

Rix's Creek Mine Non-Indigenous Heritage Impact Assessment

Rix's Creek Mine Continuation Project



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Client: Rix's Creek Mine Pty Ltd

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Quality Information

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Reviewed by Sharmin Lubonski

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			Name/Position	Signature
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Executive Summary

AECOM Australia Pty Ltd (AECOM) was commissioned by Rix's Creek Mine on behalf of Bloomfield Collieries Pty Limited (Bloomfield) to undertake a non-Indigenous heritage impact assessment as part of an Environmental Impact Statement (EIS) that is to be prepared for the Rix's Creek Continuation of Mining Project (the Project). The assessment is to form part of an Environmental Impact Statement (EIS) being prepared by Rix's Creek Mine to support an application for State Significant Development Consent to facilitate the ongoing operation of open cut coal mining operations, and associated infrastructure.

The Project Area for this assessment comprises two spatially discrete parcels of land within Bloomfield's existing CL352 Mine Lease (ML) boundary and proposed lease extension area. The first is located to the north/northwest of existing open cut Pits 2 and 3 on the western side of the New England Highway and covers an area of approximately 133 ha. The second is located to the southwest of the mine's existing Coal Handling and Preparation Plant (CHPP) complex on the eastern side of the New England Highway and covers an area of approximately 32 ha. Collectively, these parcels of land constitute the Project's disturbance footprint and cover an area of 165 ha.

A search was undertaken of statutory and non-statutory heritage registers and inventories. No previously registered historic heritage sites were located within the bounds of the Project Area. One previously registered historic heritage site was identified immediately adjacent to the 32 hectare parcel of the Project Area on the eastern side of the New England Highway. This site – Rix's Creek Coke Ovens & Associated Works – is listed on the Singleton Local Environmental Plan (LEP) 2013 as item number I45. The curtilage for the listed historic site is approximately 50 m from the edge of the Project Area at its closest point. Currently the site and the Project Area are separated by a haul road.

Survey of the Project Area was undertaken over three days between 27 May and 29 May 2014. The field program was led by AECOM archaeologists Dr Darran Jordan and Dr Andrew McLaren. The survey was undertaken in transects spaced at 100 m intervals across the entirety of the Project Area. Four potential historic heritage items were identified during the survey. These were:

- 1) Granbalang Trig Station;
- 2) Linear Embankment;
- 3) Mound with historic material; and
- 4) Vertical shaft with fencing.

Of the four identified items, one was outside the proposed area of disturbance (Granbalang Trig Station) but has the potential for visual impacts, while the other three were within areas of proposed disturbance. One of these (vertical shaft with fencing) was assessed as having no heritage significance and therefore is not considered a historic site. Additionally, the proximity of the registered item - Rix's Creek Coke Ovens & Associated Works – meant that there was the potential for indirect impacts from blasting vibration to occur within its curtilage.

It is recommended that a Historic Heritage Management Plan (HHMP) be prepared for the Project to manage impacts to identified historic heritage items and that a Conservation Management Plan (CMP) be prepared to guide the conservation of Rix's Creek Coke Ovens & Associated Works.

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1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was commissioned by Rix's Creek Mine on behalf of Bloomfield Collieries Pty Limited (Bloomfield) to undertake a non-Indigenous heritage impact assessment as part of an Environmental Impact Statement (EIS) that is to be prepared for the Rix's Creek Continuation of Mining Project (the Project). The assessment is to form part of an Environmental Impact Statement (EIS) being prepared by Rix's Creek Mine to support an application for State Significant Development Consent to facilitate the ongoing operation of open cut coal mining operations, and associated infrastructure.

1.1 Assessment Objectives

The overarching objectives of this assessment were as follows:

- to identify, through background research and targeted archaeological investigations, the historical heritage values of the Project Area;
- to assess the significance of identified historical heritage items in accordance with the New South Wales (NSW) Heritage Branch's guidelines: *Assessing Heritage Significance* (NSW Heritage Office, 2001) and *Levels of Heritage Significance* (NSW Heritage Office, 2008);
- to prepare a Statements of Heritage Impact (SoHI) for all identified heritage items within the Project Area in accordance with the NSW Heritage Branch's guidelines: *Statements of Heritage Impact* (NSW Heritage Office, 2002); and
- to provide, on the basis of significance assessments and SoHIs, appropriate mitigation strategies for all identified and potential historical heritage items.

1.2 Project Background

The Project Area for this assessment comprises two spatially discrete parcels of land within Bloomfield's existing CL352 Mine Lease (ML) boundary and proposed lease extension area. The first is located to the north/northwest of existing open cut Pits 2 and 3 on the western side of the New England Highway and covers an area of approximately 133 ha. The second is located to the southwest of the mine's existing Coal Handling and Preparation Plant (CHPP) complex on the eastern side of the New England Highway and covers an area of approximately 32 ha. Collectively, these parcels of land constitute the Project's disturbance footprint and cover an area of 165 ha (see Figure 1 and Figure 2).

Rix's Creek Pty Ltd has owned and operated the Mine since 1989. Current mining operations are forecast to continue until 2038, subject to approval. There is potential for further resource recovery to continue beyond this period subject to separate environmental assessment and approvals.

The Mine currently extracts from within the Barrett, Liddell, Arties and Pikes Gully and Lemington seams of the Whittingham Coal Measures and predominately produces thermal and semi-soft coking coal for export with small quantities for domestic consumption. A truck and shovel method is used to remove and stockpile ahead of mining operations. Overburden is then drilled and blasted, with blasting requirements dependent on the characteristics of overburden. Blasting is typically undertaken using Ammonium Nitrate Fuel Oil (ANFO).

Coal is currently extracted from two operational pits: Pit 1 to the east of the New England Highway; and Pit 3 to the west of the Highway and on the western side of Rix's Creek. Ongoing mining continues concurrently in Pits 1 and 3 with production rates of around 2.5 Mtpa of Run-of-mine (ROM) coal. Annual production is currently around 1.5 Mtpa of product coal.

It is anticipated that current open cut coal extraction from the northern end of Pit 1 will be complete by the beginning of 2014, with coal extraction concentrated in Pit 3 after that time. With the completion of coal extraction from the northern end Pit 1, overburden will be progressively backfilled into the void prior to capping to final levels and rehabilitation. Extraction of coal from Pit 2 ceased in 2003, with this pit utilised for tailings emplacement from 2005 onwards (as Tailings Emplacement No 3). This tailings emplacement area is expected to reach capacity by mid-2014, after which dewatering and rehabilitation will commence. Tailings will then be disposed into Tailings Emplacement No. 4 which is contained within the Pit 1 (North Pit) void.

1.3 Project Description

Bloomfield is seeking approval for the Project, which relates to the continuation of existing multi-seam benching open cut mining operations in Pit 3, within Coal Lease (CL) 352 and Mining Lease (ML) 1432, owned by Rix's Creek Pty Ltd. The project would allow the Mine to continue operating as an open cut mine, and would utilise existing mine infrastructure. The project would also include a small extension of the existing Mining Lease boundary in a westerly direction to accommodate a proposed new overburden emplacement area, which would reduce the impact of noise and visual amenity. Bloomfield is seeking approval for the Project as a State Significant Development to be carried out under Division 4.1, Part 4 of the EP&A Act and the *Environment Planning and Assessment Regulations 2000* (Regulation).

The Project generally comprises:

- The extension of the existing Mining Lease boundary in a westerly direction to accommodate a proposed new overburden emplacement area;
- The Coal Handling and Preparation Plant (CHPP) may increase to allow the 4.5 Mtpa ROM coal to be processed under continued mining operations;
- Some additional mobile equipment to be added to the existing mine fleet to allow for the increased production levels. The existing policy of fleet renewal will mean the replacement of some of the current mine fleet as required;
- The northward progression of mining in Pit 3; and
- An additional New England Highway crossing will also be required. This crossing will be located to the north of the existing tunnel crossing. The existing southern tunnel crossing will be temporarily inaccessible as the pit void progresses north, but will be re-established as the dump profile advances. It is proposed to construct a second tunnel under the New England Highway to provide unrestricted access for mine vehicles to transport coal across the highway, without impacting the traffic on the highway. The exact location and construction methodology for the tunnel crossing would be confirmed at a later stage.

1.4 Related Studies

The studies which are to be read in conjunction with this assessment include the following:

- The Rix's Creek Continuation of Mining Project Environmental Impact Statement (EIS);
- The Rix's Creek Aboriginal Archaeology and Cultural Heritage Impact Assessment;
- The Rix's Creek Vibration Assessment; and
- The Rix's Creek Visual Impact Assessment.

1.5 Director General's Requirements (DGRs)

This assessment has been prepared to form part of an EIS for submission to the Department of Planning and Infrastructure (DP&I) for the approval of the Project. Applications for Project Approval carried out under Section 78A(8A) of the *Environmental Planning and Assessment Act 1979* are to be supported by an EIS. The EIS is to be prepared in accordance with the Director-General's Requirements (DGRs). This assessment, which forms part of the EIS, addresses the Environmental Assessment Requirements (EARs) relating to a historic heritage assessment (non-Indigenous heritage assessment).

Table 1 lists the DGRs that are relevant to this assessment and the sections in this report where each DGR is addressed.

Table 1 Director-General's Environmental Assessment Requirements

Key Issue	Requirement	Report Section
Non-Indigenous Heritage	Include a statement of heritage impact (including significance assessment) for any State significant or locally significant heritage items;	Sections 6.1, 6.0, 9.0 and 9.7.
Non-Indigenous Heritage	Outline any proposed mitigation and management measures (including an evaluation of the effectiveness and reliability of the measures).	Sections 6.1, 6.0, 9.0 and 9.7.

As required by the DGRs, the following guidelines and policies were considered when preparing this assessment:

- NSW Heritage Manual (NSW Heritage Office & NSW Department of Urban Affairs and Planning, 1996a);
- The Burra Charter (the Australia ICOMOS charter for places of Cultural Significance) (ICOMOS (Australia), 2013);
- Statements of Heritage Impact (NSW Heritage Office, 2002); and
- NSW Heritage Manual (1996a).

In addition to the policies identified in the DGRs, the following policies and guidelines were considered in this assessment:

- Assessing Heritage Significance (NSW Heritage Office, 2001);
- Heritage Curtilages (NSW Heritage Office & NSW Department of Urban Affairs and Planning, 1996b); and
- Levels of Heritage Significance (NSW Heritage Office, 2008).

1.6 Project Team

AECOM archaeologists Dr Darran Jordan (PhD (Archaeology) 2012, University of Sydney) and Dr Andrew McLaren (PhD (Archaeology) 2009, University of Cambridge), undertook the survey. Dr Darran Jordan produced the report with contributions from AECOM heritage team members Dr Andrew McLaren, Geordie Oakes and Rochelle Coxon. Sharmin Lubonski, Associate Director, provided quality review of the document. Tim Osborne provided figures. Calamity Mason provided administrative support.

1.7 Punctuation note

Regarding the punctuation of this report, please note that both the suburb Rix's Creek and the watercourse Rix's Creek do not have an apostrophe within the correct presentation of their name. The name of the mine site and the Project, however, are correctly presented in this report as Rix's Creek Coal Mine and the Rix's Creek Continuation of Mining Project, as per the presentation used in official mine documentation by The Bloomfield Group.

1.8 Limitations

Within this report predictions have been made about the probability of subsurface archaeological materials occurring within the study area based on surface indications and environmental contexts. However, it is possible that materials may occur in areas without surface indications and in any environmental context.

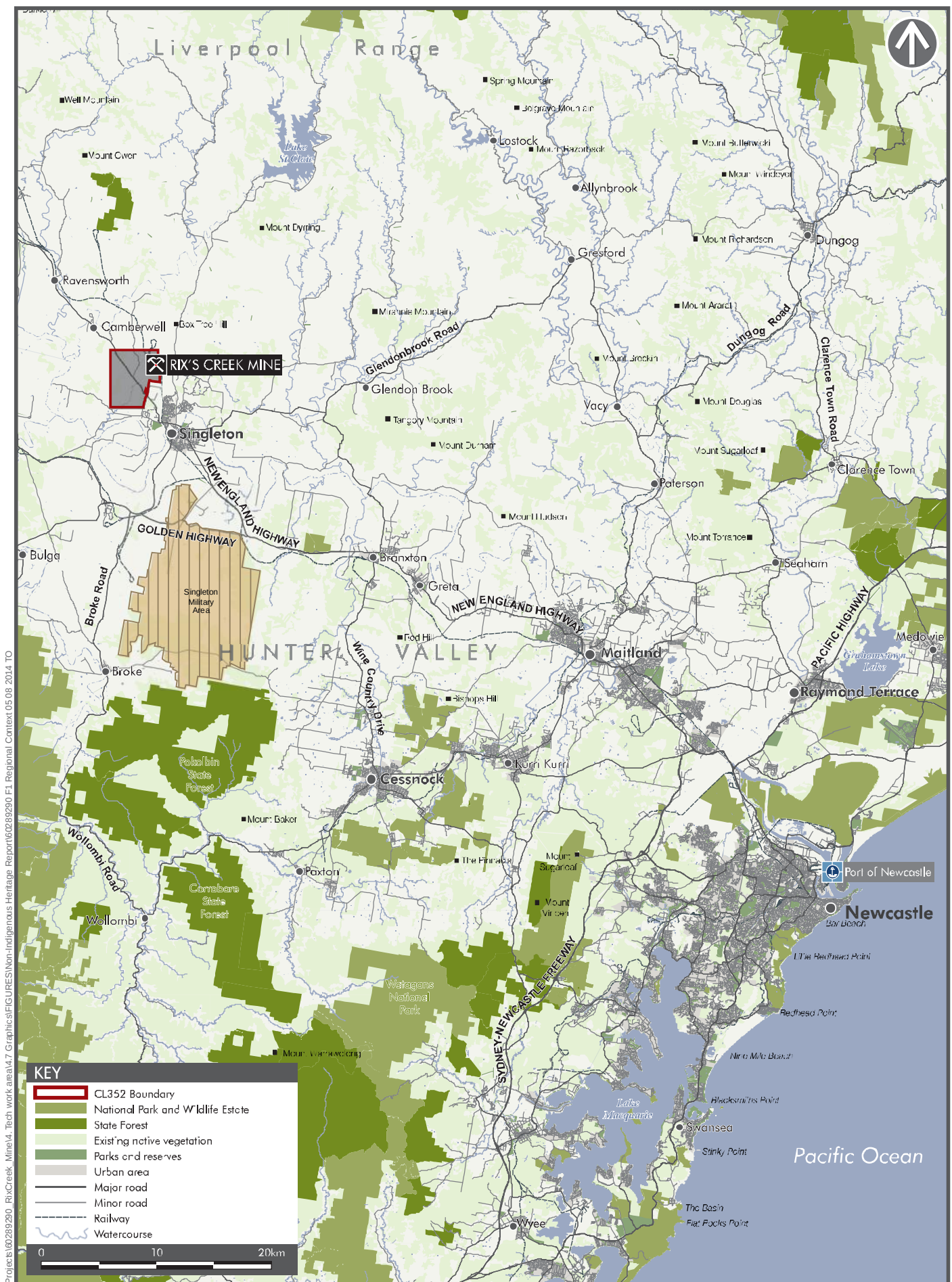
A summary of the statutory requirements regarding non-Indigenous heritage is provided in Section 2.0. This is provided based on experience with the heritage system in New South Wales (NSW) and does not purport to be legal advice. It should be noted that legislation, regulations and guidelines change over time and users of the report should satisfy themselves that the statutory requirements have not changed since the report was written.

