11

11 EUROPEAN HERITAGE

11.1 Introduction

A European Heritage Report prepared by Godden Mackay Logan (GML) focussed on the areas where construction work would take place at or above the ground surface, namely the surface civil construction sites, including station areas and service facilities, at grade rail line, above-ground viaducts and bridges and the stabling facility (refer to Technical Paper 3).

The objectives of the European Heritage Report were to address impacts on European heritage from the Major Civil Construction Works component of the NWRL project, which would primarily result from demolition and clearing, removal of vegetation and site preparation works such as excavation and establishing foundations.

11.2 Director-General's Requirements, Conditions of Approval and Statement of Commitments

Table 111 sets out the Director-General's Requirements (DGRs), the Conditions of Approval (CoA) and Statement of Commitments (SoCs) as they relate to European heritage, and where in the project these have been addressed.

Table 11.1 Director-General's Requirements, Conditions of Approval and Statements of Commitment

DGR Reference	Description	Addressed
Non-Indigenous Heritage	Potential visual and cultural landscape impacts on Rouse Hill House Estate must be assessed.	Section 11.5.16.
CoA Reference	**Description**	**Addressed**
3.15	The Proponent shall review the European Heritage impacts of the project, describing measures to minimise and / or appropriately manage impacts.	Sections 11.5 and 11.6.
Statement of Commitments	**Description**	**Addressed**
30	Additional research would be undertaken to determine the history and potential heritage significance of the sites identified in Castle Hill. Site-specific archaeological assessments would be undertaken in the event that they are found to have heritage significance.	Sections 11.5.4 and 11.6.
31	Site-specific archaeological assessments would be undertaken for the two archaeological sites identified along Old Windsor Road and Windsor Road.	Section 11.6.
32	A view analysis would be undertaken to and from Rouse Hill House and its estate and the Glenhope property. If required appropriate mitigation measures would be identified	Section 11.6.

11.3 Assessment Methodology

The methodology for the European Heritage Report undertaken for the project included:

- Review of heritage reports previously prepared for the NWRL project.
- Review of statutory heritage lists, including the State Heritage Register, heritage schedules on Local Environmental Plans (LEPs) and Regional Environmental Plans (REPs), State Agency Section 170 heritage and conservation registers and the Register of the National Estate, National Heritage List and Commonwealth Heritage List.
- Review of non-statutory heritage lists, including the National Trust Register and the Royal Australian Institute of Architects (RAIA) Register of Significant 20th Century Buildings.
- Review of relevant archaeological assessments and zoning plans as available.
- Desktop research and historical research, including a review of relevant conservation management plans (CMPs) and plans of management.

- Consultation with heritage advisors at local councils and state agencies regarding items on their heritage registers.
- Assessments of heritage significance for the assessed heritage items, including heritage curtilages and assessments of condition, based on the NSW heritage criteria as set out in the NSW Heritage Manual guideline Assessing Heritage Significance, prepared by the NSW Heritage Council 2002.
- Site inspections of the NWRL route undertaken by GML.

11.4 Existing Environment

The European Heritage Report provides an historical overview of the districts through which the route of the NWRL passes as well as historically important areas close by. It also outlines the historical context, including a brief history of settlement and land use in those regions where the NWRL is to be built. Below is a summary of this historical and heritage context for each construction site.

11.4.1 Construction Site 1 (Epping Services Facility) and Construction Site 2 (Epping Decline)

The area around construction sites 1 and 2 is characterised by late nineteenth and early twentieth century residential development. The Northern Railway was constructed through Epping in 1886 and the area, which had previously been dominated by orchards and sparsely settled, saw a marked increase in population and residential development.

In the vicinity of the Epping construction sites there is remnant native bushland and sandstone outcropping. Some individual trees within the bushland date from circa 1940 and include Blackbutt Blue Gum, Stringybark, Red Bloodwood, Pittosporum and many smaller shrubs. The bushland provides evidence of the original, natural landscape of the Epping area.

11.4.2 Construction Site 3 (Cheltenham Services Facility)

The site area at Cheltenham Park lies within the boundary of the broader Beecroft/Cheltenham Heritage Conservation Area, which is significant because it demonstrates layers of suburban subdivision, re-subdivision and development from the 1880s until the present day. The construction area contains numerous individual houses, churches and other structures of fine aesthetic quality from the Victorian, Federation, Inter-war and Post-war periods, many of which were designed by architects of note. The intactness of the early twentieth century residential fabric and streetscape contributes to the significance of this area.

The area demonstrates the influence of the natural topography and vegetation on the suburban fabric. Remnant vegetation is closely integrated into the street patterns and residential allotments, and the dominant character of the area is derived from the tall tree canopy in pockets of remnant forests and in reserves. The forest trees provide a backdrop behind the majority of the buildings. Records show that the oval at Cheltenham Park was constructed in circa 1934 and aerial photographs of the area indicate that the oval was well established by 1943. The existing amenities block near Castle Howard Road appears to have been constructed at a later date.

11.4.3 Construction Site 4 (Cherrybrook Station)

The area of construction site 4 remained largely rural until the 1960s. The station site currently consists of a number of residential properties, some areas of open space, as well as bushland and a transmission line easement. Some large houses established during the late nineteenth century and early twentieth century are located nearby. The character of Castle Hill Road in this area remains predominantly verdant with stands of tall trees remaining on both sides of the road.

Glenhope, a large two-storey residence is situated on the southern side of Castle Hill Road, directly opposite the proposed station site. The house, which faces the road, is set back within a landscaped garden setting and extensive grounds. The outlook from Glenhope to the north is of trees and bushland on the northern side of Castle Hill Road and provides an appropriate setting for the house. Inala School, located on Castle Hill Road, is a good example of a large early Federation Bungalow style house.

11.4.4 Construction Site 5 (Castle Hill Station)

Arthur Whitling Park was established in the 1930s on the site of a former tramway terminal (1910-1922) and later Castle Hill Railway station (1923-1932) to perpetuate the memory of former local Councillor and Shire President Arthur Whitling. An Anzac Memorial Hall was located at the southern end of the park until 2005. It was constructed for use as the first Castle Hill RSL and was later used as a cinema, then community hall. A number of potentially significant items are located within the grounds of this park including a war memorial, several other memorials and commemorative trees, as well as some other mature trees.

11.4.5 Construction Site 6 (Hills Centre Station)

Castle Hill Showground has hosted the annual Castle Hill Show since the 1890s and is regularly used by a number of local community groups. The showground has retained its rural character which is reinforced by the vernacular nature of the majority of sheds and pavilions located to the north and west of the large show ring. The shape and size of the fenced arena with its perimeter racetrack has been modified a number of times during the past one hundred and twenty years.

The existing showground site covers an extensive area and includes a fenced oval and racetrack on the eastern side of Doran Drive (and to the immediate north of the Hills Centre) as well as a number of associated buildings and structures including several showground pavilions (the oldest, the Taylor Pavilion, now home of a local theatre group, was built in 1925).

11.4.6 Construction Site 7 (Norwest Station)

Historically, the area was characterised by large land grants made in the early years of the colony, the largest being a grant to Foveaux and Grimes in 1799—land which was known as Bella Vista Farm from 1821. The transformation of the area into residential and commercial development has occurred over the past 20 years.

11.4.7 Construction Site 8 (Bella Vista Station)

The designated site for Bella Vista Station is located on the eastern side of Old Windsor Road. Similar to construction site 7, the area was characterised by large land grants made in the early years of the colony. Foveaux and Grimes in 1799 obtained the largest land grant known as Bella Vista Farm from 1821. The area was connected to Sydney by the Old Windsor Road, established in 1794.

