proposed for this assessment are therefore considered unlikely to cause either direct or indirect impacts to this item.

Following the Statements of Heritage Impact (2002) document, Table 8-3 following provides an assessment of whether the proposal will have a negative impact on the heritage significance of the item Coke Ovens.

Questions	Answers
How is the impact of the new development on the heritage significance of the item or area to be minimised?	No direct impacts are proposed within the curtilage of the coke ovens.
Why is the new development required to be adjacent to a heritage item?	The new development is a road corridor, associated with the existing New England Highway, which this location is in close proximity to.
How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?	The item retained a large curtilage in order to maintain the integrity of the item and its views and immediate surrounds. These will not be impacted by works, the proposal would occur outside of the southern extent of the curtilage.
How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?	There will be no impacts to views to or from the heritage item as a result of these works, which are contained in an area visually separated from the coke ovens by hills and existing mounds that were built up during past development.
Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they	There are no known or potentially significant archaeological deposits within the southern portion of the item's curtilage.

 Table 8-3
 Works adjacent to heritage item questions

Questions	Answers
rejected?	
Is the new development sympathetic to the heritage item? In what way (e.g. form, siting, proportions, design)?	The new development is in keeping with the existing New England Highway which is present immediately adjacent to this location.
Will the additions visually dominate the heritage item? How has this been minimised?	The proposal will not visually dominate the fabric of the heritage item, which is located further north, out of visual range and outside of the proposal area.
Will the public, and users of the item, still be able to view and appreciate its significance?	No access will be affected as a result of these works.

The following (Table 8-4) presents the required SoHI data as stipulated by OEH for impacts to heritage significance (NSW Heritage Office, 2002).

Table 0-4 Outlinary of hemage impacts for Coke Ovens	Table 8-4	Summary of Heritage impacts for Coke Ovens
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Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	None.
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	None.
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	None.
Negligible or no impacts (does not affect heritage values either negatively or positively)	No direct impacts are proposed within the curtilage of the coke ovens. There will be no impacts to views to or from the heritage item as a result of these works.
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	None.

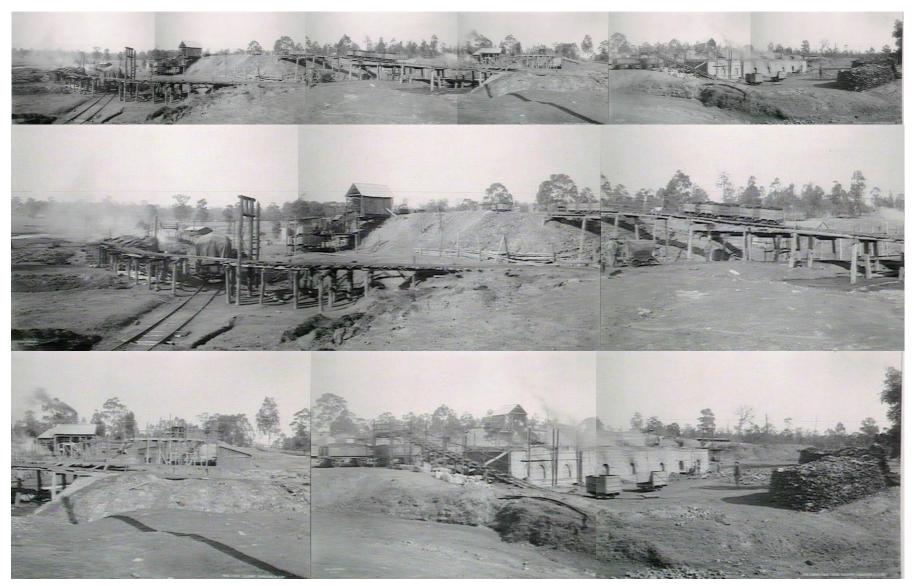


Plate 8-9 Panorama, Rix's Creek Colliery and Coke Ovens in 1906 (State Library of NSW: 176336-176340, Government Printing Office 1: 10559-10563). Note that none of the areas shown here are within the proposal area

## 8.2 Great Northern Railway section

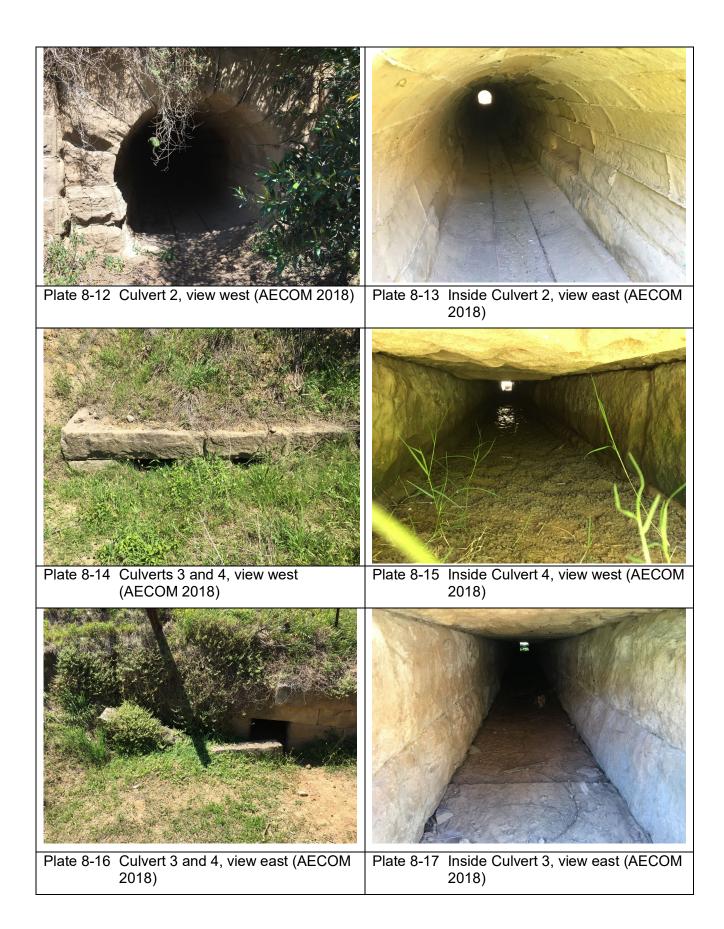
### 8.2.1 Description of the Heritage Item

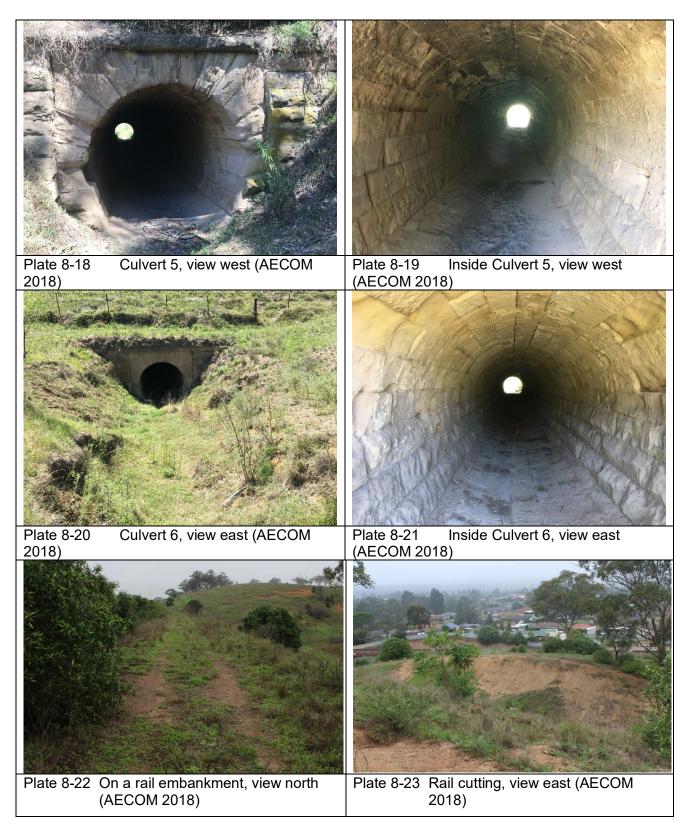
During the survey, a linear section of bypassed rail corridor was identified. This was part of the Great Northern Railway corridor that was constructed after the rail line reached Singleton in 1863. It was in active use from around 1869, when the railway was extended to Muswellbrook (Whitelaw, 1971: 12) up until the Great Northern Railway was deviated in December 1952. This linear rail corridor still contains earth embankments, cuttings and culverts that were all part of the extant physical structure of this deviated section of railway corridor.

The bypassed rail corridor has been assessed here as one heritage item, inclusive of the multiple elements that compose it. It extends from the New England Highway in McDougalls Hill, diverting from the current rail corridor and running parallel to it in a northerly direction. It extends for approximately 3.4 kilometres to the Rixs Creek area before intersecting once again with the current rail corridor. Close to this point of intersection it passes the disused Rixs Creek Rail Platform, which remains intact, although it has been impacted by vegetation growth and animal burrows. Also close to this location is the connection point to the remnant linear corridor to the Coke tramway, which runs for approximately 1.2 kilometres, connecting the rail corridor to the Coke Ovens situated to the west. The rails have since been removed from both the tram and rail lines. The disused Rixs Creek Rail Platform, tram line and approximately 1.4 kilometres of the diverted section of the Great Northern Railway corridor are outside the proposal area, to its immediate north. Approximately two kilometres of the rail corridor, including the four culverts along with embankments and cuttings, are located within the bounds of the proposal area.

During the inspection culverts of varying sizes were identified as part of the diverted rail corridor. Some were large enough to allow pedestrian access and could be used as tunnels to pass beneath the embankment that originally contained rail lines in this area, while others were square in shape and low to the ground, approximately one metre wide. All of these culverts were built from sandstone blocks, all in good condition although some were obscured by vegetation. Photos of the culverts, cutting and embankment are included from Plate 8-10 onwards, presented in order from north to south along the alignment.





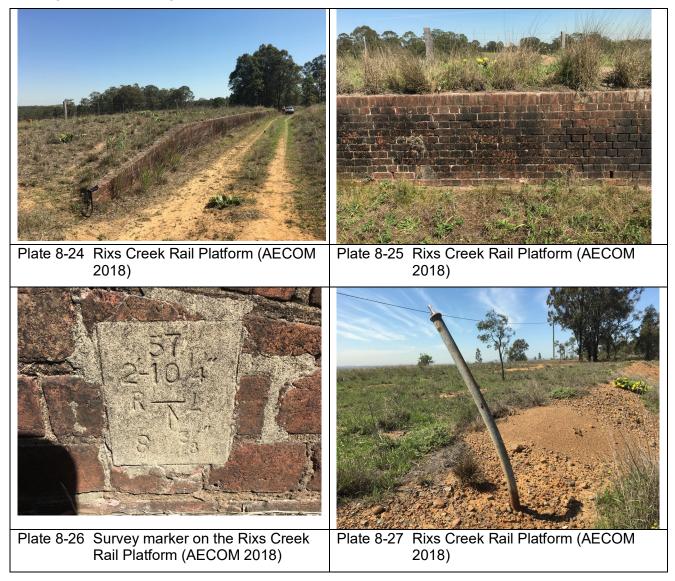


### 8.2.2 Historical context

The Great Northern Railway (also known as the Main North railway line) was extended to Singleton in 1863, then was opened for services on to Muswellbrook and Murrurundi around 1869 (Whitelaw, 1971: 12). This section of that original alignment includes cuttings through natural landforms and built up embankments with associated culverts, that were constructed between 1863 and 1869.

The Great Northern Railway was deviated slightly in December 1952. The currently used rail line is further to the east, parallel to this diverted section. The rails have been removed from the original section of rail corridor (in use from approximately 1869 to 1952) but it is still marked by the cuttings, embankments and culverts.

The item extends from McDougalls Hill in the south (within the proposal area) to Rixs Creek in the north (outside the proposal area). It passes the now disused Rixs Creek Rail Platform (see Plate 8-24 to Plate 8-27), located along the alignment to the north of (and outside the bounds of) the proposal area. The Rixs Creek platform was opened in 1885 and was in use up until the closure of the platform in November 1938. The former rail corridor is not currently listed on any heritage registers. The combination of features that make up the deviated section of alignment constitute a heritage item of local significance.



## 8.2.3 Relationship to Historic Themes

Commonwealth and NSW heritage agencies use themes as a means of categorising how a place contributed to historical events at a National, State and local level. Historical themes are a means of relating site-specific developments to broader historical patterns. The themes that apply to the Great Northern Railway section (including the culverts, platform and so on) are provided in Table 8-5.

Table 8-5Historic Themes (NSW Office of Environment & Heritage, 2018)
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Australian Theme	NSW Theme	Local Theme
3. Economy-Developing local, regional and national economies	Transport-Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	Railways
3. Economy-Developing local, regional and national economies	Industry-Activities associated with the manufacture, production and distribution of goods	Coal and Pastoral

### 8.2.4 Significance Assessment

The assessment against the NSW Heritage Branch guidelines Assessing Heritage Significance (NSW Heritage Office, 2001) is presented in Table 8-2 below.

Application of Criteria	
Historical significance SHR criteria (a)	The diverted section of the Great Northern Railway is important in the course of the development of the Rixs Creek and Singleton areas, the movement of people and goods and the development of the coal and pastoral industries. It was directly associated with the Coke Ovens (I45) through the linking tramway and was used as a transport system to distribute the coke to Cobar, approximately 644 kilometres away.
Historical association significance SHR criteria (b)	This item is not of historical associative significance on a State or local level.
Aesthetic significance SHR criteria (c)	This item is not of aesthetic significance on a State or local level.
Social significance SHR criteria (d)	This item has social significance on a local level relating to the people of the area and the movement of them and their goods between 1869 and 1952.
<b>Technical/Research significance</b> SHR criteria (e)	The item has archaeological and interpretive significance with the potential to demonstrate the early developments of transportation in relation to the developing economies of the region through local industry practice and the movement of goods and people beyond the local area. The item is likely to contain evidence of construction works for this section of railway dating from 1863 to 1869 and use from 1869 to 1952.
<b>Rarity</b> SHR criteria (f)	This item is not of rarity significance on a State or local level.
<b>Representativeness</b> SHR criteria (g)	This item is not of representative significance on a State or local level.

Table 8-6Significance Assessment

## 8.2.5 Grading of Significant Components

As different elements of an item can have a different contribution to its heritage significance, it is useful to define which elements are of significance and which may detract from its significance. A full survey of the entire item has not been possible at this time due to access limitations, but reference to grading has been undertaken for those elements that have been identified at this time. The NSW Heritage Division (NSW Heritage Office, 2001:11) use the grading criteria applied in Table 8-7.

Table 8-7	Grading of Important Fabric and Condition	
Grading	Element Meeting Criteria	Condition
Exceptional	None	N/A
High	The four culverts and the Rixs Creek Rail Platform	Good
Moderate	Alignment, embankments and cuttings	Good
Little	None	N/A
Intrusive	Vegetation growth on the embankments and platform as well as around the culverts	Impacting the condition of the features

## 8.2.6 Statement of Significance

The diverted section of the Great Northern Railway is important in the course of the development of the wider area, having contributed to the movement of people and goods during its period of operation. The transportation system it provided was an integral part of developing the coal and pastoral industries, reaching new and wider markets for local products. It demonstrates railway construction practices of the 1863 to 1869 period and use from 1869 to 1952. Features that contribute to the overall significance of the larger item include embankments, cuttings, culverts, the adjoining Rixs Creek tramway and the disused Rixs Creek Rail Platform. The extent of this item has been defined as stretching approximately 3.4 kilometres south to north from McDougalls Hill to Rixs Creek, with the associated tramway alignment of 1.2 kilometres length joining the rail line to the Coke Ovens east to west. Although not listed on any register, this item has been assessed as having local heritage significance.

