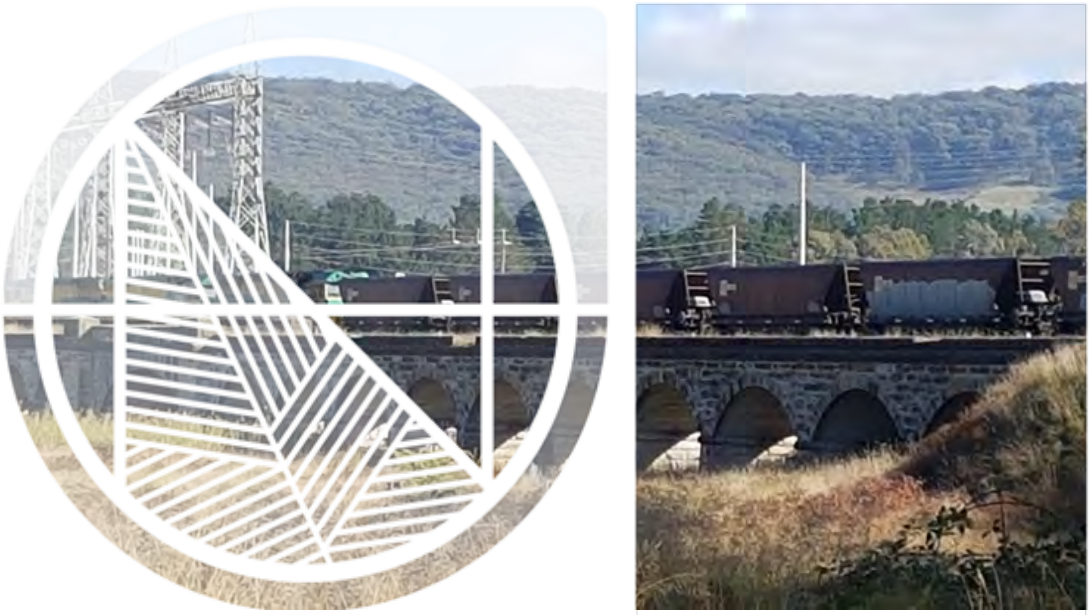
HISTORICAL ARCHAEOLOGY ASSESSMENT AND STATEMENT OF HERITAGE IMPACT

Wallerawang BESS - Greenspot

October 2021



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ACRONYMS AND ABBREVIATIONS

AHD	Australian Heritage Database
Burra Charter	Refers to *The Burra Charter* prepared by Australia ICOMOS
Cultural Significance	Aesthetic, historical, scientific, social or spiritual value for past, present or future generations
CHL	Commonwealth Heritage List
CMP	Conservation Management Plan
DCP	Development Control Plan
EP&A Act	Environmental Planning & Assessment Act 1979
EPBC Act	Legal framework for the protection and management of places of national environmental significance
Fabric	Physical material of the *place* including components, fixtures, contents, and objects
HA	Heritage Assessment
Heritage Significance	A term used to describe the inherent cultural and historical value of an item
HIA	Heritage Impact Assessment
HCA	Heritage Conservation Area
ICOMOS	International Council on Monuments and Sites
Interpretation	All the ways of representing the *cultural significance* of a *place*
LEP	Local Environment Plan
LGA	Local Government Area
NHL	National Heritage List
NPW Act	*National Parks & Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	(NSW) Office of Environment and Heritage (former)
Place	Site, area, land, landscape, building or other works, and may include components, contents, spaces and views

Reconstruction	Means returning a *place* to a known earlier state and is distinguished from *restoration* by the introduction of a new material into the *fabric*
Restoration	Means returning the existing *fabric* of a *place* to a known earlier state by removing accretions or by assembling existing components without the introduction of a new material
SHR	State Heritage Register
RNE	Register of the National Estate
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHL	World Heritage List

EXECUTIVE SUMMARY

This report provides an historical heritage assessment for the proposed *Wallerawang Battery Energy Storage System* (Wallerawang BESS), State Significant Development (SSD) #14540514, for Greenspot (the Proponent). NGH was engaged on behalf of the Proponent by Arcadis, who is preparing the Environmental Impact Statement (EIS) for the Project. The planning approvals process seeks development consent for the construction, operation and maintenance of a BESS of 500 MW capacity that would provide 1,000 MWh of energy storage.

The Project Area is located 1.5 km southwest of Wallerawang town centre, within the Lithgow City Local Government Area (LGA) (Parish of Lidsdale, County of Cook).

This assessment provides an assessment of the potential impact of the proposal upon built heritage items, historical archaeology and heritage values.

HERITAGE ASSESSMENT OF THE PROJECT AREA

After the European exploration of the Blue Mountains, the Project Area was part of a land grant granted in 1833 to James Walker, who became a prominent pastoralist in the region. Typical archaeological evidence of historical, pastoral activities and material culture could include for example homesteads and underfloor, archaeological deposits; sheds and fences; dams, tracks and roads, and tools. Research of the historical property titles relevant to the Project Area indicates that the James Walker 'Wallerawang House' Homestead was located 1.2 kms outside, and to the south, of the Project Area. No structures or infrastructure relating to the pastoral history of the Project Area were identified by the historical background research including a review of historical aerials and plans, or during a site survey undertaken by NGH archaeologists.

The Project Area was used for pastoralism exclusively until the building of the NSW Great Western Railway line in 1870. Construction of the Great Western Railway (GWR) included Wallerawang Railway Station and yard group, and a seventeen stone arch railway viaduct, both of which are listed on the NSW State Heritage Register (SHR). The GWR originally ran through the Project Area, for which the original railway embankment remains providing a physical remnant of the original railway line alignment. Within the remnant railway embankment is a sandstone culvert. The railway embankment and sandstone culvert are not listed on any statutory heritage lists but have been assessed within this assessment as having locally significant heritage values.

Whilst there are no statutory listed heritage items within the Project Area, there are known heritage items within proximity of the Project Area:

- Wallerawang rail bridges over Cox's River (SHR), which includes the 1870 stone arch railway viaduct and a 1920s brick arch railway viaduct that was built when the railway line was duplicated
- Wallerawang A and B Power Stations chimney stack (Section 170 Conservation and Heritage Register).

These listed items will neither be impacted materially or visually by the proposal.

IMPACT ASSESSMENT CONCLUSION

The BESS would require a built area of about 10 hectares of land within the Project Area of about 40 hectares. The proposed ground disturbance for the Wallerawang Battery project consists of the construction of the battery footprint, transmission towers and maintenance roads.

NGH provided Arcadis and Greenspot with results of our heritage research and assessment throughout the design phase. As a result, Greenspot has designed the project to retain a section of the original Great Western Railway line embankment including the sandstone culvert, located within the Project Area.

In summary, the assessment of heritage impacts for the proposal to construct and operate the Wallerawang BESS within the Project Area has found that the overall impact is minor and that any partial adverse impacts to the original Great Western Railway heritage can be mitigated by the retention of the sandstone culvert and the completion of an archival recording. This assessment is based on the following considerations:

- There will be no impact to any items of state heritage significance.
- There will be no impact to any locally listed items of heritage.
- The history of the Project Area indicates that the Project Area was used primarily as paddocks for grazing and there is low potential for historical archaeology.
- While the railway embankment and sandstone culvert comprise a section of the original Great Western Railway line alignment, they are not rare. 130 m of the embankment will be preserved, including the sandstone culvert. The physical impact upon the railway embankment will not impact upon its identified heritage values and significance. Partial conservation of the embankment and associated sandstone culvert will conserve existing values.

In summary, the cumulative impact of the proposed construction of the Wallerawang BESS is assessed to be low.

RECOMMENDATIONS

The following recommendations are made for the proposal:

1. Construction works should not cause secondary impacts on the culvert through vibrational impacts. A structural engineer should be consulted to consider how vibration risks to the culvert can be minimised and avoided.
2. An archival recording of the railway embankment and culvert should be completed both before and after the proposed works.
3. Any changes to the works outside of scope would be subject to additional assessment.
4. In the event any heritage finds are identified, works must cease temporarily, and the ‘Unexpected Finds Procedure’ described in Appendix A should be adhered to.

1. INTRODUCTION

1.1. BACKGROUND

Greenspot Wallerawang Pty Ltd (Greenspot) is seeking development consent for the construction, operation and maintenance of a Battery Energy Storage System (BESS), of up to 500 Megawatts (MW), within the buffer lands of the decommissioned Wallerawang Power Station site, at Wallerawang. The battery will be known as the **'Wallerawang 9 Battery'** (the Project) to reflect the long-term role the Power Station played in the NSW energy sector. This project has been designated a State Significant Development (SSD).

NGH was commissioned by Arcadis on behalf of Greenspot (the Proponent) to assess the potential heritage impact of the proposed development to inform an Environmental Impact Statement (EIS)

Two listed heritage items have been identified as being in proximity to the proposed works area and may be impacted by the works. An additional two items have been identified as potentially holding heritage significance (assessed in Section 4 of this report) that will also be included within this SOHI (Table 1, below).

Table 1-1. Heritage sites subject to this heritage impact assessment

Heritage Item	Heritage Listing	Proximity to the proposal location	Rationale for inclusion in this report
Wallerawang Rail Bridges over Cox's River	State Heritage Register	30 m north of the Project Area.	Whilst the proposed works will not materially impact upon the heritage item, this SOHI will assess whether the proposed works may result in visual impacts to this State heritage item.
Wallerawang A and B Power Stations chimney stack	State Government Agency	88 m north of the Project Area	Whilst the proposed works will not materially impact upon the heritage item, this SOHI will assess whether the proposed works may result in visual impacts to this State heritage item.
Section of the original Great Western Railway line	Not listed	Within the Project Area	Not currently listed on any heritage register as an item of heritage significance, but identified during the site survey as potentially holding heritage significance
Sandstone culvert	Not listed	Within the Project Area	Not currently listed on any heritage register as an item of heritage significance, but identified during the site survey as potentially holding heritage significance.

A site visit was carried out by NGH Heritage consultant, Jakob Ruhl – NGH Principal Heritage Consultant, to determine the existing physical aspects of the Project Area, the heritage items within proximity, and any conservation areas. A subsequent survey of the Project Area was completed by NGH and Aboriginal stakeholders for the Aboriginal heritage assessment, during which no additional historical heritage items were identified.

1.2. LOCATION

The proposed Wallerawang BESS is located along the western side of the Castlereagh Highway, approximately 1.5 km north east by east of Wallerawang town centre NSW, and 9.2 km north west of Lithgow, NSW, refer to **Error! Reference source not found.** and **Error! Reference source not found.**, and within the Lithgow City Local Government Area (LGA) (Parish of Lidsdale, County of Cook).

The Project Area is within the following Lot and Deposited Plan's (DPs):

- Lot 3, DP1018958
- Lot 4, DP1016725
- Lot 3, DP1181412
- Lot 3, DP1226927
- Lot 4, DP1226927
- Lot 91, DP1043967
- Lot 115, DP1204803

1.3. PROPOSAL DESCRIPTION, OBJECTIVE AND RATIONALE

The proposal is part of the NSW Government's strategy for a reliable, affordable and sustainable electricity future that supports a growing economy. BESS facilities, such as the Wallerawang 9 Battery, will provide enabling infrastructure for expanding the renewable energy industry in NSW, particularly in and around the Central-West Orana Renewable Energy Zone. As such, the Proponent considers that the project will play a significant role in the transformation of the NSW energy sector.

The Wallerawang BESS construction will require vegetation clearance and leveling and or benching of the Project Area. The proposal includes the:

- Subdivision of the Project Area, as required to delineate the Project Area from the remaining adjacent land.
- Operation of a large-scale BESS including battery enclosures, inverters and transformers and associated substation.
- A transmission line connection from an existing line in the northwest corner of the Project Area (above ground) between the BESS and the nearby TransGrid Wallerawang 330kV substation.
- Ancillary upgrades to the Wallerawang 330kV substation.
- A site access to the BESS from the Castlereagh Highway, with appropriate auxiliary turn treatments in accordance with AustRoad requirements.

1.4. ASSESSMENT APPROACH

The purpose of this study is to assess the potential impact of the proposal upon any historic, non-Aboriginal heritage sites and values identified within the Project Area. The assessment has been prepared in accordance with the following guidelines:

- NSW Heritage Division (formerly Heritage Office) (Office of Environment and Heritage) publication *Statements of Heritage Impact* (2002).
- NSW Heritage Division (formerly Heritage Office) (Office of Environment and Heritage) publication *Assessing Heritage Significance* (2001); and
- Australia's ICOMOS *Burra Charter*. The Charter sets the standard of practice for providing advice or making decisions about of undertaking works at places of heritage or cultural significance, including owners, managers and custodians (ICOMOS 1999).

The report specifically includes the following:

- Review of existing heritage assessments and condition of the heritage items.

- Searches of national and state heritage databases. This includes the Australian Heritage Database (National and Commonwealth Heritage Lists), and the NSW Heritage Division State Heritage Inventory.
- Search of the Lithgow City Council Local Environmental Plan (LEP).
- Review of relevant literature.
- Site visit.
- Assessment of the heritage significance of the site and heritage items (if not done previously), and determination of the impacts on these items and if they are acceptable.
- Recommendations are provided accordingly that would help to avoid, minimise or mitigate against impacts to the identified cultural heritage values of the heritage items.