11.4.8 Construction Site 9 (Balmoral Road)

There are no known heritage items or potential heritage items within the proposed Balmoral Road construction works zone. No known archaeological sites have been identified within the proposed Balmoral Road construction works zone.

11.4.9 Construction Site 10 (Memorial Avenue)

The area of the Memorial Avenue construction site has historically been rural, with the area sparsely developed and populated. Old Windsor Road has been the main road through the area since 1794.

11.4.10 Construction Site 11 (Kellyville Station)

The site for Kellyville Station on the eastern side of Old Windsor Road is located within an area along an original alignment of the road. The area of the station remained predominantly rural until the 1990s, when residential subdivisions and development began to occur.

11.4.11 Construction Site 12 (Samantha Riley Drive to Windsor Road)

The area of construction site 12 has historically been rural and sparsely populated. Until comparatively recently, development in the vicinity of this site has also been sparse. Old Windsor Road has been the main road through the area since 1794.

11.4.12 Construction Site 13 (Old Windsor Road to White Hart Drive)

The area of construction site 13 remained predominantly rural following European settlement in the area and the construction of Old Windsor Road in the late eighteenth century. Residential subdivisions have occurred since the late twentieth century and are transforming the visual character of the area.

One heritage item is located in the vicinity of the construction site, Mungerie, a late-nineteenth century house located on Windsor Road, south of White Hart Drive. The house is located within an allotment that has been landscaped to mimic the historic rural setting of the building. The current allotment although substantial, is a remnant of what once was originally a much larger landholding. The open character of the vegetated landscape and the nature and spacing of the trees along both sides of the traditional entry drive between Mungerie and the North – West T-way provides an appropriate rural setting for the house. The house has been refurbished for use as the Rouse Hill Visitor Information Centre.

11.4.13 Construction Site 14 (Rouse Hill Station)

The proposed Rouse Hill Station would be located in an area that includes a number of sites with historical associations with the colonial period. These include the site of the Battle of Vinegar Hill in 1804 (the colony's only convict uprising), Old Windsor Road (one of the earliest roads in the colony) and Rouse Hill Farm, which was the property of free settler Richard Rouse, superintendent of public works for Parramatta, Richmond and Windsor in the early nineteenth century.

11.4.14 Construction Site 15 (Windsor Road Viaduct)

This site is to occupy the north-east and north-west corners of the intersection of Windsor Road, Schofields Road, and Rouse Hill Drive plus a small zone in the median of Windsor Road. The site

currently comprises an overflow carpark for the Rouse Hill Town Centre on the north-east side and a residential property on the north-west side. No heritage context was identified for this area.

11.4.15 Construction Site 16 (Windsor Road Viaduct to Cudgegong Road)

The area of construction site 16 was formerly part of the Rouse Hill Estate one of the major colonial estates in the area and most likely contained open paddocks. Aerial photographs indicate that the paddocks in this area had reverted to bushland by 1947. Subdivision of the estate for smaller rural allotments occurred from the second half of the twentieth century.

11.4.16 Construction Site 17 (Cudgegong Road Station and Tallawong Stabling Facility)

Both Cudgegong Road Station and Tallawong Stabling Facility would be on land that was originally part of the Rouse Hill Estate. The surrounding rural areas are designated for future urban development.

11.5 Potential impacts

In order to assess the potential impacts of the proposed works a ranking measuring the severity of potential impacts on heritage values was developed. The methodology used to rate the severity is explained in **Table 11.2**.

Table 11.2 Ranking of severity of heritage impact

Rating	Definition
Major adverse	Actions which will have a severe, long-term and possibly irreversible impact on a heritage item. Actions in this category would include partial or complete demolition of a heritage item or addition of new structures in its vicinity that destroy the visual setting of the item. These actions cannot be fully mitigated.
Moderate adverse	Actions which will have an adverse impact on a heritage item. Actions in this category would include removal of an important part of a heritage item's setting or temporary removal of significant elements of fabric. The impact of these actions could be reduced through appropriate mitigation measures.
Minor adverse	Actions which will have a minor impact on a heritage item. This may be the result of the action affecting only a small part of the place or a distant/small part of the setting of a heritage place. The action may also be temporary and/or reversible.
Neutral	Actions which will have no heritage impact.
Minor positive	Actions which will bring a minor benefit to a heritage item, such as an improvement in the item's visual setting.
Moderate positive	Actions which will bring a moderate benefit to a heritage item, such as removal of intrusive elements or fabric or a substantial improvement to the item's visual setting.
Major positive	Actions which will bring a major benefit to a heritage item, such as reconstruction of significant fabric, removal of substantial intrusive elements/fabric or reinstatement of an item's visual setting or curtilage.

The European Heritage Report (refer to Technical Paper 3) identifies the existing and potential heritage items and archaeological potential within or in the vicinity of the 17 construction sites along the route of the proposed NWRL and explains the likely direct and indirect impacts upon these items resulting from the proposed works. A summary is provided below.

11.5.1 Construction Site 1 (Epping Services Facility) and Construction Site 2 (Epping Decline)

Figure 11.1 shows the location of potentially impacted European heritage items in the vicinity of construction sites 1 and 2.

Heritage Items

Heritage items in the vicinity of construction sites 1 and 2 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.3**.

Table 11.3 Potentially impacted heritage items in the vicinity of construction sites 1 and 2

No.	Item	Address	Listing
357	Bushland	Road Reserve, Beecroft Road between Carlingford Road and Kandy Avenue, Epping	Local (Hornsby LEP)
403	'Woodlands' house	25 Ray Road, Epping	Local (Hornsby LEP)

Archaeological Potential

A stone causeway over Devlins Creek was identified to the north of construction sites 1 and 2, refer **Table 11.4**. No other known historical archaeological sites are located within the construction sites.

Table 11.4 Archaeological potential of construction sites 1 and 2

Item	Address	Listing	Archaeological Remains	Archaeological Potential
Stone causeway over Devlins Creek	Beecroft Road, Epping	Local (Hornsby LEP)	Aligned sandstones	High

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that two heritage items are likely to be affected by the NWRL project. The potential impacts on these items are assessed in**Table 11.5**.

Other existing heritage items are located within the broader vicinity of construction sites 1 and 2, but were assessed as being unlikely to be affected by the proposed works due to the nature of existing development in the immediate vicinity and their distance from the proposed civil construction work sites.

Table 11.5 Assessment of Heritage Impacts – construction sites 1 and 2

Bushland, road reserve Beecroft Road between Carlingford Road and Kandy Avenue	
Significance	**Local**
Statement of Significance	Remnant native forest in prominent location along Beecroft Road in Epping. Of local significance. (State Heritage Inventory) Remnant native forest and sandstone outcropping located north of Epping Station. Individual trees within the bushland date from circa 1940 and include Blackbutt Blue Gum, Stringybark, Red bloodwood, Pittosporum and many smaller shrubs. The bushland has aesthetic significance at the Local level, forming an attractive visual corridor along Beecroft Road. The bushland provides evidence of the original, natural landscape of the Epping area.
Heritage Impact	It is understood that the civil construction works at Epping (the Epping Decline) would require the removal of some existing bushland including a number of trees in the vicinity of Beecroft Road, (opposite Kandy Avenue) and the existing railway corridor. Planned works for the proposed Epping Services Facility would also necessitate removal of part of the existing heritage-listed bushland in the zone between Carlingford Road and Kandy Avenue. The construction works proposed for both Epping sites would have a major adverse impact upon the heritage-listed bushland in this region due to the necessary clearing of some existing vegetation.
'Woodlands' house	
Significance	**Local**
Statement of Significance	Fine quality Federation Bungalow style house with complex roof form and good original sandstone. Integrity partly compromised by verandah enclosures. (State Heritage Inventory) Woodlands house has an aesthetic and representative significance at the Local level. It is a good, representative example of the Federation Bungalow style architecture and retains primary features of the style, including a sandstone and timber verandah and rendered brick chimneys. The visual setting of the house has been compromised by the adjacent residential flat development, which has removed its original grounds.
Heritage Impact	The designated civil construction works sites are mainly separated from Woodlands house by existing medium density unit development along the eastern side of Edensor Street. An area of remnant bushland beyond the medium-density development is evident in views from the house and forms part of its visual setting. As this remnant bushland would not be removed for the construction of the Epping Services Facility there would be a neutral impact on the historic setting of the house.

