

APPENDIX 14

Historic Heritage Assessment



GLENCORE

**HISTORIC HERITAGE
ASSESSMENT**

Mount Owen Continued Operations
Project

FINAL

October 2014

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Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Mount Owen Pty Limited

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Report No. **3109/R04/FINAL**
Date: **October 2014**



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Executive Summary

This Historic Heritage Assessment has been prepared as part of an Environmental Impact Statement (EIS) required under Part 4 of the *Environmental Planning & Assessment Act* (1979) (EP&A Act) for the continuation of the existing open cut operations at the Mount Owen Complex. The Mount Owen Continued Operations Project ('The Project') includes continued operations and construction of infrastructure at Mount Owen and Ravensworth East Mines.

Methodology

This report examines the Historic (non-Aboriginal) heritage issues associated with the Project with the aim of assessing and evaluating the potential heritage impacts of the Project. The report identifies the potential heritage sites/items contained within, and in the vicinity of, the Project Area and assesses the significance of these potential sites/items. The report includes a heritage impact statement and management strategy for the heritage sites/items within and where relevant within the vicinity of the Project Area. In accordance with the DGRs, the report also evaluates the effectiveness and reliability of the proposed mitigation measures.

Listed Heritage Items

No sites/items with any form of statutory heritage listing were identified within the Project Area. Several listed items were identified in the vicinity of the Project Area.

Potential Heritage Items

The historical heritage evidence of the Project Area demonstrates the documented pattern of settlement and use from the early to mid nineteenth century, including its settlement by Europeans and the subsequent clearance and use of the land for pastoral and agricultural activities. The historical heritage resource, with the exception of the Ravensworth Village area, is considered to be typical of the surrounding region and includes evidence of former house sites, sheds, yards and other rural structures that demonstrate the pattern of land use and historical development of the area. In general, these sites have been assessed as having no significance, or at best local significance.

The Ravensworth Village area has been assessed as being of local significance and has archaeological research potential.

The potential heritage sites/items within the Project Area identified during research and historical heritage surveys have been inspected and assessed as part of this report. Although unlikely, any as yet unidentified potential heritage sites/items that may be present within the Project Area are likely to comprise of evidence of timber yards and fencing. If present, these sites/items are likely to be typical of those found throughout the Hunter Valley and rural NSW and be of no, or at best be of local, significance.

Impacts

A number of the potential heritage sites/items identified within the Project Area and assessed as being of no heritage significance will be impacted by the North Pit Continuation including MOH6 (a former house site) and MOH7 (timber yards).

The Ravensworth Village area is located at the corner of the New England Highway and Hebden Road. An approximately 180 by 100 metre area of the former village will be impacted as a result of the proposed Hebden Road rail overpass.

The listed and non-listed heritage items in the vicinity of the Project Area have been considered in terms of indirect impact resulting from vibration from blasting, which has the potential to damage/destroy/disturb historical heritage items. No listed heritage item located in the vicinity of the Project Area is predicted to be potentially subject to vibration impacts and as such the listed items are not expected to be impacted by the Project.

Management

All potential heritage sites/items identified and assessed within this report have been recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**). In general, with the exception of the Ravensworth Village area, no further management is required with regards to the potential historical heritage resource of the Project Area.

The impact to the Ravensworth Village area provides an opportunity to undertake archaeological investigation of the Proposed Disturbance Area to identify if any significant archaeological remains associated with the history of the establishment, use and occupation of Ravensworth Village survives as an archaeological resource. As such, archaeological investigation work is proposed to be undertaken in the Ravensworth Village disturbance area to normal professional standards and accepted best practice procedures, in accordance with a Heritage Branch (now Heritage Division), Office of Environment and Heritage (OEH) endorsed archaeological work method statement.

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APPENDIX

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1.0 Introduction

The Mount Owen Complex is located within the Hunter Coalfields in the Upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres north-west of Singleton, 24 kilometres south-east of Muswellbrook and to the north of Camberwell village (refer to **Figure 1.1**).

Mount Owen Pty Limited (Mount Owen), a subsidiary of Glencore Coal Pty Limited (formerly Xstrata Coal Pty Limited (Xstrata)), currently owns and operates the three existing open cut operations in the Mount Owen Complex; Mount Owen (North Pit), Ravensworth East (West Pit) and Glendell (Barrett Pit). Mount Owen anticipate that mining will commence in the northern portion of the Ravensworth East in an area known as the Bayswater North Pit (BNP) in 2015. The mining operations at the Mount Owen Complex include the integrated use of the Mount Owen coal handling and preparation plant (CHPP), coal stockpiles and the rail load out facility.

Mount Owen (North Pit) has an approved production rate of 10 million tonnes per annum (Mtpa) of run of mine (ROM) coal, and blended with Ravensworth East (approved 4 Mtpa) and Glendell (approved 4.5 Mtpa) ROM coal, feed the Mount Owen CHPP and associated infrastructure, which has a total approved processing capacity of 17 Mtpa of ROM coal. Processed coal, both semi soft and thermal, are transported via the Main Northern Rail Line to the Port of Newcastle for export, or by conveyor for domestic use as required.

Mount Owen expects, subject to market conditions, that mining will be completed within the currently approved area of the North Pit and the West Pit by 2018 and late 2014 respectively; and Glendell by 2022. Mount Owen has undertaken extensive exploration of its mining tenements and identified substantial additional mineable coal tonnes to the south of the currently approved North Pit. Further exploration verified economically viable reserves within an area located in the northern portion of the existing approved Ravensworth East Mine, referred to as the BNP. The proposed Ravensworth East Resource Recovery (RERR) Mining Area, is located immediately east of the West Pit and is proposed to be mined sequentially after mining has been completed in the BNP.

Mount Owen is seeking development consent for the Mount Owen Continued Operations Project (the Project) to extract these additional mineable coal tonnes through continued open cut mining methods. The Project proposes to continue the existing mining operations within the North Pit to the south beyond the current approved North Pit mining limit (the North Pit Continuation) in addition to undertaking mining operations within the BNP area, sequentially followed by the RERR Mining Area (refer to **Figure 1.2**).

The Project seeks to maintain the current approved North Pit extraction rate of 10 Mtpa of ROM coal, extracting approximately 74 million tonnes (Mt) of ROM coal from the North Pit Continuation. The extraction of these additional mineable coal tonnes would continue the North Pit life to approximately 2030 (an additional 12 years). Additionally, the Project seeks to maintain the current approved Ravensworth East extraction rate of 4 Mtpa of ROM coal, and to extract approximately 12 Mt of ROM coal from the BNP. Subject to market conditions, mining within the BNP area would be undertaken from approximately 2015 to 2022, with the mining in the RERR Mining Area to follow sequentially from approximately 2022 to 2027 and extract approximately 6 Mt of ROM coal.

The Project will enable the consolidation of the Mount Owen and Ravensworth East Operations to provide for further operational efficiency by providing a single development consent for continued operations. The Project does not include any aspect of the ongoing operations at Glendell Mine and it will continue to operate in accordance with its current development consent.



FIGURE 1.1
Locality Plan

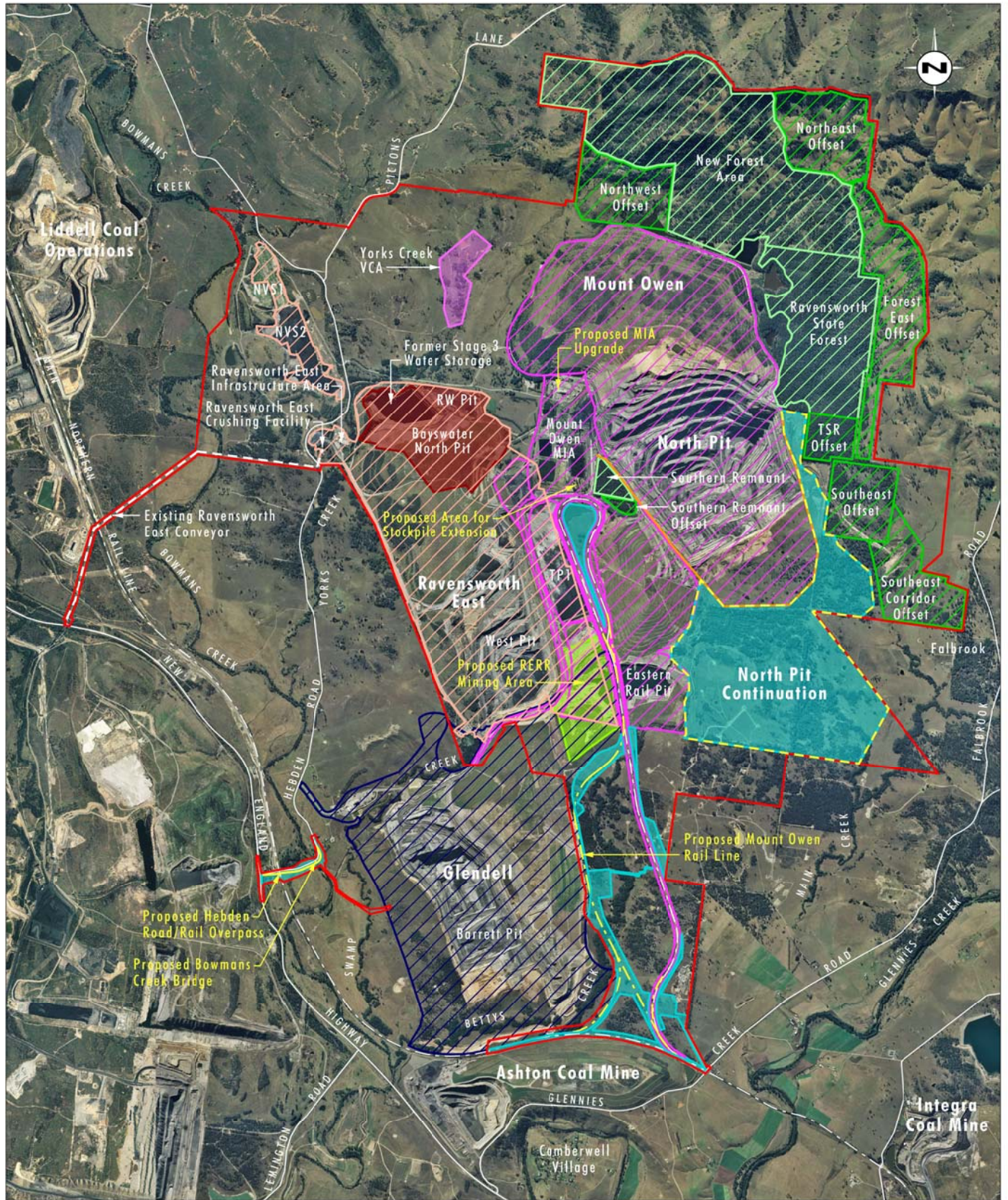


Image Source: Mount Owen (2012-2013)
Data Source: Mount Owen (2014)

0 1 2 3 km
1:60 000

Legend

- | | |
|--|---|
| Project Area | Yorks Creek VCA |
| Approved North Pit Mining Extent | Boyswater North Pit |
| Proposed North Pit Continuation | Mount Owen Operational Area |
| Proposed Rail Upgrade Works | Glendell Operational Area |
| Proposed Hebden Road Upgrade Works | Ravensworth East Operational Area |
| Proposed Disturbance Area | Existing Biodiversity Offset Area |
| Proposed RERR Mining Area | Ravensworth State Forest |

File Name (A4): R04/3109_405.dgn
20141008 16.21

FIGURE 1.2

Proposed Mount Owen
Continued Operations Project

The Project is State Significant Development as defined by the provisions of the State Environmental Planning Policy (State and Regional Development) 2011 and requires development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Minister for Planning is the consent authority for the Project.

An Environmental Impact Statement (EIS) has been prepared for the Project to accompany a Project Application following Department of Planning and Environment (DP&E) issuing Director-General's Requirements (DGRs) for the Project in March 2013. The following Historic Heritage Assessment was prepared to meet the Director-General's EIS requirements in relation to heritage issues for the Project.

2.0 Project Overview

The Project aims to maintain the utilisation of the existing Mount Owen and Ravensworth East infrastructure and to maximise the recovery of mineable coal tonnes from within the existing Glencore mining tenements.

A key Project design consideration has been to maximise the efficient use of the existing infrastructure and areas previously approved for disturbance and as a result, minimise the overall surface disturbance area required for the Project as far as practicable.

The key features of the Project are outlined in **Table 2.1**. **Figure 1.2** shows the general layout of the Project. For a detailed description of the existing approved operations and the Project refer to Section 2.0 of the EIS.

Table 2.1 – Key Proposed Features of the Project

Key Feature	Proposed Operations
Mine Life	<ul style="list-style-type: none"> Consent will be sought for 21 years (from date of Project Approval) to provide for mining until approximately 2030 and contingency for other activities such as rehabilitation and capping of tailings emplacement areas.
Limits on Extraction	<p>No change in approved extraction rates.</p> <ul style="list-style-type: none"> North Pit – up to 10 Mtpa ROM. Ravensworth East – up to 4 Mtpa ROM.
Mine Extent	<ul style="list-style-type: none"> Continuation of the North Pit footprint to the south of current approved North Pit mining limit. Mining within the approved BNP, followed sequentially by mining within the RERR Mining Area within the Ravensworth East Mine. Mining depths to approximately 300 m (North Pit). Total additional mineable coal tonnes of approximately 92 Mt ROM (comprising 74 Mt ROM (North Pit Continuation), 12 Mt ROM (BNP) and 6 Mt ROM (RERR) Mining Area). Changes to mine water management system.
Operating Hours	<ul style="list-style-type: none"> No change proposed - 24 hours per day, 7 days per week.
Workforce Numbers	<ul style="list-style-type: none"> No significant change to workforce numbers is required. Current workforce required to operate North Pit and CHPP fluctuates and peaks at about 660 and the Ravensworth East development consent allows for a workforce of up to 260 to operate Ravensworth East operations. Addition of approximately 330 personnel for construction phase for proposed infrastructure works (approximately 18 months).
Mining Methods	<ul style="list-style-type: none"> No change to mining methods proposed.
Mount Owen CHPP and MIA	<ul style="list-style-type: none"> No change to existing approved CHPP capacity of 17 Mtpa ROM. product stockpile extension; CHPP improvements (including operational efficiencies) to increase processing capacity and tailings management; MIA extensions and improvements;
Existing Mine Infrastructure	<ul style="list-style-type: none"> Continued utilisation of all existing mining infrastructure, including the existing crushing plant for the crushing of overburden.

Table 2.1 – Key Proposed Features of the Project – cont.

Key Feature	Proposed Operations
Infrastructure Construction Activities	<ul style="list-style-type: none"> Infrastructure upgrades including: <ul style="list-style-type: none"> provision for a northern rail line turn-out and additional Mount Owen rail line; Hebden Road overpass over Main Northern Rail Line; and New Hebden Road bridge crossing over Bowmans Creek.
Tailings and Coarse Reject Emplacement	<ul style="list-style-type: none"> Continued use of the Ravensworth East voids for tailings emplacement and co-disposal of coarse reject and overburden within the North Pit Continuation, the West Pit / BNP and the RERR Mining Area as mining progresses. Tailings cells may be constructed and filled within the North Pit Continuation area as required to allow time for consolidation and drying of tailings in the West Pit and the RERR Mining Area. Allowance for the receipt of tailings from other mines.
Coal Transportation	<ul style="list-style-type: none"> No change to current export coal transportation with the exception of the use of the proposed additional rail line. No change to capacity of 17 Mtpa ROM coal. Use of existing rail line for Glencore train park up. Transportation of up to 2 Mtpa ROM coal and crushed gravel on an as required basis via the existing overland conveyor to Liddell Coal Operations and the RCT in addition to maintaining the current approval to transport ROM coal to Bayswater and Liddell power stations.

The Proposed Disturbance Area is the area of land that would be directly impacted by the Project. The total Proposed Disturbance Area is approximately 485 hectares (North Pit Continuation approximately 381 hectares and the proposed Hebden Road upgrade works and Mount Owen Rail works approximately 104 hectares). The Proposed Disturbance Area represents the area that is additional to the currently approved disturbance areas.

2.1 Historic Heritage Assessment

Umwelt (Australia) Pty Limited (Umwelt) has been commissioned by Mount Owen to prepare an Environmental Impact Statement (EIS) for the Project, with this historic heritage assessment undertaken as part of the EIS. The report was prepared by Tim Adams, Senior Archaeologist, a qualified and experienced historic consultant. This report examines the historical (non-Aboriginal) heritage issues associated with the Project with the aim of assessing and evaluating the potential heritage impacts associated with the Project. The report identifies the heritage sites contained within and in the vicinity of the Project Area and assesses the significance of any impacts on these sites potentially resulting from the Project.

As outlined in the DGRs for the Project, this assessment has been undertaken in accordance with guidelines set out in the *NSW Heritage Manual 1996* (Heritage Office and Department of Urban Affairs & Planning), including *Archaeological Assessments*, *Assessing Heritage Significance*, *Statements of Heritage Impact* and *Heritage terms and Abbreviations* and with consideration of the principles contained in *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 1999* (Australia ICOMOS. 2000) and the *Historical Archaeology Code of Practice* (2006).

The Preliminary Environmental Assessment (PEA) for the Project was reviewed by the Heritage Branch (now Heritage Division), Office of Environment and Heritage (OEH) as part of the DP&E request for DGRs for the Project (letter to DP&E from Heritage Division, OEH 05/03/2013). Heritage Division comments are reflected in the DGRs (refer to **Section 1.3**).

This report does not include an assessment or consideration of any Aboriginal archaeological values or Aboriginal cultural heritage values related to the Project. Aboriginal archaeological values and cultural heritage values are assessed in separate reports prepared by OzArk (Aboriginal Archaeological Values Assessment Mount Owen Continued Operations Near Ravensworth, Upper Hunter Valley, NSW Singleton LGA, OzArk 2014) and Australian Cultural Heritage Management (ACHM) (Mount Owen Continued Operations Project Aboriginal Cultural Heritage Assessment Report and Consultation Records, ACHM 2014).

2.2 Statutory Overview

The *Heritage Act 1977* (NSW) (the Heritage Act) and the *Environmental Planning and Assessment Act 1979* (EP&A Act) are the primary statutory controls protecting historical/European heritage (non-Aboriginal) within NSW.

As the Project is a development for the purposes of coal mining, the Project is a State Significant Development (SSD) as defined under Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011. The appropriate approval path for this Project is a new project approval under Part 4 of the EP&A Act. As a SSD, the Minister for Planning is the consent authority and the relevant approval provisions of the Heritage Act and local planning instruments established under the EP&A Act do not apply.

The DGRs for the Project require a historic heritage assessment (including archaeology). A checklist of where these requirements are addressed in this report is provided in **Table 2.2**.

Table 2.2 – Matters Specified in the DGRs and Where They Are Addressed in this Report

DGRs for Historic Heritage	Where addressed in report
The historic heritage assessment (including archaeology) must include:	
A statement of heritage impact (including significance assessment) for any State significant or locally significant heritage items	Section 5.0 – Significance assessment. Section 6.0 – Heritage impact statement.
Outline any proposed mitigation and management measures (including an evaluation of the effectiveness and reliability of the measures)	Section 6.0 – Mitigation and management measures. Section 7.0 – Evaluation of management measures.

Approval conditions relating to heritage may be issued by DP&E in consultation with the Heritage Council of NSW and delegate officer of the Heritage Division, OEH.

Heritage Council of NSW comments received as part of the DGRs included the need to consider the following:

- The heritage significance of any identified sites (refer to **Section 5.0**) and any impacts the development may have upon this significance (refer to **Section 6.0**); and

- Non-Aboriginal heritage items within the area affected by the proposal should be identified by field survey (refer to **Section 4.0**). A statement of significance (refer to **Section 5.0**) and an assessment of the impact of the proposal on the heritage significance (refer to **Section 6.0**) of these items should be undertaken. Any policies/measures to conserve their heritage significance should be identified (refer to **Section 6.0**). This assessment should be undertaken in accordance with the guidelines in the NSW Heritage Manual (refer to Section 2.1). The field survey and assessment should be undertaken by a qualified practitioner/consultant with historic sites experience (refer to Section 2.1).

2.3 Heritage Listings

In order to identify if any historical heritage items are located within or in the immediate vicinity of the Project Area, desktop searches were conducted of the NSW State Heritage Register (SHR) and State Heritage Inventory, the Australian Heritage Database (including Commonwealth and National Heritage lists and the Register of the National Estate (RNE)), and local planning instruments (Singleton Local Environment Plan (LEP) 2013).

No listed sites/items were identified within the Project Area. However, several listed items were identified within the vicinity of the Project Area. These are listed in **Table 2.3** and identified on **Figure 2.1**.

Table 2.3 – Listed Heritage items Located Outside but within the Vicinity of the Project Area

Item Name	Location	Listing and Significance	Distance to Project Area and Disturbance Area
Ravensworth Homestead	463 Hebden Road (Lot 228 DP 752470)	Singleton 2013 LEP – local significance. Register of the National Estate (RNE ¹).	700 metres west of the Project Area boundary. 3.7 kilometres west of the North Pit Continuation Over 1.6 kilometres south-west of the proposed Bayswater North Pit Over 2.4 kilometres west of the RERR Mining Area

¹ The Register of the National Estate (RNE) is a non-statutory list of natural, Indigenous and historic heritage places throughout Australia. Many places in the RNE are now included in other statutory lists, such as the state heritage lists, or local government heritage registers. As a result, those places receive protection under the relevant federal, state, territory or local legislation.

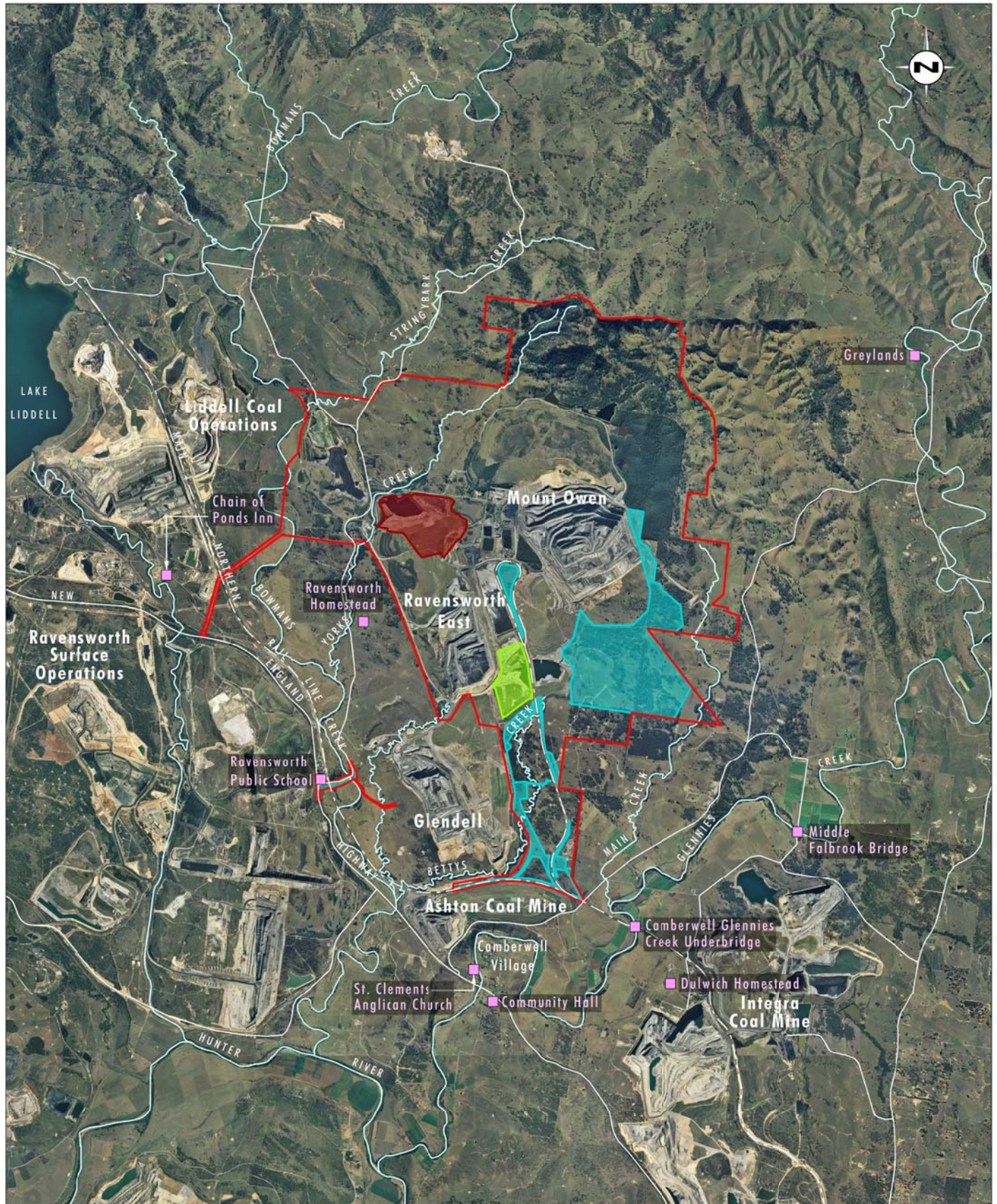


Image Source: Mount Owen (2012-2013)
Data Source: Mount Owen (2014)

0 1.0 2.5 5.0 km
1:100 000

Legend

- Project Area
- Proposed Disturbance Area
- Bayswater North Pit
- Proposed RERR Mining Area
- Listed Heritage Item (refer to Table 2.3 for listing details)

FIGURE 2.1

Listed Heritage Items

Table 2.3 – Listed Heritage items Located Outside but within the Vicinity of the Project Area (cont.)

Item Name	Location	Listing and Significance	Distance to Project Area and Disturbance Area
Former Chain of Ponds Inn (listed as Inn & Outbuildings)	Old New England Highway, Liddell (Lot 211 DP 975271)	State Heritage Register (SHR). Singleton 2013 LEP – state significance. RNE. National Trust of Australia (NSW) Register.	Over 2 kilometres south-west of the Project Area boundary. One kilometre west of the existing Ravensworth East conveyor. Over 7.3 kilometres west of the North Pit Continuation Over 4.2 kilometres west of the proposed Bayswater North Pit Over 6.3 kilometres west of the RERR Mining Area
Middle Falbrook Bridge (over Glennies Creek)	Middle Falbrook Road, Middle Falbrook (road reserve)	SHR Singleton 2013 LEP – state significance. RMS Section 170 NSW State agency heritage register ² RNE	3 kilometres south-east of the Project Area boundary. Over 3.3 kilometres south-east of the North Pit Continuation Over 8.3 kilometres south-east of the proposed Bayswater North Pit Over 5.5 kilometres south-east of the RERR Mining Area
Greylands and Outbuildings	665 Goorangoola Road, Greenlands (Lot 111 DP 10854409)	Singleton 2013 LEP – local significance. RNE	Over 4 kilometres east of northern Project Area boundary. Over 6.3 kilometres north-east of the North Pit Continuation Over 8.9 kilometres north-east of the proposed Bayswater North Pit Over 9.1 kilometres north-east of the RERR Mining Area

² Section 170 of the *Heritage Act 1977* (NSW) requires the identification, conservation and management of heritage assets owned, occupied or managed by NSW government agencies through the upkeep of a Register of heritage items (a Heritage and Conservation Register or a S.170 Register). A S.170 Register is a record of the heritage assets owned or managed by a government agency and consists of a list of heritage assets and an assessment of the significance of each asset.

Table 2.3 – Listed Heritage items Located Outside but within the Vicinity of the Project Area (cont.)

Item Name	Location	Listing and Significance	Distance to Project Area and Disturbance Area
Ravensworth Public School (former)	Hebden Road/New England Highway (Lot 11 DP 825904)	Singleton 2013 LEP – local significance.	Immediately adjacent to the Project Area boundary and proposed Hebden Road rail overpass works. Over 4.9 kilometres south-west of the North Pit Continuation 4.5 kilometres south-west of the proposed Bayswater North Pit Over 3.5 kilometres south-west of the RERR Mining Area
St. Clements Anglican Church	20 Glennies Creek Road, Camberwell (Lot 102 DP 738182)	Singleton 2013 LEP – local significance.	1.5 kilometres south of the southern Project Area boundary. Over 5.4 kilometres south- west of the North Pit Continuation Over 7.6 kilometres south of the proposed Bayswater North Pit Over 4.7 kilometres south of the RERR Mining Area
Community Hall	3 Lethbridge Street, Camberwell (Lot 2 Sec 13 DP 758214)	Singleton 2013 LEP – local significance.	Over 2 kilometres south of the southern Project Area boundary. Over 5.7 kilometres to the south-west of the North Pit Continuation Over 8.1 kilometres south of the proposed Bayswater North Pit Over 5.1 kilometres south of the RERR Mining Area

Table 2.3 – Listed Heritage items Located Outside but within the Vicinity of the Project Area (cont.)

Item Name	Location	Listing and Significance	Distance to Project Area and Disturbance Area
Camberwell Glennies Creek Underbridge	Camberwell (252.613 km Main Northern Railway)	Australian Rail Track Corporation Section 170 NSW State agency heritage register	1 kilometre south-east of the south-eastern corner of the Project Area. Over 4.1 kilometres south of the North Pit Continuation Over 7.7 kilometres south-east of the proposed Bayswater North Pit Over 4.6 kilometres south-east of the RERR Mining Area
Former Dulwich Homestead (listed as Kangory Homestead)	485 Middle Falbrook Road, Glennies Creek (Lot 8 DP 246434)	Singleton 2013 LEP – local significance.	2.25 kilometres south- east of the south- eastern corner of the Project Area Over 5.1 kilometres to the south of the North Pit Continuation Over 8.9 kilometres southeast of the proposed Bayswater North Pit Over 5.8 kilometres south-east of the RERR Mining Area

Roselands (Uniting Church), Goorangoola Road, Goorangoola (outside the Project Area) was listed on the Singleton 1996 LEP. However, the church has been destroyed by a storm and has been deleted from the heritage schedule. As such, it is not listed on the Singleton 2013 LEP and is not considered in this report.

3.0 Historical Context

As part of NSW heritage assessment procedures it is essential to have a full understanding of a site or item based on its historical and physical context. This section of the report provides a historical context for the Project Area and its broader locality to provide an understanding of the significance of any heritage sites within the Project Area.

The Upper Hunter Valley of NSW has an extensive history of research, and in recent decades, has become one of the most intensively studied regions in NSW with numerous studies conducted in advance of proposed mining activity. This body of research has been focused predominantly on Aboriginal heritage associated with Aboriginal archaeological surveys and excavations. However, there are number of heritage reports relevant to the historical heritage of the Project Area and the surrounding region. The historical context below and this assessment in general have been prepared using relevant information included in the following reports:

- *Ravensthorpe, A history*. Prepared by C. Hunter (1997) for EJE Architecture on behalf of Glendell Coal Joint Venture (Hunter 1997).
- *Mt Owen Operations Historic Heritage Assessment*. Prepared by Umwelt for Hunter Valley Coal Corporation (2003).
- *Historical Heritage Assessment for Modification of Glendell Mine Operations*. Prepared by Umwelt for Xstrata Mount Owen (2005b).
- *The Historical Archaeology of Ravensthorpe East Mine, near Singleton, NSW: Excavation and Recording of Sites RE31, RE32 and RE33*. Prepared by Umwelt for Xstrata Mount Owen (2006a).
- *Historical Archaeology: Archival Recording and Excavation, Mt Owen Operations, Singleton, NSW*. Prepared by Umwelt for Xstrata Mount Owen (2006b).
- *Historical Heritage Assessment for Modification of Glendell Mine Operations*. Prepared by Umwelt for Xstrata Mount Owen (2007).
- *Archival Recording of Heritage Items, Glendell Mine*. Prepared by Umwelt for Xstrata Mount Owen (2008).

In addition, research undertaken by the Singleton Historical Society & Museum Inc and the Muswellbrook Shire Local & Family History Society Inc has been utilised during the preparation of this report. Singleton Council also provided information and plans in relation to the area of Ravensthorpe Village located at the corner of Hebden Road and the New England Highway.