1.5. REPORT STRUCTURE

This report:

- Outlines the background of the current study/proposal (Section 1).
- Discusses issues such as statutory heritage listings and legislative requirements (Section 2).
- Provides a summary in terms of an historical and physical overview of the place (Section 3).
- Provides a description and evaluates the significance of affected items (Section 4).
- Provides a description of the proposed works and assesses the potential impacts from the proposal (Section 5).
- Makes recommendations regarding the potential impacts on those items (Section 6).

Note, it is outside of the scope of this report to provide a detailed historical account of the area. We have relied upon previous historical information in secondary sources.

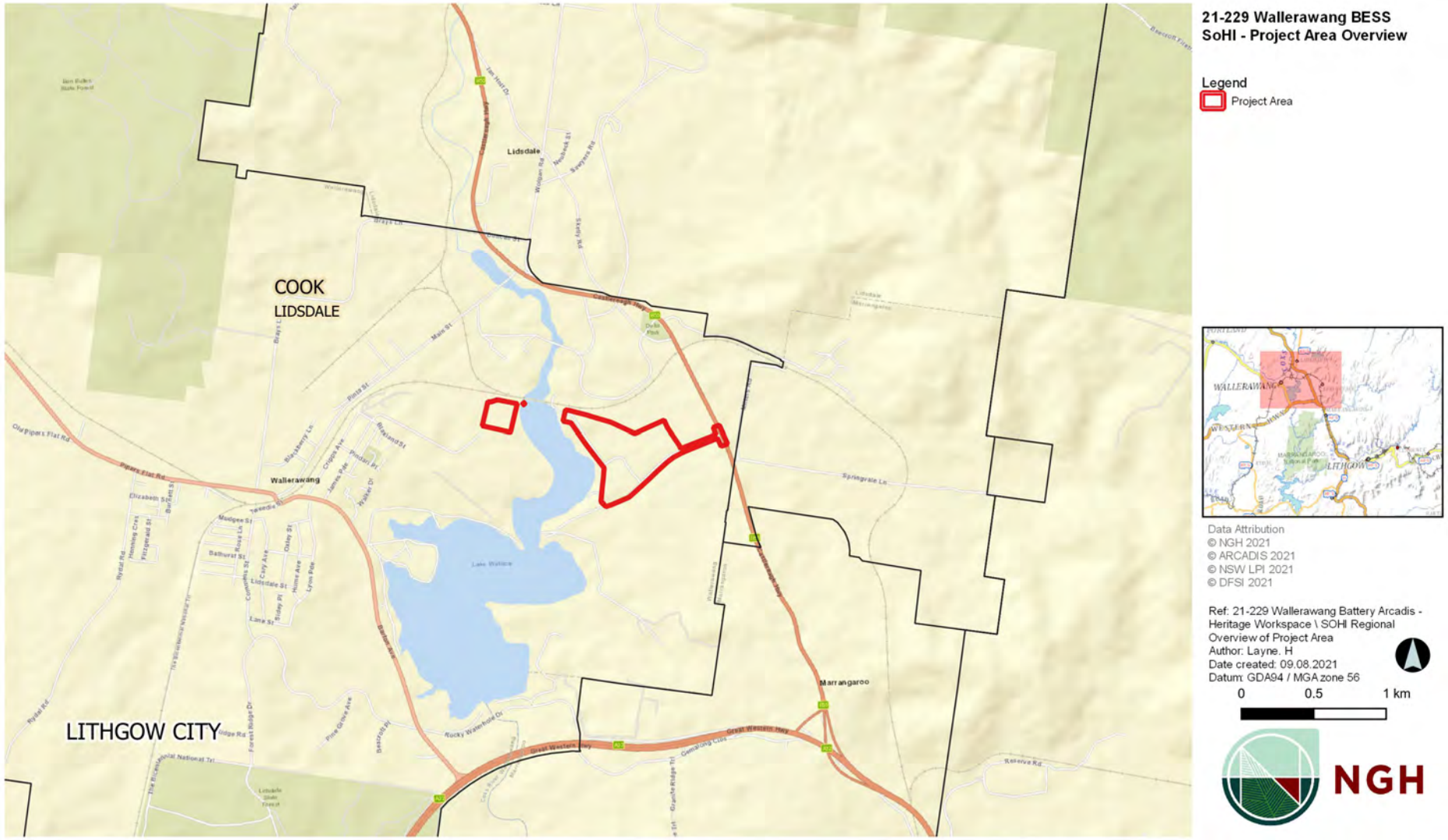

Figure 1-1 Regional Overview of the Project Area

Figure 1-2 Location of the Project Area

2. LEGISLATIVE AND NON-STATUTORY CONSIDERATIONS

Places of heritage value can be subject to different levels of recognition and protection. This protection (at local, state and national levels) includes specific measures for the protection of heritage items. The text below provides a summary of the legislative framework at each level of government.

2.1. ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework for the protection and management of places of national environmental significance. The heritage lists addressed by the EPBC Act include the United Nations Educational, Scientific and Cultural Organisation (UNESCO), World Heritage List (WHL), National Heritage List (NHL) and the Commonwealth Heritage List (CHL).

All WHL properties in Australia are protected and managed under the EPBC Act. The NHL protects places that have outstanding value to the nation. The CHL protects items and places owned or managed by Commonwealth Government agencies. The Commonwealth Department of Agriculture, Water and Environment (DAWE)is responsible for the implementation of national policy, programs and legislation to protect and conserve Australia's environment and heritage and to promote Australian arts and culture. The Minister's approval is required for controlled actions which would have a significant impact on items and places included on the WHL, NHL or CHL.

The Australian Heritage Database (AHD) includes the NHL, which includes the natural, historic and indigenous places that are of outstanding national heritage value to the Australian nation. The AHD also contains the CHL, which comprises those places on Commonwealth lands and waters, or under Australian Government control which could possess heritage value. Items on both lists are protected under the EPBC Act. The AHD also includes places listed as World Heritage value by UNESCO.

References to the Register of the National Estate (RNE) were removed from the EPBC Act in 2012. The RNE is no longer a statutory list but remains an archive of information of more than 13,000 places throughout Australia and includes two entries in relative proximity to the Project Area. These entries, while providing a contribution to understanding the character and heritage values of the Project Area, do not carry statutory weight (unless they are also listed on a statutory list) and do not require assessment in relation to this project.

Table 2-1. Results from search undertaken of the Australian Heritage Database.

Item Name	Status and Listing ID	Location and proximity to the Project Area
Cox's River Rail Bridge at Wallerawang (former) Main Great Western Railway Line (former)	(Registered) Register of the National Estate (Non-statutory archive) Place ID: 15887	30 m north of the Project Area

Item Name	Status and Listing ID	Location and proximity to the Project Area
Willow Vale Farm	Indicative Place Register of the National Estate (Non-statutory archive) Place ID: 101905	3.6 km Northwest of the Project Area

2.2. NSW HERITAGE ACT

State Heritage Register

Natural, cultural and built heritage is protected in NSW under the *Heritage Act 1977*. Administration of the Act is currently under Heritage NSW, Community Engagement Group of the Department of Premier and Cabinet.

The Act creates the State Heritage Register (SHR) which provides permanent protection for State Significant heritage items and places. Items of State heritage significance are defined as a place, building, work, relic, moveable object or precinct which is of historical, scientific, cultural, social, archaeological or natural significance to the State (Section 4A(1) of the Act). The effect of SHR listing is that a person cannot damage, destroy, alter or move an item, building or land without approval from the Heritage Council. Information about items included on the SHR can be found in the NSW State Heritage Inventory (SHI), an electronic database of statutory listed heritage items in NSW.

The Heritage Council of NSW, constituted under the *Heritage Act 1977*, is appointed by the Minister for Heritage and is responsible for heritage in NSW. The Council reflects a cross-section of community, government and conservation expertise with the (former) Heritage Division being the operational arm of the Council.

The 2001 NSW Heritage Manual Update, published by the NSW Heritage Office (now 'Heritage NSW') provides guidelines for 'Assessing Heritage Significance'. The Manual includes specific criteria for assessing heritage significance and the significance assessment within this report has been completed in accordance with these guidelines.

When items are listed on the SHR, applications to carry out works on those items need to be made to the Heritage Council under Section 60 of the Act.

A search of the study area and surrounds indicated three items listed on the SHR in the Wallerawang area. As the proposed Project Area is 30 m away from Wallerawang rail bridges over Cox's River, it will be considered in this SOHI as there are anticipated visual impacts to the items as a result of the proposal. The two other State heritage items located over 500 m from the proposed Project Area will not be considered in this SOHI, as there are no anticipated visual impacts to the items as a result of the proposal.

Table 2-2. Places listed under the NSW Heritage Act.

Item name	Location and proximity to the Project Area	LGA	SHR Listing ID
Wallerawang rail bridges over Cox's River	Main Great Western Railway, Wallerawang, 30 m north of the project Area, crossing the Cox's River	Lithgow	01064
St John the Evangelist Church	530 m northwest of the Project Area, located on Main Street, Wallerawang, Located	Lithgow	01702
Wallerawang Railway Station and yard group	890 m west of the Project Area, located on Main Great Western Railway, Wallerawang	Lithgow	01282

State Agency Heritage Registers

Under Section 170 of the Heritage Act, State agencies and authorities in NSW are required to keep a register of heritage places for which they are responsible. The s.170 registers are also held in the SHI.

There are three listings within proximity to the Project Area on the s.170 register. The other State heritage items located over 500 m from the proposed Project Area will not be considered in this SOHI, as there are no anticipated visual impacts to the items as a result of the proposal.

Table 2-3. Locations listed on the State Agency Heritage Register

Item Name	**Address**	**Suburb**	**LGA**	**Government body responsible for the heritage site**
Wallerawang rail bridges over Cox's River	Main Great Western Railway, Wallerawang	Wallerawang	Lithgow	TAHE - Country Rail Network - former John Holland Australian Rail Track Corporation
Wallerawang Railway Station and yard group	Main Great Western Railway, Wallerawang	Wallerawang	Lithgow	Transport Asset Holding Entity (former Railcorp) - Transport for NSW
Wallerawang A and B Power Station chimney stacks	Main Great Western Railway, Wallerawang	Wallerawang	Lithgow	Utilities - Electricity

Figure 2-1 Project Area Overview showing the heritage listings within 3 kms

Figure 2-2 Heritage items located adjacent to the Project Area

2.2.1. Historical Archaeology

The Heritage Act gives statutory protection to relics that form part of historical archaeological deposits.

Amendments to the Heritage Act made in 2009 defined an archaeological 'relic' under the Act. A relic is an archaeological deposit, resource or feature that has heritage significance at a local or State level. The definition is not based on age.

The practical application of this is that it is not necessary to apply for exemptions if an item has been assessed as having no heritage significance. Sections 139-145 of the Heritage Act prevents the excavation or disturbance of land for the purpose of discovering, exposing or moving a relic, except in accordance with an excavation permit issued by the Heritage Council of NSW. The level of heritage significance of an item determines the excavation permit necessary for the works.

When a place is listed on the SHR or affected by an interim heritage order, the approval of the Heritage Council of NSW is required for any major work. The Heritage Council works to ensure that any changes, additions or new buildings on the site do not detract from the heritage significance of the place. A Section 60 application, outlining the proposed works and supporting documents is required to be submitted to the Heritage Council for assessment prior to works on the site/building commencing. Standard Exemptions for works to State Heritage Listed items may apply and should be reviewed prior to submitting an application to the Council.

If any works require excavation to be undertaken on an item of local heritage significance, a Section 140 excavation permit under the Heritage Act 1977, or a Section 139 Exception will be required from the Heritage Council. Any works that require a Section 140 excavation permit will require an Archaeological Assessment, Research Design and Methodology that details the proposed archaeological work and an archaeologist present during any excavation works.

Section 139 prohibits the excavating or disturbing of land leading to a relic being discovered, exposed, moved, damaged or destroyed. To excavate and disturb land in the context of the NSW Heritage Act is associated with the activity of digging or unearthing. The new definition also indicates that the 'relic' being exposed or disturbed is considered significant (or has the potential to be significant) at the time of its excavation, removal or destruction.

A Section 139 (1B) exception is for excavation or disturbance of land that will have a minor impact on archaeological relics including the testing of land to verify the existence of relics without destroying or removing them.

2.3. NSW ENVIRONMENTAL PLANNING & ASSESSMENT ACT

The *Environmental Planning & Assessment Act 1979* (EP&A Act) controls land use planning in NSW. The planning system established by the EP&A Act requires that local authorities prepare an LEP and associated Development Control Plans (DCP) under Part 3. These planning instruments include provisions relating to the management and protection of heritage and in particular, the LEP contains a schedule of all known heritage items within an LGA which are subject to these protections.

Heritage items are added to the heritage schedule of an LEP often following identification and assessment from a local shire heritage study. The SHI also holds local heritage items listed by local councils in NSW. These items are given protection by the heritage provisions within the relevant plan, which will then require consent of Council for certain developments.

2.3.1. Lithgow Local Environmental Plan, 2014

The Lithgow LEP (2014) identifies and protects heritage conservation areas and listed buildings/items, identifies environmentally sensitive land, and prescribes land use practices. As a result, Heritage items

(if any) are listed and described in Schedule 5. Heritage conservation areas are shown on the Heritage Map as well as being described in Schedule 5.

There are several local heritage items in the Wallerawang area, but only one item is within proximity on the surrounding lands to the Project Area: *Stone Viaduct Cox's River Wallerawang*. The following table lists LEP listed items within 2 kms of the Project Area in order of proximity. Listing the LEP heritage items within proximity of a study area can provide an indication of the historical themes and heritage values relevant to that area.