Assessment of Archaeological Impacts

GML determined that there is no known archaeological potential within construction sites 1 and 2. The stone causeway over Devlins Creek is located outside the construction sites and would not be affected by the works. There is the possibility of indirect impacts on the causeway from erosion and sedimentation associated with the construction works.

11.5.2 Construction Site 3 (Cheltenham Services Facility)

Figure 11.2 shows the location of potentially impacted European heritage items in the vicinity of construction site 3.

Heritage Items

Heritage items in the vicinity of construction site 3 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.6**.

Table 11.6 Potentially impacted heritage items in the vicinity of construction site 3

No.	Item	Address	Listing
70	Bushland Reserve, Beecroft/ Cheltenham Park	Castle Howard Road, Beecroft	Local (Hornsby LEP)
69	Street trees	Castle Howard Road, Beecroft	Local (Hornsby LEP)
-	Beecroft/Cheltenham Heritage Conservation Area	Area generally bounded by Boundary Road, Hull Road, Beecroft and Castle Howard Bushland Reserves and the suburb boundaries of Epping and North Epping.	Local (Hornsby LEP)

Archaeological Potential

There are no known archaeological sites within the boundary of the Cheltenham Services Facility construction zone.

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, GML determined that there is potential for two heritage items and one heritage conservation area to be affected by the NWRL project. The potential impacts on these items are assessed in **Table 11.7**.

Other existing heritage items are located within the broader vicinity of construction site 3, but were assessed as being unlikely to be affected by the proposed works due to the nature of existing development in the immediate vicinity and their distance from the proposed civil construction work sites.

Table 11.7 Assessment of Heritage Impacts – construction site 3

Bushland Reserve, Beecroft/Cheltenham Park	
Significance	**Local significance**
Statement of Significance	Bushland reserve along railway and adjacent roadsides significant element on local landscape and for passenger traffic on trains.(State Heritage Inventory) The bushland reserve at Cheltenham Park has significance at the Local level for its aesthetic qualities and natural values. Trees in the reserve include Blue Gums, Grey Ironbark, Smooth Bark Angophora, Pittosporum and Geebung. Note: The oval and sports amenities at Cheltenham Park are not included in the listing.
Heritage Impact	Part of an existing heritage-listed bushland reserve in the vicinity of the Cheltenham Oval area would be affected by the removal of trees to enable works. However, the affected area represents a relatively small percentage of the total tract of bushland in this area. The proposed construction works will have a minor adverse impact on the bushland reserve.

Street Trees, Castle Howard Road, Beecroft	
Significance	**Local significance**
Statement of Significance	Roadside verge conserving remnant forest of indigenous trees and some indigenous shrubs displaying rustic bushland local Australian identity. Of local significance. (State Heritage Inventory).
Heritage Impact	The street trees along the full length of Castle Howard Road are listed as a landscape heritage item of local significance on Hornsby LEP. Construction of the proposed service facility at Cheltenham would have a minor adverse impact on this item resulting from the necessary removal of a number of trees along the southern side of the road at Cheltenham Park.

Beecroft / Cheltenham Heritage Conservation Area	
Significance	**Local significance**
Statement of Significance	The heritage conservation area is significant because it contains numerous churches, houses and other structures from the Victorian, Federation and Inter-War and Post-War periods, many of which were designed by architects of note. The area exhibits layers of suburban subdivision, re-subdivision and development from the 1880s until the present day. Also contributing to the significance of the area is the intactness of the streetscape and early twentieth century residential fabric. The suburban fabric of the heritage conservation area has been influenced by the natural topography and vegetation. The dominant character of the area is derived from the tall tree canopy in areas of remnant forests and reserves, and remnant vegetation is closely integrated into the street patterns and residential allotments.

Heritage Impact	As the existing areas of bushland in the vicinity of Cheltenham Oval make an important contribution to the character of the Beecroft / Cheltenham Conservation Area, it follows that the loss of vegetation resulting from the construction activities associated with the Cheltenham Services Facility site would have a minor adverse impact upon the significance of the broader conservation area.

Assessment of Archaeological Impacts

As no archaeological potential has been identified within the construction zone, the construction works are unlikely to have an archaeological impact.

11.5.3 Construction Site 4 (Cherrybrook Station)

Figure 11.3 shows the location of potentially impacted European heritage items in the vicinity of construction site 4.

Heritage Items

Heritage items in the vicinity of construction site 4 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.8**.

Table 11.8 Potentially impacted heritage items in the vicinity of construction site 4

No.	Item	Address	Listing
197	Glenhope	113 Castle Hill Road, West Pennant Hills	Local (Baulkham Hills LEP)
303	Inala School	160-168 Castle Hill Road, Cherrybrook	Local (Hornsby LEP)

Archaeological Potential

Two potential archaeological sites were identified within construction site 4, refer **Table 11.9**.

Table 11.9 Archaeological potential of construction site 4

Site	Address	Listing	Archaeological Remains	Archaeological Potential
House Site	Franklin Road, Cherrybrook	Noted in Casey and Lowe (2006)	Structural remains (postholes, timber posts), wells/cisterns, privies, refuse dumps, sand pits, scattered domestic and other artefacts, evidence of land cultivation.	Low

Site	Address	Listing	Archaeological Remains	Archaeological Potential
House Site	Franklin Road, Cherrybrook	Noted in Casey and Lowe (2006)	Structural remains (postholes, timber posts), wells/cisterns, privies, refuse dumps, sand pits, scattered domestic and other artefacts, evidence of land cultivation.	Low

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is potential for two heritage items to be affected by the NWRL project. The potential impacts on these items are assessed in **Table 11.10**.

Other existing heritage items are located within the broader vicinity of construction site 4, but were assessed as being unlikely to be affected by the proposed works due to their distance from the proposed civil construction work sites.

Table 11.10 Assessment of Heritage Impacts – construction site 4

Glenhope

Significance	State
Statement of Significance	Glenhope is an intact early Federation period mansion characteristic of its type. It is particularly important for its retained internal finishes and architectural features which heralded new trends in late nineteenth century interior decoration. Its prominent ridge-crest location, remnant garden features and mature trees provide Glenhope with an outstanding setting which is rare for this area. (Adapted from the Australian Heritage Places Inventory).
Heritage Impact	The construction works would have some temporary adverse impacts upon the setting of (and the outlook from) the heritage-listed Glenhope, which is directly opposite the access road to Cherrybrook Station construction site. Existing vegetation on the northern side of the road (within the construction site) forms part of the visual setting for Glenhope house. Much of this vegetation would be removed from the proposed civil construction works. The proposed construction woks would have a moderate adverse impact on the visual setting of Glenhope.