3.1 European Contact

The Central Lowlands of the Hunter Valley is the traditional country of the Wonnarua people, one of the 600 different clan groups or 'nations' present in Australia at the time of European contact. Although early records on traditional tribal boundaries are limited, it is understood that the country of the Wonnarua was centered on the Upper Hunter Valley. Records also identify that the Wonnarua were closely affiliated with the Kamilaroi, whose country extended from the west as far south as Jerry's Plains according to some early authors (Threlkeld 1892, Matthew 1903). Other early authors, such as Howitt (1904:104), further describe the Geawegal (part of the Kamilaroi 'nation') as occupying the eastern side of the

Hunter Valley, from Ravensworth to Murrurundi (Brayshaw 1986:51). The Wonnarua also had close connections with other surrounding groups, such as the Awabakal centred on Lake Macquarie and the Worimi north of the Hunter River. There was apparently considerable contact between all of these groups, with social links connecting the coast and inland (Brayshaw 1986:51).

With the arrival of European settlers in the nineteenth century, traditional patterns of Aboriginal life were quickly and dramatically altered. Disease spread through the Aboriginal population of the Hunter Valley, and displacement from traditional lands soon followed, with European settlers taking up land first along the major river systems then spreading inland. Conflict often resulted, with warriors fighting to retain access to land and country, and Aboriginal use of resources – including hunting of settler stock – seen as theft, and quickly punished. Although not all interactions were hostile, some authors (refer to Milliss 1992) argue that there was a general hostility between the European settlers and Aboriginal people, evidenced by violent skirmishes from the earliest European settlement.

The material culture of Aboriginal people also changed dramatically following contact, with the rapid influx of new technologies and materials. For example, Threlkeld (in Gunson 1974:54, 67) provides two examples of new technologies being utilised by Aboriginal people within the Lake Macquarie area, noting that bottle glass was replacing stone ('fragments of quartz') in Aboriginal weapons and that iron and glass were being used for fish hooks. A number of archaeological sites have also been recorded throughout the Hunter Valley evidencing Aboriginal use of introduced materials.

The Aboriginal Archaeological Values Assessment (OzArk 2014) and Aboriginal Cultural Heritage Assessment (ACHM 2014) should be referred to for further background information on the connection of Aboriginal people to the Project Area and the region.

3.2 Early Settlement and Exploration

3.2.1 Newcastle and the Hunter River

In 1770 Captain James Cook sailed past Stockton Bight, noting only Nobby's Island (*Whibayganba*) and Port Stephens. The first knowledge of the Hunter region and its coal reserves came in 1791 through tales told by escaped convicts. In March 1791 William Bryant with his wife Mary, their two children and seven other convicts escaped from Port Jackson in the governor's cutter and sailed for east Timor. They arrived in Koepang 69 days later (Currey 1966). They observed coal during the early stages of their voyage after running their cutter into 'a small creek', thought to have been Glenrock Lagoon to the south of Newcastle (Turner 1997:4). Mary Bryant and four of the other convicts eventually reached England, but William and their children died. The Hunter River was also visited in 1796 by a party of fishermen, who brought samples of coal back to Sydney (Newcastle City Council nd). In 1797 Lieutenant John Shortland entered the Hunter River estuary and came ashore along Stockton Bight during a search for escaped convicts. He observed the coal resources responsible for much of the later European settlement in the wider Hunter region. Officially the river at this time was named after John Hunter, the colony's governor and Shortland's superior naval officer, but to many it was known simply as Coal River.

Miners and merchants seeking timber soon followed Shortland's observations. Besides coal, vast cedar forests covered a huge area up the Hunter River, providing a source of urgently needed building timber for the infant Sydney colony. Governor King decided to make a more systematic exploration of the area and its natural resources and sent an expedition in *HMS Lady Nelson*, commanded by Lieut. James Grant, to survey these resources and explore the Hunter. On board were Lieut. Col. Paterson, Ensign Barallier, J.W. Lewin, a

mining expert, five sawyers, and a crew of nearly 60. The *Lady Nelson*, accompanied by the schooner *Francis* arrived off the mouth of the Hunter River on June 14 1801, and Col. Paterson named the island at the river mouth Coal Island (now Nobby's Island). Paterson prepared a detailed report on the resources of the area, commenting on the potential of coal, salt, lime, fish and pasture. He proposed a permanent settlement at the mouth of the Hunter River (Turner 1997:7).

Impressed by Paterson's report of the rich resources of the area and the already successful coal mining being undertaken, Governor King decided to establish a permanent settlement at Newcastle in 1801. The venture failed within six months and the convicts and their overseers were evacuated back to Sydney Cove. The estuary of the Hunter River was not attractive to agriculturalists and the extent of the swamps and sand dunes in the area ensured that Newcastle would have to depend on its coal and port for its future development.

It was not until 1804 that Newcastle was resettled as a penal colony. Although Governor King planned Newcastle to be more than a penal outpost, the majority of people arriving were sent to serve colonial sentences and formed a large part of the workforce available for the exploitation of the resources of the region; including coal, timber, salt and lime. The convicts were engaged in exploiting these natural resources to supply Sydney with much needed building and heating supplies – the cedar forests and shell middens (most the result of past Aboriginal activity) produced building timber and lime respectively, and coal heated the houses and forges. The lime was produced by gathering and burning the local shells (ENSR 2008: 17). The lands were closed to free settlement at the time, with profits from resources going to the Government.

The penal settlement was founded under the administration of Lieut. Charles Menzies with 34 Irish prisoners, exiled by Governor King for their role in the Battle of Vinegar Hill of 1804. Menzies had commanded the detachment of marines who quelled the Vinegar Hill convict rebellion. The expedition to found the new colony left Sydney on 28 March 1804. Menzies was accompanied by Dr James Mileham (surgeon), Isaac Knight (superintendent of convicts), John Tucker (store-keeper), Ferdinand Bauer (artist), George Caley (botanist), 11 military guards and 34 convicts. Among the convicts were three miners, three sawyers/timber cutters, two carpenters, a gardener and a salt bailer (to make salt from salt water for both the new settlement and Sydney). They arrived on 30 March 1804. Menzies named the new settlement Kingstown, but Governor King's own choice, Newcastle, prevailed. Menzies' instructions were to use the convicts in 'getting as many coals as possible', cutting cedar, clearing ground for cultivation and 'to enforce a due observance of religion and good order'. During his term as commandant, Menzies had huts constructed for the military guard and the convicts, built a large stone wharf, established a coal beacon to assist navigation into the harbour, organised the cutting of cedar and the obtaining of salt from salt-pans at Collier's Point and reached satisfactory rates of production of coal (Flowers 1967).

Under Captain James Wallis, commandant from 1815 to 1818, the convicts' conditions improved, and a building boom began. Wallis laid out the streets of the town, built the first church on the site of the present Anglican Cathedral, erected the old gaol on the seashore, and began work on the breakwater which now joins Nobbys to the mainland. The quality of these buildings was poor and only (a much reinforced) breakwater survives. For these works, and for his humane rule in the convict colony, Wallis earned the personal commendation of Governor Macquarie.

At its peak in 1821 the convict population of Newcastle had risen to more than 1,100. However, in Governor Macquarie's opinion the Newcastle prison settlement was too close to Sydney and the proper exploitation of the land was not practicable with prison labour. In 1823, military rule in Newcastle ended. The number of prisoners was reduced to 100 and the remaining 900 were sent to Port Macquarie (Newcastle City Council, nd). Although the

penal settlement was closed in 1823 in favour of Port Macquarie, convicts continued to toil in Newcastle on public works projects such as the breakwater and in private assignment into the 1840s. In the 1830s the majority of the population of the town were still convicts; a total of 60 per cent in 1836 (Turner 1997:14).

The establishment of the new penal station at Port Macquarie allowed Newcastle and the Hunter Valley to be settled.

3.2.2 Hunter Valley

The Patersons Plains area had been opened to several people from 1813 onwards, including the first free settler John Tucker who settled with his family in 1814. Tenants were allowed to settle in the Wallis Plains area (north of present day Morpeth) but upstream from these farms the land remained untouched by European infiltration. This all changed when the necessity of opening the valley to settlers was recognised by Governor Macquarie. His despatch of 8 March 1819 acknowledged the growing population and the 'extensive rich and fertile land being found at no great distance' along the principal sources of the Hunter River (Campbell, 1926:73). Macquarie thought it:

...judicious to establish settlers on the plains along the River Hunter where they would have the combined advantages of a fertile soil of comparatively easy cultivation, and the benefit of water conveyance for their produce to Newcastle and thence by sea to the principal mart of Sydney...(Campbell, 1926; 74)

A number of exploratory expeditions had sought to find new routes and open up new areas for colonial development in the Hunter region in the early 1800s. Colonel Paterson may have reached the Singleton area on an exploratory river trip he undertook in the early 1800s, although the furthest point he reached is uncertain due to a lack of recorded data. The earliest recorded journey that did reach the area occurred during October and November in 1817. This expedition was from the Hawkesbury area, journeying to what was most likely the headwaters of Doyles Creek, located to the west of Warkworth. The expedition included William Parr and Benjamin Singleton. Benjamin Singleton returned to the area on another expedition in 1818. Two trips were made into the area in October 1819 and March 1820 by John Howe (Chief Constable of Windsor from 1813 to 1825) looking for a line of road for an overland route between Sydney and Newcastle. John Howe, Benjamin Singleton and the others who took part in these two expeditions, reached the Hunter River in the vicinity of Whittingham after 10 days in March 1820. They were given land grants in the district as their reward for discovering an overland route to the area, signalling the beginnings of European settlement in the area (Dames & Moore 1981: 55; Whitelaw undated; Singleton Argus 1966). The overland route became what is known as the Bulga Track. The route is now known as Putty Road; located well to the south-west of the Project Area.

In 1821 John Marquett Blaxland found an alternative track from the Hawkesbury to the Wollombi district. Governor Brisbane promised him land in return for his discovery which he later selected as a 640 acre grant on the western side of Wollombi Brook (Dunne 2012:31). John Marquett Blaxland was the eldest son of John Blaxland Snr, who was one of the colony's most prominent landholders.

In 1821, Henry Dangar (refer to **Section 3.3**) was commissioned to undertake a survey of the Hunter Valley to assess its suitability for settlement and farming, with the survey of the lower Hunter Valley complete in 1822 and the Upper Hunter Valley complete in 1826 (Brayshaw 1986:9).

Settlement in the region followed closely behind Dangar's 1821 survey party, with settlers occupying land as far north as Singleton by October 1821. Early reports describing the suitability of the land for pastoral pursuits resulted in the establishment of large scale pastoral holdings. European settlement expanded quickly into the mid nineteenth century, with a total of 372,141 acres being allotted to European settlers in the Hunter Valley between 1822 and 1826. This was increased to over 500,000 acres by 1867 (Brayshaw 1986:10). During the nineteenth century, pastoral grazing was the dominant land use of the Hunter Valley, with more than 25,000 cattle and 80,000 sheep introduced to the area by 1867. Agriculture was also important to the growing economy of the region, with a variety of crops cultivated including maize, potatoes, wheat, barley and tobacco.

Wool production, dairy farming and wheat growing were the predominant industries. Horse breeding also became a thriving industry as early as 1822. Wheat production went into decline in the mid 1800s owing to the disease *rust* which struck severely in 1857 (Turner 1995). The late 19th century saw the decline of agriculture along river flats as they were converted to dairying on pastures improved by pump irrigation (Dean-Jones and Mitchell 1993:2). The pastoral and dairy industries continued to dominate into the twentieth century.

Many of the land holders in the region also owned tracts of land inland and the trend in the late 1800s was for these landholders to replace sheep with cattle from their inland runs. Many of the larger holdings were subdivided in the early 1900s, some of which were part of the Soldier Settlement Scheme following the First World War (refer to **Section 3.3.6**).

In the latter part of the twentieth century, many of the smaller holdings in the area were consolidated into large scale coal mining leases.

3.3 Land Ownership

The earliest land taken up in the region of the Project Area was that of Dr James Bowman (surgeon and pastoralist) at Ravensworth in October 1824, and for one year, Bowman's Ravensworth Estate was the northernmost settlement of the Hunter Valley. Other early settlers are indicated in **Table 3.1**.

Table 3.1 - Early Settlers in the Region

Name	Description	Location
Dr James Bowman	Ravensworth Estate - a 1824 land grant of 11,000 acres	West of the Project Area
George Bowman (unrelated to James Bowman)	Archerfield, Singleton on a 1824 grant of 1,130 acres	South of the Hunter River (south of the Project Area)
Robert Lethbridge	Granted 1,200 acres of land on 10 July 1837	East side of Glennies Creek (east of the Project Area)
James Glennie	Land originally promised to Glennie by Sir Thomas Brisbane on 24 June 1824. The 1828 census lists (Glennie) as a Farmer of Dulwich at Patrick Plains with 2,080 acres of land and 21 assigned convicts	East side of Glennies Creek (east of the Project Area)
John Gaggin	Gaggin had lost this Hunter property by 1832	West side of Glennies Creek (immediately to the east of the Project Area)

Table 3.1 - Early Settlers in the Region (cont.)

Name	Description	Location
William Simms Bell	Granted 700 acres of land near Lemington by Sir Thomas Brisbane on 14 July 1825	South of the Hunter River (south of the Project Area)
Robert Dawson	Grant of 1,280 acres from Governor Bourke in March 1836 in recompense for the grant he had sought unsuccessfully from Sir Ralph Darling in 1828. Named 'Goorangula'	Goorangoola Creek (northeast of the Project Area)

Information sourced from Gray nd, Nexus 2008, Flowers nd and www.jenwilletts.com

Robert Dixon's 1837 Map of the Colony of NSW illustrates the locations and size of some of these early allocations in the region of the Project Area (refer to **Figure 3.1**). Dixon's map (full title: *Exhibiting the Situation and Extent of the Appropriated Lands, including the Counties, Towns, Villages, Reserves, Compiled from Authentic Surveys*) is commonly known as 'the Squatter's Map' and comprises the earliest documented attempt to show who owned what land in NSW. Dixon (1800-1858) was an explorer and surveyor born in Durham in 1800 who came to NSW in 1821. From 1826 he was the assistant surveyor in the Surveyor-General's Department. The 1837 map was produced while Dixon was on leave in London and is reported to have been made using other surveys and documents. Surveyor General Major Thomas Mitchell, who had produced his own less informative map of NSW in 1834 is reported to have been offended by Dixon's 1837 map and refused to reappoint Dixon on his return to Sydney after nearly 15 years of service (Warden 2010:16-17). The 1837 map shows the western portion of the Project Area as being within James Bowman's Ravensworth Estate (refer to **Figure 3.1**).

Henry Dangar's 1828 *Map of the Hunter River, and its Branches* shows three 'Farm Houses' in proximity to the Project Area (indicated on the map with a symbol representing a house): an un-named farm house (or homestead) on Dr James Bowman's land (later named Ravensworth), Ashton to the south of the Project Area and Dulwich (James Glennie's homestead) to the east of the Project Area, on Fal Brook (Glennies) Creek (refer to **Figure 3.2**). Dangar's map and accompanying index and directory were written for the guidance of emigrant settlers to the areas adjoining the Hunter River. Dangar described the Hunter River area as:

...rich without parallel in the known parts of the Colony...but little inferior to the most improved English meadows (Dangar 1828).

Dangar described the Parish of Vane, the area of which the Project Area is part, as:

Some good country extending along the Fal-brook: the parish is generally elevated, but affording some good vallies and desirable pastures (Dangar 1828).

Henry Dangar had emigrated to NSW as a free settler and was appointed assistant in the Survey Department with the instructions to survey the country in the vicinity of Newcastle and the Hunter River. In addition to preparing the town plan of Newcastle, he extensively surveyed the Hunter River, its tributaries and the region of the estuary, measuring and marking out village reserves, church lands and allocations for settlers along the lower branches of the Hunter River. He marked out the road from Newcastle to Maitland, explored the present sites of Muswellbrook, Aberdeen and Scone, was the first European to observe the confluence of the Goulburn and Hunter Rivers and crossed the Liverpool Range to the plains beyond. His reports caused an immediate rush of applicants for land grants in these desirable new districts. Dangar was dismissed from government service in 1827 over

0 2 4 6 km
1:120 000

- Project Area
- Proposed Disturbance Area
- Bayswater North Pit
- Proposed RERR Mining Area

Detail of Robert Dixon's 1837 Map of the Colony of NSW

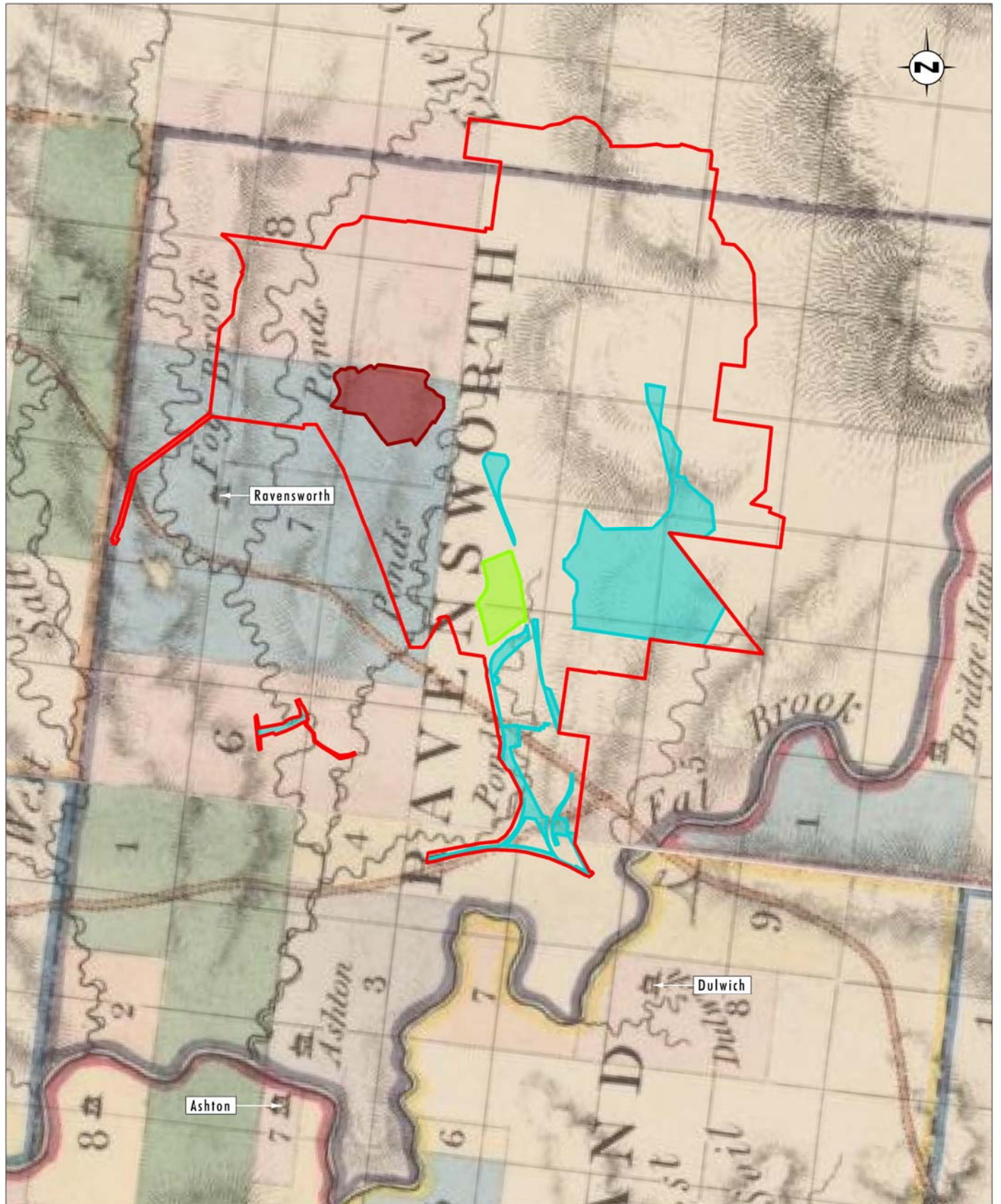


Image Source: Department of Lands (1999)
Data Source: Mount Owen (2014)

0 1 2 4 km
1:80 000

Legend

- ▬ Project Area
- ▬ Proposed Disturbance Area
- ▬ Bayswater North Pit
- ▬ Proposed RERR Mining Area

FIGURE 3.2

Detail of Henry Dangar's 1828
Map of the Hunter River

impropriety in land dealings associated with his survey work. On returning to London his talents as cartographer and surveyor were recognised by the directors of the Australian Agricultural Company (the AA Co) and by 1830 he was back in the Hunter Valley (Gray 1966). The AA Co was established in 1824 by an Act of the British Parliament and brought stability and efficiency to Newcastle's coal industry. Although the Company was granted one million acres with the primary purpose of producing wool, the AA Co also entered the coal industry with the intention of exporting coal to India for use by the steamers of the east India Company. The AA Co held a monopoly over the coal mining industry in the Newcastle area until 1847 when the Company agreed to abandon its protected position in the coal industry in return for the right to sell its estates.

Some of the early settlers and subsequent landholders with relevance to the Project Area are discussed further in the following sections.

3.3.1 Dr James Bowman and the Ravensworth Estate

As discussed in **Section 3.1**, land was first taken up in the region of the Project Area by Dr James Bowman at Ravensworth in October 1824, and for one year, the Ravensworth Estate was the northernmost settlement of the Hunter Valley. James Bowman had married Mary Macarthur, the second daughter of John and Elizabeth Macarthur, in 1823. Mary's dowry enabled Bowman to apply for the 11,000 acre land grant that became Ravensworth (Hunter 1997:4-5).

The Ravensworth Estate was described in 1824 as '12,160 acres in three portions' (Hunter 1997:1) encompassing Bowmans Creek and Yorks Creek. Yorks Creek is thought to have provided a good supply of fresh water compared to the brackish water of Bowman's Creek. This is likely to have led Bowman to locate his homestead (Ravensworth Homestead) close to Yorks Creek. The property was later expanded to include frontage to the Hunter River and by 1828 over 40 convicts and overseers worked on the Ravensworth property as shepherds, labourers, carpenters, sawyers, blacksmiths and stone masons (Hunter 1997:17).

Bowman also purchased over 36 acres of land in Glebe, Sydney and engaged the architect John Verge to design and build a mansion house; Lyndhurst (built 1834-37). There is evidence to suggest that Verge also designed Ravensworth Homestead (built by 1842) as:

...substantial historical evidence suggests that it is possible that John Verge, Macarthur's architectural consultant from 1833, may have designed Bowman's simple veranda stone-built residence and the other buildings that form the large, stockade-like complex. Verge may have executed drawings for Ravensworth; however, no documented evidence of these exists. Similarities also said to exist between an unbuilt Verge plan for stables at Camden Park and those at Ravensworth (EJE Architecture 1997:13).

Although some alterations have been made to the homestead, including cast iron veranda posts replacing timber posts, roof ventilators and the addition of several rooms, Ravensworth remains relatively intact and has escaped any significant alterations to Mary and James Bowman's mid nineteenth century design' (EJE Architecture 1997:3). Ravensworth Homestead is located outside, approximately 700 metres to the west of the Project Area boundary, over 1.6 kilometres south-west of the proposed Bayswater North Pit, over 2.4 kilometres west of the proposed RERR Mining Area and approximately 4 kilometres to the west of the North Pit Continuation (refer to **Figure 2.1**).

With the economic depression of the 1840s and the costs of building Lyndhurst, Bowman fell into financial trouble. As a result James and William Macarthur (Mary Bowman's brothers) took over his liabilities and the management of his estate. He died in 1846 at Ravensworth and the Macarthurs sold the property in 1847 to Captain William Russell, who already owned substantial tracts of land in the area with his wife Eliza.

Glencore with assistance from EJE Architecture and Australian Heritage Restorations have recently (between 2008 and 2009) undertaken the conservation and restoration of the Ravensworth Homestead.

3.3.2 Captain William Russell

Captain William Russell was the original grantee of the land now comprising the east portion of the Project Area, immediately to the east of Bowman's original Ravensworth Estate. Russell arrived in NSW in approximately 1837 following his retirement from his regiment and became a pastoralist and agriculturalist. Russell was firstly a squatter (a term that originally referred to those who extended their activities across the arbitrary boundaries established by the colonial government, and became holders of vast tracts of country and wealth (Tindall 1982:5)) with large runs in the Gwydir district where his primary pastoral activities were focused. He complemented his pastoral leaseholds with purchases in the Hunter Valley to use as holding places for the fattening and marketing of livestock (Hunter 1997:9-10). His Hunter Valley properties included Ravensworth, Glenridding near Singleton, Waverley and Cheshunt Park on the Hunter River in addition to several blocks of land he purchased from the Crown. He extended the Ravensworth Estate area with the adjoining land to the east (including the Project Area). He is reported to have held over 30,000 acres of freehold land in the Hunter Valley (Hunter 1997:9-10).

Russell served in Parliament, including representing Patricks Plains (as the first member to represent Patricks Plains in the reformed parliament) in the NSW Legislative Assembly between 1859 and 1860 and the NSW Legislative Council between 1861 and 1865 (Singleton Historical Society & Museum Inc nd).

In the late 1850s Russell travelled to Europe and purchased merino rams to improve his NSW flocks. He also arranged to send to Cheshunt 'one shipload of 4,000 grape vines of one year's growth' to stock his vineyard there (Hunter 1997:11).

When Russell died in England in 1866, the land remained as part of his estate and his wife Eliza appears to have continued the supervision of his Hunter Valley Estates. Eliza Russell died in 1881 and in 1882 a subdivided Ravensworth and other properties from the Russell estate were advertised for sale (Hunter 1997:11).

The preliminary notice of sale noted:

GRIFFITHS & WEAVER are instructed by the. Executors of the late Captain Russell, to sell by auction...The Most Magnificent Fattening and Grazing Property, RAVENSWORTH, situated on the Great Northern Railway Line, about 60 miles north of Newcastle...This property is thoroughly improved, has extensive STONE BUILDINGS, in all perfect order; is fenced and divided into some 70 paddocks by upwards of 250 miles of substantial fencing, is thoroughly and permanently watered by the Hunter River, Foybrook, Falbrook, and numerous creeks and dams. The land is of the best fattening description, well suited for agriculture, and turns out the best class of fat stock for Sydney and Maitland markets. The estate also possesses a great prospective and vantage in its large deposits of coal and other minerals, which are visible in many places. The whole estate is well secured, and offers a rare chance to a capitalist of acquiring one of the finest grazing properties in the noted valley of the Hunter... (The Maitland Mercury & Hunter River General Advertiser 1882).

The sale included all of the stock including cattle, sheep and horses.

3.3.3 Duncan Forbes Mackay

The Mackay family became one of the principal grazing and cattle breeding families in NSW and owned vast pastoral leases in both NSW and Queensland. In 1882 Duncan Forbes Mackay purchased part of the original Ravensworth Estate, including the homestead. During the later part of the nineteenth century the Mackay family became one of the principal grazing and cattle breeding families in NSW. Mackay improved the Ravensworth Estate, including clearing to increase the land available for grazing to make it a first class sheep raising property. In 1883 approximately 40 men are reported to have been employed at Ravensworth (Hunter 1997:13).

Duncan Forbes Mackay died at Singleton in 1887 and the Land Company of Australasia purchased the Ravensworth Estate.

3.3.4 Land Company of Australasia

The Land Company of Australasia was established to develop innovative schemes for irrigation and to promote the government's policies of closed settlement in order to stop 'vast areas of NSW' being 'tied up in the hands of pastoralists who were making little use of it' (EJE Architecture 1997:13). The Company bought the Ravensworth Estate from Mackay at 2 pounds an acre and introduced the Lincoln breed of sheep to the area. However, the Lincolns suffered from parasitic infections; a problem which influenced Upper Hunter graziers in general to turn from sheep to cattle raising and dairy farming (Hunter 1997:13-14). The Land Company failed in 1892, which resulted in the Ravensworth title reverting to Duncan Forbes Mackay's estate. Mackay's estate was run by his nephew William Mackay who during 1894 to 1895 attempted to sell the property advertised as being of 62,651 acres (Hunter 1997:14).

3.3.5 F.J.L. Measures

F.J.L. Measures was an American entrepreneur who purchased several large estates in the Hunter Valley region and subdivided them for resale. In approximately 1911, Measures advertised the sale of 30,000 acres of land in the Ravensworth area divided into 100 blocks for dairy farms, vineyards, orchards and grass blocks. The homestead lot was 1,100 acres. An advertisement in *The Singleton Argus*, Saturday 21 March 1911 details a clearing out sale of all furniture, fixtures and animals (horse, cattle and pigs) from the Ravensworth Homestead under instruction from R. A. Hill Esquire. A later advertisement in *The Singleton Argus*, Saturday 25 March 1911 offers the lands within the Project Area including adjoining lands that were part of the Ravensworth Estate to prospective 'lucerne growers, general farmers, dairy men and fruit growers' to 'investigate the great advantages the farms offer'. The advertisement is for the private sale of 56 farms ranging from 30 acres to 2,000 acres. The advertisement also indicates that much of the land 'has been cleared for many years'. A similar advertisement was re-advertised in *The Singleton Argus*, 1 April 1911. Measures improved the lots by erecting houses, dairies and farm buildings on a number of the blocks in order to encourage buyers to the new farms. The proximity of the railway would allow for produce to be sent daily to markets in Newcastle or Sydney. Measures appeared to have failed financially and the venture was kept going by the solicitor F.H. King. Many of the subdivided lots were eventually sold to graziers and farmers. Measures was in and out of court throughout his career including for voluntary bankruptcy between 1916 and 1917 and in 1933 on a charge of 'conspiracy in real estate dealings' (Sydney Morning Herald Wednesday 24 May 1933).

Following Measures ownership, various farmers and other occupants then owned the land in the area from 1916 (refer to **Table 3.2**).

3.3.6 Soldier Settlement

Following the First World War the Commonwealth and State Governments cooperated to initiate programs to enable returned soldiers to settle on their own farms or secure their own homes (under the *War Service Homes Act 1918* and soldier settlement schemes). While most land made available to returning soldiers was former Crown land, some freehold land was purchased by the Crown and then made available to returned soldiers. Returned serviceman from the First World War secured portions of the Ravensworth Estate surrendered to the Crown under the Act. Such blocks were known as Settlement Purchase Areas (SPA).

3.3.7 Land Ownership Summary

The 1923 Parish Map of Vane shows most of the lands within the Project Area as being owned by the Russell family with the occasional block marked as belonging to Mackay (refer to **Figure 3.3**). Several SPA blocks are also indicated on the 1923 Parish Map of Vane. The 1923 Parish Map of Liddell shows the eastern portion of the Project Area as being part of Bowman's Ravensworth Estate (refer to **Figure 3.4**). The 1917 Parish Map of Goorangoola shows a number of smaller blocks as still being owned by William and Eliza Russell as well as a number of other individuals including Duncan Mackay (refer to **Figure 3.5**). The larger blocks labelled as Farm A and Farm B are SPAs gazetted in 1921.

Table 3.2 below indicates the owners of Lot 922 DP 844642 taken from the results of a historical title search which indicates the registered owners of the land from the original grantee (refer to **Figure 3.3**). It indicates the typical history of ownership across the area, mirroring the early history of owners of the Ravensworth Estate, as being originally granted to William Russell, then purchased by the Mackay family and Frank Measures before being subdivided and sold to a succession of farmers in the 20th century. The title search was undertaken as part of investigative works in relation to a former house site (site MOH12) on Lot 922 DP 844642 (refer to **Section 4.5.4**).