This assessment does not address areas outside of the identified Project Area.

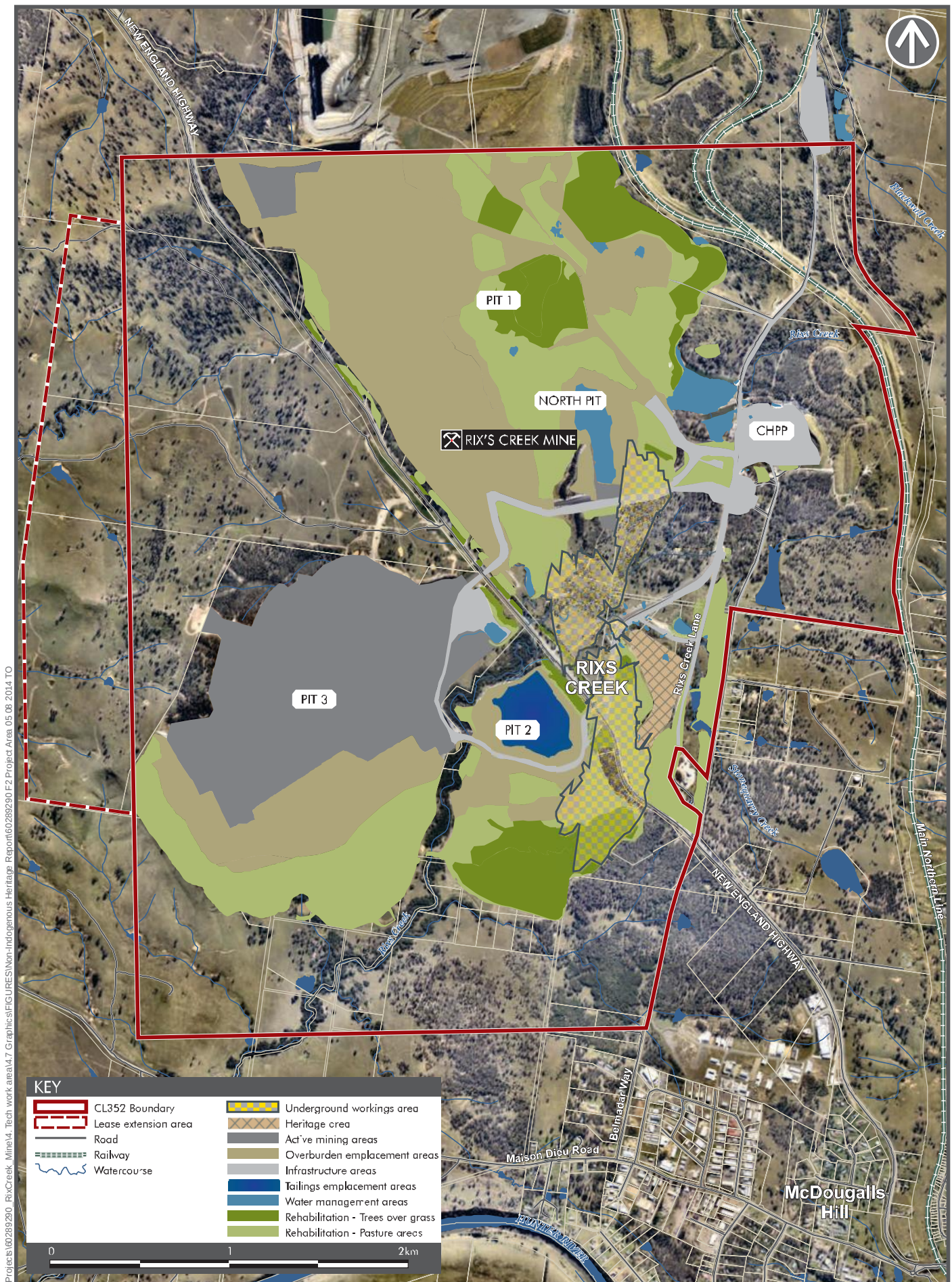
1.9 Report Structure

The report has the following structure:

- **Section 1.0** provides background information on the Project and the assessment undertaken.
- **Section 2.0** outlines the policy and legislation within which this assessment has been undertaken.
- **Section 3.0** outlines the methodology with regard to field survey and analysis.
- **Section 4.0** provides the historical context of land within the Project Area.
- **Section 5.0** provides the results of the historic heritage register/list searches.
- **Section 6.0** provides the field results and significance assessments of the identified heritage items.
- **Section 7.0** provides a cultural heritage landscape assessment for land within the Project Area.
- **Section 8.0** provides an assessment of the potential impacts of the Project on identified heritage items.
- **Section 9.0** details comprehensive management and mitigation strategies for identified heritage items.
- **Section 10.0** provides an overall summary.
- **Section 11.0** lists the references used in this assessment.



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2.0 Applicable Policy and Legislation

A number of planning and legislative documents govern how heritage is managed in NSW and Australia. The following section provides an overview of the requirements under each as they apply to the Project.

2.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) took effect on 16 July 2000.

Under Part 9 of the EPBC Act, any action that is likely to have a significant impact on a matter of National Environmental Significance (known as a controlled action under the Act), may only progress with approval of the Commonwealth Minister for the Department of Environment. An action is defined as a project, development, undertaking, activity (or series of activities), or alteration. An action will also require approval if:

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

The Bloomfield Group intends to refer the proposed development to the Department of the Environment to determine if the proposed development is a controlled action under Section 68(2) of the EPBC Act.

The EPBC Act defines 'environment' as both natural and cultural environments and therefore includes Indigenous and non-Indigenous historic cultural heritage items. Under the Act protected heritage items are listed on the National Heritage List (items of significance to the nation) or the Commonwealth Heritage List (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate (RNE). While the RNE has been suspended and is no longer a statutory list, it remains available as an archive.

The heritage registers mandated by the EPBC Act have been consulted and there are no items within the Project Area on these registers.

2.2 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) provide the framework for environmental planning in NSW and include provisions to ensure that proposals that have the potential to impact upon the environment are subject to detailed assessment and provide opportunity for public involvement. In NSW, environmental impacts are interpreted as including impacts to cultural heritage.

Division 4.1 provides for the planning assessment and determination regime for State Significant Development (SSD). Section 89C of the EP&A Act stipulates that a development will be considered SSD if it is declared to be such by the new State Environmental Planning Policy (State and Regional Development) 2011 (SEPP SRD).

Under Clause 8(1) of SEPP SRD, a development is declared to be a State Significant Development if:

- a) the development on the land concerned is, by the operation of an environmental planning instrument, permissible with development consent under Part 4 of the EP&A Act; and
- b) the development is specified in Schedule 1 or 2 of SEPP SRD.

Development Consent for the Rix's Creek Coal Mine was granted on the 19th October 1989 by the Minister for Planning pursuant to section 101 of the Environmental Planning and Assessment Act 1979 (EP&A Act). A second development consent was granted by the Minister for Urban Affairs and Planning on the 19th October 1995, pursuant to section 92 of the EP&A Act. The Bloomfield Group has applied for the Rix's Creek Continuation of Mining Project as a State Significant Development under Application Number SSD 6300.

2.3 The Heritage Act 1977

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

having State heritage significance can be listed on the SHR by the Minister on the recommendation of the Heritage Council.

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

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

Under Section 170 of the *Heritage Act*, NSW government agencies are required to maintain a register of heritage assets. The register places obligations on the agencies, but not on non-government proponents, beyond their responsibility to assess the impact on surrounding heritage items. AECOM has searched s.170 registers to determine whether there are listed items within the Project Area. No listed items were identified (see Section 5.0).

2.4 Singleton Local Environmental Plan (LEP) 2013

The Singleton Local Environmental Plan (LEP) 2013 is the comprehensive statutory planning document that applies to the Singleton Local Government Area (LGA). Section 5.10 of the LEP provides specific provisions for the protection of heritage items and relics within Singleton LGA. The following controls apply with respect to the development of heritage items:

Development consent is required for any of the following:

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

- (i) a heritage item,
- (ii) an Aboriginal object,
- (iii) a building, work, relic or tree within a heritage conservation area,

(b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,

(c) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,

(d) disturbing or excavating an Aboriginal place of heritage significance,

(e) erecting a building on land:

- (i) on which a heritage item is located or that is within a heritage conservation area, or
- (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,

(f) subdividing land:

- (i) on which a heritage item is located or that is within a heritage conservation area, or
- (ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.

Schedule 5 of the LEP provides a list of heritage items and relics within Singleton LGA. There are no heritage items listed in the heritage schedule that fall within the boundaries of the Project Area. One listed item, Rix's Creek Coke Ovens & Associated Works, is located adjacent to the Project Area.

2.5 Hunter Regional Environmental Plan (Heritage) (1989)

The Hunter regional Environmental Plan (REP) was deemed a *State Environmental Planning Policy* (SEPP) on 1 July 2009. The aims of the Hunter REP are threefold:

- To conserve the heritage of the Hunter Region;
- To promote the appreciation and understanding of the variety of items; and
- To encourage the conservation of townscapes that are desirable to conserve.

To this end, Schedule 1 lists items of State significance, Schedule 2 items of regional significance and Schedule 3 items of local significance within the Region. Schedule 4 includes items requiring further investigation to determine their level of significance.

Clause 6 requires LGAs to include provisions for significant items within LEPs, while Clause 7 provides for the development of heritage items. It requires that applications to alter, damage, remove or construct in the vicinity, be accompanied by a Statement of Heritage Impact, which addresses the impact to the significance of the item.

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3.0 Methodology

Archaeological survey of the Project Area Survey was undertaken over three days, between 27 May and 29 May 2014. The survey was led by AECOM archaeologists Dr Darran Jordan and Dr Andrew McLaren. Rix's Creek Mine representative John Hindmarsh (Senior Environmental Officer) also participated. The following sections describe the methodology used during the field survey.

3.1 Field Survey Methodology

Historical research prior to the fieldwork had not identified any areas of interest within the bounds of the Project Area.

The objective of the field survey was to assess the defined Project Area and to determine if there were any sites of heritage significance present. The field survey of the Project Area was a pedestrian survey covering the entire area in transects spaced at 100 m intervals. This covered and, in some areas exceeded, the extent of the defined Project Area.

The following method of investigation was undertaken with each site identified on the survey:

- Rix's Creek Coal Mine Senior Environmental Officer John Hindmarsh was asked for any known information regarding each site;
- The structures and/or features at the site were identified and recorded;
- The structures and/or features were assessed for historical significance;
- Photographs of the structures and/or features were captured and details were recorded in a photo log; and
- The position of the item/s was recorded with a GPS.

3.2 Analysis Method

The GPS data was provided to AECOM's GIS analyst for mapping. The field notes were then typed into Heritage Inventory Sheets for each of the sites inspected during the field survey. During this process, the physical evidence was analysed in light of the item's historical context and the item's significance was then assessed. The process of determining significance is described further in Section 6.1. The significance of each item and the information collected in the field are key components in determining what impact, if any, the Project may have on the items. Based on the significance of the item and the level of potential impact, management recommendations were developed.

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4.0 Historical Context

4.1 Introduction

The historical context of an area is important in understanding the type of sites likely to be identified and their potential distribution. The following section provides a brief overview of the history of the Project Area.

4.2 Early European Exploration

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

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

Land was quickly surveyed and by 1823 grants along rivers and creeks had been issued. Settlement, however, occurred at a slower pace. A traveller in 1827 said that the area was inhabited by single shepherds with their flocks (Hunter, 2010: 8).

4.3 Rix's Creek History

4.3.1 Early Coal Industry

Known historical industry developments in the Rix's Creek area were associated with mining and farming. William Longworth was employed by the Bowman family to sink a shaft to test for coal in 1847. Longworth's report that the coal was not of sufficient quality to warrant mining led to the closure of the shaft soon after (Noble, n.d.).