### 8.2.7 Statement of Heritage Impact

The southern-most section of the item would be directly impacted by the proposed works. Approximately 300 metres out of the two kilometre length of this item contained within the proposal area would be directly impacted by the proposal. The impacted section includes some cuttings and embankments. The sandstone culverts and more extensive cuttings and embankments to the north will be avoided from impacts and retained. The proposed works would alter the existing visual aesthetic, but would not greatly impact public view lines since the area is largely inaccessible at the moment, being located on property not open to general access. The main public view that will be altered is that from the current rail line, where passengers can currently look west from within trains to view parts of the original alignment in adjacent areas. The direct impacts will leave the majority of the total alignment (and the most contributory elements) intact (including sections outside the proposal area to the north). As the significance of the item relates to its use as a transportation corridor this would impact on the heritage significance of the current item, but minimising impacts to the southern end will retain the majority of the item and its heritage values.

Questions	Answers
Is the demolition essential for the heritage item to function?	The proposed demolition works are part of the proposal that intersects with this item. The item is not currently in use or accessible to the general public, although sections of it can be viewed by train passengers on the adjacent current track alignment. The proposed works are not related to the functioning or accessibility of the item.
Are particular features of the item affected by the demolition?	The consistent extent of the historical transportation route would be interrupted by the demolition of parts of this item. Key features proposed for demolition include cuttings and embankments.
Is the detailing of the partial demolition sympathetic to the heritage significance of the item?	The partial demolition will impact negatively upon the item's heritage significance, but has limited that scope of impact.

Table 8-8	Norks adjacent to heritage item question	ns
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The following (Table 8-9) presents the required SoHI data as stipulated by OEH for impacts to heritage significance (NSW Heritage Office, 2002).

Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	None.
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	Disruption of the linear corridor through destruction of 300 metres of its extent at its southern-most end.
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	None.
Negligible or no impacts (does not affect heritage values either negatively or positively)	None.
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	None.

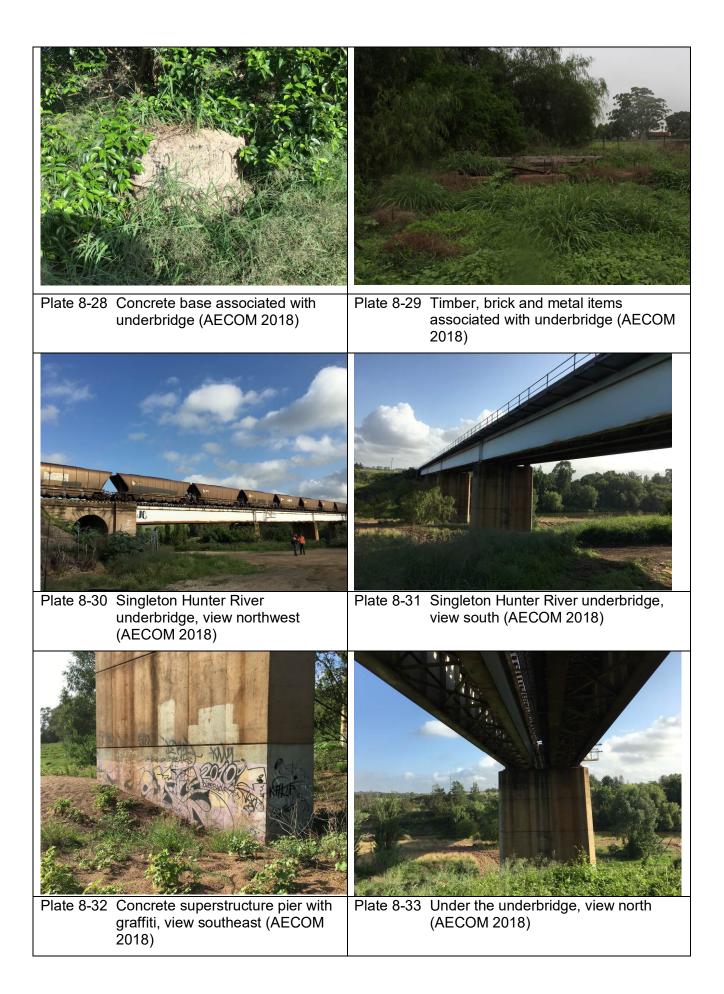
 Table 8-9
 Summary of Heritage impacts for the Great Northern Railway section

## 8.3 Singleton Hunter River Underbridge

#### 8.3.1 Description of the Heritage Item

The item Singleton Hunter River Underbridge was listed on the State Rail Authority of NSW inhouse Heritage and Conservation Register (SRA844). This item is not listed on the current S170 Heritage and Conservation Register managed by RailCorp (as per Version 7.0 dated 23 June 2017). The bridge is approximately 150 metres long and 10 metres wide. The curtilage for the item was previously defined as containing the bridge structure and extending out from it for a distance of 20 metres in all directions.

An inspection of the bridge and the surrounding area undertaken on 28 March 2018 identified two adjacent items that were assessed as being associated with the underbridge. These were a concrete base, located 15 metres west of the underbridge (see Plate 8-28), and timber, brick and metal items located 175 metres south-west of the underbridge (see Plate 8-29). The underbridge was in use and appeared to be in good condition; it had been impacted in places by graffiti (see Plate 8-30 onwards).





### 8.3.2 Historical context

The Great Northern Railway (also known as the Main North railway line) was extended to Singleton in 1863. Plans were already well underway at that time to extend the rail line further north, with a bridge crossing designed by John Whitton, the then Engineer in Chief for Railways (The Maitland Mercury and Hunter River General Advertiser, 1866).

The first contract for the Singleton Hunter River Underbridge was signed in August 1862. The first contractor ran into difficulty and the works were taken on by another contractor, but he also ran into difficulty and "became insolvent before he made a commencement". The third contract was granted in July 1863 and the bridge was opened in late August 1866, in contrast to the initially planned completion date of 1864 (The Maitland Mercury and Hunter River General Advertiser, 1866).

The bridge was made of riveted iron and timber, comprising of five arches mounted on stone piers placed at intervals, with piers either side of and within the channel of the Hunter River (The Sydney Mail and New South Wales Advertiser, 1872). It was described at the time of its opening as: "length, 523 feet; breadth, 27 feet 6 inches. It is composed of five spans of ninety feet each, with laminated arches, each giving 12 feet 3 inches of a rise. Each arch is constructed of four laminated ribs of immense strength, being three feet deep at the spring, and two feet at the crown; these arches are composed of planks 15 inches by 3 inches, and dressed and embedded in white lead, and fastened with large screws and bolts. The springs of the arches are embedded in cast iron shoes fixed in masonry. Each arch is secured by six inch and a half bolts, which run through each of the ribs. The braces, spandrils and longitudinals are also of immense strength. The joints go through the whole width of the bridge... the height of the bridge, from the bed of the rock on which the pier foundations are set to the flooring, is 26 feet, and the height of the flooring above the ordinary water level is 63 feet. There are two abutments, one north and the other south, and four piers... The piers are composed of solid masses of masonry and are nearly oval in form. The stone work is beautifully wrought, and the timber work is fitted together and finished in a manner that adds materiality to the beauty of the structure" (The Maitland Mercury and Hunter River General Advertiser, 1866) (see Plate 8-36 and Plate 8-37).

The bridge later had a flood gauge installed on one of its stone piers – set there by an officer of the Railway Department. The gauge proved to be ineffective as roads to the bridge became inaccessible during times of flood, so no-one could access the gauge to obtain readings of the correct height of the flooded stream. As a result two other flood gauges were installed at other locations in 1890 to replace it (The Maitland Mercury and Hunter River General Advertiser, 1890).

Following the appointment of E M G Eddy as Chief Commissioner of Railways in 1888, a policy was instigated that timber bridges were to be replaced with steel or iron constructions on concrete superstructures, and that riveting was to be replaced by welding (NSW Office of Environment & Heritage, 2018). As a result, the Singleton Hunter River Underbridge was replaced by one made of

welded deck plate web girders. The replacement deck format underbridge, with 33 metre single track girders, became the largest bridge fabricated by welding in the NSW rail network system (NSW Office of Environment & Heritage, 2018). Works were completed on the replacement bridge in 1902 under the supervision of Divisional Engineer Mr Nicholas and Inspector Fry (The Singleton Argus, 1902) (see Plate 8-38). The original sandstone abutments either side of the Hunter River appear to have been left intact and reused for the replacement underbridge. The bridge was damaged by fire and temporarily closed so that repairs could be enacted in 1923 (The Maitland Weekly Mercury, 1923). The bridge remains in use to this day to support the egress of two rail lines over the Hunter River.

#### 8.3.3 Relationship to Historic Themes

Commonwealth and NSW heritage agencies use themes as a means of categorising how a place contributed to historical events at a National, State and local level. Historical themes are a means of relating site-specific developments to broader historical patterns. The themes that apply to the Singleton Hunter River Underbridge are provided in Table 8-10.

Table 8-10Historic Themes (NSW Office of Environment & Heritage, 2018)

Australian Theme	NSW Theme	Local Theme
3. Economy-Developing local, regional and national economies	Transport-Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	Railways

#### 8.3.4 Significance Assessment

The assessment against the NSW Heritage Branch guidelines Assessing Heritage Significance (NSW Heritage Office, 2001) is presented in Table 8-11 below. This assessment was undertaken by AECOM as none was available from the previous listing.

Application of Criteria	Application of Criteria		
Historical significance SHR criteria (a)	This bridge is evidence of the development of the railway and the significant Hunter River crossing necessary to continue the transportation network to the north. It is associated historically with the policies of Chief Commissioner of Railways E M G Eddy, which led to the replacement of the original bridge.		
Historical association significance SHR criteria (b)	The original bridge was associated with Engineer in Chief for Railways, John Whitton. The replacement bridge now present at this location is associated with Divisional Engineer Mr Nicholas and the policies of Chief Commissioner of Railways E M G Eddy.		
Aesthetic significance SHR criteria (c)	The underbridge is aesthetically significant as an effective engineering solution to meet local conditions, with public views from an adjoining park area to it and the Hunter River.		
<b>Social significance</b> SHR criteria (d)	This item has social significance on a local level relating to the people of the area and the movement of them and their goods after 1869, when the northern section of railway was opened from Singleton.		
<b>Technical/Research</b> <b>significance</b> SHR criteria (e)	This item does not have research significance.		
<b>Rarity</b> SHR criteria (f)	This item is not of rarity significance on a State or local level.		
Representativeness SHR criteria (g)	This item is not of representative significance on a State or local level.		

#### Table 8-11 Significance Assessment

#### 8.3.5 Statement of Significance

Although not listed on the current S170 Heritage and Conservation Register, the removed S170 listing from the previous register is still available on the NSW State Heritage Inventory and includes the following Statement of Significance:

"Largest welded deck plate web girders in the system."

This statement was last updated 1 May 2007.

AECOM provide the following Statement of Significance based on this assessment:

The Singleton Hunter River Underbridge is evidence of the development of the railway and the significant Hunter River crossing that was required in order to continue the transportation network to the north. This item has social significance on a local level relating to the people of the area and the movement of them and their goods after 1869, when the northern section of railway was opened from Singleton. The original bridge was associated with Engineer in Chief for Railways, John Whitton. The replacement bridge now present at this location is associated with Divisional Engineer Mr Nicholas and the policies of Chief Commissioner of Railways E M G Eddy (which led to its replacement). The underbridge is aesthetically significant as an effective engineering solution to meet local conditions, with public views from an adjoining park area to it and the Hunter River.

#### 8.3.6 Grading of Significant Components

As different elements of an item can have a different contribution to its heritage significance, it is useful to define which elements are of significance and which may detract from its significance. The NSW Heritage Division (NSW Heritage Office, 2001:11) use the grading criteria applied in Table 8-12.

Grading	Element Meeting Criteria	Condition
Exceptional	None.	N/A
High	The underbridge, comprising welded deck plate web girders on concrete superstructure piers with original sandstone abutments.	Good
Moderate	None.	N/A
Little	An associated concrete base as well as timber, brick and metal items in the surrounding area. Their association has not been defined but based on material and location they are likely to relate to the item.	
Intrusive	Graffiti on the underbridge.	Visually intrusive to the item.

#### Table 8-12 Grading of Important Fabric and Condition

#### 8.3.7 Statement of Heritage Impact

No direct impacts are proposed to the Singleton Hunter River Underbridge or the two associated features identified during survey, with the proposal crossing the Hunter River on a new bridge on the western side of the underbridge. The proposed development will impact the item visually, changing the view lines from its western side. Currently the public view lines to the item are predominantly undertaken from its eastern side as that is the location of a public park area adjacent to the Hunter River (Rose Point Park), with the western side largely inaccessible, taken up by private property. Indirect impacts could occur from vibration caused by the movement or machinery and other construction related activity. Through appropriate mitigation measures and monitoring, it is possible to avoid indirect impacts to this item.

Table 8-13 Works adjacent to heritage item questi	ons
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Questions	Answers
How is the impact of the new development on the heritage significance of the item or area to be minimised?	The new development is proposed to avoid direct impacts to the heritage item. Indirect impacts will result from a change to view lines to the underbridge, but these have been minimised by containing the proposed works on the western side of the item, leaving views from the public park on the eastern side intact.
Why is the new development required to be adjacent to a heritage item?	The proposal requires a crossing of the Hunter River and this is the most suitable location.
How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?	The curtilage of the listed item (defined as 20 metres from the structure on all sides) will not be encroached upon, with the closest works proposed to be located 30 metres from the edge of the item's curtilage boundary.
How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?	The new development will affect views to the heritage item on its western side. The most prominent public location to view the underbridge and the Hunter River is on its eastern side from a public park and these views will be kept intact.
Is the development sited on any known, or potentially significant archaeological deposits?	There are no known archaeological deposits associated with the underbridge in the proposal area.
Is the new development sympathetic to the heritage item?	The new development is a road crossing the Hunter River adjacent to the underbridge on its western side. It is sympathetic in that it is a similar form of crossing and has been contained on the western side to minimise alterations in public views from the park area.
Will the additions visually dominate the heritage item? How has this been minimised?	The new development will visually dominate the item on its western side. By containing the proposed works on the western side they will avoid impacts to the view lines from the public park on the eastern side, which are more prominent heritage views.
Will the public, and users of the item, still be able to view and appreciate its significance?	The public will still be able to access and view the item from the public park on its eastern side, as is currently the case.

The following (Table 8-14) presents the required SoHI data as stipulated by OEH for impacts to heritage significance (NSW Heritage Office, 2002).

Table 8-14	Summary of Heritage	impacts for Singletor	Hunter River Underbridge
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Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	None.
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	None.
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	None.

Impact Type	Impact
Negligible or no impacts (does not affect heritage values either negatively or positively)	None.
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	Current view lines from the western side towards the item will be altered. Presently this area is largely limited to private property landowners. If views are left open from on the proposed crossing, the road development could allow drivers and passengers on the road to view the underbridge from its western side, which is currently largely inaccessible, while retaining the prominent public view lines from the public park area to the east.
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	None.