Table 3.2 – Lot 922 DP 844642

Date and Term of Purchase	Registered Owner and Occupation Where Available
27.06.1856 (1856 to 1883)	William Russell (Grantee) and his deceased estate
09.02.1883 (1883 to 1902)	Duncan Forbes Mackay (Grazier) and his deceased estate
30.07.1902 (1902 to 1911)	William Hooke Mackay (Grazier)
01.04.1911 (1911 to 1916)	Frank Joseph Lappen Measures (Farmer)
12.10.1916 (1916 to 1920)	Alexander Couchrian Reid (Grazier)
08.04.1920 (1920 to 1940)	Robert Turner (Farmer)
21.11.1940 (1940 to 1970)	Allan John Moss (Farmer)
29.06.1970 (1970 to 1979)	John Della-Ca (Farmer)
07.03.1979 (1979 to 1981)	David John Newberry (Farmer) and Judith Ann Newberry (Married Woman)
09.03.1981 (1981 to 1995)	Ernest William Kerin (Manufacturer) and Jann Margaret Kerin (Married Woman)
11.10.1995 (1995 to 2007)	Jamie Fairfull and Lauren Sylvia Fairfull
21.12.2007 (2007 to date)	Mount Owen Pty Limited

Source: Service First Registration Pty Ltd, Lands and Property Information

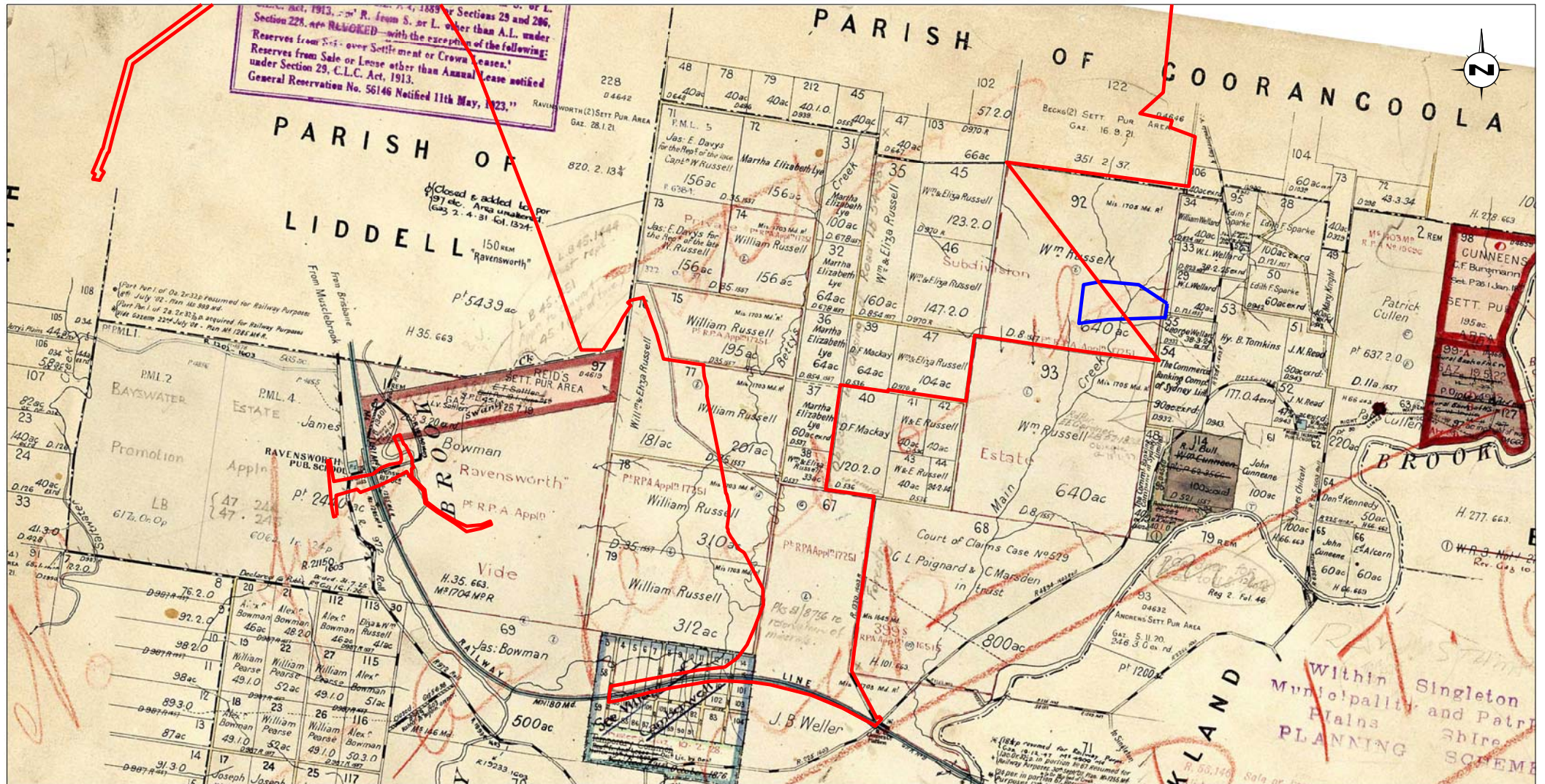


Image Source: LPI (2008)
Data Source: Mount Owen (2014)

Legend

- Project Area
- Lot 922 DP 844642

FIGURE 3.3

1923 Parish Map of Vane

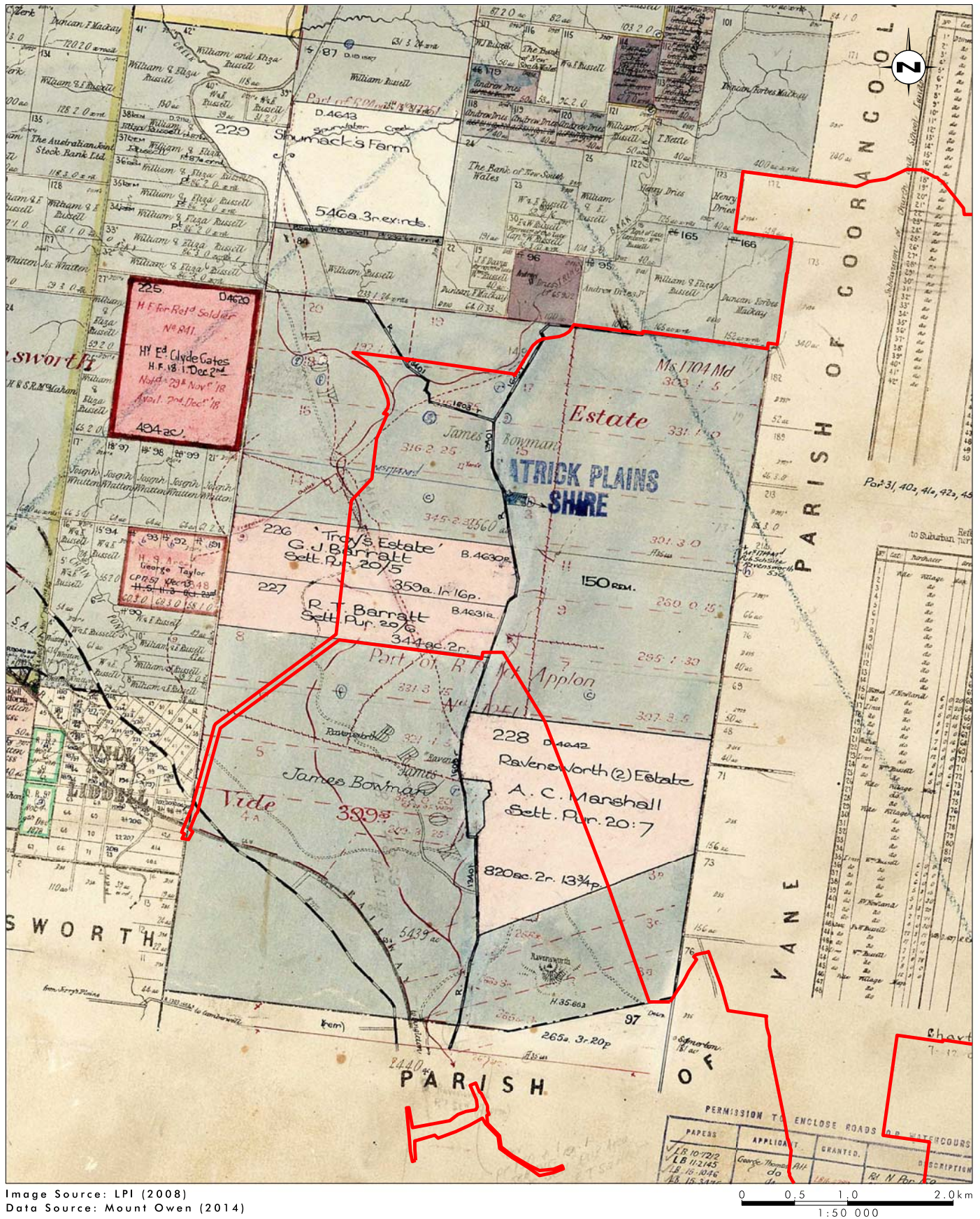


Image Source: LPI (2008)
Data Source: Mount Owen (2014)

Legend

Project Area

FIGURE 3.4

1923 Parish Map of Liddell

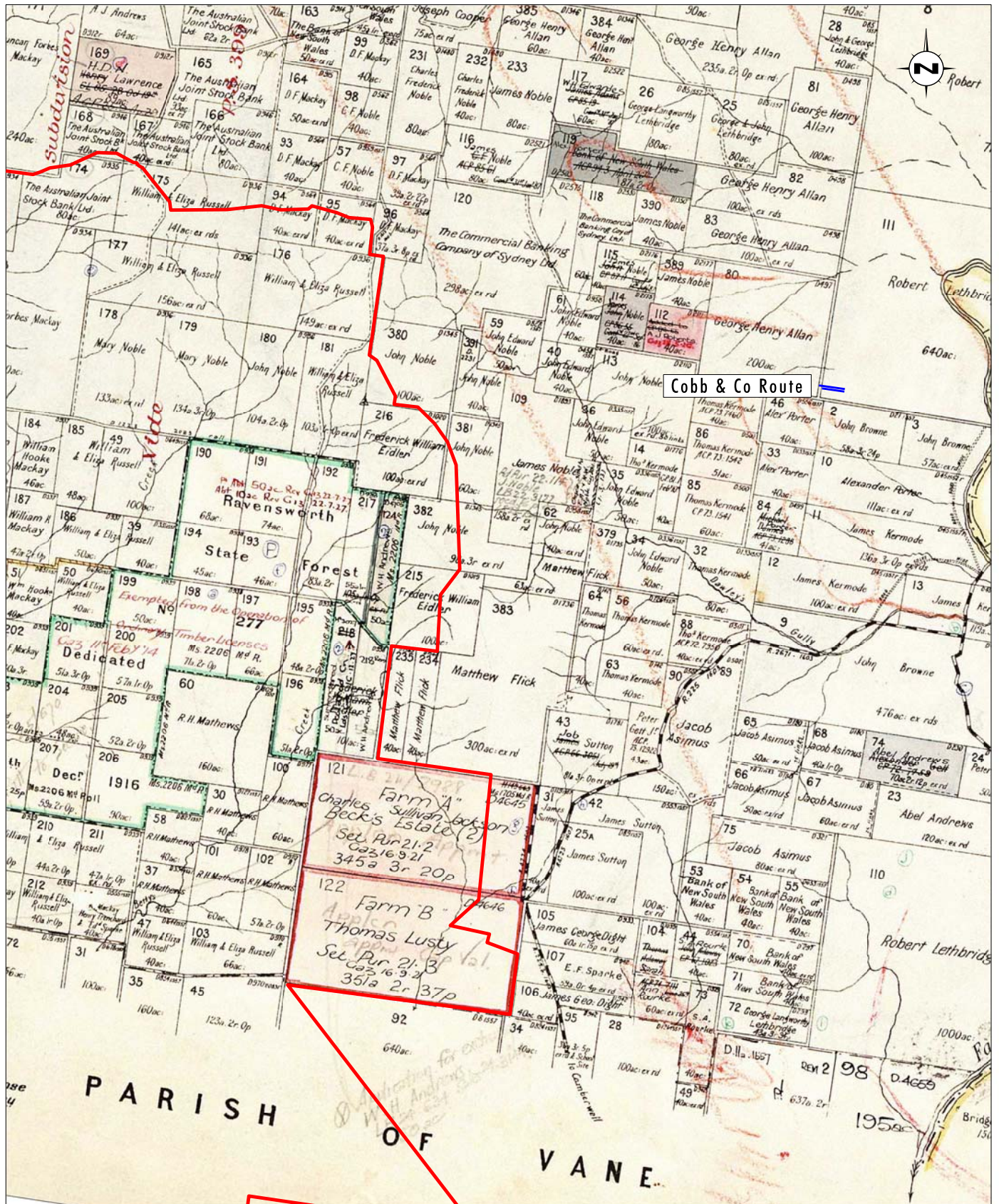


Image Source: LPI (2008)
Data Source: Mount Owen (2014)

0 0.5 1.0 2.0 km
1:40 000

Legend

- Project Area
- Cobb & Co Route

FIGURE 3.5

1917 Parish Map of Goorangoola

3.4 Ravensworth Village Area

Newspaper articles from the late 1880s to mid 1900s provide an insight into the small village community of Ravensworth which was based around a train station, post office, public school and a long established wine store/saloon. Several of these articles and a summary of the land ownership of the Ravensworth Village area are discussed below. The discussion in **Section 3.4.1** will focus on the area to the south of Hebden Road within the Proposed Disturbance Area. The area to the north of Hebden Road (the site of the former Ravensworth Public School) is discussed in **Section 3.4.2**.

3.4.1 Ravensworth Village

Ravensworth Village was not set out as a surveyed Government town, but grew organically around the needs of workers on the railway and Ravensworth Estate. Prior to 1876, those living in the area would have been employees of Ravensworth Estate or railway employees. A railway station was opened at Ravensworth Village on 1 June 1869 (refer to **Section 3.5.1**) and in 1876 a Half-time school was constructed in a slab building located close to Ravensworth Station. In 1880 the extant Ravensworth Public School at the corner of Hebden Road and the New England Highway opened as a full-time school (refer to **Section 3.4.2**).

The Ravensworth Village area (the area south of Hebden Road) was originally part of James Bowman's Ravensworth Estate (refer to **Section 3.3.1**). **Table 3.3** indicates the owners of the Ravensworth Village area until its purchase by William Wolfgang in 1908. Apart from current Lot 1 DP 151176 (refer to **Table 3.4**), which was sub-divided and sold in 1927, the majority of the land was retained by the Wolfgang family until the 1950s. The existing road in the Ravensworth Village area appears to have been formalised in 1952 when the road was dedicated to the public pursuant to the Local Government Act of 1919 (refer to **Figure 3.6**).

Table 3.3 – Ravensworth Village

Date and Term of Purchase	Registered Owner and Occupation Where Available
23.08.1838 (1838 to 1842)	James Bowman (Esquire)
12.09.1842 (1842 to 1847)	James Macarthur (Esquire) William Macarthur (Esquire)
28.08.1847 (1847 to 1853)	The Bank of Australasia
15.12.1853 (1853 to 1966)	William Russell (Esquire)
07.06.1866	Death of William Russell
25.10.1866	Assigned to Eliza Russell, for her life, after for their ten children
Ten Children	William James Russell (Esquire) Baker Creed Russell (Major in Her Majesty's Regiment) John William Russell (Esquire) Bessie Ellice Russell Bower (Married Woman) Maria Jane Russell (Spinster) Rachel Eliza Auley (Married Woman) George Brown Russell (Lieutenant in Her Majesty's Regiment) Sarah Justinia Russell (Spinster) Frederick Love Russell (Esquire) Edmund Henry Somerset Russell (Esquire)



Image Source: Mount Owen (2012)
Data Source: Mount Owen (2014)

0 20 40 80 m
1:1 500

- Legend**
- Project Area
 - - - Proposed Disturbance Area
 - ▨ Former Community Hall Site
 - ▨ Former Ravensworth Park Site

FIGURE 3.6

Ravensworth Village

Table 3.3 – Ravensworth Village (cont.)

Date and Term of Purchase	Registered Owner and Occupation Where Available
19.06.1869	William James Russell (Esquire) John William Russell (Esquire) Maria Jane Russell (Spinster)
23.06.1869	William James Russell (Esquire) John William Russell (Esquire) Baker Creed Russell (Major in Her Majesty's Regiment) (Trustees for sale)
07.08.1882 (1882 to 1885)	James Edmond Davys (Gentleman)
12.09.1885 (1885 to 1908)	John Janz (Farmer)
04.06.1908	William Wolfgang (Farmer, now Australian Wine Licensee) (Purchased from mortgagee in possession)

Source: Service First Registration Pty Ltd, Lands and Property Information

In 1877 the Ravensworth area was described from the window of a railway carriage as having the 'greenest and freshest grass' (The Sydney Morning Herald 18 December 1877).

In 1880 a report of a new teacher being appointed to Ravensworth Public School describes the area as looking:

...beautiful and green since the recent rains, and the wheat crops appear promising (The Maitland Mercury & Hunter River General Advertiser 16 October 1880).

In 1889 a land sale was advertised for a subdivision of part of the Ravensworth Estate at Ravensworth Township (refer to **Figure 3.7**). The land was described as comprising:

...probably the most fertile portions of the far-famed Ravensworth estate, and as it adjoins the railway station the value of the land is considerably enhanced for farmers and orchard proprietors...there are 23 farm blocks...75 building sites in the Township of Ravensworth, immediately opposite the Ravensworth railway Station and between the railway line and the Great Northern Road, having frontages to both...there is an excellent Public School adjoining the railway station. (The Maitland Mercury & Hunter River General Advertiser 14 December 1889).

The 1889 Plan of the Subdivision of Part of the Ravensworth Estate shows the subdivision, labelled as Township of Ravensworth, located between the New England Highway and the rail line on the north side of the Ravensworth Public School (refer to **Figure 3.7**). Orchards and paddocks are shown to the east of the rail line. No subdivision or other improvements are shown to the south of Hebden Road at this time. The 1889 Plan indicates two huts on the east bank of Bowmans Creek, however no evidence for these structures remain in these locations today. The huts would likely have been fettlers' (rail maintenance workers) huts of a temporary construction with little potential for any archaeological remains.

A Singleton Argus article reporting the death of William Wolfgang describes how he took over the licence of the Ravensworth wine shop from his father-in-law (John Janz) in 1895 which he held until his death in 1954. The Wolfgang family also owned orchards in the area; likely those shown on the 1889 sub division map to the east of the rail line (Kelly 1976:17) (refer to **Figure 3.7**). In 1945 the wine shop is described as being:

...the main wine shop in this area when the railway line construction was in progress...reputed to be the best kept of any situated on the route of the line of construction (Singleton Argus 27 June 1945).

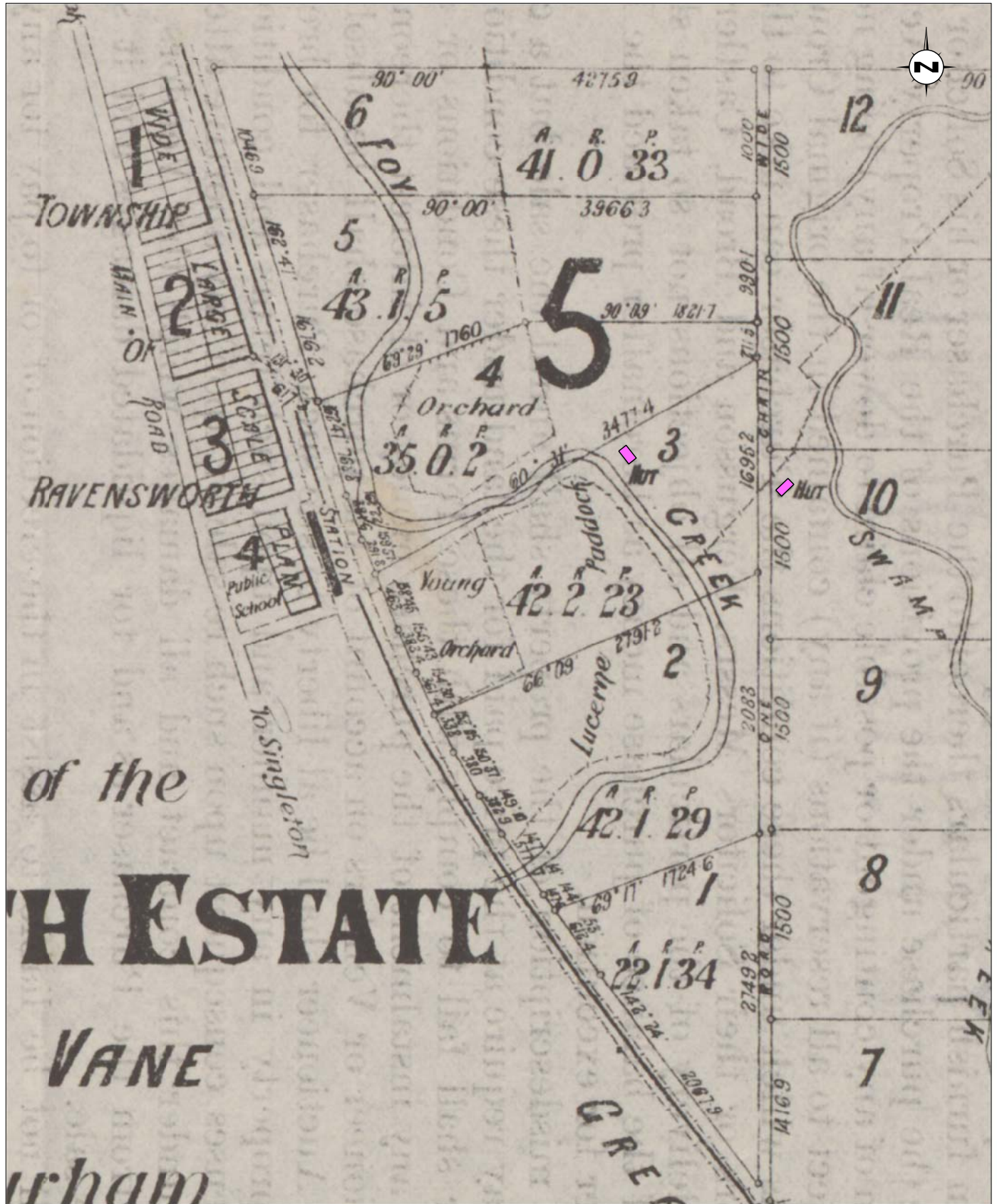


Image Source: National Library of Australia MAP Folder 144, LFSP 2308

Legend

- Location of 1889 Huts

FIGURE 3.7

Detail of 1889 Plan of Subdivision of
Part of the Ravensworth Estate

This suggests a wine shop may have been located in Ravensworth Village area since the late 1860s when the rail line was being extended from Singleton through Ravensworth to Muswellbrook (refer to **Section 3.5.1**).

In 1897 William Wolfgang's residence burnt down and a man, Robert Forrest an itinerant worker, died in the fire. The residence was described as having:

...seven rooms in the main building, which was built of wood, and all the bedrooms had calico ceilings. The roof was of galvanised iron (Singleton Argus 17 April 1897).

The same newspaper report also refers to fettlers living in tents in the Ravensworth Village area.

Johanna Wolfgang took over the running of the 'wine saloon' at Ravensworth following the death of William Wolfgang. In 1946 it was reported she had been living at Ravensworth for over 60 years and was applying for a liquor license for the same premises. As part of evidence in favour of granting the license a local grazier and shire councillor described Ravensworth

...as a progressive little village, closely settled, and considered that it would be an advantage to have a liquor license (Singleton Argus 4 November 1946).

Johanna Wolfgang's license was refused on the grounds that the trade of the wine saloon was small and consumers were amply catered for by the 10 hotels of Singleton.

In 1911, at the time F.J.L. Measures was selling farms at Ravensworth, Wolfgang constructed a blacksmith's shop, and a call for a general store and additional cottages was made (Singleton Argus 19 June 1911).

In 1912, the Ravensworth Progress Association had been established, by local farmers, and requested road repairs be undertaken by Patrick Plains Shire (Singleton Argus 12 November 1912).

A storm at Ravensworth on 11 January 1916 is described as damaging the post office, the sheds of the wine cellars, Mr Wolfgang's stables and haysheds and a fettler's hut as well as dwellings along Bowman's Creek and the railway camp (Singleton Argus 11 January 1916).

In the years following the war, a Mutual Improvement Club was established, with meetings to be held in the schoolroom (Singleton Argus 12 July 1919). Meetings continued until at least 1927 (Singleton Argus 21 May 1927). In 1922 a meeting was held to discuss the need for a School of Arts and assembly hall at Ravensworth. Mention of finding a location for a machine gun trophy, and the fencing and preparation of a race track was also made (Singleton Argus 12 July 1919).

In 1931 the Ravensworth Memorial Hall was officially opened (Singleton Argus 26 October 1931). **Figure 3.8** indicates the former location of the former community hall on current Lot 1 DP 151176. **Table 3.4** indicates the owners of Lot 1 DP 151176 following its purchase from William Wolfgang in 1927. The Lot was owned by the 'Trustees for a Memorial Hall' until purchased by Glendell Tenements Pty Ltd.

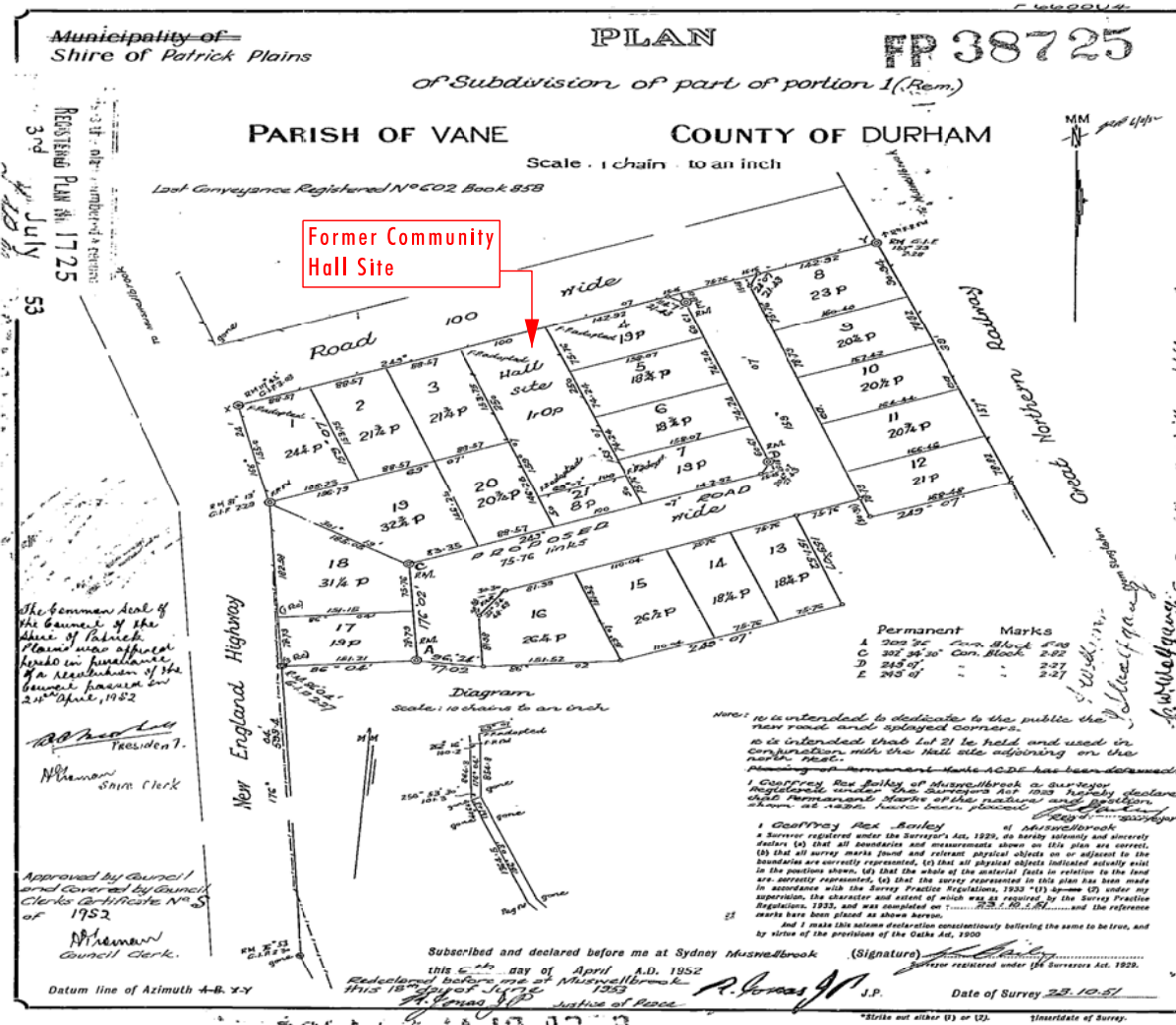


FIGURE 3.8

Detail of 1953 Subdivision Plan Showing Location of Ravensworth Community Hall

Table 3.4 – Lot 1 DP 151176

Date and Term of Purchase	Registered Owner and Occupation Where Available
09.03.1927 (1927 to 1931)	Wellesley Ignatius Hartcher (School Teacher) Andrew Peter O'Brien (Farmer) Edward Patrick Farrar (Railway Employee) (Trustees for a Memorial Hall)
07.09.1931 (1931 to 1933)	Andrew Peter O'Brien (Farmer) Ivor Thomas Peebles (Farmer) Thomas McGregor (Railway Employee) (Trustees for a Memorial Hall)
04.12.1933 (1933 to 1935)	Andrew Peter O'Brien (Farmer) Ivor Thomas Peebles (Farmer) Herbert Alfred Smith (or Alfred Herbert Smith) (Farmer) (Trustees for a Memorial Hall)
28.10.1935 (1935 to 2011)	Andrew Peter O'Brien (Farmer) Alfred Herbert Smith (or Herbert Alfred Smith) (Farmer) Edwin Thomas Sattler (Farmer) (Trustees for a Memorial Hall)
17.01.2011 (2011 to date)	# Glendell Tenements Pty Ltd (Purchased from the Council pursuant to unpaid rates)

Source: Service First Registration Pty Ltd, Lands and Property Information

The Singleton Argus 27 April 1938 reports that:

Mr 'Doe' Harvey has just completed a nice four-roomed cottage for Mr Frank Hartley, our assistant station master. There is a demand for houses in Ravensworth, and a few more, besides supplying a want, would greatly add to the attractiveness of the village (Singleton Argus 27 April 1938).

Between 1939 and 1946 the Ravensworth Hall was used for community balls, the first recorded being the Church of England Ball (Singleton Argus 25 August 1939 and 11 October 1946).

In April 1947 a petition was signed by 16 residents of Ravensworth to prevent the Denman-Singleton Pastures Protection Board establishing a 10 acres stock reserve immediately opposite the Ravensworth Public School. The Shire Council forwarded the petition on to the Pastures Protection Board (Singleton Argus 21 April 1947).

In the late 1940s the Shire Council reported that:

A sizeable village is about to be created at Ravensworth in the near future (Singleton Argus 29 July 1949).

Davies Construction, who were developing a local open cut coal mine, were intending building homes for its employees at Ravensworth and were planning for the township to be built (Singleton Argus 29 July 1949). The Council intended to have control of the proposed buildings and sub-divisions to avoid the 'temporary hutments' that had previously occupied the village site (Singleton Argus 26 August 1949). However, the Council did not obtain control, but were asked to take over as trustees of Ravensworth Hall (Singleton Argus 24 March 1950). Later mentions of Ravensworth include reports of a caravan park at

Ravensworth with poor sanitary conditions (Singleton Argus 28 March 1951) and an automatic telephone exchange with 22 subscribers (Singleton Argus 16 October 1953).

The Council of the Shire of Patricks Plains (now Singleton Council) purchased Lots 4, 5, 6 and 21 DP 38725 in 1953. Green space was declared and a small park created with play equipment and park facilities (refer to **Figure 3.6**). In March 2006 Singleton Council stopped maintaining the park and removed the facilities, rezoning the land from community space to operational land, allowing them to sell it (Singleton Council pers. comm.).

The remainder of the Ravensworth Village area located to the south of the Hebden Road was sub-divided and sold by the Wolfgang family from 1953. Johannah Wolfgang (listed as a widow), Ivy Sophia Wolfgang (spinster) and Cecil Wolfgang (retired store keeper) owned Lot 1 DP 159786 until 1974 (refer to **Figure 3.6**).

Aerial photographs showing the Ravensworth Village area were available for review from the Department of Lands dating from 1958. The 1958 aerial shows three buildings in the village area on the south side of Hebden Road and a number of smaller structures. The buildings comprise the community hall on Lot 1 DP 151176, structures (likely houses) on Lots 8 and 16 DP 38725 and a number of smaller structures on Lot 13 DP 38725 (refer to **Figure 3.9**). The 1967 aerial indicates two new larger structures (likely houses) have been built on Lots 15 and 11 DP 38725 (refer to **Figure 3.10**). The 1983 aerial indicates that all the previous buildings are still standing and a number of addition smaller structures have been constructed (refer to **Figure 3.11**). By 2002 the community hall has been demolished but the other three larger structures extant in 1983 are still present. By 2008 all structures have been demolished.