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

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

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

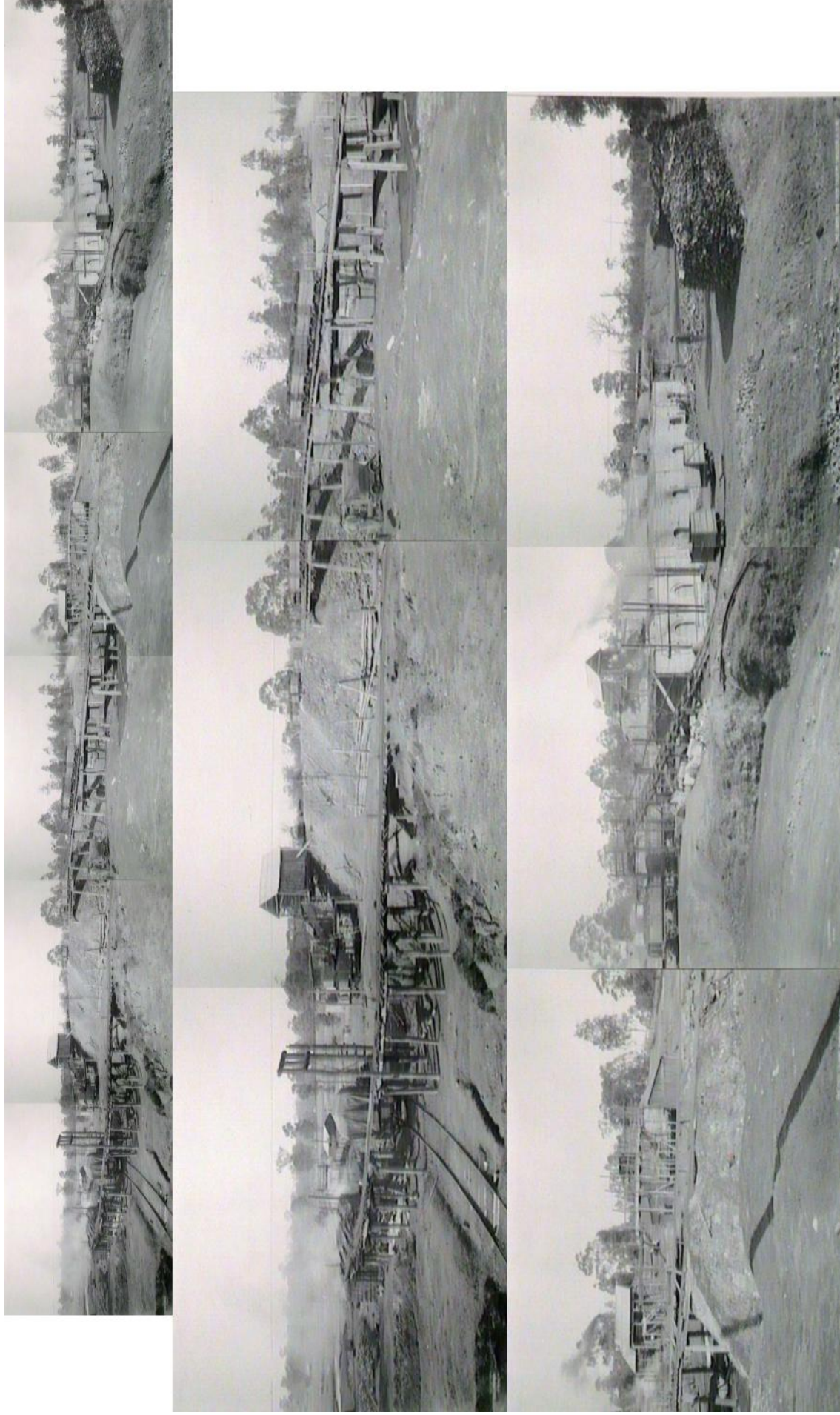


Plate 1 Panorama, Rix's Creek Colliery and Coke Ovens in 1906 (State Library of NSW: 176336-176340, Government Printing Office 1: 10559-10563)

4.3.1 Rix's Creek Coke Ovens

The syndicate formed by Dr Richard Read that had opened the New Park mine in 1881 also opened the Rix's Creek Coke Ovens (Noble, n.d.). A battery of coke ovens were built at Rix's Creek in the 1880s; these later had a second battery of ovens constructed around 1900 (see Plate 1). Both batteries were cited as being visually discernible in the area. The coke produced at the ovens was described in 1890 as "the best available" (Armstrong, 1983). A major business in the area, the remnant coke ovens and associated works (now long disused) have since been listed in the Singleton LEP (2013).

4.3.2 The Tramway and Great Northern Railway

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

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

By 1870 the Government were in the process of constructing a railway siding four miles from Singleton station, connecting to the Main North Line. This siding was accessible from a section of road located approximately two miles (3.2 km) from the Rix's Creek Colliery. Mr Elliot and Edward Campbell were still planning a tramway for direct connection, as the demand for coal from Rix's Creek had increased. From the two men they had originally employed at the mine in 1860, numbers had increased to between 20 and 30 men, with lessee Mr Elliot stating "he could find steady employment for ten more good and steady miners" (The Newcastle Chronicle, 1870).

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

The tramway petitioned for in 1869 was eventually built between the coal pits area (close to the Coke Ovens) and Rix's Creek Station. The tramway was in operation from at least 1887 (Singleton Argus, 1887), extending across a 50 acre block then owned by S. Noble, before reaching the Alexander Gardner owned land parcel where the Coke Ovens were situated. After the tramway fell into disuse its rails were removed. In 2012 AECOM identified remnants of the tramway, consisting of a raised linear earth mound corridor marking its original route (AECOM Australia Pty Ltd, 2012).

The Main North Line was utilised to transport both goods and people to and from Rix's Creek between 1885 and 1938. The full extent of the Main North Line started at Sydney and extended north to the town of Wallangarra on the Queensland border, with the main northern trunk line carrying freight and passengers between Sydney and Maitland. At the time of writing this report the Main North Line remains an active and important piece of transport infrastructure in NSW. Between 1885 and 1938 it was an important piece of historic infrastructure that connected the goods, produce and people of Rix's Creek to external markets and places. Industries in the area during that period included farms (dairy and pastoral), coal mines, stores and the coke ovens. The Rix's Creek platform was opened in 1885 to service the Main North Line and was in use up until the closure of the platform in November 1938. The 1930 Local Appendix lists it as station number N23A and states that it consisted of a platform only (there were no other station structures). The platform did not have permanent staff and was used only infrequently (New South Wales Government Railways, 1930). It is shown on the 1929 parish map of Darlington as being located in the rail corridor next to a 58 acre lot owned by F. L. Mackay (see Plate 2). In December 1952 the Main North Line was deviated slightly (approximately 90 m further east) in the area of Rix's Creek, with the disused platform located on the original alignment (Bozier, 2012). The rails have since been removed from the original

section of rail corridor for the Main North Line, with the remnant corridor used since then as a vehicle track (Bozier, 2012).

As previously noted, during a survey undertaken by AECOM in 2012 for a non-Indigenous heritage impact assessment, the historic tramway that linked the Main North Line to the coal pits and coke ovens was identified. The section of tramway identified crossed between 326526mE 6399938mN and 326562mE 6399895mN GDA 94 (Zone 56). The railing lines were not present on the identified section and there were no visible signs of historic material on the surface. The remnant alignment consisted of the built up, mounded area that the tracks had previously been mounted on (AECOM Australia Pty Ltd, 2012).



Plate 2 Detail of the 1929 Parish Map of Darlington

4.3.3 Rixs Creek Settlement

Some of the other historic businesses noted at Rixs Creek in the 1880s included three hotels, two stores, one church and a sports ground. One of these hotels was the Auckland Arms, which operated at Rixs Creek between 1861 and 1867. The first licensee was Joseph Morris, who was replaced in 1863 by James Quiggan. A local entrepreneur, Quiggan also opened his own coal shaft around 1862. The Auckland Arms was a brick structure, the business built specifically to house railway workers during the extension of the Main North Line. Local farmers also increased food production during this time to have sufficient stock to feed the workers. As the train line continued further north, however, the workers departed from the Rixs creek area, leading to the closure of the Auckland Arms (Foggo, 1990:64).

The total population situated Rixs Creek and its neighbouring suburb Nundah was over six hundred people in the 1880s, with Rixs creek reported at that time to have had "the best brass band in the north of the state" (Noble, n.d.). Data about the residents of Rixs Creek from the 1860s to the 1920s is documented in church records and Post Office directories, describing the names and occupations of locals during this time. Records from the 1860s list storekeepers, labourers, carriers, farmers, settlers, a coal driver and a publican all based at Rixs Creek. Farmers included names like Martin Marr, James Paul, Patrick Grady and Alexander Gardener. Settlers in the area included Peter and Martha Armstrong, James and Martha Wilson, and Joseph and Elizabeth Aberfield. The local storekeepers in 1864 were Samuel and Caroline Carson and the local publican in 1867 was James Quigan (Bailliere's Post Office, 1867). Quigan had also opened up a seam of coal at Rixs Creek in 1862 ((The Maitland Mercury and Hunter River General Advertiser, 1862).

Landholders at Rixs Creek in 1885 included John Elliot (who was listed as owning three horses, three cattle and two pigs), A. Wilson (who was listed as owning ten horses) and Mrs Price (listed as owning 400 acres, 12 horses, 88 cattle, 33 sheep and six pigs) (Singleton Legislative Council, 1885). Mr George Partridge managed the Granbalong estate which was used to run a dairy business, supplying milk to the area (The Singleton Argus, 1889).

There were also 37 residents by 1884 who listed their occupation as miner, as well as William Lindsay who listed himself as an engineer. Other farming families during 1884 included James Dobie, John Price, Richard Price and William Price (Sands Country Directory, 1884). By 1922 the Price name was still active in the area with John Price registered as owning grazing land and operating a dairy farm at Rixs Creek. As well as miners, farmers and labourers, one Donald Coates was listed as living in the area and working as an engine driver (Shire of Patrick Plains, 1922). The 1923 and 1929 Parish Maps of Darlington show Rixs Creek Public School located on the same land as the Rixs Creek Coke Ovens, a 110 acre block owned by Alexander Gardner (see Plate 2).

Rixs Creek School was opened in 1888, consisting of a public school building and teacher residence. At its most prosperous the school had approximately 150 students and was known for having a good reference library and geological specimens. Teachers at the school included James Cody, D. Howell, O. Jones, McPherson, F Breakwell and A Partridge. The school was closed in 1923 due to dropping attendance, as following a local mine closure in 1917 local mining families relocated to Cessnock and Greta. A subsidised school ran for six months in 1923 under the tutorship of Miss Hooker, following the official closure. While out of commission the empty structures were utilised as “camping quarters for tramps” which eventually prompted their demolition in January 1928 (The Singleton Argus, 1928).

4.4 Land-use and Disturbance

European settlement in the general Singleton area commenced in the late 1820s. Early land development was associated with wheat cropping, tobacco production dairy farming and timber cropping. From the 1870s onwards the land in the vicinity of Rixs Creek was cleared, predominantly for mining activities and stock grazing.

Subsequently the area within, and in the vicinity of, the Project Area, has been used for both mining and grazing activities, which have significantly affected the physical environment of the area. The smaller portion of the Project Area located to the east of the New England Highway predominantly covers land previously owned by Alexander Gardner, according to the 1912 Parish Map of Darlington. It may cross at the margins into areas owned by John Martin David and William Webb. The larger portion of the Project Area on the western side of the New England Highway covers land previously owned by Joseph Thomas Threlkeld and John Wiseman, according to the 1905 Parish Map of Auckland.

Much of the surface soil in the local area has been disturbed as a result of native vegetation clearance. Sheet and gully erosion has resulted in some areas from clearing and subsequent grazing activities. This has been exacerbated by soils are quite shallow and susceptible to erosion (Kovac & Lawrie, 1991:371). Sheet erosion is generally evident on lower slopes. This has resulted in the loss of topsoil, particularly across the lower to mid slope sections, which collect water runoff from higher ground during times of rain. Dead Man's Gully, Rixs Creek and their tributaries are generally in a rather degraded state in the vicinity of the Project Area, with stream bank erosion and gullying evident along drainage lines. The construction of dams, in conjunction with mining activities undertaken in the area, has also significantly altered the previous drainage regimes in the vicinity of the Project Area.

Past land uses and associated disturbances within the Project Area can be summarised as follows:

- Native vegetation clearance;
- Trampling from cattle grazing;
- Fencing works;
- Earthworks and excavation for dams;
- Erosion, particularly along creeklines;
- Landscape disturbances from the construction of vehicle tracks;
- Landscape disturbances from the construction of infrastructure, including roads; and
- Landscape disturbances from coal mining activities.

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5.0 Heritage Inventory Search Results

As discussed in Section 2.0, Commonwealth, State and local Governments maintain inventories of items of historical significance within each jurisdiction. The following section discusses listed heritage items within the Project Area.

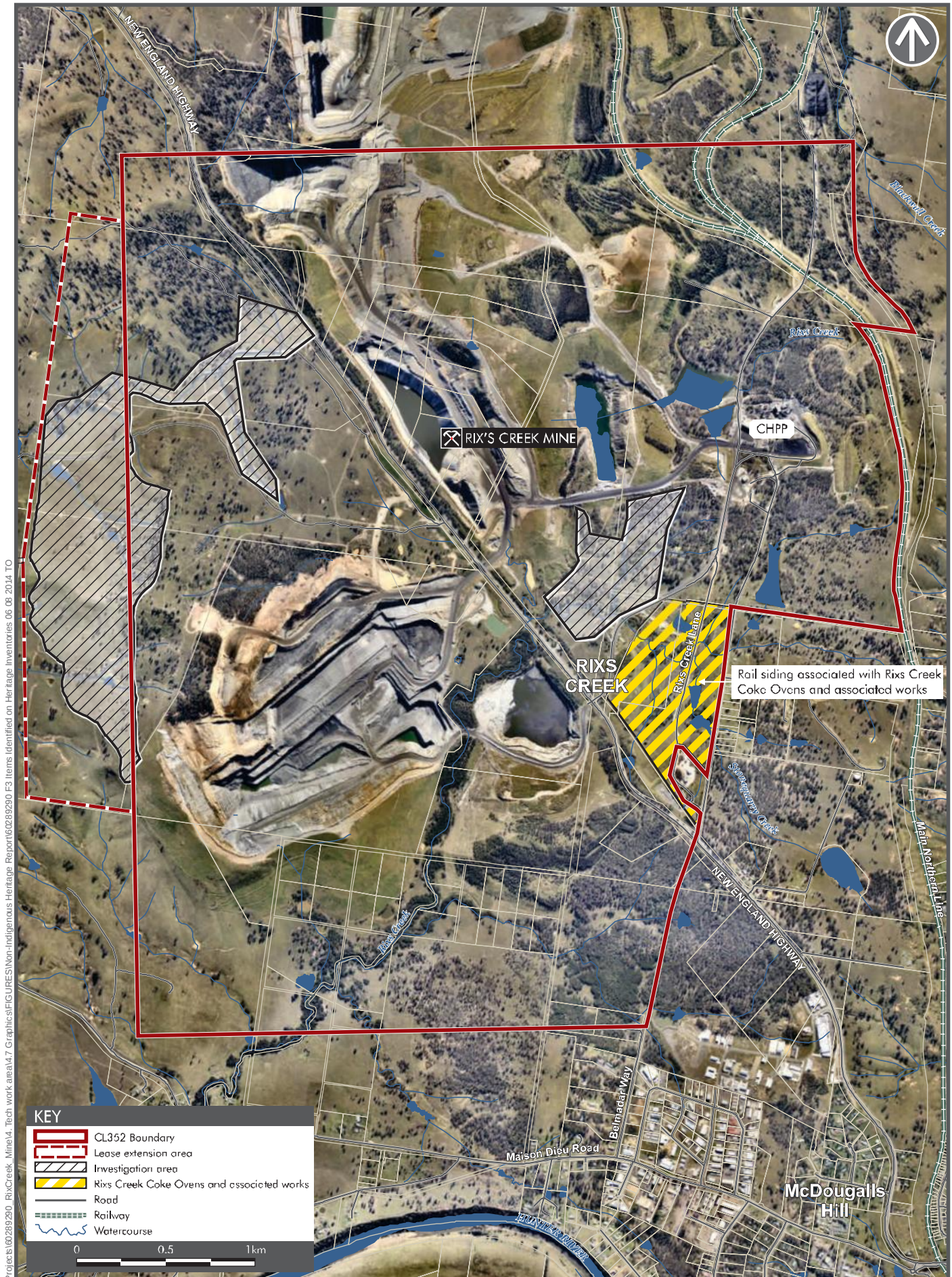
5.1 Heritage Inventory Searches

AECOM undertook a search of relevant heritage inventories on 26 May 2014, searching Rix's Creek and surrounding areas Camberwell, McDougalls Hill, Singleton, Ravensworth and Oak Park for any listings relevant to the Project Area. Table 2 summarises the heritage items listed on heritage inventories at the time of this assessment.