Plate 8-36 The original Singleton Hunter River Underbridge circa 1861 (Mika et al., 2010)



Plate 8-37 The original Singleton Hunter River Underbridge circa 1866 (Mika et al., 2010)



Plate 8-38 The second Singleton Hunter River Underbridge circa 1963 (Mika et al., 2010)

## 8.4 Former Pumping Station

#### 8.4.1 Description of the Heritage Item

The Former Pumping Station consists of a twin gabled corrugated steel shed of timber stud construction. Pump equipment is still in place, associated with the shed. Other features include the battered bank, willow tree plantings and the well. There is the likelihood that archaeological deposits and relics as well as subsurface infrastructure associated with the Former Pumping Station may be present in the vicinity of the extant shed and on its western side (closest to the Hunter River). It should also be noted that the area adjacent to the listed curtilage is currently in use as the Singleton Water Depot, demonstrating a continuity of water management activities at this location since 1909.

The curtilage of the item has been subject to extensive past disturbance for the construction, upgrading and operation of the Former Pumping Station and ongoing activities at the adjacent Singleton Water Depot. This continuity of history and ongoing use are contributing factors to the significance of this item, which shows both the early development and ongoing importance of services for the developing and ongoing township.

A site inspection was undertaken on 29 March 2018. Only one of the twin gabled sheds clad in corrugated steel mentioned in the 2015 listing description provided in the SHI was present at the site at the time of inspection. Available aerial imagery shows there were originally three sheds abutting each other at the centre of Lot 2, but two of these have since been demolished (see Plate 8-40 to Plate 8-44).

The remaining shed was noted as being in poor condition exhibiting rust, boarded up and covered sections, and graffiti (yellow paint at the building's south-eastern corner). Willow tree plantings were evident along the western boundary of the curtilage, immediately adjacent to the Hunter River. Access was not possible at the time of inspection to the lower bank area; as a result the historic well and bank condition could not be verified.

Some structures from the active Singleton Water Depot were verified as partially falling within the listed curtilage for this item, contained within a fenced enclosure that extends across the boundary of Lot 2 into Lot 3 DP 1159019. Within this enclosure (predominantly outside the listed curtilage in Lot 3) are three corrugated steel sheds (one with an abutting concrete tower), one concrete reservoir, one raised brick structure on a concrete base and a work yard with various equipment, machinery and enclosures delineated by two course high concrete block walls (see Plate 8-39). Only the northern sections of two sheds and the northern portion of the fenced enclosure extended into Lot 2 and the defined curtilage of the heritage listing. Although the described elements are modern structures of an active facility, they attest to the ongoing use of this area for water management and should be considered as contributory towards the overall heritage significance of this location in the narrative connection they have to the adjacent Former Pumping Station area.



Plate 8-39 Site curtilage shown as a red outline



Plate 8-40 SIX viewer aerial shows three gabled sheds circa 2009, but only one was present at the time of this inspection (NSW Government, 2018)



Plate 8-41 Gabled corrugated steel shed, view southwest (AECOM 2018)



Plate 8-42 Gabled corrugated steel shed with adjacent equipment, view northwest (AECOM 2018)



Plate 8-43 Singleton Water Depot sheds and enclosure, view southeast (AECOM 2018)



Plate 8-44 Willow tree plantings adjacent to the Hunter River, view northwest (AECOM 2018)

#### 8.4.2 Historical context

On Saturday 23 January 1909 work began on the pumping station. The announcement of the completion of construction works followed towards the end of that same year, on Thursday 16 December 1909. As was noted in Sections 5.6 and 5.7 between the opening of the pumping station in late 1909 and 2001 there were a total of 18 flood events that caused erosion. Willow trees were planted along the bank of the Hunter River in proximity to the pumping station in order to protect the bank from further erosion. In 1921 plans were approved for an auxiliary water supply and in 1933 tenders were sought (Singleton Argus, 1933) with the new pumping unit installed in 1934 (Singleton Argus, 1934). Since then the original pumping station has been decommissioned and the Singleton Water Depot erected on its southern side, a facility that remains active to this day.

#### 8.4.3 Relationship to Historic Themes

Commonwealth and NSW heritage agencies use themes as a means of categorising how a place contributed to historical events at a National, State and local level. Historical themes are a means of relating site-specific developments to broader historical patterns. The themes that apply to the Former Pumping Station are provided in Table 8-15.

Table 6-15 Historic Themes (NSW Office of Environment & Hentage, 2016)		
Australian Theme	NSW Theme	Local Theme
4. Settlement-Building settlements, towns and cities	Utilities-Activities associated with the provision of services, especially on a communal basis	Water

#### Table 8-15 Historic Themes (NSW Office of Environment & Heritage, 2018)

#### 8.4.4 Significance Assessment

The assessment against the NSW Heritage Branch guidelines Assessing Heritage Significance (NSW Heritage Office, 2001) is presented in Table 8-16 below.

Application of Criteria	1
Historical significance SHR criteria (a)	This item is representative of the development of water services required within the developing township, as well as changing services over time as the water infrastructure changed in relation to public needs and changing conditions at the site (including responses to erosion after flooding).
Historical association significance SHR criteria (b)	This item does not meet this criterion.
Aesthetic significance SHR criteria (c)	This item contains a simple shed indicative of industrial buildings and pumping equipment indicative of the functionality of water supply.
Social significance SHR criteria (d)	This item does not meet this criterion.
Technical/Research significance SHR criteria (e)	As the pumping station adapted over time to changes in local conditions, including flooding and erosion, as well as changing needs for water and power supply as the local population increased, there is research potential in the material culture relating to the changing use of machinery and equipment, as well as changes to the subsurface piping and infrastructure at this location.
<b>Rarity</b> SHR criteria (f)	This item does not meet this criterion.
<b>Representativeness</b> SHR criteria (g)	This item does not meet this criterion.

Table 8-16Significance Assessment

## 8.4.5 Grading of Significant Components

As different elements of an item can have a different contribution to its heritage significance, it is useful to define which elements are of significance and which may detract from its significance. The NSW Heritage Division (NSW Heritage Office, 2001:11) use the grading criteria applied in Table 8-17.

Grading	Element Meeting Criteria	Condition
Exceptional	None	N/A
High	The remnant corrugated steel shed and adjacent equipment is one of the few remnant features associated with the former pumping station. The well's condition was unable to be verified, but its importance would be graded as high due to its significance to this listing.	Poor
Moderate	The battered bank and willow plantings contribute to the changes made at this location in order to preserve it and extend its functional life following heavy erosion along the creek bank after flooding of the Hunter River.	Good
Little	The adjacent Singleton Water depot extends partially into the curtilage. Its presence contributes to the larger narrative of water management services at this location since 1909.	Good
Intrusive	None.	N/A

 Table 8-17
 Grading of Important Fabric and Condition

#### 8.4.6 Statement of Significance

The Statement of Significance for this item from Section 3 of the NSW Heritage Inventory is included below.

*"Historic - Representative of the services required within the developing township. Scientific - Research potential in original machinery retained in building as well as various items of equipment. Aesthetic - Simple sheds indicative of industrial buildings"* (NSW Office of Environment & Heritage, 2018).

This Statement of Significance was last updated 13 May 2015.

As has been previously noted, features included the extant shed, pumping equipment, subsurface infrastructure, the battered bank, willow tree plantings and the well. The continuity of water management history at this location currently represented by the adjacent Singleton Water Depot is also a contributing factor to the significance of this item, as it shows both the early development and ongoing importance of services for the township.

#### 8.4.7 Statement of Heritage Impact

This item is within the impact area and will be removed for the proposal. The Former Pumping Station is currently on private land and inaccessible to the general public. The removal of the Singleton Water Depot would impact the heritage significance, as the continuity of water management at this location is part of its heritage value.

The proposal also has the potential to impact on subsurface infrastructure and deposits associated with the Former Pumping Station (although the main area of sensitivity is on its western side, closest to the Hunter River). Such deposits could potentially contain obsolete machinery and subsurface infrastructure that could provide evidence of the changing technological approaches to water management at this location over time.

Table 8-18 Works adjacent to heritage item questions

Questions	Answers
How is the impact of the new development on the heritage significance of the item or area to be minimised?	The proposal would require the removal of the item. Design constraints in this area are such that minimisation is unlikely and mitigation measures should be considered.
Why is the new development required to be adjacent to a heritage item?	The proposal requires access through this vicinity.
How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?	The curtilage refers to the area of activity of the heritage item as well as, in part, the ongoing water management activities still conducted to the south of the item. This curtilage will be directly impacted by the proposal.
How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?	The proposal would require the removal of the item.
Is the development sited on any known, or potentially significant archaeological deposits?	There is the potential for associated deposits and subsurface infrastructure in the immediate vicinity of the shed and to the west of it.
Is the new development sympathetic to the heritage item?	The proposal is not sympathetic to the heritage item.
Will the additions visually dominate the heritage item? How has this been minimised?	The proposal would require the removal of the item.
Will the public, and users of the item, still be able to view and appreciate its significance?	The proposal would require the removal of the item.

The following (Table 8-19) presents the required SoHI data as stipulated by OEH for impacts to heritage significance (NSW Heritage Office, 2002).

 Table 8-19
 Summary of Heritage impacts for Former Pumping Station

Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	The proposal would require the removal of the item.
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	None.
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	None.
Negligible or no impacts (does not affect heritage values either negatively or positively)	None
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.

Impact Type	Impact
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	None.

# 8.5 Bebeah

# 8.5.1 Description of the Heritage Item

The following description of Bebeah has been taken from the Singleton LEP 2013 item entry included under Section 3 of the NSW State Heritage Inventory. This description was last updated 16 August 2010.

*"Brick and corrugated steel roof. Seemingly original. Residence. Exterior in seemingly original condition but with replaced roof sheeting"* (NSW Office of Environment & Heritage, 2018).

A site inspection was undertaken on 3 April 2018. In addition to the residence, which was confirmed to be in good condition, other associated structures and features were also investigated. These included garden plantings, such as fruit trees, two corrugated steel sheds, a brick and corrugated steel shed, a brick structure, three tanks, one silo and enclosures fenced with corrugated steel (see Plate 8-45 to Plate 8-54).



Plate 8-45 Farmed area to the south-west of the Bebeah house, view east (AECOM 2018)



Plate 8-46 Front of Bebeah, view west (AECOM 2018)



Plate 8-47 Rear of Bebeah, view east (AECOM 2018)



Plate 8-48 Planting associated with Bebeah on its southern side, view west (AECOM 2018)



Plate 8-49 Southern side of Bebeah, view east (AECOM 2018)



Plate 8-50 Enclosures, shed and silo to the west of Bebeah, view north (AECOM 2018)



Plate 8-51 Brick structure to the west of Bebeah, view north-east (AECOM 2018)



Plate 8-52 Interior of brick structure to the west of Bebeah, view north (AECOM 2018)



Plate 8-53 Brick and corrugated steel structures and tank to the west of Bebeah, view northwest (AECOM 2018)



Plate 8-54 Brick and corrugated steel structure to the west of Bebeah, view west (AECOM 2018)

# 8.5.2 Historical context

Although the available Parish maps for Whittingham, covering the period from 1887 to 1933, do not list ownership for the property on which the Bebeah residence is now situated (see Figure 8-1), it was most likely owned by Mr Alexander Munro. Originally from Scotland, Munro was transported as a convict to Australia in 1831. After gaining his certificate of freedom in 1836, he moved to Singleton where he became a pioneer of the area, finding success as a business man (building the Caledonian Hotel), landowner and politician, elected as the town's first mayor in 1866 (Janilye, 1999). He built Ardersier House at 48 Maitland Road Singleton as his home, a two storey High Victorian sandstone brick homestead. When recently sold in February 2018 the property was described as having an "entrance hall, suite banquet or ballroom, dining, kitchen and pantry, balcony and verandahs, three bedrooms, two bathrooms plus study and attic" (Wilkinson, 2018). Munro's home of Ardersier House was known to have been located on the grounds of his Bebeah Vineyard. The current Bebeah residence being directly across the road (380 m south of Ardersier) suggest that both parcels were owned by Munro and used for his winemaking enterprise. A description of the area from 1876 described it thus:

"Bebeah Vineyard is situated on the Maitland Road, about one mile from Singleton. The area under vines, inclusive of roadways, is thirty-six acres, nearly all of which is now in full bearing. The vines are planted at right angles, seven feet by seven feet apart, and are trained on wire trellis, and pruned on the most approved French principle... This vineyard gives employment to ten men and two boys, exclusive of two coopers, and in vintage time twenty-four women, who pick the grapes" (The Sydney Mail and New South Wales Advertiser, 1876).

The reporter also noted that: "among the samples that I had submitted to me by Mr Munro were some of Australian port and claret, two good sound wines, with plenty of body, good bouquet, and flavour – wines, when matured, that should suit the public taste" (The Sydney Mail and New South Wales Advertiser, 1876). The Bebeah Vineyard wines would go on to win in excess of 2000 prizes worldwide, more than 500 of which were first prizes (Janilye, 1999). In Alexander Munro's 1889 obituary it was written that: "Bebeah wines attained such a celebrity that at length they appeared at the table of the gracious Sovereign who rules the destinies of this great Empire. The late Emperor

William of Germany also patronised Bebeah wines, and expressed himself in approving terms of their excellent character" (The Maitland Mercury and Hunter River General Advertiser, 1889).

The Bebeah residence was built in the Federation Queen Anne style, suggesting construction sometime between 1885 and 1915, as this was the period when this style of house was most popular in Australia. The term refers to a revival of red brick architecture of Flemish influence that had been popular in Britain in the late 17th century. From 1880 onwards the arrival of English trained architects in Australia saw the adaptation of this style for Australian architecture, with Federation Queen Anne houses built throughout Australia, a number of which have since been granted heritage listing in NSW. Common characteristics of this style of house include "picturesque asymmetrical forms... arched feature windows, turned timber verandah columns... tall dominant chimneys with corbelled brick tops... dominant high pitched tiled roof forms with a combination of hips and gables" (Staas, 1999).

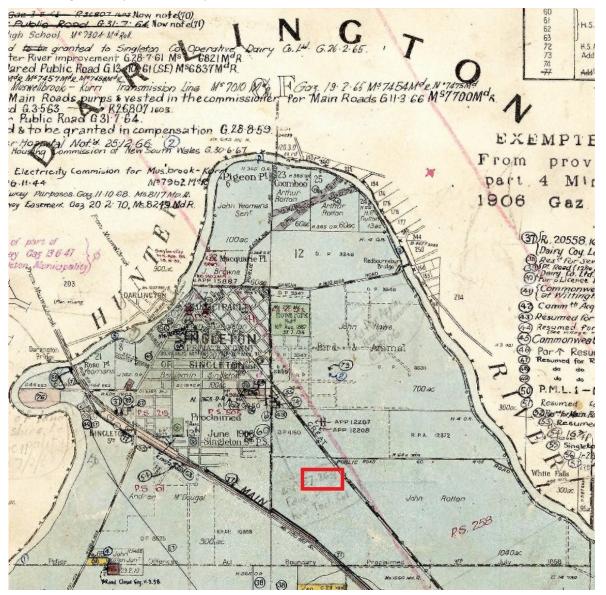


Figure 8-1 Extract from 1933 Parish Map of Whittingham – approximate location of Bebeah residence shown by red rectangle (NSW Land & Property Information, 2018)

#### 8.5.3 Relationship to Historic Themes

Commonwealth and NSW heritage agencies use themes as a means of categorising how a place contributed to historical events at a National, State and local level. Historical themes are a means of relating site-specific developments to broader historical patterns. The themes that apply to Bebeah are provided in Table 8-20.

