



**NEWCREST**  
MINING LIMITED

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**CADIA**

## **Historical Heritage Management Plan**

**710-005-EN-PLA-0013**

**DOCUMENT CONTROL**

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## 1. INTRODUCTION AND BACKGROUND

### 1.1 Introduction

Project Approval for the Cadia East Project was granted by the NSW Minister for Planning under Part 3A of the Environmental Planning and Assessment Act, 1979 (EP&A Act) on 6 January 2010. The Cadia East Project is described in Schedule 1 of the Project Approval as including the Cadia East underground mine, the Ridgeway underground mine, the Blayney and Cadia Dewatering Facilities, and ancillary infrastructure. These components are together known as the Cadia Valley Operations (Cadia).

This Historical Heritage Management Plan (HHMP) outlines the conservation management strategy, mitigation measures, monitoring, protection and interpretation to be implemented for heritage items in the vicinity of Cadia. The HHMP addresses the consent requirements specified in Condition 43 of Schedule 3 of the Cadia East Project Approval (Project Approval 06\_0295). The table below repeats the requirements of Condition 43 and indicates which sections of the HHMP address them.

This Management Plan applies to all activities undertaken at Cadia including:

- mining and exploration activities;
- processing of copper / gold ore resources;
- project development;
- maintenance activities;
- mine closure;
- logistics; and
- associated service and support functions

Project Approval Requirement	Relevant Section of Plan
<b>Historical Heritage Management Plan</b>	
<p>43. The Proponent shall prepare and implement a Historical Heritage Management Plan for the project to the satisfaction of the Secretary. This plan must:</p> <p>(a) be prepared in consultation with the Heritage NSW and be submitted to the Secretary for approval within 6 months of the date of this approval;</p> <p>(b) include:</p>	
<p>➤ compilation of archival recording, excavation and/or salvage of heritage items within the project disturbance area, including the Wire Gully Gold Workings and the Little Cadia Copper Mine;</p>	Section 2.2
<p>➤ a detailed conservation management strategy for heritage items outside the project disturbance area but within the vicinity of the site, including:</p>	Section 3
<ul style="list-style-type: none"> <li>• A description of the measures that would be implemented to protect heritage items from disturbance, including disturbance from blasting activities;</li> </ul>	Section 3.1
<ul style="list-style-type: none"> <li>• A program to monitor the effects of blasting on relevant heritage items; and</li> </ul>	Section 3.2
<ul style="list-style-type: none"> <li>• an Interpretation Plan for the Cadia Village.</li> </ul>	Section 3.3
<p><i>Note: The Little Cadia Copper Mine is outside the zone of subsidence for the Cadia East mine but within its zone of influence, and therefore may potentially be subject to impact. It is proposed to conserve the site in-situ, if possible.</i></p>	

Cadia consulted with the Office of Environment and Heritage (OEH) and the Department of Planning and Environment (DoPE) in June 2010 during the development of this HHMP. Additional discussions have been undertaken up to 2015 regarding the Heritage Management Plan, in particular the interpretation requirements required by the Cadia East Project Approval and the support of the Orange Museum.

## 1.2 Background

### 1.2.1 Overview of Mining Activities

Cadia currently comprises the Cadia East underground mine and the Ridgeway underground mine and is located within the Cadiangullong Creek Valley within Mining Leases ML1405, ML1472, ML1481, ML1449, ML1689 and ML1690. The Blayney Dewatering Facility and the Cadia Dewatering Facility are located approximately 25 kilometres to the east of Cadia in the town of Blayney.

Mining of the Cadia Hill open pit commenced in 1998, Ridgeway commenced production in 2002 and Cadia East commenced production in January 2013. Mining of Cadia Hill open pit and Ridgeway Underground mines has concluded. The Cadia Hill Pit is now used as a tailings storage facility while the Ridgeway Underground Mine is currently in a state of 'care and maintenance'.

Cadia East is an underground mine located to the east of, and adjacent to, Cadia Hill (Open Pit) Tailings Storage Facility. Cadia East has an approved mine life until 2031.

### 1.2.2 Overview of European Heritage Assessments Conducted

Numerous European heritage assessments have been conducted at Cadia, including assessments conducted as part of the Cadia Hill and Ridgeway Project Environmental Impact Statements (EISs) (Newcrest, 1995; CHPL, 2000) and the Cadia East Project Environmental Assessment (Cadia East EA) (CHPL, 2009a).

Studies undertaken to date include:

- Godden Mackay (1995) Cadia Mining Precinct, Final Conservation Plan (herein referred to as the Cadia Conservation Plan). Prepared for Newcrest Mining Limited.
- Edward Higginbotham & Associates Pty Ltd. (1997) Report on site survey of archaeological remains at the site of the East Cadia Village, Cadia, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd. (1997) Report to determine the curtilage of the Cadia Engine House, Cadia, NSW., for the purpose of redefining the boundary of the permanent conservation order. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd. (1997) Report on the test excavation of the Cadia Cemetery, Cadia Road, Cadia, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd. (1998) Historical and Archaeological Assessment of the Cadia Ridgeway Project on 'Tunbridge Wells', Four Mile Creek Road, Near Orange, N.S.W. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd. (1998) Cadia Engine House PCO. Report on the proposed Garden of Remembrance. Prepared for Cadia Holdings Pty Limited
- Heritage Management Consultants (2000) European Heritage Survey & Assessment, in Appendix N of Ridgeway Project EIS. Prepared for Cadia Holdings Pty Limited.
- Edward Higginbotham & Associates Pty Ltd (2000) Historical and Archaeological Assessment of Cadia Village in Advance of the Proposed Mining of Cadia Quarry, Cadia, NSW. Prepared for Cadia Holdings Pty Limited.
- Edward Higginbotham & Associates Pty Ltd (2001) Progress report on archaeological investigations, Cadia Hill Gold Mine and the Ridgeway Project, Cadia, NSW (1996-2000). Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2001) Historical and archaeological evidence for mining activity on the route of the proposed underground conveyor, Cadia Ridgeway Project. Tunbridge Wells, Four Mile Creek Road, near orange, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2001) Archival Recording of Waringa Homestead, Cadia Hill Gold Mine, near Orange, N.S.W. Prepared for Cadia Holdings Pty Limited.
- Edward Higginbotham & Associates Pty Ltd (2001) Archaeological Assessment of Proposed Development, Site of Smelter No. 1, Old Cadia Road, Cadia, NSW. Prepared for Cadia Holdings Pty Limited.

- Edward Higginbotham & Associates Pty Ltd (2001) Report on the archaeological excavation of Tynan's Slaughterhouse, Old Cadia Road, Cadia, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2001) Report on the archaeological excavation of Smelter No 1, Old Cadia Road, Cadia, NSW. (Volumes 1 and 2). Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2002) Report on the excavation of the Cadia Cemetery, Cadia Road, Cadia, NSW (Volumes 1 to 5). Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2002) Progress Report on archaeological excavations, Cadia Hill Gold Mine and the Ridgeway Project, Cadia, NSW (Progress report 2, 2001-2002). Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2003) Archival Recording of Sites in Advance of the Extension of Mining Works, Cadia Valley Operations, Cadia, NSW. Prepared for Cadia Holdings Pty Limited.
- Edward Higginbotham & Associates Pty Ltd (2003) Report on the archaeological excavation of Warringa Hut, near Cadia, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2004) Historical and Archaeological Assessment of Proposed Development, Blayney Copper Mine, near Blayney, NSW. Prepared for Cadia Holdings Pty Limited. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2004) Historical and Archaeological Assessment of Proposed Development, Little Cadia Copper Mine and neighbouring property, near Orange, NSW. Prepared for Cadia Holdings Pty Limited.
- Edward Higginbotham & Associates Pty Ltd (2005) Report on the archaeological excavation of part of Cadia Mining Village, near Orange, NSW. (volumes 1 to 3). Prepared for Cadia Holdings Pty Limited.
- Edward Higginbotham & Associates Pty Ltd (2005) Archival Recording of Little Cadia Copper Mine, near Orange, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2005) Archival Recording of Blayney Copper Mine, near Blayney, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2005) Historical and Archaeological Assessment of the proposed 'Big Cadia' mining development, Cadia Valley Operations, near orange, NSW. Including 'The Iron Duke', 'West Cadia Copper Mine', 'East Cadia Copper Mine' and associated heritage items. Prepared for Cadia Holdings Pty Limited.
- Edward Higginbotham & Associates Pty Ltd (2005) Archival Recording of 'The Iron Duke', 'West Cadia Copper Mine', 'East Cadia Copper Mine' and associated heritage items at Cadia, Old Cadia Road, near Orange, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2006) Historical and archaeological assessment of proposed development, "Te Anau" Homestead and Outbuildings, Old Cadia Road, near Orange. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2006) Archival Report for "Te Anau" Homestead and Outbuildings, Old Cadia Road, near Orange, NSW. Prepared for Cadia Holdings Pty Limited

- Edward Higginbotham & Associates Pty Ltd (2006) A Guide to the Conservation and Management of historical heritage items, Cadia Valley Operations, near Orange, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2006) Report on the archaeological excavations of Little Cadia Copper Mine, near Orange, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2007) Historical and Archaeological Assessment (European Heritage) of Oaky Creek and Adjacent Properties, South of Panuara Road, near Panuara, N.S.W. Prepared for Cadia Holdings Pty Limited.
- Edward Higginbotham & Associates Pty Ltd (2009) Historical and archaeological assessment (European Heritage) of the Cadia east Project, Cadia Holdings Pty.Ltd. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2010) Report on the archaeological monitoring program for Stage 1. Exploration Drilling. Proposed “Big Cadia” Mining Development, Cadia Valley Operations, near Orange, NSW. Prepared for Cadia Holdings Pty Limited
- Edward Higginbotham & Associates Pty Ltd (2010) Archival report for farms and outbuildings (Te Anau, and Wire Gully Farms, near Orange, NSW. Prepared for Cadia Holdings Pty Limited.
- Edward Higginbotham & Associates Pty Ltd (DRAFT 2019) Cadia Engine House Mining Precinct. Conservation Management Plan. Prepared for Cadia Holdings Pty Limited.
- Heritage Management Consultants (2001) Archival Recording. Springdell Homestead Group, Panuara Road, Rodds Creek. Prepared for Cadia Holdings Pty Limited.

### 1.2.3 Overview of European Heritage Precincts at Cadia

Cadia contain numerous sites, locations, structures and relics that are of heritage significance. The majority of these items constitute historical heritage from post-European settlement and mining in the Cadia area. Historical mining has involved the mining of gold, copper and iron ore by several companies. Godden Mackay (1995) conducted surveys and assessments of European heritage in Cadia Valley in 1992 and 1995 for the Cadia Hill EIS (Newcrest, 1995). These investigations concentrated on the historic mine workings and buildings within ML 1405.

The surveys identified 153 items and divided the ML1405 area into the following six major heritage ‘precincts’ (Refer to Figure 2-1):

- Cadia Engine House and Chimney;
- West Cadia;
- Iron Duke;
- East Cadia;
- Cadia Village; and
- Little Cadia Copper Mine (Little Cadia).

An additional area of historic mine workings at 'Wire Gully' (to the immediate south of ML 1405) was surveyed and assessed as part of the Ridgeway Project EIS (CHPL, 2000). For the purposes of this HHMP, the Wire Gully Gold Workings (including the Water Race) is also included as a heritage precinct.

#### 1.2.4 Overview of Potential Impacts Associated with the Cadia East Project

Potential impacts to European heritage areas and items, associated with the Cadia East Project include (CHPL, 2009a) :

- a portion of the Little Cadia precinct that would be within the zone of influence associated with the Cadia East subsidence zone; and
- a larger proportion of the Wire Gully Gold Workings (excluding the Water Race) that would be inundated by tailings due to the expansion of the Southern Tailings Storage Facility.

The blasting assessment undertaken in the Cadia East EA indicated that the structural damage criteria would be met at all receivers and blasting emissions at the Cadia Engine House and Chimney would be below the relevant criteria (refer to Section 3.2).