Table 2-4. LEP listed heritage items within proximity to the Project Area

Item name	Location and proximity to the Project Area	Listing ID
Stone Viaduct Cox's River Wallerawang	30 m north of the Project Area, crossing Cox's River – addressed within this SOHI until the SHR listing for the Wallerawang Rail Bridges over Cox's River.	I440
The following listings are all located over 400 m from the Project Area		
Tunnel Hill Tunnels and Overbridge	405 m northeast of the Project Area, located on the Main Great Western Railway	I439
Walker-Barton Private Cemetery – Archaeological item	500 m south of the Project Area on the north bank of the lake.	A109
Former Wallerawang Public School and Residence	530 m west of the Project Area, located on Main Street, Wallerawang.	I225
Church of St John the Evangelist	729 m northwest of the Project Area, located on Main Street, Wallerawang	I112
Old Wallerawang School (former National School)	760 m northwest of the Project Area, located on the corner of Main Street and Castlereagh Highway, Wallerawang.	I113
The Cottage	820 m north of the Project Area, located on Skelly Road, Lidsdale.	I191
Wallerawang Conservation Area	950 m west of the Project Area, located on the eastern extent of Main Street, Wallerawang.	C13
Bottom Pub	1100 m west of the Project Area, located on Main Street, Wallerawang.	I207
War Memorial – Archaeological item	1110 m west of the Project Area, located on Main Street, Wallerawang.	A184
Meadowside	1137 m north of the Project Area, located on Wolgan Road, Lidsdale.	I192

Item name	Location and proximity to the Project Area	Listing ID
Braemai	1140 m north of the Project Area, located on Wolgan Road, Lidsdale.	I193
Uniting Church	1145 m north of the Project Area, located on Wolgan Road, Lidsdale.	I194
Cottage	1145 m north of the Project Area, located on Wolgan Road, Lidsdale.	I195
Cottage and Stone Barn	1148 m north of the Project Area, located on Skelly Road, Lidsdale.	I196
Wallerawang Junction Railway Station Group	1180 m southwest of the Project Area located in Wallerawang town centre.	I208
Surgery	1185 m west of the Project Area, located on Main Street, Wallerawang.	I209
Wang Antiques and Emporium	1200 m west of the Project Area, located on Main Street, Wallerawang.	I210
Post Office	1290 m west of the Project Area, located on Main Street, Wallerawang.	I211
Former Commercial Banking Co.	1295 m west of the Project Area, located on Main Street, Wallerawang.	I212
Stone Cottage	1935 m southeast of the Project Area, located on the Great Western Highway, Marrangaroo.	I190

Local heritage items that will be specifically addressed within this report will be limited to those 400 m to the proposed works area. This includes one item: *Stone Viaduct Cox's River* (ID# I440)

2.4. THE BURRA CHARTER

The Australia ICOMOS (International Council on Monuments and Site) Charter for the conservation of places of cultural significance (the Burra Charter) (current edition 2013) sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance including owners, managers and custodians. The Charter is not a statutory document but does provide specific guidance for physical and procedural actions that should occur in relation to significant places. A copy of the charter can be accessed at http://icomos.org/australia. This SOHI has been prepared in accordance with the Burra Charter.

An appreciation of landscape is highlighted in the 1999 revision of the Burra Charter of Australia ICOMOS, placing greater emphasis on 'setting'. Article 8 of the Burra Charter now reads:

"*Conservation* requires the retention of an appropriate visual *setting* and other relationships that contribute to the *cultural significance* of the *place*. New construction, demolition, intrusions or other changes which would adversely affect the setting or relationships are not appropriate".

3. HISTORICAL & PHYSICAL OVERVIEW

The Project Area is within the suburb of Wallerawang and the LGA of Lithgow City Council, situated within the Central Tablelands Region of NSW. The Wiradjuri people are the traditional custodians of the land in which the Project Area is located.

3.1. EUROPEAN SETTLEMENT AND PASTORALISM

By the 1820s European settlement had begun around the Lithgow region, bringing with it pastoral and industrial practices. The development of the Lithgow region is associated with the construction of a road across the Blue Mountains from Sydney to Bathurst between 1815 and 1830 and the subsequent construction of Blue Mountains and Bowenfels rail lines from Sydney to connect these two areas in the 1860s and 1870s.

The Wallerawang area was initially surveyed in 1823 by James Blackman, after whom the nearby locality of Blackman's Flat is named. The name, "Wallerawang" was first mentioned in the log of Surveyor McBain, who noted that they crossed a stream of that name which flowed south-east with an open plan of sandy soil and good pasture on the south side of the rivulet (Conybeare & Morrison, 2006:13).

The first European settler in the Wallerawang area was James Walker, a naval officer who resided on 2000 acres, which includes the bounds of the Project Area. It is probable that he squatted on the land from around 1824 prior to it being granted to him in 1833 (Parsons, 1967). After the grant, he named the station "Wallerowang" (later becoming "Wallerawang"), a Wiradjuri word meaning "place of plenty of water and wood" (Conybeare & Morrison, 2006:9, 13).

The Wallerawang Homestead is identified by a map completed by the Australian Railway Historical Society located within the approximate location of Lot 1 DP 1181412, approximately 1.2 km south of the Project Area (Plate 3-2). The homestead house is visible in historical imagery from 1975 (Figure 3-1 1975 Historic Imagery over the Project Area and Wallerawang region. Note Project Area has been cleared of all vegetation), however later imagery from 1984 after the development of Lake Wallace shows the house removed, however cultural plantings remain (Figure 3-2 1984 Historic Imagery over the Project Area and Wallerawang region. Since 1975, the imagery clearly shows that Cox's River had been dammed just before the Great Western Highway, New, unsealed roads were also constructed within the Project Area). Walker's land was one of the largest in the area, including fertile ground on the alluvial plains of the Cox's River. Prior to occupation, the area was likely to have been comprised of dry sclerophyll forests and open woodlands (NGH 2021).

Walker married his cousin Robina in 1834 and they had four children Allison, Wilhelmina, Archibald and Georgina Lyon Wolgan Walker. The Walker Family became a powerful pastoralist family in the central tablelands who later developed links across NSW and QLD (Christian Akian Associates 1998). Wallerawang Station became a major stopping place for travellers between Sydney and Mudgee. One of the most notable was Charles Darwin, who stayed at the station in 1836 and offered the following description in his journal:

> *"...I left the high road and made a short detour to a farm called Wallerowang, to the superintendent of which I had a letter of introduction from the owner in Sydney. Mr Brown had the kindness to ask me to stay the ensuing day, which I had much pleasure in doing. This place offers an example of one of the large farming or rather sheep grazing establishments of the colony. Cattle and horse are however in the case, rather more numerous than usual, owing to some of the valleys being swampy and producing coarse pasture. The sheep were 15,000 in number, of which the greater part were feeding under the care of different shepherds in unoccupied ground, at a distance of more than 100 miles beyond the limits of the colony... Two or three flat pieces of ground near the house were cleared and cultivated with corn, but no more wheat is sown than sufficient for the annual support of the labourers employed on the*

establishment. The usual number of assigned servants here is about 40, but at the present time there are rather more. Although the farm was well stocked with every requisite, there was an apparent lack of comfort and not even a single woman resided here" (Darwin, 1839).

The success of the Walker Family in the area may be linked to the location of the Wallerawang Railway Station located within their land grant (see Plate 3-1).

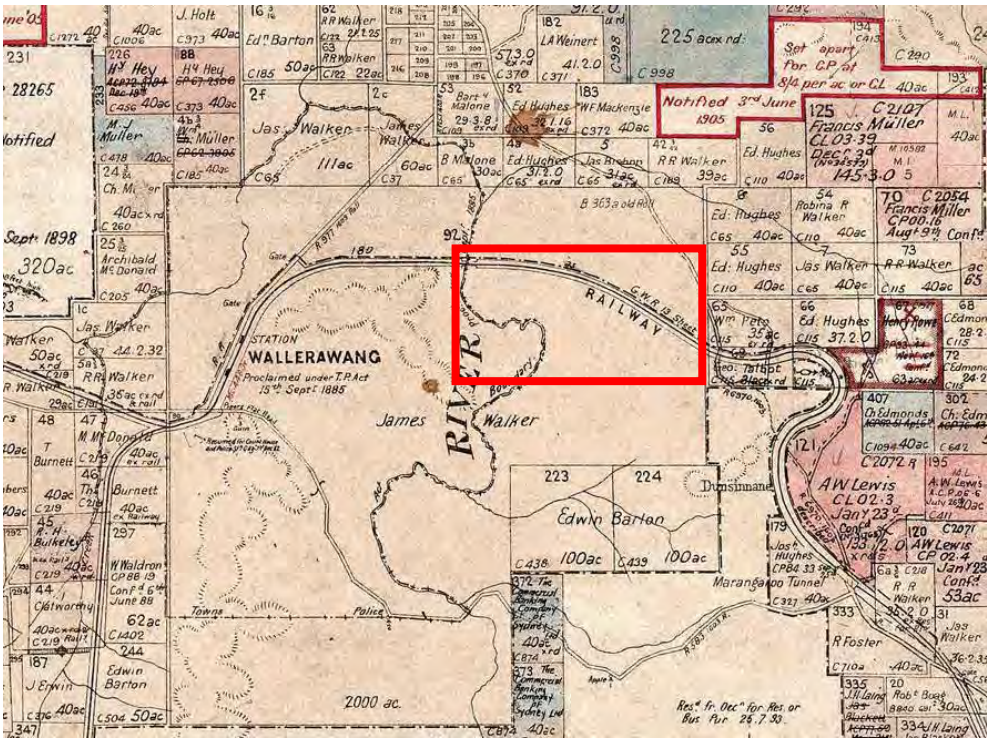

Plate 3-1: Parish Map of County of Cook, Parish of Lidsdale 1897.The red box marking the approximate location of the Project Area (not to scale) (NSW Historical Lands Viewer)

While Mr Walker was establishing his estate, the construction of the Great Western Railway had commenced in 1855. Railway Engineer, Edwin Barton, participated in trail surveys for the Bowenfels, connecting the Blue Mountains Region to Bathurst via Wallerawang. Among other accomplishments, Barton oversaw the construction of the Zig Zag Railway at nearby Clarence. During this time, it was likely that Barton encountered Pastoralist James Walker to negotiate the route of the original Great Western Railway (subject of this report) through Walker's estate. Georgina Walker married Edwin Barton.

After Walker's death in 1856, the property reverted to his wife Robina, who then held the licences for 16 stations totalling 4,700,000 acres. Barton eventually took over the running of the Wallerawang Estate and changed the name to Barton Park which remained in the family until around 1948, when two of the three remaining Barton descendants (Lyon and Loveday) were murdered at the Wallerawang House/Barton Park by a disgruntled employee. It passed through several hands, including the Joint Coal Board in 1949. Various sheep farmers including Walter and Albert Matters in 1951 and Ray Fitzpatrick Pty Ltd (company) in 1961. Pastoralism remained the main use of the Project Area until the pollution from the Wallerawang Power station began affecting the stock in the late 1950s and early 1960s. When the needs of the power station required the flooding of the Cox's River in the 1980s, the original Wallerawang House/Barton Park was demolished to create Lake Wallace (Winchester, 1972).

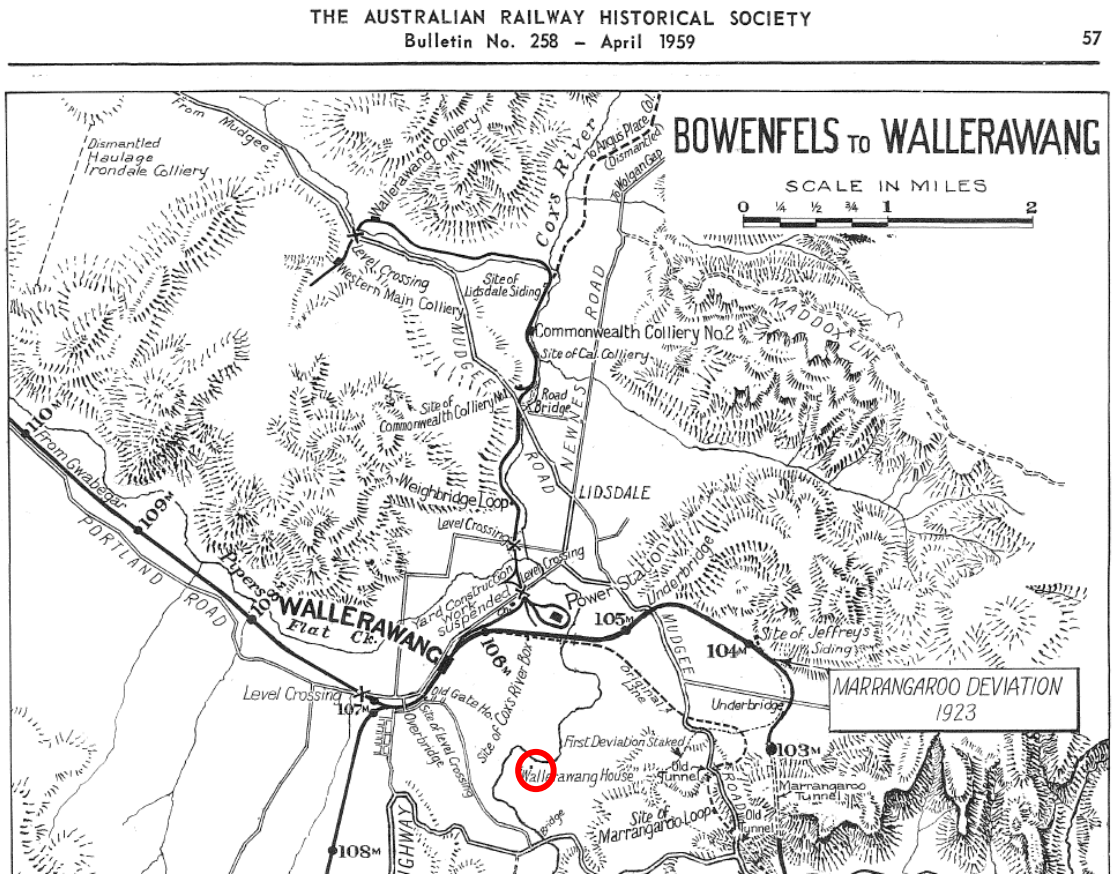

Plate 3-2: Map of the Bowenfels to Wallerawang line red circle marking approximate project location. Note the original line for the Great Western Railway running through the Project Area and the Marrangaroo Deviation connecting to the original Railway east of the Cox's River (The Australian Railway Society, 1959)

3.2. GREAT WESTERN RAILWAY

Within the Project Area, the rail corridor was acquired by the commissioner of Railways in 1870 for the acquisition of the Great Western Railway. The railway land comprised Lot 2 D.P. 827541 now forming part of Lot 3 D.P. 1018958, intersecting the Project Area east to west. The new addition was part of the Bowenfels line, connecting Sydney to the Central Tablelands. It served as passenger and goods travel and would be used for the growing industrialisation of the Lithgow area for coal mining, iron smelting and brick making (Rowland 1954, p. 261).