The structure shown on the 1958 aerial on Lot 16 DP 38725 is likely to be to have been the location of the wine saloon. The Wolfgang family residence is also likely to have been part of the same premises. The building located on Lot 8 shown on the 1958 aerial may date from 1956 when the lot was purchased from the Wolfgang family by Wallace Andrews (a sub-foreman) (refer to **Figure 3.9**).

Apart from the store/bottle shop run by William Wolfgang (and its associated sheds, stables, cellars and blacksmith's shop) and potential fettler huts/tents there appears to have been no structural improvements to the area of Ravensworth Village south of Hebden Road prior to the 1930s. The village hall was built by 1931 and any other structural improvements are likely to date to the late 1950s and 1960s when the majority of the area had been sub-divided and sold.

3.4.2 Ravensworth School

Ravensworth School opened as a Half-time School in October 1876 with Chilcott Plains School as its Half-time Partner School. In September 1880 the Half-time School closed and the Public School opened. Ravensworth Public School closed in December 1986. Chilcott Plains School operated variously as a Half-time School, Provisional School and Public School between 1876 and 1889 (NSW Department of Education and Communities).

Half-time Schools were elementary schools established from 1867 to cater for children in areas of scattered population. The 1866 Public Schools Act provided for the appointment of itinerant teachers who, between 1867 and 1868, were in charge of up to seven 'stations'. From 1869 each teacher visited only two stations, and thus the schools became truly Half-time. At least 20 children were required to attend the schools, in two groups of 10 or more. In 1898 the required attendance was reduced to 16, and by 1908 no fixed number was required.



Image Source: Department of Land and Property Information (2013)

0 100 250 500m
1:10 000

FIGURE 3.9

Detail of 1958 Aerial Photograph
Showing Ravensworth Village Area



Image Source: Department of Land and Property Information (2013)

0 100 250 500m
1:10 000

FIGURE 3.10

Detail of 1967 Aerial Photograph
Showing Ravensworth Village Area



Image Source: Department of Land and Property Information (2013)

0 100 250 500m
1:10 000

FIGURE 3.11

Detail of 1983 Aerial Photograph
Showing Ravensworth Village Area

Provisional Schools were established in areas where at least 15 children, but fewer than the 25 required for a Public School, could be expected to attend. During the 1880s the minimum number of children required was reduced to 12, from 1898 the minimum was 10 and from 1945 it was nine. The schools were generally staffed by untrained teachers or by teachers of the lowest classification. Gradually they became in effect simply small Public Schools, and in November 1957 the remaining Provisional Schools were converted to Public Schools.

The Public School was the basic elementary School in the NSW education system. Originally known as National Schools (from 1848 to 1866) they became known as Public Schools from 1867. Originally the attendance of 30 children was required for the establishment of a Public School, but this was reduced to 25 in 1867 and 20 in 1880; in 1957, when Provisional Schools were converted to Public Schools, the minimum figure was reduced to nine. Until the 1880s there were no government Secondary Schools. But the 1880 *Public Instruction Act* recognised the presence at school of numbers of children who had completed the primary course, by providing for the establishment of Superior Public Schools with primary and post-primary courses, and for separate High Schools. After 1913 many Public Schools incorporated one or more distinct secondary departments or 'schools' (NSW Department of Education and Communities).

When the Ravensworth Half-time School opened in 1876 there were 14 children attending aged between four and 11 from five different families. The teacher, Vesey Hine, had only one month of training under the tutelage of the Headmaster at Maitland East Public School (Kelly 1976:1). Vesey Hine taught at both Ravensworth and Chilcott Plains School until Ravensworth became a Public School in 1880. The distance between the schools was described by the Council of Education inspector as being:

...four miles of lonely and thickly timbered country (Kelly 1976:2).

The original Ravensworth school building was of 'slab construction with a shingled roof' and timber floor located close to the then Ravensworth Station (Kelly 1976:3). From 1878 the residents of Ravensworth were requesting the school be converted into a Full-time Public School. The majority of pupils were children of railway workers and employees of Ravensworth Estate, most living 'at least three miles' from the site of the school (Kelly 1976:4-5). In 1880 construction commenced of the new school comprising the:

...brick school room (23 feet by 17 feet) and the attached three-roomed residence for the teacher (Kelly 1976:6).

By December 1880 enrolment at the school had risen to 40 pupils with an average of 29 attending compared to 7 in 1879. However enrolment dropped to 18 in 1886 with only an average attendance of 10. The reputation of the teachers was generally given as the reason for the fluctuating enrolment figures. Enrolment rose again in the late 1880s but then declined in the early 1890s as the Railway Department removed a number of married men with children from working on the rail line and replaced them with single men. In 1893 the attendance had fallen again to 10 children; the teacher reporting that only 'nine children of school age lived within three miles of the school'. The early 1890s also saw a reduction in the number of employees on the Ravensworth Estate and the rail line as a result of the low prices for primary products at the time (Kelly 1976:12-15). However the end of the 1890s saw enrolment average between 20 and 30 children.

A pupil from the early 1900s remembered:

The wonderful picnics we had on the flat near Bowman's Creek, the beautiful orchards owned by the Dries and Wolfgang families (Kelly 1976:17).

In 1913 renovations were carried out to modernise the school building including replacing the wooden shingles with galvanised iron. In the 1920s renovations were also undertaken to the school residence, however there were no further changes to the school until the replacement school building was constructed in the 1970s (Kelly 1976:18-19). Cesspits (pit toilets) had been used until the new building was constructed (Kelly 1976:21).

The new Ravensworth Public School was opened 26 September 1971 as a one teacher school for 24 pupils, with room for expansion to up to 40 pupils, at a cost of \$44,000. The new school was described as being a:

...brick building with classroom, office, foyer, hat stand, two storerooms, separate toilets and bubblers all under one tiled roof...the old building, still standing, was erected in 1880 (Newcastle Morning Herald 22 September 1971).

Ravensworth Public School closed in 1986. Both the 1880s constructed school and the 1970s new school building are located on the north side of Hebden Road, at the intersection with the New England Highway, outside but immediately adjacent to the Proposed Disturbance Area boundary and the proposed Hebden Road rail overpass works (refer to **Figure 3.6**).

3.5 Communication, Roads and Railways

3.5.1 Main Northern Railway Line/Great Northern Railway and Ravensworth Station

The Great Northern Railway or as it is now referred to, the Main Northern Railway, was built in part following the Great North Road in the 1860s to the 1870s. The Main Northern Railway's first section was built from Newcastle to Victoria Street, Maitland in 1857. It then extended to Singleton (1863), Muswellbrook (1869), Murrurundi (1872), Werris Creek and west Tamworth (1878), Armidale (1883) and Wallangarra, Queensland in 1888. A railway station was opened at Ravensworth Village on 1 June 1869 and closed on 11 January 1975. The station was originally named Camberwell Station but was renamed Ravensworth in 1876 (Bozier nd). The railway line in part diverges through the Ravensworth Estate and forms the southern boundary of the Project Area.

In 1869 a description of the opening of the northern railway extension between Singleton and Muswellbrook describes the Ravensworth passenger platform and also Ravensworth Homestead:

About this spot we observe what appears to be a platform for the accommodation of passengers in course of erection...as we proceed we obtain a glimpse of the Ravensworth homestead, which with its surrounding oak buildings looks like a peaceful rural village in England, while the illusion is further carried out by the luxuriant character of the pasturage (Maitland Mercury & Hunter River General Advertiser 22 May 1869)

There was some discussion and disapproval from the residents of Camberwell that a station house was to be built at Ravensworth rather than Camberwell (The Maitland Mercury & Hunter River General Advertiser 7 February 1874). The community at Camberwell felt that the decision to construct the rail station at Ravensworth rather than Camberwell was undertaken in an underhand manner:

...the underhand manner in which persons...caused the removal of the railway station to Ravensworth, over which there is so much fruitless strife...(The Maitland Mercury & Hunter River General Advertiser 25 January 1876).

The same newspaper report complained that a post office had been established at Ravensworth after having been at Camberwell for 20 years (The Maitland Mercury & Hunter River General Advertiser 25 January 1876). The inhabitants of Camberwell feared that the Camberwell Post Office would be demolished as a result of the Ravensworth post office opening (Singleton Argus 5 February 1876).

A report from 1980 describes a fire at the Ravensworth Station building which destroyed the building:

The Ravensworth Railway Station building, halfway between Muswellbrook and Singleton, was completely destroyed by fire early on Friday afternoon...the timber building was erected in the late 1880s, and had been unmanned for about 6 years...the only portion of the Railway left standing was the brick chimney (Muswellbrook Chronicle 16 September 1980).

The Ravensworth platform and the remains of the station building have since been removed. No potential items or sites associated with the Great Northern Railway/Main Northern Railway have been identified through research and site survey within the Project Area. The heritage listed Camberwell Glennies Creek Underbridge is located outside, and approximately one kilometre to the south-east of, the Project Area and is further discussed in **Section 4.4.8**.

3.5.2 Great Northern Road

In the Upper Hunter area, roads were the most important means of transport until 1869 when the Great Northern Railway reached Muswellbrook (Turner 1995:32).

The first overland route to the Hunter River was discovered, after several unsuccessful attempts, by John Howe, Benjamin Singleton and others, who travelled from Windsor to near Singleton in late 1819. The route they discovered was officially opened in 1823 and when first opened, travellers required a permit. It became known as the Bulga Track/Road or The Parson's Road, but is now known as Putty Road. The discovery of this route meant that stock could now be taken overland from the Cumberland Plains north to the Upper Hunter Region. However, the route was recognised as being a treacherous journey and fell into disrepair and out of use.

The origins of the New England Highway lie not in the work of early surveyors like Dangar but in that of explorer and botanist Allan Cunningham, who traversed the region in the period 1827 to 1829. Between January and August 1827, Cunningham travelled from the Hunter Valley northwards, crossing the Peel and Dumaresq Rivers, discovering the Darling Downs, before returning to the Hunter Valley and Bathurst. While exploring the Darling Downs, he discovered Spicer's Gap, through which there was access from Moreton Bay to the fine grazing offered by the Downs. Cunningham later found a second gap, Cunningham's Gap, in 1828-1829 (Perry 1966).

The roads leading north through the Hunter Valley were developed in the first part of the nineteenth century. Agitation for a shorter route north than the Putty Road had led Governor Brisbane to issue instructions for the surveying of a new route beginning at Castle Hill, which became known as the Great North Road. A second route to the Hawkesbury was developed along Peat's Ferry Road, now the Pacific Highway. By 1850 the main road to the north had extended from Muswellbrook to Murrurundi and onto Tamworth and Armidale. The road north of Murrurundi follows the track over the Liverpool Ranges discovered by William Nowland in 1827. The road forms the basis of the New England Highway of today.

3.5.3 Travelling Stock Routes

Travelling stock routes and reserves in NSW (also known as the Long Paddock in Australian literature) originated from the need to move stock to pastures and markets. To assist with the stock movements the government established a network of watering points and wide corridors for stock routes. Stock routes evolved from the 1830s onwards, the early routes generally following rivers or roads. By the 1860s legislation was introduced to protect the rights of adjacent run-holders and drovers. The *Occupation Act 1861* and the *Pastures and Stock Protection Act 1880* attempted to regulate the use and administration of stock routes. By this time railway lines were also used as stock routes in some areas. During the 1880s and 1890s improvements were made to administration of the routes, culminating in the *Pastures Protection Act 1902* which established Pastures Protection Districts and Boards (AHMS 2008:39-40).

The stock routes are not used as often for droving as they were in the past as truck transport provides an alternative. However the use and growth of the routes peaked during the two world wars, and continued in the post-war period particularly during the droughts of the late 1950s. Since then there has been a decline in use of the routes except during drought periods when they are used mainly for grazing stock rather than transporting them. The *Rural Lands Protection Acts* of 1989 and 1998 transferred administration of the routes to Rural Lands Protection Boards. The Boards now manage almost 600,000 hectares of traveling stock routes on crown land throughout NSW (AHMS 2008:39-40). There has been a significant increase in the numbers of stock using traveling stock reserves and public roads since the onset of the drought in the early twenty-first century (Hale 2008). Following the renewed use of the routes, concerns have grown about soil erosion and weed control, and protection of wildlife and remnant native vegetation (AHMS 2008:40).

There is one known travelling stock route or reserve within the Project Area; located within an existing biodiversity offset area and not proposed to be disturbed as a result of the Project. As such, it is not considered further in this report.

3.5.4 Cobb & Co Coach Line

Freeman Cobb was a businessman and coach line proprietor born on 10 October 1830 at Brewster, Massachusetts, United States of America. In 1849 Cobb joined Adams & Co. express agents and worked with the coaching lines in California and Central America established during the Californian gold rush. In approximately May 1853 he arrived in Melbourne to help establish a branch of Adams & Co. in Australia. Several American coach drivers and carriers employed by Adams & Co., or the rival firm Wells, Fargo & Co., followed in June 1853. Cobb joined three of the other American coach company employees (John Murray Peck, James Swanton and John B. Lamber) to form the coach company Cobb & Co (Austin nd).

The company commenced carrying between Melbourne and Port Melbourne in July 1853 using two Concord thoroughbrace wagons that Cobb had brought out from America. However the route was soon abandoned as a result of the wet weather which made the primitive road virtually impassable. The company adopted the title 'American Telegraph Line of Coaches', and on 30 January 1854 began to operate a passenger service between Forest Creek (Castlemaine), Bendigo and Melbourne. Although the company did not secure a mail contract, it operated very profitably for two years and acquired a great reputation for efficiency and reliability (Austin nd).

On 16 May 1856 Cobb announced that the business had been sold and returned to America. The business then passed through several changes in ownership and more Cobb & Co routes were opened. In 1861 the business was purchased by a syndicate led by another American, James Rutherford and Cobb & Co.'s operations extended into NSW and

Queensland, rapidly growing into a number of loosely associated firms that together dominated the coaching industry of Australia until the early twentieth century. Rutherford retained control in NSW and Queensland for 50 years until he died on 13 September 1911. On 14 August 1924 the last Cobb & Co. coach made its final run in south-west Queensland (Austin nd).

Freeman Cobb's name has passed into the Australian language as a synonym for a coach. His fame was due partly to his enterprise in introducing the latest American methods and equipment into the coaching industry of Victoria when the gold rushes had created a vast demand for passenger transport. His methods set the standard and as the coach lines multiplied Cobb's name was acquired by many firms through purchase, agreement or unspoken consent (Austin nd).

A Cobb & Co route has been identified by a community member outside, and approximately 3 kilometres to the east of, the Project Area (refer to **Figure 3.12**). The area is marked on the 1917 Parish Map of Goorangoola as being owned by Robert Lethbridge (refer to **Figure 3.5**). Robert Lethbridge had arrived in NSW as a free settler in 1823. He was one of the early landowners in the Hunter Valley with a property called Bridgman established at Falbrook in 1825. He soon owned a considerable portion of the land in the area (refer to **Figure 3.1**). In 1832 he established the Oakhampton Estate near Maitland.

3.5.4.1 Chain of Ponds Inn

In the late 1800s the coaches utilised by a coaching business operated from the Chain of Ponds Inn (located outside the Project Area, refer to **Figure 2.1**) were purchased by a coach firm utilising the Cobb & Co. name.

The Chain of Ponds Inn was built in the 1840s by Henry Nowland (or Nowlan) halfway between Muswellbrook and Singleton on what was then the New England Highway. The hotel served as an inn for the coach and horse borne traffic in the mid nineteenth century between Morpeth and Tamworth.

In 1842 the Government decided to create a village (the Village of Liddell) in the vicinity of the Western Salt Ponds, halfway between Singleton and Muswellbrook, on the main route north. The proposed village did not eventuate, likely as a result of Henry Nowland eventually purchasing most of the allotments. Nowland initially purchased Lot 1, consisting of 4 acres, 3 roods and 21 perches at the junction of the Chain of Ponds with Saltwater Creek, Liddell. This was an ideal location for the establishment of an inn and a stabling area for coaches and horses. In 1842 he built a sandstone building and police lockup and the Inn and soon after established a successful coaching business on the site. The inn was constructed by convict stonemasons using blocks of stone 2 foot thick.

A brick stables to the rear of the inn, and also a blacksmiths, are likely to have been constructed in the early 1840s to cater for the Nowland coaches. The stables may also have been used as a mounted police barracks (RNE Place ID 1440).

In 1849 the Maitland Mercury (6 January 1849) announced that Henry Nowland had mail contracts for:

- Singleton-Muswellbrook-Scone by three horse carriage three times a week;
- from and to Scone and Murrurundi by two-horse cart twice a week; and
- from and to Tamworth, Warialda, Wee Waa, Armidale, Tenterfield, Warwick, Drayton, Brisbane (via Ipswich) once a week for 730 pounds.

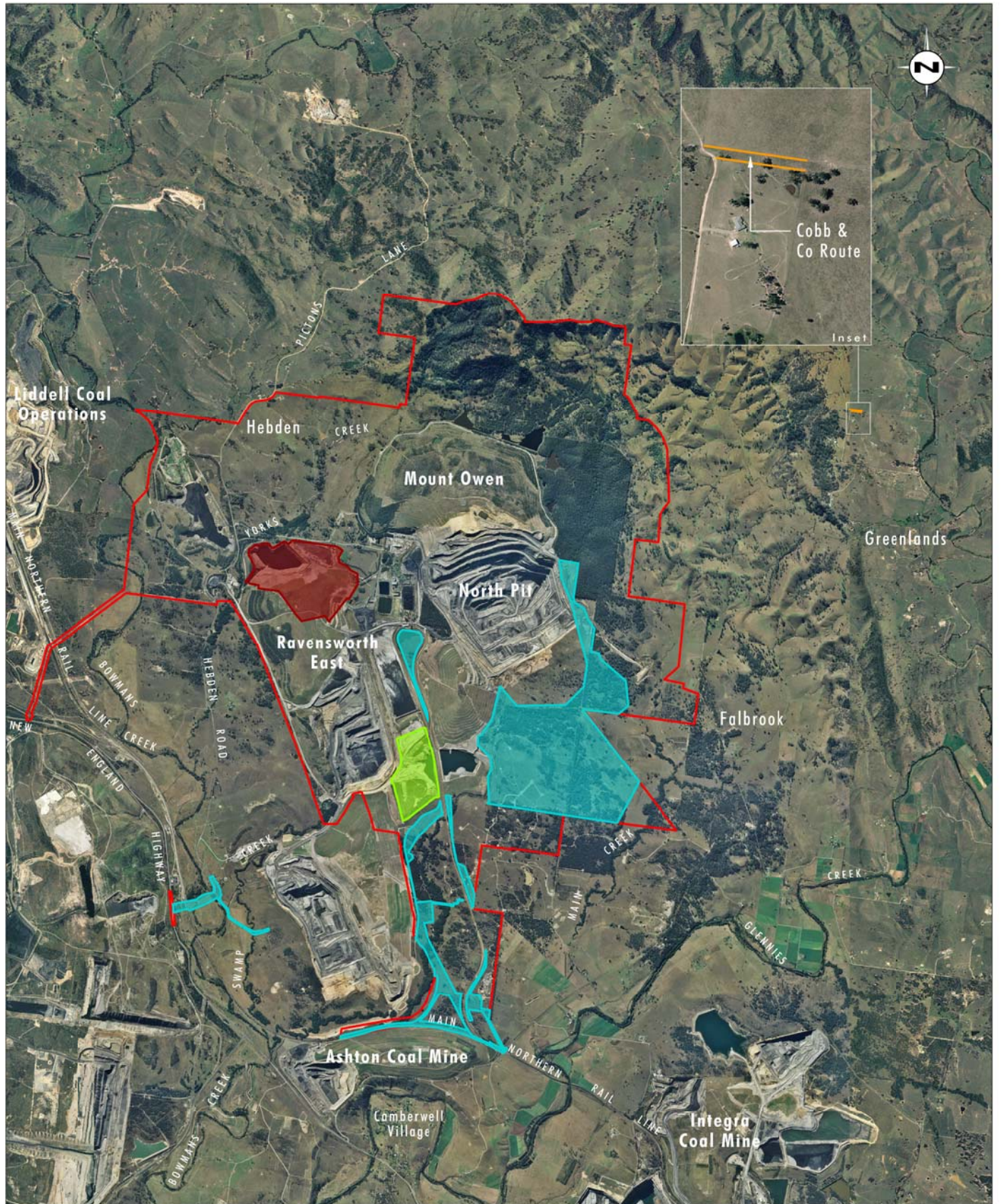
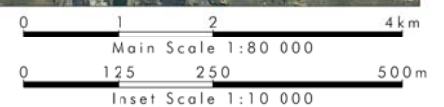


Image Source: Mount Owen (2012-2013)
Data Source: Mount Owen (2014)



Legend

- ▬ Project Area
- ▬ Proposed Disturbance Area
- ▬ Bayswater North Pit
- ▬ Proposed RERR Mining Area
- ▬ Cobb & Co Route

FIGURE 3.12

Location of Identified
Cobb & Co Route

Henry Nowland died on the 10 February 1863 (aged 66) leaving everything to his widow, Mrs Harriet Nowland. The coaching business went into decline in the period from Henry's death to the introduction of rail in 1867 and as discussed the coaches were subsequently purchased by Cobb & Co.

3.6 Land Use and Industries

A review of aerial photographs obtained from the Department of Lands dating from 1958 was undertaken as part of this assessment and shows that prior to 1958 substantial clearing had been undertaken in the Project Area likely as a result of agricultural expansion (refer to **Figure 3.13**).

3.6.1 Pastoralism

The pastoral industry was the earliest established industry within the area. Benjamin Singleton placed a notice in the Sydney Gazette as early as December 1821 advertising agistment at St Patrick's Plains at 10 shillings a head per annum for not less than three years. In 1823, John Howe was granted permission to graze his stock at Patrick's Plains, agisting 1,000 sheep and 1,200 cattle. Horse breeding also became a thriving industry. The Scotts of Glendon were importing stud horses in 1822 and Alexander Bowman bred a number of race horses at Oaklands, to the south-east of the Project Area. In the 1820s, Dr James Bowman ran 2,000 merino sheep and 200 head of cattle on his Ravensworth Estate. Bowman's sheep were said to rank among the first crossbreeds in the colony.

During the nineteenth century the area of Ravensworth Estate was central to local and regional wool production. In the late 1850s Captain William Russell had travelled to Europe specifically to purchase merino rams to improve his NSW flocks. However, there was a shift from wool production in the nineteenth century to mixed farming, dairying and to a lesser degree grazing became more important in the twentieth century. Parasitic infections in sheep in the late nineteenth century further encouraged the shift to dairy farming.

The 1828 census indicates that, of the 191 large (over 1,000 acre) estates occupying the Upper Hunter Valley, 'only one third were sheep grazing enterprises with cattle raising being much more common' (Turner 1995: 18).

3.6.2 Dairying

Dairying was one of the initial impetuses for the division of large estates in the Upper Hunter. The subdivision of the area's large estates commenced in the mid 19th century and by the early twentieth century the Upper Hunter was mostly occupied by dairy farms of up to 500 acres in size (Heritage Office & DUAP 1996a:49). Dairy farming became an important land use after sheep/wool production began to wane in the nineteenth century due to parasitic infections in sheep.

The importance of the dairying industry in the Upper Hunter coincided with the 'development of the mechanical separation of milk and refrigeration causing a re-shaping of the pattern of farming' in the Singleton and Muswellbrook Local Government Area, due to the increased demand for dairy products in Australia and overseas (Turner 1995:19). Dairying increased after the World War I as soldiers were given small holdings and government assistance to establish small agricultural businesses, such as dairy farms (Heritage Office & DUAP 1996a:49). The effect of soldier settlement increased after the World War II in Singleton when the 'country was cut up into wheat-sheep farms' (Heritage Office & DUAP 1996a:49). In 1955 the NSW milk board established quotas for the supply of milk to overcome shortages.

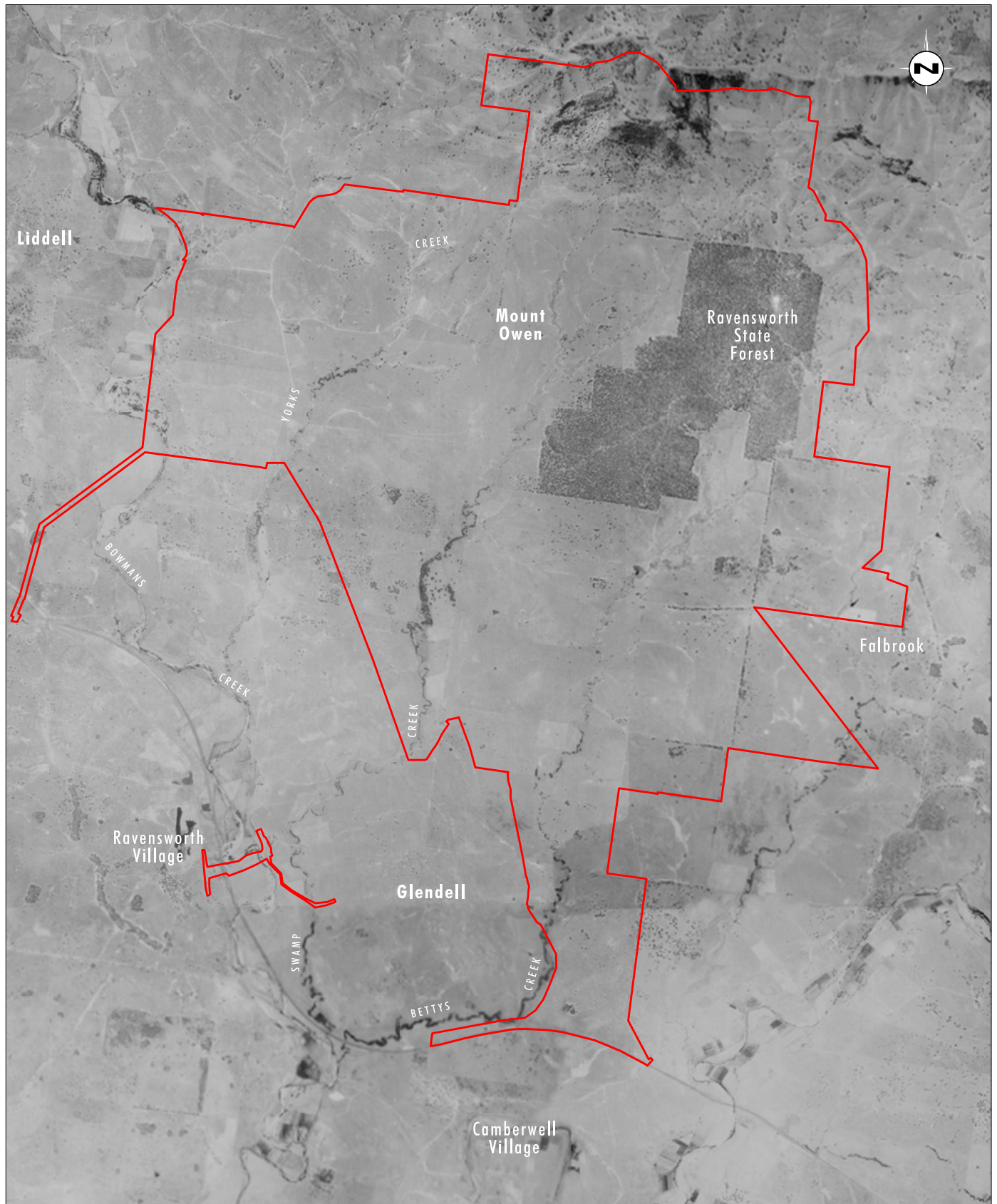


Image Source: Department of Land and Property Information (2013)
Data Source: Mount Owen (2014)

0 1.0 2.0 3.0 km
1:60 000

Legend

Project Area

FIGURE 3.13

1958 Aerial Photograph

In the second half of the twentieth century the dairying industry went into a gradual decline. Since 1901 the dairy industry in NSW had been controlled by various government bodies. In the mid to late 1960s policies aimed towards specialisation and amalgamation affected the smaller scale dairy farms. Then in the 1970s Britain joined the European Economic Community and Australia lost its main dairy export market. In the early 1970s the Milk Board was replaced with the Dairy Industry Authority resulting in the reallocation of milk quotas and the eventual deregulation of the industry. Farm improvements to meet new regulations and standards, including the installation of refrigerated holding tanks, resulted in many of the typical small dairy farms of the area becoming unviable. The number of dairy farms in NSW dropped from 9061 in 1970 to 4626 in 1976 (Dunne 2012:75-81).

The importance of dairying as a land use is reflected in the history of the Project Area and the number former dairy sites identified within and in the vicinity of the Project Area as part of previous assessments and the current assessment (refer to **Section 4.3**).

3.6.3 Agriculture

The Singleton locality contained several thousand acres clear of timber and covered with rich alluvial soil which produced heavy crops of wheat, maize, barley, oats, rye, potatoes and natural grasses.

A correspondent of the Australian in 1827 reported the Castle Forbes properties yielded thirty-six bushels (1 bushel = 8 gallons/36.37 litres) to the acre of wheat. The correspondent reports that there were two stack yards within a mile of each other containing together 10,000 bushels of wheat. Tobacco was another crop grown in the area and a few properties also experimented with cotton which ultimately failed.

Historical records indicate the extent of cultivation in 1831. These records state that the Patrick's Plains district cultivated 1,054 acres of wheat, 625 acres of maize, 54 of barley, 10 of oats, 15 of rye, 15 of potatoes, and 17 acres of tobacco. In 1836, the number of acres in the counties of Brisbane, Northumberland, Hunter and Durham under wheat was 27,424 and maize 7,899 with 45 tons of tobacco harvested (JRAHS 1953). **Table 3.5** shows the area under cultivation for wheat decline while the area under maize and tobacco increased between 1836 and 1844.

Table 3.5 - Area under Cultivation - Counties of Brisbane, Northumberland, Hunter and Durham (JRAHS 1953)

Crop	1836	1839	1844
Wheat	27,424 acres	15,114 acres	21,534 acres
Maize	7,899 acres	10,112 acres	14,226 acres
Tobacco	45 tons	1,505 hundred wt	4,890 hundred wt

Returns for 1860 show that there were 206 landholders at Patricks Plains which included the counties of Durham, Hunter and Northumberland and they held 161,310 acres. Of this area 155,508 acres were not cultivated. The crop yields were: wheat 22,000 bushels, maize 25,926 bushels, barley 400 bushels, rye 45 bushels, millet 15 tons, potatoes 49 tons, sorghum 243 hundred weights and hay 235 tons (JRAHS 1953).

Wheat crops grown in the Hunter Valley were prone to the disease 'rust', which struck severely in 1857 (Turner 1995). Disease together with the relatively dry conditions in the Upper Hunter made wheat a precarious crop and as a result its production declined. The decline in wheat cultivation saw an increase in barley production mainly for stock feed but as the dairy industry began to grow lucerne crops became a more viable option. Lucerne crops

are indicated on the 1889 Plan of the Subdivision of Part of the Ravensworth Estate to the east of the rail line (refer to **Figure 3.7**)

3.6.4 Viticulture

As dairying went into decline in the second half of the twentieth century wine growing began to grow in importance in the region. Today's wine region has its beginnings with the early settlers experimenting with growing vines on their large estates. The Reverend Richard Hill is reported to have planted over two and a half thousand vines on his Milbro Dale Estate by 1834 (to the south of the Project Area – east of Broke). During Captain William Russell's trip to Europe in the late 1850s to purchase merino rams he also arranged to send 'one shipload of 4,000 grape vines of one year's growth' to stock his NSW vineyards (Hunter 1997:11). Commercial wine growing in the area developed following the establishment of Soldier Settlement viticultural farms in the 1920s however, the boom of grape growing in the Hunter Valley did not occur until the 1970s. Viticulture farms are not extensively located in the Ravensworth area.

3.6.5 Mining

The development of coal resources comprises an important part of the region's history of coal mining within the Hunter Valley and began on a limited scale in the early 1900s, prior to a rapid expansion in the 1950s with the establishment of large open-cut mines (Dean-Jones and Mitchell 1993:2).

Coal was known to exist in Singleton and its surrounding areas since early exploration. In 1819 when exploring the Jerrys Plains area John Howe is reported to have been:

...picking up in the river some large pieces of coal, which they took back to Windsor (Wood 1972:11).

The first official coal seam was discovered on the Wambo Estate in 1863. Its discovery was reported in the Maitland Mercury:

A rich seam was recently discovered at Wambo, Cockfighters Creek, the estate of William Durham Esq....We believe this is the first coal seam which has been discovered in the country of the Hunter; and as Mr Durham's estate is about 12 miles from Singleton, it is clear proof of the wide spread of the coal deposits in this district (Singleton Historical Society nd).