Inala

Significance	Local
Statement of Significance	Good example of a large early Federation Bungalow style house. Elegant design with distinctive tall chimney and pair of gablets. Integrity affected by some unsympathetic modifications. (State Heritage Inventory).

Glenhope

Significance	State
Statement of Significance	Glenhope is an intact early Federation period mansion characteristic of its type. It is particularly important for its retained internal finishes and architectural features which heralded new trends in late nineteenth century interior decoration. Its prominent ridge-crest location, remnant garden features and mature trees provide Glenhope with an outstanding setting which is rare for this area. (Adapted from the Australian Heritage Places Inventory).
Heritage Impact	The construction works would have some temporary adverse impacts upon the setting of (and the outlook from) the heritage-listed Glenhope, which is directly opposite the access road to Cherrybrook Station construction site. Existing vegetation on the northern side of the road (within the construction site) forms part of the visual setting for Glenhope house. Much of this vegetation would be removed from the proposed civil construction works. The proposed construction woks would have a moderate adverse impact on the visual setting of Glenhope.
Heritage Impact	There may be some minor impact upon the setting of this property resulting from the station construction works if trees are to be removed from near Franklin Road. It is considered that the proposed construction works would have a minor adverse impact on Inala.

Assessment of Archaeological Impacts

Any archaeological remains associated with the two structures would be located within the perimeters of the proposed deep excavations for the construction of Cherrybrook Station. The proposed earthworks required for the station would result in the removal of any potential archaeological resource that may have survived at the site. This would be a *moderate adverse* impact.

11.5.4 Construction Site 5 (Castle Hill Station)

Figure 11.4 shows the location of potentially impacted European heritage items in the vicinity of construction site 5.

Heritage Items

Heritage items in the vicinity of construction site 5 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.11**.

Table 11.11 Potentially impacted heritage items in the vicinity of construction site 5

No.	Item	Address	Listing
-	Arthur Whitling Park	Old Northern Road, Old Castle Hill Road and McMullen Avenue	Not listed
-	The White House Gallery	6 McMullen Avenue, Castle Hill	Not listed

Archaeological Potential

The Parramatta to Castle Hill tramway consisted of a single track with a reversing loop at Castle Hill and was extended to Rogans Hill in 1924. This tramway was used to transport fruit grown in the Castle Hill district to markets in Sydney. This tramway is not listed as a heritage item or archaeological site in The Hills Shire LEP however it has been assessed by Casey and Lowe (2006) as having high local significance.

Based on the available historical evidence of the high level of disturbance caused by the construction of Arthur Whitling Park, it is considered unlikely that archaeological evidence associated with the former tramway and terminus still survives at the site.

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is potential for two heritage items to be affected by the NWRL project. The potential impacts on these items are assessed in **Table 11.12**.

Other existing heritage items are located within the broader vicinity of construction site 5, but were assessed as being unlikely to be affected by the proposed works due to their distance from the proposed civil construction work sites.

Table 11.12 Assessment of Heritage Impacts – construction site 5

Arthur Whitling Park

Significance	Local (potential)
Statement of Significance	Arthur Whitling Park has significance at the local level for its historic use as the site of the Castle Hill railway station and terminus, and as the first site of the Castle Hill RSL, in the Anzac Memorial Hall (demolished 2005). The reserve land has a long history of community use, being the site of Castle Hill's first community hall in 1879. However, no physical evidence of these past significant uses remain within the reserve; rather, its history is reflected in the numerous plaques and memorials to local people that are scattered throughout the reserve and the construction of a new war memorial at its northeastern corner. The war memorial and commemorative elements have social value at a local level as places of remembrance and ceremony. Arthur Whitling Park has some aesthetic significance for its elegant arrangement of mature trees and planted beds.
Heritage Impact	The entire area of Arthur Whitling Park would be directly affected by the proposed works. This park is not a listed heritage item however it has existed since the mid-1930s, and it contains several monuments and memorials as well as numerous established mature trees. An existing war memorial including a central fountain occupies the northern section of the park. The memorials would be dismantled and placed within the station precinct or as agreed with the Returned and Services League (RSL). The removal of the park and all of its various components would adversely affect the existing aesthetic character of the space. The works would also have negative heritage impacts upon the existing historic and social values of the park. The works are considered to have a range of adverse impacts from minor to major, depending on the individual item.

White House Gallery

Significance	Local
Statement of Significance	The White House Gallery has significance at the local level for its historic aesthetic values. This former residence is a good representative example of the Inter-War Spanish Mission style of domestic architecture. Its characteristic features include a roughly textured stucco wall finish, gabled tops to the chimneys and a projecting loggia-style porch with barley twist columns supporting a series of four arched openings beneath a decorative parapet. It is now a part of a centre for senior citizens.
Heritage Impact	The White House Gallery is located directly opposite the northeastern end of Arthur Whitling Park on the northern side of McMullen Avenue. The building is oriented towards the southeast, and does not face the park. Its traditional setting has previously been compromised by later building construction. Although the construction works for Castle Hill Station would have some impact on the visual setting of this building, such impact would be of a minor nature. The excavation of the reserve would have some impact on the visual setting of the house. However, the works are considered to have a minor adverse impact.

Assessment of Archaeological Impacts

The potential archaeological remains associated with the Parramatta to Castle Hill tramway and terminus are located within the perimeter of the proposed deep excavations for the construction works, therefore any potential archaeological resource would be totally removed. This was determined to be a *moderate adverse* impact.

11.5.5 Construction Site 6 (Hills Centre Station)

Figure 11.5 shows the location of potentially impacted European heritage items in the vicinity of construction site 6.

Heriitage Items

Heritage items in the vicinity of construction site 6 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.13**.

Table 11.13 Potentially impacted heritage items in the vicinity of construction site 6

No.	Item	Address	Listing
-	Castle Hill Showground	Showground Road, West Pennant Hills	Not listed

Archaeological Potential

Two potential archaeological sites were identified within construction site 6, refer **Table 11.14**.

Table 11.14 Archaeological potential of construction site 6

Item	Address	Listing	Archaeological Remains	Archaeological Potential
House Site	Off Carrington Road, Castle Hill	Noted in Casey and Lowe (2006)	Structural remains (remnant footings, postholes), services, wells/ cisterns, privies, refuse dumps and pits with artefacts.	Low-medium
House Site	Off Carrington Road, Castle Hill	Noted in Casey and Lowe (2006)	Structural remains (remnant footings, postholes), services, wells/ cisterns, privies, refuse dumps and pits with artefacts.	Low-medium

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is potential for one heritage item to be affected by the NWRL project. The potential impacts on this item are assessed in **Table 11.15**.

Other existing heritage items are located within the broader vicinity of construction site 6, but were assessed as being unlikely to be affected by the proposed works due to their distance from the proposed civil construction work sites.

Table 11.15 Assessment of Heritage Impacts – construction site 6

Castle Hill Showground	
Significance	**Local**
Statement of Significance	Castle Hill Showground has significance at the local level for its historic, rarity and representative values. The showground has been the home of the Castle Hill Show since 1890, which by the 1950s was the second largest show in Sydney region, after the Royal Agricultural Society's show at Moore Park. It provides evidence of the historical importance of agriculture to The Hills district and is a reminder of the vital role the area once played in providing produce for Sydney. Castle Hill Showground is a representative example of rural showgrounds in NSW, with a large show ring and pavilions arranged around it. While the shape of the show ring has changed over time, the layout of the showground, with the pavilions arranged around the north and western edges of the show ring, remains unchanged since at least 1930. The Showground is an important and much used cultural and recreational facility in The Hills Shire.
Heritage Impact	The designated construction zone would have potential adverse impacts upon parts of the Castle Hill Showground, which is a rare example of a rural-style showground within the Sydney metropolitan area. The showground facility has existed in this location since the 1890s and the place retains its rural character. However it is considered that very few of the existing showground pavilions and associated structures have high heritage values as individual built elements. The resulting impacts on the affected portion of the Showground and some component items in this region would be major. Whereas, other areas and component elements of the Showground well outside the construction zone would remain relatively unaffected by the works.