Table 2 Heritage Items Identified on Heritage Inventories

Register	Items within Project Area	Items within 2.5 km of Project Area
Commonwealth Heritage List	0	0
National Heritage List	0	0
Register of the National Estate	0	0
NSW State Heritage Register	0	0
NSW State Heritage Inventory	0	0
S170 Registers	0	0
Singleton Shire Council LEP 2013	0	Rix's Creek Coke Ovens & Associated Works
Hunter Regional Environmental Plan 1989 (Heritage)	0	0
EPBC Act Protected Matters	0	0

There are no listed heritage items within the Project Area. There is one item located immediately adjacent to the Project Area, its outer curtilage being approximately 50 m from it at its closest point. This item is the locally significant 'Rix's Creek Coke Ovens & Associated Works' listed on the Singleton Shire Council LEP 2013. The location of this item in relation to the Project Area is shown on Figure 3.



Projects\0289290_Rix's Creek_Mine\4_Tech work area\4.7 Graphics\FIGURES\Non-Indigenous Heritage Report\0289290_F3 Items Identified on Heritage Inventories 06_08_2014 TO

6.0 Significance Assessment and Statements of Heritage Impact

6.1 Significance Assessment Criteria

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

The process of linking this assessment with a site's historical context has been developed through the NSW Heritage Management System and is outlined in the guideline *Assessing Heritage Significance* (NSW Heritage Office, 2001), part of the NSW Heritage Manual (NSW Heritage Office & NSW Department of Urban Affairs and Planning, 1996a). The *Assessing Heritage Significance* guidelines establish seven evaluation criteria (which reflect four categories of significance and whether a place is rare or representative) under which a place can be evaluated in the context of State or local historical themes. Similarly, a heritage item can be significant at a local level (i.e. to the people living in the vicinity of the item), at a State level (i.e. to all people living within NSW) or be significant to the country as a whole and be of National or Commonwealth significance.

Following amendments to the *Heritage Act* in 2009, to be of State significance an item must meet two or more of the criteria below. Items can be deemed of local significance if they meet one or more criteria.

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

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

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

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

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

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

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

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

Criterion (e) – an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area). Significance under this criterion must have the potential to yield new or further substantial information.

Under the guideline, an item can be excluded if the information would be irrelevant or if it only contains information available in other sources.

Criterion (f) – an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area). The site must show evidence of the element/function, etc. proposed to be rare.

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

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

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

The Heritage Council requires the summation of the significance assessment into a succinct paragraph, known as a Statement of Significance. The Statement of Significance is the foundation for future management and impact assessment.

6.2 Rixs Creek Coke Ovens & Associated Works

6.2.1 Description

Historical photographs from 1906 show seven coke ovens in one continuous battery. Materials used to build the ovens included brick and sandstone. The 1906 photographs show the coke ovens to be situated within the larger Rixs Creek mining area, surrounded by such infrastructure as rail tracks housing trolley cars, wooden huts and earth embankments (see Plate 1 and Plate 3). In 1982 the coke ovens were inspected and described as:

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

Further description from 1982 described the larger site area as containing:

“40 Coke Ovens in two batteries, 3 closed mine entrances, coal and scree dumps, the remains of a tram way, some large mullock heaps, several building and machinery foundations, and a large amount of scattered pieces of iron and machine pieces, much half-buried... the mine is sited further up the hill than the ovens and is connected by a raised embankment probably used as a Tramway to carry the coal in skips from the mine entrance... There are remains of skip tracks on top of the ovens” (Croft and Associates Pty Ltd, 1982:Appendix 1).

In 2009 the coke ovens were inspected and described as being overgrown by vegetation, having also undergone collapse and vandalism in some areas (see Plate 9 and Plate 10) (The Amateur Geological Society of the Hunter Valley, 2009:7-8). In 2014 the president of the Singleton Historical Society & Museum advised AECOM that “the trees were growing through the ovens even before the present mine owned the land” (Peggy Moore pers.comm 30 June 2014).

The item ‘Rixs Creek Coke Ovens & Associated Works’ (item number I45) is described in the Singleton LEP (2013) as having State significance. It is not, however, listed on the SHR or SHI, only being listed locally on the Singleton LEP.



Plate 3 Panorama, Coke ovens, Rixs Creek Colliery 1906
(State Library of NSW: 176339-176340, Government
Printing Office 1: 10562-10563)



Plate 4 Rixs Creek Coke Oven circa 1982 (Croft and
Associates Pty Ltd, 1982:10)

	
Plate 5 Rixs Creek Coke Oven circa 1982 (Croft and Associates Pty Ltd, 1982:11)	Plate 6 Rixs Creek Coke Oven circa 1982 (Croft and Associates Pty Ltd, 1982:11)
	
Plate 7 Rixs Creek Coke Oven circa 2006 (Lonergan, 2007)	Plate 8 Rixs Creek Coke Oven circa 2006 (Lonergan, 2007)
	
Plate 9 Rixs Creek Coke Oven circa 2009 (The Amateur Geological Society of the Hunter Valley, 2009)	Plate 10 Rixs Creek Coke Ovens circa 2009 (The Amateur Geological Society of the Hunter Valley, 2009)

6.2.2 Historical Context

A syndicate formed by Dr Richard Read opened the New Park mine in 1881, then built a battery of coke ovens at Rixs Creek in the 1880s (Noble, n.d.). The coke produced at the ovens was described in 1890 as “the best available” (Armstrong, 1983). A second battery of ovens was constructed at the same location around 1900. Both batteries were cited as being visually discernible. The coke ovens were a major business in the area.

The Rixs Creek rail platform was opened in 1885 to service the Main North Line. A tramway was also built to connect the Rixs Creek coke ovens and mining area to the Main North Line. This tramway was in operation from at least 1887 (Singleton Argus, 1887), its extent shown on the 1912 and 1923 Parish Maps of Darlington, extending across a 50 acre block that was owned by S. Noble, before reaching the Alexander Gardner owned land parcel where the Coke Ovens were situated.

6.2.1 Significance Assessment

APPLICATION OF CRITERIA	
Historical significance SHR criteria (a)	The Rixs Creek Coke Ovens & Associated Works are currently listed with local historical significance as tangible evidence of historic local mining industry practices, still an active economic force within the wider Hunter Valley area. The social institutions of the Rixs Creek community were historically strongly tied to mining and the associated coke ovens, as they were a source of work for local residents. This item also has State significance as the beehive type coke ovens present here were important in the early industrial development of NSW and this site contains the material record of the complete operation of a small coke-works.
Historical association significance SHR criteria (b)	This item is not of historic associative significance on a State or local level.
Aesthetic significance SHR criteria (c)	This item is not of aesthetic significance on a State or local level as it does not demonstrate aesthetic characteristics or a high degree of creative or technical achievement.
Social significance SHR criteria (d)	This item is not of social significance on a State or local level.
Technical/Research significance SHR criteria (e)	The site has State archaeological and interpretive significance with the potential to demonstrate growth and technical change in coke manufacture as well as the early developments of coal mining as a local industry practice. As beehive type coke ovens were integral in the early industrial development of Australia this item has the potential for research questions addressing the history of the larger industry.
Rarity SHR criteria (f)	This item has State significance due to its rarity. There are currently only four other coke oven sites heritage listed in NSW, being Coalcliff Colliery Coke Ovens (extant and still in use circa 2000), Wollongong Coke Ovens (subsurface remains only), Newcastle Coke Ovens (subsurface remains only) and the Lithgow Blast Furnace Coke Ovens (extant). This item is the only one of its design type and era currently listed in NSW.
Representativeness SHR criteria (g)	This item is of State representative significance as it demonstrates the principal characteristics of a beehive type coke oven as well as that of a small coke-works facility, containing evidence within the curtilage area of the smelting and refining process.

6.2.2 Statement of Significance

The Rixs Creek Coke Ovens & Associated Works have local and State significance for their historical links, research potential, rarity and representativeness. As example of an early mining related activity in the Rixs Creek area, it provides material evidence of the development of industrial development and coke manufacturing processes. It is one of five locally listed coke ovens in NSW, but is the only one listed with its design type, place and period of use. This item demonstrates the principal characteristics of a coke oven site, also having subsurface archaeological potential due to the associated works that surrounded the coke ovens during their period of operation.

6.2.3 Statement of Heritage Impact

No direct impacts are proposed within the curtilage bounds of the Rixs Creek Coke Ovens & Associated Works. Indirect impacts could occur from vibration caused by blasting and other mining related activity, as the assessed Project Area is approximately 50 m from the historic heritage curtilage at its closest point. Through avoidance, blasting limitations and monitoring it is possible to avoid indirect impacts to this item.

The following (Table 3) presents the required SoHI data as stipulated by OEH (NSW Heritage Office, 2002).

Table 3 Statement of Heritage impact for Rixs Creek Coke Ovens & Associated Works

SOHI Requirement	Response
Reference:	Item number 145 in the Singleton LEP.
Address and property description:	New England Highway, Rixs Creek, NSW.
How is the impact of the new development on the heritage significance of the item or area to be minimised?	There will be no direct impacts on the heritage item from the proposed development. Indirect impacts from vibration are to be minimised by controlled activity and monitoring, to be managed by a Conservation Management Plan (CMP).
Why is the new development required to be adjacent to a heritage item?	The new development is a coal mine and the area adjacent to the heritage item is where the coal deposits are situated.
How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?	The curtilage around the heritage item contains both the coke ovens and their associated works. The heritage significance of the item is retained through the protection of the linked elements with the coke-works landscape. No direct impacts are proposed within this curtilage.
How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?	The proposed development consists of open cut mining which predominantly comprises a negative space in the landscape, being an excavated void in the ground. This should not affect views to and from the heritage item. To minimise negative effects spoil piles will be deposited further to the west on the opposite side of the New England Highway.
Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they rejected?	The proposed development has been identified as impacting on two other heritage items (Linear Embankment and Mound with historic material, both discussed separately). Alternative sites are not possible as this is the location of the coal deposit that the mine seeks to extract.
Is the new development sympathetic to the heritage item? In what way (e.g. form, siting, proportions, design)?	The item remains bounded within its own curtilage and the proposed works will not have any direct impact within the bounds of that identified curtilage.
Will the additions visually dominate the heritage item? How has this been minimised?	The proposed works consist of open cut mining which predominantly comprise a negative space in the landscape as an excavated void in the ground. The Project is not likely to dominate the heritage item, which remains bounded within its own curtilage.
Will the public, and users of the item, still be able to view and appreciate its significance?	The item has been privately owned by Bloomfield for some time. Access has been granted previously upon request to Rixs Creek Mine. Access can still be organised upon request following the proposed works.
The following aspects of the proposal respect or enhance the heritage significance of the item or conservation area for the following reasons:	The proposed works will avoid any direct impacts to the item and will not encroach upon its curtilage, respecting the item's heritage significance.
The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:	Indirect impacts through vibration have the potential to be caused by the proposed works. Vibration has the potential to detrimentally impact on heritage significance by damaging the physical structure of the item. The proposed measures to minimise impacts are through limitations to blasting and a monitoring program to be outlined in a HHMP.
The following sympathetic solutions have been considered and discounted for the following reasons:	Preservation through avoidance and ongoing management through a HHMP were considered the most effective protective measures. No other adequate solutions were identified, thus no other solutions were considered and discounted.

6.3 Granbalang Trig Station

6.3.1 Description

A trig station was identified during the survey. Based on a reference on the 1972 Parish Map of Auckland it was identified as the Granbalang Trig Station. It was located approximately 25 m to the west of the outer edge of the Project Area boundary at its closest point, at coordinates 322180mE 6399334mN GDA94 (Zone 56).

The trig station consisted of a concrete foundation mounting a metal pillar. The metal pillar was white on its lower section and black on its upper portion. The black section of the metal pillar was mounted by a black metal vane, consisting of four half circle sections positioned perpendicular to each other, forming a cross made up of the flat planes of two intersecting circles.

The outlook from the location of the Granbalang Trig Station was uninterrupted to the south, looking across to Gowrie Terrace and Rix's Creek.

A modern emplacement had been established on the same hill top within a fenced enclosure, adjacent to the trig station and approximately 12 m distance from it. Vegetation clearance, past mining activity and rehabilitation works have all been past impacts in this general area.

	
Plate 11 Granbalang Trig Station	Plate 12 'T. S. Granbalang' plaque on Trig Station
	
Plate 13 Modern emplacement adjacent to Granbalang Trig Station	Plate 14 Southern outlook from Granbalang Trig Station

6.3.2 Historical Context

The Granbalang Trig Station is of a type commonly found throughout NSW. Trig (short for trigonometric) stations were utilised as a control network for triangulation during small scale surveys and mapping. It is defined by NSW Land & Property Information as a permanent survey mark that defines "location for surveying, mapping and engineering projects. Uses include housing developments, new road and bridge construction, improving railways and environmental mapping" (NSW Land & Property Information, 2012).

The Granbalang Trig Station is of a type designed to replace an earlier version, which had consisted of a brass marker set within a rock cairn. Maintenance and survey use of the earlier design required the dismantling and reassembly of the rock cairn. The concrete pillar model was designed for ease of maintenance and surveying usage, having a threaded spigot in the metal column allowing the vane section to be removed and thus for surveyors to mount their own survey equipment (Doherty Smith & Associates, 2013). This style of trig station was being constructed from the 1870s onwards (Australian Government, 2014).

There are currently three trig stations with heritage listings in NSW, two having been assigned local significance, one listed on the Commonwealth Heritage List and RNE. The details of these three items have been included below for comparative analysis with the Granbalang Trig Station.