Coal was first mined in the Upper Hunter in the Rixs Creek area near Singleton in the 1860s (Rappoport 2006:24). However, early coal operations such as this were not commercially viable because of the then underdeveloped transport network. Development and extension of the Great Northern Railway provided the stimulus needed for the development of coal mining in the area (Dunne 2012:88). On 23 September 1886, the 'Singleton News' in the Maitland Mercury reported that:

Since Messrs Nowland opened up their mine, sinking for coal has been actively prosecuted on the Ravensworth estate and we learn that the perseverance of the promoters has been successful to such a degree that they intent to float the undertaking shortly into a company with equal capital of £50,000. A prospectus will be shortly issued.

Noble writes that no further information was found on this venture but it indicates that coal extraction was commencing during this time. According to the Heritage Office & DUAP (1996a:4) 'coal was not commercially exploited until the 1890s in the Upper Hunter' and the area remained dominated by the agricultural industry, with a continued focus on dairying.

Coal mining and electricity generation have become major industries in the Singleton area since the 1950s with the first wave of collieries built to meet export demand at Liddell, Foybrook and Liddell State. Since the mid-twentieth century, coal mining operations 'expanded from Cessnock/Maitland area to the triangle bounded by Singleton, Muswellbrook and Denman, using highly mechanised, open cut surface mining techniques in which all overburden is stripped from the surface' (Rappoport 2006:24).

In 1964 the State Electricity Commission commenced construction of the Liddell power station, which was commissioned in 1973. The Bayswater Power station was commissioned in 1980. These projects changed the lifestyle of the residents of Singleton and surrounding local government areas by affecting employment, population, housing, commerce and the character of the locality. The power stations increased the demand for coal, as did the expanding export market.

Swamp Creek Mine began operating in the 1960s. In 1997 a new mining lease (ML 1415) was issued after a period of care and maintenance and the mine was renamed Ravensworth East Mine. Ravensworth East Mine operates under DA 52-03-99 which originally allowed for the supply of coal to the domestic market through the transportation of ROM (run-of-mine) coal via conveyor to both the Bayswater and Liddell power stations. Subsequent modifications to DA 52-03-99 in 2000, 2003, 2004 and 2005 have included modifications to allow the extraction of coal for the export market following the processing of coal at the Mount Owen Coal Handling and Preparation Plant (CHPP), an increase in the extraction rate and the emplacement of tailings from the Mount Owen operations within Ravensworth East voids.

The Mount Owen Mine commenced operations in November 1993 under the management of Hunter Valley Coal Company (HVCC) with the original development consent (DA 63/91) granted in November 1991 by Singleton Council. The initial approval was for the production of 1.4 Mtpa ROM coal.

3.7 Historical Themes

A historical theme is a research tool, which can be used at the national, state or local level to aid in the identification, assessment, interpretation and management of heritage places (AHC 2001:1). Nine national historical themes have been identified by the Australian Heritage Commission (AHC now Australian Heritage Council). The Heritage Division, OEH has identified 35 historical themes for understanding the heritage of NSW. The development of the Project Area is broadly reflective of the history of the local region, and can be assessed in the context of the broader historic themes defined by the Heritage Division, OEH and AHC. In accordance with the Heritage Division and AHC framework of historic themes, the themes in **Table 3.6** are relevant to the Project Area and locality.

Table 3.6 - Historical Themes Relevant to the Project Area and Locality

National	National Sub Themes	NSW Themes	Local Themes	Examples
Peopling Australia	Living as Australia's earliest inhabitants Adapting to diverse environments	Convict	Activities relating to incarceration, transport, reform, accommodation and working during the convict period in NSW	Landscapes of control, convict built structure

Table 3.6 - Historical Themes Relevant to the Project Area and Locality (cont.)

National	National Sub Themes	NSW Themes	Local Themes	Examples
Developing local, regional and national economies	Developing Primary Production	<p>Pastoralism</p> <p>Agriculture</p> <p>Mining</p>	<p>Activities associated with the breeding, raising, processing and distribution of livestock for human use</p> <p>Activities relating to the cultivation and rearing of plant and animal species, usually for commercial purposes</p> <p>Activities associated with identification, extraction, processing and distribution of mineral ores</p>	<p>Rural landscape, hay barn, dairy, vineyard, farmstead, fencing, shed, orchard</p> <p>Pastoral landscape, homestead, fencing, well, water trough, shearing shed</p> <p>Mining field or landscape, mine, quarry, processing plant, miners office, collier, mine shaft</p>
Developing local, regional and national economies	Moving Goods and People	Transport	Activities associated with moving goods and people from one place to another, and systems for the provision of such services	Highway, railway, lane, stock route, bridge, footpath, horse yard
Building settlements, towns and cities	<p>Making settlements to serve rural Australia</p> <p>Remembering significant phases in the development of settlements, towns and cities</p> <p>Supplying Urban Services</p>	<p>Land Tenure</p> <p>Towns, suburbs and villages</p> <p>Utilities</p> <p>Accommodation</p>	<p>Activities and processes for identifying forms of ownership and occupancy of land</p> <p>Activities associated with creating, planning and managing urban functions, landscapes and lifestyles in towns, suburbs and villages</p> <p>Activities associated with the provision of services, especially on a communal basis</p> <p>Activities associated with the provision of accommodation, and particular types of accommodation</p>	<p>Fence, survey mark, subdivision pattern, stone wall</p> <p>Town plan, village reserve, subdivision pattern, abandoned town site</p> <p>Bridge, culvert, weir, well, cess pit, reservoir, dam</p> <p>Homestead, cottage, house site (archaeological site)</p>
Education	Establishing Schools	Education	Activities associated with teaching and learning by children and adults, formally and informally.	Local school sites

4.0 Physical Context

This section discusses the potential historical heritage items present within and in the vicinity of the Project Area, identified through a search of relevant heritage registers, historical research and site survey. This information, in conjunction with the historical context (refer to **Section 3.0**), forms the basis of the significance assessment (refer to **Section 5.0**) and management strategy (refer to **Section 6.0**).

4.1 Physical Context of the Project Area

The Project Area is situated centrally on the main floor of the Hunter Valley. The Project Area is typical of the Central Lowlands of the Hunter Valley, which are characterised by undulating to low rolling hills which extend to lower areas associated with the waterways that traverse the Project Area. Elevations range between 80 metres AHD in the south and 400 metres AHD in the northern extent of the Project Area.

The Project Area is located within both the Bowmans Creek and Main Creek catchments. Bowmans Creek is a tributary of the Hunter River. The North Pit is primarily within three sub-catchments of Bowmans Creek, namely Yorks Creek, Swamp Creek and Bettys Creek. Areas associated with the alluvial plains of Bettys Creek, Main Creek and the Hunter River, are generally flat to gently sloping. Bettys Creek, Yorks Creek and Swamp Creek flow through the Project Area before flowing into Bowmans Creek. Main Creek flows for a short section through the east of the Project Area and then into Glennies Creek south-east of the Project Area. Bowmans Creek is located to the west of the existing Mount Owen Complex and flows in a southerly direction to join the Hunter River approximately 4 kilometres downstream of the Project Area.

The BNP and proposed RERR Mining Area are located within the current mining operational area, and have been previously disturbed.

The Project Area is located within a landscape which has been heavily cleared and disturbed over a long period of time predominantly as a result of pastoral and agricultural activities dating from the 1820s.

A review of aerial photographs obtained from the Department of Lands dating from 1958 was undertaken as part of this assessment and shows that prior to 1958 substantial clearing had been undertaken in the Project Area likely as a result of pastoral and agricultural expansion (refer to **Figure 3.13**).

4.2 Site Survey

A targeted approach to site survey was undertaken in order to ground truth:

- the results of the research undertaken and presented in **Section 3.0**;
- the review of previously prepared reports;
- the review of existing topographic maps; and
- previously identified areas of potential.

The targeted site inspection was undertaken on 19 February 2013.

An Aboriginal archaeological survey was undertaken in December 2012 and subsequent Aboriginal archaeological test excavations in March 2013 by Ozark and the Project Registered Aboriginal Parties (RAPs). Additionally, a field survey was undertaken in April 2014 focussing on an additional area of the now proposed North Pit, which was not previously surveyed. No potential historical heritage sites or items were identified during the 2012 or 2014 Aboriginal survey or test excavations.

4.3 Existing Mount Owen Operations and Previous Historic Heritage Studies

There are two existing development consents for the current mining operations located within the Mount Owen and Ravensworth East Mines which are listed in **Table 4.1**.

Table 4.1 – Existing Development Consents for the Mount Owen Complex

Development Consent	Date Approved	Description	Validity	Consent Authority
DA 14-1-2004	8/12/2004	Mount Owen Open Cut Coal Mine	10 Mtpa ROM coal	2025
DA 52-03-99	2/03/2000	Ravensworth East Open Cut Coal Mine	4 Mtpa ROM coal	2021

Previous historical archaeological and heritage studies have been undertaken in association with the existing operations listed in **Table 4.1**. The reports relevant to these previous studies include:

- *Ravensworth East Mine Environmental Impact Statement – European Heritage (Volume 2 Appendix M)*. Prepared by ERM Mitchell McCotter for Ravensworth East Mine (1999).
- *Statement of Heritage Impact and Research Design: Ravensworth East Coal Mine*. Prepared by Umwelt for Ravensworth East Mine (2002).
- *Mt Owen Operations Historic Heritage Assessment*. Prepared by Umwelt for Hunter Valley Coal Corporation (2003).
- *Historical Heritage Assessment for Modification of Glendell Mine Operations*. Prepared by Umwelt for Xstrata Mount Owen (2007).

These studies identified a number of sites within and in the vicinity of the current Project Area. These previously identified sites are listed in **Table 4.2** and presented on **Figure 4.1** in relation to the existing approved development consent boundaries for the Mount Owen Mine and Ravensworth East Mine and in relation to the current Project Area and disturbance area.

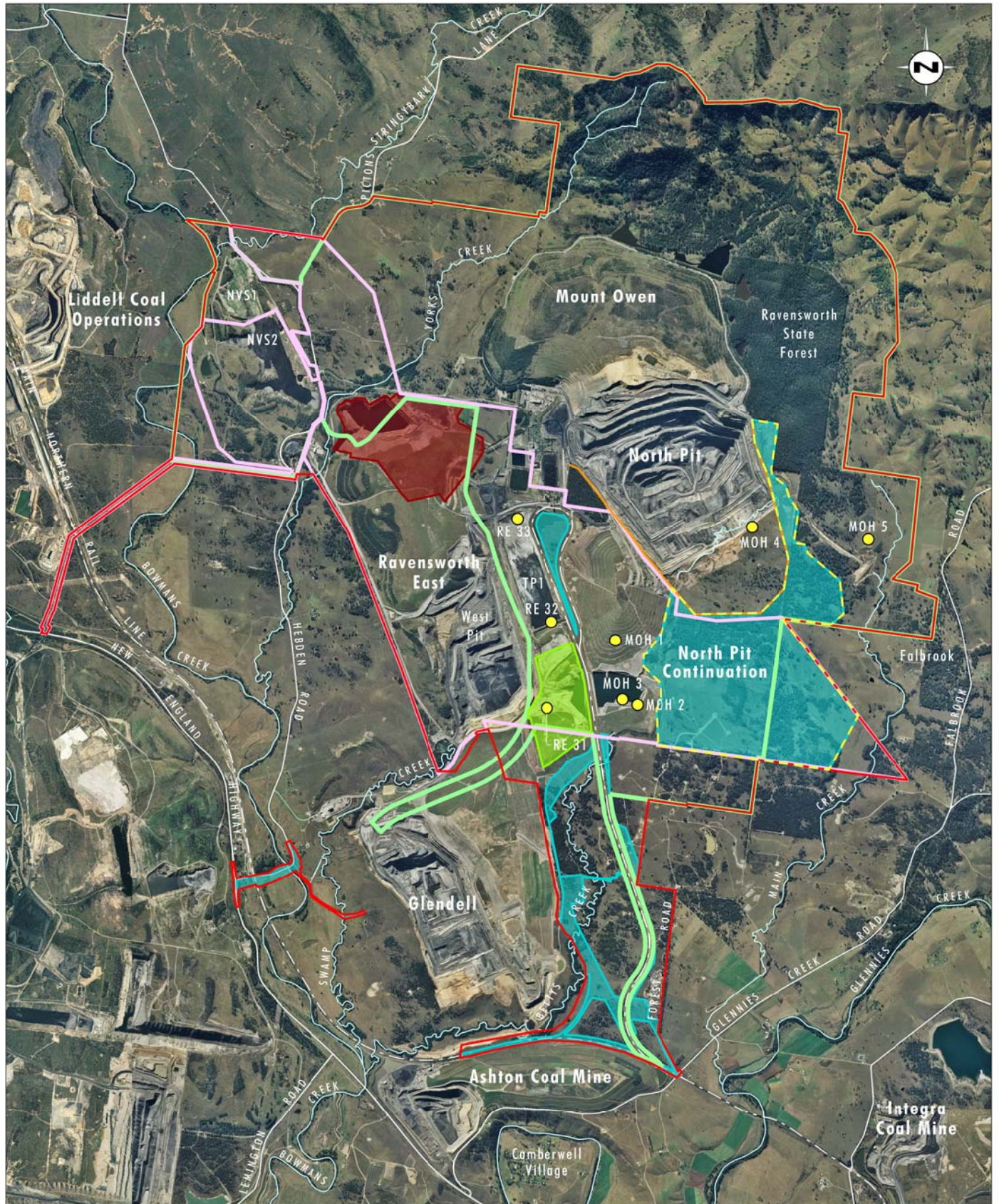


Image Source: Mount Owen (2012-2013)
Data Source: Mount Owen (2014)

0 1 2 3 km
1:60 000

Legend

- Project Area
- Proposed Disturbance Area
- Bayswater North Pit
- Proposed RERR Mining Area
- Ravensworth East Mine DA Boundary (DA 52-03-99)
- Mount Owen Mine DA Boundary (DA 14-1-2004)
- Approved North Pit Mining Extent
- Proposed North Pit Continuation
- Previously Identified Non-listed Heritage Site

FIGURE 4.1

Mount Owen Complex Current and Proposed Operations and Previously Identified Non-listed Heritage Sites

Table 4.2 - Summary of Previously Identified Historical Heritage Sites

Mining Operation	Site	Description
Ravensworth East Coal Mine	RE31	Fence posts, foundation stumps, gate posts
	RE32	Yards and sheep dip
	RE33	Foundations of dwelling and outbuildings
Mount Owen Coal Mine	MOH1	Former dwelling
	MOH2	Former dwelling
	MOH3	Fence posts
	MOH4	Former dairy floor, yards and dwelling
	MOH5	Former homestead and dairy complex

Sites RE31 to RE33 were originally identified as part of the 1999 Environmental Impact Statement prepared for Ravensworth East Mine by ERM Mitchell McCotter (ERM 1999).

The management of these sites has been undertaken in accordance with the relevant approval conditions (as listed in **Table 4.1**) and reported as part of the following reports:

- Sites RE31 to RE33 - *The Historical Archaeology of Ravensworth East Mine, near Singleton, NSW: Excavation and Recording of Sites RE31, RE32 and RE33*. Prepared by Umwelt for Xstrata Mt Owen (2006a).
- Sites MOH1 to MOH5 - *Historical Archaeology: Archival Recording and Excavation, Mt Owen Operations, Singleton, NSW*. Prepared by Umwelt for Xstrata Mount Owen (2006b).

In general, these previously identified and managed sites were representative of early dairy farming in the Upper Hunter in the twentieth century, after F.J.L. Measures subdivided the Ravensworth Estate and sold the subdivided lots to prospective mixed farming and dairy enterprises (refer to **Section 3.3.5**).

Following their excavation and/or recording in accordance with the relevant approval conditions, all of the previously identified sites listed in **Table 4.2** located within the Project Area (RE31 to RE33 and MOH1 to MOH5) have been removed as part of approved works with the exception of MOH5.

Consent Condition 55 of DA 14-1-2004 requires a photographic recording of the condition and integrity of site MOH5 to be undertaken every 5 years. Recording was last undertaken in March 2010. This site was inspected as part of the site inspection for the Project (refer to **Section 4.5**). A comparison of the current condition of the site compared with the previously recorded condition is outside the scope of this assessment. However, apart from the continued natural degradation of the shed, the site appears to be in a similar condition to its 2010 condition (compare **Plates 4.1 to 4.4**).

4.4 Listed Heritage Items within Vicinity of the Project Area

As discussed in **Section 1.2**, several heritage items with a statutory listing are located outside, but within the vicinity of, the Project Area (refer to **Figure 2.1**). These items are summarised in **Table 4.3** (refer to **Table 1.1** for full details).



PLATE 4.1
View to south - MOH5.
Photograph dated January 2010



PLATE 4.2
View to south - MOH5.
Photograph dated February 2013



PLATE 4.3
View to north - MOH5.
Photograph dated January 2010



PLATE 4.4
View to north-east - MOH5.
Photograph dated February 2013

Table 4.3 – Listed Heritage Items Located within Proximity of the Project Area

Item Name	Location	Significance
Ravensthorpe Homestead	463 Hebden Road	Local
Former Chain of Ponds Inn	Old New England Highway, Liddell	State
Middle Falbrook Bridge over Glennies Creek	Middle Falbrook Road, Middle Falbrook	State
Greylands and Outbuildings	665 Gooangoola Road, Greenlands	Local
Ravensthorpe Public School	Hebden Road/New England Highway	Local
St. Clements Anglican Church	20 Glennies Creek Road, Camberwell	Local
Community Hall	3 Lethbridge Street, Camberwell	Local
Camberwell Glennies Creek Underbridge	Camberwell	Local
Former Dulwich Homestead (Kangaroo Homestead)	485 Middle Falbrook Road, Glennies Creek	Local

The heritage items identified in **Table 4.3** are not within the Project Area and will not be directly impacted by the Project. Potential indirect impacts in relation to vibration from blasting are considered in **Section 6.3**. Several of these items are in close proximity to the boundary of the Project Area. The listed heritage items are briefly discussed below.

4.4.1 Ravensworth Homestead

Ravensthorpe Homestead has a Statutory Heritage listing of local significance on the Singleton Local Environmental Plan 2013. Although not listed on the SHR, Ravensthorpe Homestead was assessed as being State significant in the *Ravensthorpe Homestead and Farm Complex Structural and Material Condition Report* (EJE Architecture 1997).

In a 1982 study of the Nineteenth Century Buildings of the Hunter Region (Sheedy 1982), nine homestead complexes are identified as being outstanding. These outstanding homesteads include Ravensthorpe Homestead and Wambo Homestead at Warkworth. All nine of the homesteads identified as outstanding by Sheedy remain today (GML 2010:52). In 2010 Godden Makay Logan undertook a survey of listed colonial homesteads in the Hunter Region. Ravensthorpe was identified as one of most significant of the 23 remaining comparable homestead complexes which retain both the original residence and outbuildings (GML 2010).

Ravensthorpe Homestead is located approximately 700 metres to the west of the Project Area boundary, over 1.6 kilometres south-west of the BNP, over 2.4 kilometres west of the proposed RERR Mining Area and approximately 4 kilometres to the west of the North Pit Continuation and as such is unlikely to be directly or indirectly impacted as part of the Project (refer to **Figure 2.1**). Ravensthorpe Homestead is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

4.4.2 Former Chain of Ponds Inn

As discussed in **Section 3.5.4.1**, the Chain of Ponds Inn was built in the 1840s by Henry Nowland. It has also been known as The Halfway House, standing halfway between Muswellbrook and Singleton on what was then the New England Highway. The hotel served as an inn for the coach and horse borne traffic in the mid nineteenth century between Morpeth and Tamworth.

The Chain of Ponds Inn and its outbuildings are assessed as being of State significance as an:

.. inn complex which is historically significant as a rare survivor of such complexes which served the coach and horse borne traffic in the mid nineteenth century between Morpeth and Tamworth. The hotel is architecturally significant as a late example of the Georgian Regency style. The stone outbuilding, believed to be a farm house which predates the hotel, and the brick stables, possibly a former mounted police barracks, are also significant as examples of that style. Also of interest as part of the complex are the remains, including brick paving, of timber stables and a domed well in the hotel courtyard (RNE Place ID 1440).

The site of the former Police Lock-up associated with the Chain of Ponds Inn is likely to have been located directly to the south of the inn and for the purposes of this report is considered as being part of the same site.

The former Chain of Ponds Inn and former Police Lock-up site are located over 2 kilometres to the south-west of the Project Area boundary, approximately 1 kilometre to the west of the existing Ravensworth East conveyor, over 4.2 kilometres west of the BNP, over 6.3 kilometres west of the proposed RERR Mining Area and over 7.3 kilometres to the west of the North Pit Continuation and as such is unlikely to be directly or indirectly impacted as part of the project (refer to **Figure 2.1**). The former Chain of Ponds Inn and Police Lock-up site is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

The former Chain of Ponds Inn is currently being managed in accordance with Liddell Coal Operations - Meteorological Assessment, Blast Monitoring and Reporting Procedure.

4.4.3 Middle Falbrook Bridge over Glennies Creek

The Middle Falbrook Bridge is a DeBurgh timber truss road bridge completed in 1904. DeBurgh trusses were fourth in the five stage design evolution of NSW timber truss road bridges. Designed by Public Works engineer Ernest M. DeBurgh, the DeBurgh truss is an adaptation of the American Pratt truss design. The DeBurgh truss is the first to use significant amounts of steel and iron, and did so in spite of its high cost and the government's historical preference for timber.

The Middle Falbrook Bridge is a representative example of DeBurgh timber truss road bridges, and is assessed as being State significant, primarily on the basis of its technical and historical significance (State Heritage Register Listing 01474).

Middle Falbrook Bridge is located approximately 3 kilometres to the south-east of the Project Area boundary, over 8.3 kilometres south-east of the BNP, over 5.5 kilometres south-east of the proposed RERR Mining Area and over 3.3 kilometres to the south-east of the North Pit Continuation and as such is unlikely to be directly or indirectly impacted as part of the Project (refer to **Figure 2.1**). The Middle Falbrook Bridge is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

4.4.4 Greylands and Outbuildings

Greylands Homestead Complex and Outbuildings has been identified as a Hunter Homestead dating from between 1850 and 1900 and is assessed as being of local significance (Godden Mackay Logan 2010 Appendix B).

Greylands is located over 4 kilometres to the east of the northern Project Area boundary, over 8.9 kilometres north-east of the BNP, over 9.1 kilometres north-east of the proposed

RERR Mining Area and over 6.3 kilometres to the north-east of the North Pit Continuation and as such is unlikely to be directly or indirectly impacted as part of the Project (refer to **Figure 2.1**). Greylands Homestead is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

4.4.5 Ravensworth Public School

Ravensworth Public School is a listed heritage item within the immediate vicinity of the Proposed Disturbance Area (approximately 10 metres to the north), assessed as being of local significance (refer to **Figures 1.3** and **3.6** and **Plates 4.5** and **4.6**).

The extant Ravensworth School building opened in 1880 and closed in December 1986 (refer to **Section 3.4.2**).

Ravensworth Public School is located immediately adjacent to the Project Area boundary and the proposed Hebden Road rail overpass works (refer to **Figure 3.6**). The school is located over 4.5 kilometres south-west of the BNP, over 3.5 kilometres south-west of the proposed RERR Mining Area and over 4.9 kilometres to the south-west of the North Pit Continuation (refer to **Figure 2.1**). Ravensworth Public School is unlikely to be directly or indirectly impacted as part of the Project. Potential impacts are considered in **Section 6.3**.

4.4.6 St. Clements Anglican Church

St Clements Anglican Church is listed as being of local significance. The church is located approximately 1.5 kilometres to the south of the southern Project Area boundary, over 7.6 kilometres south of the BNP, over 4.7 kilometres south of the proposed RERR Mining Area and approximately 5.4 kilometres to the south-west of the North Pit Continuation and as such is unlikely to be directly or indirectly impacted as part of the Project (refer to **Figure 2.1**). St Clements Anglican Church is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

4.4.7 Community Hall

The Community Hall is listed as being of local significance. The hall is located over 2 kilometres to the south of the southern Project Area boundary, over 8.1 kilometres south of the BNP, over 5.1 kilometres south of the proposed RERR Mining Area and over 5.7 kilometres to the south-west of the North Pit Continuation and as such is unlikely to be directly or indirectly impacted as part of the Project (refer to **Figure 2.1**). The Community Hall is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

4.4.8 Camberwell Glennies Creek Underbridge

The original, single track timber bridge crossing Glennies Creek was built in 1869. By the turn of the century the condition of the timber bridge warranted replacement. A heavy duty bridge was constructed to carry twice the locomotive weight and to have double tracks to allow for future duplication. Completed in 1908, the Glennies Creek Bridge operated as a single track bridge until duplication of the line in 1952.

By the early 1900s the changeover from British to American bridge technology was complete. Glennies Creek truss bridge was the last of the transition series of American-type steel Pratt trusses. Thereafter, American-type Pratt trusses became standard on the NSW railway system.



PLATE 4.5
View to south - 1880 and 1971
constructed Ravensworth Public School buildings



PLATE 4.6
View to south-east - 1880 constructed
Ravensworth Public School building



PLATE 4.7
Former Hebden Public School site



PLATE 4.8
Former Hebden Public School site

The locally listed curtilage includes the bridge structure and extends for a distance of 20 metres in all directions (NSW State Heritage Inventory listing sheet).

Camberwell Glennies Creek Underbridge is located approximately 1 kilometre to the south-east of the south-eastern corner of the Project Area, over 7.7 kilometres south-east of the BNP, over 4.6 kilometres south-east of the proposed RERR Mining Area and over 4.1 kilometres to the south of the North Pit Continuation (refer to **Figure 2.1**). As such it is unlikely to be directly or indirectly impacted as part of the Project. The Camberwell Glennies Creek Underbridge is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

4.4.9 Former Dulwich Homestead (Kangory Homestead)

As discussed in **Table 3.1**, the 1828 census lists James Glennie as a Farmer of Dulwich at Patrick Plains with 2,080 acres of land and 21 convicts assigned to him. James Glennie arrived as a free settler in Australia on the *Guildford* in 1824 and was promised the land that became the Dulwich Estate by Sir Thomas Brisbane. Glennie is reported to have been allocated 100 convicts to clear the land and used the timber to make post and rail fences, a slab house and outbuildings. Glennie's first homestead was likely located closer to Falbrook Creek than a new house built around 1832 in the vicinity of the existing homestead. The current listed homestead was built by Thomas Ware Smart. Smart purchased the Dulwich Estate in 1876 as his country estate and built the existing homestead, stables and outbuildings (Umwelt 2011:8-10).

Dulwich Homestead (now named Kangory Homestead) is listed as being of local significance. The homestead is located approximately 2.25 kilometres to the south-east of the south-eastern corner of the Project Area boundary, over 8.9 kilometres south-east of the BNP, over 5.8 kilometres south-east of the proposed RERR Mining Area and over 5.1 kilometres to the south of the North Pit Continuation and as such is unlikely to be directly or indirectly impacted as part of the Project (refer to **Figure 2.1**). The homestead is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

4.5 Non Listed Potential Historical Heritage Items Identified within and in Immediate Vicinity of the Project Area

Table 4.4 identifies the potential historical heritage sites/items with no statutory listing present within and immediate vicinity of the Project Area. The location of the sites/items is shown on **Figure 4.2**.

A number of the sites comprise previously identified areas or sites which are known to contain or have the potential to contain historical heritage items and/or archaeological 'relics'. These comprise the former Hebden Road Public School, the John Winter Memorial site, a former Cobb and Co. route and the Ravensworth Village area.

Additionally, sites MOH6 to MOH12 are potential new sites identified during the preparation of this assessment and inspected as part of the site survey. The MOH (Mount Owen Historical) site naming convention utilised during the preparation of the 2003 Historic Heritage Assessment (Umwelt 2003) has been retained for these sites. Sites/items with existing names (for example the Ravensworth Village area) have retained their names rather than being renumbered/renamed.

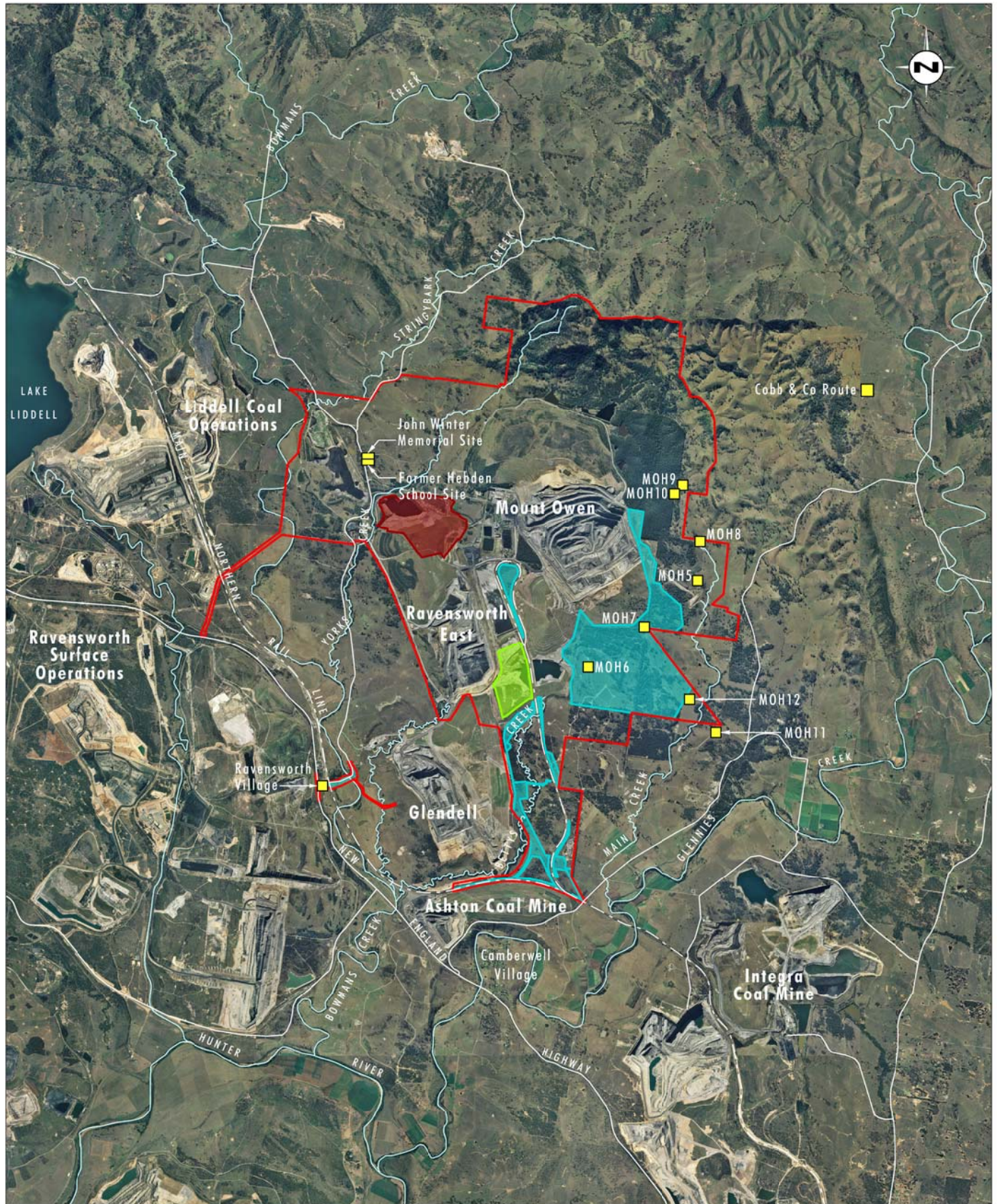


Image Source: Mount Owen (2012-2013)
Data Source: Mount Owen (2014)

0 1.0 2.5 5.0km
1:100 000

Legend

- Project Area
- Proposed Disturbance Area
- Bayswater North Pit
- Proposed RERR Mining Area
- Identified Potential Heritage Sites

FIGURE 4.2

Identified Potential
Non-listed Heritage Sites

Table 4.4 – Potential Historical Heritage Items Identified within and in the Vicinity of the Project Area

Item Name	Description	Location	Coordinates
Hebden Public School site	Former 1912 public school site	Hebden Road. Within Project Area – approximately 880 metres north-west of BNP, approximately 4.4 kilometres north-west of proposed RERR Mining Area and approximately 5 kilometres north-west of North Pit Continuation.	318020/6415052
John Winter memorial site	Memorial and potential grave site	Hebden Road. Within Project Area – approximately 880 metres north-west of BNP, approximately 4.4 kilometres north-west of proposed RERR Mining Area and approximately 5 kilometres north-west of North Pit Continuation.	318070/6415101
Cobb & Co. route	Potential location of a former Cobb & Co. route	West of Goorangoola Road. Outside Project Area – approximately 2.8 kilometres to north-west of the Project area, approximately 4.7 kilometres north-east of North Pit Continuation, approximately 7.8 kilometres north-east of BNP and approximately 8 kilometres north-east of proposed RERR Mining Area.	327331/6416346
Ravensworth Village	Former Ravensworth Village	South side of Hebden Road at intersection with New England Highway. Within Project disturbance area – construction of Hebden Road rail overpass. Approximately 4.6 kilometres south-west of BNP, approximately 3.6 kilometres south-west of proposed RERR Mining Area, and approximately 4.6 kilometres south-west of North Pit Continuation.	317270/6408945 (= central point in village area)

Table 4.4 – Potential Historical Heritage Items Identified within and in the Vicinity of the Project Area (cont.)