#### 1.2.5 Overview of Potential Impacts Associated with the Existing Cadia Hill and Ridgeway Mines

Prior to the granting of the Cadia East Project Approval in January 2010, the potential impacts and management of European heritage associated with the Cadia Hill and Ridgeway Mines were assessed and implemented in accordance with the relevant planning approvals granted for these mines. The main potential impacts associated with previous mining activity at Cadia, namely Cadia Hill Pit and Ridgeway Underground Mine was the progressive expansion of the northern and southern tailings storage facilities and potential blasting and seismic related impacts on the Cadia Engine House and Chimney.

### 1.3 Other Project Approval Conditions Relevant to Historical Heritage

Conditions 10 and 11 of Schedule 3 of the Cadia East Project Approval (06\_0295) specify blast criteria and blast monitoring requirements for heritage items at Cadia. Condition 16 of Schedule 3 requires the preparation of a Blast Monitoring Program, which is to include a protocol for evaluating blast-related impacts (including blast-induced seismic activity) on items of non-indigenous and cultural heritage significance (including the Cadia Engine House and Surrounds) and demonstrating compliance with the blasting criteria.

These conditions have been considered and addressed in the Cadia Blast Monitoring Program (BMP) and are repeated in full below. The current and approved Blast Monitoring Program is available on the Cadia website ([www.cadiavalley.com.au](http://www.cadiavalley.com.au)). The relevant blast monitoring station, (stated in the Blast Monitoring Program) is "Chimney" which measures ground vibration and overpressure at the Cadia Engine House and is used to determine compliance with the following criteria.

**Schedule 3, Condition 10**

**Blasting Impact Assessment Criteria**

The Proponent shall ensure that blasting at the project does not exceed the criteria in Table 7.

Location	Time of Blasting	Airblast Overpressure	Ground Vibration	Allowable Exceedance
Heritage sites, including Cadia Engine House and Surrounds (but excluding Little Cadia Copper Mine)	Any time	-	15	0%

Note: The impact assessment criteria for Cadia Engine House and Surrounds apply in the absence of any anti-vibration strengthening. Alternative criteria may be approved under the Historical Heritage Management Plan (see condition 43) if anti-vibration strengthening works are implemented.

**Schedule 3, Condition 11**

**Operating Conditions**

11. During mining operations on site, the Proponent shall implement best blasting practice to:

...

(b) protect items of Aboriginal and non-indigenous cultural heritage significance; and to the satisfaction of the Director-General.

**Schedule 3, Condition 16**

16. The Proponent shall prepare and implement a Blast Monitoring Program for the project to the satisfaction of the Director-General. This program must:

(b) include a protocol for evaluating blast-related impacts (including blast-induced seismic activity) on, and demonstrating compliance with the blasting criteria in this approval for:

...

– items of Aboriginal and non-indigenous cultural heritage significance (including the Cadia Engine House and Surrounds);

In 2002, Cadia received approval under section 57 of the NSW Heritage Act, 1997 (NSW Heritage Act) to place anti-vibration strengthening works on the Cadia Engine House, Crusher Room and Chimney to protect the structures from blasting activity in the Cadia Extended open pit for a period of 5 years. In 2007, approval was granted by the NSW Heritage Council for retention of the strengthening works for a further 5 years. In 2012, Cadia again applied to extend the life of the strengthening works to protect the structure from blast or mine related seismicity; the application was approved in October 2013. In late 2018, the retention of the strengthening works was again approved for a further 5 years. The removal of strengthening structures are now scheduled to occur prior to 31 December 2023.

The impact assessment criteria for the Cadia Engine House and surrounds applicable during the implementation of anti-vibration strengthening works are outlined in the 2007 approval and reproduced below:

**Condition 6**

*Ground vibrations will be monitored and recorded for each blast at the Chimney blast monitoring station; and*

**Condition 7**

*Ground vibration as measured at the Chimney blast monitoring station over any one calendar month will be limited to;*

- i 95% percentile = 25mm/sec*
- ii 99% percentile = 30mm/sec*
- iii Maximum = 55mm/sec*

## 1.4 Heritage Guidelines and Legislative Requirements

The following heritage guidelines and legislation have been considered in the development of this HHMP, where applicable:

- NSW Heritage Manual (NSW Heritage Office and Department of Urban Affairs and Planning, 1996);
- The Burra Charter (The Australia International Charter for the Conservation and Restoration of Monuments and Sites [ICOMOS] Charter for places of cultural significance);
- Heritage items listed under the Cabonne Local Environmental Plan, 1991 (Cabonne LEP);
- Heritage items listed under the Blayney Local Environmental Plan, 1998 (Blayney LEP);
- NSW Heritage Act;
- Relevant excavation permits issued by the Heritage Branch, DoP;
- NSW State Heritage Register; and
- Ruins – a Guide to Conservation and Management (Australian Heritage Council)

## 2. OVERVIEW OF CADIA VALLEY HISTORICAL HERITAGE SIGNIFICANCE

### 2.1 Introduction

Pastoral settlement in the Cadia Valley commenced in the 1830's. Copper and gold mineralisation were first officially discovered at Cadia in 1851.

The overall historical significance of Cadia was summarised by Godden Mackay (1995) as follows:

*The Cadia mining precinct is representative of a class of landscapes which have long associations with mining and evidence progressive overlaying of cultural activity in the resulting landscape. Cadia is unusual for the range of minerals mined on the site, which included copper, gold, silver, and iron ore. The earliest period of copper mining is represented by the Cadia Engine House, a very rare and significant remnant of the nineteenth century introduction of Cornish mining technology to Australia, and that early period has strong associations with Josiah Holman, an important local figure. The Cadia Engine House is a local landmark and icon representative of the district's mining heritage. The Cadia mining precinct has associations with the early period of the development of the steel industry in Australia and with Sandford and Hoskins. It was also briefly an important primary resource during World War II. Surface historical mining fabric related to all post 1880s phases is fragmented, partial and often ephemeral, but the precinct has high potential to contain significant archaeological deposits related to the lifestyle and technology of the former community and mining activity.*

Mining activity in the Cadia Valley had commenced by 1856 and was centred mainly on the upper Cadiangullong Creek Valley. Over the period from 1856 to the 1950s, a series of copper and iron ore mines were intermittently established in the Cadia Valley. Developments during this period included Cadia Village, Cadia School, Cadia engine house, smelters, aerial ropeway, bridges, railways and numerous underground and open pit mining ventures. In addition, gold mining was undertaken at Wire Gully and numerous small alluvial workings in the local area. A comprehensive history of the development of the early mines at Cadia is provided in Appendix O of the Cadia Gold Mine EIS (Mackay, 1995).

Limited physical evidence of the previous mining activity at the Cadia Valley remains, as each successive era of mining tended to remove the traces of the previous developments and the majority of infrastructure was sold or salvaged following mine closures.

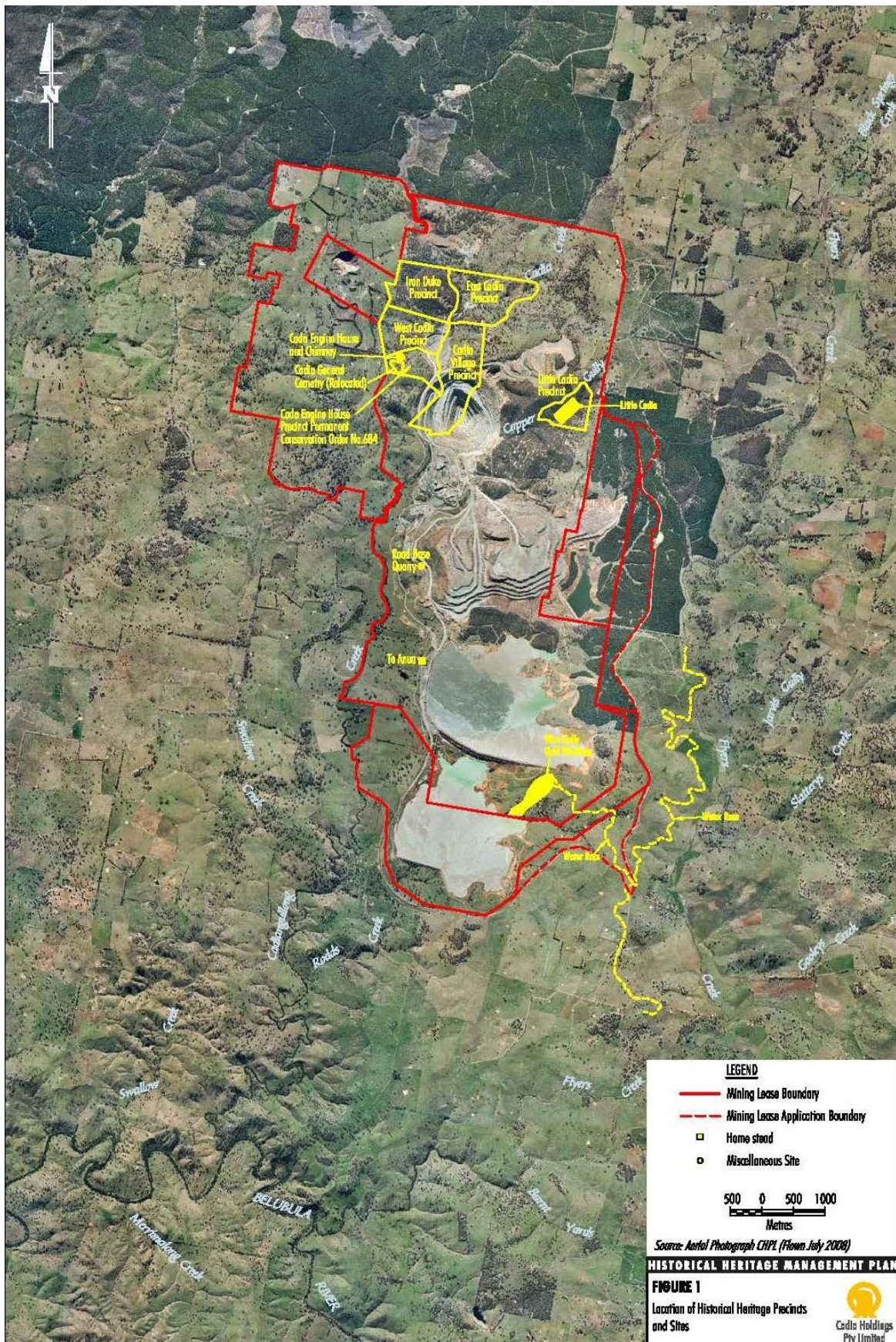
The Cadia Engine House and Chimney is the most significant surviving structure at Cadia and has been identified as being of State significance and is listed on the State Heritage Register.

In the past two decades, there has been a renewed appreciation of Cadia's mining heritage, particularly in regard to copper mining. Much of this community interest and appreciation has developed through the research, conservation works, archaeological investigations and public tours undertaken as part of the current heritage and community relations programs.

### 2.2 Heritage Precincts at Cadia

A summary of the historical significance and conservation works completed to date for each of the heritage precincts as well as other sites of relevance to Cadia is provided in Sections 2.2 to 2.3. Reference should be made to the Cadia Conservation Plan (Godden Mackay, 1995) and European heritage studies prepared by Dr Edward Higginbotham (Section 1.2) for detailed descriptions of the heritage items within each of the precincts. The location of each of the heritage precincts is shown on Figure 2-1.

Figure 2-1: Heritage Precinct Locations



## 2.2.1 Little Cadia

### 2.2.1.1 Historical Significance

The Little Cadia precinct (and the historical material contained within the precinct) was listed in the Cadia Gold Mine EIS as follows (Newcrest, 1995):

*This precinct contains numerous shafts, a small shed, remnants of a weir, chimney bases, remnants of a former structure, miscellaneous timbers, copper precipitation works, dam, blast furnace platform and smelter site, well, slag, heap, prospecting lease corner post, tramway remains and old workings.*

Copper mining began at Little Cadia in the late 1850s and continued intermittently until the 1970s. Little Cadia vies with East Cadia for the first place to be mined for copper in the locality (Higginbotham, 2006).

The assay furnaces at Little Cadia are regarded by Higginbotham (2009) as an excellent example of Cornish and Welsh mining and smelting technology transferred to New South Wales in the 1850s to 1860s.

The Little Cadia precinct is not listed as a heritage item on the State Heritage Inventory but is considered to have a local level of significance (Higginbotham, 2005c).