Assessment of Archaeological Impacts

Any potential archaeological remains associated with the two pre-1920s buildings identified on historic plans and aerials would be located within the area designated for earthworks construction of the Hills Centre Station. The nature of the proposed earthworks would require that any archaeological remains in situ be removed prior to the construction phase. It was determined that this would be a moderate adverse impact.

11.5.6 Construction Site 7 (Norwest Station)

Heritage Items

No heritage items in the vicinity of construction site 7 were assessed as having the potential to be impacted by the NWRL.

Archaeological Potential

No known archaeological sites were identified within the proposed Norwest Station construction zone.

Assessment of Heritage Impacts

It was determined that the construction zone for Norwest Station would not result in any adverse impacts on any known European heritage items.

Assessment of Archaeological Impacts

As no archaeological potential was identified within the construction zone, it was concluded that the construction works are unlikely to result in any archaeological impacts.

11.5.7 Construction Site 8 (Bella Vista Station)

Figure 11.6 shows the location of potentially impacted European heritage items in the vicinity of construction site 8.

Heritage Items

Heritage items in the vicinity of construction site 8 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.16**.

Table 11.16 Table 1116:Potentially impacted heritage items in the vicinity of construction site 8

No.	Item	Address	Listing
-	Bella Vista	Elizabeth Macarthur Drive, Bella Vista	State Heritage Register

Archaeological Potential

No known archaeological sites were identified within the proposed Bella Vista Station construction zone.

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is potential for one heritage item to be affected by the NWRL project. The potential impacts on this item are assessed in **Table 11.17**.

Other existing heritage items are located within the broader vicinity of construction site 8, but were assessed as being unlikely to be affected by the proposed works due to their distance from the proposed civil construction work sites.

Table 11.17 Assessment of Heritage Impacts – construction site 8

Bella Vista Farm	
Significance	**State**
Statement of Significance	Bella Vista Farm is of at least state significance to NSW as a rare example of an intact rural cultural landscape on the Cumberland Plain, continuously used for grazing since the 1790s: evidence of patterns of agricultural use of the farm over the last 200 years survive including field patterns, post and rail fences, vernacular slab farm buildings and evidence of the alignment of its traditional transport route, Old Windsor Road, as well as cultural plantings and remnant woodland trees…. Bella Vista Farm is one of the most intact and best examples on the Cumberland Plain of the summit model of homestead siting, where the house and plantings are sited high on a prominent hill in contrast with open fields around. Its driveway is intact and relates to the traditional transport route (Old Windsor Road). Its prominent siting allows views to and from the property from a wide area. Views to the 'summit' are also available from Old Windsor Road. (Adapted from the State Heritage Inventory)
Heritage Impact	It is considered that there would be few appreciable adverse impacts upon any known items of European heritage arising from the construction of Bella Vista Station. The station site is unlikely to be visible from anywhere within the State heritage listed property of Bella Vista Farm which is located approximately one km from the construction zone. Recent developments in the vicinity include the Norwest Business Park.

Assessment of Archaeological Impacts

As no archaeological potential was identified within the construction zone, the construction works are unlikely to result in any archaeological impacts.

11.5.8 Construction Site 9 (Balmoral Road)

Figure 11.6 shows the location of potentially impacted European heritage items in the vicinity of construction site 9.

Heritage Items

Heritage items in the vicinity of construction site 9 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.18.**

Table 11.18 Potentially impacted heritage items in the vicinity of construction site 9

No.	Item	Address	Listing
3252	House	36 Old Windsor Road (more recently 18 Cumberlege Lane), Kellyville	Not listed. Noted in Windsor and Old Windsor Roads Conservation Management Plan (CMP)(Clive Lucas, Stapleton and Partners, 2005), however, has since been demolished.

Archaeological Potential and Impacts

As no items of archaeological potential were identified within the construction zone, the construction works are unlikely to result in any archaeological impacts.

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is one potential heritage item to be affected by the NWRL project. The potential impacts on this item are assessed in **Table 11.19.**

Table 11.19 Assessment of Heritage Impacts – construction site 9

Weatherboard house, 36 Windsor Road	
Significance	**Local significance**
Statement of Significance	Cream weatherboard on brick piers with corrugated iron gable roof, sash windows. Fanlight above door. Concrete verandah. Verandah roof supported by timber supports. (Windsor Road and Old Windsor Road CMP. Clive Lucas, Stapleton and Partners, 2005).
Heritage Impact	Construction works would require removal of this house if it was extant. It would appear however that the building has been demolished.

11.5.9 Construction Site 10 (Memorial Avenue)

Figure 11.6 shows the location of potentially impacted European heritage items in the vicinity of construction site 10.

Heritage Items

There are no known heritage items or potential heritage items within the proposed Memorial Avenue construction zone.

Archaeological Potential

A number of boundary stones along Old Windsor Road were identified in the Windsor Road and Old Windsor Road CMP (Clive Lucas, Stapleton and Partners, 2005) to the north of Memorial Avenue. These boundary stones were most likely buried during construction of the North-west T-way during the past decade.

Assessment of Heritage Impacts

The construction works would have no perceived impacts upon any known European heritage items. The construction works zone is not located in the vicinity of any listed heritage precincts of Old Windsor Road.

Assessment of Archaeological Impacts

The boundary stones along Old Windsor Road, if extant, would be located outside the Memorial Avenue construction works zone and as a result the construction works are unlikely to have any archaeological impacts.

11.5.10 Construction Site 11 (Kellyville Station)

Figure 11.7 shows the location of potentially impacted European heritage items in the vicinity of construction site 11.

Heritage Items

Heritage items in the vicinity of construction site 11 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.20**.

Table 11.20 Potentially impacted heritage items in the vicinity of construction site 11

No.	Item	Address	Listing
	Windsor Road and Old Windsor Road Heritage Precincts (Stanhope Farm Alignment)	Windsor Road and Old Windsor Road	RTA S170 Heritage and Conservation Register (State significance)

Archaeological Potential

Several archaeological sites were identified within construction site 11, refer **Table 11.21**.

Table 11.21 Archaeological potential of construction site 11

Item	Address	Listing	Archaeological Remains	Archaeological Potential
Archaeological site (Archaeological site item 74 or RH/35 or site no. 49- RTA European Heritage Item 4227)	**South from Samantha Riley Drive, Kellyville**	Noted in Casey and Lowe (2006)	Structural remains (remnant footings, postholes), services, brick wells/cisterns, privies, refuse dumps and pits with artefacts.	Low – medium

Item	Address	Listing	Archaeological Remains	Archaeological Potential
Pair of Boundary Markers	80m south from Samantha Riley Drive, Kellyville	Noted in Windsor Road and Old Windsor Road CMP (Clive Lucas, Stapleton and Partners, 2005)	Have been removed / reburied as part of North-west T-way (RTA comments)	Nil
Pair of Boundary Markers	Immediately South of Samantha Riley Drive, Kellyville	Noted in Windsor Road and Old Windsor Road (Clive Lucas, Stapleton and Partners CMP 2005)	Have been removed/ reburied as part of North-west T-way (RTA comments)	Nil
Site of the Battle of Vinegar Hill	Kellyville	Memorial site listed in Blacktown LEP	Three possible locations: cemetery, the corner of Windsor and Old Windsor Roads, or on Old Windsor Road near Rouse Hill House. Potential scattered/lost personal and other artefacts	Low–nil

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is potential for one heritage item to be affected by the NWRL project. The potential impacts on this item are assessed in **Table 11.22**.