As part of the development of the Great Western Railway, John Whitton designed a series of stone arch bridges and three major viaducts, the most substantial being the Sandstone Viaduct over the Cox's River (subject of this report). The elliptical shape of this viaduct and 16.5 m arch is unusual for Australian practice and unique amongst Whitton railway bridges (O'Connor 1985). The sandstone bricks share similarities with the Triassic Hawksbury sandstone resources of the region. John Whitton chose to use stone arch construction for his Great Western Railway bridge development when denied sufficient funds to use imported wrought iron girders. A similar

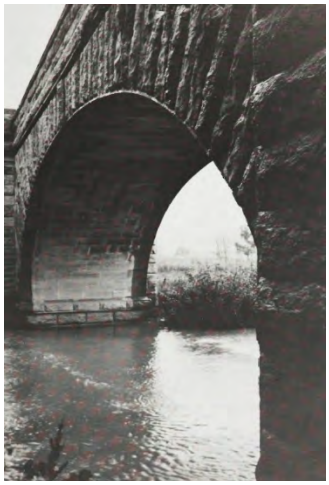

Plate 3-3: Central 16.5-m span of Cox's River Viaduct, 1870 (O'Connor, 1985)

example of John Whitton's Great Western Rail Bridges is the Farmers Creek Stone Viaduct at Bowenfels.

The Great Western Railway line through Lithgow and Bowenfels was under construction before the Zig Zag was completed in 1869. The bridges and culverts in this area mostly belong to 1868-9 and are built in excellent stonework (SHI listing for *Railway Culvert of Ida Falls – Lithgow LEP (2014), listing ID A133)*.

In 1927, the line of track through the Project Area was decommissioned and replaced with the Marrangaroo deviation. This avoided a steep section of track through the Marangaroo ranges (Rowland 1954, p. 262). The decommissioned track was later resumed by Electricity Commission of New South Wales – Trading as Pacific Power in 1994.

3.3. COAL AND DEVELOPMENT OF THE REGION

The formation of the rail link to Sydney allowed coal on the Western Coal Fields to be sent to Sydney and exported to other destinations. With the opening of the railway line to Wallerawang in 1871 the town began to develop adjacent to the station. Until the completion of the line to Bathurst in 1876, Wallerawang became the terminus for all travellers to Mudgee and Bathurst. Travellers were conveyed to Cobb and Co. coaches at Wallerawang to complete the journey.

Like Lithgow, Wallerawang was to progressively develop an industrial focus. Its main activities were associated with the development of the shale-oil industry followed by the coal industry, and later power generation. A pine plantation was also established in the area in 1932 to supply a local box factory and sawmill.

The strength of development in Lithgow was closely linked to the availability of abundant supplies of natural resources such as coal, iron ore, copper, kerosene shales and water resources as well as resources from the surrounding pastoral industries.

In 1867 the mining of Kerosene shale commenced at Kerosene Valley near Lidsdale in the approximate location of the Wallerawang Power Station. The area at that time was known as Bathgate after Bathgate in Scotland where Kerosene shale was mined.

Coaling began in Wallerawang around 1873 with several mines being opened on the Lithgow seam at Mount Piper, mid-way between Wallerawang and Lidsdale. The main mines at Wallerawang included The Irondale Colliery, Cullen Bullen Colliery, The Ivanhoe Colliery, The Commonwealth Colliery; The Great Western Mine; and The Invincible Colliery.

Between 1900 and 1910 several small mines were also opened between Piper's Flat and Blackman's Flat including, Black Diamond Mine (later known as Western Mine); Wallace's Colliery (later known as Huon); Neubeck's Mine; Springvale Colliery; The Commonwealth Colliery, Newcom Colliery; and The Angus Colliery.

In 1949 the Joint Coal Board approached the NSW Railways about the construction of a power station at Wallerawang to provide a market for the by-products of a coal cleaning plant planned for the western coalfield.

In 1950 the NSW Railways submitted a proposal to the Electricity authority to construct the power station. Construction of the Power Station began in 1951 and was officially opened by the Premier J. Cahill in 1958. An additional 500 megawatts were later added to the station requiring additional water supplies to be secured through the construction of a reservoir on the Cox's River near Wallerawang in the 1980's.

The town of Wallerawang began to grow as the power station grew, with the construction of Housing Commission homes in the 1950's.

3.4. LAND ACQUISTION CHRONOLOGY

The following table provides a chronology of land acquisition within the Wallerawang BESS Project Area.

Table 3-1. Land Acquisition Chronology

Date of Acquisition	Registered Proprietor(s) & Occupations of the Project Area
1st May 1833	James Walker (Grantee and Grazier)
7th February 1870	Railway land corridor is acquired by Commissioner for Railways
19th February 1907	James Lyon Walker Barton (Grazier) (Not including the sale of the railway land)
15th November 1951	Joint Coal Board (Not including the sale of the railway land)
28th February 1957	Walter and Albert Henry Matters (Grazier) (Not including the sale of the railway land)
29th March 1961	Ray Fitzpatrick Pty Limited (Not including the sale of the railway land)
26th April 1979	The Electricity Commission of New South Wales (Not including the sale of the railway land)
15th April 1994	Resumption by of Railway Land by Electricity Commission of New South Wales – Trading as Pacific Power

3.5. REVIEW OF HISTORICAL IMAGERY

Historical imagery was sourced from the NSW Government Spatial Services website with the earliest available dating from 1975 (Figure 3-1 1975 Historic Imagery over the Project Area and Wallerawang region. Note Project Area has been cleared of all vegetation). The 1975 imagery shows that the Wallerawang Power Station was in operation, along with its associated infrastructure. The imagery also clearly identifies the original Great Western Railway embankment in operation within the Project Area. The imagery from 1975 also provides insight into how Cox's River originally ran through the Project Area prior to its damming. This image depicts the original Wallerawang House/Barton Park House located south of the Project Area before its later demolition.

Historical imagery from 1984 (Figure 3-2 1984 Historic Imagery over the Project Area and Wallerawang region. Since 1975, the imagery clearly shows that Cox's River had been dammed just before the Great Western Highway, New, unsealed roads were also constructed within the Project Area) clearly shows that since the 1975 imagery was taken the Cox's River had been dammed, forming Lake Wallace in the process. The purpose of creating a lake was to provide the Wallerawang Power Station with a cooling source (Delta Electricity 2009). This affected some parts of the current Project Area that were located on the banks of Cox's River, as the creation of Lake Wallace inundated a small section of land on the bend (in the southwest of the Project Area). The 1984 imagery also shows that an unsealed road had been formed within the southern portion of the Project Area. It should also be noted that the Wallerawang A Power station chimney stack had been built within the Wallerawang Power Station just north of the railway that separates it from the current Project Area.

Historical imagery from 1991 (Figure 3-3 1991 Historic Imagery over the Project Area and Wallerawang region. Noting the development of the pine plantation) shows that since 1984, more land from the eastern bank of Cox's River had been inundated by Lake Wallace. It should be noted that the water level of the lake is dependent on local rainfall and the water flow of Cox's River. It is also clearly visible in the 1991 imagery that, in the time since the 1984 imagery was taken, a portion of the Project Area closest to Cox's River began to be used for pine plantation forestry. This was accompanied by the creation of new logging trails to provide access to the plantations.

Historical imagery from 1998 (Figure 3-4 1998 Historic Imagery over the Project Area and Wallerawang region. Since 1991, the imagery shows that the forest within the Project Area has grown.) shows that very little change has happened within the Project Area since 1991, except for the expansion of the area used for pine plantation forestry. It should be noted that natural forces associated with the manmade Lake Wallace have gradually created a wet marshy area in the western part of the Project Area over the decades.

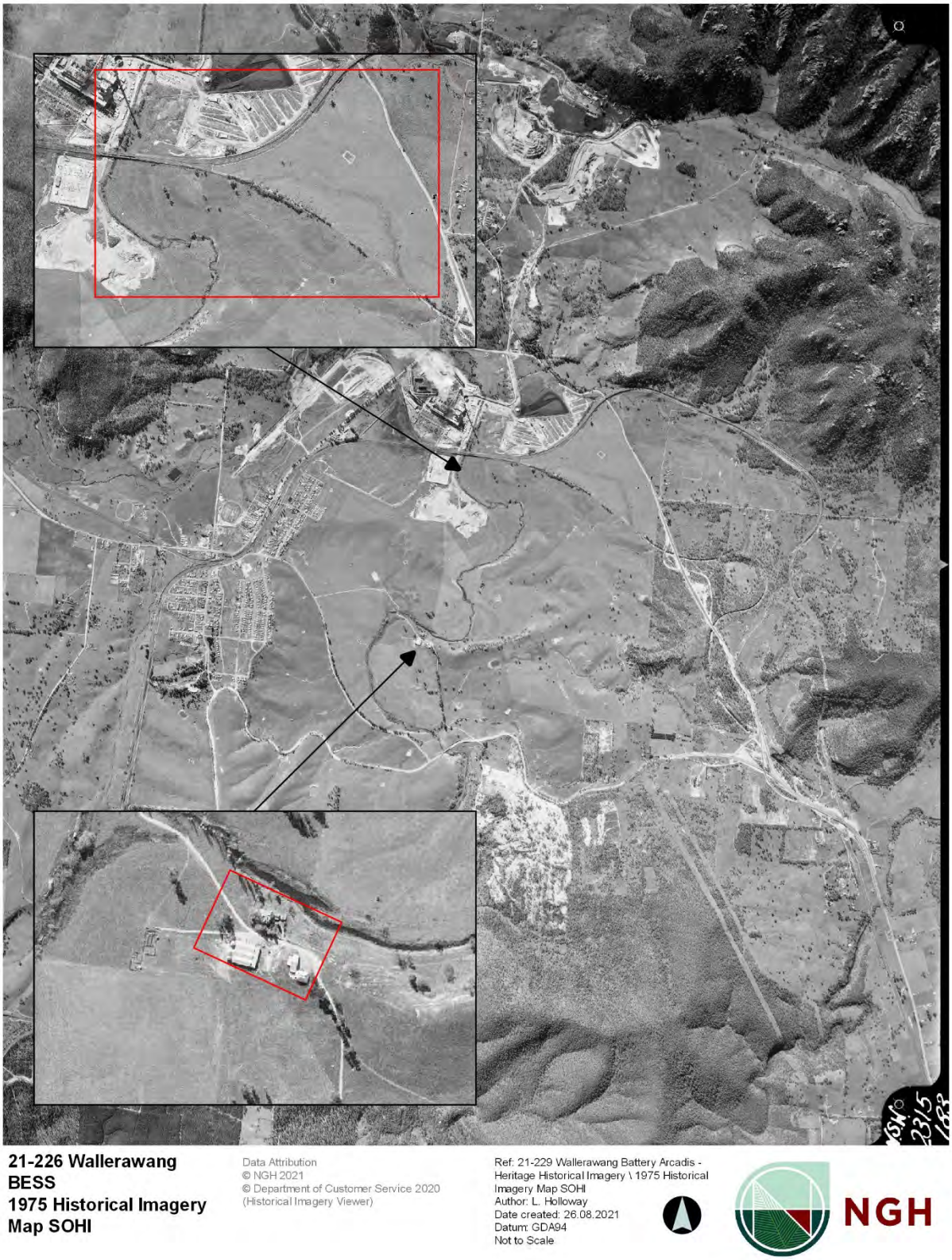

Figure 3-1 1975 Historic Imagery over the Project Area and Wallerawang region. Note Project Area has been cleared of all vegetation

Figure 3-2 1984 Historic Imagery over the Project Area and Wallerawang region. Since 1975, the imagery clearly shows that Cox's River had been dammed just before the Great Western Highway, New, unsealed roads were also constructed within the Project Area

Figure 3-3 1991 Historic Imagery over the Project Area and Wallerawang region. Noting the development of the pine plantation

Figure 3-4 1998 Historic Imagery over the Project Area and Wallerawang region. Since 1991, the imagery shows that the forest within the Project Area has grown.