### 2.2.1.2 Conservation Works Undertaken to Date

Management measures recommended by Godden Mackay (1995) for Little Cadia included photographic recording of a small shed, shaft, remnant of dam and weir, chimney base and miscellaneous timbers. Archaeological investigation was also recommended for the chimney base and remnants of walls of structure (Godden Mackay, 1995). In June 2004, a survey of the Little Cadia site was undertaken, with archival photography and archaeological investigations completed in 2005 (Higginbotham, 2005d). A report on the archaeological investigations of the Little Cadia copper mine was prepared in 2006 (Higginbotham, 2006). Artefacts collected during the investigations were catalogued and packed into archive boxes for storage at the Cadia mine.

### 2.2.1.3 Relevance to the Cadia East Project

Portions of the Little Cadia precinct are located within the predicted Cadia East subsidence zone and the surrounding zone of influence. No known heritage items are located within the predicted subsidence zone.

The Cadia East zone of influence is an area approximately 200 m wide surrounding the subsidence zone that could experience some cracking as a result of the underground mining, but the ground is not expected to subside. This area is fenced to exclude people and vehicles for safety reasons and therefore is not accessible. Various heritage items identified in the Little Cadia precinct are located within the zone of influence (Higginbotham, 2009).

2.2.1.4 Management Measures

Higginbotham (2009) recommended the following measures be implemented at the Little Cadia precinct to mitigate the potential impacts of the Cadia East mine:

Management Measure	Status
<p><i>The remains of the Little Cadia Copper Mine, outside the subsidence zone, should be protected from disturbance. In order to preserve the historical setting of the mine, the upstream creek environment around the Little Cadia Copper Mine should not be disturbed.</i></p> <p>Action: Update the CE subsidence zone model to ensure that Little Cadia ruins and environments are protected from actual subsidence.</p>	<p>Model update completed by August 2020.</p>
<p><i>The archaeological excavation site should be backfilled and the archaeological remains in the excavated area should be conserved in situ, in accordance with the following recommendations.</i></p> <ul style="list-style-type: none"> <li>➤ <i>The excavated surface should be covered with geotextile, including the:</i> <ul style="list-style-type: none"> <li>• <i>Stone forge;</i></li> <li>• <i>Stone forge cut into the slope;</i></li> <li>• <i>Base of the Assay Office wall footings to the top of the assay furnace brickwork; and</i></li> <li>• <i>Arch of the fireplace in the opposite end wall.</i></li> </ul> </li> <li>➤ <i>The above items should then be sandbagged to protect the masonry, including all brickwork of the assay furnaces.</i></li> <li>➤ <i>The sandbagging should be covered with a layer of soil, 200 mm thick.</i></li> <li>➤ <i>The soil for the backfill of the excavation should be recovered from the excavation soil dump (fill of creek diversion channel).</i></li> <li>➤ <i>The implementation of the above recommendations (A to D) should be supervised by the archaeologist.</i></li> <li>➤ <i>Since public access to these remains would be limited given that it is within an operating Mining Lease, interpretation and display relating to the site should be located elsewhere.</i></li> </ul>	<p>Complete. (refer to the Cadia 2016-17 AEMR (CHPL 2017))</p>

In addition to the above, Cadia will continue to implement the 'General Conservation Measures' for Cadia (refer to Section 3.1).

**2.2.2 Wire Gully Gold Workings and Water Race**

**2.2.2.1 Historical Significance**

The Wire Gully Gold Workings is the site of a small find in the early 1880s or 1890s and appear to have been worked in two principal stages, namely the 1890s to 1911 and then again in the 1930s (Higginbotham, 2009). The remains of the water races, dams, shafts, mullock heaps, engine beds and other features demonstrate the nature of small-scale gold workings of the 19th and 20th centuries. The Wire Gully Gold Workings have been assessed by Higginbotham (2009) as being of local significance.

The Wire Gully homestead and farm buildings were also identified in the Ridgeway EIS as being in vicinity of the Wire Gully Gold Workings area. Archival recording of the Wire Gully homestead and farm buildings was completed in 2009 (Higginbotham, 2010b), in accordance with the EIS recommendations (Heritage Management Consultants, 2000). However, given the farmhouse is dated post-1951 and has little heritage significance (Higginbotham 2010(b), it is not discussed further in this HHMP and will ultimately be lost to the expanding Southern Tailings Storage Facility.

**2.2.2.2 Conservation Works Undertaken to Date**

The Wire Gully Gold Workings and Water Race were assessed in 2000 and an archaeological investigation and archival recording was completed in 2002 (Higginbotham, 2003).

**2.2.2.3 Relevance to the Cadia East Project**

The Wire Gully Gold Workings are partially located in the currently approved southern tailings storage facility inundation area and were therefore assessed in the Ridgeway EIS (CHPL, 2000). The approved Cadia East Mine allows an increased height of the Southern Tailings Storage Facility, therefore inundating the Wire Gully Gold Workings.

**2.2.2.4 Management Measures**

Higginbotham (2009) recommended the following measures be implemented at the Wire Gully precinct to mitigate the potential impacts of the Cadia East mine:

Management Measure	Status
<ul style="list-style-type: none"> <li>➤ <i>The relics in the study area should be collected in accordance with the “Relics Collection Policy” of the Cadia Conservation Plan.</i></li> <li>➤ <i>The above work should be supervised by the archaeologist.</i></li> <li>➤ <i>The following relics should be recorded and collected, including:</i></li> <li>➤ <i>Wheel and timber post structure.</i></li> <li>➤ <i>Pile of timber members.</i></li> <li>➤ <i>Other items, if identified.</i></li> </ul> <p><i>Figures showing the locations of the above items are provided in Higginbotham (2009) (Appendix L of the Cadia East EA).</i></p>	<p>*Complete (refer to the Cadia 2013-14 AEMR (CHPL 2014))</p>
<p>*The mitigation measures listed above were undertaken between 19 and 26 September 2013. Wire Gully relics were relocated to the site heritage area located adjacent to SHR779 and the Cadia Garden of Remembrance. Interpretative signs have been installed outlining the original location of the relics and historical relevance.</p>	

In addition to the above, Cadia will continue to implement the 'General Conservation Measures' for Cadia (Section 3.1).

## 2.2.3 Cadia Cornish Engine House and Chimney Precinct

### 2.2.3.1 Historical Significance

The Cadia Engine House precinct (and the historical material contained within the precinct) was listed in the Cadia Gold Mine EIS as follows (Newcrest, 1995):

*This precinct contains the Cornish Engine House [also referred to as the Cadia Engine House and Chimney], Cornish boiler, pump gland, ore dressing floor, footings and floor former structures, copper mine shafts and workings, southern workings and remnant roads.*

*Of the above items, the Cadia Engine House and Chimney is the most significant surviving structure at Cadia. The hilly site of the engine house, the strong character of the building and the surrounding landscape of eroding gullies and dead trees contributes to an impressive historical landmark.*

*The Cadia Engine House and Chimney was erected in 1865 for use on the southern section of the West Cadia mines. The plain stone building, with a stone and brick chimney, contained the Cornish condensing engine with a 25-inch cylinder and a ten-ton boiler, with pumping, winding, stone- breaking, crusher and jiggling machinery.*

The significance of the Cadia Engine House and Chimney and its associated machinery was first summarised in 1989 as part of the Cadia Conservation Study (McCarthy and Connell, 1989), viz.:

*The Cadia engine house, associated buildings and surrounding mine infrastructure constitute a historic site of national significance. The high level of integrity of the surviving structural elements, and the physical evidence of the mine layout, combined with the presence of unique components of the engine and crushing machinery, as well, the manufacturer's original drawing of the engine and engine house, make the site one of the most important of its kind in Australia.*

*The engine house, crusher and boiler house are a typical arrangement of Cornish mining machinery and represent the peak of mining technology of the period. The evidence of the layout of the machinery is clear and demonstrates the role of the engine with the peripheral devices such as driving the crusher, winding over the headframe and operating flat rods to dewater the shaft.*

*This Cornish engine house is one of only four in Australia that has its chimney still standing. The associated mine layout with its several levels, ore floors, drainage channels, buddle's, tailing heaps and other features is a complete example of a Cornish-based operation of this type. The extremely brief main mining phase from 1865 to 1867, and the relative lack of subsequent reworking has resulted in the preservation of all the main elements of the above ground workings from the historic period.*

*The site gains historical significance from its association with Captain Holman, James Sim and the Scottish Australian Mining Company. Although the individual structural remains are not unique within Australia, the combination of all the elements prescribes a level of cultural significance which is greater than the sum of its parts. This significance is further enhanced by the presence and rarity of the machinery remains which also exist at the site.*

The Cadia Engine House and Chimney is currently listed on the NSW State Heritage Register (Area SHR 779), which also includes the remains of a crusher house, paved hardstand areas, machinery pits, remnant walls and old excavations (CHPL, 2002). A Permanent Conservation Order (No. 684) was gazetted under Section 35A of the Heritage Act, 1977 for the Cadia Engine House complex in June 1989 (Godden Mackay, 1995).

There are no specific management actions nor recommendations associated with the formal listing under the Heritage Act 1977

### 2.2.3.2 Conservation Works Undertaken to Date

The Cadia Engine House and Chimney were restored, and the crusher house walls stabilised by Cadia under the guidance of OEH during the Initial period of Cadia Hill exploration activities (1993-1995). These works provide ongoing support and protection of the structures whilst mining was conducted in the Cadia Hill open pit.

Since the initial restoration works, a range of additional stabilisation and maintenance works have been completed (subject to the necessary approval and exemptions) including:

- Installation of a blast monitor at the Chimney (An additional monitor was placed on the gable of the Engine house and subsequently decommissioned in 2015);
- Construction of anti-vibration strengthening works at the Cadia Engine House, Crusher Room and Chimney (Section 1.3);
- The application of concrete to the existing sandbag footings, reinstatement of steel bracing on the main doorway of the Cadia Engine House;
- Replacement of 'packing' sandbags in windows, doors and gables
- Exclusion of livestock within the heritage curtilage area;
- Rabbit and termite baiting programs and weed spraying;
- Removal of rotted timber inserts and replacement with clay period bricks;
- Periodic replacement of the protective tarpaulin covering the engine house;
- Ongoing patching and repair of mortar as required.

Monthly inspections are carried out by an authorised Cadia officer and annual inspections are conducted by a suitably qualified and experienced heritage engineer. The most recent inspections have concluded there have been no significant deterioration of any part of the Cadia Engine House or Chimney. A summary of inspection findings and recommendations are included in each Annual Environmental Management Report (AEMR) which are available on the Cadia website ([www.cadiavalley.com.au](http://www.cadiavalley.com.au))

The Cadia Engine House is included in the Cadia Blast Monitoring Program and performance against blast vibration criteria is reported monthly on the Cadia website and in the AEMR.

A pavilion/shelter was constructed in 2000 adjacent to the Cadia Engine House and Chimney that contains interpretive signs about the history of the Cadia Valley and past mining activity. In 2014 additional interpretive signs were installed as part of the Cadia District Enhancement Project.

### 2.2.3.3 Relevance to the Cadia East Project

The Cadia East Mine does not involve any additional land clearing or physical disturbance within or near the Cadia Engine House and Chimney precinct. The only potential impact on the Engine House and Chimney is associated with blasting and seismic induced vibration. The blasting impact assessment conducted by Wilkinson Murray (2009) concluded that Cadia East will comply with the relevant vibration criteria (Section 1.3).

### 2.2.3.4 SHR 779 Conservation Management Plan

The most significant heritage precinct at Cadia (identified as 'state significant') is the heritage precinct surrounding the Cornish Engine House, Crusher and Chimney, located to the west of the Cadia East Mine. The areas significance is due to the following (refer also to Section 2.1 and Section 2.2.3.1):

- The only remaining standing Cornish Engine House and Chimney in NSW
- One of the few Cornish Engine Houses in Australia that retains some of the original iron and timber work.
- One of the few Cornish Engine Houses in Australia, where the surrounding mining landscape remains relatively in-tact.

Due to its significance, the conservation and management of this precinct remains a high priority for future management, as such specific conservation management plans are required to address the extensive and complex conservation issues and required actions.