Other existing heritage items are located within the broader vicinity of construction site 11, but were assessed as being unlikely to be affected by the proposed works due to their distance from the proposed civil construction work sites.

Table 11.22 Assessment of Heritage Impacts – construction site 11

Old Windsor Road Heritage Precinct 1 (OWR 1) Stanhope Farm Alignment	
Significance	**State**
Statement of Significance	*Surviving section of the old alignment of Windsor Road showing early construction and design methods. Contains the largest group of alignment stones. Remnants of the early setting also remain. Named after original land grant.* (Windsor Road and Old Windsor Road CMP 2005) Assessed as having high historic, associative, aesthetic, research and rarity values in the Windsor Road and Old Windsor Road CMP 2005, this precinct was altered to some extent during the North-west T-way works. However, some elements of the precinct remain in situ.
Heritage Impact	As the proposed station site would be located adjacent to one of the identified historic precincts along Old Windsor Road, there may be some impacts upon this historic roadway precinct. Since there have been numerous physical changes to this part of Old Windsor Road in recent times, any negative heritage impacts are likely to be of a relatively *minor adverse* nature.

Assessment of Archaeological Impacts

The two cisterns/wells, recorded by Casey and Lowe (2006), are located within the perimeters of the ground disturbance works required for the construction of the proposed above-ground Kellyville Station. There is the potential that other known and potential archaeological features associated with the former house still remain within the area designated for the construction of the station. It is also possible that remains of boundary stones markers may have survived in this region.The nature of the proposed earthworks for the construction of the elevated station would have the potential to disturb or destroy the known and potential archaeological resource. The magnitude of this impact would be determined by the depth of excavation required.

Given that the exact location of the site of the battle of Vinegar Hill has not been accurately identified there is the potential, although minor, of survival of archaeological evidence associated with this significant event. The nature of the proposed earthworks for the construction of the elevated station would have the potential to disturb or destroy the known and potential archaeological resource.

11.5.11 Construction Site 12 (Samantha Riley Drive to Windsor Road)

Figure 11.7 shows the location of potentially impacted European heritage items in the vicinity of construction site 12.

Heritage Items

A series of eucalyptus trees along Old Windsor Road were identified in the Windsor Road and Old Windsor Road CMP (Clive Lucas, Stapleton and Partners, 2005) to the north of Samantha Riley Drive.

Archaeological Potential

A series of boundary stones along Old Windsor Road were identified in the Windsor Road and Old Windsor Road CMP (Clive Lucas, Stapleton and Partners, 2005) to the north of Samantha Riley Drive. The boundary stones were not visible during recent field surveys. GML determined that it is likely that they were buried or removed during construction of the North-west T-way. No other known archaeological sites were identified within the proposed Samantha Riley Drive to Old Windsor Road construction site.

Assessment of Heritage Impacts

The construction works between Samantha Riley Drive and Windsor Road would have no perceived impacts upon any known European heritage items. The eucalyptus trees would be located outside the construction works zone.

Assessment of Archaeological Impacts

The boundary stones, if extant, would be located outside the construction works zone. As no other archaeological sites were identified within the proposed Samantha Riley Drive to Old Windsor Road construction site, it was concluded that the construction works are unlikely to result in any archaeological impacts.

11.5.12 Construction Site 13 (Old Windsor Road to White Hart Drive)

Figure 11.8 shows the location of potentially impacted European heritage items in the vicinity of construction site 13.

Heritage Items

Heritage items in the vicinity of construction site 13 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.23**.

Table 11.23 Potentially impacted heritage items in the vicinity of construction site 13

No.	Item	Address	Listing
-	**Windsor Road and Old Windsor Road Heritage Precincts** **(WR 14—Caddies Creek Alignment)**	Windsor Road and Old Windsor Road	State Heritage Register State (RTA S170 Heritage and Conservation Register)
183	**Mungerie**	Windsor Road, Rouse Hill	Local (Baulkham Hills LEP and Department of Planning S170 Heritage and Conservation Register)

Archaeological Potential

One archaeological site was identified within construction site 13, refer **Table 11.24**.

Table 11.24 Archaeological potential of construction site 13

Item	Address	Listing	Archaeological Remains	Archaeological Potential
Archaeological site, former Swan Inn (RH/36)	**Eastern side of Windsor Road, north of the intersection with Old Windsor Road**	Local (Baulkham Hills LEP)	Structural remains (remnant footings, postholes), services, brick wells/cisterns, privies, refuse dumps and pits with artefacts.	Low – medium

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is potential for two heritage items to be affected by the NWRL project. The potential impacts on these items are assessed in **Table 11.25**.

Table 11.25 Assessment of Heritage Impacts – construction site 13

Windsor Road Heritage Precinct 14 (WR 14) Caddies Creek Alignment

Significance	State
Statement of Significance	*Surviving section of the old alignment of Windsor Road and approach to old bridge crossing at Caddies Creek. Remains of the old road alignment also exist on the eastern side of the creek.* (Windsor Road and Old Windsor Road CMP 2005) Assessed as having high historic, associative, research and rarity values in the Windsor Road and Old Windsor Road CMP 2005, this precinct was altered to some extent during the North-west T-way works. However, some elements of the precinct remain in situ, including the original alignment.
Heritage Impact	As the proposed construction works site is located adjacent to one of the identified historic precincts along Old Windsor Road, there may be some impacts upon this historic roadway precinct. Since there have been numerous physical changes to this part of Windsor Road in recent times, any negative heritage impacts are likely to be of a relatively *minor adverse* nature.

Mungerie

Significance	Local
Statement of Significance	*Evidence of late nineteenth century farming. If a Pearce property, the place is also significant for its association with and evidence of the Pearce family as major graziers, orchardists and land dealers in this part of the Shire.* (The Hills Shire Council Heritage Inventory Sheet)

Heritage Impact	It is considered that there would be a *major adverse* impact upon the setting and curtilage of Mungerie. The proposed rail corridor cuts across the original entrance driveway into the Mungerie property and the viaduct structure would substantially reduce the remnant curtilage of the house, dominate views to the west and interrupt important traditional links between the main road and this 1890s house. The proposed work would therefore result in further erosion of the traditional setting of the house and would constitute a *major adverse* impact.

Assessment of Archaeological Impacts

The site of the former Swan Inn (RH/36) is located within the proposed Old Windsor Road to White Hart Drive construction site. The proposed works would result in a *major adverse* impact on the site of the former Swan Inn.

11.5.13 Construction Site 14 (Rouse Hill Station)

Figure 11.8 and **Figure 11.9** shows the location of potentially impacted European heritage items in the vicinity of construction site 14.

Heritage Items

Heritage items in the vicinity of construction site 14 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.26**.

Table 11.26 Potentially impacted heritage items in the vicinity of construction site 14

No.	Item	Address	Listing
23	Battle of Vinegar Hill (memorial)	712 Windsor Road	Local (Blacktown LEP)

Archaeological Potential

No known archaeological sites were identified within the proposed Rouse Hill Station site.

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is potential for one heritage item to be affected by the NWRL project. The potential impacts on these items are assessed in Table 1128.