Table 4 Heritage Listed Trig Stations in NSW as of June 2014

Item	Date of Construction	Location	Statement of Significance	Listing
Mv001 : Trig Station	1878	5-9 Apex Avenue Mount Victoria NSW	"The One Tree Hill trig marker at Mount Piddington is a rare permanent recording in an easily accessible location of the original name of the area which is now known as Mount Victoria."	Blue Mountains LEP
Yr001 : Yellow Rock Trig Station	1880 (rebuilt 1994)	132 Yellow Rock Road Yellow Rock NSW	"The early Trigonometrical Stations on the Mountains all have some significance for their record of nineteenth-century surveying prior to the opening up of new residential areas. Although the Yellow Rock Station has been reconstructed in 1994, it retains some historical significance at the Local level. The setting of the Trig Station in bush with an uninterrupted, meaningful view-line due west to Mount Hay is significantly attractive."	Blue Mountains LEP
North Base Trig Station	1879/1880 (rehabilitated 1977)	Dight Street, Richmond RAAF Base, Richmond	The North Base Trig Station (1879-80) is of exceptional interest as a permanent survey marker defining one of two nineteenth century Trigonometrical baselines in New South Wales. The North Base Trig Station is the northern end of a baseline which established the datum for survey data extending some 300 miles (500 Kilometres) to the north west as part of the geodetic triangulation system in New South Wales (Australian Government, 2014).	RNE (ID 100316) & Commonwealth Heritage List (ID 105240)

6.3.3 Significance Assessment

APPLICATION OF CRITERIA	
Historical significance SHR criteria (a)	This item has local historical significance relating to the early surveying and mapping of the area, which utilised this trig point.
Historical association significance SHR criteria (b)	This item has no State or local historical associative significance.
Aesthetic significance SHR criteria (c)	This item is not of aesthetic significance on a State or local level as it does not demonstrate aesthetic characteristics or a high degree of creative or technical achievement.
Social significance SHR criteria (d)	This item is not of social significance on a State or local level as it does not have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.
Technical/Research significance SHR criteria (e)	This item is not of State or local research significance.
Rarity SHR criteria (f)	This item does not qualify as significant under this criterion as it is not rare, being of a type and design commonly found throughout NSW.
Representativeness SHR criteria (g)	This item has local significance as it is representative of the principal characteristics of a trig station.

6.3.4 Statement of Significance

The Granbalang Trig Station has historical significance at the local level due to its link to the surveying and mapping of the area. It also has representative significance embodying the principal characteristics of a trig station. The trig station has been constructed and/or updated with contemporary materials. The setting of the Trig Station includes a prominent view-line to the south, taking in both Gowrie Terrace and Rixs Creek. Other heritage listed trig stations have additional significance due to their location being integral in opening up new areas or providing important parts of the baseline used for early survey and mapping activity in NSW. Granbalang Trig Station is of a common design with numerous other representative examples present throughout NSW.

6.3.5 Statement of Heritage Impact

This item is outside the Project Area and the currently proposed works will not directly impact on it. There are the potential for indirect impacts through visual obstruction of the current outlook.

The following (Table 6) presents the required SoHI data as stipulated by OEH (NSW Heritage Office, 2002).

Table 5 Statement of Heritage Impact for Granbalang Trig Station

SOHI Requirement	Response
Reference:	This item is not registered and has no reference number.
Address and property description:	New England Highway, Rixs Creek, NSW.
How is the impact of the new development on the heritage significance of the item or area to be minimised?	There will be no direct impacts on the heritage item from the proposed development. Indirect visual impacts are to be minimised by controlled activity to be managed by a Historical Heritage Management Plan (HHMP) for the Project.
Why is the new development required to be adjacent to a heritage item?	The new development is a spoil dump associated with a coal mine. The area adjacent to the heritage item has been chosen to minimise impacts in other areas.
How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?	The curtilage around the physical component of the heritage item is small and is located outside the Project Area. No direct impacts are proposed within this curtilage. Indirect impacts may occur if the outlook of the item is obstructed, as the trig station's outlook is integral to its function and heritage value.
How does the new development affect views to, and from, the heritage item?	The proposed development consists of spoil pile deposition. This has the potential to affect views from the heritage item. To minimise

SOHI Requirement	Response
What has been done to minimise negative effects?	negative effects spoil piles managed by a Historical Heritage Management Plan (HHMP) for the Project.
Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they rejected?	The proposed development has been identified as impacting Aboriginal archaeological sites. These impacts have been addressed in a separate report.
Is the new development sympathetic to the heritage item? In what way (e.g. form, siting, proportions, design)?	The item remains bounded within its own curtilage and the proposed works will not have any direct impact within the bounds of that identified curtilage. The placement of spoil piles in the vicinity will be sympathetic, managed by a Historical Heritage Management Plan (HHMP) for the Project.
Will the additions visually dominate the heritage item? How has this been minimised?	The proposed works consist of spoil pile deposition, which have the potential to visually block outlook views from the heritage item. This can be minimised by management through a Historical Heritage Management Plan (HHMP) for the Project.
Will the public, and users of the item, still be able to view and appreciate its significance?	The item has been privately owned by Bloomfield for some time. Access can be granted upon request to Rix's Creek Mine.
The following aspects of the proposal respect or enhance the heritage significance of the item or conservation area for the following reasons:	The proposed works will avoid any direct impacts to the item and will not encroach upon its curtilage, respecting the item's heritage significance.
The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:	Indirect impacts through visual obstruction have the potential to be caused by the proposed works. The proposed measures to minimise visual impacts are through the sympathetic placement of spoil, with measures to be outlined in a HHMP.
The following sympathetic solutions have been considered and discounted for the following reasons:	Preservation through avoidance and ongoing management through a HHMP were considered the most effective protective measures. No other adequate solutions were identified, thus no other solutions were considered and discounted.

6.4 Linear Embankment

6.4.1 Description

During this assessment a section of mounded earth in a linear alignment was identified. Based on aerial images, historical photographs, comparison with the previously identified tramway remnants (AECOM Australia Pty Ltd, 2012) and the oral testimony of mine representative John Hindmarsh (Senior Environmental Officer, Rix's Creek Mine), the alignment was tentatively identified as being associated with the coke ovens and historic mining area. An illustration of the coke oven area from 1982 suggests the linear embankment either led to the second group of coke ovens or to the No. 3 Mine that was adjacent to them (Croft and Associates Pty Ltd, 1982:Figure 3). The mounded linear alignment is likely to have housed tracks for trolley cars or a tram, utilised to transport material to and from the coke oven area. Any rail lines that may have been present have since been removed.

In addition to the embankment, associated wooden pole remnants were present. Some surface material was also identified, including pieces of metal and broken glass. As the mounded embankment was constructed to house rails, which have since been removed, there is not likely to be a subsurface deposit at this location. Small numbers of surface items (predominantly metal and wood) were identified in proximity to the item, likely associated with the (since removed) rails.

	
Plate 15 Linear Embankment with associated wooden pole	Plate 16 Linea Embankment
	
Plate 17 Wooden post remnant	Plate 18 Wooden post remnants
	
Plate 19 Metal piece associated with Linear Embankment	Plate 20 Green broken glass fragment associated with Linear Embankment

6.4.2 Historical Context

The linear embankment was likely to be part of a historical transport route that linked the Singleton LEP listed coke ovens with coal mines and associated works in the surrounding area.

6.4.3 Significance Assessment

APPLICATION OF CRITERIA	
Historical significance SHR criteria (a)	The linear embankment has local significance as a historic transport route and tangible evidence of local industry practices, linked to the listed item Rixs Creek Coke Ovens & Associated Works.
Historical association significance SHR criteria (b)	This item has no historical associative significance.
Aesthetic significance SHR criteria (c)	This item is not of aesthetic significance on a State or local level as it does not demonstrate aesthetic characteristics or a high degree of creative or technical achievement.
Social significance SHR criteria (d)	This item is not of social significance on a State or local level as it does not have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.
Technical/Research significance SHR criteria (e)	This item is not of State or local research significance as it does not have the potential to yield information that could contribute to or enhance our understanding of the coal transport of the period.
Rarity SHR criteria (f)	This item does not qualify as significant under this criterion as it is not rare.
Representativeness SHR criteria (g)	This item is not of representative significance as it does not demonstrate the principal characteristics of a class of State or local cultural places or environments.

6.4.1 Statement of Significance

The linear embankment is of local historical significance as it relates specifically to the Rixs Creek Coke Ovens & Associated Works and the local coal industry.

6.4.2 Statement of Heritage Impact

The linear embankment is in an area proposed for high levels of disturbance. The linear embankment would be destroyed by the proposed works. Mitigation measures for the loss of heritage values could include archival recording of the item prior to its destruction and the collection of any surface material with historic relevance.

The following (Table 6) presents the required SoHI data as stipulated by OEH (NSW Heritage Office, 2002).

Table 6 Statement of Heritage Impact for Linear Embankment

SOHI Requirement	Response
Reference:	This item is not registered and has no reference number.
Address and property description:	New England Highway, Rixs Creek, NSW.
Have all options for retention and adaptive re-use been explored?	The item cannot be retained if the proposed development is to proceed. The linear embankment is not suitable for reuse.
Can all of the significant elements of the heritage item be kept and any new development be located elsewhere on the site?	The surface artefacts can be collected and retained. The earth embankment cannot be retained if the proposed works are to proceed due to coal deposits beneath this area.
Is demolition essential at this time or can it be postponed in case future circumstances make its retention and conservation more feasible?	Demolition is essential for the proposed works to proceed due to coal deposits beneath this area.
Has the advice of a heritage consultant been sought? Have the consultant's recommendations been implemented? If not, why not?	A consultant has undertaken this assessment. Recommendations are for mitigation measures including archival recording and surface collection, to be managed by a Historical Heritage Management Plan (HHMP) for the Project.
The following aspects of the proposal respect or enhance the heritage significance of the item or conservation	The proposed works will completely destroy the identified item. The proposed works are not able to enhance the heritage significance of the item. Respect for the heritage value of the item will be demonstrated

SOHI Requirement	Response
area for the following reasons:	through mitigation measures.
The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:	The proposed works will completely destroy the identified item. Mitigation measures are proposed to preserve the identified heritage values through archival recording and surface collection, to be undertaken at this location prior to the proposed works proceeding. These measures are to be outlined in a HHMP.
The following sympathetic solutions have been considered and discounted for the following reasons:	The recommended measures are evaluated as effective and reliable methods of managing and mitigating heritage values associated with the Project Area. The option to preserve this item in situ was considered and discounted due to its poor state of preservation. The values of this locally significant item were assessed as sufficiently preserved through archival recording and surface collection.

6.5 Mound with historic material

6.5.1 Description

An artificial mound was identified with some historic surface material on it at coordinates 325232mE 6400736mN GDA94 (Zone 56). The purpose of the mound could not be determined, but its proximity to the historic coal pit and coke oven area means that it may have been associated in some way. The surface historic material included small quantities of wood, metal and glass. There is the potential for further items of the same type to be present in disturbed subsurface contexts within the mound.



6.5.2 Historical Context

No specific historical context could be identified for the mound with historic material, but its location means that it may have been associated with the historic coal pit and coke oven area in some way.

6.5.3 Significance Assessment

APPLICATION OF CRITERIA	
Historical significance SHR criteria (a)	The mound with historic material has local significance linked to the listed item Rixs Creek Coke Ovens & Associated Works as well as the other historic coal pits that were active in this area.
Historical association significance SHR criteria (b)	This item has no historical associative significance.
Aesthetic significance SHR criteria (c)	This item is not of aesthetic significance on a State or local level.
Social significance SHR criteria (d)	This item is not of social significance on a State or local level.
Technical/Research significance SHR criteria (e)	Although historic surface material was noted at the site, this item is not of State or local research significance as it does not have the potential to yield information that could contribute to or enhance understanding of the coal industry in this area.
Rarity SHR criteria (f)	This item does not qualify as significant under this criterion as it is not rare.
Representativeness SHR criteria (g)	This item is not of representative significance as it does not demonstrate the principal characteristics of a class of State or local cultural places or environments.

6.5.4 Statement of Significance

The mound with historic material is of local significance due to its link to the Rixs Creek Coke Ovens & Associated Works and the local coal industry.

6.5.5 Statement of Heritage Impact

The mound with historic material is in an area proposed for high levels of disturbance. The mound with historic material would be destroyed by the proposed works. Mitigation measures for the loss of heritage values could include archival recording of the item prior to its destruction and the collection of any surface material with historic relevance.

The following (Table 7) presents the required SoHI data as stipulated by OEH (NSW Heritage Office, 2002).

Table 7 Statement of Heritage Impact for Rixs Creek Coke Ovens & Associated Works

SOHI Requirement	Response
Reference:	This item is not registered and has no reference number.
Address and property description:	New England Highway, Rixs Creek, NSW.
Have all options for retention and adaptive re-use been explored?	The item cannot be retained if the proposed development is to proceed. The mound is not suitable for reuse.
Can all of the significant elements of the heritage item be kept and any new development be located elsewhere on the site?	The surface artefacts can be collected and retained. The mound cannot be retained if the proposed works are to proceed due to coal deposits beneath this area.
Is demolition essential at this time or can it be postponed in case future circumstances make its retention and conservation more feasible?	Demolition is essential for the proposed works to proceed due to coal deposits beneath this area.
Has the advice of a heritage consultant been sought? Have the consultant's recommendations been implemented? If not, why not?	A consultant has undertaken this assessment. Recommendations are for mitigation measures including archival recording, surface collection and monitoring, to be managed by a Historical Heritage Management Plan (HHMP) for the Project.
The following aspects of the proposal respect or enhance the heritage significance of the item or conservation area for the following reasons:	The proposed works will completely destroy the identified item. The proposed works are not able to enhance the heritage significance of the item. Respect for the heritage value of the item will be demonstrated through mitigation measures.

SOHI Requirement	Response
The following aspects of the proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:	The proposed works will completely destroy the identified item. Mitigation measures are proposed to preserve the identified heritage values through archival recording and surface collection, to be undertaken at this location prior to the proposed works proceeding. These measures are to be outlined in a HHMP.
The following sympathetic solutions have been considered and discounted for the following reasons:	The recommended measures are evaluated as effective and reliable methods of managing and mitigating heritage values associated with the Project Area. The option to preserve this item in situ was considered and discounted due to its poor state of preservation. The values of this locally significant item were assessed as sufficiently preserved through archival recording and surface collection.

6.6 Vertical shaft with fencing

6.6.1 Description

At coordinates 325213mE 6400806mN GDA94 (Zone 56) a vertical shaft was identified. No surface material or infrastructure was located in the vicinity, but a fence comprised of wooden posts and barbed wire had been erected around the shaft at some time in the past. The fence was in a dilapidated state with posts fallen and the barbed wire sagging. It was not possible to ascertain if the shaft had been excavated for some purpose or if it was a natural sink hole, potentially resulting from past mining activity in the area.



Plate 23 Vertical shaft surrounded by dilapidated fencing

Plate 24 Vertical shaft surrounded by dilapidated fencing

6.6.2 Historical Context

No historical context was able to be identified for this item.

6.6.3 Significance Assessment

APPLICATION OF CRITERIA	
Historical significance SHR criteria (a)	This item has no historical significance.
Historical association significance SHR criteria (b)	This item has no historical associative significance.
Aesthetic significance SHR criteria (c)	This item is not of aesthetic significance.
Social significance SHR criteria (d)	This item is not of social significance.
Technical/Research significance SHR criteria (e)	This item is not of State or local research significance.
Rarity SHR criteria (f)	This item does not qualify as significant under this criterion as it is not rare.
Representativeness SHR criteria (g)	This item is not of representative significance as it does not demonstrate the principal characteristics of a class of State or local cultural places or environments.