In 1995, a conservation management plan was developed by Godden MacKay (Godden MacKay 1995) that proposed a range of broad conservation measures for the Cornish heritage precinct. In 2019, Cadia commissioned Edward Higginbotham and Associates to develop an updated conservation plan to guide the ongoing management and conservation of the site. The plan will be developed with guidance from the Burra Charter (ICOMOS 2013) and the Australian Governments publication 'Ruins, A guide to Conservation and Management' (Australian Heritage Council 2013). This conservation plan will replace all previous documents and plans regarding the conservation of sites and relics within SHR779. The Plan is scheduled for completion and submission to the NSW Department of Environment and Heritage during 2020.

SHR779 is approximately 23 hectares in size and includes several structures, items and areas as per the following description and figures including:

- Area overview Figure 2-2
- Engine House and Environs. Cornish Engine House, Crusher and Chimney including stone pavements, stone retaining walls, timber relics, an end portion of the boiler, portions of the old beam engine, steel shafts, gears, brakes and pumps and a range of minor miscellaneous steel and timber relics. (Figure 2-3)
- Mining on Jones' Lode. Several open shafts / adits and associated stone pavements, assay / blacksmiths forge, waste stockpiles and structures. (Figure 2-4)
- Mining on Clark's and Bakers Lode. Several open shafts. Area currently contains the original outer boiler which was dislodged from an up-slope location during a storm in January 2016. (Figure 2-6)
- Garden of Remembrance. The Cadia Garden of remembrance (exhumed and relocated from the edge of the Cadia Hill Pit between 2000 and 2002). (Figure 2-5)

Appendix A contains an extract from the Draft Conservation Management Plan and a description of each of the items referenced in Figure 2-2 to Figure 2-6

Figure 2-2: SHR779 Overview

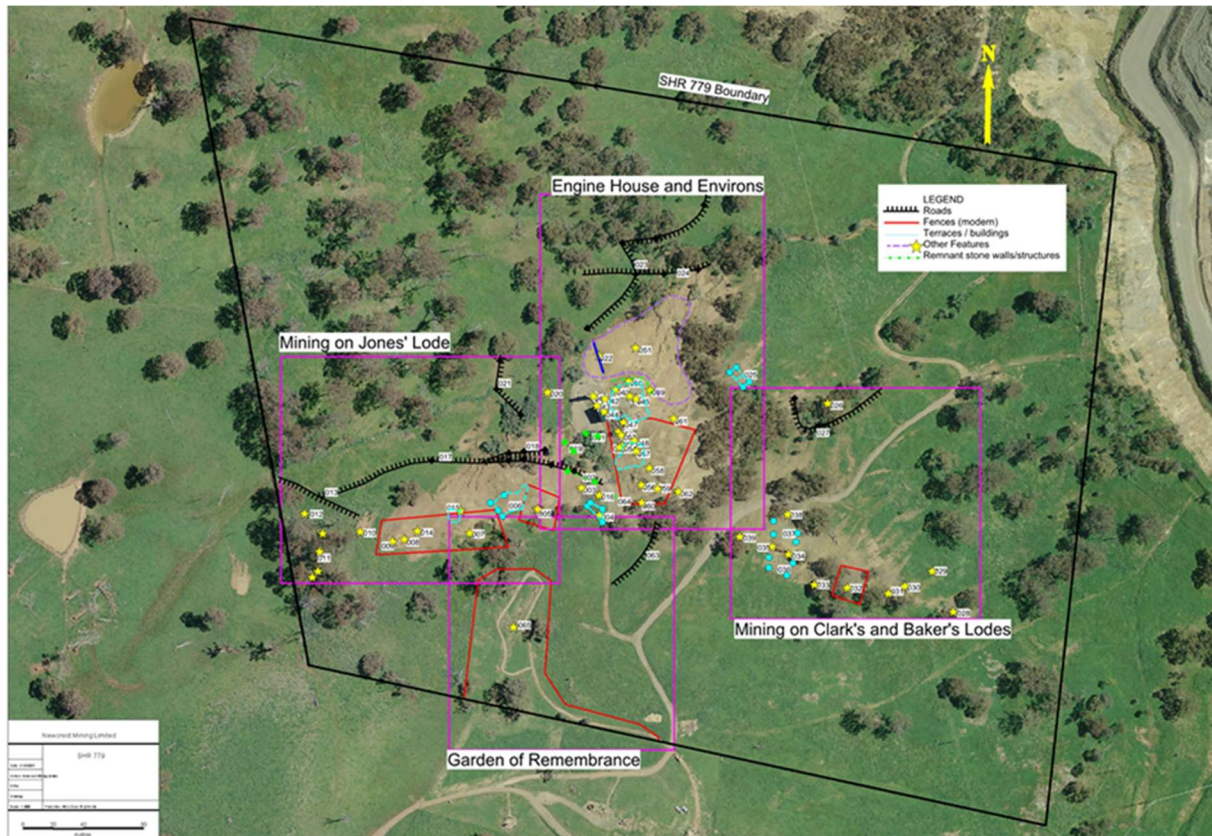




Figure 2-4: Jones Lode

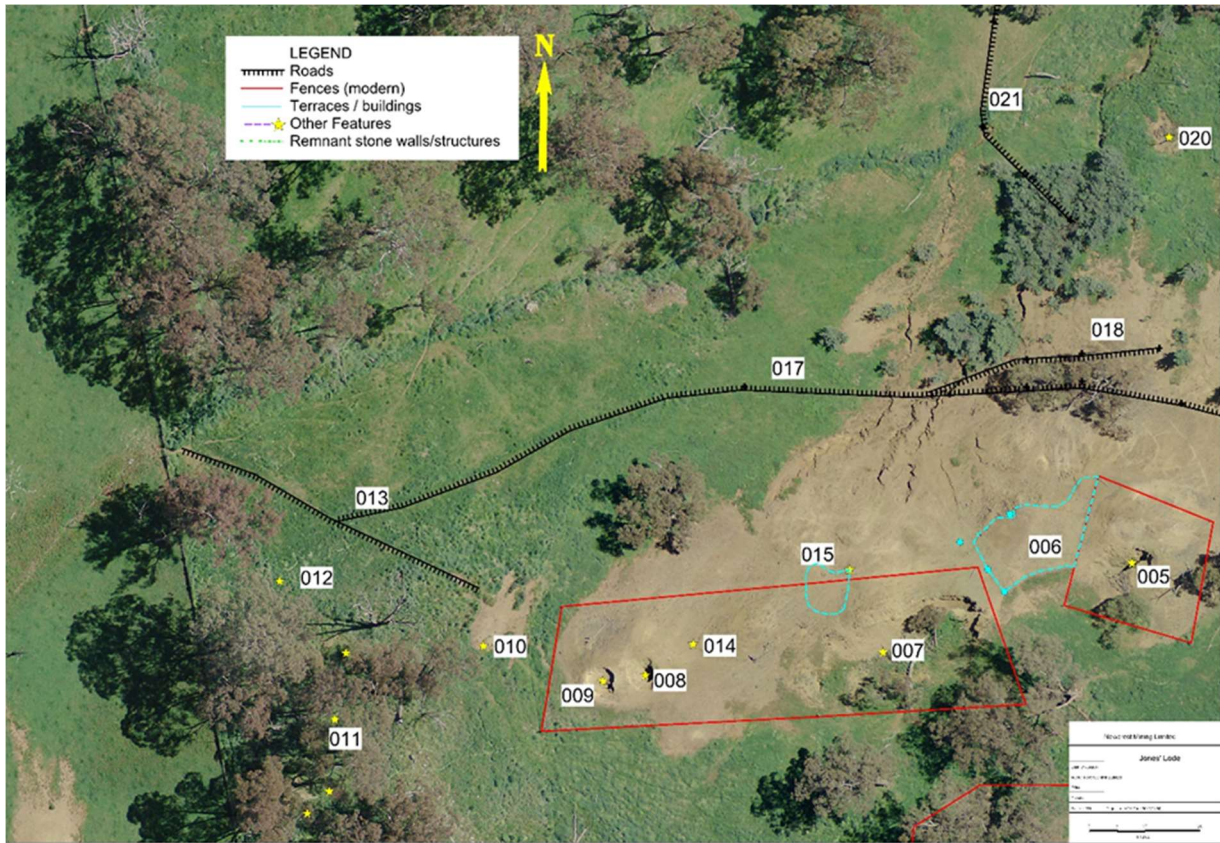


Figure 2-5: Garden of Remembrance



Figure 2-6: Mining of Clarke's and Baker's Lode



### 2.2.3.5 Management Measures

The following tables provide a range of management measures for identified issues, items and risks within SHR 779.

Management Measure	Status
Complete and submit (for approval) Updated Conservation Management Plan for SHR779. Followed by the planning and implementation of recommendations.	Due 2020
Undertake monthly inspections and reporting as required by heritage permits.	Ongoing
Undertake annual structural engineer inspection and maintenance of strengthening infrastructure (as recommended in Engineers report).	Ongoing
Undertake area maintenance including: Rabbit baiting (as required) Termite baiting (ongoing) Weed Control (ongoing) Grounds maintenance – Garden of Remembrance (Ongoing) Maintenance of drainage infrastructure (bunds and drains) Prevention / repair of erosion	Ongoing
Minor repairs as required, such as re-pointing mortar, repair of headstones, replacement of rotted timbers, protection of timbers etc (generally subject to exemption approvals under Sn57 of the Heritage Act 1977)	Ongoing
Monitoring and reporting on Blast vibration (in accordance with the approved Blast Monitoring Program.	Ongoing
Inspect and maintain exclusion fencing around any open shafts / adits etc	Ongoing
Continue to exclude grazing from SHR779	Ongoing
Remove strengthening infrastructure and repair any associated damage (specific works to be identified in the Conservation Management Plan.	December 2023

## 2.2.4 Cadia Village

### 2.2.4.1 Historical Significance

The Cadia Village precinct (and the historical material contained within the precinct) was listed in the Cadia Gold Mine EIS as follows (Newcrest, 1995):

*This precinct contains the old Cadia Village site, former cyanide tanks, open cut gold mining, plugged and former gold mining shafts, Cadia Cemetery, copper smelter sites No. 1 and 2, permanent way of the East Cadia Tramway, bridge over Cadiangullong Creek, Cadia National School and the school road.*

Of the above items, the old Cadia Village site (including the Cadia National School), Cadia General Cemetery and copper smelter site No. 1 are discussed below.

### 2.2.4.2 Cadia Village

The Cadia Village area dates to the 1800s and at one stage contained a population of some 600 people. The village included miners' huts, the Cadia National School (including schoolhouse buildings, school yard, tennis court, sheds, agricultural gardens, agricultural farming land and land for experimental work), a chapel and stores (CHPL, 2002). The precinct has seen a number of mining ventures come and go, and because the early owners kept control of the village and never sold blocks or cottages for private development and removed the village in 1950, there is no substantial village fabric associated with the historical mining activities left on site (Godden Mackay, 1995).

The Cadia National School was described in the Cadia Gold Mine EIS as follows (Newcrest, 1995):

*The school block is a prominent feature in the valley landscape, with mature plantings of pine, elm, poplar, hawthorn and privet surrounding the substantial foundations which clearly show the room layout...In addition, considerable information about the school, its teachers and its pupils survives in the records held by the Archives Office of New South Wales.*

*The historical significance of the school was attributed to the fact that it was continuously occupied for a period of seventy-five years and had the longest period of continuous association with the Cadia community of any structure on the site (Godden Mackay, 1995).*

#### **2.2.4.3 Copper Smelter No. 1**

Located on the east side of Cadiangullong Creek, south of Hoares Creek, this site operated from 1861 to 1864. Higginbotham (2001) described the site as being marked mainly by brick scatters and slag deposits and remnant footings and floors. In common with the pattern of mining development and decline at Cadia, each development used the existing infrastructure and/or salvaged what remained of earlier works.