3.6. HERITAGE ITEMS IN PROXIMITY OF THE PROPOSAL SITE

The following descriptions and assessments of significance are from the State Heritage Inventory listings.

3.6.1. Stone Viaduct Cox's River (SHR 01064; LEP I440)

It has seventeen stone arch spans totalling 139.6m and is the longest masonry arch bridge ever built in Australia. Its main span of 16.5m is also large, being the fifth longest of its type for its age (1870). It is also unusual in having an elliptical arch rib.

This 1870 bridge is significant because it is one of the oldest stone arch railway viaducts in New South Wales. It is associated with John Whitton the 'father of New South Wales railways', it is an impressive sandstone structure on the outskirts of historic Wallerawang, its construction contributed significantly to the subsequent railway extension to Bathurst and on to western New South Wales. When John Whitton was denied funds to continue with the expensive wrought iron girder bridges, he chose the stone arch viaduct for his major bridge works, particularly for the Zig Zag east of Lithgow and the extension west to Wallerawang. It is the largest of Whitton's stone arch viaducts. It is a fine representative example of a stone arch railway viaduct, and it retains its original fabric.

Plate 3-4. Cox's River Rail Bridge at Wallerawang (former) (O'Connor, 1985)

3.6.2. Wallerawang A and B Power Stations chimney stack (S.170 # 3431007)

The chimney stacks for Wallerawang A & B Stations are of faceted, reinforced concrete type. These stacks have incorporated facets and flutes as an architectural feature. The remaining stack is an 80 m high concrete windshield with three levels of architectural fluting at the top and corbel supported acid resistant blocks. Chimney Stacks A and B were designed by Mouchel & Partners and built by Eastman Pty Ltd. in 1950. The current use for the Wallerawang A Chimney stack is purely for heritage preservation. Prior to decommissioning, the Chimneys were associated with electricity generation

Prior to 1950, the electricity supply industry in NSW consisted of several State Government, Local Government and privately owned corporations, each responsible for power generation. The Electricity Commission of NSW was set up by act of parliament in May 1950. The Commission was set up to take

over the generation and main transmission functions of electricity industry. In 1953 Wallerawang Power Station, which was planned by the Railways department, was transferred during construction phase to the Commission. Wallerawang A station began operation in April 1957 and was decommissioned in May 1986. This station consisted of four 30MW units. The fourth unit being completed in 1959. All have now been demolished. Wallerawang B station began operation in January 1961 and consisted of two 60MW units. The installation of the second unit occurred in November 1961. B station was decommissioned in 1990. It has since been demolished. One A station stack remains due to its rarity of construction and social significance.

Plate 3-5: Wallerawang A Chimney Stack marked with the red rectangle.

3.7. SITE VISIT

A site visit was undertaken by NGH Senior Heritage Consultant, Jakob Ruhl, on the 16th of June 2021 to determine if any unrecorded heritage items or values were present within the Project Area and to assess the visual impact of the proposed works on the views to and from the adjacent heritage items, namely the *Wallerawang Rail Bridge Over the Cox's River* and *Wallerawang A Power station chimney stack*.

The Project Area was traversed from east to west to sample all aspects of the Project Area. The eastern extent of the Project Area, adjacent to the Castlereagh highway presented a grassed paddock lined with mature (Plate 3-24) pine and eucalypt trees. Paddock was absent of cattle; however, a small possible stock yard and remnant dam was observed in the northeastern extent. The dam is interconnected to an ephemeral drainage line that intersects the Project Area. Moving west of the Paddock, a 2 – 4 m – wide high levee formed of clay, sands and intermixed fill was observed traversing the centre of the Project Area in a north-south orientation, (Plate 3-16). Native trees were observed buried in the embankment (Plate 3-8). Material at the top of the embankment was remnant of rail track with blue metal, track ballast and occasional metal nails and wire fencing with metal star picket poles (Plate 3-22, Plate 3-20), remnants of railway tracks were not present. It was confirmed that the mounded

embankment was remnant of a section of the original Great Western Railway that was later decommissioned due to the addition of the Marrangaroo Deviation.

A sandstone culvert measuring 2 m in length and 1 m in height was located under the railway embankment, within the alignment of an ephemeral drainage line from the adjacent cleared paddock, assumed to be flowing west into Cox River (Plate 3-17, Plate 3-18). The culvert was constructed out of sandstone bricks approximately 20 cm in width and various lengths forming a half circle 80 cm diameter passage for under passing water (Plate 3-15, Plate 3-16). This passage remains clear of obstructions and the large sandstone brick work continues throughout. The sandstone bricks, seemingly of local origin were noted to have chisel marks suggesting colonial stone masonry techniques where employed (Plate 3-19).

Immediately west of the railway embankment was a mature pine plantation forest located on a sloping landscape (Plate 3-9). The alignment of tree formations in rough furrows suggest that the plantation was furrowed in by manual means. The ground surface was densely covered in pine needs resulting in poor visibility, however occasional steam erosion and sloping areas revealed a sandy rocky subsoil. No notable historical features were identified within the pine plantation area, however a water pipe and a subsurface electrical line was observed crossing the planation area in a north south direction into the adjacent decommissioned Wallerawang powerplant (Plate 3-10).

The western extent of the pine plantation transitioned to an alluvial terrace on the shores of northern extent of Lake Wallace, a man-made water storage area. The remaining natural course of the Cox's River (Plate 3-11) was observed on the north of the Project Area, under passing the Wallerawang Rail Bridges. The riparian corridor of the river was densely covered in high grass and blackberry bush, resulting in limited access and viability of the riverbank areas. An unsealed access road and overhead power line was present with some metal fencing marking boundary areas (Plate 3-23). On the northern boundary of the western extent of the Project Area, the Wallerawang Rail Bridge Over the Cox's River were located just outside of the Project Area boundary (Plate 3-12). The Viaduct style bridges are spaced approximately 10 – 20 m apart, with the colonial sandstone Viaduct style bridge on the south alignment, immediately adjacent to the Project Area (Plate 3-12), and the mid-century grey/brown brick bridge to the north (Plate 3-13).

The western bank of the Cox's River featured a sharp bank slope with riparian vegetation transitioning to the disturbed flat where the Wallerawang 330 K Substation and unsealed access tracks are located (Plate 3-25). No further historical values were identified.

In summary, the site inspection of the Project Area revealed its association with pastoral, forestry and industrial practices. The only heritage items located during the survey were the unlisted section of the original Great Western Railway alignment and sandstone culvert. Views of the recorded heritage items, Wallerawang Rail Bridges over Cox's River, remain prominent in the vicinity of Lake Wallace, however, the Wallerawang Power Station is the most predominant feature in the landscape.

Plate 3-6: General view of the Project Area looking north over grassed paddock towards Wallerawang Power station.

At the far left of the photo, the railway embankment and culvert run approximately north to south (to the east of the pine plantation).

Plate 3-7: General view of the Project Area looking east over grassed paddock towards Castlereagh Highway.

Plate 3-8: Looking west towards the railway embankment (foreground) and pine plantation (background) from the eastern paddock.

Plate 3-9: General landscape within the pine plantation forest depicting furrowed planting lines.

Plate 3-10: Western extent of the pine plantation looking west towards Lake Wallace.

Plate 3-11: General view looking northwest over Lake Wallace and Cox's River with Wallerawang A Power Station chimney stack in the background.

Plate 3-12: Twin Wallerawang Rail bridges over Cox's River, looking northeast. The sandstone viaduct is in the foreground.

Plate 3-13: Wallerawang Rail bridges over Cox's River, looking southwest.

Plate 3-14: Sandstone culvert structure located within the Project Area under passing the railway embankment – eastern side.

Plate 3-15: Detailed sandstone brick work.

Plate 3-16: Stonework joining to the rail embankment.

Plate 3-17: View through the sandstone viaduct, noting the rectangular sandstone brick work.

Plate 3-18: Sandstone culvert structure located within the Project Area under passing the railway embankment – western side. Remnant native trees are buried within the built-up railway embankment. Culvert within an ephemeral drainage line

Plate 3-19: Close up of brick work detailing the potential of hand chiselled brickwork.

Plate 3-20: Apex of rail embankment, looking south. Surface exposures of rail ballast and fill present.

Plate 3-21: Profile view of embankment material with water rolled stones stabilising the edge of the railway line.

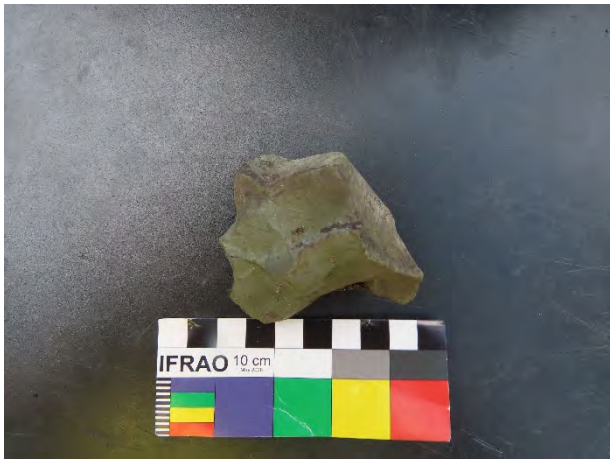

Plate 3-22: Sample of rail ballast material located on the remnant track line.

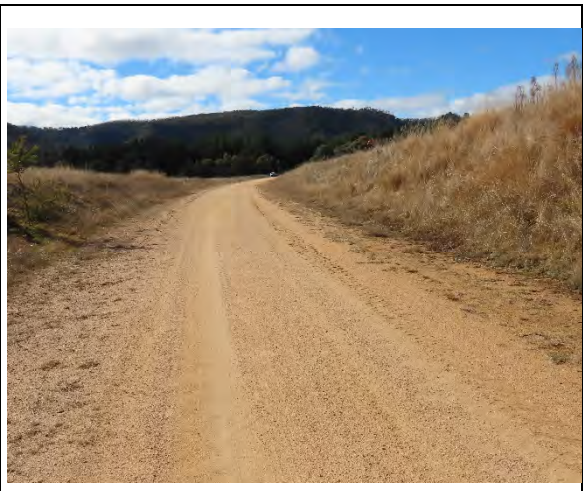

Plate 3-23: Cut in unsealed road located on the southern extent of the Project Area.

Plate 3-24: South-eastern extent of Project Area entry point into the Project Area via the Castlereagh highway.

Plate 3-25: Unsealed access track and Substation in for ground, looking west.

Figure 3-5 Site Inspection Results

3.8. SUMMARY OF ARCHELOLOGICAL POTENTIAL OF THE PROJECT AREA

The Project Area has played part in the history of the Wallerawang region, due to its associations with pastoralism and industry. Analysis of historical resources and historical aerial imagery indicate that the Project Area has experienced little change from its historical uses as grazing paddocks and for the railway, apart from the establishment of the pine planation, which resulted in the repurposing of grazing land in the 1980's.

The Wallerawang Homestead would have been surrounded by stables, out buildings and various accommodations for agricultural workers and stockmen with yards on either side for mustering horses, sheep and cattle. This homestead precinct would have been contained by post and rail fences but beyond this the sheep and cattle would have been allowed to graze freely under the supervision of the stockmen. Archaeological evidence of early pastoral occupation and activities would therefore be centred around the location of the homestead, which is just over a kilometre away from the Project Area.

The archaeological potential of Project Area indicates that the archaeological potential is low. Predominantly, the Project Area was used as paddocks for grazing. An unexpected find would likely be related to the previous pastoral history and could include:

- Roads and tracks
- Fences and gates
- Metal (nails and structural fittings, horseshoes and accessories).

4. HERITAGE SIGNIFICANCE

4.1. INTRODUCTION

'Heritage significance' is a term used to describe the inherent cultural and historical value of an item. Significance may be contained within the fabric of a building or other place, in its setting and its relationship with other nearby items.

The main aim in assessing significance is to produce a succinct statement of significance, which summarises an item's heritage values. The statement is the basis for policies and management structures that will affect the item's future (NSW Heritage 2001).

The NSW Heritage Division recommends assessment of heritage items in a number of situations, which include:

- Making decisions about whether to retain an item.
- Considering changes to an item.
- Preparing a heritage study.
- Preparing a conservation management plan.
- Considering an item for listing on the State Heritage Register or on the schedule of heritage items in a local environmental plan, or
- Preparing a statement of environmental effects or a heritage impact statement as part of the development and building approval process.

The following assessment of significance is based on the NSW heritage assessment criteria. The criteria encompass the four values in the Australia ICOMOS Burra Charter (1999), which are commonly accepted as generic values by Australian heritage agencies and professional consultants:

- Historical significance.
- Aesthetic significance.
- Scientific significance.
- Social significance.

The above are expressed as criteria in a more detailed form than this to:

- Maintain consistency with the criteria of other Australian heritage agencies.
- Minimise ambiguity during the assessment process.
- Avoid the legal misinterpretation of the completed assessments of listed items.

4.2. HERITAGE ASSESSMENT CRITERIA

Assessments of Significance

The following assessment follows the guidelines set out by the Heritage NSW and the principles of the Australia's ICOMOS Burra Charter.

The OEH guidelines for *Assessing Heritage Significance (Heritage Office* (former), 2001) states that an item will be considered to be of state and/or local heritage significance if it meets one or more of the NSW Heritage Assessment Criteria, below:

Table 4-1. NSW Heritage Assessment Criteria

Criteria	Description
Criterion (a)	An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);
Criterion (b)	An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area);
Criterion (c)	An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);
Criterion (d)	An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;
Criterion (e)	An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);
Criterion (f)	An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);
Criterion (g)	An item is important in demonstrating the principal characteristics of a class of NSW's • cultural or natural places; or • cultural or natural environments. (or a class of the local area's • cultural or natural places; or • cultural or natural environments.)