 Table 8-20
 Historic Themes (NSW Office of Environment & Heritage, 2018)

Australian Theme	NSW Theme	Local Theme
4. Settlement-Building settlements, towns and cities	Towns, suburbs and villages-Activities associated with creating, planning and managing urban functions, landscapes and lifestyles in towns, suburbs and villages	Local development

#### 8.5.4 Significance Assessment

The assessment against the NSW Heritage Branch guidelines *Assessing Heritage Significance* (NSW Heritage Office, 2001) is presented in Table 8-21 below. This is an updated significance assessment undertaken by AECOM.

Table 8-21 Significance Assessment		
Application of Criteria		
<b>Historical significance</b> SHR criteria (a)	This item has historical significance associated with the development of viticulture in the region, with particular association to Bebeah wines.	
Historical association significance SHR criteria (b)	The item has association with business man, wine maker, landowner and politician Mr Alexander Munro and Bebeah wines.	
Aesthetic significance SHR criteria (c)	This item does not meet this criterion.	
<b>Social significance</b> SHR criteria (d)	This item does not meet this criterion.	
<b>Technical/Research</b> <b>significance</b> SHR criteria (e)	This item does not meet this criterion.	
<b>Rarity</b> SHR criteria (f)	This item does not meet this criterion.	
<b>Representativeness</b> SHR criteria (g)	This item is listed due to being a representative example of the style Federation Queen Anne in the building's look, design and construction. While it is still considered to be representative it should be noted that modifications to the building have had an impact on this aspect of its significance.	

#### 8.5.5 Statement of Significance

The Statement of Significance for this item taken from Section 3 of the NSW State Heritage Inventory is included below.

"Representative of Federation Queen Anne style residence. Early settlement of peripheral area of Singleton near the main regional access road (Now New England Highway). Building in general, appears externally to be in original condition other than replaced roof sheeting" (NSW Office of Environment & Heritage, 2018).

This Statement of Significance was last updated 16 August 2010.

As has been previously noted, other features apparent in the site inspection that are associated with the Bebeah listing include garden plantings, such as fruit trees, two corrugated steel sheds, a brick and corrugated steel shed, a brick structure, three tanks, one silo and enclosures fenced with corrugated steel.

# 8.5.6 Grading of significant components

As different elements of an item can have a different contribution to its heritage significance, it is useful to define which elements are of significance and which may detract from its significance. The NSW Heritage Division (NSW Heritage Office, 2001:11) use the grading criteria applied in Table 8-22.

Grading	Element Meeting Criteria	Condition
Exceptional	None	N/A
High	The Bebeah residence is in good condition and is the primary focus for the local significance of this listed item.	Good
Moderate	The associated garden plantings, two corrugated steel sheds, a brick and corrugated steel shed, a brick structure, three tanks, one silo and enclosures fenced with corrugated steel contribute to the history of use and activity at Bebeah.	Good
Little	None.	N/A
Intrusive	None.	N/A

 Table 8-22
 Grading of Important Fabric and Condition

# 8.5.7 Statement of Heritage Impact

No direct impacts are proposed to the features cited as contributing to the Bebeah item, although works are proposed within the larger curtilage of the item. The residence and associated plantings, sheds and structures are all outside the proposal area. The larger curtilage is proposed for impacts on its southern side, across farmed land within the bounds of the item's curtilage. The proposed works would alter the existing views, with a road proposed through the paddocks on the property's southern side. The current main public view to the property is from the New England Highway to the east of the item. These views will remain intact. There are no known archaeological deposits associated with the item in the proposed area of impact, which was subject to survey. Indirect impacts could occur from vibration caused by the movement or machinery and other construction related activity as the structures are within 110 metres of the proposal. Through management measures and monitoring it is possible to avoid such indirect impacts to this item; this should be further assessed in accordance with the relevant vibration criteria for heritage structures.

Table 8-23Works adjacent to heritage item questions

Questions	Answers
How is the impact of the new development on the heritage significance of the item or area to be minimised?	The proposal is to the south of the item and its associated features. They will be undertaken within its larger curtilage, in cleared paddocks on its southern side.
Why is the new development required to be adjacent to a heritage item?	The new development is a road and requires a connection to the existing New England Highway at this location.
How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?	The curtilage refers to the area of land ownership associated with the heritage item. No specific historical association has been identified relating to the curtilage shape and it is likely to be a modern construct based on property boundaries.
How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?	The current main views and access from the New England Highway will not change.
Is the development sited on any known, or potentially significant archaeological deposits?	There are no known deposits associated with this item in the proposal area.

Questions	Answers
Is the new development sympathetic to the heritage item?	The new development is not sympathetic to the heritage item.
Will the additions visually dominate the heritage item? How has this been minimised?	The additions will not visually dominate the heritage item or the existing views to and from it.
Will the public, and users of the item, still be able to view and appreciate its significance?	The current main views and access from the New England Highway will not change.

The following (Table 8-24) presents the required SoHI data as stipulated by OEH for impacts to heritage significance (NSW Heritage Office, 2002).

Table 6-24 Summary of Hemage impacts for bebean		
Impact Type	Impact	
Major negative impacts (substantially affects fabric or values of state significance)	None.	
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	None.	
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	Proposed road works will occur to the south of the property, within the item's curtilage but without impacting on the established public view lines or the fabric of the item.	
Negligible or no impacts (does not affect heritage values either negatively or positively)	None.	
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.	

Table 8-24 Summary of Heritage impacts for Bebeah

Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	None.

# 8.6 The Woolpack Inn

# 8.6.1 Description of the Heritage Item

The Woolpack Inn is listed on the Singleton LEP 2013 (I151) as being located at 3 Newington Lane, Whittingham, in the Singleton Local Government Area of NSW (see Plate 8-55 to Plate 8-61). It consists of a building, currently used as a residence, located on a rise, with other associated structures. Outlook from the building to the southwest and northwest have views across to the New England Highway and paddocks to the Ardersier property and on towards Singleton.



Plate 8-55 Woolpack Inn view north-east (AECOM 2018)



Plate 8-56 Woolpack Inn, view south (AECOM 2018)



Plate 8-57 Woolpack Inn, view north-west (AECOM 2018)



Plate 8-58 Woolpack Inn view south-east (AECOM 2018)



Plate 8-59 Woolpack Inn, view south on the eastern side of the building (AECOM 2018)



Plate 8-60 Outlook to New England Highway, view south-west (AECOM 2018)



Plate 8-61 Outlook towards Ardersier, view north-west (AECOM 2018)

# 8.6.2 Historical context

The Woolpack Inn was one of a number of establishments that provided accommodation, food and drink within the Singleton area. Others along Singleton Road included the Traveller's Home, Crown Inn, Branxton Inn, Bush Inn, Gordon Arms, Cross Keys, Spread Eagle, Union Inn and Red Lion. The publican at the Woolpack Inn in 1852 was Hugh King (The Maitland Mercury and Hunter River General Advertiser, 1852) and in 1854 was William M'Phelemy (The Maitland Mercury and Hunter River General Advertiser, 1854). The Newington races were a regular event in Singleton in the 1850s and 1860s. They were held on a race course located close to the Woolpack Inn, with special races at Easter and on New Year's Day (Empire, 1861). The Woolpack Inn was also used to house other events, such as the auction of furniture and other general merchandise in November 1853 (The Maitland Mercury and Hunter River General Advertiser, 1853).

A publican's licence was granted to Patrick M'Cosker in April 1864 for operation at the Woolpack Inn (The Maitland Mercury and Hunter River General Advertiser, 1864). The area is shown on the 1887 and 1933 parish maps as being on a 1000 acre parcel of land belonging to John Rotton (NSW Land & Property Information, 2018).

During the 1880s the Woolpack Inn was run by landlord Bertram Clifford Rodd (The Singleton Argus, 1880) and his wife Ellen Maude Rodd (The Singleton Argus, 1881). A foiled burglary was reported at the Woolpack Inn in December 1880 (The Singleton Argus, 1880). Mr and Mrs Rodd later gave evidence at an enquiry about a stolen five pound note that was used at the Inn during May 1881 (The Singleton Argus, 1881).

#### 8.6.3 Relationship to Historic Themes

Commonwealth and NSW heritage agencies use themes as a means of categorising how a place contributed to historical events at a National, State and local level. Historical themes are a means of relating site-specific developments to broader historical patterns. The themes that apply to the Woolpack Inn are provided in Table 8-25.

 Table 8-25
 Historic Themes (NSW Office of Environment & Heritage, 2018)

Australian Theme	NSW Theme	Local Theme
4. Settlement-Building settlements, towns and cities	Accommodation-Activities associated with the provision of accommodation, and particular types of accommodation – does not include architectural styles – use the theme of Creative Endeavour for such activities.	none
9. Phases of Life-Marking the phases of life	Persons-Activities of, and associations with, identifiable individuals, families and communal groups	none

#### 8.6.4 Significance Assessment

The assessment against the NSW Heritage Branch guidelines Assessing Heritage Significance (NSW Heritage Office, 2001) is presented in Table 8-26 below. This assessment was undertaken by AECOM as none was available in the existing listing.

Application of Criteria	Application of Criteria		
Historical significance SHR criteria (a)	The Woolpack Inn has historic significance as a former roadside inn. As a surviving historic inn along the New England Highway it is significant of both the development of the road and the Whittingham area. It has further significance for its role in the development of the local economy.		
Historical association significance SHR criteria (b)	The inn is associated with the land grant of John Rotton. It is also associated with various local inhabitants who worked as landlords and publicans, including Bertram Clifford Rodd and his wife Ellen Maude Rodd.		
Aesthetic significance SHR criteria (c) Social significance SHR criteria (d)	There is some aesthetic significance to the site, as it demonstrates the form of a historic inn. Plantings around the structures may be remnant from its former use and add to the overall aesthetic. The Woolpack Inn has social significance for its association with the people of Singleton and Whittingham during its period of operation, used as a place of social gathering for both travellers and local residents.		
Technical/Research significance SHR criteria (e)	There is the potential for associated subsurface deposits in some locations on this property, predominantly on the rise associated with the main building and its surrounding structures.		
Rarity SHR criteria (f)	This item does not meet this criterion.		
<b>Representativeness</b> SHR criteria (g)	This item does not meet this criterion.		

#### Table 8-26Significance Assessment

# 8.6.5 Statement of Significance

The Woolpack Inn was an historical facility that provided food, drink and accommodation as well as a social focal point, predominantly from the 1840s to the 1860s. The remnant structures associated with the Woolpack Inn provide evidence of those times. There is the potential for associated subsurface deposits in some locations on this property, predominantly on the rise associated with the main building and its surrounding structures.

# 8.6.6 Grading of Significant Components

As different elements of an item can have a different contribution to its heritage significance, it is useful to define which elements are of significance and which may detract from its significance. The NSW Heritage Division (NSW Heritage Office, 2001:11) use the grading criteria applied in Table 8-27.

Grading	Element Meeting Criteria	Condition
Exceptional	None.	N/A
High	The inn building with associated structures and plantings. Deposits on the rose associated with the structures and plantings (ie – subsurface potential). View lines to and from the item.	Good
Moderate	None.	N/A
Little	None.	N/A
Intrusive	None.	N/A

#### 8.6.7 Statement of Heritage Impact

The proposal would involve impacts adjacent to and within the curtilage of the Woolpack Inn associated with works for a new access road between Newington Lane and White Falls Lane. There would be no direct impacts to the Woolpack Inn.

Works for the access road adjacent to the curtilage of the item would be located to the south west, around 40 metres from the Woolpack Inn at its closest point.

Works for the access road within the curtilage of the item would extend for around 120 metres and would be located 200 metres north west of the Woolpack Inn at its closest point. The highest area of archaeological sensitivity is on the rise associated with the main building and its associated structures. The location of the proposal predominantly avoids that area, being situated downslope from it.

The main view lines to and from the item will not be impacted as it is situated on a rise and these works are proposed in a lower area associated with the New England Highway. Indirect impacts from the proposed works could occur from vibration caused by the movement or machinery and other construction related activity. Through avoidance, management measures and monitoring it is possible to avoid such indirect impacts to this item.

Questions	Answers
How is the impact of the new development on the heritage significance of the item or area to be minimised?	The proposal has been designed to limit direct impacts within the curtilage of the item to an area around 200 metres north west of the Woolpack Inn, away from areas of high archaeological sensitivity.
Why is the new development required to be adjacent to a heritage item?	The new development is a road and requires a connection to the existing New England Highway at this location.
How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?	The curtilage refers to the area of land ownership associated with the heritage item.
How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?	The current main views to and from the item and access from the New England Highway will not change, as the building is in an elevated area.
Is the development sited on any known, or potentially significant archaeological deposits?	There are potential deposits in the on the rise associated with the main building and its associated structures. Works for the proposal would not be carried out in this area.
Is the new development sympathetic to the heritage item?	The new development is in keeping with the existing New England Highway at this location.
Will the additions visually dominate	The additions will not visually dominate the heritage item or

#### Table 8-28 Works adjacent to heritage item questions

Questions	Answers
the heritage item? How has this been minimised?	the existing views to and from it, but the side road will encroach on the southwestern side.
Will the public, and users of the item, still be able to view and appreciate its significance?	The current main views and access from the New England Highway will not change.

The following (Table 8-29) presents the required SoHI data as stipulated by OEH for impacts to heritage significance (NSW Heritage Office, 2002).

Table 0-29 Summary of Hemage impacts for woolpack in	Table 8-29	Summary of Heritage impacts for Woolpack Inn
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Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	None.
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	None.
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	Proposed road works will occur to the north west of the property, within the item's curtilage but without impacting on the established public view lines or the fabric of the item.
Negligible or no impacts (does not affect heritage values either negatively or positively)	None.
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	None.

# 8.7 Impacts to known Sites

Consideration of proposed construction activities in relation to the identified historical sites within the proposal area are summarised below in Table 8-30. The consequence of harm refers to impacts that are likely to alter the existing significance level of the item (ie – may reduce its significance by the level of associated destruction).

Table 8-30	Impact summary for historic sites

Item name	ID	Type of harm	Degree of harm	Consequence of harm
Coke Ovens	145	None	None	No impact existing heritage significance
Great Northern Railway section	Unlisted	Direct	Moderate	Will impact existing heritage significance
Singleton Hunter River Underbridge	SRA844	Indirect	Low	Unlikely to impact existing heritage significance
Former Pumping Station	l21	Direct	High	Will impact existing heritage significance
Bebeah	1120	Direct	Low	Unlikely to impact existing heritage significance
The Woolpack Inn	1151	Direct	Low	Unlikely to impact existing heritage significance

# 9.1 Introduction

The following recommendations are made regarding the identified historical heritage values of the proposal area, on the basis of:

- The results of the archaeological survey and research
- The results of known heritage listings within and surrounding the proposal area
- The significance and impact assessments of identified historical heritage items
- Comments received from Singleton Council regarding the impacts of the proposal on heritage items.

It has been concluded that the proposal would impact the following items:

- Great Northern Railway section (unlisted)
- Singleton Hunter River Underbridge (SRA844)
- Former Pumping Station (I21)
- Bebeah (I120)
- The Woolpack Inn (I151).

The following recommendations are made to avoid or protect heritage values and to minimise or mitigate heritage impacts.