The historical significance of this site was summarised as follows (Higginbotham, 2001):

*The site of smelter No.1 at Cadia is associated with the pioneering or initial development stage of copper mining in NSW. Cadia was the first mine to have a relatively efficient and complete range of copper smelting furnaces, as described by Stutchbury or Carne. Only the larger and more economic mines possessed smelters. Less than 37 mine sites out of a total of 80 copper mines listed by Carne before 1908 possessed smelters.*

*The smelting of copper at Cadia has strong associations with both Cornish mining technology and Welsh smelting technology and the immigration of the Welsh and Cornish to NSW. The locations of Cornish and Welsh settlement and workplace in NSW have a strong association for the descendants of these communities. The Scottish Australian Mining Company was to have an ongoing involvement in copper mining in NSW.*

*The site of smelter No.1 at Cadia has revealed evidence relating to traditional Welsh smelting technologies, the development of these technologies to suit Australian conditions and the use of traditional building techniques in industrial construction. The smelting furnaces at Cadia are standard reverberatory furnaces of Welsh design, but unlike the Welsh smelting houses or halls of an earlier period, the smelting hall at Cadia was connected to a single large chimney stack by a principal and subsidiary flue. This development only appears to have taken place in NSW in the 1830s and 1840s, so the use of it at Cadia represents the rapid transfer of technological improvements to Australia.*

*The presence of a conical furnace at Cadia, with six fire boxes (furnace 7) is extremely unusual in the available historical documentation. It is clearly identified as a calcining furnace and was therefore used in the initial stages of the smelting process. The only parallels to this type of furnace are the conical furnaces in Anglesey, North Wales for calcining or roasting, although the latter are associated with the condensing of the sulphur and then its melting into a marketable product.*

*The smelting processes used at Cadia in 1865 indicate adaptation to local conditions, suitable for the smelting of sulphide ores, mixed with carbonate ores. They differed from the processes used in Swansea and Anglesey at this time, because the latter were designed for the efficient processing of pyritic ores.*

*The site of smelter No.1 at Cadia is therefore of State significance. The closest parallels to this are in South Australia, Swansea in South Wales, and in Anglesey, North Wales. Cadia was the first mine to have a relatively efficient and complete range of copper smelting furnaces in NSW. The site possessed typical Welsh reverberatory furnaces, while the smelting process was adapted to local conditions. It also possessed a very rare example of a conical furnace for calcining. Smelter No.1 represents the final stage of development for the standard reverberatory furnace before improvements led to the construction of much larger furnaces during the 1870s and 1880s onwards.*

#### **2.2.4.4 Cadia General Cemetery**

The historical significance of the Cadia General Cemetery was attributed to its strong associations with the former Cadia village and tenure of Josiah Holman (Godden Mackay, 1995). The cemetery was recognised by Godden Mackay (1995) as a rare remnant of the occupation of the mining site. The cemetery is listed as a heritage item under the Blayney Local Environmental Plan (LEP).

#### **2.2.4.5 Conservation Works Undertaken to Date**

##### Cadia Village and Cadia National School

A portion of the Cadia Village precinct has been permanently removed by the Cadia Hill open pit and Cadia Extended (an extension to the Cadia Hill open pit). Photographic recording was undertaken of the objects that were in the affected area. A historical and archaeological assessment of Cadia Village was undertaken in 2000 (Heritage Management Consultants, 2000). Archaeological investigations and documentation were undertaken by Cadia in the lower Cadia Village site prior to disturbance by the Cadia Extended mining activities (Higginbotham, 2005b).

No disturbance works are proposed within the Cadia School precinct, as such archaeological assessment and archival recording are yet to be completed in this area,

##### Copper Smelter No. 1

An archaeological investigation of Copper Smelter No. 1 was undertaken Higginbotham (2001). The site has now been removed through mining activity, but research and investigation have developed a substantial information resource, as well as recovering movable items, such as smelting tools for interpretation.

##### Cadia General Cemetery

A permit for the archaeological excavation of the Cadia General Cemetery was granted in October 1997 (Higginbotham, 2005). Approval for relocation of the cemetery was granted by the NSW Department of Health and the Blayney Shire Council. Agreement to the relocation was granted by the descendants of those buried at the cemetery who were able to be contacted (Godden Mackay, 1995). Archaeological excavation (including exhumation of human skeletal remains) was undertaken in 1997 and 1998, prior to the relocation of the remains to a new area within ML 1405 (known as the 'Garden of Remembrance'). This area is within a State Heritage Register Area 779 to the south-west of the Cadia Engine House and Chimney (CHPL, 2002). Interpretive signs have been installed overlooking the relocated cemetery including a burial register indicating the age and date of death. In 2000, Cadia received recognition for its heritage management initiatives with the receipt of the Premier's Award for Environmental Excellence in the NSW Minerals Industry for Cadia's work on the Cadia Cemetery Relocation Project.

### 2.2.4.6 Relevance to the Cadia East Project

The Cadia Village precinct was not directly impacted by the Cadia East Mine.

The only additional physical disturbance activities which occurred in this precinct was the construction and operation of the new water transfer pipeline which will connect Cadiangullong Dam with Rodds Creek Dam. The pipeline is located within existing disturbance areas and is aligned adjacent to existing roads or pipelines, where practicable.

### 2.2.4.7 Management Measures

Cadia will continue to implement the 'General Conservation Measures' for the Cadia Valley Operations (Section 3.1).

Details of the Cadia Village Interpretation Plan are provided in Section 3.3.

## 2.2.5 West Cadia

### 2.2.5.1 Historical Significance

The West Cadia precinct (and the historical material contained within the precinct) was listed in the Cadia Gold Mine EIS as follows (Newcrest, 1995):

*This precinct consists of numerous mine workings, the West Cadia adit and a collapsed adit.*

*The most notable heritage item within the precinct is the West Cadia Copper Mine, which was the last major copper mining enterprise at Cadia (Higginbotham, 2005a). The West Cadia Copper Mine is situated on the lower slopes of the Iron Duke iron ore quarry (Section 2.2.6). West Cadia was discovered in the late 1880's, and the mine opened in 1905. It continued operation until 1917. Infrastructure included shafts, the main adit, tramways, smelters, engine houses and mullock heaps (Higginbotham, 2005a). The historical significance of the West Cadia precinct was attributed to its strong associations with the earliest period of operation at Cadia as well as for its associations with the Cadia Engine House and Chimney, the earliest Cornish technology and mid- nineteenth century portable equipment operated on the site (Godden Mackay, 1995).*

*The West Cadia Copper Mine resulted in an influx of population into the Cadia Village, the mining of extensive shafts and adits and the construction of two copper smelters (i.e. reverberatory furnaces – Smelter No. 2 in 1905 and water jacket furnaces – Smelter No. 4 in 1912). The West Cadia Copper Mine was directly associated with the sequence of mines owned by the Scottish Australian Mining Company, including the East Cadia Mine (1850s to early 1860s) and the North and South Section Mines (1863 to 1868) (the Cadia Engine House and Chimney being erected on the latter mine).*

### 2.2.5.2 Conservation Works Undertaken to Date

A historical and archaeological assessment of West Cadia Copper Mine was undertaken in 2005 by Higginbotham (2005a). In the assessment report, Higginbotham (2005a) recommended archaeological investigation of the (unconfirmed) engine house and chimney remains at the West Cadia Copper Mine. Implementation of these conservation measures for the West Cadia precinct is not required as no surface development activities in this area are currently proposed by Cadia.

### 2.2.5.3 Relevance to the Cadia East Project

The West Cadia precinct is not directly impacted by the Cadia East Mine.

### 2.2.5.4 Management Measures

No specific management measures for the West Cadia precinct are required. Cadia will continue to implement the 'General Conservation Measures' for Cadia (Section 3.1).

## 2.2.6 Iron Duke

### 2.2.6.1 Historical Significance

The Iron Duke precinct (and the historical material contained within the precinct) was listed in the Cadia Gold Mine EIS as follows (Newcrest, 1995):

*This precinct contains numerous mining benches, rock and timber platform, detonator stores, adits, ore bin loading platforms, timber post and beam constructions, skip ways, gold mine shafts, Iron Duke Two Line Skip way terminus, Iron Duke Road, Pacific Copper pilot treatment complex, ten head stamping battery remnants, trough, cyanide tank, Pacific Copper headframe, copper mine shaft No. 1, 2 and 3, slag heaps and timber, brick and stone remnants.*

*Workings at the Iron Duke iron ore quarry began in 1919 and continued until 1928. It was re-opened in 1941, however the old aerial ropeway (to transport ore to the rail sidings) was cost prohibitive to repair so a new double skip way or inclined plane was constructed east of Cadiangullong Creek. Infrastructure included a crusher, inclined ways, mining benches and ore chutes (Higginbotham, 2005a). The historical significance of the Iron Duke quarry was attributed to its strong associations with the gold, copper and iron mining that occurred at Cadia (Godden Mackay, 1995) and its role in the development of the Australian iron and steel industry (Higginbotham, 2005a).*

*The open cut methods employed on the eastern side of the Iron Duke were a visual testament to the former mining operations (Godden Mackay, 1995). The physical evidence of former mining operations existed in the form of scattered remnants and mining was mainly represented by the open cut platforms and the tracks of the former ore tramway systems. The Iron Duke quarry provided a good insight into iron ore quarrying techniques of the 20th century, with good surviving examples of ore transportation technology (Higginbotham, 2005a). The Iron Duke iron quarry has been assessed by Higginbotham (2005a) as being of local significance.*

The historical workings within the Iron Duke precinct are also known as 'Big Cadia'.

### 2.2.6.2 Conservation Works Undertaken to Date

The Iron Duke assessment by Higginbotham (2005a) included a number of recommendations for conservation and archaeological investigation, including archaeological investigation of the Inclined Railway No. 2, ore chutes and Benches 7 and 8 and the collection of relics in accordance with the Cadia Conservation Plan. Implementation of these conservation measures for the Iron Duke precinct is not required as large-scale surface disturbance activities or mining in this area are not currently proposed by Cadia.

Cadia is however conducting exploration activities in the Iron Duke area and these activities result in some relatively minor surface disturbance. An archaeological monitoring program for exploration drilling in the 'Big Cadia' area was prepared by Higginbotham (2010a). Recommendations included archival recording, relocation of drill holes to avoid heritage impacts and implementation of an archaeological monitoring program where impacts were unavoidable on the Iron Duke benches.

### 2.2.6.3 Relevance to the Cadia East Project

The Iron Duke precinct is not directly impacted by the Cadia East Mine.

### 2.2.6.4 Management Measures

Cadia will continue to implement the 'General Conservation Measures' for the Cadia Valley Operations (Section 3.1).

Cadia will conduct exploration activities in the vicinity of the Iron Duke workings in accordance with the recommendations in Higginbotham (2010a) (Edward Higginbotham & Associates Pty Ltd (2010a). *Report on the Archaeological Monitoring Program Stage 1. Exploration Drilling. Proposed "Big Cadia" Mining Development, Cadia Valley Operations Near Orange, NSW.* Report prepared for Cadia Holdings Pty Limited. 2010)

## 2.2.7 East Cadia

### 2.2.7.1 Historical Significance

The East Cadia precinct (and the historical material contained within the precinct) was listed in the Cadia Gold Mine EIS as follows (Newcrest, 1995):

*This precinct contains the former workers camp, aerial ropeway stanchion footings and route, shed, fibro-sheathed residence, water tanks, engine beds of powerhouse, former boiler hall, shearing complex...East Cadia copper field, Murphy's shaft and tailings dump.*

*Along with the Canobolas Copper Mine at Little Cadia, the East Cadia Copper Mine was the earliest copper mining enterprise at Cadia, with mine working commencing in the late 1850s (Higginbotham,*

*2005a). The East Cadia Copper Mine played an initial role in the development of large-scale copper mining at Cadia in the later 1860s. Along with the Canobolas Mine at Little Cadia it showed the initial stages of a major mining enterprise. The East Cadia Copper Mine has been assessed by Higginbotham (2005a) as being of local significance.*

*The East Cadia precinct includes the Mine Manager's residence, which was probably built in the period 1887 to 1890 and was the only surviving building at Cadia, which was constructed by the Scottish Australian Mining Company (Higginbotham, 2005a). Only the kitchen wing of the original Mine Manager's residence survived, since the original house was replaced in the 1920s. It has been assessed by Higginbotham (2005a) as being of local significance.*

### 2.2.7.2 Conservation Works Undertaken to Date

The assessment report by Higginbotham (2005a) included several recommendations for conservation and archaeological investigation, including archaeological investigation of the East Cadia Copper Mine and Engine Shaft and conservation and management of the Mine Manager's residence. Implementation of these conservation measures for the East Cadia precinct is not required as no surface disturbance activities in this area are currently proposed by Cadia.