To undertake an assessment of an item against the NSW heritage assessment criteria, the OEH guidelines recommend that the following steps be undertaken:

- Investigate the historical context of the item or study area.
- Investigate the community's understanding of the item.
- Establish local historical themes and relate them to the State themes.
- Investigate the history of the item; and
- Investigate the fabric of the item.

4.3. NSW HISTORICAL THEMES

An historical theme is a way of describing a major force or process which has contributed to history. Historical themes provide a context within which the heritage significance of an item can be understood, assessed and compared. In using themes to assess heritage items and places it is useful to identify both local or regional themes applying to the item and the broader state theme to which the local or regional theme relates.

The following table shows the correlation between national and state heritage themes with those relating to the two surrounding items of listed heritage significance; the Wallerawang rail bridges over Cox's River and the Stone Viaduct Cox's River, as well as the two additional items identified during the site visit as holding potential heritage significance; the Original Western line railway alignment, and the sandstone culvert, both of which are located within the Project Area and have the potential to be physically and/or visually impacted by the proposed works.

This table has been adapted from a document produced by the Heritage Council of NSW in 2001: *New South Wales Historical Themes*.

Table 4-2. NSW Historic Themes and Wallerawang BESS

Australian Theme	NSW Theme	Description	Examples	Wallerawang rail bridges over Cox's River	Wallerawang A and B Power Stations chimney stack	Original Western Line Railway Alignment	Sandstone Culvert
3 **Developing local, regional and national economies**	Environment – cultural landscape	Activities associated with the interactions between humans, human societies and the shaping of their physical surroundings	A landscape type, bushfire fighting equipment, soil conservation structures, national park, nature reserve, market garden, land clearing tools, evidence of Aboriginal land management, avenue of trees, surf beach, fishing spot, plantation,	Engineering the public railway system	*Not Relevant.*	Engineering the public railway system	Sandstone culvert constructed to allow waterflow underneath the original Great Western Railway Line.

Australian Theme	NSW Theme	Description	Examples	Wallerawang rail bridges over Cox's River	Wallerawang A and B Power Stations chimney stack	Original Western Line Railway Alignment	Sandstone Culvert
			place important in arguments for nature or cultural heritage conservation.				
3 **Developing local, regional and national economies**	Mining	Activities associated with the identification, extraction, processing and distribution of mineral ores, precious stones and other such inorganic substances.	Mine, quarry, race, mining field or landscape, processing plant, manager's office, mineral specimen, mining equipment, mining license, ore laden shipwreck, collier, mine shaft, sluice gate, mineral deposit, slag heap, assay office, water race.	*Not Relevant.*	Chimney stack associated with electricity generation.	*Not Relevant.*	*Not Relevant.*
3 **Developing local, regional and national economies**	Transport	Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	Railway station, highway, lane, train, ferry, wharf, tickets, carriage, dray, stock route, canal, bridge, footpath, aerodrome, barge, harbour, lighthouse, shipwreck, canal,	Rail bridges for the Great Western Railway line in NSW.	*Not Relevant.*	Original Western Railway Alignment in NSW.	Original Western Railway Alignment in NSW.

Australian Theme	NSW Theme	Description	Examples	Wallerawang rail bridges over Cox's River	Wallerawang A and B Power Stations chimney stack	Original Western Line Railway Alignment	Sandstone Culvert
			radar station, toll gate, horse yard, coach stop.				

4.4. COMPARATIVE ANALYSIS

A comparative analysis of a heritage item with similar heritage items is a useful tool to assist in the identification of heritage values that may be shared and therefore whether an item has representative values. Additionally, it is used to identify where an item is rare or unique. Sometimes items were once very common but now rarely survive.

The Cox's River Viaduct and the Power Station Stack are statutory listed items of heritage with established statements of significance. NGH has reproduced those statements of significance for these two items in section 4.4 below. Neither of these two items will be materially impacted by the proposed Wallerawang Battery project. However, the railway embankment and culvert that are located within the Project Area, are not statutory listed items of heritage. So, to assist in the completion of a statement of significance for these items a comparative analysis has been completed.

Comparative Analysis methodology and notes

The Heritage NSW State Heritage Inventory (SHI) database was searched for culverts and embankments with the following results:

Culverts	• Two (2) state significant: 1. *Towrang Convict Stockade (SHR Listing ID: 01905)* 2. *Lower Prospect Canal Reserve (SHR Listing ID: 01945)* • 27 locally listed: 1. Of the 27 locally listed culverts, two have been chosen as they are both regionally (both listed on the Lithgow LEP, 2014), historically and thematically comparable: 2. *Railway Culvert of Ida Falls (LEP listing ID: A133)* 3. *Road Culvert and sustaining wall at Emoh (LEP listing ID: A027)*
Embankments	• 11 locally listed railway lines. The following three (3) heritage items were chosen for the comparative analysis as they are all disused railway lines, one of which is listed on the Lithgow LEP 2014, *Railway Line Newnes – Zig Zag etc*. 1. Railway Line Newnes - Zig Zag etc 2. Archaeological - Disused Railway Line (Guyra-Dorrigo railway line) 3. Fassifern to Toronto Branch Railway Line

Culverts

Towrang

The six extant culverts located along the former Great South Road at Towrang were constructed between 1833 and 1843 by Convict chain gangs. The culverts are predominately of coursed random rubble shale construction with wing walls and dressed sandstone voussoirs and quoins.

Statement of Significance – *State significant*

The Towrang Bridge and culverts are historically and archaeologically very significant for their association with the convict era and with the building of the Great South Road and therefore, the development of Goulburn and the southern region of New South Wales. The structures provide an

insight into early road building methods and they have rarity value due to the many changes made to the line of this highway which have resulted in the loss of much of the original road. The bridge and culverts, having carried traffic over an extensive period, reflect a fine level of stonemasonry.

Lower Prospect Canal Reserve

The canal had 18 culverts running beneath it, six of which operated as inverted syphons. There were five scour valves along its length. The culverts are typically composed of reinforced concrete on concrete piers.

Statement of Significance (abridged) – *State significant*

The Lower Canal, and its associated infrastructure, is state significant as a key component of the Upper Nepean Scheme.

The Upper Nepean Scheme was one of the largest engineering and public infrastructure works carried out in Australia up to 1888. It was an important determinant of Sydney's growth potential. No other similar water supply canals of the form and scale of those associated with the Upper Nepean Scheme have ever been built in NSW.

The Lower Canal functioned as a key element of the Upper Nepean Scheme for over 100 years.

The Lower Canal is an excellent example of the techniques of 19th century hydraulic engineering, particularly the use of gravity directed water flow to supply a large area of Sydney with water.

The Lower Canal has research potential for its detailed and varied evidence of engineering construction techniques, both the original masonry and the later reinforced concrete upgrade works.

Railway Culvert of Ida Falls

The culvert is oval, supported by masonry blocks in a wall 12 courses high.

Statement of Significance – *Locally significant*

Historic: As part of the earliest rail link to the west, the culvert has high local significance.

Aesthetic: Finely constructed in stone, the culvert has significant aesthetic appeal when viewed both from Bell Street and Ida Falls Gully.

Road Culvert and sustaining wall at Emoh

The ashlar wall on the south side is six courses high above the tunnel entrance, which has a circular arch. North wall has been reconstructed, but some original material may be buried.

Statement of Significance – *Locally significant*

Historic: The culvert is a rare example of the work of the Public Works Department (PWD) *just before the railway building over the Mountains diverted resources from road maintenance. This part of the road has been in constant use since 1828 and the present culvert is likely to be the successor of an earlier drain.*

Aesthetic: As viewed from Emoh's garden, the south wall is exceptionally pleasing with good quality stone-work and excellent detailing, including the parapet walls.

Scientific: The culvert and wall cast light on the building techniques of the PWD in the 1860s.

Comparative analysis of culverts discussion

The state significant culverts described above are components of large, complex, infrastructure sites. Both Towrang and the Lower Prospect Canal are sites that have historical significance for significantly contributing to the development of the state. The culverts at both locations have technical and aesthetic significance.

Whilst the two locally listed culverts described above are not part of important heritage sites, they are listed for being early, and increasingly rare, examples of culverts constructed in the mid to late 19th century as part of the road and rail expansion over the Blue Mountains and into western NSW.

Railway Lines / Embankment

Two searches of the Heritage NSW State Heritage Inventory were undertaken using the keywords of *railway line* and *embankment* with the result of 11 locally listed heritage items. The following three (3) heritage items were chosen for the comparative analysis as they are all disused railway lines, one of which is listed on the Lithgow LEP 2014, *Railway Line Newnes – Zig Zag etc*.

Railway Line Newnes - Zig Zag etc

Railway line constructed 1869, commencing 1km south of present Newnes Junction. Now main road leading to top of Zig Zag. Includes the Clarence Tunnel (disused) and the deviation of 1897 known as Dargans Deviation.

Statement of Significance – *Locally significant*

The items set out are the most important of a lengthy complex, all of which are of great industrial archaeological interest representing a cross-section of railway history and architecture.

This stretch of railway has been extensively rebuilt since its opening in 1869-71. Most structures and buildings located on the original line are however still standing and in total represent a unique set of items.

Archaeological - Disused Railway Line (Guyra-Dorrigo railway line)

The disused railway line runs across the New England Highway just north of Guyra and heads off towards Dorrigo in an easterly direction. Along the line there is evidence of embankments, cuttings and concrete culverts. Ballast or steel lines were not laid. Sections of the railway cuttings are still evident at Mickey's Gully and Willow Glen, east of Guyra.

Statement of Significance – *Locally significant*

The archaeological remains of the railway line that was to connect Guyra to Dorrigo have landmark, historical, research, social and representative significance. The initial construction of the railway line from Guyra to Dorrigo is associated with the New State movement and the role played by various politicians in seeking its construction and then stopping its construction after a change of government. Engineering skills are revealed in the number of embankments, cuttings and culverts that remain.

Social significance arises from the role of the navvies and the part that they played in the construction of the line and the economic and social development of Guyra. The initial construction of the railway from Guyra to Dorrigo is indicative of the power of country residents to lobby for improved railway services. Its demise with a change of government and the onset of the Great Depression is indicative of the factors that lead to a reversal of government policy.

Fassifern to Toronto Branch Railway Line

The Railway was 4.4 km from Fassifern to Toronto Pier, built in 1891.

It was built by a private company, with standard gauge, so Govt. trains could be run on the line.

Line ran on an embankment & (later) over an arched bridge (FF-02) & down a creek valley to the Lake shore at Fennell Bay opposite the Fossil Tree Reserve (BK-04).

Statement of Significance (abridged) – *Locally significant*

The Fassifern to Toronto branch line, including its components of underbridges, overbridge, remnant track and platforms has historical significance at a local level.

It is the only surviving branch line off the Main Northern line, which was deliberately privately planned and constructed and contributed to the subdivision and development of Toronto for tourist purposes at the end of the 19th century.

The line has remained largely intact since reconstruction in 1910, from which time the majority of components date. The original alignment of the track can be accessed and understood through the siting of a public cycling/walkway adjacent.

Comparative analysis of railway embankments/lines discussion

Each of the heritage items described above include various components, forming a cohesive site that represent historical, social and technical/aesthetic heritage values.

4.5. HERITAGE ASSESSMENT

In this section, the two surrounding items of listed heritage significance; the *Wallerawang rail bridges over Cox's River*/*Stone Viaduct Cox's River* (SHR) and the *Wallerawang A and B Power Stations chimney stack (S170)*, as well as the two additional items identified during the site visit as holding potential heritage significance; the *Original Western line railway alignment*, and the *sandstone culvert*, are assessed against the seven NSW Heritage Significance criteria listed in Section 4.2 (Table 5) per the guidelines provided below. NGH has used the assessments against each of the heritage significance criteria from the existing SHI database inventory listings for the two statutory listed items (presented in italics).

4.5.1. Criterion (a) – Historical:

An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area)

Guidelines for the inclusion or exclusion of an item as being of state or local heritage significance against criterion (a)
Guidelines for INCLUSION:
• shows evidence of a significant human activity • is associated with a significant activity or historical phase • maintains or shows the continuity of a historical process or activity
Guidelines for EXCLUSION:

• has incidental or unsubstantiated connections with historically important activities or processes • provides evidence of activities or processes that are of dubious historical importance • has been so altered that it can no longer provide evidence of a particular association

Wallerawang rail bridges over Cox's River (SHR: 01064)

This 1870 bridge is significant because it is one the oldest stone arch railway viaducts in NSW and its construction contributed significantly to the subsequent railway extension to Bathurst and on to western New South Wales.

The brick bridge is part of the Bowenfels to Wallerawang duplication, the last of such works dominated by brick arch construction.

Wallerawang rail bridges over Cox's River meets criterion (a) at a state level.

Wallerawang A and B Power Stations chimney stack (SHI: 3431007)

Wallerawang Power Station (including A & B Stations) is significant because of its role in the extension of the NSW integrated transmission system to the western coal fields.

Wallerawang A and B Power Station Chimney Stack meets criterion (a) at a local level.

Railway Embankment and sandstone culvert

The railway embankment and culvert were part of the original alignment of the Great Western Railway line prior to the 1927 deviation of the line from a point just before Marrangaroo Station to the Cox's River Viaduct. The deviation was built when the line was being duplicated. The opportunity was taken to reduce the grade between Marrangaroo and Cox's River from 1 in 40 to 1 in 80 and therefore this original section of line was by-passed.