Item Name	Description	Location	Coordinates
MOH6	Former House/dairy site	Within North Pit Continuation. Approximately 3.6 kilometres south-east of BNP and approximately 1.2 kilometres east of proposed RERR Mining Area.	322162/6411204 (former house location)
MOH7	Timber yards and shed	Within North Pit Continuation. Approximately 4 kilometres south-east of BNP and approximately 2.3 kilometres north-east of proposed RERR Mining Area.	323196/6411953
MOH8	Timber yards	Approximately 4.5 kilometres east of BNP, 3.9 kilometres north-east of proposed RERR Mining Area and approximately 1 kilometre east of North Pit Continuation – within Project Area.	324238/6413531
MOH9	Timber yard/house site	Approximately 4.2 kilometres north-east of BNP, 4.3 kilometres north-east of proposed RERR Mining Area and approximately 900 metres east of North Pit Continuation – within Project Area. Within existing biodiversity offset area.	323919/6414582 (timber yards location)
MOH10	Timber loading ramp	Approximately 4 kilometres north-east of BNP, 4.1 kilometres north-east of proposed RERR Mining Area and approximately 700 metres east of North Pit Continuation – within Project Area. Within Ravensworth State Forest.	323764/6414421

Table 4.4 – Potential Historical Heritage Items Identified within and in the Vicinity of the Project Area (cont.)

Item Name	Description	Location	Coordinates
MOH11	Former House/dairy site	Outside Project Area – Approximately 6.1 kilometres south-east of BNP, approximately 3.5 kilometres south-east of proposed RERR Mining Area, approximately 800 metres south-east of North Pit Continuation.	324529/6409998
MOH12	Former house site	No significance with no research potential.	Falbrook Road, Falbrook. Within Project Area – approximately 5.4 kilometres south-east of BNP, approximately 3 kilometres east of proposed RERR Mining Area, and approximately 80 metres outside south-east boundary of North Pit Continuation.

4.5.1 Former Hebden Public School

The former Hebden Public School site is within the north-west corner of the Project Area approximately 880 metres to the north-west of the BNP, approximately 4.4 kilometres to the north-west of the proposed RERR Mining Area and approximately 5 kilometres to the north-west of the North Pit Continuation and as such will not be directly impacted as part of the Project (refer to **Figure 4.2** and **Plates 4.7** to **4.9**). The site is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

The former Hebden Public School was opened in October 1912 and closed in December 1973 (NSW Department of Education and Communities). A minimum attendance of twenty children was required at this public school until 1957 when the number was reduced to nine. Various records and registers are available relating to the school including the Register of Admission, Observation Books, Punishment Book and Visitors' Books. Visitors recorded in these records include the Bishop of Newcastle on 13 July 1927 (NSW Department of Education and Communities).

The former school site comprises a small weatherboard structure (the school building) built on timber piers with a corrugated iron roof, timber floor and external brick chimney. The school building comprises a single classroom and foyer. The locations of other former structures are evident by the presence of areas of remnant timber flooring, concrete piers, concrete slabs and evidence of landscaping such as concrete pathways. The site is enclosed by a relatively recently constructed steel post and wire fence.



PLATE 4.9
Former Hebden Public School site and John Winter Memorial



PLATE 4.10
John Winter Memorial detail



PLATE 4.11
View to north Ravensworth Village
animal enclosure



PLATE 4.12
View to south Ravensworth Village
former Ravensworth Park

4.5.2 John Winter Memorial Site

The John Winter memorial site is within the north-west corner of the Project Area approximately 880 metres to the north-west of the BNP, approximately 4.4 kilometres to the north-west of the proposed RERR Mining Area and approximately 5 kilometres to the north-west of, the North Pit Continuation and as such will not be directly impacted as part of the Project (refer to **Figure 4.2** and **Plates 4.9** and **4.10**). The site is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

The site comprises a terrazzo headstone and monument, located immediately adjacent to the former Hebden Public School site (refer to **Figure 4.2** and **Plate 4.9**). The headstone inscription indicates the grave is the resting place of John Winter 'Pioneer of Canberra' who died at Hebden in 1928. No other graves or memorials are evident in the area.

John Winter is recorded as dying at Ravensworth in 1928 at the age of ninety seven and being buried in the Church of England cemetery at Hebden. He was a prominent early settler and landholder in the Gungaharra region and recognised as being part of one of Canberra's pioneer families (ACT Heritage Council 2011). John Winter was born at Barnet, Buckinghamshire, England in 1832 and arrived in Australia on the *Blenheim* in 1855. On arrival in Sydney he travelled on foot through the Hunter Valley to Kentucky, New England. In Kentucky he prospered working as a mower in an area where good mowers were scarce as a result of the gold rush. He eventually worked his way south until he reached Canberra. On arrival he is recorded as saying 'this is the place for me'. He selected land there; calling it Red Hill (now known as Gungaharra). On 13 June 1861 John Winter married Jemima McPherson and had eight children; four sons and four daughters (Shumack 1967).

John Winter added to his Red Hill property until he owned approximately 1,000 acres. After the Federal Government resumed the land he moved to Ravensworth and lived with his daughter Sarah until his death (Shumack 1967).

As a result of the distance of the memorial site from the proposed project disturbance area and lack of potential direct impacts, further detailed research and analysis has not been undertaken for this site as part of this report.

4.5.3 Cobb & Co Route

Mount Owen's engagement program that has been ongoing as part of the environmental impact assessment and approval process allows the opportunity for the community to provide information to Mount Owen for consideration in project planning, to identify community needs, concerns and opportunities and to be involved in the environmental and social assessment process.

A Cobb & Co. route has been identified by a community member during Mount Owen community engagement. Evidence for a Cobb & Co. route in this location is only likely to remain in the form of oral and documented history and cadastral information. The site is located approximately 3 kilometres to the east of the Project Area boundary, approximately 7.8 kilometres to the north-east of the BNP, approximately 8 kilometres to the north-east of the proposed RERR Mining Area and approximately 4.7 kilometres to the north-east of the North Pit Continuation (refer to **Figure 4.2**). There is unlikely to be any physical remains present in the identified location and the former Cobb & Co. route is unlikely to be directly or indirectly impacted as part of the Project. The location is considered in relation to potential indirect impacts resulting from vibration from blasting in **Section 6.3**.

As a result of the identified Cobb & Co. route being located outside the Project Area boundary and lack of potential impacts, further detailed research and analysis has not been undertaken for this site as part of this report.

4.5.4 Ravensworth Village

Ravensworth Village is located at the corner of the New England Highway and Hebden Road (refer to **Figure 4.2**). As discussed in **Section 3.4.1** the area of the Village once included a school, train station, store, community hall and several other buildings. The listed Ravensworth Public School and an adjacent weatherboard house, both located on the north side of Hebden Road, are the only structures remaining in the village area. With the exception of the train station and associated structures (station building, post office etc) all other buildings are likely to have been located in the area to the south of Hebden Road (refer to **Section 3.4**). Potential impacts to the listed former school building are considered in **Section 6.2**.

The Ravensworth Village area on the south side of Hebden Road comprises of approximately 25 lots and a road. An approximately 180 by 100 metre area of the former village located to the south of Hebden Road will be impacted as a result of the proposed Hebden Road rail overpass. Of the 25 village lots, 18 lots and 5 partial lots are within the Project Area and Project disturbance area on the south side of Hebden Road (refer to **Figure 4.3** and **Plates 4.11 to 4.14**). The only extant structures within the Ravensworth Village area (on the south side of Hebden Road) include an Air Quality Monitoring Station, a telecom telephone exchange and small animal enclosure (including corrugated iron shelter and timber sheep ramp) (refer to **Figure 4.3** and **Plate 4.11**).

The area has the potential for sub-surface evidence of:

- late 1800s - 1897 wine shop and associated buildings (potentially including cellars) – likely located in the area of Lot 16 DP 38725;
- early 1900s wine shop and associated buildings constructed following destruction of earlier shop by fire in 1897 (including sheds, cellars, stables and blacksmith's shop) – likely located on Lot 16 DP 38725 and shown on the 1958 aerial (refer to **Figures 3.9** and **4.4**);
- fettler's huts and tents;
- 1930s constructed community hall; and
- post 1950s constructed houses.

The late 1800s - 1897 wine shop and the early 1900s wine shop that replaced the earlier structure were likely located in the area of Lot 16 DP 38725. Although no above ground evidence for these structures survives there is potential for an archaeological resource associated with these former structures and their associated buildings (sheds, cellars, stables and blacksmith's shop), features (cesspits/privies, rubbish pits and bottle dumps) and artefacts.

There is no evidence on site of the fettlers' huts that are likely to have been located within the area of the former village. The huts would have been of a temporary construction and any archaeological evidence would be ephemeral in nature. With the exception of the location of the huts indicated on the 1889 Plan of Ravensworth Village (refer to **Figure 3.7**), it would be impossible to specify what such remains may entail and where they would be located. One of the former locations of the huts indicated on the 1889 Plan is within the disturbance area of the proposed Hebden Road rail overpass works (refer to **Figure 4.4**). However, this area



PLATE 4.13
View to south-west Ravensworth Village
former Ravensworth Park lots and
steps up to location of former Community Hall



PLATE 4.14
View to west Ravensworth Village
potential location of Wolfgang's store
(Lot 2 DP793886 and Lot 16 DP 38725)



PLATE 4.15
View to west site MOH6
former house site



PLATE 4.16
View to west site MOH6
remnant timber yards



Image Source: Mount Owen (2012)
Data Source: Mount Owen (2014)

0 20 40 80m
1:1 500

Legend

- Project Area
- - Proposed Disturbance Area
- ▨ Former Community Hall Site
- ▨ Former Ravensworth Park Site
- ▨ Potential Location of Wolfgang's 1880s and 1900s Stores and Outbuildings

FIGURE 4.3

Ravensworth Village

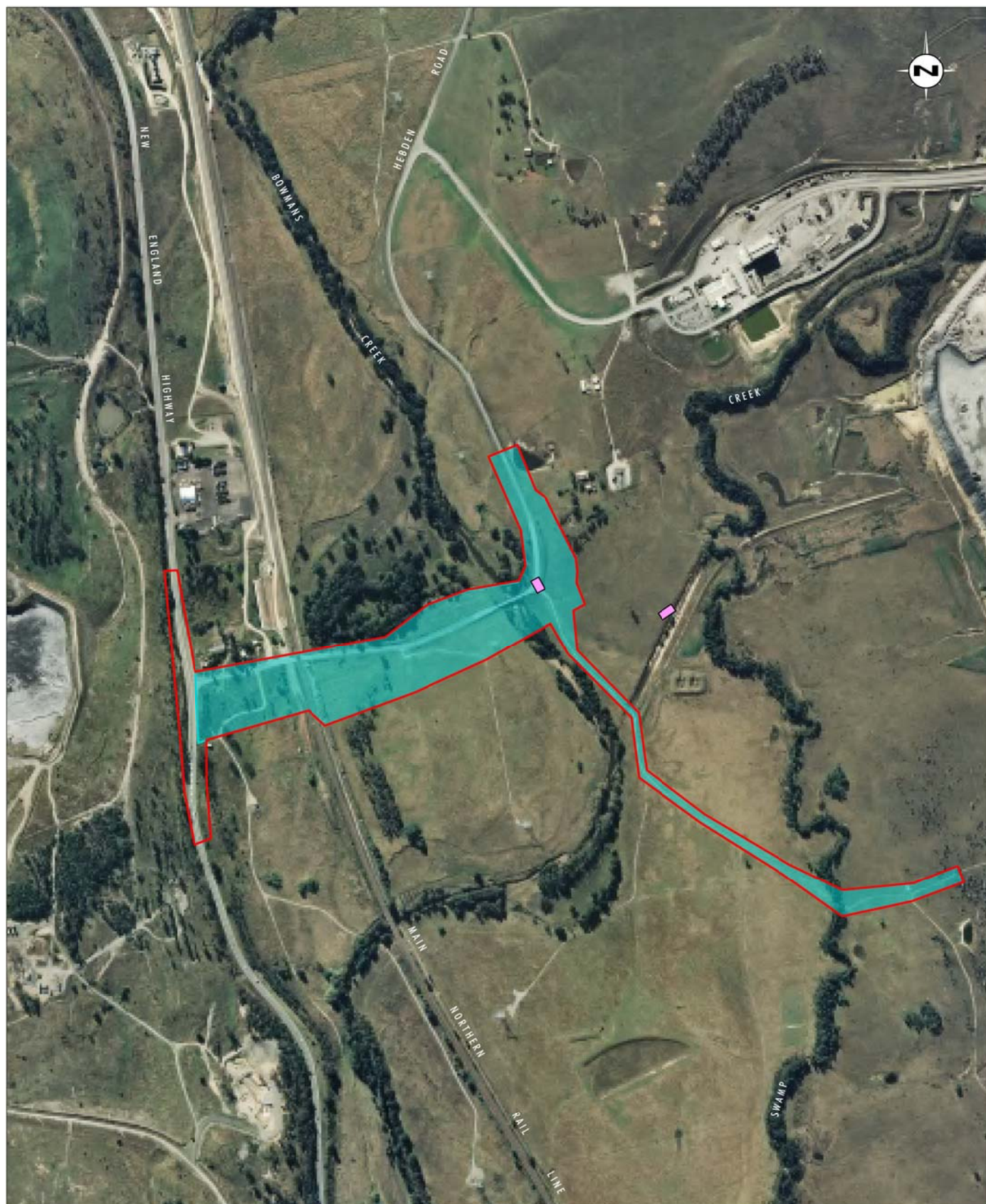


Image Source: Mount Owen (2013)
 Data Source: Mount Owen (2014),
 National Library of Australia MAP Folder 144, LFSP 2308

0 100 250 500m
 1:10 000

Legend

- Project Area
- Proposed Disturbance Area
- Approximate Location of Huts

FIGURE 4.4

Approximate location of
 1889 Ravensworth Village Huts

is located at the junction of current Hebden Road and a track leading to the south and is also immediately adjacent to the current crossing of Bowmans Creek. As a result, the area has previously been disturbed and there are unlikely to be any remains of the hut, which as discussed is likely to have been of a temporary construction with little potential for any intact archaeological resource.

The community hall was built in the 1930s and was likely constructed from timber raised on piers. Apart from the extant concrete steps leading up to the former location of the Community Hall from the former Ravensworth Park lot there is no evidence of the structure left on site (refer to **Plate 4.13**). There is unlikely to be any potential archaeological resource associated with the former community hall.

The area has been extensively ripped and planted since the demolition of any structures previously extant in the area. A telephone exchange and air quality monitoring station have been constructed and there are a number of communication cables through the area. The former Ravensworth Park lots (Lots 4, 5, 6 and 21 DP 38725) have been levelled and there are extant concrete steps leading up to the former location of the Community Hall (refer to **Figure 4.3** and **Plates 4.12** and **4.13**). The likely location of the former wine shop (Lot 16 DP 38725) has been ripped and planted and there is no evidence of any former occupation (refer to **Plate 4.14**). Note that no surface artefacts or evidence of a bottle dump were identified during the site survey.

4.5.5 Site MOH6 – Former House Site

Site MOH6 comprises a former house site located within the North Pit Continuation (refer to **Figure 4.2** and **Plates 4.15** to **4.18**). The former house is evident by an approximately 10.5 by 7 metre area of concrete slab footing with remnant single width brick walls (refer to **Plate 4.15**). Associated with the slab is assorted domestic debris including a television, oven and washing machine. The house site is part of an approximately 175 metre long area containing derelict timber yards and sheep ramp, concrete slab with concrete machine bases, concrete water tank with PVC piping, demolition rubble and a timber frame enclosure/chicken coop (refer to **Plates 4.16** to **4.18**).

4.5.6 Site MOH7 – Timber Yards

Site MOH7 comprises an area of timber yards and a small corrugated iron shed located within the North Pit Continuation (refer to **Figure 4.2** and **Plates 4.19** to **4.21**). The yards are predominantly constructed of cut timber (not split or sawn) and branches and occasional split timber. The yards comprise a post and four rail construction, however the mortises are not through mortises and the rails are fixed to the posts using wire. The gates are all constructed with cut timber. The simple timber framed corrugated iron clad shed measures approximately 7 by 4 metres and is located approximately 60 metres to the west of the yard area. The fencing associated with the yard and shed area is timber and metal post with wire fencing.

4.5.7 Site MOH8 – Timber Yards

Site MOH8 comprises an area of timber yards located on the edge of a creek located within the Project Area and outside the BNP (approximately 4.5 kilometres to the east), the proposed RERR Mining Area (approximately 3.9 kilometres to the north-east) and the North Pit Continuation (approximately 1 kilometre to the east) (refer to **Figure 4.2** and **Plates 4.22** to **4.24**). Site MOH8 is located immediately outside (to the north-east of) an existing biodiversity offset area. The site comprises a large (approximately 32 by 20 metre) post and wire enclosure with a smaller area of yards (measuring approximately 12 by 10 metres and including a loading ramp) located in the north-east corner of the enclosure. The small area



PLATE 4.17
View to west site MOH6
demolition rubble



PLATE 4.18
View to west site MOH6
timber frame



PLATE 4.19
View to south-east site MOH7
timber yards



PLATE 4.20
View to south-east site MOH7
timber yards and shed



PLATE 4.21
View to south-east site MOH7
shed



PLATE 4.22
View to south-east site MOH8
enclosure and yards



PLATE 4.23
View to west site MOH8
enclosure and yards



PLATE 4.24
View to south-west site MOH8
yards

of post and three rail yards is constructed using cut timber (not split or sawn) and branches. The rails are fixed to the posts using wire. A track now crosses the area of yards.

Site MOH8 is in the approximate location of 'Russell's Station' as marked on an *1855 Plan of 2 Sections of Land: County of Durham; Parish of Vane* (refer to **Figure 4.5**). The site is also marked as 'yards' on the topographic map. The area of land is marked on the 1855 plan as then belonging to William Russell (refer to **Section 3.3.2**). No evidence of 'Russell's Station' was evident on site and the extant yards are very unlikely to date to the 1850s. 'Russell's Station' is likely to have been a small pastoral outstation associated with the wider Ravensworth Estate when it was owned by William Russell.

4.5.8 Site MOH9 - Timber Yards and Potential House Site

Site MOH9 comprises an area of timber yards adjacent to a fenced former house site located within the Project Area and outside the BNP (approximately 4.2 kilometres to the north-east), the proposed RERR Mining Area (approximately 4.3 kilometres to the north-east) and the North Pit Continuation (approximately 900 metres to the north-east) (refer to **Figure 4.2** and **Plates 4.25** to **4.28**). Site MOH9 is located within an existing biodiversity offset area. The yards measure approximately 30 by 25 metres and comprise an enclosure of post and two rail fencing with an area of post and three (or four) rail yards and loading ramp in the south-east corner. The timbers are both sawn and split and the rails are fixed to the posts using wire (refer to **Plate 4.26**).

The house site comprises a large gated area enclosed with a timber post, wire and wire mesh (chicken wire) fence (refer to **Plate 4.27**). The gate includes a timber cattle grid. Within the fenced area is a raised concrete slab measuring approximately 8 by 5 metres with a concrete ramp on the southern side and an area of garden edging (refer to **Plate 4.28**). Elsewhere within the fenced area is evidence of concrete machine bases and PVC piping. There are three dams located to the east of the fenced area. A telephone line terminates at the site.

4.5.9 Site MOH10 – Timber Loading Ramp

Site MOH10 comprises a long loading ramp located within Ravensworth State Forest and close to Site MOH9 (refer to **Figure 4.2** and **Plate 4.29**). The site is located within the Project Area (in Ravensworth State Forest) and outside the BNP (approximately 4 kilometres to the north-east), the proposed RERR Mining Area (approximately 4.1 kilometres to the north-east) and the North Pit Continuation (approximately 700 metres to the north-east). The ramp is approximately 12 metres in length and is located along an existing track. While the ramp is unlikely to relate to early timber getting in the area, at the time of writing this report the exact function of the ramp is unknown. The ramp comprises of two tree trunks laid on top of low timber piers and secured to an upright timber post at either end. A low rubble and earth ramp has been constructed behind the timber structure.

4.5.10 Site MOH11 – Former House and Pastoral Site

Site MOH11 is a former house and pastoral site covering an area measuring approximately 80 by 40 metres located alongside an existing track from the junction of Glennies Creek and Falbrook Road to the east of Main Creek (refer to **Figure 4.2** and **Plates 4.30** to **4.33**). The site is located outside the Project Area, approximately 6.1 kilometres to the south-east of BNP, approximately 3.5 kilometres to the south-east of proposed RERR Mining Area and approximately 800 metres to the south-east of the North Pit Continuation.



PLATE 4.25
View to north-west site MOH9
yards

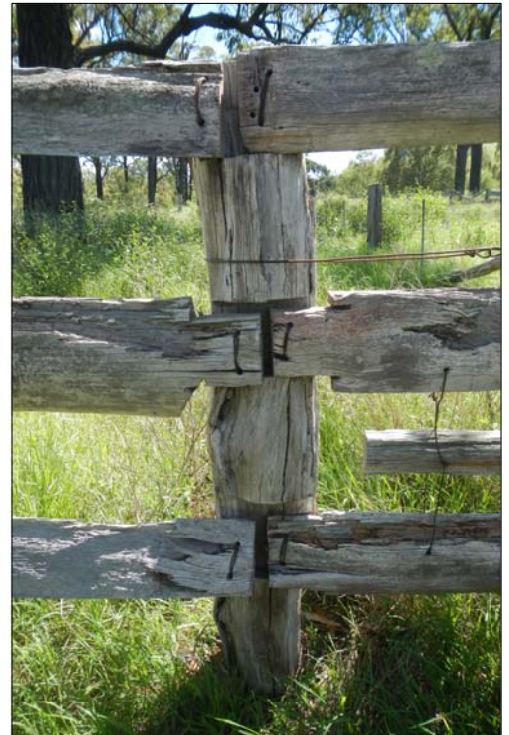


PLATE 4.26
View to west site MOH9
yards



PLATE 4.27
View to south site MOH9
gate



PLATE 4.28
View to north-east site MOH9
concrete slab



PLATE 4.29
View to north-west site MOH10
timber loading ramp



PLATE 4.30
View to south site MOH11
brick chimney and concrete slab



PLATE 4.31
View to south-west site MOH11
yards and brick chimney



PLATE 4.32
View to east site MOH11
sheep dip

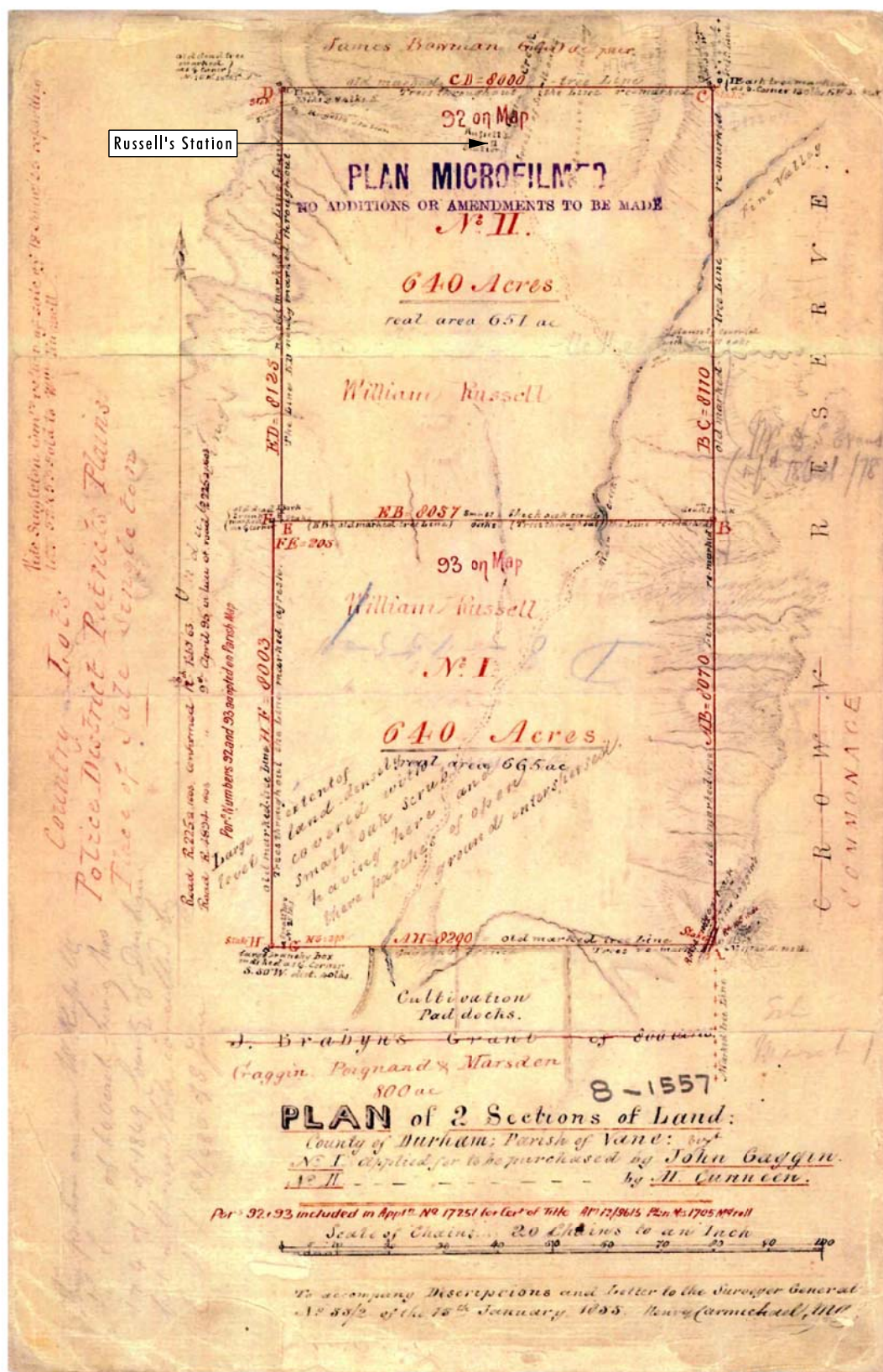


FIGURE 4.5

1855 Plan of 2 Sections of Land County of Durham, Parish of Vane

The site comprises:

- A former small house site including extant brick chimney and concrete slab measuring approximately 5 by 4 metres (refer to **Plates 4.30 to 4.31**).
- A derelict timber yard with a mature pepper tree (pepper trees are generally an indicator of an early rural property) associated with a sheep dip and loading ramp (refer to **Plates 4.32 to 4.34**). The sheep dip is brick built with cement render.
- A timber and metal constructed yard complex with evidence of three phases/periods of yard construction (refer to **Plate 4.31**).
- A series of raised corrugated iron tanks with concrete lined interiors.
- A number of exotic plantings.

Site MOH11 may date to the early twentieth century when the larger estates were being subdivided and purchased by graziers and farmers or when soldiers were given small holdings and government assistance after the World War I to establish small agricultural businesses, such as dairy farms.

4.5.11 Site MOH12 – Former House Site

Site MOH12 comprises a former house site identified within the Project Area and immediately adjacent to (outside) the North Pit Continuation by Glencore representatives in 2012 (refer to **Figure 4.2** and **Plate 4.34**).

The former house site comprises a remnant brick chimney and associated concrete slab; likely the remains of an early twentieth century farmstead or house site. Apart from the extant brick chimney and associated plantings (Oleander, citrus and peach trees) and a concrete slab (a 3 by 3 metre L-shaped slab) there is no other evidence located on the surface. A similar site located approximately 2 kilometres to the north (MOH5) comprises a similar brick chimney with extant timber pier footings indicating the former house is likely to have had timber footings and a raised timber floor.

4.6 Potential Other Sites/Items

4.6.1 Fence Lines and Rural Infrastructure

Rural fences have been built by landholders in NSW since first settlement in 1788. Fences were constructed to mark boundaries, exclude or enclose stock and to facilitate management. They can provide insights into the sequence of land settlement, the development of technology and legislation, environmental changes and the hopes and aspirations of settlers in the Hunter region (Pickard 2009:3). Nineteenth century land legislation in NSW required the fencing of conditional purchase and conditional leases. The post and rail fence is the most iconic of rural NSW fences, however it was expensive and required skill to construct. The use of wire in fencing came about as a way of saving costs (longer panels could be used resulting in fewer posts), as well as being a simpler and faster method of construction.

Based on knowledge of the past use of the land, there may be as yet unidentified evidence of fencing and other rural infrastructure within the Project Area. However, any additional, as yet unidentified, fencing and other rural infrastructure that may be present within the Project Area is likely to be similar to those items identified within the Project Area and already described in



PLATE 4.33
View to east site MOH11
sheep dip



PLATE 4.34
View to south site MOH12 brick chimney
(scale = 2 metres)

this section and are therefore not considered to change the impact assessment findings and management strategy outlined in **Section 6.0**.

4.7 Summary of Historical, Archaeological and Physical Contexts

The potential heritage resource of the Project Area generally reflects the documented history of the surrounding region (discussed in **Section 3.0**) which indicates that the land has predominantly been utilised by graziers, agriculturalists and in recent times the mining industry. The potential historical heritage resource of the area generally reflects its history as cleared agricultural and pastoral land and the importance of dairying as a land use. The resource, with the exception of the Ravensworth Village area, is considered to be typical of the region.

The historical heritage evidence of the Project Area demonstrates the documented pattern of settlement and use from the early to mid nineteenth century, including its settlement by Europeans and subsequent use of the land for pastoral and agricultural activities. Sheep and cattle grazing were undertaken across the Project Area supplemented by agricultural activities with the cultivation of crops. Evidence of former house sites, sheds, yards and other rural structures demonstrate the typical pattern of land use and historical development of the area. Extant fence lines indicate the enclosing of the landscape to make paddocks and are typical of fences found throughout the Hunter Valley and rural NSW. Farm dams are of some importance as sources of fresh water for dairy cattle and their location relative to fences can help understand how the landscape was used for dairying.

The Project Area and the area in the vicinity of the Project Area have been fairly intensively studied, surveyed and assessed as part of the historical heritage assessment and environmental assessment process associated with several approved coal mining projects currently operating in the immediate area; including Mount Owen Mine and Ravensworth East Mine. As a result, in addition to the listed heritage items, a number of potential heritage sites/items have previously been identified and studied in the area (refer to **Figure 4.1** and **Section 4.3**).

The Ravensworth Village area has the potential for sub-surface remains associated with a history of use and occupation from the late nineteenth century. However the area has been extensively ripped and planted resulting in some degree of disturbance/impact to any potential archaeological resource.

On the basis of the historical context and the history of land ownership, any improvements to the Project Area would likely have been effected from the mid to late nineteenth century. These improvements were likely initially for sheep management with modifications to provide for cattle management. The general unsuitability of the Hunter for intensive sheep-raising, by comparison with large animals, was being recognised in the early twentieth century although sheep continued to be raised in the vicinity for perhaps another 50 years.

Any additional, as yet unidentified, heritage items that may be present within the Project Area are likely to be similar to those items identified within the Project Area and described in this section.

The significance of the potential heritage sites/items identified within the Project Area and described in this section, is assessed in **Section 5.0** of this report. The impact of the Project on these items and recommended management strategies to address any heritage impacts is discussed in **Section 6.0**.