### 2.2.7.3 Relevance to the Cadia East Project

The East Cadia precinct is not directly impacted by the Cadia East Mine.

### 2.2.7.4 Management Measures

Cadia will continue to implement the 'General Conservation Measures' for the Cadia Valley Operations (Section 3.1).

## 2.3 Other Heritage Sites Relevant to Cadia

### 2.3.1 Heritage Sites Relevant to the Cadia Dewatering Facility

The Cadia East Project also included construction and use of concentrate and return water pipelines to the existing Blayney Dewatering Facility and the proposed new Cadia Dewatering Facility.

Heritage sites relevant to the activities in Blayney include the railway bridge over the Belubula River in Blayney and a railway culvert.

The single-track railway crosses the Belubula River, approximately 400 metres to the east of the Railway Station (Higginbotham, 2009). The railway bridge, originally designed for double tracks, has brick abutments and piers and a deck comprising two steel I-beams. The bridge construction is common throughout the railway network and is considered by Higginbotham (2009) to have little or no heritage significance.

The railway track between the existing Blayney Dewatering Facility to the Cadia Dewatering Facility includes three railway culverts. Two of these are concrete pipe culverts, which possess no cultural significance (Higginbotham, 2009). There is one small brick arch culvert, which was assessed by Higginbotham (2009) as having local significance.

The pipeline easement between the existing and proposed dewatering plants will run along the north side of the railway tracks at Blayney Railway Station, to avoid any heritage impact. The pipes will avoid any structural impact on the railway bridge over the Belubula River at Blayney. Nonetheless, the proposed pipeline may use the existing cavities (cut by previous pipework) in the masonry abutments, as required. The proposed development of the pipeline and Cadia Dewatering Facility will not disturb the brick arch railway culvert, adjacent to the Cadia Dewatering Facility.

### 2.3.2 Te Anau Homestead

The Te Anau Homestead and outbuildings are located adjacent to the west wall of the northern tailing's storage facility at Cadia.

The Te Anau Homestead holds significance due to its association with Josiah Holman, who was Captain of the Scottish-Australian Mining Company and was a key local notable for much of the history of the Cadia Mine. He owned a part of the holdings of the Te Anau property, forming a small part of his estate (Higginbotham 2010a). After his death, the property passed on to his daughter, Annie, who erected the house known as "Te Anau".

#### 2.3.2.1 Conservation Works Undertaken to Date

An archaeological assessment of the farmhouse was undertaken by Higginbotham (2006a) and an archival recording was also completed in 2006 (Higginbotham, 2006b). The Te Anau Homestead and outbuildings are considered by Higginbotham (2006a) to have local significance.

#### 2.3.2.2 Relevance to the Cadia East Project

The Te Anau Homestead and outbuildings are not directly impacted by the Cadia East Mine, however future designs and expansion of the Northern Tailings Storage Facility footprint will likely necessitate the removal of the structures.

#### 2.3.2.3 Management Measures

Cadia has obtained approval for the demolition of the Te Anau homestead and surrounding outbuildings (letter from Heritage Council of NSW dated 18/1/2013). Cadia will likely undertake the demolition of these buildings during 2020-21 to make way for the proposed expanding footprint of the Northern Tailings Storage Facility.

## 3. CONSERVATION MANAGEMENT STRATEGY

The following strategic principals will be used to guide the conservation and management of Historical Heritage assets at Cadia:

- Cadia has an opportunity and obligation to manage and conserve significant historical heritage assets for the benefit of future generations; this should guide the prioritisation and resourcing of conservation works.
- Ensure that historical heritage sites are located, documented and managed in accordance with legislative requirements and community expectations.
- Prior to any site disturbance, subject areas are assessed for the presence of any significant historical heritage areas or items; every attempt will be made to avoid the disturbance of areas that contain significant historical heritage assets.
- If disturbance cannot be avoided:
  - the necessary formal approvals are obtained prior to disturbance.
  - appropriate archival recording, interpretation and collection / salvage of relics is conducted in accordance with legislative requirements.
- Progressively build the knowledge of the historical context of the site through investigation, interpretation, documentation and presentation of findings.

- Provide a means of safe public access to historical heritage information, sites, relics and reports.
- Plan for the long-term management and historical heritage assets (beyond mine closure) and ultimate public access to heritage precincts and information.

### 3.1 General Conservation Measures

The general conservation management and mitigation measures to be implemented at Cadia are as follows:

- All employees and contractors will be made aware of the significance of historical heritage at Cadia through targeted site wide communications and promotion of the Cadia heritage website.
- Employees and contractors will use existing tracks and access roads unless otherwise authorised by the Manager – Health, Safety, Environment, Social Performance and Assurance (HSESRA).
- All vegetation clearing and/or soil disturbance works will only occur in areas that have been formally assessed and approved as part of the Cadia Hill, Ridgeway or Cadia East Approvals (or similar approval process).
- Planned new disturbance areas required for Project activities will be assessed and approved for disturbance; any identified heritage items will be clearly identified and segregated to avoid disturbance.
- Where disturbance to known European heritage sites cannot be avoided, and has been assessed and approved, clearing and soil disturbance activities will be conducted in accordance with the Cadia East Project Approval, this HHMP and any permits issued under the relevant NSW legislation.
- Known European heritage sites in the immediate vicinity of active disturbance areas will be fenced, sign-posted or otherwise delineated to employees and contractors in order to minimise the potential for accidental damage.
- Archival recording of known European heritage sites will be undertaken, where required.
- Consultation with European heritage consultants and/or the OEH will be undertaken prior to ground disturbing works, where required.
- The presence of heritage items will be a key consideration of the site ‘Environmental Impact Permit’ (EIP’s) process. “Edward Higginbotham & Associates Pty Ltd (2006) A Guide to the Conservation and Management of historical heritage items”, will be used to assist in the assessment of EIP’s.
- Exclusion fencing of open shafts will be undertaken to prevent unauthorized or accidental entry.

## 3.2 Blast Monitoring Program (BMP)

The Cadia BMP includes a program to monitor the effects of blasting on relevant heritage items as summarised below:

- Monitoring will be conducted using blast monitoring units which measure ground vibration and air overpressure. A blast monitor is located at the Chimney. (Note: A monitor was previously installed on the northern gable of the engine house to measure structural vibration, this monitor was decommissioned in 2015).
- Continuous ground vibration monitoring will be conducted to assess the ground vibration from blasting and mine induced seismic events.
- The Cadia BMP contains protocols to evaluate compliance with the relevant criteria for heritage sites including the Cadia Engine House and surrounds. The impact assessment criteria specified for the Cadia Engine House and surrounds will apply in the absence of any anti-vibration strengthening.
- A program (including implementation of a management strategy, review and reporting) will be implemented for determining the blast control and management measures that will be adopted in the event of non-compliance. This process is outlined in the approved BMP.

Cadia provides monthly summaries and independent consultant reports on the Cadia website. These reports assess blast monitoring data against compliance criteria. An annual review will be also completed that will include a review of the blast monitoring results against the criteria for relevant heritage items (Annual Environmental Management Report).

## 3.3 Cadia Village Interpretation Plan

### 3.3.1 Introduction

The requirement for an interpretation strategy for the Cadia Village site arose from the Development Consent issued for the Cadia Hill Gold Mine. Specifically, Condition 92(e) of the Development Consent (DA 44/95 as modified on 11 December 2002) which relevantly states:

*e) Within six months of completing the excavation program, the Applicant must submit final details of the interpretation strategy for the Cadia Village site, including information relating to the display and housing of artefacts within a public space, to the Director of the NSW Heritage Office for approval. Within 12 months of completing the excavation program, the Applicant must complete the interpretation for the Cadia Village site.*

The excavation permits for the archaeological investigations of Smelter No. 1 and Cadia Village, in 2001 and 2002 respectively, also had conditions requiring the preparation of an Interpretation Plan (Higginbotham, 2005a).

Interpretation activities and cultural programs undertaken by Cadia to date have included:

- Heritage visitor tours on request;
- The construction of the 'heritage pavilion' adjacent to SHR779 displaying interpretive signs on the Cadia Village, the Cornish Engine House and historical mining.
- The loan of relics from various mining activities to the Millthorpe Museum as well as an initial contribution of \$40,000 provided in 2004/05 to assist with the building of a new display building. Within the building is an area dedicated to the history of the Cadia district. The project was a joint partnership with the Blayney Shire Council.

Cadia has continued to donate funds for projects to the Millthorpe museum with \$50,000 donated between 2012 and 2015 for further expansion of facilities.

- Cadia have donated seed funding (\$100,000 between 2013 and 2016) for the construction of the Orange Museum and will continue to work with the museum should they request interpretative material or relics for display.
- Allowing controlled access to the Cadia Garden of Remembrance and adjacent 'heritage pavilion area to local residents as part of the Cadia District Enhancement Project. The area includes a formed pathway and interpretive signs focusing on historical mining precincts (and associated areas such as Cadia village) and modern mining features.

### 3.3.2 Cadia Village Interpretation Plan

The following Cadia Village Interpretation Plan has been prepared to meet the heritage interpretation requirements as prescribed in Condition 43(b) of Schedule 3 of the Project Approval and to meet Cadia's target of providing an informative and interesting interpretation of heritage items. The Cadia Village Interpretation Plan presented in this HHMP supersedes earlier draft interpretation plans proposed for Cadia (eg. Winkworth, 2005). The objective of the interpretation is to communicate the significance of items, both during and post mining operations. Key interpretation themes, storylines, audiences and proposed actions for implementation have been identified and are described below.

Two broad levels of interpretation will be used for the Cadia Valley Interpretation Plan.

#### 3.3.2.1 Primary Interpretation

The site, structures, landscape, and the collection of artefacts from the Cadia Valley and surrounding area constitute the primary fabric and exhibits. The opportunity for visitors to the Cadia Valley to experience these elements in their existing form will remain as the primary means of interpretation.

#### 3.3.2.2 Secondary Interpretation

The purpose of the secondary means of interpreting the Cadia Valley and surrounding area is to communicate the significance of the site. This will be achieved through documentation and explanation. A wide variety of devices for documenting and explaining the significance are available. These devices can be implemented with minimum impact on the primary interpretation and in combination with each other and will be used to enhance the primary interpretation.

The objectives of the secondary interpretation are to present the interpretative material in an accessible, entertaining and educational manner; to facilitate professional research and study; to provide a forum for critical analysis and debate; and to apply high standards of scholarship to the interpretation.

The objectives of interpretation at Cadia will be:

- Entertaining – to hold the visitor's attention in a pleasurable and stimulating manner.
- Relevant – to seek to make connections with the visitor's knowledge, interests, concerns and experience.
- Organised – to be structured in a way that makes it easy for the visitor to follow it.
- Thematic – to be structured around a central message or messages; this will be clearly stated, preferably at the outset of the presentation.

- Diverse – to attempt to stimulate learning and enjoyment through a wide range of learning styles, including art, sound, text, performance and interactive experience.
- Open-ended – that presents complex issues as points for discussion and matters for debate.
- Best practice – based on the best contemporary research in interpretation and historical scholarship.
- Consultative – that involves staff, colleagues and other stakeholders in planning and delivering interpretation in all media.
- Visitor focused – with ongoing audience research and evaluation to contribute to planning and delivery of interpretation.
- Maintained, Evaluated and Reviewed- ongoing management of items; regular maintenance, evaluation and review of the interpretation plan.

### 3.3.2.3 Displays

A portable display has been created for events such as open days, field days, information and careers days. The display has been designed to give a sense of the atmosphere of the past, enabling visitors to make stronger and more immediate connection with the past.