The original line was built by contract labour under P. Higgins to whom the contract was let for the construction of the Great Western Railway line from Lithgow Zig Zag to Wallerawang on 18.7.1866, which included the railway line and associated infrastructure, the Cox's River Viaduct, and the Wallerawang Railway Station. The line was opened for traffic on 1.3.1870 as a single track.

The formation of the rail link to Sydney allowed coal won on the Western Coal Fields to be sent to Sydney and exported to other destinations. With the opening of the railway line to Wallerawang in 1871, the town began to develop adjacent to the station. Until the completion of the line to Bathurst in 1876, Wallerawang became the terminus for all travellers to Mudgee and Bathurst. Travellers were conveyed to Cobb and Co. Coaches at Wallerawang to complete the journey.

Like Lithgow, Wallerawang was to progressively develop an industrial focus. Its main activities were associated with the development of the shale-oil industry followed by the coal industry, and later power generation.

Railway embankment and sandstone culvert meets criterion (a) at a local level.

4.5.2. Criterion (b) – Associative:

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

Guidelines for the inclusion or exclusion of an item as being of state or local heritage significance against criterion (b)
Guidelines for INCLUSION:
• shows evidence of a significant human occupation • is associated with a significant event, person, or group of persons
Guidelines for EXCLUSION:
• has incidental or unsubstantiated connections with historically important people or events • provides evidence of people or events that are of dubious historical importance • has been so altered that it can no longer provide evidence of a particular association

Wallerawang rail bridges over Cox's River (SHR: 01064)

The early bridge is associated with John Whitton the 'father of New South Wales railways'. When John Whitton was denied funds to continue with the expensive wrought iron girder bridges, he chose the stone arch viaduct for his major bridge works, with this example being one of the largest examples.

Wallerawang rail bridges over Cox's River meets criterion (b) at a state level.

Wallerawang A and B Power Station Chimney Stacks (SHI: 3431007)

Wallerawang A and B Power Station Chimney Stacks do not have any associations with a significant event, person, or group of persons.

Wallerawang A and B Power Station Chimney Stack does not meet criterion (b) at a local or State level.

Railway embankment and sandstone culvert

The railway embankment and culvert are the remains of a section of the original alignment of the Great Western Railway (GWR) line. The GWR is associated with John Whitton and this section of the line was built by contract labour under P. Higgins to whom the contract was let for the construction of the Great Western Railway line from Lithgow Zig Zag to Wallerawang on 18.7.1866.

Railway embankment and sandstone culvert meets criterion (b) at a local level.

4.5.3. Criterion (c) – Aesthetic/Technical:

An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area)

Guidelines for the inclusion or exclusion of an item as being of state or local heritage significance against criterion (c)
Guidelines for INCLUSION:
• shows or is associated with, creative or technical innovation or achievement • is the inspiration for a creative or technical innovation or achievement • is aesthetically distinctive • has landmark qualities • exemplifies a particular taste, style or technology
Guidelines for EXCLUSION:
• is not a major work by an important designer or artist • has lost its design or technical integrity • its positive visual or sensory appeal or landmark and scenic qualities have been more than temporarily degraded • has only a loose association with a creative or technical achievement

Wallerawang rail bridges over Cox's River (SHR: 01064)

The Wallerawang rail bridges over Cox's River do not meet the criteria to be of aesthetic or technological significance.

Wallerawang rail bridges over Cox's River does not meet criterion (c) at a state level.

Wallerawang A and B Power Station Chimney Stacks (SHI: 3431007)

Wallerawang A & B Stations originally contained several items which were significant because of their innovative industrial design, within the context of power generation technology. These were the precipitators and the coal weighers which were of an innovative, lightweight design. As these are no longer present at the Power Station, it does not retain the integrity of these attributes.

Wallerawang Power Station, especially the stacks, can be said to have significance as a visually dominant element of the cultural landscape. The fact that it is a prominent landmark on the skyline for some distance, provides a visual focus and stimulus for evoking the local community's close historical and cultural association with the station.

Wallerawang A and B Power Station Chimney Stack meets criterion (c) at a local level.

Railway embankment and sandstone culvert

The sandstone culvert is well constructed with dressed masonry. It has aesthetic significance.

The sandstone culvert meets criterion (c) at a local level.

4.5.4. Criterion (d) – Social:

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

Guidelines for the inclusion or exclusion of an item as being of state or local heritage significance against criterion (d)
Guidelines for INCLUSION:
• is important for its associations with an identifiable group • is important to a community's sense of place
Guidelines for EXCLUSION:
• is only important to the community for amenity reasons • is retained only in preference to a proposed alternative

Wallerawang rail bridges over Cox's River (SHR: 01064)

The duplication work contributed significantly to the railway extension to Bathurst and to the continued development of Western New South Wales, for land transport to Sydney.

Wallerawang rail bridges over Cox's River meets criterion (d) at a state level.

Wallerawang A and B Power Station Chimney Stack (SHI: 3431007)

Wallerawang Power Station is significant as a major regional employer, drawing employees from the western Blue Mountains to Bathurst. It provided indirect employment through supplying local industries and business with contracts, and supporting local coal fields with contracts for coal. Thirdly, the Station played a pioneering role in some areas of mid-20th century industrial reform and employee relations within the electricity supply industry. It can therefore be said to have social significance for a large group of past employees at a local and regional level. Wallerawang Station, especially the stacks, can be said to have significance as a visually dominant element of the cultural landscape. The fact that it is a prominent landmark on the skyline for some distance, provides a visual focus and stimulus for evoking the local community's close historical and cultural association with the station.

Wallerawang A and B Power Station Chimney Stack meets criterion (d) at a local level.

Railway embankment and sandstone culvert

The railway embankment and culvert do not hold special significance to an identifiable group or provide a sense of place to the local community and therefore do not meet criterion (d).

4.5.5. Criterion (e) – Research

An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)

Guidelines for the inclusion or exclusion of an item as being of state or local heritage significance against criterion (e)
Guidelines for INCLUSION:
• has the potential to yield new or further substantial scientific and/or archaeological information • is an important benchmark or reference site or type • provides evidence of past human cultures that is unavailable elsewhere
Guidelines for EXCLUSION:
• the knowledge gained would be irrelevant to research on science, human history or culture • has little archaeological or research potential • only contains information that is readily available from other resources or archaeological sites

Wallerawang rail bridges over Cox's River (SHR: 01064)

The brick arch was still the most common form of railway bridge in the early 1920s due to the shortage of steel after World War I.

Wallerawang rail bridges over Cox's River meets criterion (e) at a state level.

Wallerawang A and B Power Station Chimney stack (SHI: 3431007)

The potential of research on Wallerawang A & B stations, based on either documentary or physical evidence, to contribute to a major or important research questions is likely to be low.

Wallerawang A and B Power Station Chimney Stack meets criterion (e) at a local level.

Railway embankment and sandstone culvert

The culvert is well constructed and has research potential to demonstrate building techniques of the NSW Railways as part of the Great Western Railway construction.

The sandstone culvert meets criterion (e) at a local level.

4.5.6. Criterion (f) – Rarity

An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area)

Guidelines for the inclusion or exclusion of an item as being of state or local heritage significance against criterion (f)
Guidelines for INCLUSION:
• provides evidence of a defunct custom, way of life or process • demonstrates a process, custom or other human activity that is in danger of being lost • shows unusually accurate evidence of a significant human activity • is the only example of its type • demonstrates designs or techniques of exceptional interest • shows rare evidence of a significant human activity important to a community
Guidelines for EXCLUSION:
• is not rare • is numerous but under threat

Wallerawang rail bridges over Cox's River (SHR: 01064)

The sandstone bridge has seventeen stone arch spans totalling 139.6m and is the longest masonry arch bridge ever built in Australia.

The Wallerawang sandstone rail bridge over Cox's River meets criterion (f) at a state level.

Wallerawang A and B Power Station Chimney stack (SHI: 3431007)

The Stacks from A & B station are considered significant under this criterion. Wallerawang was the first station to utilise concrete, faceted stacks. At later stations, this type was replaced by more modern smooth, tapered stacks.

Wallerawang A and B Power Station Chimney Stack meets criterion (f) at a local level.

Railway embankment and sandstone culvert

Railway embankment and sandstone culvert does not meet criterion (f) at a local level.

4.6. CRITERION (G) – REPRESENTATIVE:

An item is important in demonstrating the principal characteristics of a class of NSW' s cultural or natural places; or cultural or natural environments. (or a class of the local area' s)

Guidelines for the inclusion or exclusion of an item as being of state or local heritage significance against criterion (g)
Guidelines for INCLUSION:
• is a fine example of its type • has the principal characteristics of an important class or group of items • has attributes typical of a particular way of life, philosophy, custom, significant process, design, technique or activity • is a significant variation to a class of items • is part of a group which collectively illustrates a representative type • is outstanding because of its setting, condition or size • is outstanding because of its integrity or the esteem in which it is held
Guidelines for EXCLUSION:
• is a poor example of its type • does not include or has lost the range of characteristics of a type • does not represent well the characteristics that make up a significant variation of a type

Wallerawang rail bridges over Cox's River (SHR: 01064)

It is a fine representative example of a stone arch railway viaduct, and it retains its original fabric.

Wallerawang rail bridges over Cox's River meets criterion (g) at a state level.

Wallerawang A and B Power Station Chimney Stack (SHI: 3431007)

The station has a moderate significance under this criterion. Individual items of plant which represent well preserved examples of their type are the compressor house and the control room panels, including baily meters.

Wallerawang A and B Power Station Chimney Stack meets criterion (g) at a local level.

Railway embankment and sandstone culvert

Sandstone was locally available throughout the Blue Mountains and was used as an inexpensive yet strong material for bridges and culverts

The sandstone meets the criterion (g) at a local level.

4.7. STATEMENT OF SIGNIFICANCE

The following statements of heritage significance that are taken from the NSW State Heritage Inventory listing for an item is presented in italics.

4.7.1. Wallerawang rail bridges over Cox's River (SHR: 01064)

This 1870 bridge is significant because it is one the oldest stone arch railway viaducts in New South Wales. It is associated with John Whitton the 'father of New South Wales railways', it is an impressive sandstone structure on the outskirts of historic Wallerawang, its construction contributed significantly to the subsequent railway extension to Bathurst and on to western New South Wales and when John Whitton was denied funds to continue with the expensive wrought iron girder bridges he chose the stone arch viaduct for his major bridge works, particularly for the Zig Zag east of Lithgow and the extension west to Wallerawang. It is the largest of Whitton's stone arch viaducts. It is a fine representative example of a stone arch railway viaduct and it retains its original fabric.

Date significance updated: 15.3.2006

4.7.2. Wallerawang A and B Power Station Chimney Stack

These stations have now been demolished except for one remaining stack. Although the stations are seen as historically and socially significant, they had little aesthetic or scientific significance. The stations were regarded as having little significance under the criteria of representativeness due to being of relatively common type. Much of the significance is due to the stacks. These are significant under the criteria of rarity, but also maintain the historic and social significance of the site by providing a visual focus and stimulus for evoking the local community's close association with the station.

Date significance updated: 2.07.1999

4.7.3. Railway Embankment and Sandstone Culvert

The railway embankment and culvert are existing and original components of the Great Western Railway line constructed between 1866 and 1870. The Great Western Railway line is associated with John Whitton the 'father of New South Wales railways', and its construction contributed significantly to the subsequent railway extension to Bathurst and on to western New South Wales. In 1927 the line of track through the Project Area was decommissioned and replaced with the Marrangaroo deviation. This avoided a steep section of track through the Marangaroo ranges (Rowland 1954, p. 262). The decommissioned track was later resumed by Electricity Commission of New South Wales – Trading as Pacific Power in 1994.

The culvert is a well-constructed sandstone structure. The use of sandstone is common throughout the Blue Mountains and was locally available, strong and relatively inexpensive material. When John Whitton was denied funds to continue with the expensive wrought iron girder bridges, he chose the stone arch viaduct for his major bridge works, particularly for the Zig Zag east of Lithgow and the extension west to Wallerawang. The use of sandstone became common because of its strength and availability (i.e., the geology of the Blue Mountains is sandstone – in fact, beyond Cox's River the geology changes to granite). Other examples of sandstone for bridges and culverts appear along this route; some notable examples include Knapsack viaduct near Glenbrook, the Great Lithgow Zig Zag and the viaduct over Farmer's Creek between Bowenfels and Marrangaroo.

The railway embankment and culvert have historical significance having been constructed as the original alignment of the Great Western Railway extension from Bowenfels to Wallerawang. The culvert has aesthetic significance and demonstrates the quality of building techniques and workmanship employed by the NSW Railways in 1860s.

5. IMPACT ASSESSMENT

5.1. PROPOSED DEVELOPMENT

The proposal would involve the construction and operation of a large-scale BESS at Wallerawang, NSW. The BESS would require a built area of approximately 10 hectares of land within the Project Area (26 Ha). The configuration of the final built form of the proposal would be confirmed as part of further design developments and detailed within the EIS. The BESS will be up to 500 MW and would provide up to 1000 megawatt hours (MWh) of storage capacity, or up to two hours of storage duration.

The proposal would include the following key built form features:

- Subdivision of the Project Area, as required to delineate the Project Area from the remaining adjacent land.
- Operation of a large-scale BESS including battery enclosures, inverters and transformers and associated substation.
- A transmission line connection from an existing line in the northwest corner of the Project Area (above ground) between the BESS and the nearby TransGrid Wallerawang 330kV substation.
- Ancillary upgrades to the Wallerawang 330kV substation.
- A site access to the BESS from the Castlereagh Highway, with appropriate auxiliary turn treatments in accordance with AustRoad requirements.