5.0 Significance

5.1 Introduction

An assessment of significance is undertaken to explain why a particular place is important and to enable appropriate site management to be determined. In accordance with the Director-General's Requirements for the Project, this section comprises a significance assessment of the historic heritage items within the Project Area.

The Australian ICOMOS *Burra Charter* 1999 (the *Burra Charter*) defines cultural significance as meaning 'aesthetic, historic, scientific or social value for past, present or future generations' (Article 1.2). The *Burra Charter* was written to explain the basic principles and procedures that should be followed in looking after important places. Cultural significance is defined as being present in the 'fabric, setting, use, associations, meanings, records, related places and related objects'. The fabric of a place refers to its physical material and can include built elements, sub-surface remains and natural material (Australia ICOMOS 2000).

5.2 Basis of Assessment

The NSW Heritage Manual (1996) published by the then NSW Heritage Office and Department of Urban Affairs and Planning, sets out a detailed process for conducting assessments of heritage significance. The manual provides a set of specific criteria for assessing the significance of an item, including guidelines for inclusion and exclusion.

The seven criteria defined by the Heritage Division, OEH, and used by the NSW Heritage Council as an assessment format within NSW are outlined below:

Criterion (a) an item is important in the course, or pattern, of NSW's cultural or natural history.

Criterion (b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history.

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

Criterion (d) an item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons.

Criterion (e) an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history.

Criterion (f) an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history.

Criterion (g) an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.

The following significance assessment is based upon the above seven criteria.

As a component of the holistic concept of significance, archaeological significance has been described as a measure by which a site may contribute knowledge, not available from other sources, to current research themes in historical archaeology and related disciplines (Bickford & Sullivan 1984 19-26). Archaeology is concerned with material evidence and the archaeological record may provide information not available from other sources. An archaeological study focuses on the identification and interpretation of material evidence to explain how and where people lived, what they did and the events that influenced their lives.

Considerations material to the study of the archaeology include:

- whether a site, or the fabric contained within a site, contributes knowledge or has the potential to do so. If it does, the availability of comparative sites and the extent of the historical record should be considered in assessing the strategies that are appropriate for the management of the site; and
- the degree and level at which material evidence contributes knowledge in terms of 'current research themes in historical archaeology and related disciplines'.

Following Bickford and Sullivan's work on archaeological significance (1984, 19-26) the following questions can be used as a guide to assessing the significance of an archaeological site:

- Can the site contribute knowledge that no other resource can?
- Can the site contribute knowledge that no other site can?
- Is this knowledge relevant to general questions about human history or other substantive questions relating to Australian history, or does it contribute to other major research questions?

The Heritage Council of NSW recognises four levels of significance for heritage in NSW: Local, State, National and World. An item has local heritage significance when it is important to the local area. An item has state heritage significance when it is important in NSW. Most heritage in NSW is of local significance.

The significance of the Project Area as a whole is considered in the Statement of Cultural Significance in **Section 5.4**.

5.3 Significance of the Potential Heritage Sites/Items within and in the Immediate Vicinity of the Project Area

5.3.1 Statement of Significance

The potential heritage sites/items located within the Project Area (refer to **Section 4.0**) are assessed in **Table 5.1** below. Note the already listed heritage items with identified significance discussed in **Section 4.4** are not considered as part of this section.

Table 5.1 – Statement of Significance

Heritage Division Standard Criteria	Statement of Significance
<p>Criterion (a) Historical</p>	<p>While the Project Area has the potential to demonstrate the pattern of land use and development from its early exploration and settlement in the early to mid nineteenth century (including its settlement by Europeans and the subsequent clearing of the land for pastoral and agricultural activities through to its exploitation for coal resources), with the exception of the Ravensworth Village area the Project Area is unlikely to contain historical archaeological remains associated with this development history.</p> <p>Any other archaeological evidence associated with the use and development of the Project Area (such as for grazing, agriculture and land clearing) is likely to be patchy at best, and it would be impossible to specify what such remains may entail and where they would be located.</p> <p>Evidence of extant rural buildings/structures (both standing and derelict) (for example MOH6, MOH11 and MOH12), fencing, yards and other rural infrastructure demonstrate the pattern of land use and historical development of the area. Remnant concrete slab floors are likely associated with former dairy farms. By the late nineteenth century dairy farming had become an important industry in the Upper Hunter.</p> <p>Previous heritage studies, archaeological investigative works and archival recordings have been undertaken for similar sites both within and in the immediate vicinity of the Project Area (refer to Section 4.3).</p> <p>As a result, in general, with the exception of the Ravensworth Village area, the potential heritage items/sites present within the Project Area are unlikely to provide information not already known from the historical record.</p> <p>Ravensworth Village</p> <p>The potential archaeological resource at this site may provide a tangible link to the different phases of historical development and ownership of the Ravensworth Village area.</p>
<p>Criterion (b) Associative</p>	<p>The Project Area has associations with several prominent personalities and families in the region; including Dr James Bowman and Captain William Russell (refer to Section 3.0). However, while the Project Area has this associative significance due to its land tenure history, the potential heritage sites/items identified within the Project Area are unlikely to provide evidence of these associations.</p> <p>John Winter (one of Canberra's pioneer families) is buried adjacent to the former Hebden Public School site (refer to Section 4.5.2).</p> <p>Note this report does not consider any Aboriginal historic associations with the Project Area, refer to the Aboriginal Cultural Heritage Assessment for the Project (ACHM 2014) for consideration of any such associations or connections.</p> <p>The Project Area is not known to have any other associations of particular significance.</p>

Table 5.1 – Statement of Significance (cont.)

Heritage Division Standard Criteria	Statement of Significance
<p>Criterion (c) Aesthetic</p>	<p>The potential heritage sites/items identified within the Project Area do not generally demonstrate distinctive aesthetic qualities or technical innovations, other than those typical of buildings and features found in rural areas characterised by rural landholdings, native bushland and primary industries including agriculture, forestry and extractive industries.</p> <p>The Project Area may demonstrate some aesthetic significance as a rural landscape through the creation of a pastoral landscape via the clearing of the native vegetation and construction of fences.</p> <p>The rural infrastructure present within the Project Area portrays construction techniques common in the Hunter Region from a limited range of materials, principally timber and it may have some aesthetic significance in the context of the surrounding landscape, however there are many other similar and better examples of rural infrastructure in the Hunter area.</p> <p>In general, any buildings or ruins extant on the Project Area are representative of a range of farm and residential buildings and other rural infrastructure potentially dating from the late nineteenth century. They may be considered to have some aesthetic qualities arising from their simple unadorned construction from a limited palette of materials, principally timber or as ruins within a rural landscape.</p> <p>Site MOH11 (former house site) could be seen as having aesthetic values as a ruin standing in a rural landscape that demonstrates local vernacular construction.</p> <p>In general the Project Area is unlikely to meet this criterion.</p> <p>Ravensworth Village</p> <p>At this time, when the archaeological evidence at the site is obscured, it is not possible to determine with any certainty whether, and if so, how, the archaeological features at this site would meet this criterion.</p>
<p>Criterion (d) Social</p>	<p>The Project Area demonstrates the pattern of settlement and development in the area from the early to mid nineteenth century, and is typical of a large rural landscape within the wider regional area.</p> <p>A Social Impacts and Opportunities Assessment (Coakes 2014), including consultation with local landholders and other stakeholders, has been prepared as part of the Project. A small number of community members raised concern regarding Aboriginal cultural heritage, Camberwell Church, Ravensworth Public School and a general loss of history. However, it is considered unlikely that with the exception of the John Winter memorial site the potential historic (non-Aboriginal) heritage resource of the Project Area, and particularly any archaeological remains that survive there, would have a strong association with any previous or contemporary particular community or group. Members of the local community are also likely to have associations with the former Ravensworth and Hebden Public Schools.</p> <p>Note this report does not consider any Aboriginal social, cultural or spiritual associations with the Project Area, refer to the Aboriginal Cultural Heritage Assessment for the Project (ACHM 2014) for consideration of any such associations with both traditional and modern Aboriginal ways of life.</p> <p>The potential historical archaeological resource of the proposed Project Area does not strongly meet this criterion based on available information. However, an archaeological site (for example the Ravensworth Village area) can take on additional social values as a result of community interest in archaeological excavations and any remains uncovered.</p>

Table 5.1 – Statement of Significance (cont.)

Heritage Division Standard Criteria	Statement of Significance
<p>Criterion (e) Scientific</p>	<p>With the exception of the Ravensworth Village area there are unlikely to be any intact archaeological remains associated with the nineteenth and twentieth century development and occupation of the Project Area. A high degree of intactness in the archaeological resource is necessary before a substantive contribution can be made to the research potential and hence, the ability of the archaeological resource to answer research questions for the site. Generally any archaeological remains that may be present would be unlikely to have any research potential and would at best provide only a minor contribution to the significance of the area (see separate discussion relating to Ravensworth Village area below).</p> <p>Evidence of clearing would support the known history of clearing in the area and is unlikely to provide any additional information to that already known for the area.</p> <p>General evidence of rural buildings/structures (both standing and derelict), concrete slabs, yards, roads, tracks and rural fences etc. demonstrate the pattern of land use and historical development of the area and could provide information about how the landscape was used and changed during its use as pastoral land. However, in general as individual items they have little research potential.</p> <p>In addition, previous archaeological investigative works and archival recordings have been undertaken for similar sites both within and in the immediate vicinity of the Project Area (refer to Section 4.3).</p> <p>In general, the known and potential historical heritage items extant on site are typical of the area as a large rural landscape and are unlikely to provide further unknown information regarding the history and development of the area.</p> <p>Archaeological deposits and features can provide evidence of the history and settlement of NSW unavailable from other sources, such as historical documentation. Archaeological investigation can provide information regarding technologies, economic and social conditions, taste and style. Archaeological features and deposits can provide primary evidence about the way of life of previous generations. Archaeological significance is derived from the potential for a site to provide information unavailable from other sources (Heritage Office 1996:25).</p> <p>Ravensworth Village</p> <p>As discussed, the research potential of a particular site and its ability to answer research questions is dependent on a high level of intactness in the archaeological resource. It is not possible to accurately determine the extent of disturbance (the Ravensworth Village area has been ripped and planted following the demolition of any former buildings) and hence the level of intactness of the potential archaeological resource, due to the lack of sub-surface visibility</p> <p>However, the archaeological resource that may survive includes building foundations, occupation deposits containing cultural material associated with former structures, deeper sub-surface features (cesspits/privies, rubbish pits and bottle dumps) and artefacts.</p> <p>This potential archaeological resource could yield information about the historical development, occupation and commercial use of the site from the late nineteenth century and in particular information regarding the Wolfgang wine store and associated structures.</p> <p>If intact, these remains may provide a tangible link to this period of the area's history and would have research potential.</p>

Table 5.1 – Statement of Significance (cont.)

Heritage Division Standard Criteria	Statement of Significance
Criterion (f) Rarity	<p>In general, the potential heritage sites/items identified within the Project Area, including any extant structures, are typical of structures and other sites/items typically found within rural landscapes such as that of the Project Area and are unlikely to meet this criterion.</p> <p>The potential heritage resources associated with the Project Area are not associated with an unusual or remarkable aspect of the region's history. Although any heritage or archaeological resource within the Project Area is part of an ever decreasing resource, in general the resource does not meet this criterion.</p>
Criterion (g) Representativeness	<p>The potential heritage sites/items identified within the Project Area are representative of the structures items/sites typically found in a rural landscape with a history of pastoral and agricultural activities and the exploitation of timber and mineral resources.</p> <p>The potential archaeological resources within the Project Area would be part of a resource provided by a group of sites which contribute evidence of late nineteenth to early twentieth century residential and commercial usage of this nature in the region, and would be considered as representative of their period.</p>

5.3.2 Archaeological Significance

Archaeological significance is directly linked to the archaeological (or scientific) research potential of an archaeological site or resource. An archaeological site broadly comprises below ground physical evidence of building foundations, occupation/archaeological deposits, features and artefacts (Heritage Office & DUAP 1996b:2). In general no potential historical archaeological resource has been identified within the Project Area, with the exception of potential remains associated with Ravensworth Village. As a result, the three questions derived from Bickford and Sullivan's work on archaeological significance (discussed in **Section 5.2**) have only been further considered in relation to Ravensworth Village.

Can the site contribute knowledge that no other site can?

The potential archaeological resource from Ravensworth Village area may provide physical evidence that could be used to supplement and test what is known about the Upper Hunter region and its history from other sites.

If intact, the archaeological resource may provide an opportunity to investigate the settlement and use of the area from the late nineteenth century and associations with the extension of the rail line north and the Ravensworth Estate. If present, intact artefact bearing deposits (occupation/underfloor deposits, cesspits/prives, bottle dumps and other sub-surface features), could provide insight into aspects of a small village and family commercial enterprise in late nineteenth and early twentieth centuries not available from other similar sites.

Can the site contribute knowledge that no other resource can?

The research already undertaken as part of this project has included an evaluation of available documentary evidence which provides relevant information about the potential structural remains and the use and development of the area. However, an archaeological resource is likely to be able to add to and fill gaps in the available documentary resource of the area. For example, intact artefact bearing deposits may provide specific information about the ways of life of the people who worked and resided in the area.

Is this knowledge relevant to general questions about human history or other substantive questions relating to Australian history, or does it contribute to other major research questions?

The proposed Project Area was part of the historical development of the Upper Hunter Valley. There may be an opportunity to reveal additional information about its past through the material remains that may have accumulated in the Ravensworth Village area. The archaeological resource may also be suitable for comparative analysis with other sites in area, as well as in a wider context of settlement and exploitation of the area.

5.4 Condition and Integrity of Sites within the Project Area

This section addresses matters that combine with the assessment of significance to allow a formal Heritage Impact Statement to be appropriately validated. The condition and integrity of sites/items is considered as part of the assessment of heritage significance.

A heritage item is said to have integrity if its fabric is still largely intact. In general, the condition of the potential historical heritage resource of the Project Area is in a poor physical condition represented by standing ruins and ruins of former rural structures and rural infrastructure with varying degrees of intact fabric.

There is very little original fabric associated with the former Ravensworth Village area located to the south of Hebden Road. The presence of any intact archaeological remains would need to be confirmed with sub-surface investigation.

5.5 Summary Statement of Significance

The Project Area is typical of a rural landscape within the Upper Hunter region of NSW. The history of the area from the early to mid nineteenth century, including its settlement by Europeans and subsequent use as cleared pastoral and agricultural land through to its exploitation for mineral resources is reflected in the low potential of the archaeological resource and in the evidence of former house and dairy sites and other rural structures and infrastructure. Similar sites, both within the Project Area and in the immediate vicinity, have been assessed and recorded as part of previous heritage studies, archaeological investigative works and archival recordings (refer to **Section 4.3**).

In general terms, with the exception of the Ravensworth Village area, the John Winter Memorial site and the former Hebden Public School site, the identified and potential historical heritage components of the Project Area have been assessed as having no significance with no research potential.

Former house and pastoral site MOH11 has been assessed as being of local significance as a relatively intact small dwelling and former working pastoral site with some aesthetic qualities that demonstrate local vernacular construction. Both the John Winter Memorial site and the former Hebden Public school site are also considered to be of local significance, primarily in terms of their potential associative and social significance.

Any archaeological remains present within the Ravensworth Village area, potentially related to the ownership of the area by the Wolfgang family who both resided there and ran a successful commercial enterprise servicing an itinerant working population would likely be of local significance and have archaeological research potential.

Any additional, as yet unidentified, potential heritage sites/items that may be present within the Project Area are likely to comprise of evidence of former rural structures and infrastructure. If present, these are likely to be typical of those found throughout the Hunter Valley and rural NSW and of no or at best local significance.

6.0 Heritage Impact Statement and Management Strategy

This section provides a heritage impact statement and management strategy for the heritage sites/items within and where relevant within the vicinity of the Project Area. The heritage impact statement identifies the potential impacts from the Project on all known and potential heritage sites/items identified within, and where relevant within the vicinity of, the Project Area. The impacts are assessed against the significance of the respective elements.

6.1 Potential Impacts of the Project

The potential impacts of the Project are considered in terms of direct impacts and indirect impacts.

6.1.1 Direct Impacts

Direct impacts are considered to be physical impacts to a site, including removal/destruction.

Potential direct impacts are discussed in **Sections 6.3** and **6.4**.

6.1.2 Indirect Impacts

Indirect impacts are considered to include vibration from blasting; which has the theoretical potential to damage/destroy/disturb historical heritage items.

Operations will undertake blasting in accordance with a detailed design process that will consider operational, geological and environmental constraints.

There is little reliable information available regarding the threshold of vibration induced damage to older 'heritage' buildings and standing ruins that may be more sensitive to vibration induced damage. Annex A of the British Standard BS7385:Part2:1993 for the Evaluation and Measurement for Vibration in Buildings states that:

...the age and existing condition of a building are factors to consider in assessing the tolerance to vibration. If a building is in a very unstable state, then it will tend to be more vulnerable to the possibility of damage arising from vibration or any other ground-borne disturbance.

The German standard DIN 4150: Part 3 Effects of Vibration on Structures includes a building type 'Particularly Sensitive' which is assigned vibration limits of 3 mm/s (at less than 10Hz), 3 to 8 mm/s (at 10-50Hz) and 8 to 10 mm/s (at 50-100Hz). Swiss Standard SN640 312:1978 also includes a 'Particularly Sensitive' structural type which is assigned vibration limits of 3 mm/s (at 10 to 30Hz) and 3 to 5 mm/s (at 30 to 60 Hz).

Mount Owen is considered a:

...mature operation with well-developed blasting systems and blasting is conducted in accordance with an approved Blast Management Plan BMP. As the current operational system is well established and functioning very efficiently the same system will be used for the Project...as with the current blasting activities at Mount Owen and Ravensworth East mines, the blasting for the Project will be undertaken in accordance with the existing BMP (Enviro Strata 2013:7-9).

Potential indirect impacts are discussed in **Sections 6.3** and **6.4**.

6.2 Listed Heritage Items Located Outside the Project Area

The Blast Impact Assessment of the Mount Owen Continued Operations Project on the Adjacent Community, Infrastructure and Underground Mine by Enviro Strata Consulting Pty Ltd (Enviro Strata Consulting 2014a) undertook modelling to assess the potential impact of blasting based on the model specified for Mount Owen Complex conditions.

Table 6.1 details the listed heritage items located outside, but in proximity to, the Project Area and considers them in terms of potential vibration impacts (refer to **Figure 6.1**).

Table 6.1 – Listed Heritage Items Located Outside the Project Area and Predicted Ground Vibration due to Blasting

Item Name	Location	Listing	Predicted Range of Maximum Ground Vibration (mm/s)
Ravensworth Homestead	463 Hebden Road (Lot 228 DP 752470)	Local	0.1 to 2.9
Former Chain of Ponds Inn (listed as Inn & Outbuildings (former)) including police lock-up site	Old New England Highway, Liddell (Lot 211 DP 975271)	State	0.1 to 0.6
Middle Falbrook Bridge over Glennies Creek	Middle Falbrook Road, Middle Falbrook (road reserve)	State	0.1 to 1.3
Greylands and Outbuildings	665 Gooangoola Road, Greenlands (Lot 111 DP 10854409)	Local	Less than 0.1 to 0.5
Ravensworth Public School (former)	Hebden Road/New England Highway (Lot 11 DP 825904)	Local	0.1 to 1.5
St. Clements Anglican Church	20 Glennies Creek Road, Camberwell (Lot 102 DP 738182)	Local	Less than 0.1 to 0.9
Community Hall	3 Lethbridge Street, Camberwell (Lot 2 Sec 13 DP 758214)	Local	Less than 0.1 to 0.8
Camberwell Glennies Creek Underbridge	Camberwell (252.613 km Main Northern Railway)	Local	0.1 to 0.9
Former Dulwich Homestead (Kangory Homestead)	485 Middle Falbrook Road, Glennies Creek (Lot 8 DP 246434)	Local	0.1 to 0.7

Predicted range of maximum ground vibration sourced from Table 5 in Enviro Strata 2014 Blast Impact Assessment report.

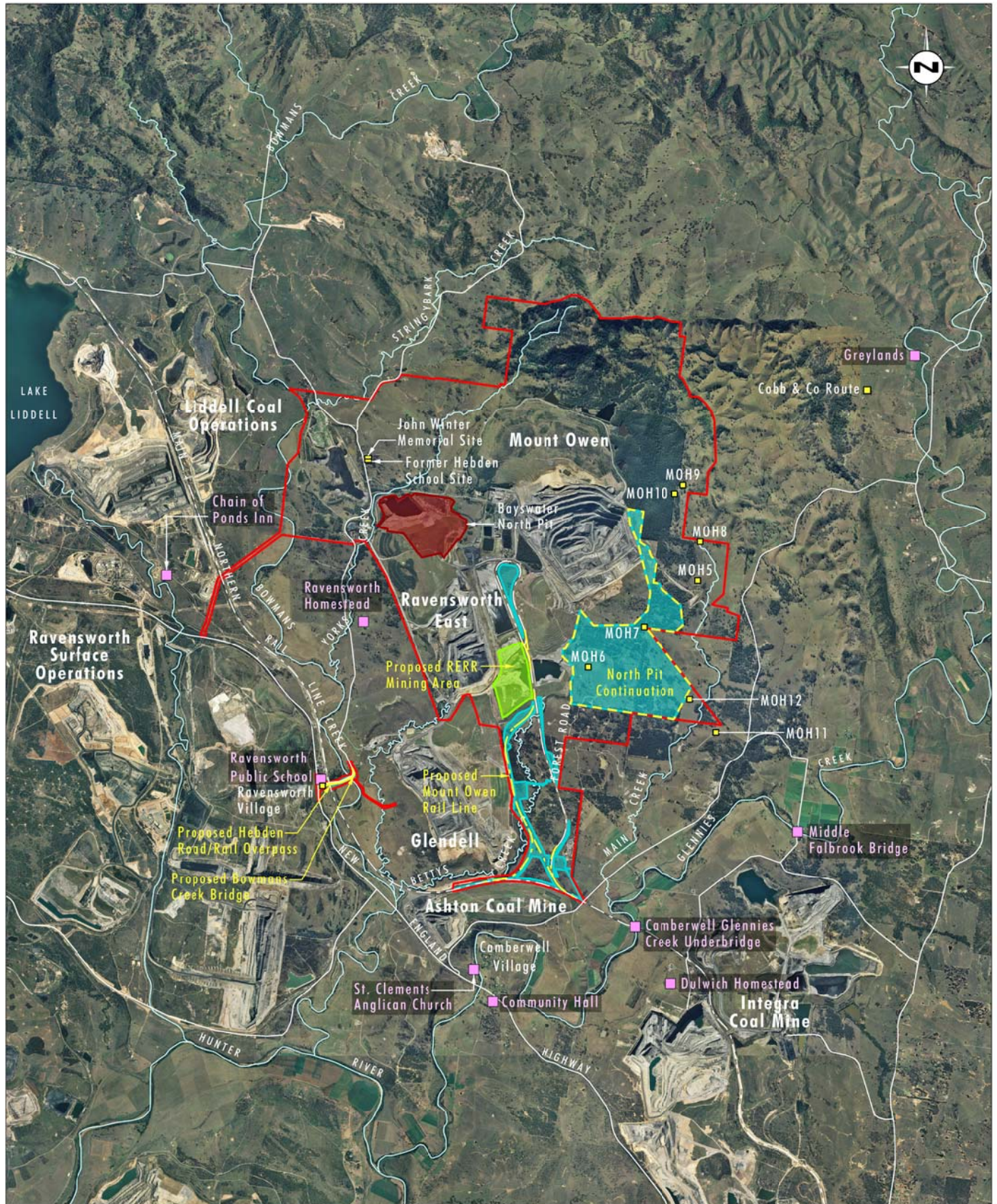


Image Source: Mount Owen (2012-2013)
Data Source: Mount Owen (2014)

0 1.0 2.5 5.0km
1:100 000

Legend

- Project Area
- Proposed Disturbance Area
- Bayswater North Pit
- Proposed RERR Mining Area
- Proposed North Pit Continuation
- Proposed Rail Upgrade Works
- Proposed Hebden Road Upgrade Works
- Potential Heritage Sites
- Listed Heritage Item

File Name (A4): R04/3109_407.dgn
20140922 14.41

FIGURE 6.1

Location of Listed and
Potential Heritage Sites

Note that none of the listed items detailed in **Table 6.1** have a predicted ground vibration level that exceeds 3 mm/s. As such, there are not expected to be any direct or indirect impacts to the listed items as part of the Project. As no impacts on these sites are proposed or predicted, no management measures are required in relation to these items as part of the Project. As a result of its proximity to the Project Area and the proposed Hebden Road upgrade works disturbance area, the listed former Ravensworth Public School is discussed further below.

6.2.1 Former Ravensworth Public School

Heritage Impact Statement

The former Ravensworth Public School is immediately adjacent to, approximately 10 metres to the north of the Project Area and the proposed Hebden Road upgrade works disturbance area (refer to **Figures 4.3** and **6.1**). There are unlikely to be any direct impacts to the former school buildings as a result of the proposed Hebden Road upgrade works.

An approximately 10 metre wide corridor on the north side of Hebden Road is located within the Project Area and the proposed Hebden Road upgrade works disturbance area (refer to 'area of potential interest' on **Figure 6.2**). No physical impacts and no sub-surface disturbance to this 10 metre wide corridor are proposed as part of the Hebden Road upgrade works. The area may be utilised as part of ancillary works including stockpiling of material etc.

The former Ravensworth Public School is located over 4.5 kilometres to the south-west of the BNP, over 3.6 kilometres south-west of proposed RERR Mining Area and over 5 kilometres to the south-west of the North Pit Continuation (refer to **Figure 6.1**) and is not expected to be indirectly impacted as a result of vibration from blasting.

Recommendation

Prior to the commencement of upgrade works for the construction of the Hebden Road rail overpass and if any physical (stockpiling of materials for example) or sub-surface impacts are proposed in the 'area of potential interest' to the north of Hebden Road (within the Proposed Disturbance Area on the north side of Hebden Road - refer to **Figure 6.2**), the area will be surface surveyed to identify, or confirm the absence of, the potential for items or remains that may be associated with the listed former Ravensworth Public School.

If any potential items or remains are identified, management measures will be developed in consultation with the Heritage Division, OEH to ensure the items or remains are protected or, if appropriate, mitigated. Mitigation measures could include photographic/archival recording in accordance with Heritage Division, OEH guidelines *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006).

Although unlikely, if sub-surface impacts (other than those associated with minor sub-surface impacts like geotechnical core holes) are proposed to the area on the north side of Hebden Road, an archaeological investigation of the area proposed to be impacted should be undertaken prior to the commencement of works. The investigations should comprise (subject to consultation with the Heritage Division, OEH) archaeologically monitored machine stripping of the area to identify the presence (or absence) of any archaeological evidence or remains that may be associated with the former Ravensworth Public School. These works should be undertaken in accordance with the archaeological work method statement for the proposed archaeological investigation of the Ravensworth Village area located to the south of Hebden Road (refer to **Section 6.4.5** for details).



Image Source: Mount Owen (2012)
Data Source: Mount Owen (2014)

0 10 25 50 m
1:1 000

Legend
 Project Area
 Proposed Disturbance Area
 Area of Potential Interest

FIGURE 6.2
Former Ravensworth Public School

A protocol will be developed in relation to the Proposed Disturbance Area on the north side of Hebden Road to ensure there are no physical or other impacts to the fabric of the former school buildings during the Hebden Road works. The protocol should include, but not be limited to, consideration of the curtilage of the school and establishing a fenced buffer area to the south of the former school buildings.

6.3 Potential Impact to identified Non-listed Sites within and in the vicinity of the Project Area and Management Strategies

This section addresses the potential impacts resulting from the Project to each of the non-listed site/items identified within and in the vicinity of the Project Area and proposes a management strategy to mitigate any impacts.

Figure 6.1 shows the current mine plan in relation to the locations of the identified heritage sites/items within and in the immediate vicinity of the Project Area.

6.3.1 Former Hebden Public School site

Heritage Impact Statement

The former Hebden Public School site is within the north-west corner of the Project Area approximately 880 metres north-west of the BNP, approximately 4.4 kilometres north-west of the proposed RERR Mining Area and over 5 kilometres to the north-west of the North Pit Continuation (refer to **Figure 6.1**).

Vibration limits at the former Hebden Public School have been identified as 16 to 19 mm/s. However, these levels are very conservative when considering weatherboard structures such as the former Hebden Public School; as timber is a very flexible material when exposed to blast vibrations (Enviro Strata Consulting 2014b). The predicted maximum ground vibration at the former Hebden Public School site as a result of blasting at the BNP is 6.3 mm/s (Enviro Strata Consulting 2014a). This figure is a worst case scenario prediction for the largest predicted blast at the closest point to the former school site.

As discussed, the former Hebden Public School site is within the Project Area but outside any proposed disturbance area. Vibration limits at the site have been identified as 16 to 19 mm/s. The predicted maximum ground vibration at the site as a result of blasting at the BNP is 6.3 mm/s. As such, there are not expected to be any impacts (either direct or indirect as a result of vibration from blasting) at the former Hebden Public School site as part of the Project

Recommendation

No further management of the former Hebden Public School site is required for the Project.

Note that this site has been photographically recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**).

6.3.2 John Winter Memorial Site

Heritage Impact Statement

The John Winter memorial site is within the north-west corner of the Project Area approximately 880 metres north-west of the BNP, approximately 4.4 kilometres north-west of the proposed RERR Mining Area and over 5 kilometres to the north-west of the North Pit Continuation (refer to **Figure 6.1**).

The inferred safe vibration level for the John Winter Memorial has been identified to be in the order of 250 mm/s. From a blasting perspective the memorial is constructed using very strong and homogenous materials that are not easily susceptible to damage by ground vibration movement (Enviro Strata Consulting 2014b). The predicted maximum ground vibration at the John Winter memorial site as a result of blasting at the BNP is 6.4 mm/s (Enviro Strata Consulting 2014a). This figure is a worst case scenario prediction for the largest predicted blast at the closest point to the memorial site.

As discussed, the John Winter memorial site is within the Project Area but outside any proposed disturbance area. Vibration limits at the site have been identified as 250 mm/s. The predicted maximum ground vibration at the site as a result of blasting at the BNP is 6.4 mm/s. As such, there are not expected to be any impacts (either direct or indirect as a result of vibration from blasting) at the John Winter memorial site as part of the Project.

Recommendation

No further management of the John Winter memorial site is required for the Project.

Note that this site has been photographically recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**).

6.3.3 Cobb & Co. Route

Heritage Impact Statement

The identified former Cobb & Co. route is located approximately 3 kilometres to the east of the Project Area boundary approximately 7.8 kilometres north-east of the BNP, approximately 8 kilometres north-east of proposed RERR Mining Area and approximately 4.7 kilometres to the north-east of the North Pit Continuation (refer to **Figure 6.1**). As such the site is not expected to be impacted as a result of the Project.

Recommendation

No further management of the former Cobb & Co. route is required for the Project.

6.3.4 Ravensworth Village

Heritage Impact Statement

Ravensworth Village is located at the corner of the New England Highway and Hebden Road (refer to **Figure 6.1**). An approximately 180 by 100 metre area of the former village located to the south of Hebden Road will be impacted as a result of the proposed Hebden Road rail overpass (refer to **Figure 6.3**).

As discussed in **Section 2.0**, the Project includes the construction of a rail overpass for road traffic adjacent to the existing level crossing where Hebden Road crosses the Main Northern Rail Line. Due to the anticipated increase in future train movements on the Main Northern Rail Line as a result of anticipated western coal expansions, the purpose of the proposed rail overpass construction is to improve traffic flow and reduce traffic hazards by eliminating the potential for traffic to queue back onto the New England Highway.

As discussed in **Sections 4.5.5** and **5.3**, the area of Ravensworth Village located to the south of Hebden Road has the potential for a locally significant archaeological resource.

The former location of a hut indicated to the east of Bowmans Creek on a 1889 subdivision plan of part of the Ravensworth Estate will be impacted as a result of the proposed Hebden Road works (refer to **Figure 4.4**). However, there is unlikely to be any surviving archaeological evidence of the hut, which is likely to have been of a temporary construction with little potential for any intact archaeological resource. In addition, the former location of the hut is at the junction of current Hebden Road and an access track, and is also immediately adjacent to the current crossing of Bowmans Creek. As a result, the area has previously been disturbed. The former location of the second hut indicated on the 1889 Plan is outside the disturbance boundary and will not be impacted by the Project.