#### Themes

The target theme is the Cadia Village (including the old Cadia National School) with other themes/stories covering the following heritage items/historical mining activities at Cadia:

- Cadia General Cemetery;
- past mining methods;
- relevance of Cadia in regional mining;
- Cadia Engine House and Chimney;
- Smelter No 1;
- Little Cadia and assay furnaces;
- Big Cadia and Scottish Australian mining company history, including the old mine manager's residence; and
- Te Anau Homestead and outbuildings and agriculture in a mining village.

The display contains movable relics from past mining activities (such as smelting tools salvaged from the archeological investigation of Smelter No. 1 and relics salvaged from the Wire Gully Gold Workings and Water Race prior to disturbance for the Cadia East Project), banners and posters. A catalogue of the salvaged relics is currently held with Cadia's heritage consultant and internally at Cadia. 2 models have been constructed highlighting heritage locations and features including Cadia Village, Cadia School, smelters and the Cadia Engine House and Chimney.

#### Implementation

The interpretation display listed above is utilised at various events including, for example open days, field days and career days. The 2 heritage models were completed in 2016 and have been used at the 2016 and 2019 Open Days.

### 3.3.2.4 Signage

The main purpose of signage is to inform on-site personnel of the sensitivity of heritage sites and to provide information and interpretation for tour groups as to the heritage significance of the Cadia Valley.

Permanent signs have been erected at and near the heritage pavilion that provide historic information and interpretation material on the Cadia Engine House and Chimney, as well as for the non-visible past activities such as the tramway, cable way and Old Cadia Village.

Cadia will periodically review and update interpretative material at the pavilion/shelter.

#### Themes

Whilst the Cadia General Cemetery has signage providing details of the name and age at death of the people buried in the cemetery, there are personal stories available on some of the people who lived and died in the area that can help interpret the way of life in the Cadia Village. These stories are available through the Cadia heritage website and the Cadia Heritage Brochure (see Sections 3.3.2.6 and 3.3.2.7 respectively).

Interpretation of the Cadia Engine House and Chimney is currently provided via signage at the pavilion and at the site heritage area and at a viewing location overlooking the Engine House and Chimney, (within the Cadia Garden of Remembrance).

Additional signs have been placed within the site heritage area, adjacent to SHR779 and the Cadia Garden of Remembrance highlighting features of the Iron Duke precinct where there are items of interest including open cut benches, tramway sidings.

#### Implementation

During 2014 a series of interpretative signs were installed at the site heritage area (adjacent to SHR779 and the Cadia Garden of Remembrance) to explain and depict the heritage features of the valley. No further signs are planned at this stage. A heritage booklet has also been produced (refer to Section 3.3.2.7) that supports and provides more information on the heritage themes within Cadia Valley. The booklet is available on the Cadia website and is distributed during heritage-based tours. An interpretive website has also been developed describing the pastoral and mining history.

### 3.3.2.5 Tours

A 'standard' heritage tour of the main historic features of the Cadia Valley and accompanying booklet (refer to Section 3.3.2.7) has been established. This tour will be available to groups of less than 20 people upon request. Tours for larger groups, and for limited access to heritage sites within the Cadia Valley, will be arranged on request, subject to safe access to the relevant areas being available.

#### Themes

The guided tour will include visiting of the Cadia Engine House and Chimney, the relocated Cadia Garden of Remembrance, the old Cadia Village main street and the pavilion/shelter where Cadia has erected interpretative signs and from which the current Cadia mining operations mining activities can be viewed.

#### Implementation

Heritage tours will be available upon request and will be effective immediately.

### 3.3.2.6 Education

Cadia has developed an educational interpretative website that provides detailed information for use by individuals, schools and university groups interested in historic mining activities ([www.cadiavalleyheritage.com.au](http://www.cadiavalleyheritage.com.au)).

#### Themes

The central theme is the pastoral and mining history of the Cadia area and has been developed to complement existing education resources on mining in NSW.

#### Implementation

The website was launched in June 2015 ([www.cadiavalleyheritage.com.au](http://www.cadiavalleyheritage.com.au)).

### 3.3.2.7 Publications

An introductory heritage brochure of the Cadia Valley has been prepared and is made available to those on organised visits to the mine. The heritage brochure complements the existing colour brochure on Cadia and is available on the Cadia website.

The existing archaeological investigations and archival recordings for key heritage sites such as Little Cadia, Big Cadia and Smelter No. 1 will be digitised and catalogued. Reports are available on the Cadia Heritage website.

#### Themes

The heritage brochure includes information on the archaeological investigations and conservation works that have been undertaken by Cadia in the Cadia Valley, particularly the Cadia Village, Cadia Engine House and Chimney, Cadia General Cemetery and Smelter No. 1.

#### Implementation

The heritage brochure has been developed and is available on the Cadia website.

Archaeological investigations and archival recordings have been digitised and are available on the Cadia Heritage website.

### 3.3.2.8 Regional Co-operation

Cadia will continue to work together with government authorities and non-government organisations such as museums, interpretation centres and heritage trails to conserve the heritage of the Cadia Valley and surrounds, and to make informative interpretation material available to the public.

Support may include donations (assessed as part of the Community Partnerships Committee), loans of relics for display and provision of information, photos and resources.

Cadia has previously formed alliances with Millthorpe Museum providing donations, relics for display and historical research. Cadia believes that co-operation and partnerships with community organisation providing items for exhibitions and events is a more valuable tool of interpretation than providing contributions leading to buildings or structures to house

heritage relics in one place. Cadia will continue to consider any requests from local museums to contribute to displays and display items including the Orange Museum.

### 3.3.3 Post Closure Historical Heritage Interpretation

#### 3.3.3.1 Overview of the Rehabilitation Strategy and Mine Closure Goals

As described in Section 5 of the Cadia East EA, the overall rehabilitation goal for Cadia is to generate enduring land value. Land value is seen by Cadia to be primarily a function of ecological value (e.g. biological diversity and other environmental values) and agricultural value (i.e. the ability to produce agricultural goods as the major land uses across Cadia-owned lands in the long-term).

Rehabilitation activities would aim to generate sustainable landforms at the mine site, Cadia-owned land and the region, by rehabilitating mine disturbed lands to:

- add value to the current vegetation corridor program (ecological value);
- allow for the future land use of grazing, where appropriate and sustainable (agricultural value);
- and
- retain areas that may be important for future industry and infrastructure needs.

In addition to the principal land use values above, social and cultural factors such as heritage conservation are recognised as requiring consideration in mine closure.

For heritage areas at Cadia, including all key precincts discussed in this management plan, the planned future land use remains for heritage conservation (refer to Table 1 in the Cadia Rehabilitation Strategy). For the most significant Areas, such as State Heritage Areas 779, it is proposed that at land ownership and management be transferred to a suitable agency capable of implementing conservation measures such as Cabonne Council or the National trust etc. Further information is provided below in Section 3.3.3.2.

#### 3.3.3.2 Post-Closure Historical Heritage Interpretation

In accordance with the Cadia Mine Closure Procedure, five years prior to the end of mine operations, Cadia will liaise with stakeholders in relation to the long-term management of stored relics and heritage sites. Expressions of Interest will be sought from government agencies and organisations (such as heritage/environmental trusts, local government etc.) for the management of Cadia's heritage items in perpetuity. Criteria for determining appropriate management will be defined at that time in consultation with the OEH and may include, but is not necessarily limited to, consideration of factors such as: experience in interpretation and management of heritage sites; local history; and proposed final land use options that optimise interpretation and promotion of the site.

Cadia's objectives for historical heritage interpretation at the Cadia Valley Operations after mining operations cease are as follows:

- All physical historical heritage items collected during the life of the mine operations will be placed in a secure long-term storage place or places, from where they could be made available for inspection, interpretation and research by interested parties.

- Historical heritage assessment reports, archaeological investigation reports, and other relevant documents prepared during the project life will be catalogued and securely stored in digital and physical format.
- The location of the secure long-term storage places for heritage items and reports will be as agreed with the OEH in consultation with relevant stakeholders.
- Residual historical heritage items within the Cadia Valley that were not directly impacted by the project mining activities will be left in-situ, unless otherwise agree with the OEH.
- Interpretation signs for key historical heritage items and events have been installed at the site heritage area in order to provide visitors to the rehabilitated mine site with an appreciation of the historical heritage of the area.

#### 4. REVIEW

This HHMP will be reviewed on a bi-annual basis and if required, updated to ensure the currency and usefulness of the document. Out of cycle reviews may also be conducted following one of more of the following triggers being realised:

- A project approval modification:
  - where an impact to heritage items / areas is predicted
  - where there is a change to pre-existing identified impacts or
  - Where new heritage items are identified.
- A significant incident (such as unauthorised damage) to heritage items / areas occurs
- Changes in legislation or Newcrest policies and standards.
- Changes in proposed conservation measures.
- Direction from regulatory agencies

## 5. REFERENCES

- Australian Heritage Council (2013). Ruins, A guide to Conservation and Management
- Australia Incorporated International Council on Monuments and Sites (ICOMOS) (2013). The Burra Charter, The Australian ACOMOC Charter for Places of Cultural Significance.
- Cadia Holdings Pty Limited (2000) *Ridgeway Project Environmental Impact Statement*.
- Cadia Holdings Pty Limited (2002) *Cadia Extended Modification - Statement of Environmental Effects*.
- Cadia Holdings Pty Limited (2009a) *Cadia East Project Environmental Assessment*.
- Cadia Holdings Pty Limited (2014) *Cadia 2013-14 Annual Environment Management Report*.
- Cadia Holdings Pty Limited (2017) *Cadia 2016-17 Annual Environment Management Report*.
- Edward Higginbotham & Associates Pty Ltd (2001) *Report on the Archaeological Excavation of Smelter No.1, Old Cadia Road, Cadia*. Report prepared for Cadia Holdings Pty Ltd, October 2001.
- Edward Higginbotham & Associates Pty Ltd (2003) *Archival Recordings of Sites in Advance of the Extension of Mining Works*. Report prepared for Cadia Holdings Pty Ltd.
- Edward Higginbotham & Associates Pty Ltd (2005a) *Historical and Archaeological Assessment of the Proposed 'Big Cadia' Mining Development, Cadia Valley Operations, Near Orange, NSW. Including 'The Iron Duke', 'West Cadia Copper Mine', 'East Cadia Copper Mine' & Associated Heritage Items*. Report prepared for Cadia Holdings Pty Ltd.
- Edward Higginbotham & Associates Pty Ltd (2005b) *Report on the archaeological excavation of part of Cadia Mining Village, near Orange, NSW. Volumes 1 to 3*. Report prepared for Cadia Holdings Pty Ltd.
- Edward Higginbotham & Associates Pty Ltd (2005c) *Historical and archaeological assessment of proposed development, Little Cadia Copper Mine and neighbouring property, near Orange, NSW*. Report prepared for Cadia Holdings Pty Ltd.
- Edward Higginbotham & Associates Pty Ltd (2005d) *Archival Recording of Little Cadia Copper Mine, Near Orange, NSW*. Report prepared for Cadia Holdings Pty Ltd.
- Edward Higginbotham & Associates Pty Ltd (2006) *Report on the archaeological excavations of the Little Cadia Copper Mine, near Orange, NSW*. Report prepared for Cadia Holdings Pty Ltd.
- Edward Higginbotham & Associates Pty Ltd (2006a). *Historical and archaeological assessment of proposed development, "Te Anau" Homestead and Outbuildings, Old Cadia Road, Near Orange, NSW*. Report prepared for Cadia Holdings Pty Limited. 2006.
- Edward Higginbotham & Associates Pty Ltd (2006b). *Archival Report for "Te Anau" Homestead and Outbuildings, Old Cadia Road, Near Orange, NSW*. Report prepared for Cadia Holdings Pty Limited. 2006.
- Edward Higginbotham & Associates Pty Ltd (2009) *Historical and Archaeological Assessment (European Heritage) of the Cadia East Project*. Appendix L in Cadia Holdings Pty Limited (2009a) *Cadia East Project Environmental Assessment*.

Edward Higginbotham & Associates Pty Ltd (2010a). *Report on the Archaeological Monitoring Program Stage 1. Exploration Drilling. Proposed "Big Cadia" Mining Development, Cadia Valley Operations Near Orange, NSW.* Report prepared for Cadia Holdings Pty Limited. 2010

*Edward Higginbotham & Associates Pty. Ltd (2010b) Archival Report for Farms and Outbuildings (Te Anau & Wire Gully Farms) Near Orange, NSW.* Report prepared for Cadia Holdings Pty Limited. 2010.