6.6.4 Statement of Significance

No heritage significance was identified for this item.

6.6.5 Statement of Heritage Impact

The vertical shaft with fencing is in an area proposed for high levels of disturbance. The vertical shaft with fencing would be destroyed by the proposed works. No mitigation measures are required as no heritage significance was identified for this item. As no heritage significance was identified no SoHI is required.

7.0 Cultural Landscape Assessment

A cultural landscape is a geographical area that reflects the interaction between humans and the natural environment. As such, a cultural landscape assessment requires a review of geographical information, historical textual information, cultural heritage items and an understanding of the interaction of these features. In completing this assessment, reference was made to the following guidelines: *NSW Heritage Manual* (NSW Heritage Office & NSW Department of Urban Affairs and Planning, 1996a) and *Cultural Landscapes: A Practical Guide for Park Management* (NSW Department of Environment Climate Change and Water, 2010).

7.1 Historical Themes

Table 8 lists the historical themes associated with the Project Area, including heritage items and cultural values associated with each theme.

Table 8 Cultural Landscape Values

Historic Theme	Landscape	Place/feature	Cultural value
Natural	Landscape	The landscape contains watercourses Rixs Creek and Dead Man's Gully which flow across an area of flats and rolling hills. The natural landscape in this area has been modified by pastoralism and mining.	Historic
Aboriginal culture	Aboriginal landscape	Aboriginal archaeological sites within the Project Area include stone artefacts at artefact scatter and isolated artefact sites. These are detailed separately in the Aboriginal assessment for the Project.	Historic Scientific Social Spiritual
Pastoralism; working the land: grazing, dairying and cropping	Landscape associated with farming plant and animals for commercial purposes	The general area is historically known for stock grazing and dairy industry. The Project Area had evidence of ongoing activity with cattle present along with fences, animal enclosure areas and dams.	Historic Scientific Social
Mining	Landscape associated with mining development and activity (the extraction, processing and distribution of mineral ores, precious stones and other such inorganic substances)	The identified historic items Rixs Creek Coke Ovens & Associated Works, Linear Embankment and Mound with historic material physically embody elements of historic mining.	Historic Scientific Social

7.1.1 Natural Landscape

The natural landscape of the Project Area is centred around the water courses of Rixs Creek and Dead Man's Gully, each with associated unnamed drainage lines and gullies that drain across the area. The central lowland areas of alluvial flats and low rolling hills have been utilised for farming and grazing activities, with landform modification also impacting the area from long term mining activity. Due to the level of modification the natural landscape value is predominantly situated in the historic association with modification activity.

7.1.2 Aboriginal Landscape

The present day Aboriginal community of the Rixs Creek area and its surrounding suburbs, comprising representatives of the Wonnarua, maintain a cultural attachment to the physical evidence of past Aboriginal occupation. Artefact scatter and isolated artefact sites present within the landscape offer a tangible connection to the ancestors. The sites also offer a focus for reconnection for members of the community that have lost direct

cultural transmission through dispossession. The Aboriginal landscape of the Project Area is part of a much larger spread of Aboriginal archaeological sites across the wider region.

7.1.3 Pastoral Landscape

From as early as 1827 the pastoral landscape was in use, with the grazing of cattle and sheep undertaken consistently across the area up until the present (Hunter, 2010:8). Cattle are still grazed across the Project Area today, with evidence of this use present in physical items like fences, enclosures, contour banks and dams.

7.1.4 Mining Landscape

Known historical industry developments in the Rixs Creek area were associated with mining, with William Longworth employed by the Bowman family to sink a shaft to test for coal in 1847 (Noble, n.d.). Since then numerous coal pits have been opened across the area, Rixs Creek Mine still an active part of the area today. Historic remnants of early development are present in the form of the heritage listed Rixs Creek Coke Ovens & Associated Works.

7.2 Statement of Cultural Significance

The cultural landscape of the Project Area contains material traces of Aboriginal culture, pastoralism and mining. The heritage significance includes spiritual, historic, social and scientific values. While extant features of the landscape demonstrate these themes, the historic values identified in this assessment are strongly tied to individual elements, rather than being representative of the larger cultural landscape.

8.0 Impact Assessment

The following section draws upon information provided in Section 6.0 to address the issues and potential impacts on identified heritage items during the construction and operation phases of the Project. As previously noted, proposed disturbances within the Project Area vary across its extent. Some areas are proposed for road development and spoil dumping, some for mining activity and other sections are to be left undisturbed.

8.1 Direct Impacts

The Project seeks approval for mining, spoil dumping (overburden emplacement) and road development. It is anticipated that any historical heritage items located within the proposed areas of impact will be completely destroyed by mining-related earthworks. Items in the immediate vicinity of these areas may also be significantly disturbed or destroyed, with major potential impacts including earthworks, vehicle traffic and blasting.

The development of the Project would result in direct impacts to two items identified during the field survey as having heritage value. These items are:

- 1) Linear Embankment; and
- 2) Mound with historic material.

Impacts on these items will include their complete destruction as they are located in areas proposed open cut mining development.

8.2 Indirect Impacts

8.2.1 Vibration

Vibration impacts are anticipated as a result of general run of mine activities, such as the operation of large vehicles and blasting activities. As a result of these activities, associated ground vibrations have the potential to impact the structural integrity of heritage sites.

The development of the Project could potentially result in indirect impacts to one listed heritage item:

- 1) Rix's Creek Coke Ovens & Associated Works.

This item has the potential to be damaged by indirect impacts such as vibration caused by the nearby development and activity such as earthworks and blasting.

In 1991 and 1992 blasting was undertaken in the area adjacent to the Rix's Creek Coke Ovens & Associated Works. Vibration limits of 5 mm/s were imposed at this time due to the proximity of the sensitive heritage item, as per the recommendation of the Australian Blasting Consultants. This recommendation followed an experimental blasting program carried out in order "to determine site specific vibration equations" with five monitors used to simultaneously measure ground vibration (Australian Blasting Consultants Pty Ltd, 1991:i). Monitoring was undertaken throughout the period of blasting and the Coke Ovens & Associated Works were assessed for damage after each blast. It was stated that: "the blast designs have been modified after each set of blasts, with the aim to keep vibration down to acceptable levels" and that "no damage was observed to the coke oven structures after any of these blasts" (Rix's Creek Pty Ltd, 1992:1-2). Implementing this strategy for the proposed future works would mitigate the danger of indirect impacts through vibration.

8.2.2 Visual Impacts

Completion of the Project, including development of mine areas, overburden emplacement, road development and mine infrastructure will modify the existing visual environment and potentially the visual aesthetics of the surrounding heritage sites. Consideration of the location of the identified heritage sites in relation to potential visual impacts noted that the Granbalang Trig Station, although physically located outside the Project Area, could suffer visual impacts from spoil placement if it is positioned in an area that blocks the trig station's outlook. Currently Granbalang Trig Station has a prominent view-line to the south, taking in both Gowrie Terrace and Rix's Creek. If this view-line became obscured it could impact upon the item's heritage value.

Visual impacts have been assessed in a separate report, *Landscape Character and Visual Impact Assessment Rix's Creek Continuation of Mining Project* (RPS, 2014).

8.3 Project Impact Summary

A total of two heritage items were located within the Project Area, with two additional items located in the areas adjacent to the Project Area. The potential impacts are summarised below in Table 9.

Table 9 Impact Assessment Summary

Site Name	Significance	Type of Impact	Degree of Impact
Rixs Creek Coke Ovens & Associated Works	Local (but described in local LEP listing as having State significance)	Indirect (possible vibration impacts)	Potentially partial
Granbalang Trig Station	Local	Indirect (possible visual impacts)	Potentially partial
Linear Embankment	Local	Direct (mine disturbance area)	Whole
Mound with historic material	Local	Direct (mine disturbance area)	Whole

9.0 Mitigation and Management

Where engineering design measures are unable to avoid impacts to items of heritage significance, mitigation and management measures for each impact are proposed to reduce the magnitude of the impacts as far as practicable.

9.1 Statutory Requirements

As indicated in Section 1.0, the historical heritage impact assessment detailed in this report forms part of an Environmental Impact Statement (EIS) being prepared to support an application for State Significant Development (SSD) Consent under Division 4.1, Part 4 of the EP&A Act and the *Environment Planning and Assessment Regulations 2000* (Regulation).

As an SSD Project, impacts to historical heritage are managed under Section 89J of the EP&A Act. For these developments, an approval to interfere with places or buildings protected by a heritage protection order or excavation permit under Section 139 of the *Heritage Act 1977* is not required.

9.2 Management Principals

The following general management principles apply to the identified historical heritage items within the Project Area:

- 1) Impacts to items with elements of state heritage significance should be avoided if possible;
- 2) Where possible, engineering design solutions should be sought and incorporated into the Project design in order to avoid all impacts to identified heritage items;
- 3) Where design solutions are not possible and impacts to identified heritage items are unavoidable, mitigation and management measures should be implemented to reduce impacts;
- 4) A Historic Heritage Management Plan (HHMP) should be prepared to manage potential impacts to historical heritage items within the Project Area and/or potentially impacted by the Project; and
- 5) Conservation Management Plans should be prepared to guide conservation of historical structures within the Project Area and/or potentially impacted by the Project.

9.3 Management Strategy

The proposed mitigation measures for heritage items impacted by the Project are provided below.

Site Name	Significance Criteria	Impact	Recommendations
Linear Embankment	Local	Direct	Archival recording and surface collection. This is to be managed through a HHMP.
Mound with historic material	Local	Direct	Archival recording, surface collection and monitoring during earth disturbance works. This is to be managed through a HHMP.
Rixs Creek Coke Ovens & Associated Works	State	Indirect	A CMP be produced to manage the Rixs Creek Coke Ovens & Associated Works. The CMP would investigate ways to reduce the impacts from vibration impacts as well as exploring ways to preserve and maintain it, considering other potential impacts such as vegetation growth, weathering and erosion.
Granbalang Trig Station	Local	Indirect	It is recommended that the placement of spoil piles in proximity to Granbalang Trig Station be sympathetic to the outlook of the trig station. This is to be managed through a HHMP.

9.4 Historical Heritage Management Plan (HHMP)

It is recommended that the above management strategy be detailed in a HHMP for the Project. The plan should, at a minimum, include the following:

- A list and map indicating the locations of historical heritage items identified within to the Project Area;
- Significance assessment and Statement of Significance for each historical heritage item;
- Detailed management and mitigation measures for impacted historical heritage items (see section 9.6); and
- An unexpected finds procedure, including a specific procedure for human remains.

9.5 Conservation Management Plans (CMP)

An updated CMP should be prepared to guide the conservation of the following:

- Rixs Creek Coke Ovens & Associated Works.

The CMP for Rixs Creek Coke Ovens & Associated Works would investigate ways to reduce potential impacts from vibration as well as exploring ways to preserve and maintain it, considering other potential impacts such as vegetation growth, weathering and erosion. This would update the previous conservation plan produced in 2007 for the Rixs Creek Coke Ovens & Associated Works. At that time no blasting was proposed in proximity, so the potential of indirect vibration impacts was not considered. The recommendations contained therein focussed on slowing deterioration by keeping the site clean and clear, listing the following actions:

1. *Cutting and cleaning dead wood*
2. *Preventing over growth of trees on the batteries*
3. *Maintain security fencing and restrict access*
4. *Ageist a controlled number of cattle (say no more than 30)" (Lonergan, 2007).*

In addition to considering indirect impacts from blasting, the updated CMP should assess the success of the above actions since 2007, comparing the current condition of the item with past inspection photographs and recordings.

9.5.1 Directly Impacted Items

Two heritage items (linear embankment and mound with historic material) identified within the Project Area will be impacted by the proposed works, with destruction to occur for both the sites. It is recommended that archival recording and surface collection be undertaken. It is recommended that monitoring be undertaken at the mound during earth disturbance works due to the potential for subsurface material. It is also recommended that the recording and surface collection of historic artefacts be carried out in compliance with the NSW Heritage Division (formerly the NSW Heritage Branch), within the NSW Office of Environment and Heritage, guidelines: *How to Prepare Archival Records of Heritage Items* (NSW Heritage Office, 1998a) and *Photographic Recording of Heritage Items using Film or Digital Capture* (NSW Heritage Office, 2006). These works should be undertaken by a qualified heritage specialist. Details of recommended archival recording and surface collection procedures are included in Section 9.6.1.

9.5.2 Indirectly Impacted Items

Rixs Creek Coke Ovens & Associated Works has the potential to be indirectly impacted by vibration caused by earthworks and blasting activities proposed to be undertaken adjacent to its curtilage. It is recommended that, as per the results of past studies, vibration limits of 5 mm/s be imposed for blasting undertaken in the area adjacent to the Rixs Creek Coke Ovens & Associated Works (Australian Blasting Consultants Pty Ltd, 1991:i).

It is recommended that a program of monitoring be undertaken before, during and after the proposed works, to ensure that the heritage item does not suffer damage. It is recommended that multiple monitors be utilised to simultaneously measure ground vibration at varied locations. If any impacts on the Rixs Creek Coke Ovens & Associated Works are identified during the monitoring program that can be ascertained as indirectly caused by the Rix's Creek Mine development works, then those works should cease and alternative methods and/or additional protection measures be sought. These works should be undertaken by a qualified specialist. Details of recommended monitoring procedures are included in Section 9.6.2.

Granbalang Trig Station has the potential to be indirectly impacted visually if its prominent view-line to the south is blocked by spoil piles. It is recommended that the placement of spoil piles in proximity to Granbalang Trig Station be sympathetic to the outlook of the trig station.

9.5.3 General Historical Heritage Management

The identified Granbalang Trig Station is located outside the bounds of the Project Area and is not currently proposed for direct impacts. Should direct impacts be proposed in the future it is recommended that the procedures for survey mark protection be followed, as per the guidelines provided by NSW Land and Property Information (LPI). These guidelines are as follows:

If survey marks are likely to be disturbed or destroyed, avoid disturbing or destroying survey marks by:

- 1) diverting works to avoid disturbing the marks; or
- 2) contacting a Registered Surveyor to place and survey a mark at a more suitable site nearby to maintain survey integrity.

Any survey necessary to recover the position of survey marks proposed to be destroyed may only be undertaken by a surveyor registered under the Surveying and Spatial Information Act 2002 or by survey staff authorised by the Surveyor General (NSW Land & Property Information, 2012).