# 9.2 Recommendations

Impact	Environmental Safeguards	Responsibility	Timing
Heritage impacts	<ul> <li>A heritage management plan should be produced and included with in the Construction and Environment Management Plan measures to manage the identified heritage items in relation to the proposed works, including:</li> <li>Heritage protection measures</li> <li>An induction program for construction personnel on the management of non- Aboriginal heritage values</li> <li>Procedures to be implemented if previously unidentified non-Aboriginal relics or heritage items are discovered during construction, in accordance with the Roads and Maritime's Standard Management Procedure - Unexpected Archaeological Finds</li> </ul>	Construction contractor	Detailed design and construction

Impact	Environmental Safeguards	Responsibility	Timing
Heritage impacts	<ul> <li>If the use of vibration intensive plant cannot be avoided within the minimum working distance for cosmetic damage the following procedure would occur as a minimum:</li> <li>Notification of the works to the affected residents and community</li> <li>Works would not proceed until attended vibration measurements are undertaken. Vibration monitors are to provide real-time notification of exceedances of levels approaching cosmetic damage criteria.</li> <li>If ongoing works are required a temporary relocatable vibration monitoring system would be installed, to warn operators (via flashing light, audible alarm, short message service (SMS) etc) when vibration levels are approaching the cosmetic damage objective.</li> </ul>	Construction contractor	Detailed design and construction
Heritage impacts	Singleton Council should be informed of the proposed impacts to heritage items and their records relating to the corresponding LEP listings should be updated accordingly.	Roads and Maritime	Construction
Heritage impacts	Should any heritage items, archaeological remains or potential relics of Non-Aboriginal origin be encountered, then construction work that might affect or damage the material will cease and notification be provided to Roads and Maritime as per Roads and Maritime Standard Management Procedure - Unexpected Archaeological Finds. Work will only re-commence once the requirements of that Procedure have been satisfied.	Roads and Maritime / Construction contractor	Construction
Heritage impacts	Roads and Maritime will investigate the need to salvage heritage fabric from listed items removed by the proposal, for possible reuse in heritage reinterpretation in consultation with Singleton Council.	Roads and Maritime	Detailed design
Heritage impacts	An archival recording of the Former Pumping Station (I21) will be prepared prior to the removal of the item. The recording will be prepared in accordance with guidelines published by the Heritage Division, Department of Premier & Cabinet.	Roads and Maritime	Detailed design and construction
Heritage impacts	Prior to ground disturbance impacts at the Former Pumping Station (I21), a permit under Section 140 of the <i>Heritage Act 1</i> 977 would be obtained given the potential for archaeological relics at this location.	Roads and Maritime / contractor	Detailed design and construction

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# **Appendix A – Historical Aerials**



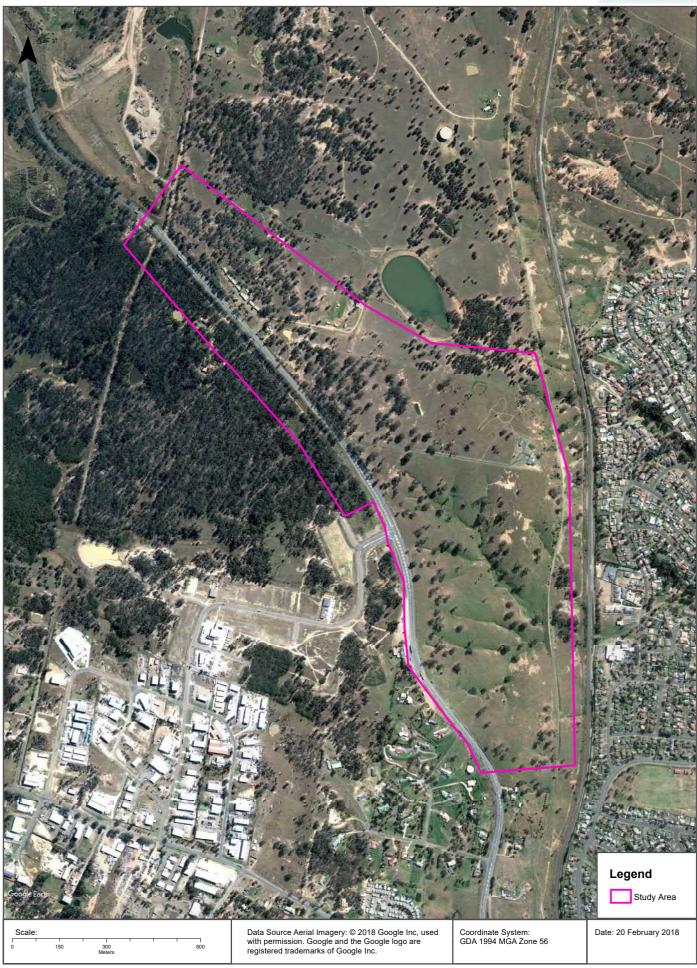
# **Aerial Imagery Report**

Singleton Bypass Concept Design and Environmental Assessment (Section 1) Report Date: 20 February 2018