Godden MacKay (1995). Cadia Mining Precinct – Final Conservation Plan. Volume 1. Prepared for Newcrest Mining Ltd.

Heritage Council of NSW and Department of Urban Affairs and Planning (1996) *NSW Heritage Manual.*

Heritage Management Consultants (2000) *European Heritage Survey & Assessment.* In Cadia Holdings Pty Limited (2000b) *Ridgeway Project Environmental Impact Statement.*

Newcrest Mining Limited (1995) *Cadia Gold Mine Environmental Impact Statement.* Report prepared by Woodward Clyde.

Newcrest Mining Limited (2014) *Cadia Valley Operations Vibration Monitoring Program (including Blast Monitoring Program).*

Wilkinson Murray (2009) Cadia East Project Noise and Blasting Impact Assessment. Appendix D in Cadia Holdings Pty Limited (2009a) Cadia East Project Environmental Assessment.



Winkworth, K. (2005) Cadia Interpretation Plan (DRAFT). Prepared for Cadia Valley Operations. Revised October 2005.


Appendix A





Inventory of SHR779 archaeological sites (extract from draft conservation plan) (refer to Table 5-1).



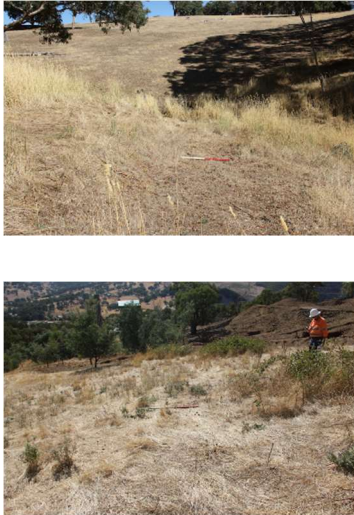

Table 5-1: Inventory of SHR779 Archaeological Sites








Inventory Number	Description	Photograph
001	Dry stone wall	
002	Stone revetment wall for road alignment, continuation of 013 and 017 and 064	
003	Timber post, in the round, shaped to take 2 horizontal timbers at top. Iron spike, loose, at base of post. Related to 016, possibly forming remnant of large timber building with raised floor, adjacent to Blacksmith's Workshop and Forge 004	

Inventory Number	Description	Photograph
004	<p>Forge of Blacksmith's Workshop, which is on a terrace, levelled into the hill slope. The site has been cut by the current access road to the Engine House. Prior to grading, a second forge probably marked the end of the building. The Blacksmith's Workshop may be conjoined to the building with a raised floor, indicated by posts 003 and 016.</p>	
005	<p>Shaft and adit, probably Lawson's Shaft, with timber props in situ. Large mullock heap on both uphill and downhill sides.</p>	






Inventory Number	Description	Photograph
006	Cobbled yard surface, with a low dry stone revetment wall on the uphill (west) side. Another dry stone revetment wall on the downslope (north) side. Some stone rubble obscures a portion of the cobbles.	






Inventory Number	Description	Photograph
006	A timber lined trough is also on the northern edge of the cobbles, 2.4 metres long, 0.4 metres wide, with copper oxide ore and stone rubble inside.	
007	Shaft, probably Want's Shaft. A large open pit or depression. One vertical timber post at north-east end. A large mullock heap on the downslope (north) side. Shaft eroded and backfilled at west end of depression.	
008 and 009	Two adjacent shafts, east 008 with mullock heap on downslope (north) side, and west 009, with mullock heaps all round, except upslope (south) side. Probably William's shafts. Western end of visible copper mine workings.	
010	Single course of rough dry stone walling at upslope (south) end of bare eroded soil, possibly marking a previous dump of ore or spoil, with acid mine waste causing lack of vegetation growth.	






Inventory Number	Description	Photograph
011	<p>Group of four test-pits or costains for mine exploration. These pits are uphill (west) of the main copper mine workings and are probably associated with gold exploration in the 1870s to 1880s. Similar to features above, west of the Iron Duke</p>	
012	<p>Linear test-trench or costain, aligned north-south, for mine exploration, probably 1870s to 1880s and indicative of gold exploration. Downslope (north) of 011, near creek or watercourse.</p>	
013	<p>Track or road from the west to the uphill or western end of the copper mine workings. The road ends at the area of bare earth 010 and the shafts(008 and 009).</p> <p>The track branches and travels downslope (east) towards the Blacksmith's Workshop / Forge 004 and become 017 and 002.</p>	
014	<p>Mullock heap with evidence of structural timbers, located between Shaft 008 and Pit or Depression 007</p>	






Inventory Number	Description	Photograph
015	Cobbled yard, downslope (north-east) from mullock heap 014, with dry stone rough wall adjacent to 014. The cobbles are eroding on the downslope (north) side.	
015	As with the other cobbled yard 006, there is a timber plank features on the downslope (north) side of the pavement. There are water deposited silts within the timber remains, possibly indicating some form of flotation to separate ore from waste. A series of planks laid on edge form a series of benches or tables, down the slope, now eroding.	
016	Large timber post, in the round, with one side, facing upslope (south) shaved off and flattened. The top of the post is shaped to take 2 horizontal timbers, aligned with post 003. The two posts indicate the remnants of a large timber building with a raised timber floor, probably attached to the Blacksmith's Workshop or Forge 004.	
017	Road or track, with dry stone revetment wall on downslope (north) side. It is a continuation of 002 and 013 and 064, and provides access from the west to the Blacksmith's Workshop / Forge 004 and the building indicated by posts 003 and 016.	
018	Road or track, branching from 017, forming a route to the Engine House and Crusher Building	
019	Stone rubble embankment, but without sufficient evidence for a hut or building platform. Possibly a short trench, now infilled.	
020	Square building, with remnants of substantial stone rubble walls. Possibly a powder magazine.	




Inventory Number	Description	Photograph
021	Road or track, crossing from the north side or the watercourse to the south side and providing access to the Engine House. This may be a recent farm track.	
022	Remnants of timber trestles for ore chute from the Crusher House and the cobbled yard below the Engine House. The ore chute carried the ore to the carts at the road head on the north side of the watercourse.	
023	Road or track (road head) from the Engine House to Smelter No. 1. This was the route taken by the drays that carried the ore.	 
024	Road or track, crossing watercourse and continuing directly upslope (west) towards 021, another farm track. Both are likely to be recent.	




Inventory Number	Description	Photograph
025	<p>Stone footings for large building, aligned north-west to south-east, facing downslope (north-east). Dry stone walls, with some large corner blocks define a rectangular structure divided into three main rooms. The north and south corners of the building are divided off by masonry walls, one of which has fragmentary brickwork. There is a large paved threshold on the south-west or upslope side of the building.</p> <p>The building is comparable with the stone platform that marked one of the two assay offices at Smelter No. 1.</p> <p>This building was almost certainly the assay office located at the Engine House.</p> <p>R. Ian Jack also identified this site as an assay office in the Conservation Plan 1995.</p>	 <p>North corner of building.</p>  <p>Southern half of building.</p>  <p>Building, looking north-east.</p>  <p>Building, looking north.</p>  <p>Building, looking north-west</p>





Inventory Number	Description	Photograph
026	Three course of rough stonework in centre of watercourse, divided by large rock outcrops. Possibly an abutment for a footbridge.	
027	Road or track, following south side of watercourse, down the hill. This track crosses the watercourse on a flat rock outcrop, upstream from 026. The road continues to the vicinity of the large building with stone footings, identified as an assay office 025.	
028	Shaft or adit, infilled, with small mullock heap on downslope (north) side. East end of visible mine workings.	
029	Abandoned plough, four tilling blades, fitted for tractor attachment.	
030	Rough dry stone wall below mullock heap.	






Inventory Number	Description	Photograph
031	Linear mine workings, with a potential infilled shaft at the western end. Small mullock heap downslope (east) end of workings, next to dry stone wall 030.	
032	Shaft / adit with mullock heap.	
033	Pit / shaft, infilled, at western end of 032.	
034	<p>Shaft and mullock heaps. Some timbering of the shaft is visible. Probably Baker's Shaft.</p> <p>For Cornish boiler, see 035</p>	 




Inventory Number	Description	Photograph
035	Cornish Boiler, originally from Engine House. The boiler had been moved to a display area outside the SHR boundary. Strong winds in 2015 caused it to move from its footings and roll downhill to its current position.	
036	Level platform above shaft 034, with small test pit or shaft on south side.	
037	Cobbled yard, below (north) of shaft 034	
038	Mullock heap adjacent to cobbled yard 037.	
039	Shaft, infilled, possibly Martin's Shaft.	



Inventory Number	Description	Photograph
040	Top of ore chute 022 at cobbled yard 045, below Engine House 044.	
041	Chimney for Boiler house 043 flue.	
042	End of Cornish boiler. See 035.	





Inventory Number	Description	Photograph
043	Boiler house with evidence for brick lined flues beneath boiler. See 035.	 <p>The photographs for inventory 043 show the remains of a boiler house. The top image is a large pile of grey rocks and debris. The middle image shows a brick-lined flue structure. The bottom image is a close-up of the brick-lined flues.</p>
044	Engine House, completed 1865. It is a half-engine house, with the Flywheel Assembly exposed on the south side.	 <p>The photographs for inventory 044 show the Engine House. The top image shows the stone structure with a green tarp on top. The bottom image shows the exposed flywheel assembly.</p>
045	Lower cobbled yard or working floor beside the Engine House 044	 <p>The photograph for inventory 045 shows a lower cobbled yard or working floor.</p>


Inventory Number	Description	Photograph
046	<p>Part of the stone crusher machinery, formerly located in the Crusher House 047.</p> <p>Originally located within Crusher. Moved to present location, when strengthening works were completed.</p>	
047	<p>Crusher House, with surviving internal timbers and supports for stone crushing machinery.</p>	
048	<p>Rough dry stone revetment walls to upper cobbled yard or working floor to the south of the Engine House 044 and Crusher House 047.</p>	
049	<p>Dry stone revetment wall on east side of cobbled yard 045</p>	

Inventory Number	Description	Photograph
050	Dry stone revetment wall on north side of cobbled yard 045, together with other remnants of walling.	
051	Mullock heaps and mine waste downslope (east) of Engine House 044 and cobbled yard 045.	
052	Wooden brake shoe for flywheel of Engine House 044	
053	Timber footings and tie rods for stone crusher to south of Engine House 044	
054	Iron component of stone crusher 053 ?	

Inventory Number	Description	Photograph
055	Trench for flat rod drive from Engine House 044 to pump at Phillip's or Engine Shaft 056. Also timber supports for cable to headframe to raise and lower cage / skip in shaft. These features are on the upslope (west) side of the upper cobbled yard or working floor 057	
056	Phillip's or Engine Shaft with timber remains of headframe and supports for cable.	
057	Upper cobbled yard or workfloor, upslope (south of Engine House 044 and Crusher House 047)	

Inventory Number	Description	Photograph
058	Alignment of timber posts and remnants of timber structure on east side of cobbled yard or working floor 057	 <p>The top photograph shows a dirt area with several vertical wooden posts and a horizontal beam. A red and white measuring tape is visible. The bottom photograph shows a similar scene from a different angle, with a red and white measuring tape on the ground.</p>
059	Remains of timber trestle for tramway to carry waste to mullock heap from Phillip's or Engine Shaft 056	 <p>The photograph shows a dirt slope with several vertical wooden posts and a horizontal beam, similar to the previous images. A red and white measuring tape is visible. The background shows a landscape with trees and hills.</p>

Inventory Number	Description	Photograph
060	Remnant of pump from Phillip's or Engine Shaft 056, comprising plunger and gland.	
061	Grate irons from Boiler House firebox 043	
062	Mullock heap, associated with trestles 059 and part of the much larger area of mine waste 051 below Engine House 044	
063	Track or road from the south towards the Engine House 044 complex or the assay office 025.	

Inventory Number	Description	Photograph
064	Revetment wall for track or road on downslope (east) side of modern access road, a continuation 002, 013, 017	
065	Garden of Remembrance with headstones and boulders marking other graves.	