Recommendation

Prior to the commencement of works associated with the Hebden Road upgrade on-site archaeological investigation of the area proposed to be impacted will be undertaken to normal professional standards. The investigations should comprise (subject to consultation with the Heritage Division, OEH) a program of archaeologically monitored machine stripping of the grass cover focusing on the potential area of archaeological interest (the former Wolfgang wine shop and associated buildings likely to have been located in the approximate area of current Lot 2 DP 793886 and Lots 15 and 16 DP 38725 - refer to **Figures 4.3** and **6.3**).

Following the stripping of all grass cover across the area of archaeological interest illustrated on **Figure 6.3**, any archaeological remains (including concentrations/deposits of artefacts, structural remains or deeper cut features) exposed in this area during the monitored machine stripping would be recorded and hand excavated as part of the archaeological works. If no potential archaeological remains are identified following initial monitored machine stripping of the grass cover within the area of archaeological interest, further monitored machine stripping would be undertaken until either archaeological remains are exposed or sterile deposits with no evidence of historical archaeological remains or deposits have been encountered. Excavation would not be required once natural sub-soils are exposed, unless an archaeological feature is identified cut into the sub-soil.

A series of test trenches should be machine excavated across the remainder of the Ravensworth Village area located within the Proposed Disturbance Area (refer to **Figure 6.3**) to identify the potential for archaeological remains surviving. If any archaeological remains are exposed during the monitored machine excavation of test trenches, the remains would



Image Source: Mount Owen (2012)
Data Source: Mount Owen (2014)

0 20 40 60m
1:1 250

Legend

- Project Area
- - - Proposed Disturbance Area
- Area of Ravensworth Village within Proposed Disturbance Area
- ▨ Area of Potential Interest

FIGURE 6.3

Ravensworth Village

be recorded and hand excavated as part of the works. Further machine stripping may be required if any areas of archaeological interest are identified.

The use of an archaeologically monitored excavator is considered an efficient and effective method of identifying the presence (or absence) of any archaeological evidence or remains.

Prior to archaeological works commencing an archaeological work method statement detailing the proposed works would need to be endorsed by the Heritage Division, OEH.

No further management in relation to the former location of the hut on the east side of Bowmans Creek is required for the Project.

6.3.5 Site MOH5 – Former Homestead and Dairy Complex

Heritage Impact Statement

Site MOH5 comprises a former homestead and dairy complex located within the Project Area and within an existing Biodiversity Offset Area. The site is not proposed be impacted as a result of the Project (refer to **Figure 6.1**). Proposed mining will be moving further from the site than mining already undertaken under the current approval.

Site MOH5 was identified during the preparation of the Mt Owen Operations Historic Heritage Assessment (Umwelt 2003). The 2003 report assessed the site as potentially being subject to impact from vibration due to blasting (Umwelt 2003:6.2).

Site MOH5 has been photographically recorded in accordance with NSW Heritage Office guidelines in 2006 (Umwelt 2006b) and 2010 (Umwelt 2010). The February 2013 site inspection identified that, apart from the continued natural degradation of the timber clad with corrugated iron roof dairy shed, the site appears to be in a similar condition to both its 2003 and 2010 photographically recorded condition.

The site is not expected to be impacted as a result of the Project.

Previous Recommended Management

The 2003 report assessed Site MOH5 as being of Local significance and potentially being subject to impact from vibration due to blasting (Umwelt 2003:6.2). The report recommended that 'archival recording should be undertaken and a regular monitoring program implemented' (Umwelt 2003:8.1).

Consequently Consent Condition 55 of DA 14-1-2004 for the Mount Owen Open Cut Coal Mine requires a photographic recording of the condition and integrity of site MOH5 to be undertaken every 5 years until the cessation of mining to the satisfaction of the Director-General.

Recommendation

As discussed, to date photographic recording in accordance with Consent Condition 55 has been undertaken in 2006 (Umwelt 2006b) and 2010 (Umwelt 2010). As two photographic recordings of the site have previously been undertaken, there has been no significant change to the condition and integrity of the site as a result of mining undertaken under the current approval and proposed mining as part of the Project will be moving further away from the site no further management of site MOH5 is required for the Project.

6.3.6 Site MOH6 – Former House Site

Heritage Impact Statement

Site MOH6 comprises a former house site located within the Project Area and the Proposed Disturbance Area (refer to **Figure 6.1**). The site will be impacted as part of works associated with the North Pit Continuation.

This site has been recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**).

This site has been assessed as having no significance and no research potential.

Recommendation

No further management of site MOH6 is required for the Project.

6.3.7 Site MOH7 – Timber Yards

Heritage Impact Statement

Site MOH7 comprises an area of timber yards and a small corrugated iron shed located within the Project Area and the Proposed Disturbance Area (refer to **Figure 6.1**). The site will be impacted as part of works associated with the North Pit Continuation.

This site has been recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**).

This site has been assessed as having no significance and no research potential.

Recommendation

No further management of site MOH7 is required for the Project.

6.3.8 Site MOH8 – Timber Yards

Heritage Impact Statement

Site MOH8 comprises an area of timber yards located within the Project Area but is not proposed to be impacted as a result of the Project (refer to **Figure 6.1**).

This site has been recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**).

This site (comprising the timber yards) has been assessed as having no significance and no research potential.

Recommendation

No further management of site MOH8 is required for the Project.

If any physical ground disturbance is proposed in the area as part of any future works consideration should be given to the area as the potential location of Russell's Station as marked on an *1855 Plan of 2 Sections of Land: County of Durham; Parish of Vane* (refer to **Figure 4.5**).

6.3.9 Site MOH9 - Timber Yards and former House Site

Heritage Impact Statement

Site MOH9 comprises an area of timber yards adjacent to a fenced former house site located within the Project Area and within an existing biodiversity offset area. The site is not proposed be impacted as a result of the Project (refer to **Figure 6.1**).

This site has been recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**).

This site has been assessed as having no significance and no research potential.

Recommendation

No further management of site MOH9 is required for the Project.

6.3.10 Site MOH10 – Timber Loading Ramp

Heritage Impact Statement

Site MOH10 comprises a timber and earth constructed loading ramp located within Ravensworth State Forest and within the Project Area. The site is not proposed be impacted as a result of the Project (refer to **Figure 6.1**).

This site has been recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**).

This site has been assessed as having no significance and no research potential.

Recommendation

No further management of site MOH10 is required for the Project.

6.3.11 Site MOH11 – Former House and Dairy Site

Heritage Impact Statement

Site MOH11 is located immediately outside the Project Area boundary approximately 6.1 kilometres south-east of the BNP, approximately 3.5 kilometres south-east of the proposed RERR Mining Area and approximately 800 metres to the south-east of the North Pit Continuation. As such, the site will not be directly impacted as a result of the Project (refer to **Figure 6.1**).

There is potential for some impacts to occur as a result of vibration. However, this site is currently a standing ruin located outside the Project Area and will remain as a ruin standing in a rural landscape.

This site has been recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**).

The site has been assessed as having local significance and at best low research potential.

Recommendation

No further management of site MOH11 is required for the Project.

6.3.12 Site MOH12 – Former House Site

Heritage Impact Statement

Site MOH12 comprises a former house site located within the Project Area and immediately outside the proposed Project disturbance boundary (refer to **Figure 6.1**).

The former house site is approximately 5.4 kilometres south-east of the BNP, approximately 3 kilometres east of the proposed RERR Mining Area and 80 metres outside the boundary of the proposed North Pit Continuation disturbance area and in excess of 300 metres outside the proposed North Pit mining limit at its closest point. As such, the site will not be directly impacted as a result of the Project (refer to **Figure 6.1**).

There is potential for some impacts to occur as a result of vibration. However, this site is currently a standing ruin and will remain as a ruin standing in a rural landscape which forms part of the typical pattern of land use and historical development of the area.

This site has been recorded as part of the preparation of this report. The photographic catalogue (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**).

This site has been assessed as having no significance and no research potential.

Recommendation

No further management of this site is required for the Project.

6.4 Unexpected Finds

6.4.1 Section 146 *Heritage Act 1977* (NSW)

In the unlikely event that unexpected archaeological remains or potential heritage items not identified as part of this report are discovered during the Project all works in the immediate area will cease, the remains and potential impacts will be assessed by a qualified archaeologist or heritage consultant and, if necessary, the Heritage Division, OEH notified in accordance with Section 146 of the *Heritage Act 1977* (NSW).

6.4.2 Human Skeletal Material

In the unlikely event that a potential burial site or potential human skeletal material is exposed within the Project Area, the following procedure will be followed in accordance with the Policy Directive – Exhumation of Human Remains (NSW Department of Health 2008), *Skeletal Remains – Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977* (NSW Heritage Office 1998) and the Aboriginal Cultural Heritage Standards and Guidelines Kit (NPWS 1997):

- as soon as remains are exposed, work is to halt immediately to allow assessment and management;
- contact local police, OEH and the Heritage Division;
- a physical or forensic anthropologist will inspect the remains in situ, and make a determination of ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or forensic);
- if the remains are identified as forensic the area is deemed as crime scene;
- if the remains are identified as Aboriginal, the site is to be secured and OEH and all registered Aboriginal parties are to be notified in writing; or
- if the remains are non-Aboriginal (historical) remains, the site is to be secured and the Heritage Division is to be contacted.

The above process functions only to appropriately identify the remains and secure the site. From this time, the management of the remains is to be determined through liaison with the appropriate stakeholders (NSW Police Force, forensic anthropologist, OEH, Heritage Division, registered Aboriginal parties etc) and in accordance with the *Public Health Act 1991*.

6.5 Consultation

General consultation has been undertaken by Mount Owen with government authorities and community stakeholders (including the Aboriginal community) in relation to the Project (refer to Section 4.0 of the Environmental Impact Statement (EIS) Mount Owen Continued Operations Project 2013). The consultation has included a meeting on 19 March 2013 with the Heritage Division, OEH to provide a briefing on the proposed Project and to broadly discuss the historical heritage and archaeology assessment program.

7.0 Evaluation of Management Measures

The majority of the potential historical heritage sites/items present within, and in the immediate vicinity of, the Project Area have been assessed as having no heritage significance and no research potential. All of the identified potential sites within the Project Area have been recorded as part of this report. The photographic catalogue of this recording (photographic record sheets) and photographs (as thumbnail image sheets/proof sheets and burned to DVD) are included in this report (as **Appendix 1**). As such, no further management is required for the majority of the potential sites identified within the Project Area. Those sites assessed as being of local significance and/or recommended as requiring further management are discussed further below.

7.1 Ravensworth Village and Former Ravensworth Public School

This site has been assessed as having local significance and archaeological research potential.

The recommended archaeological investigation of the area of the former Ravensworth Village proposed to be impacted, focusing on the potential area of the former Wolfgang wine shop and associated buildings, will ensure that any archaeological resource associated with the history of the establishment, use and occupation of Ravensworth Village will be recorded. This will ensure that information is not unnecessarily lost, will be able to be added to the existing knowledge base and be available for future generations.

If any physical or sub-surface impacts are proposed on the north side of Hebden Road, surface survey and if required archaeological investigation of the impact area will ensure that any fabric or archaeological resource associated with the history of the establishment and use of the school buildings will be also recorded.

The development of a protocol to protect the former school buildings during any works proposed on the north side of Hebden Road (including consideration of the curtilage of the school and the establishment of a fenced buffer area to the south of the former school buildings), and the proposed surface survey and archaeological investigation (if required), will ensure there are no impacts to the fabric or significance of the former school buildings.

All archaeological excavation/investigation work will be undertaken to normal professional standards and accepted best practice procedures, in accordance with an archaeological work method statement.

7.2 Former Hebden Public School site

The former Hebden Public School site is within the north-west corner of the Project Area approximately 880 metres north-west of the BNP. The site has a predicted maximum ground vibration of 6.3 mm/s (Enviro Strata Consulting 2014a). Vibration limits at the site have been identified as 16 to 19 mm/s (Enviro Strata Consulting 2014b).

As such, there are not expected to be any impacts (either direct or indirect as a result of vibration from blasting) at the former Hebden Public School site as part of the Project and no further management of the site is required.

7.3 John Winter Memorial Site

The John Winter memorial site is within the north-west corner of the Project Area approximately 880 metres north-west of the BNP. The site has a predicted maximum ground vibration of 6.4 mm/s (Enviro Strata Consulting 2014a). The inferred save vibration level for the John Winter Memorial has been identified to be in the order of 250 mm/s (Enviro Strata Consulting 2014b).

As such, there are not expected to be any impacts (either direct or indirect as a result of vibration from blasting) at John Winter memorial site as part of the Project and no further management of the site is required.

7.4 Site MOH5

Site MOH5 is not proposed to be impacted as a result of the Project. Site MOH5 has been photographically recorded in accordance with NSW Heritage Office guidelines in 2006 and 2010. The February 2013 site inspection identified that, apart from the continued natural degradation of the timber clad with corrugated iron roof dairy shed, the site appears to be in a similar condition to both its 2003 and 2010 photographically recorded condition.

As two photographic recordings of the site have previously been undertaken, there has been no significant change to the condition and integrity of the site as a result of mining undertaken under the current approval and proposed mining as part of the Project will be moving further away from the site no further management of site MOH5 is considered necessary for the Project. The previous recordings of Site MOH5 are considered to be an appropriate and sufficient level of documentation for this site.

7.5 Site MOH11

Site MOH11 is located outside the Project Area and will not be directly impacted as a result of the Project. Although the site may potentially be subject to vibration impacts, the site will remain as a ruin standing in a rural landscape.

Site MOH11 has been identified as being of local significance and has been recorded as part of the preparation of this report (the photographic record is included as **Appendix 1**). The recording of the site as part of this report and the photographic record appended to this report (**Appendix 1**) are considered to be an appropriate and sufficient level of documentation for this site.

7.6 Blasting/Vibrations

As discussed in **Section 6.2**, a number of listed heritage items are located outside, but in proximity to, the Project Area that have been considered in terms of indirect impact resulting from vibration from blasting, which has the potential to damage/destroy/disturb historical heritage items.

The Project will undertake blasting in accordance with a detailed design process that will consider operational, geological and environmental constraints and be undertaken in accordance with an approved BMP.

None of the listed heritage items have a predicted ground vibration level that exceeds 3 mm/s. As such, there are not expected to be any indirect impacts to the listed items as part of the Project.

7.7 Section 146 *Heritage Act 1977* (NSW)

Adherence to Section 146 of the Heritage Act, including the cessation of work and notification of relevant stakeholders, in the event unexpected archaeological remains (including human skeletal material) or potential heritage items not identified as part of this report are discovered during the Project will ensure that any unexpected archaeological remains or potential heritage items are appropriately managed in accordance with relevant statutory controls and protections.

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APPENDIX 1

Photograph Catalogue

Image/File No	Mount Owen Continued Operations Project – Historical Heritage Photograph Catalogue	
	Subject and Detail	Orientation
DSCN0516	MOH6 – collapsed yards and ramp	North
DSCN0517	MOH6 – collapsed yards and ramp	West
DSCN0518	MOH6 – collapsed yards and ramp	West
DSCN0519	MOH6 – bricks and demolition rubble	South
DSCN0520	MOH6 – bricks	South-west
DSCN0522	MOH6 – demolition rubble	West
DSCN0524	MOH6 – Yards, machinery, concrete blocks	South
DSCN0525	MOH6 – concrete footing blocks	South-south-west
DSCN0527	MOH6 – concrete footing block, detail	
DSCN0528	MOH6 – yards, machinery remains and concrete remains	North
DSCN0529	MOH6 – machinery parts and concrete remains	North-east
DSCN0530	MOH6 – machinery parts	North
DSCN0531	MOH6 – machinery parts and corrugated iron	
DSCN0532	MOH6 – machinery parts	South-west
DSCN0533	MOH6 – house site rubbish dump and timber frame	West
DSCN0534	MOH6 – house site rubbish dump	West
DSCN0535	MOH6 – house site rubbish dump	East
DSCN0536	MOH6 – house site rubbish dump	North-west
DSCN0537	MOH6 – crushed car	East
DSCN0538	MOH6 – crushed car	East
DSCN0539	MOH6 – crushed car	West
DSCN0540	MOH6 – timber frame	North-west
DSCN0541	MOH6 – timber frame	West
DSCN0542	MOH6 – dump site next to track	North
DSCN0543	MOH6 – dump site next to track	North-east
DSCN0544	MOH6 – collapsed timbers	West
DSCN0546	MOH6 – water tank	South
DSCN0550	MOH6 – house site	North-west
DSCN0551	MOH6 – house site	West
DSCN0552	MOH6 – house site	North
DSCN0553	MOH6 – house site	North
DSCN0555	MOH6 – house site	North

Image/File No	Mount Owen Continued Operations Project – Historical Heritage Photograph Catalogue	
	Subject and Detail	Orientation
DSCN0558	MOH6 – water tank pvc pipe	
DSCN0559	MOH6 – house site, centre room	North-north-west
DSCN0564	MOH6 – house site	North
DSCN0566	MOH6 – house site	West
DSCN0567	MOH6 – house site	North-west
DSCN0569	MOH6 – house site, view back towards yards	South-east
DSCN0571	MOH6 – house site, view back towards timber frame	North-east
DSCN0572	MOH6 – house site, view back towards timber frame	East
DSCN0573	MOH6 – TV set	
DSCN0575	MOH7 – yards	South-east
DSCN0576	MOH7 – yards, ramp detail	South-east
DSCN0577	MOH7 – yards, ramp detail	South-east
DSCN0578	MOH7 – yards, ramp detail	South-east
DSCN0579	MOH7 – yards, interior	West-south-west
DSCN0580	MOH7 – yards, interior	West-south-west
DSCN0581	MOH7 – yards, corner post detail	South
DSCN0582	MOH7 – yards, detail	South
DSCN0583	MOH7 – yards, ramp detail	South
DSCN0584	MOH7 – yards, internal gate detail	West
DSCN0588	MOH7 – yards	West
DSCN0591	MOH7 – yards, gate and post and wire fence	West
DSCN0592	MOH7 – yards, interior	West
DSCN0593	MOH7 – corrugated iron shed	South-west
DSCN0594	MOH7 – corrugated iron shed	South
DSCN0596	MOH7 – corrugated iron shed, interior	East
DSCN0597	MOH7 - corrugated iron shed	East
DSCN0598	MOH7 – post and wire fence adjacent to MOH7	East
DSCN0599	MOH7 – post and wire fence adjacent to MOH7	South-east
DSCN0604	MOH5 – chimney	South
DSCN0605	MOH5 – chimney, with shed in background	South-east
DSCN0608	MOH5 – chimney, with water tank	West-north-west

Image/File No	Mount Owen Continued Operations Project – Historical Heritage Photograph Catalogue	
	Subject and Detail	Orientation
DSCN0610	MOH5 – chimney	North-east
DSCN0611	MOH5 – chimney	North-east
DSCN0612	MOH5 – chimney, with shed in background	South-east
DSCN0613	MOH5 – chimney, with shed in background	South-east
DSCN0615	MOH5 – dairy	South-east
DSCN0616	MOH5 – shed	South-east
DSCN0620	MOH5 - shed	North-east
DSCN0621	MOH5 - shed	North-east
DSCN0624	MOH5 – timber post structure	
DSCN0628	MOH8 – overview of fenced enclosure and yards	North-east
DSCN0633	MOH8 – overview of fenced enclosure and yards	North-east
DSCN0634	MOH8 – overview of fenced enclosure and yards	North-east
DSCN0635	MOH8 – overview of fenced enclosure and yards	North-east
DSCN0637	MOH9 – yards	South-west
DSCN0638	MOH9 – yards	West-south-west
DSCN0639	MOH9 – yards and ramp	South-west
DSCN0640	MOH9 – ramp	South-west
DSCN0641	MOH9 – ramp	North-east
DSCN0642	MOH9 – ramp	North
DSCN0643	MOH9 – yards, joints detail	
DSCN0644	MOH9 – yards, joints detail	
DSCN0645	MOH9 – yards, internal gate	
DSCN0646	MOH9 – yards with wire fencing	South-west
DSCN0647	MOH9 – trough	
DSCN0649	MOH9 – yards	
DSCN0650	MOH9 – ramp	North-west
DSCN0651	MOH9 – house gate	North
DSCN0652	MOH9 – house gate	North-east
DSCN0653	MOH9 – house gate	North-east
DSCN0654	MOH9 – house fence with chicken wire	North
DSCN0655	MOH9 – concrete platform	North-east

Image/File No	Mount Owen Continued Operations Project – Historical Heritage Photograph Catalogue	
	Subject and Detail	Orientation
DSCN0656	MOH9 – stones/garden edging	North-east
DSCN0658	MOH9 – stones/garden edging	North-east
DSCN0659	MOH9 – concrete platform	South-east
DSCN0660	MOH9 – concrete platform	South-east
DSCN0661	MOH9 – dams beyond structures	South-east
DSCN0663	MOH9 – dams beyond structures	South-east
DSCN0664	MOH9 – pvc pipe	West
DSCN0666	MOH9 – concrete footing block	
DSCN0669	MOH9 – termination of telephone line	North-north-west
DSCN0670	MOH9 – entry gate to house area	South-south-east
DSCN0671	MOH10 – timber loading ramp	North-west
DSCN0672	MOH10 – timber loading ramp	North-east
DSCN0673	MOH10 – timber loading ramp	South-west
DSCN0674	MOH10 – timber loading ramp	North-east
DSCN0675	MOH10 – timber loading ramp	
DSCN0678	MOH9 – yards and fencing remains from MOH10	South-west
DSCN0680	MOH8 – fenced enclosure, yards and track through centre	East
DSCN0681	MOH8 – remains of enclosure fencing	South-east
DSCN0682	MOH8 – yards	East
DSCN0683	MOH8 – yards, remains of ramp	South-east
DSCN0684	MOH8 – yards	East
DSCN0685	MOH8 – yards, remains of ramp	North-east
DSCN0686	MOH8 – yards, remains of ramp	North-east
DSCN0687	MOH8 – yards, remains of ramp	South-west
DSCN0688	MOH8 – yards, remains of ramp, detail of construction	South-west
DSCN0689	MOH8 – fenced enclosure and yards	West
DSCN0690	MOH8 – fenced enclosure and yards	South-west
DSCN0692	MOH11 – yards under tree, near sheep dip	North
DSCN0693	MOH11 – yards under tree, near sheep dip	North

Image/File No	Mount Owen Continued Operations Project – Historical Heritage Photograph Catalogue	
	Subject and Detail	Orientation
DSCN0694	MOH11 – sheep dip entry	North-west
DSCN0697	MOH11 – sheep dip entry	North-north-west
DSCN0698	MOH11 – sheep dip and yards	North-east
DSCN0699	MOH11 – sheep dip and yards	East-north-east
DSCN0700	MOH11 – detail of brick construction and render	East
DSCN0701	MOH11 – sheep dip	South-east
DSCN0702	MOH11 – sheep dip	South
DSCN0706	MOH11 – sheep dip	South
DSCN0707	MOH11 – run after sheep dip	South-west
DSCN0708	MOH11 – run after sheep dip	South
DSCN0709	MOH11 – run after sheep dip	East-south-east
DSCN0710	MOH11 – run after sheep dip	South-east
DSCN0711	MOH11 – water tanks	South-east
DSCN0712	MOH11 – water tanks	South-east
DSCN0713	MOH11 – water tank, interior	
DSCN0714	MOH11 – early sheep run remains	South-west
DSCN0716	MOH11 – most recent ramp remains	South-south-west
DSCN0717	MOH11 – most recent ramp remains, with chimney in background	South-south-west
DSCN0718	MOH11 – most recent ramp remains	South-south-west
DSCN0719	MOH11 – most recent ramp remains	Southwest
DSCN0720	MOH11 – most recent ramp remains	West
DSCN0721	MOH11 – most recent ramp remains	South-west
DSCN0722	MOH11 – early sheep run remains	South-west
DSCN0723	MOH11 – yards	West-south-west
DSCN0724	MOH11 – most recent ramp remains, with water tanks	South-east
DSCN0725	MOH11 – newest ramp remains	South-east
DSCN0727	MOH11 – chimney and concrete slab	West
DSCN0732	MOH11 – chimney and concrete slab	South
DSCN0734	MOH11 – chimney and concrete slab	South-west
DSCN0735	MOH11 – chimney and concrete slab	South-west
DSCN0738	MOH11 – chimney	South-east
DSCN0740	MOH11 – chimney	South-east
DSCN0742	MOH11 – chimney	South-east

Image/File No	Mount Owen Continued Operations Project – Historical Heritage Photograph Catalogue	
	Subject and Detail	Orientation
DSCN0743	MOH11 – chimney	South-east
DSCN0745	MOH11 – chimney and concrete slab	North-west
DSCN0747	MOH11 – concrete slab	North-west
DSCN0749	MOH11 – chimney and yards	East-south-east
DSCN0750	MOH11 – exotic plantings	West
DSCN0752	MOH11 – post remains	
DSCN0753_1	MOH12 - former house site – concrete slab (scale = 1 metre)	West
DSCN0753_2	MOH12 - former house site – concrete slab (scale = 1 metre)	South-west
DSCN0753_3	MOH12 - former house site – view to brick chimney from concrete slab	South
DSCN0753_4	MOH12 - former house site – concrete slab, detail	
DSCN0753_5	MOH12 - former house site – general view	South
DSCN0753_6	MOH12 - former house site – plantings	North
DSCN0753_7	MOH12 - former house site – chimney (scale = 2 metres)	South
DSCN0753_8	MOH12 - former house site – chimney (scale = 2 metres)	South
DSCN0753_9	MOH12 - former house site – chimney (scale = 2 metres)	South
DSCN0753_10	MOH12 - former house site – chimney (scale = 2 metres)	South
DSCN0753_11	MOH12 - former house site – chimney (scale = 1 metre)	West
DSCN0753_12	MOH12 - former house site – chimney	West
DSCN0753_13	MOH12 - former house site – chimney	North-west
DSCN0753_14	MOH12 - former house site – chimney	South
DSCN0753_15	MOH12 - former house site – chimney	North-east
DSCN0753_16	MOH12 - former house site – chimney	South-east
DSCN0753_17	MOH12 - former house site – chimney detail	North-west
DSCN0753_18	MOH12 - former house site – chimney detail	South
DSCN0754	Ravensworth Village – 1880s Ravensworth School	North-east
IMG_3049	Ravensworth Village – 1970s Ravensworth School	North
IMG_3050	Ravensworth Village – 1970s Ravensworth School	North-west
IMG_3051	Ravensworth Village – 1970s Ravensworth School	North-east
IMG_3052	Ravensworth Village – 1970s Ravensworth School	South-west
IMG_3054	Ravensworth Village – 1880s and 1970s Ravensworth Schools	South

Image/File No	Mount Owen Continued Operations Project – Historical Heritage Photograph Catalogue	
	Subject and Detail	Orientation
IMG_3055	Ravensworth Village – 1880s Ravensworth School	South
IMG_3056	Ravensworth Village – 1880s Ravensworth School	South-east
IMG_3057	Ravensworth Village – 1880s Ravensworth School	South-east
IMG_3058	Ravensworth Village – 1880s Ravensworth School	East
IMG_3059	Ravensworth Village – 1880s Ravensworth School	South-east
IMG_3060	Ravensworth Village – 1880s Ravensworth School	East-north-east
IMG_3061	Ravensworth Village – 1880s Ravensworth School	East-north-east
IMG_3063	Ravensworth Village – 1880s Ravensworth School	North-east
IMG_3064	Ravensworth Village – 1880s Ravensworth School	West
IMG_3065	Ravensworth Village – 1880s Ravensworth School	West
IMG_3067	Ravensworth Village – house next to Ravensworth School	North-east
IMG_3071	Ravensworth Village – house next to Ravensworth School	North
IMG_3073	Ravensworth Village – house next to Ravensworth School	North-west
IMG_3078	Ravensworth Village – northeast corner lot	South
IMG_3079	Ravensworth Village – Telstra cables	West
IMG_3080	Ravensworth Village – Telstra cables	West
IMG_3081	Ravensworth Village – northeast corner lot	South
IMG_3082	Ravensworth Village – northeast corner lot	South
IMG_3083	Ravensworth Village – animal enclosure	North-east
IMG_3084	Ravensworth Village – animal enclosure	North-east
IMG_3086	Ravensworth Village – animal enclosure	North-east
IMG_3088	Ravensworth Village – animal enclosure	West
IMG_3089	Ravensworth Village – animal enclosure	North
IMG_3090	Ravensworth Village – citrus adjacent to animal enclosure	East
IMG_3091	Ravensworth Village – potential former location of Wolfgang family wine shop	South
IMG_3092	Ravensworth Village – potential former location of Wolfgang family wine shop	South-west
IMG_3093	Ravensworth Village – potential former location of Wolfgang family wine shop	North-east
IMG_3094	Ravensworth Village – potential former location of Wolfgang family wine shop	East
IMG_3095	Ravensworth Village – plantings in potential former location of Wolfgang family wine shop	
IMG_3096	Ravensworth Village – concrete pier	

Image/File No	Mount Owen Continued Operations Project – Historical Heritage Photograph Catalogue	
	Subject and Detail	Orientation
IMG_3097	Ravensworth Village – potential former location of Wolfgang family wine shop	South-west
IMG_3098	Ravensworth Village – general view	
IMG_3099	Ravensworth Village – locked metal box	West
IMG_3100	Ravensworth Village – metal frame	
IMG_3101	Ravensworth Village – Air quality monitor	West
IMG_3102	Ravensworth Village – north west corner	South
IMG_3103	Ravensworth Village – north west corner	South
IMG_3104	Ravensworth Village – Air quality monitor	South-west
IMG_3105	Ravensworth Village – regrowth trees	
IMG_3106	Ravensworth Village – regrowth trees on north west corner	North
IMG_3107	Ravensworth Village – general view	West
IMG_3108	Ravensworth Village – concrete steps to Community Hall lot	West
IMG_3111	Ravensworth Village – Ravensworth Park lot	South
IMG_3112	Ravensworth Village – Ravensworth Park lot	South
IMG_3113	Ravensworth Village – Ravensworth Park lot	South
IMG_3114	Ravensworth Village – Ravensworth Park lot	South
IMG_3115	Ravensworth Village – Ravensworth Park fence	South-west
IMG_3117	Ravensworth Village – concrete steps to Community Hall lot	South-south-west
IMG_3118	Ravensworth Village – concrete steps to Community Hall lot	West
IMG_3119	Ravensworth Village – Community Hall lot	South
IMG_3121	Ravensworth Village – Community Hall lot	South-west
IMG_3122	Ravensworth Village – Telstra exchange	South-west
IMG_3124	Ravensworth Village – Telstra exchange	South
IMG_3125	Ravensworth Village – Telstra exchange	South
IMG_3127	Ravensworth Village – 1970s Ravensworth School, path from Hebden Road	North
IMG_4963	Former Hebden Public School - school building interior	
IMG_4966	Former Hebden Public School - school building exterior	
IMG_4967	Former Hebden Public School site	
IMG_4968	Former Hebden Public School - school building exterior	
IMG_4969	Former Hebden Public School site	
IMG_4970	Former Hebden Public School site	

Image/File No	Mount Owen Continued Operations Project – Historical Heritage Photograph Catalogue	
	Subject and Detail	Orientation
IMG_4971	John Winter memorial site	
IMG_4972	John Winter memorial site	
IMG_4973	Former Hebden Public School site from John Winter memorial site	
IMG_4974	John Winter memorial site	
IMG_4975	John Winter memorial site	
IMG_4977	Former Hebden Public School site	
IMG_4978	John Winter memorial site	
IMG_4979	Former Hebden Public School site	
IMG_4980	Former Hebden Public School site	
IMG_4982	Former Hebden Public School site	
IMG_4983	Former Hebden Public School site	
IMG_4984	Former Hebden Public School site	
IMG_4985	Former Hebden Public School site	
IMG_4986	Former Hebden Public School - school building exterior	
IMG_4987	Former Hebden Public School - school building exterior	
IMG_4988	Former Hebden Public School - school building exterior	
IMG_4989	Former Hebden Public School - school building exterior	
IMG_4990	Former Hebden Public School - school building exterior	
IMG_4991	Former Hebden Public School - school building exterior	
IMG_4992	Former Hebden Public School - school building exterior	



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