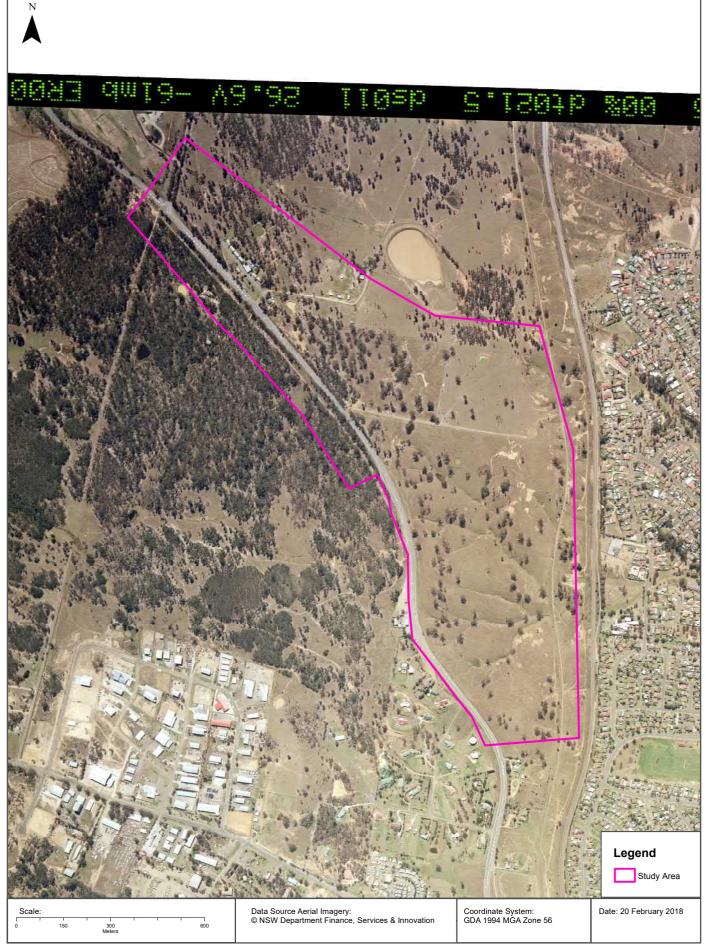




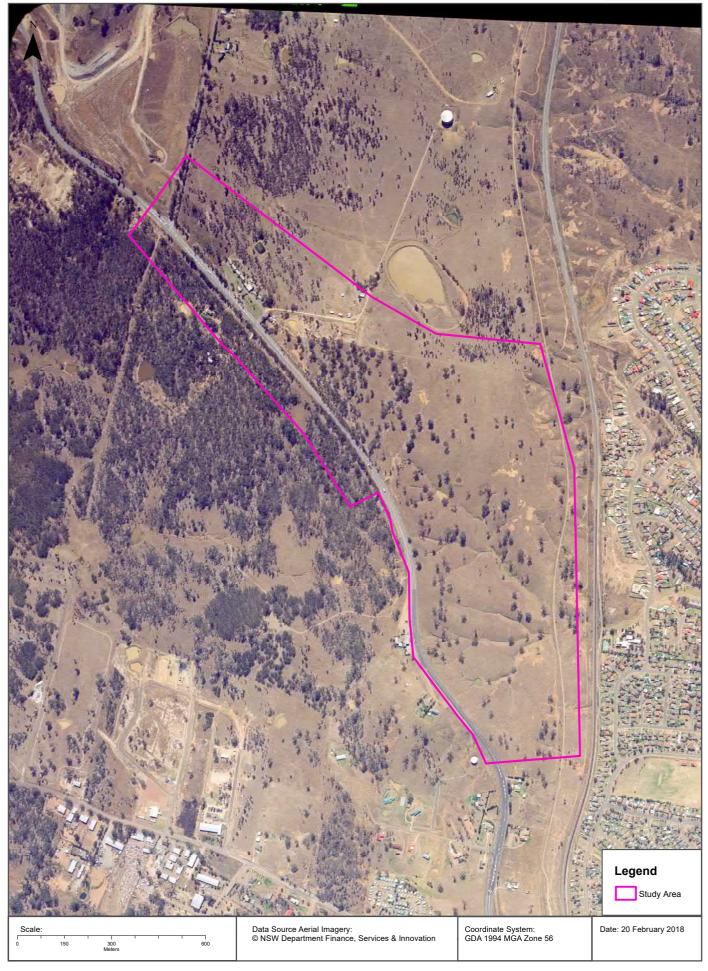




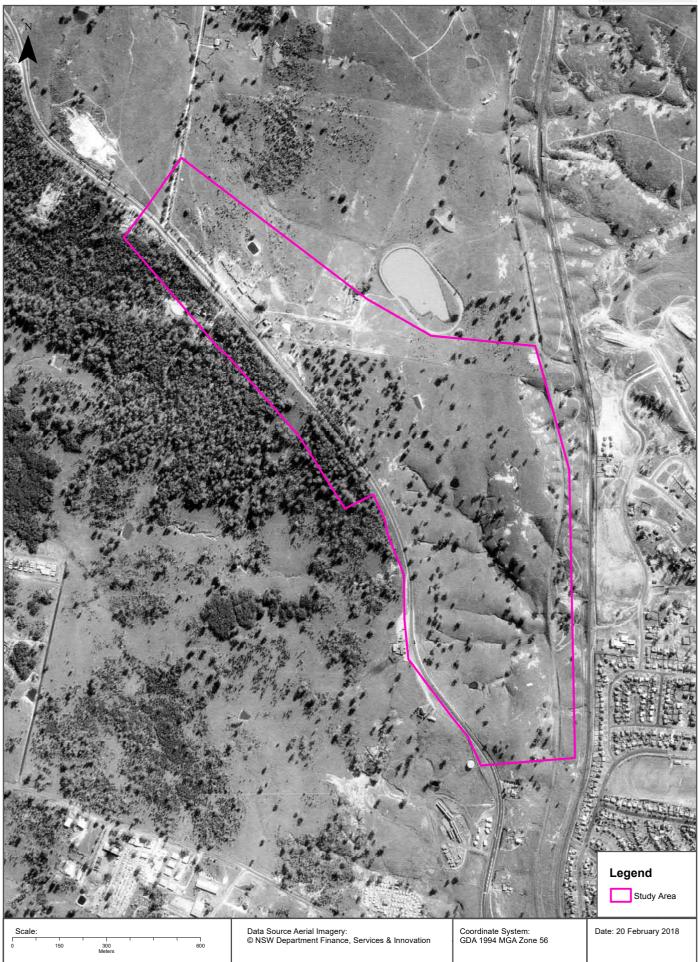




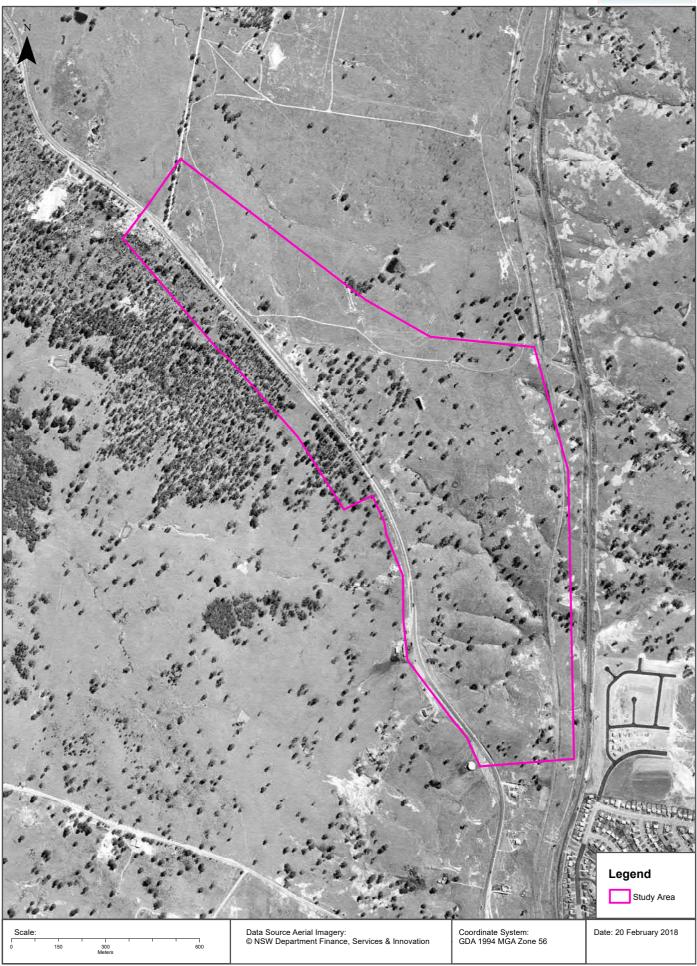
















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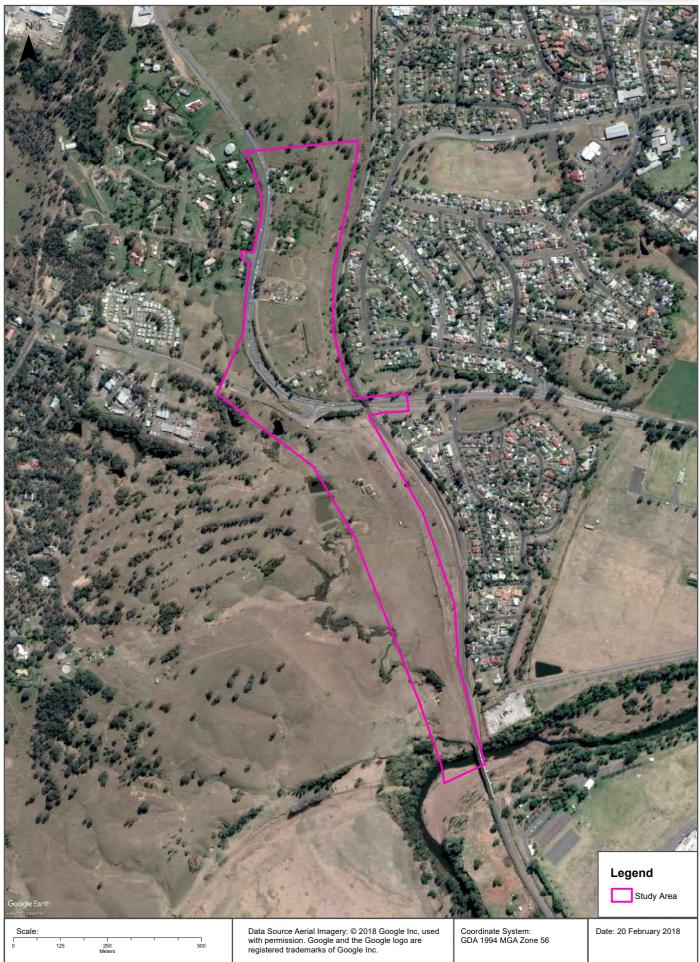
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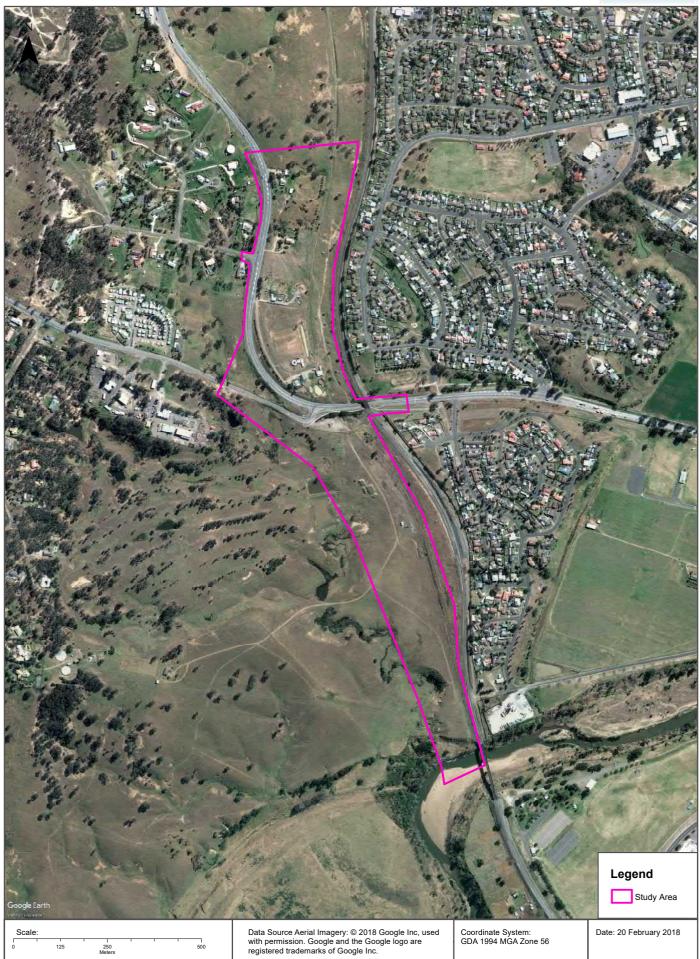
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Singleton Bypass Concept Design and Environmental Assessment (Section 2) Report Date: 20 February 2018

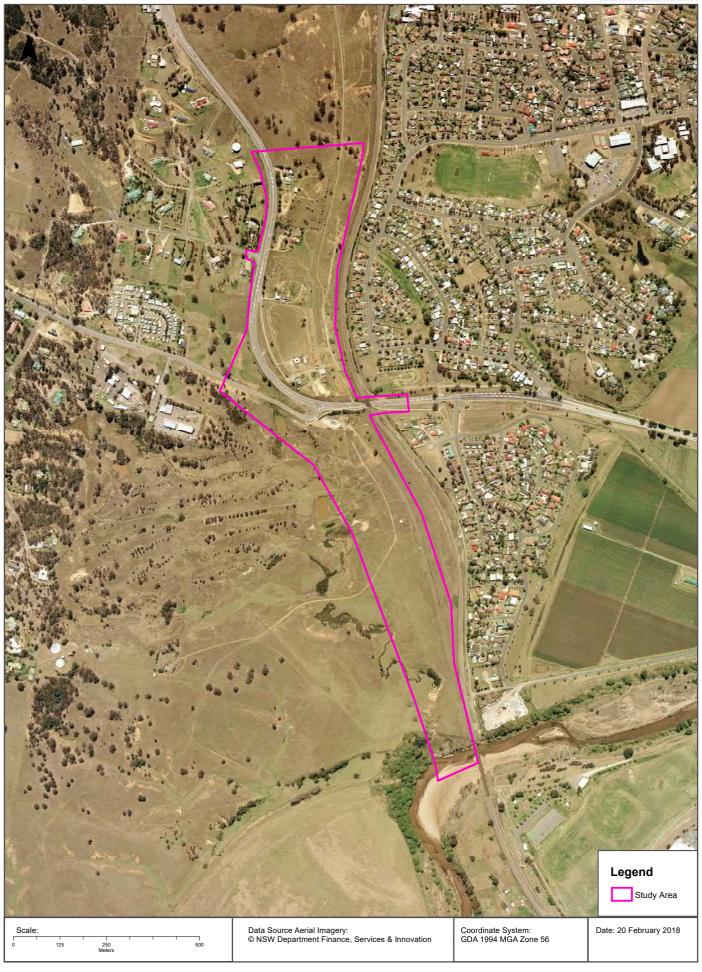




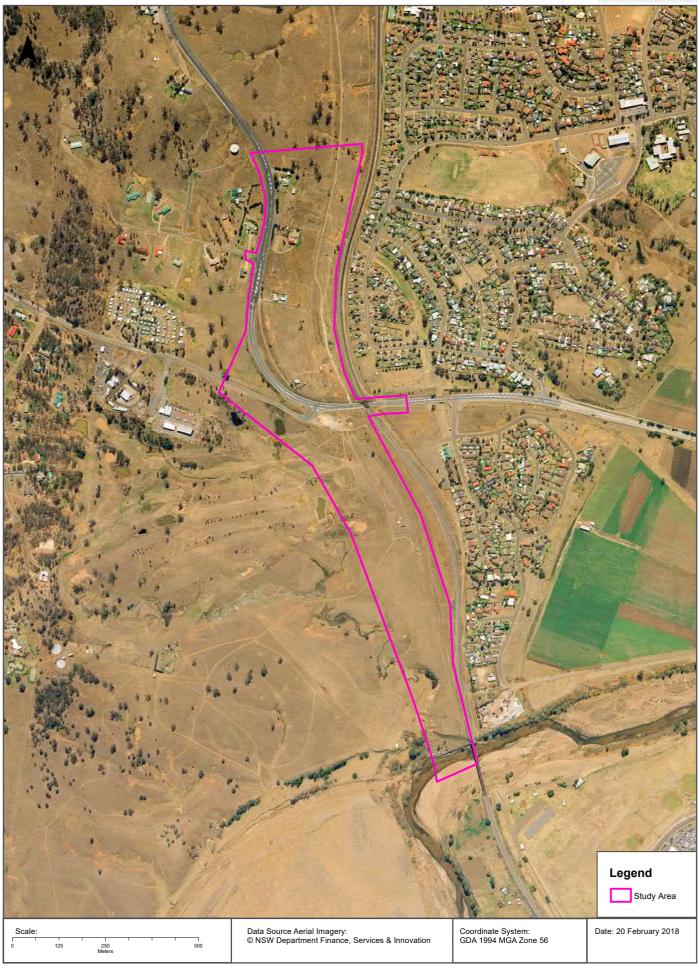




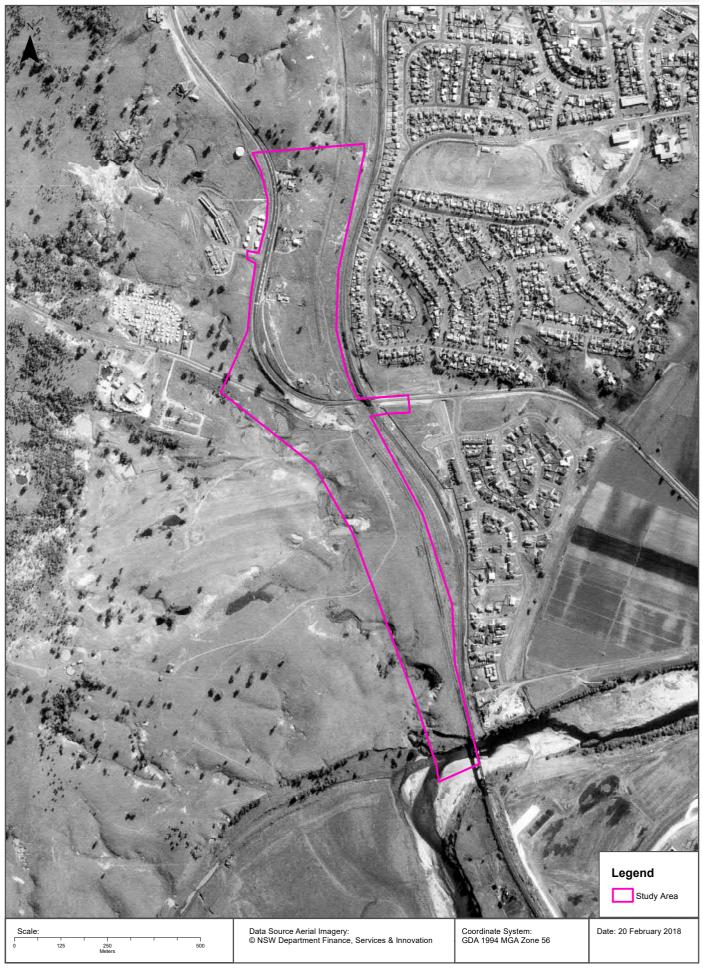




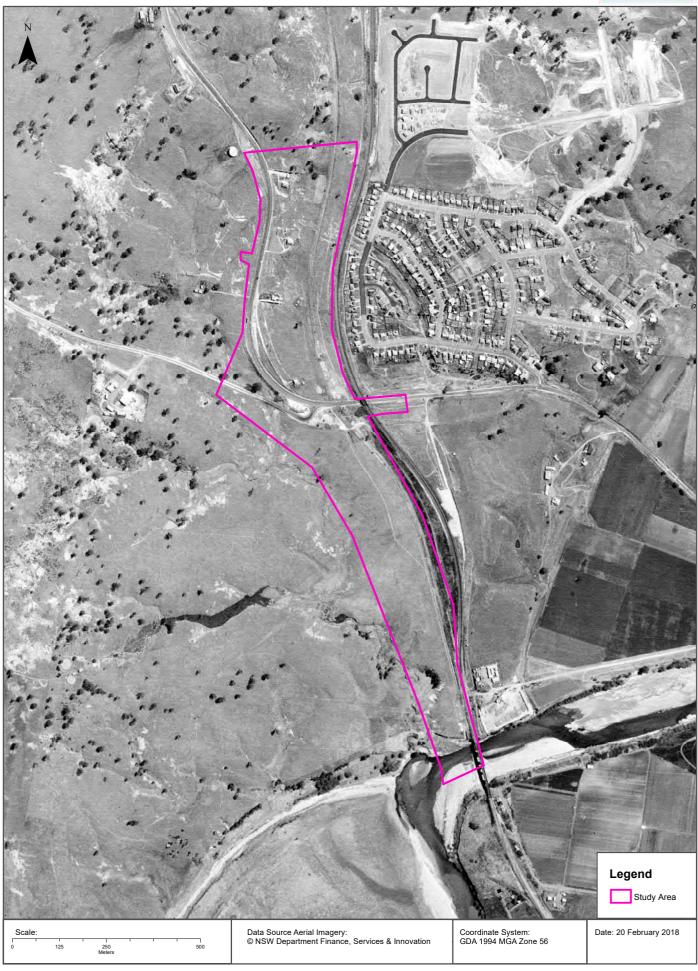




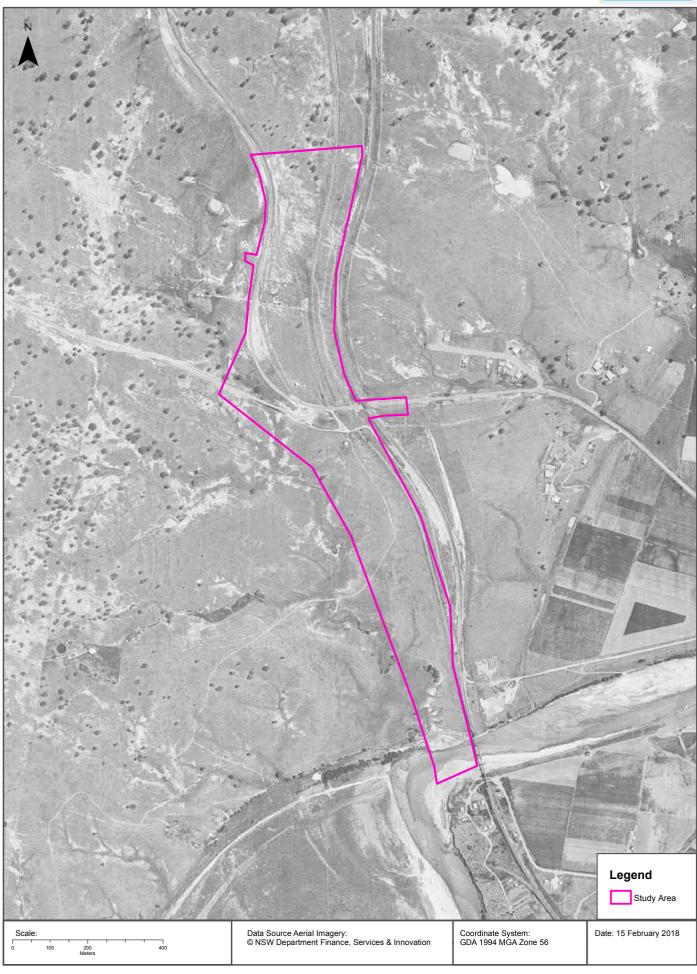




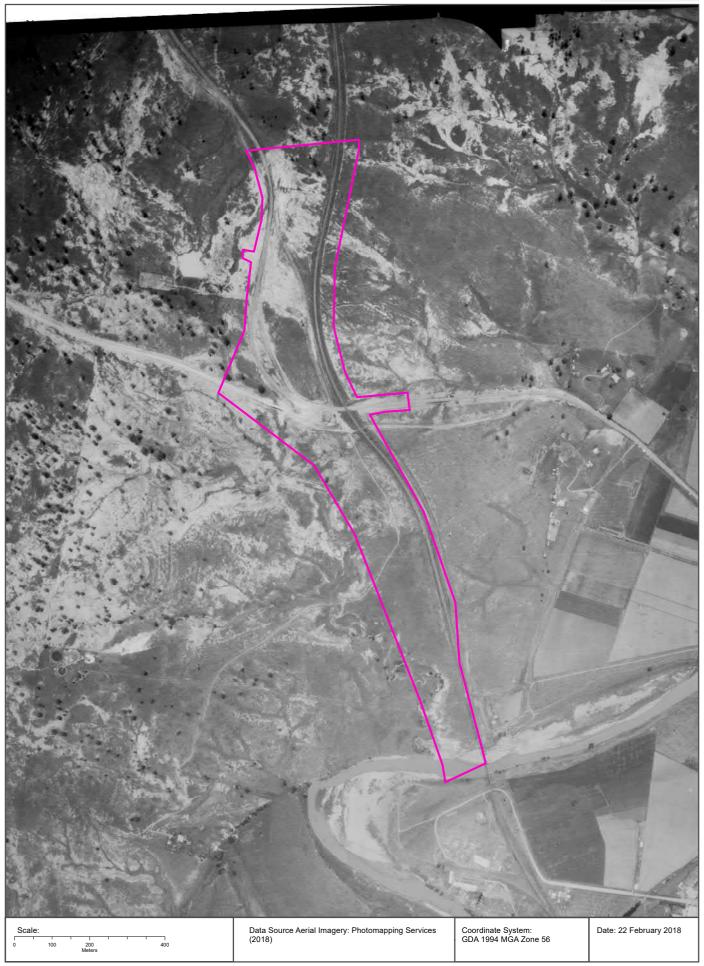












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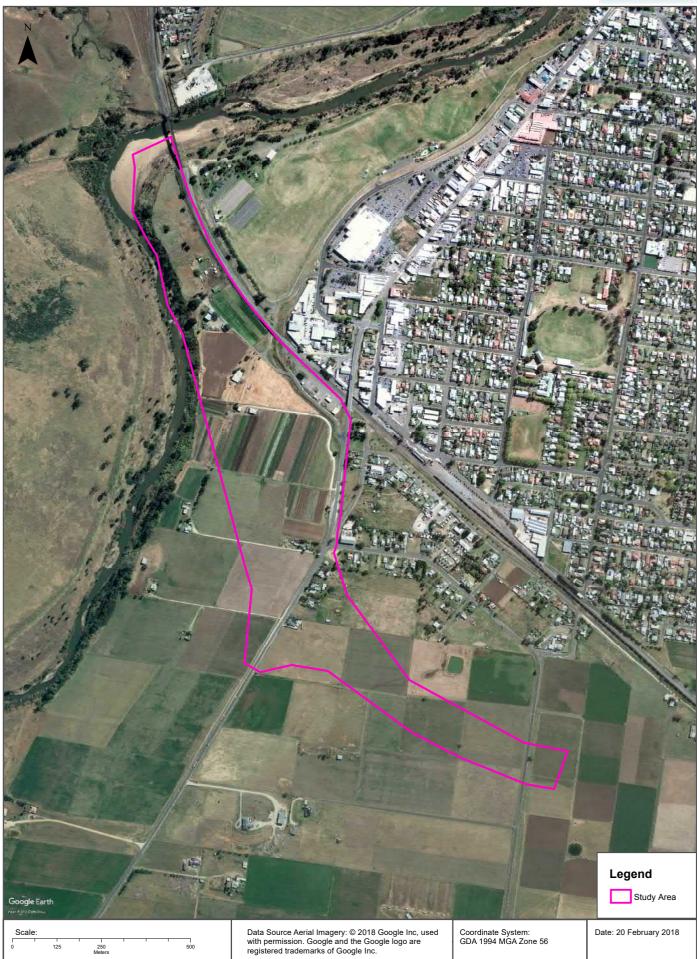
# **Aerial Imagery Report**