9.6 Detailed Management Procedures

9.6.1 Archival Recording and Surface Collection Procedures

The full extent of the linear embankment should be plotted with GPS coordinates, with photographs taken to document its full extent and its relationship with the heritage listed site Rix's Creek Coke Ovens & Associated Works. This work should be undertaken by a qualified heritage specialist.

The following recording program should be implemented for the linear embankment and the mound with historic material:

- Establish a survey datum to record the location of the features, deposits and/or relics;
- Archaeological cleaning with hand tools, as required, in order to define the feature, deposits and/or relics;
- Production of scaled plans and cross-sections, if required;
- Photographically record all phases of the archival recording with an appropriate photographic scale and photographic log;
- Photographically record all relics, features or deposits and record them with an appropriate photographic scale and photographic log; and
- Complete a context recording form for each feature, which should be sequentially numbered and record the location, dimensions and characteristics of the feature, context and/or spit. No archaeological excavation is proposed for these works.

Surface collection is to be undertaken by a qualified heritage specialist at the linear embankment and mound prior to construction works. GPS positions and photographs are to be taken for each artefact prior to collection. The artefacts are to be analysed by a historic heritage expert and a report produced of the results. Artefacts should be bagged according to the feature, context and/or spit from which they were retrieved. Ongoing management for any collected items will be undertaken by Rix's Creek Mine.

9.6.2 Monitoring Procedures

Monitoring is to be undertaken by a qualified heritage specialist in conjunction with a qualified vibration specialist for the locally listed item Rix's Creek Coke Ovens & Associated Works. It is recommended that the first stage of this monitoring consist of the gathering of baseline data prior to any works with the potential to cause vibrational impacts occurring in the vicinity.

The baseline data should be gathered as part of a heritage audit of the site. This audit should consist of an inspection of the site to identify all surface material, followed by the taking of photographs and GPS coordinates. The photographs need to detail the current condition of all features. Existing damage including cracks and collapses should be documented in detail. The purpose of this baseline data being collected is so that future inspections can be compared to this data.

Following the collection of baseline data it is recommended that monitoring be undertaken during the initial phase of development works within the section of the Project Area immediately adjacent to the curtilage of the listed item. It is recommended that, as per the results of past studies, vibration limits of 5 mm/s be imposed for blasting undertaken in the area adjacent to the Rix's Creek Coke Ovens & Associated Works and that multiple vibration monitors be utilised to measure the blasts (Australian Blasting Consultants Pty Ltd, 1991:i). It is recommended that the historic site be checked for evidence of impacts following blasting activity.

If impacts do occur that can be linked to the development activity then those works should cease and alternative methods and/or additional protection measures be sought. If no impacts occur it is recommended that regular monitoring continue throughout the life of the development. If no impacts are identified it is recommended that further monitoring inspections occur regularly, up until the completion of any vibratory works in the section of the Project Area adjacent to the curtilage of the listed item. Each monitoring inspection should compare the current state of the item to the baseline data, then take comparative recordings and produce a short report to identify the monitoring results.

9.6.3 Unexpected Finds Procedures

- 1) In the event that unexpected historic finds are identified during construction, all works should immediately cease. The following procedure guides the management of unexpected and previously unidentified finds during the course of operations. Finds includes artefact scatters (glass, animal bone, ceramic, brick, metal, etc.), building foundations and earthworks of unknown origin. The procedures are:
 - All work in the area is to cease immediately;
 - Alert the Environmental Specialist to the find;
 - If necessary, protect the area with fencing;
 - Engage a suitably qualified heritage specialist to undertake an assessment of the find/s;
 - The assessment should be undertaken using the guidelines *Assessing Significance for Historical Archaeological Sites and 'Relics'* (NSW Heritage Branch, 2009);
 - On the advice of the heritage specialist, if necessary, prepare an Impact Assessment and Research design and methodology to submit to the NSW Heritage Division for a Section 140 excavation permit or exception;
 - Undertake the archaeological mitigation in accordance with the prepared documents and the permit/exception issued by the NSW Heritage Division; and
 - Once the site has been mitigated to the satisfaction of the heritage specialist and the NSW Heritage Division, works may resume in the area.
- 2) Should human remains be found during construction or operation the following procedure should be followed.

The procedures take into account the following documents:

- *Burials - Exhumation of Human Remains* NSW Health Policy Directive PD2008_022 (NSW Health, 2008) available at : http://www.health.nsw.gov.au/policies/pd/2008/pdf/PD2008_022.pdf
- *Manual for the Identification of Aboriginal Remains* (NSW Department of Environment & Conservation, 2006);
- *Skeletal Remains – Guidelines for the management of human skeletal remains under the Heritage Act 1977* (NSW Heritage Office, 1998b); and
- *The Aboriginal Cultural Heritage Standards and Guidelines Kit* (NSW National Parks and Wildlife Service, 1997).

In the event that operations reveal possible human skeletal material (remains), the following procedure is to be followed:

- When suspected human remains are exposed, all construction work is to cease immediately in the near vicinity of the find location and the General Manager on site is to be immediately notified. The General Manager will contact the Police at the earliest reasonable time;

- An area of 5 m radius is to be cordoned off by temporary fencing around the exposed human remains site - work can continue outside of this area as long as there is no risk of interference to the human remains or the assessment of human remains. Assessment of risk may utilise the risk matrix provided within the NSW Health Policy directive on the exhumation of human burials;
- Contact the OEH Environment line on 131 555 and the NSW Heritage Division on 02 9873 8500; and
- A physical or forensic anthropologist should be commissioned by Rix's Creek Mine to inspect the remains in situ (unless otherwise directed by the police), and make a determination of ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or modern), then:
 - a) if the remains are identified as modern the area is deemed as crime scene; or
 - b) if the remains are identified as Aboriginal, the Environmental Specialist will notify OEH and representatives of the local Aboriginal community and appropriate management measures will be determined through consultation with them. Representatives of the Aboriginal community will be present during all investigations of Aboriginal remains; or
 - c) if the remains are as non-Aboriginal (historical) remains, the site is to be secured and the NSW 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 area and remains are to be determined through one of the following means:

- If the remains are identified as a modern matter, liaise with the police and/or the Coroner's Office and/or NSW Health with respect to the exhumation of the remains;
- If the remains are identified as Aboriginal, liaise with OEH and Aboriginal stakeholders;
- If the remains are identified as non-Aboriginal (historical), liaise with the NSW Heritage Division; and
- If the remains are identified as not being human then work can recommence without delay.

9.7 Evaluation of the Effectiveness and Reliability of the Recommended Mitigation Measures

The DGRs for the historical impact assessment require the effectiveness and reliability of the proposed mitigation measures to be evaluated. The proposed archival recording and surface collection of the directly impacted sites (Linear Embankment and Mound with historic material) is considered to be an effective and reliable mitigation measure as heritage and archaeological information will be gathered and preserved. Surface collection and archival recording measures will mitigate loss for the existing heritage values. It has been assessed that the mitigation and management measures recommended will be sufficient to protect and preserve the heritage values identified during this assessment.

The management of the remaining heritage items identified adjacent to the Project Area (Rix's Creek Coke Ovens & Associated Works and Granbalang Trig Station) during construction and operation will be detailed in the HHMP and CMPs. These management documents are commonly used as heritage management tools, their effectiveness and reliability is supported by Heritage Council advocacy.

These recommended measures are evaluated as effective and reliable measures to manage and mitigate heritage values associated with the Project Area.

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10.0 Summary

Based on the information drawn from the field survey, historical research and other technical study aspects, the conclusions of the historical heritage assessment for the Project are summarised below.

There are no listed heritage items within the bounds of the Project Area. Four potential historic heritage items were identified in the field survey:

- 1) Granbalang Trig Station;
- 2) Linear Embankment;
- 3) Mound with historic material; and
- 4) Vertical shaft with fencing.

Of the four identified items, one was assessed as not having heritage value (Vertical shaft with fencing). Two of the other items (Linear Embankment and Mound with historic material) were found to be within the areas of proposed disturbance and may potentially be subject to destruction as a result of the proposed works.

One listed item, Rixs Creek Coke Ovens & Associated Works, was identified as immediately adjacent to the Project Area and potentially subject to indirect Project impacts from blasting vibration.

It is recommended that a Historic Heritage Management Plan (HHMP) be prepared for the Project to manage impacts to identified historic heritage items and that an updated Conservation Management Plan (CMP) be prepared to guide the conservation of the item Rixs Creek Coke Ovens & Associated Works.

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Appendix A

EPBC Search

Appendix A EPBC Search



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

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[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

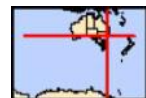
[Acknowledgements](#)



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[Coordinates](#)

Buffer: 0.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	18
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As [heritage values](#) of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	13
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	21
State and Territory Reserves:	None
Regional Forest Agreements:	1
Invasive Species:	42
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (RAMSAR) [\[Resource Information \]](#)

Name	Proximity
Hunter estuary wetlands	Upstream from Ramsar

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Frogs		
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinobius dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll	Endangered	Species or species

Name	Status	Type of Presence
(southeastern mainland population) [75184]		habitat known to occur within area
Nyctophilus corbeni South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Eucalyptus glaucina Slaty Red Gum [5670]	Vulnerable	Species or species habitat likely to occur within area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area
Prasophyllum sp. Wyhong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area
Streblus pendulinus Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Defence Housing Authority

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Places on the RNE [\[Resource Information \]](#)

Note that not all Indigenous sites may be listed.

Name	State	Status
Historic		
All Saints Anglican Church Group	NSW	Registered
Boer War Memorial Obelisk	NSW	Registered
Bon Accord	NSW	Registered
Caledonian Hotel	NSW	Registered
Club House Hotel	NSW	Registered
Club House Hotel Group	NSW	Registered
Convent of Mercy (Current Buildings)	NSW	Registered
Convent of Mercy (Original Building)	NSW	Registered
Convent of Mercy Group	NSW	Registered
Council Chambers (former)	NSW	Registered
Criterion Hotel	NSW	Registered
Ewbank and Outbuildings	NSW	Registered
Glenayr Including Fence	NSW	Registered
Percy Hotel	NSW	Registered
Redbourneberry Bridge	NSW	Registered
Shire Council Technical Offices	NSW	Registered
Singleton Conservation Area	NSW	Registered
Singleton Courthouse	NSW	Registered
Singleton Post Office and Stables (former)	NSW	Registered
St Patricks Catholic Church	NSW	Registered
Wade Cottage	NSW	Registered

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis		
Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis		
European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus		
House Sparrow [405]		Species or species habitat likely to occur within area
Pycnonotus jocosus		
Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis		
Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris		
Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula		
Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Bufo marinus		
Cane Toad [1772]		Species or species habitat likely to occur within area
Rhinella marina		
Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus		
Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer		
Feral deer species in Australia [85733]		Species or species habitat likely to occur

Name	Status	Type of Presence
Lepus capensis Brown Hare [127]		within area Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Altemanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species

Name	Status	Type of Presence
Opuntia spp. Prickly Pears [82753]		habitat likely to occur within area Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Protasparagus plumosus Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x.calodendron & S.x.reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Coordinates

-32.488056 151.076888,-32.487911 151.076888,-32.487911 151.076888,-32.485884
151.205978,-32.566791 151.204089,-32.565489 151.079292,-32.488056 151.076888

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Department of Environment, Climate Change and Water, New South Wales](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment and Natural Resources, South Australia](#)
- [Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [Environmental and Resource Management, Queensland](#)
- [Department of Environment and Conservation, Western Australia](#)
- [Department of the Environment, Climate Change, Energy and Water](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [SA Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [State Forests of NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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Appendix B

Heritage Inventory Sheets

Appendix B Heritage Inventory Sheets

The ovens themselves are the typical beehive type being dome shaped with a hole in the centre top and an arched opening at the front. Outside the oven was the 'bench' upon which the coke was 'drawn' for cooling after being 'quenched' using water from the dam constructed on the creek adjacent to this group of ovens.

Traces of the facing stone wall between each oven are clearly visible in parts (especially between ovens 4 & 5 and 7 & 8).

The bricks used in the construction of the ovens are of a soft red texture, which, inside the ovens, have acquired a hard glaze over the bricks due to the intense temperatures.

Group 2 (14 Ovens)

In this group there are eight beehive ovens and four "arched" or "culvert" type ovens. These latter ovens are very badly collapsed and one can only theorize as to what the front of the ovens would have been like.

There appear to have been two mines associated with this group of ovens - or at least the two mines are closer to these ovens than to the other group. However, a long embankment, containing the remains of a tramway, links these two lower mines to the group 1 ovens. The tables or benches outside the group 2 ovens onto which the coke was raked after it was fired are no longer clearly visible. This group of ovens is largely in a worse condition than the other group (1)

MINES:

Numbers 1 and 2 mines are largely blocked by fall at the entrances. The third mine entrance, although slightly collapsed, is still accessible and a wire cable (used for hauling the skips along) and the skip tracks are still intact and visible.

The ovens are in a 'reasonable' condition at the moment - ie. the majority of the structures are intact and it is possible to reconstruct from the visible remains the probable functioning of the whole site. They are badly in need of some stabilization work if the site is to be preserved. Several trees, some now quite large, have grown up in the batteries of ovens, and their root systems are progressively dislodging the structures. The age of these trees would give a good indication of when the site was abandoned. The surrounding land remains largely clear, due to apparently continuous grazing on the land since the cessation of mining.



The earliest known reference to this site so far located is in the 1890 "Report on the Manufacture of Coke in N.S.W." which mentions Rix's Creek Coal as being the best available for coking purposes, and that the coke from these cokeworks is superior to other coke available.

The report by E.F. Pitman in 1901 describes the Singleton Coal and Coke Company's Rix's Creek works as having, at the time, 40 ovens operating, 36 of the Beehive Type and four of the "arched" or "culvert" type. The works output is approximately 1,100 ton of coke per month, and is mostly shipped to the Cobar and Nymagee Copper Smelting Works, and to the Lithgow Copper Refinery Works.

Three Classes of Coke Ore are made.