Other existing heritage items are located within the broader vicinity of construction site 14, but were assessed as being unlikely to be affected by the proposed works due to their distance from the proposed civil construction work sites.

Table 11.27 Assessment of Heritage Impacts – construction site 13

Battle of Vinegar Hill (memorial)	
Significance	**Local (potential state)**
Statement of Significance	*The position overlooks Windsor Road, the site of the first military battle to have taken place on Australian soil.* (State Heritage Inventory). This memorial commemorates a significant event in the early colonial history of New South Wales.
Heritage Impact	The Battle of Vinegar Hill Memorial is located in an elevated position within the Castlebrook Cemetery at 712 Windsor Road, Rouse Hill. However, the actual place where the skirmish occurred has not been determined with certainty. Although the proposed construction works may be visible in views from the Battle of Vinegar Hill Memorial it is considered that these impacts would be of a relatively minor and temporary nature.

Assessment of Archaeological Impacts

As no archaeological potential has been identified within the proposed Rouse Hill Station site, it was determined that the construction works are unlikely to result in any archaeological impacts.

11.5.14 Construction Site 15 (Windsor Road Viaduct)

Figure 11.9 shows the location of potentially impacted European heritage items in the vicinity of construction site 15.

Heritage Items

Heritage items in the vicinity of construction site 15 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.28**.

Table 11.28 Potentially impacted heritage items in the vicinity of construction site 15

No.	Item	Address	Listing
23	**Battle of Vinegar Hill (memorial)**	712 Windsor Road	Local (Blacktown LEP)
185	**Royal Oak Inn (former) (now Mean Fiddler Hotel)**	2 Commercial Road, Rouse Hill	State Heritage Register
-	**Rouse Hill House and Farm**	Windsor Road, Rouse Hill	State Heritage Register

Archaeological Potential

No known archaeological sites were identified within the proposed Windsor Road Viaduct construction site.

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is potential for one heritage item to be affected by the NWRL project. The potential impacts on this item are assessed in **Table 11.29**.

Other existing heritage items are located within the broader vicinity of construction site 15, but were assessed as being unlikely to be affected by the proposed works due to their distance from the proposed civil construction work sites.

Table 11.29 Assessment of Heritage Impacts – construction site 15

Royal Oak Inn (former) (now Mean Fiddler Hotel)	
Significance	**State**
Statement of Significance	The former Royal Oak Inn (now the Mean Fiddler Inn) is of historical and technological heritage significance because: It is an important survivor of an early colonial coaching inn of the 1820-40 periods with the main part of the original complex of buildings remaining intact. (Kremmer, 1991) It is probably the only inn along the main road between Parramatta and Windsor that is conserved and which continues its use today as a "watering hole" or "stop over" for the general public and travellers along the Windsor Road. Its Georgian sandstone frontage and elegant verandah facing Windsor Road is a vivid reminder of a roadside inn that once were plentiful along Windsor and Old Windsor Roads (Edds, 2003) It is the site of one of the earliest licensed premises in the colony dating to 1830. It was a simple, practical design for a coaching inn which allowed its use to continue until the advent of the railways, to be adapted for residential use and later to be restored as a restaurant. It is well built with dressed sandstone Georgian facade enhanced with a handsome Colonial verandah. Its structure and fabric have survived relatively well despite changes in ownership and use. The seven main rooms and road frontage have been well conserved internally with plaster walls, lath and plaster ceilings, Australian cedar joinery and traditional hardware. Although compromised and consumed within the Irish Tavern, the L shaped coaching inn remains extant and recognisable. Its structure and fabric have survived relatively well despite changes of ownership and use. (Kremmer, 1991). (State Heritage Inventory).

Royal Oak Inn (former) (now Mean Fiddler Hotel)	
Heritage Impact	Removal of trees in views south along Windsor Road from the hotel could result in an impact on the visual setting of the former Royal Oak Inn. However, the trees to be removed are a substantial distance from the hotel, and therefore this impact is considered neutral.

Assessment of Archaeological Impacts

As no archaeological potential has been identified within construction site 15, it was determined that the construction works are unlikely to result in any archaeological impacts.

11.5.15 Construction Site 16 (Windsor Road Viaduct to Cudgegong Road)

Figure 11.9 shows the location of potentially impacted European heritage items in the vicinity of construction site 16.

Heritage Items

No heritage items in the vicinity of construction site 16 were assessed as having the potential to be impacted by the NWRL.

Archaeological Potential

There are no known archaeological sites within the boundary of construction site 16. By 1947 the proposed construction site area is shown to have reverted to bushland. There is some potential for subsurface archaeological remains of internal tracks/roads and post holes from old fence lines enclosing earlier paddocks.

Assessment of Heritage Impacts

Due to the topography of the area and the existing vegetation on either side of the proposed construction site, it is considered that no heritage items in the vicinity of construction site 16 would be impacted by the works.

Assessment of Archaeological Impacts

Since the potential for archaeological remains to survive in situ within construction site 16 is low, the construction works are unlikely to result in anything other than minor archaeological impacts.

11.5.16 Construction Site 17 (Cudgegong Road Station and Tallawong Stabling Facility)

Figure 11.10 shows the location of potentially impacted European heritage items in the vicinity of construction site 17.

Heritage Items

Heritage items in the vicinity of construction site 17 that were assessed as having the potential to be impacted by the NWRL are listed in **Table 11.30**.

Table 11.30 Potentially impacted heritage items in the vicinity of construction site 17

No.	Item	Address	Listing
-	Rouse Hill House and Farm	Windsor Road, Rouse Hill	State Heritage Register

Archaeological Potential

The Rouse Hill Estate originally extended as far south as Schofields Road and 250m west of Tallawong Road (to the west). The entire proposed Cudgegong Road Station and Tallawong Stabling Facility area was once located within the Rouse Hill Estate and would have comprised open paddocks for grazing and growing of grain.

Subsequent development initiated by the land subdivisions in the 1950s resulted in the formation of small farms, industries (including a still-active quarry along Schofields Road at the southern edge of the station and stabling facility area) and connecting roads, with minimal impact on the Rouse Hill Estate. The station and stabling facility area, comprising mainly farms and minor industries, has therefore been characterised by small-scale rural development and pockets of uncleared bushland allotments.

Given the above site formation processes, there is little potential for subsurface archaeological remains to exist on site. If any remains do survive in situ, they would generally include internal tracks/roads and post holes from old fence lines enclosing earlier paddocks.

Assessment of Heritage Impacts

Based on the location of the heritage sites with respect to the proposed works, it was determined that there is potential for two heritage items to be affected by the NWRL project. The potential impacts on these items are assessed in **Table 11.31**.

Other existing heritage items are located within the broader vicinity of construction site 17, but were assessed as being unlikely to be affected by the proposed works due to their distance from the proposed civil construction work sites.