The proposal will involve the following key construction activities:

- Site enabling work to prepare the Project Area and provide protection to the public, and surrounding environment, including:
    - Construction of the access road to the Project Area and a car park, which would become the permanent operation access road at the completion of construction.
    - Establishment of temporary environment controls (where required).
    - Vegetation clearance.
    - Utility supply to enable construction.
    - Construction site offices and laydown area establishment.
    - Additional geotechnical and contamination investigations, and remediation, where required.
- Earthworks, levelling, and other civil and ground preparation activities including the removal of spoil from the Project Area, if required.
- Delivery, installation and electrical fit-out for the proposal, including battery enclosures, invertors, transformers, and associated cabling and infrastructure.
- Connections between the BESS substation and the Wallerawang 330kV substation.
- Removal of construction equipment and rehabilitation of construction area.

The BESS is anticipated to be operational in 2023 with a design life of at least 20-25 years.

The BESS would be operational 24 hours a day, seven days a week. It is anticipated that the project itself would require three staff members on site per day, on an as-needs basis. The operational workforce would include maintenance workers and site technicians

Figure 5-1 Proposed Project Construction Footprint (provided by Acadis to NGH, 30.09.2021)

5.2. HERITAGE IMPACT QUESTIONS

The following questions are presented in the NSW Heritage Manual document *Statements of Heritage Impact* to address development proposals on heritage items (NSW Heritage Office 2002). These heritage impact questions are addressed with respect to the railway embankment and culvert.

What aspects of the proposal respect or enhance the heritage significance of the subject item?

The proposed works will avoid impact to the culvert and a 130m section of the former rail alignment. The remaining section with the culvert will remain and be maintained as physical evidence of the original alignment.

The embankment and culvert will be archivally recorded.

What aspects of the proposal could have a detrimental effect on the heritage significance of the subject item?

Destruction of 67.5% portion of the former railway line that remains within the Project Area and the resulting loss of physical evidence.

Have more sympathetic solutions been considered and discounted? Why?

Prior to the preliminary site visit and heritage assessment by NGH, the original development included the demolition of the railway embankment and culvert. However, once NGH recommended that the embankment and culvert had local heritage significance, other options were investigated.

A 'No impact' option proved not possible as the BESS needs to be installed on open cleared land within proximity to the TransGrid 300kV Substation and the south-east area is zoned already suitable for heavy industrial. The embankment will need to be removed to level out the area. It is unlikely that the embankment could be avoided during construction activities due to the earth works required to form a suitable bench for the BESS and as such would not be a practical solution to maintain the embankment in its entirety.

5.2.1. Major partial demolition

Is the demolition essential for the heritage item to function?

The former Great Western Railway track alignment is no longer in use, and the rail tracks have been previously removed from the site. All that currently remains as physical evidence of the previous alignment is the mounded earth that denotes the previous alignment of the track and the under passing sandstone culvert. As the track is no longer in use, continued function of the item is not applicable.

Are particular features of the item affected by the demolition (e.g. fireplaces in the buildings)?

The proposed partial demolition will be of the original Great Western Railway track alignment.

Is the detailing of the partial demolition sympathetic to the heritage significance of the item (e.g. creating large square openings in internal walls rather than removing the wall altogether)?

The proposed works have been modified from total demolition to major partial and will avoid impact to the culvert.

If the partial demolition is a result of the condition of the fabric, is it certain that the fabric cannot be repaired?

n/a

5.2.2. New development adjacent to a heritage item

How is the impact of the new development on the heritage significance of the item or area to be minimised?

Whilst a portion of the original Great Western Railway alignment will be removed to accommodate the proposed works (approximately 270 m of the 400 m total length will be removed), 32.5% of the railway line located within Project Area will be maintained as remaining physical evidence of the original alignment.

The retained section of the embankment will include the sandstone culvert as an example of one of a number of sandstone culverts along the GWR through the Blue Mountains.

Why is the new development required to be adjacent to a heritage item?

The Wallerawang BESS requires approximately 10ha. The location of the battery storage is required to be located on land owned by Greenspot and within proximity to the TransGrid 300kV Substation, and where no third-party easements or access across private property would be required (except for connection arrangements with TransGrid at its substation). Additionally, the site is already disturbed through the development of the pine plantation, which is scheduled for harvesting (under a sperate agreement) prior to the commencement of construction of the BESS. This reduces the overall impact of the proposal.

How does the curtilage allowed around the heritage item contribute to the retention of its heritage significance?

A buffer of 5 m will be maintained around the embankment and sandstone culvert. There is no public access to the site and there are no publicly accessible views.

Hard barricading will be used to ensure no accidental breach of the 5 m buffer during construction of the proposed BESS.

How does the new development affect views to, and from, the heritage item? What has been done to minimise negative effects?

There is no public access to the site and there are no publicly accessible views.

Is the development sited on any known, or potentially significant archaeological deposits? If so, have alternative sites been considered? Why were they rejected?

It has been identified in Section 3 of this SOHI report that the Project Area has been historically used as grazing land, except for the area of the railway branch line, bisecting the Project Area. No specific built items of heritage significance that are no longer extant have been identified as being located within the curtilage of the Project Area, and as a result any historic archaeological items would be limited to any remnant items from the railway line and or/ pastoral activities, such as fences and nails or tools.

Is the new development sympathetic to the heritage item? In what way (e.g. form, siting, proportions, design)?

The design of the BESS is not sympathetic to the former railway track and culvert. The BESS will be a modern, power installation and cannot be designed in a similar form or proportion to the original Great Western Railway track alignment or the culvert, as these items are pieces of infrastructure built in the 19th century.

Will the additions visually dominate the heritage item? How has this been minimised?

The addition of the BESS close to the sandstone culvert and over part of the original Great Western Railway alignment within the Project Area will visually dominate the heritage items due to the scale of the new addition. It should be noted however, that due to its size, the culvert can only currently be

viewed from a short distance. Furthermore, the embankment is only currently visible from the adjacent paddock. Finally, the railway embankment and culvert are currently on private land and cannot be viewed from any vantage points.

Will the public, and users of the item, still be able to view and appreciate its significance?

The sandstone culvert and original Great Western Railway alignment are currently located on private land and are not able to be viewed by the public.

5.3. SCOPE OF WORKS ASSESSMENT

The individual components of the proposed works are listed below and assessed for the potential impact on the identified heritage values and significance of the subject item (Table 5-2). The definitions of the assessment gradings are provided below.

Table 5-1. Heritage Impact Assessment Gradings

Heritage Impact Assessment Gradings
Positive – the proposal will enhance the heritage values and/or contribute to the preservation of the heritage item.
Nil/Neutral – no impact will result on the heritage significance of the heritage conservation zone.
Low – the proposal will impact minimally upon a heritage item or area but without impacting upon its significance.
Adverse – the proposal will impact directly upon identified heritage values of an item or area. However, the implementation of mitigation measures will reduce the impact and not alter heritage significance of the item or area.
High – the proposal represents excessive overall impact on the heritage item or area, directly reducing or removing the heritage significance of the item or area.

Table 5-2 Assessment of the proposed works to the Wallerawang BESS in relation to the heritage significance of the subject site

Proposed works to Wallerawang BESS	Effects of the proposal on the heritage significance of the subject site	Impact on the significance of the subject item.
Subdivision of the Project Area	Subdivision of the Project Area will occur to separate the area to be developed for the BESS project and the remaining lot. The proposed subdivision will result in the two items identified within this report as holding heritage significance (original Great Western Railway alignment, and the sandstone culvert) as being located within the Project Area. This subdivision will not result in a significant impact to the heritage significance of the item, as no aesthetic values have been identified in relation to the surrounds for either of the items.	Nil/neutral
Operation of a large-scale BESS including battery enclosures, inverters and transformers and associated substation	The Project would represent minimal traffic impacts during operation as traffic will be limited to staff and maintenance crews accessing the Project Site. The Project would operate 24 hours per day, seven days per week. Operational noise and Vibration would be associated with the inverters and transformers installed on the BESS and may have a minor impact to the longevity of the Sandstone Culvert located within 10 m of the BESS. Mitigation measures may be warranted.	Low
A transmission line connection from an existing line in the northwest corner of the Project Area (above ground) between the BESS and the nearby TransGrid Wallerawang 330kV substation	The installation of the above ground transmission line will involve the installation of two transmission towers with concrete footings fixed into the ground surface. The transmission powerlines will cross the Cox's River to the northern bank to connect to the Wallerawang 300 KV substation, crossing overhead, in parallel with the Wallerawang Rail Bridge. The proposed works will not impact any heritage items.	Nil/neutral
Ancillary upgrades to the Wallerawang 330kV substation	Upgrades will not be undertaken on or near an item of heritage significance, and will therefore not result in an overall impact to the heritage significance of the site.	Nil/neutral
A site access to the BESS from the Castlereagh Highway, with appropriate	Site access to the new BESS will require road widening works, including earthworks and sealing. These works will not be undertaken on or near and item of identified heritage	Nil/neutral

Proposed works to Wallerawang BESS	Effects of the proposal on the heritage significance of the subject site	Impact on the significance of the subject item.
auxiliary turn treatments in accordance with AustRoad requirements	significance and will therefore not result in an impact to any item of heritage.	
Site enabling work to prepare the Project Area and provide protection to the public, and surrounding environment	Site enabling works will include construction of an access road, vegetation clearance, utility supplies, construction of site offices, as well as geotechnical and contamination investigations. These works will not result in an overall negative physical or visual impact on any surrounding item of heritage significance.	Nil/neutral
Earthworks, levelling, and other civil and ground preparation activities including the removal of spoil from the Project Area	The proposed works will result in the levelling of the Project Area in order to allow the installation of the proposed BESS. These works will result in the levelling of approximately 270 m of the c.400 m remaining alignment of the original Great Western Rail line, that bisects the Project Area. Whilst the former railway itself has been previously removed from the site, the embankment that the line ran along remains in situ. The levelling of part of this alignment will therefore result in the loss of physical evidence of the item that has been assessed within this report as holding local heritage values. To help mitigate this impact, it has been determined that approximately 32.5% of the alignment will remain, and the entire line should be archivally recorded prior to works being undertaken to impact on the site.	Adverse
Delivery, installation and electrical fit-out for the proposal, including battery enclosures, invertors, transformers, and associated cabling and infrastructure	The proposed works to the site will include the installation of all relevant materials for the Wallerawang BESS. It has been assessed that this will not result in any visual impact to any items of surrounding heritage significance. The installation of the BESS will be located within the current pine plantation, located near the area of the original western rail line alignment, however this area will require levelling before the installation works will occur, and as a result, the installation of the BESS materials will not result in a physical impact to the heritage item.	Nil/neutral

5.4. SUMMARY OF IMPACTS

In summary, the assessment of heritage impacts for the proposal to construct and operate the Wallerawang BESS within the Project Area has found that the overall impact is minor and that any partial adverse impacts to the original Great Western Railway heritage impact can be mitigated by the retention of the sandstone culvert and the completion of an archival recording. This assessment is based on the following considerations:

- There will be no impact to any items of state heritage significance.
- There will be no impact to any locally listed items of heritage.
- The history of Project Area indicates that the Project Area was used primarily as paddocks for grazing and there is low potential for historical archaeology.
- While the railway embankment and sandstone culvert comprise a section of the original Great Western Railway line alignment, they are not rare. 130 m of the embankment will be preserved, including the sandstone culvert. The physical impact upon the railway embankment will not impact upon it's identified heritage values and significance. Partial conservation of the embankment and associated sandstone culvert will conserve existing values.

In summary, the cumulative impact of the proposed construction of the Wallerawang BESS is assessed to be low.

6. RECOMMENDATIONS

The following recommendations are made for the proposal:

1. Construction works should not cause secondary impacts on the culvert through vibrational impacts. A structural engineer should be consulted to consider how vibration risks to the culvert can be minimised and avoided.
2. An archival recording of the railway embankment and culvert should be completed both before and after the proposed works.
3. Any changes to the works outside of scope would be subject to additional assessment.
4. In the event any heritage finds are identified, works must cease temporarily and the 'Unexpected Finds Procedure' described in Appendix A should be adhered to.

7. REFERENCES

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APPENDIX A UNEXPECTED FINDS PROCEDURE

An unexpected heritage item means any unanticipated discovery of an actual or potential heritage item, for which the Proponent does not have prior approval to disturb or does not have a safeguard in place to manage the disturbance.

These discoveries are categorised as either:

a) Aboriginal objects
b) Historic/non-Aboriginal heritage items
c) Human skeletal remains

If any of the above items are suspected or identified during construction, then a series of steps must be followed. These are outlined below:

1. All work should cease in that area and notify a Project Manager or Supervisor immediately of the find.
2. A ‘no-go’ zone should be established around the find, using visibility fencing (where applicable).
3. Inform all on-site personnel and staff of the find and the demarcated ‘no-go’ zone.
4. Contact a qualified archaeologist/heritage consultant to inspect the find and provide recommendations.
5. If human remains are identified, complete steps 1-3. Replace Step 4 by immediately contacting the local police to investigate as the find may relate to a criminal investigation. The police may take command of part or all of the site.
6. Once clearance of the site has been given by a qualified archaeologist/heritage consultant, then works may proceed within the ‘no-go’ zone UNLESS specifically instructed by the professional that no further works can be completed.