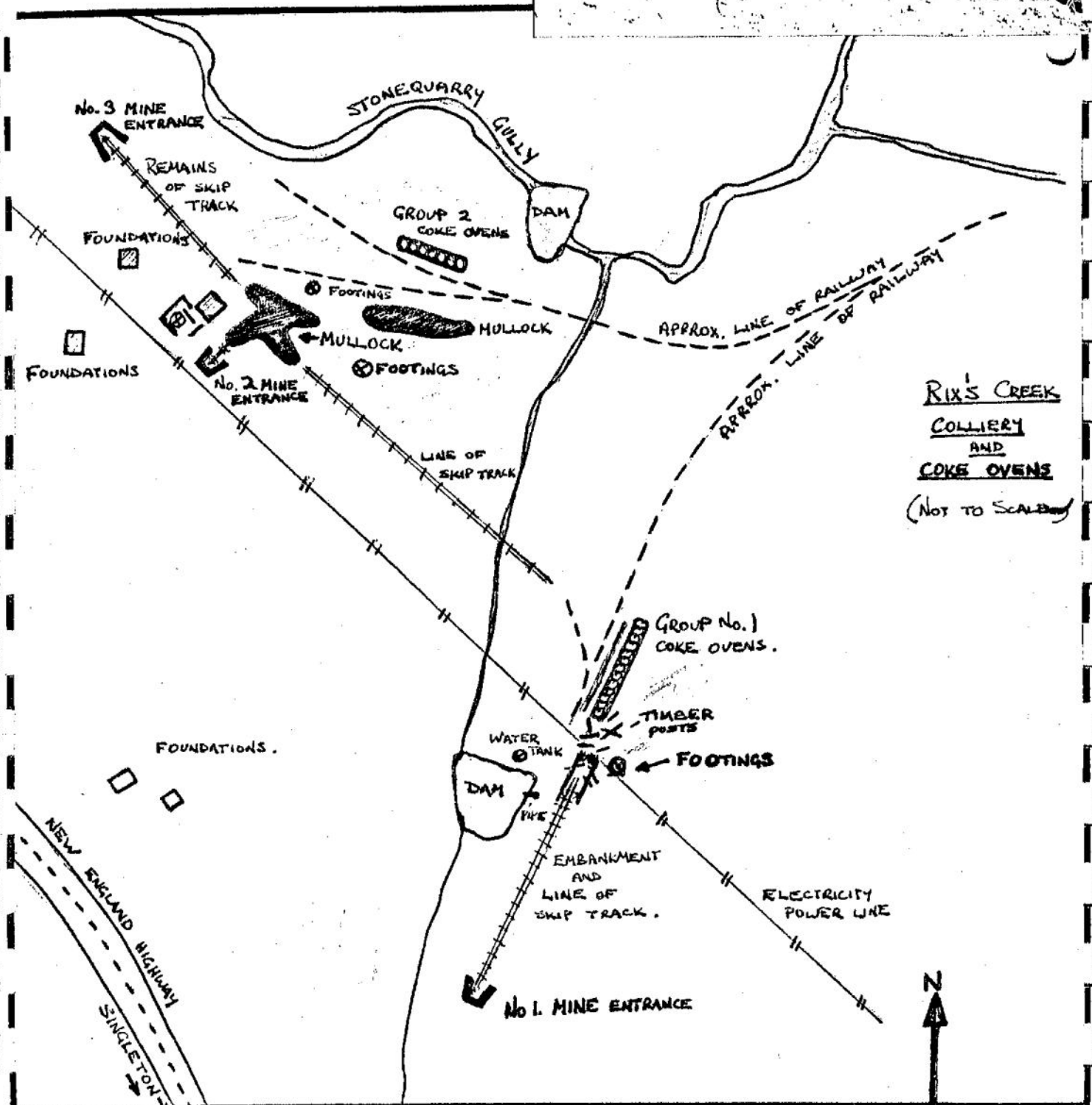
- 1) The first class of coke is made where the coal is taken as it comes from the colliery (whole coal and "smalls") and charged directly into the ovens.
- 2) In another series of ovens, coke is made direct from large or whole coal after the "smalls" have been separated through a 3/4 inch screen, but without crushing.
- 3) In a third series of ovens, coke is made from the "smalls" which, after the screening, are washed in wooden sluice boxes, giving some, though imperfect, separation of the coal from the shale or "brass". The washed coal is then put through a 1/2 inch screen, separating it into "blacksmith's nuts" and "duff". The blacksmiths nuts are sold locally, and the duff is charged into the ovens. As there is only sufficient water to wash about 10 tons of the small coal per day, the bulk coke produced at this works is largely from unwashed coal.

The Geological Survey of 1916 notes that the Great Cobar Company Ltd., was operating 26 ovens on the site, employing eight men. The company appears to have purchased the site in 1902/1903, and the older set of ovens adjacent to the former main haulage tunnel of the colliery were not used by this company. The site was connected to the Main Northern Railway Line by private railline about a mile in length from the works to the Rix's Creek Platform, which is now fully dismantled. All coal for the works was taken from the colliery on the site, and generally, all the coal mined was used in the coke works, without washing or crushing.

The ovens used were the twenty-six beehive type ovens. The coal was burned for 72-96 hours, a single charge being approximately 5 tons of coal, fed manually from the coal-hoppers into a port in the crown of the oven, and the average yield of coke was 58% of the original coal. The coke was quenched internally, withdrawn by hand and wheeled in trolleys onto the coke-bench, to be loaded then into railway trucks. The maximum output during this period was approximately 150 tons/week, or about 600 tons per month.

It is apparent that, whether they were built at the same time or not, the larger group of ovens were in use for fifteen to twenty years longer than the smaller group of ovens, accounting in part for the better condition of the larger group. A third group of ovens has been identified on the south side of the New England Highway, about 1/2 km south of the main cokeworks. It is presumed that this battery is also associated with the Rix's Creek works.

It is presumed that the Rix's Creek works were closed with the closure of the Great Cobar Company's Mines and smelters in 1920, after which all of its assets were eventually sold. One site-evidence would further suggest that the Rix's Creek Colliery and Cokeworks did not operate beyond this date.



HISTORIC SITE INVENTORY SHEET – PHYSICAL EVIDENCE

Project Name	Rix's Creek Extension Project	Inventory No.	Singleton LEP I45
Site Name/Identification	Rixs Creek Coke Ovens & Associated Works		
Location	New England Highway, Rixs Creek, NSW		
Site Type	Historic items and structures		
Photographs (left circa 1906, right circa 1982)			
			
Historical Notes A syndicate formed by Dr Richard Read opened the New Park mine in 1881, then built a battery of coke ovens at Rixs Creek in the 1880s (Noble, n.d.). The coke produced at the ovens was described in 1890 as “the best available” (Armstrong, 1983). A second battery of ovens was constructed at the same location around 1900. Both batteries were cited as being visually discernible. The coke ovens were a major business in the area. The Rixs Creek rail platform was opened in 1885 to service the Main North Line. A tramway was also built to connect the Rixs Creek coke ovens and mining area to the Main North Line. This tramway was in operation from at least 1887 (Singleton Argus, 1887), its extent shown on the 1912 and 1923 Parish Maps of Darlington, extending across a 50 acre block that was owned by S. Noble, before reaching the Alexander Gardner owned land parcel where the Coke Ovens were situated.			
Information Sources			
Written	Armstrong, J. (1983). Shaping the Hunter: a story of engineering contribution to the development of the present shape of the Hunter Region, its river, cities, industries and transport arteries. Australia: Institution of Engineers. Croft and Associates Pty Ltd. (1982). <i>The Interaction between Mining and Historic Structures on Authorisation 89, Rix's Creek NSW</i>. Noble, L. M. (n.d.). The Glennies Creek Story. Singleton Argus. (1887, July 23). Fatal Railway Accident - A Man Killed. <i>Singleton Argus</i>. Retrieved from http://trove.nla.gov.au/ndp/del/article/82613594?searchTerm=rixs creek tramway&searchLimits=		
Oral	John Hindmarsh (Rix's Creek Coal Mine Senior Environmental Officer)		
Graphic	The Singleton 1:250000 topographic map shows this area.		

HISTORIC SITE INVENTORY SHEET – PHYSICAL EVIDENCE

Historic Themes	Mining	Level	Local
Integrity	Requires inspection	Condition	Requires inspection
Heritage Listings			Period
Singleton LEP I45			1870s – 1919
SIGNIFICANCE	REPRESENTATIVE	RARE	Statement of Significance The site of the Rixs Creek Coke Ovens & Associated Works displays heritage significance due to its historical links, research potential, rarity and representativeness. As example of an early mining related industry in the Rixs Creek area, it provides a rare example of the development of local community, industry practises and manufacturing processes. It is one of five locally listed coke ovens in NSW, but is the only one listed with its design type, place and period of use. This item demonstrates the principal characteristics of a coke oven site, also having subsurface archaeological potential due to the associated works that surrounded the coke ovens during their period of operation.
Aesthetic	No	No	
Historic	Local	No	
Scientific	Local	No	
Social	Local	No	
Level of Significance: S = State R = Regional L = Local			
Recommended Action for Conservation/Management Updated inspection, full archival recording, including scaled drawings, GPS coordinates and photographs. Ongoing monitoring under specifications of HHMP for Rix's Creek Mine. This work should be undertaken by a qualified archaeologist.			
Other Information N/A			

HISTORIC SITE INVENTORY SHEET – PHYSICAL EVIDENCE

Project Name	Rix's Creek Extension Project	Inventory No.	N/A
Site Name/Identification	Granbalang Trig Station		
Location	At coordinates 322180mE 6399334mN GDA94 (Zone 56).		
Site Type	Trig Station		
Photographs (circa 2014)			
			
Historical Notes			
The Granbalang Trig Station is of a type commonly found throughout NSW. Trig (short for trigonometric) stations were utilised as a control network for triangulation during small scale surveys and mapping. It is defined by NSW Land & Property Information as a permanent survey mark that defines “location for surveying, mapping and engineering projects. Uses include housing developments, new road and bridge construction, improving railways and environmental mapping” (NSW Land & Property Information, 2012). The Granbalang Trig Station is of a type designed to replace an earlier version, which had consisted of a brass marker set within a rock cairn. Maintenance and survey use of the earlier design required the dismantling and reassembly of the rock cairn. The concrete pillar model was designed for ease of maintenance and surveying usage, having a threaded spigot in the metal column allowing the vane section to be removed and thus for surveyors to mount their own survey equipment (Doherty Smith & Associates, 2013). This style of trig station was being constructed from the 1870s onwards (Australian Government, 2014). There are currently three trig stations with heritage listings in NSW, two having been assigned local significance, one listed on the Commonwealth Heritage List and RNE. The details of these three items has been included below for comparative analysis with the Granbalang Trig Station.			
Information Sources			
Written	Australian Government. (2014). Australian Heritage Database. Retrieved June 03, 2014, from http://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=search_form;list_code=RNE Doherty Smith & Associates. (2013). Trig Stations. Retrieved June 03, 2014, from http://www.dohertysmith.com.au/blog/trig-stations/ Land & Property Information. (2012). Survey Marks: All About Protecting them. Retrieved June 03, 2014, from http://www.lpi.nsw.gov.au/_data/assets/pdf_file/0007/169522/19608_Mark_Preservation_Flyer_web.pdf		
Oral	John Hindmarsh (Rix's Creek Coal Mine Senior Environmental Officer)		
Graphic	The Singleton 1:250000 topographic map shows this area.		

HISTORIC SITE INVENTORY SHEET – PHYSICAL EVIDENCE

Historic Themes	Exploration/mapping	Level	Local
Integrity	Good	Condition	Good
Heritage Listings			Period
No listing			1870-current
SIGNIFICANCE	REPRESENTATIVE	RARE	Statement of Significance The trig station has been constructed and/or updated with contemporary materials. The setting of the Trig Station includes a prominent view-line to the south, taking in both Gowrie Terrace and Rixs Creek. The Granbalang Trig Station has historical significance at the local level due to its link to the surveying and mapping of the area. It also has representative significance embodying the principal characteristics of a trig station.
Aesthetic	No	No	
Historic	Local	No	
Scientific	No	No	
Social	No	No	
Level of Significance: S = State R = Regional L = Local			
Recommended Action for Conservation/Management Trig station to be left in situ.			
Other Information N/A			

HISTORIC SITE INVENTORY SHEET – PHYSICAL EVIDENCE

Project Name	Rix's Creek Extension Project	Inventory No.	N/A
Site Name/Identification	Linear Embankment		
Location	From 325117mE 6400226mN to 325108mE 6400447mN GDA 94 (Zone 56)		
Site Type	Transport corridor		
Photographs (circa 2014)			
			
Historical Notes			
The linear embankment was likely to be part of a historical transport route that linked the Singleton LEP listed coke ovens with coal mines and associated works in the surrounding area.			
Information Sources			
Written	Croft and Associates Pty Ltd. (1982). The Interaction between Mining and Historic Structures on Authorisation 89, Rix's Creek NSW.		
Oral	John Hindmarsh (Rix's Creek Coal Mine Senior Environmental Officer)		
Graphic	The Singleton 1:250000 topographic map shows this area.		



HISTORIC SITE INVENTORY SHEET – PHYSICAL EVIDENCE

Historic Themes	Mining	Level	Local
Integrity	Poor	Condition	Poor
Heritage Listings		Period	
There are no heritage listings for this site		1870s – 1919	
SIGNIFICANCE	REPRESENTATIVE	RARE	Statement of Significance The linear embankment is of local significance as it relates specifically to the Rixs Creek Coke Ovens & Associated Works and the local coal industry.
Aesthetic	No	No	
Historic	Local	No	
Scientific	No	No	
Social	No	No	
Level of Significance: S = State R = Regional L = Local			
Recommended Action for Conservation/Management Full archival recording, GPS coordinates and photographs along with surface collection as per requirements to be included in HHMP. This work should be undertaken by a qualified archaeologist.			
Other Information N/A			

HISTORIC SITE INVENTORY SHEET – PHYSICAL EVIDENCE

Project Name	Rix's Creek Extension Project	Inventory No.	N/A
Site Name/Identification	Mound with historic material		
Location	At coordinates 325232mE 6400736mN GDA94 (Zone 56)		
Site Type	Historic artefact scatter on artificial mound		
Photographs (circa 2014)			
			
Historical Notes No specific historical context could be identified for the mound with historic material, but its location means that it may have been associated with the historic coal pit and coke oven area in some way.			
Information Sources			
Written	Croft and Associates Pty Ltd. (1982). The Interaction between Mining and Historic Structures on Authorisation 89, Rix's Creek NSW.		
Oral	John Hindmarsh (Rix's Creek Coal Mine Senior Environmental Officer)		
Graphic	The Singleton 1:250000 topographic map shows this area.		



HISTORIC SITE INVENTORY SHEET – PHYSICAL EVIDENCE

Historic Themes	Mining	Level	Local
Integrity	Poor	Condition	Poor
Heritage Listings		Period	
No listing		1870s – 1919	
SIGNIFICANCE	REPRESENTATIVE	RARE	Statement of Significance The mound with historic material is of local significance due to its link to the Rixs Creek Coke Ovens & Associated Works and the local coal industry.
Aesthetic	No	No	
Historic	Local	No	
Scientific	No	No	
Social	No	No	
Level of Significance: S = State R = Regional L = Local			
Recommended Action for Conservation/Management Full archival recording, GPS coordinates and photographs along with surface collection as per requirements to be included in HHMP. This work should be undertaken by a qualified archaeologist.			
Other Information N/A			