Singleton Bypass Concept Design and Environmental Assessment (Section 3) Report Date: 20 February 2018

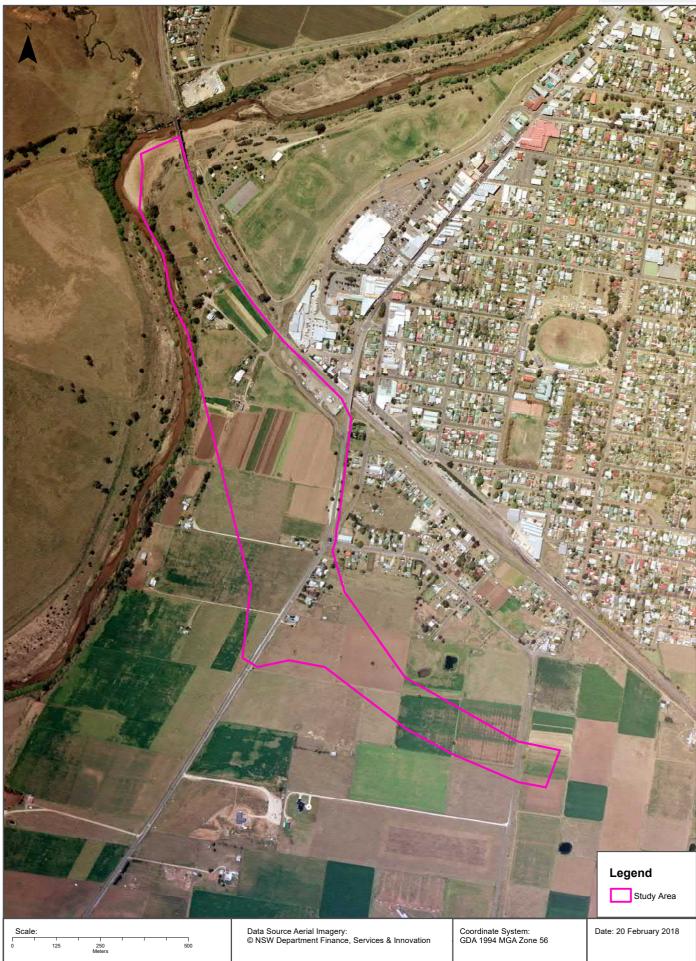








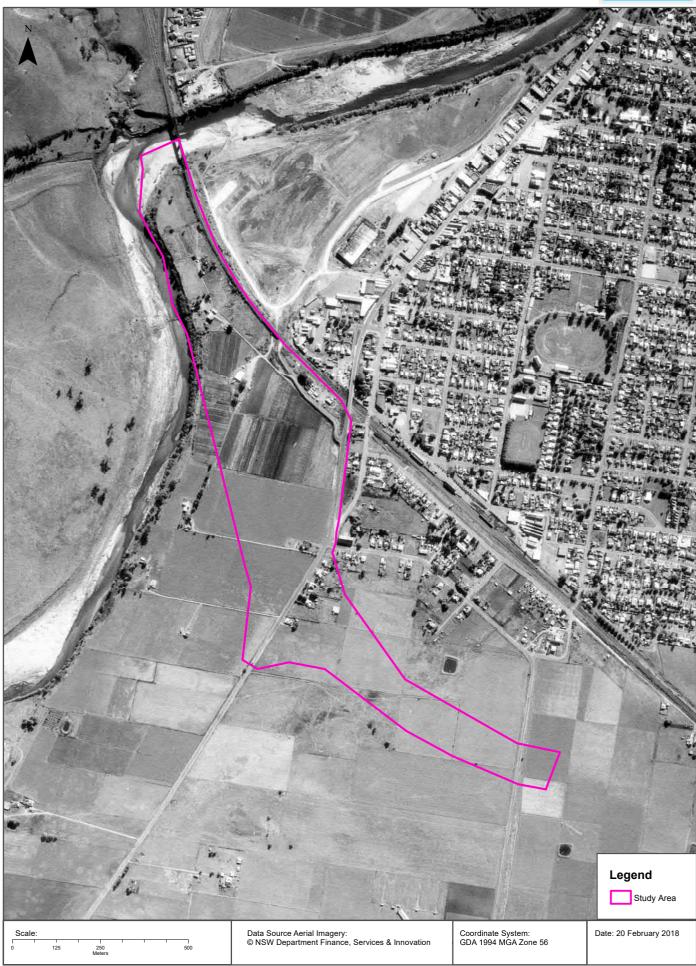




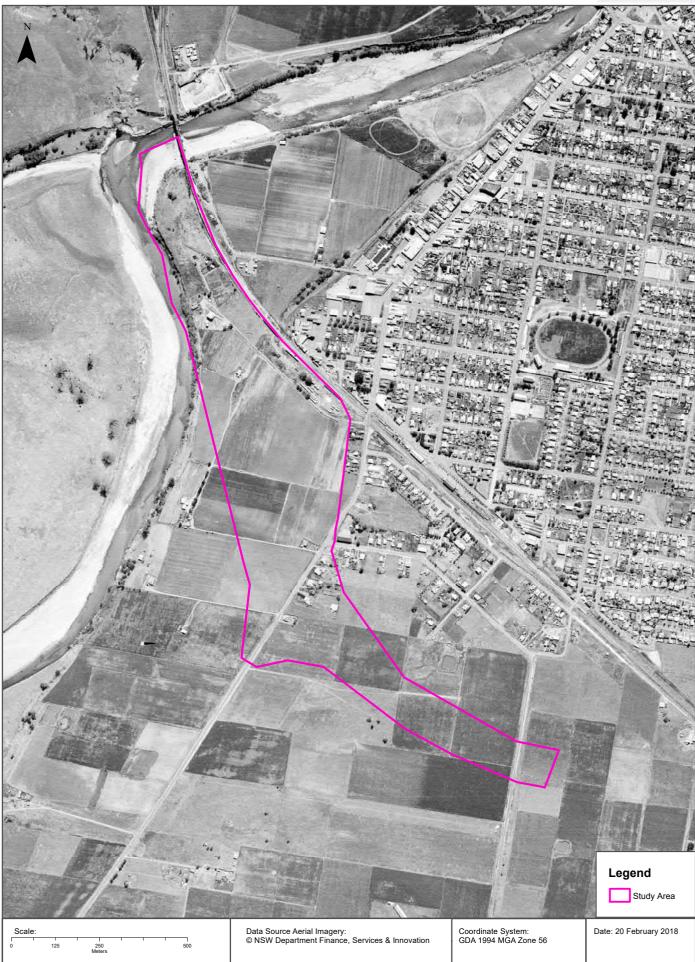








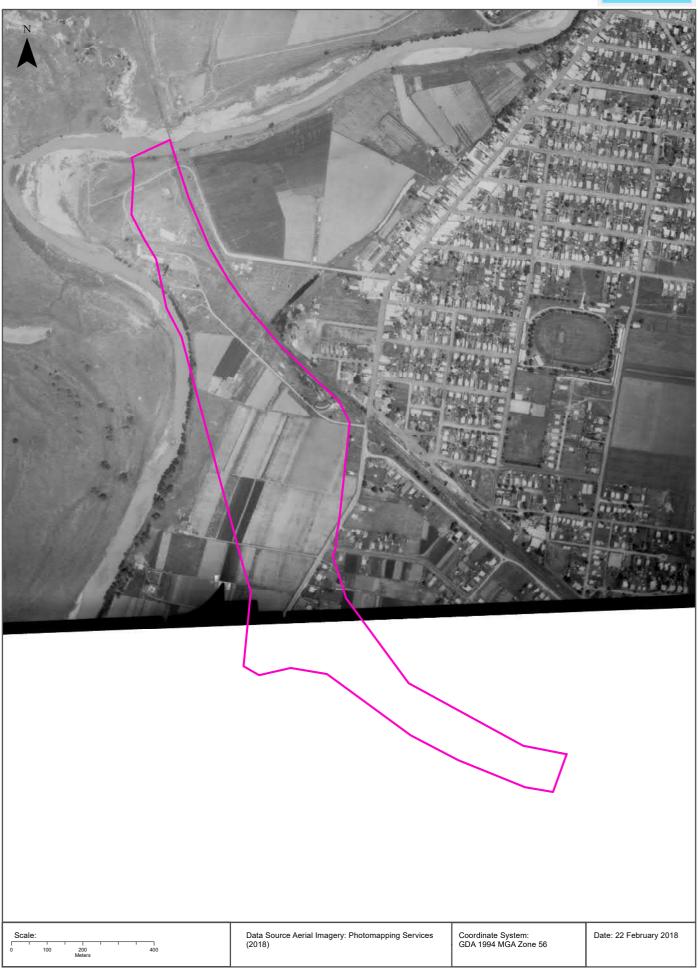
















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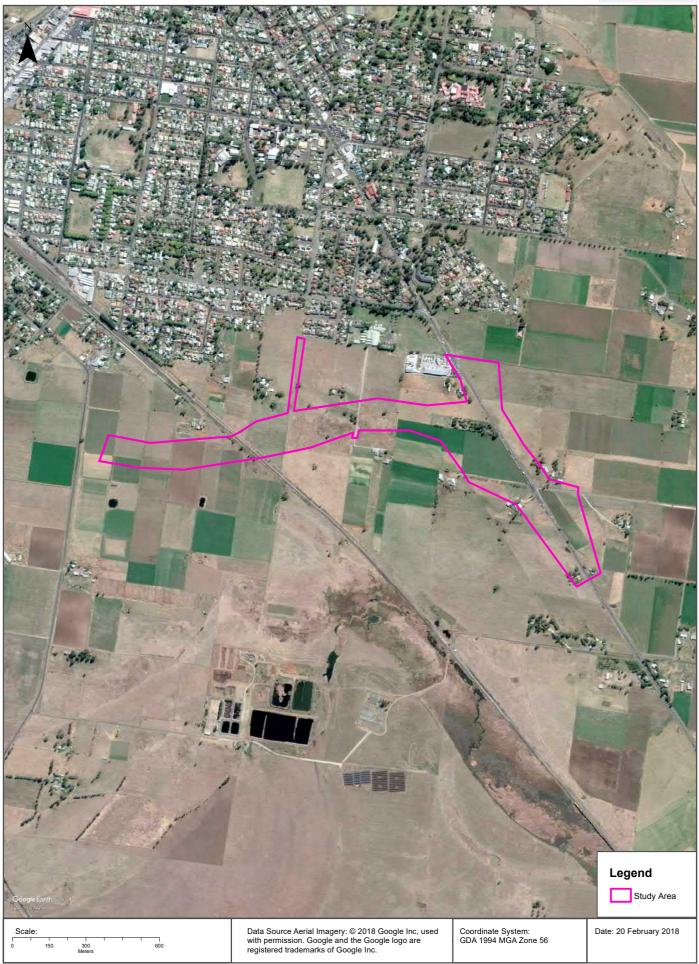
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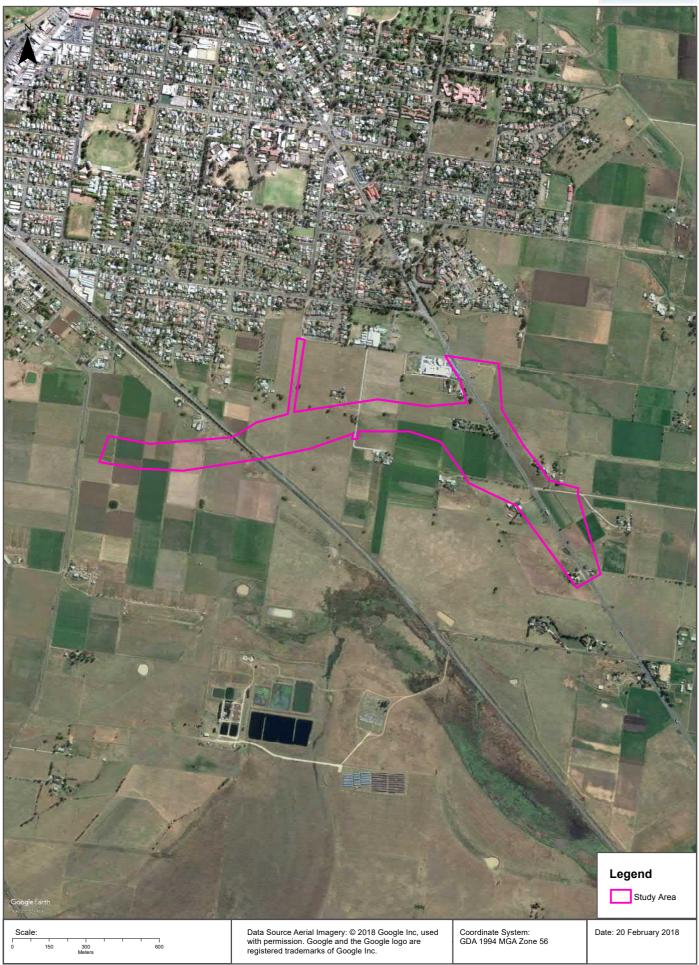
# **Aerial Imagery Report**

Singleton Bypass Concept Design and Environmental Assessment (Section 4) Report Date: 20 February 2018

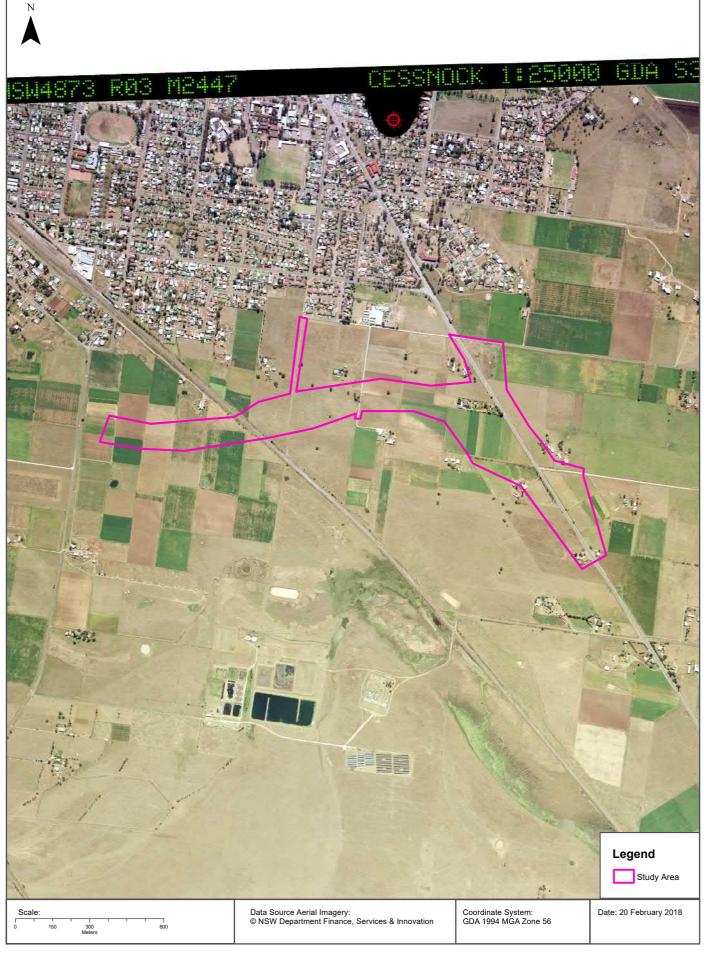




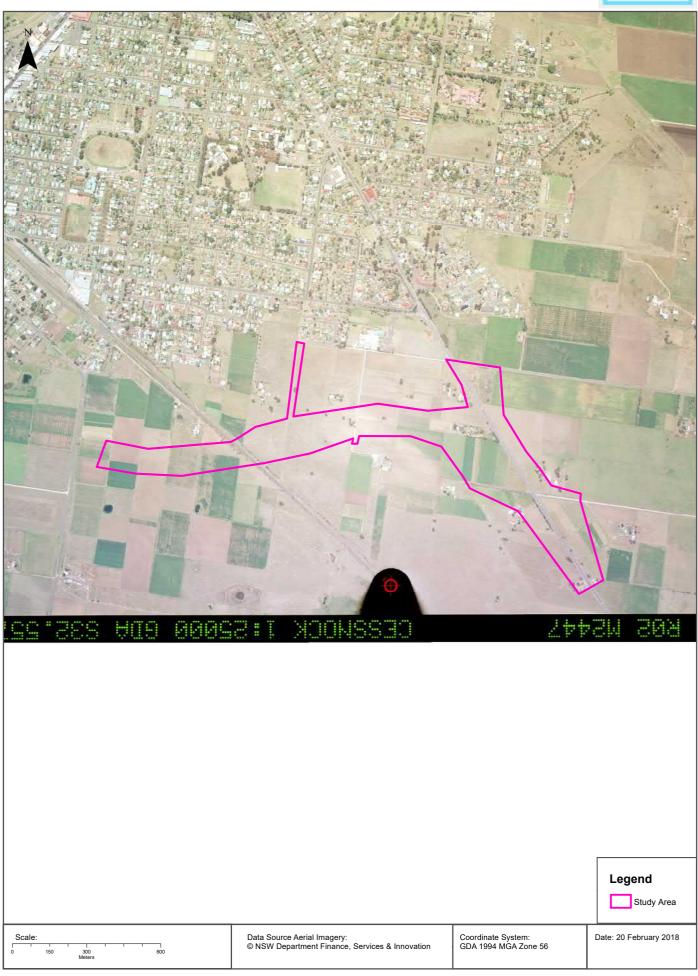








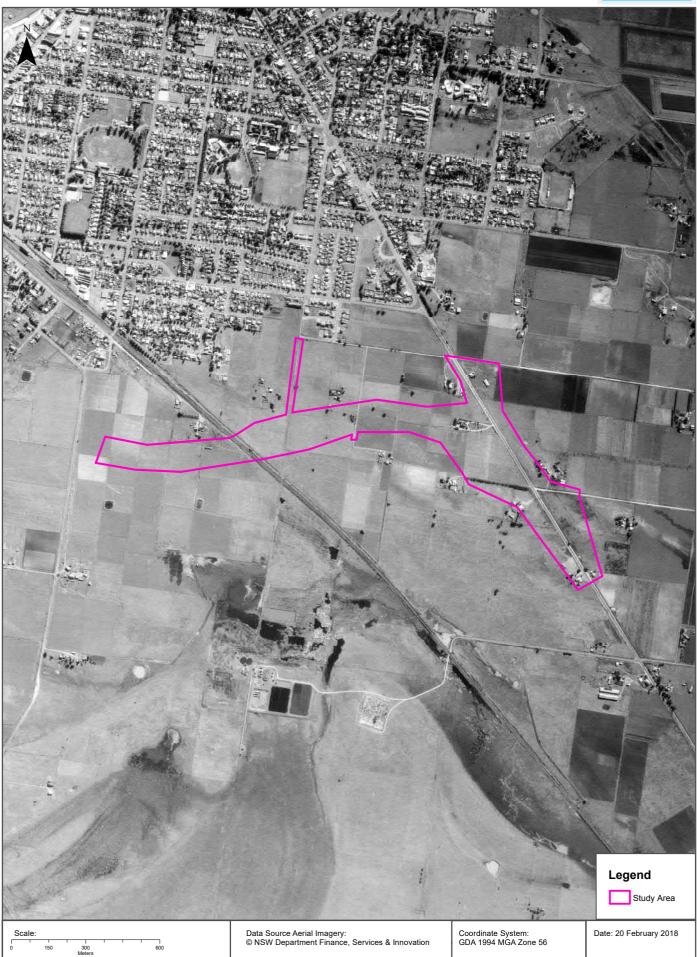




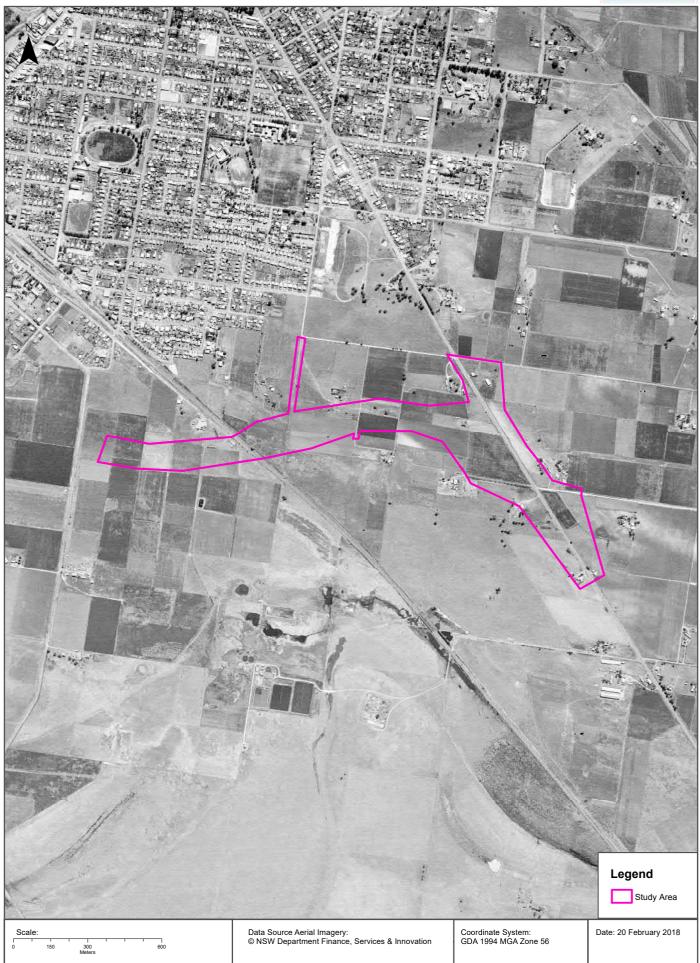




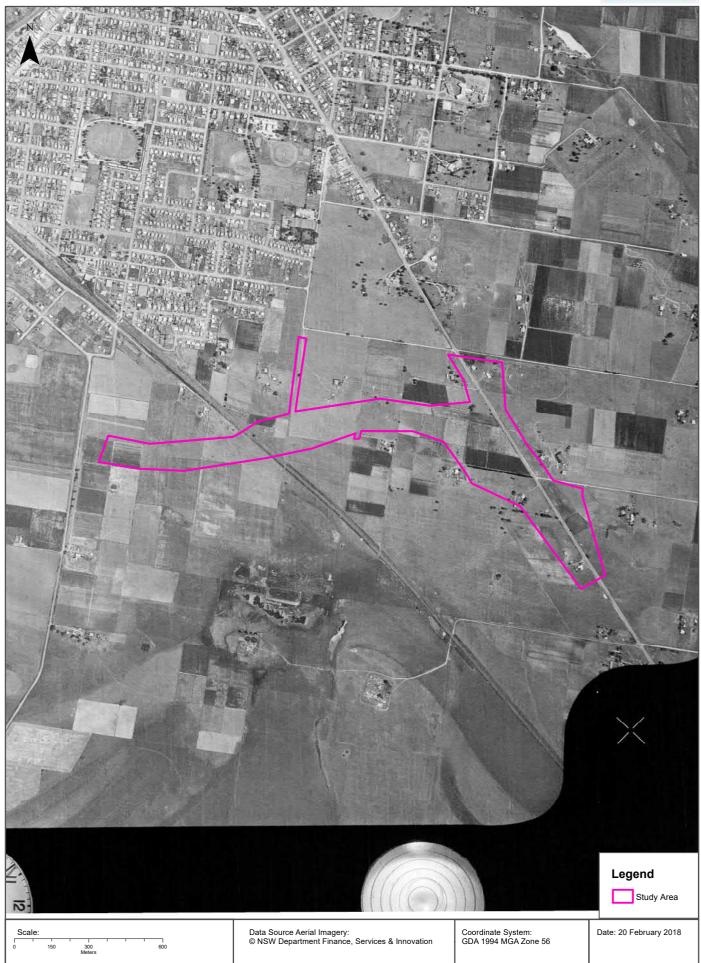




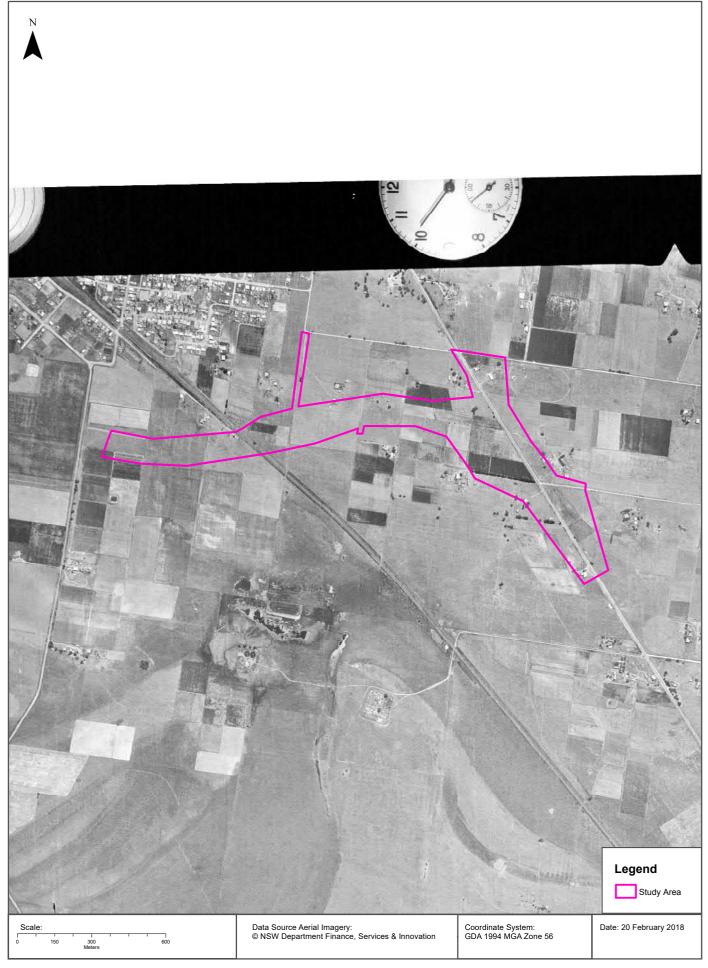




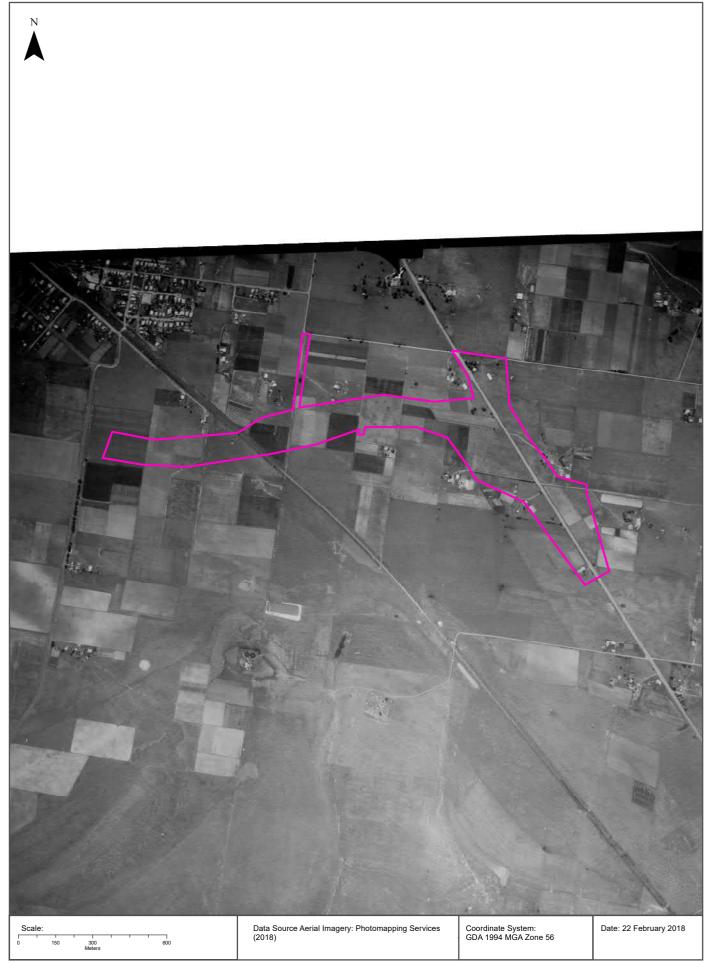












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Customer feedback Roads and Maritime Locked Bag 928, North Sydney NSW 2059