Table 11.31 Assessment of Heritage Impacts – construction site 17

Rouse Hill House and Farm

Significance	State
Statement of Significance	Rouse Hill House is one of the most significant and substantial houses of the Macquarie period which dates from 1810 to 1822. Rouse Hill House Estate has the largest and most complete publically owned physical record - in the form of buildings, furnishings, artefacts and landscape relationship - of the occupancy and culture of a European-Australian family, encompassing the tastes, fortunes, and endeavours of seven generations from the early 19th century to the late 20th century (Historic Houses Trust 1997:8). The property is perhaps unique for its survival as a largely intact estate with an unbroken chain of occupancy, allowing the survival of major garden and interior elements of every period of its history to the present. This layering of artefacts and fashions is especially prevalent in the gardens where designs and physical details such as edging, fencing, planting containers, bed designs and paths provide a case history for the study of the development of garden practices in Australia.
	The garden is perhaps Australia's oldest surviving colonial garden in relatively intact form. The surviving physical evidence in the gardens includes borders in a variety of materials, fence and gate remnants, fragments of trellis and arbours, paving and numerous soil displacements that become evident with the location's annual dry spells. These physical remains, matched with pictorial evidence from photographs, drawings and engravings of the property, and writings, have resulted in the identification of four stages of the garden's development: c.1825, c.1865, c.1885 and c.1968. This continuity and evidence of evolution of a very early intact garden from the first quarter of the 19th century to the Edwardian era and 20th century is extremely rare in Australia. (Bogle, 1993 adapted by Read, S., 2004) (State Heritage Inventory)
Heritage Impact	Analysis of the topography of the land that lies between Rouse Hill House and Rouse Hill Town Centre suggests that the potential impact of the NWRL upon the Rouse Hill House property or its extended visual curtilage would be very low. The property lies approximately 1.5 kilometres to the north of the Cudgegong Road Station site, and is further away (about 2 kilometres distant) from the Tallawong Stabling Facility construction site. The Rouse Hill Estate is separated from these two construction sites by an undulating landscape including forested areas. It is considered therefore that the Cudgegong Station and Tallawong Stabling Facility construction works would barely be visible from the Rouse Hill Estate, and that the possibility of these works resulting in any appreciable negative heritage impacts upon this historic property and its curtilage would be very low.

Assessment of Archaeological Impacts

The earthworks associated with construction of the station and stabling facility, which include a cutting, would require the removal of any surviving archaeological remains within the designated area. As the archaeological potential of the area is considered to be low, this is considered to be a *minor adverse* impact.

11.6 Management and Mitigation Measures

The Environmental Management Framework, provided in Appendix C, details the environmental, stakeholder and community management systems and processes for the construction of the NWRL.

Mitigation measures have been developed to avoid, reduce and manage identified potential impacts on European Heritage Items and Archaeology. These mitigation measures and their application to the construction sites for the NWRL are presented in **Table 11.32**.

A number of mitigation measures detailed in other chapters would also be relevant to European Heritage. Specifically mitigation measures relevant to the rehabilitation of bushland at the Cheltenham Services Facility site are detailed in Chapter 15 (Ecology).

Heritage specialists would be involved in the design documentation phase and with the construction teams selected to carry out the civil construction works to ensure that the recommended mitigation measures are implemented and impacts on heritage items minimised. Heritage specialists would also be able to assist by identifying opportunities for enhancing the significance of heritage items and archaeological sites.

In the event that archaeological remains be encountered during excavation works in the areas of the designated route not specifically identified as archaeological sites or areas of archaeological potential, it is required that the Heritage Branch be advised and that the measures set out in the Heritage Act 1977 for the management of archaeological remains be implemented.

Table 11.32 European Heritage Mitigation Measures

No.	Mitigation Measure	Applicable Sites*
Heritage Items		
EH1	Rehabilitate removed areas of bushland following completion of construction works.	1 and 2
EH2	Reinstate street trees and rehabilitate / reinstate bushland around the Cheltenham Services Facility following completion of construction works.	3
EH3	Where feasible and reasonable, retain or reinstate an adequate buffer of vegetation along the northern side of Castle Hill Road opposite the Glenhope property to preserve the character of its setting and to screen the visual impacts of the station construction site in the northern outlook from the Glenhope property.	4
EH4	Where feasible and reasonable, retain or reinstate a buffer of vegetation along the western side of Franklin Road opposite Inala School.	4

No.	Mitigation Measure	Applicable Sites*
EH5	If feasible, the existing mature plantings along the Old Northern Road edge of the park would be retained and protected during construction.	5
EH6	Reinstate key elements of Arthur Whitling Park in consultation with the Castle Hill sub-branch of the RSL, where feasible and reasonable.	5
EH7	Reinstate the landscaped public parkland (Arthur Whitling Park) following completion of construction to improve the visual setting of the White House Gallery.	5
EH8	Reinstate or rejuvenate any areas of the Showground disturbed for construction works following completion of the works.	6
EH9	Re-establish planted vegetation along the eastern side of the North-west T-way following completion of the construction works.	11 and 13
EH10	The viaduct would be designed and constructed to be as visually light and stream-lined as possible. At Mungerie, the viaduct piers would be spaced widely and, where feasible and reasonable, symmetrically on either side of the carriage loop from Old Windsor Road.	13
EH11	A buffer of trees between Mungerie and the rail corridor would be maintained. Any trees removed to facilitate construction would be reinstated on completion of works.	13
EH12	The area of the Mungerie carriage drive that would be removed during construction works would be reinstated.	13
Archaeological Sites		
EH13	Further assessment of the archaeological potential and significance of the potential resource (house sites on Franklin Road and Carrington Road at sites 4 and 6 respectively, and an archaeological site south of Samantha Riley Drive at site 11) would be undertaken prior to construction to define specific mitigation measures.	4, 6 and 11
EH14	Exposed archaeological features at Cherrybrook (should there be any) would be identified, excavated and fully recorded prior to their removal. Based on the level of significance, preparation of an interpretation plan and strategy would be undertaken for archaeological features at Cherrybrook.	4
EH15	Any exposed archaeological features and deposits related to the Parramatta to Castle Hill tramway would be fully investigated and recorded prior to their removal. Any information retrieved regarding the Parramatta to Castle Hill tramway would be used to inform the interpretation of the site for communication of the site's history.	5

No.	Mitigation Measure	Applicable Sites*
EH16	Archaeological monitoring of the areas (the house site on Carrington Road at site 6, the archaeological site south of Samantha Riley Drive at site 11, and the remains of track and post holes at site 16 and site 17) that are likely to contain archaeological remains would be undertaken with recording of any identified features and/or deposits associated with the identified buildings in accordance with archaeological best practice.	6, 11, 16 and 17
EH17	The two identified brick cisterns / wells at the Kellyville Station site would be recorded in detail and retained in situ if feasible and reasonable.	11
EH18	Further research would be undertaken to assess archaeological potential and significance of the former Swan Inn. Depending on the outcomes of the research archaeological excavation and recording of features and / or deposits would be undertaken if required. Excavation would be undertaken in accordance with archaeological best practice and would occur before or in conjunction with the construction works in this area. Based on the extent and level of significance of discovered features, the preparation of an interpretation plan and strategy could be required.	13
EH19	If archaeological deposits relating to the Rouse Hill Estate are encountered during construction, recording of the surviving features and deposits would be undertaken in accordance with archaeological best practice. Depending on the extent and level of significance of any discovered features, the preparation of an interpretation plan and strategy could be required.	16 and 17

*Site 1 - Epping Services Facility, Site 2 - Epping Decline, Site 3 - Cheltenham Services Facility, Site 4 - Cherrybrook Station, Site 5 - Castle Hill Station, Site 6 - Hills Centre Station, Site 7 - Norwest Station, Site 8 - Bella Vista Station, Site 9 - Balmoral Road, Site 10 - Memorial Avenue, Site 11 - Kellyville Station, Site 12 - Samantha Riley Drive to Windsor Road, Site 13 - Old Windsor Road to White Hart Drive, Site 14 - Rouse Hill Station, Site 15 - Windsor Road Viaduct, Site 16 - Windsor Road Viaduct to Cudgegong Road, Site 17 - Cudgegong Road Station and Tallawong Stabling Facility, and Tunnels

Figure 11.1 Potentially impacted European heritage items in the vicinity of construction sites 1 and 2

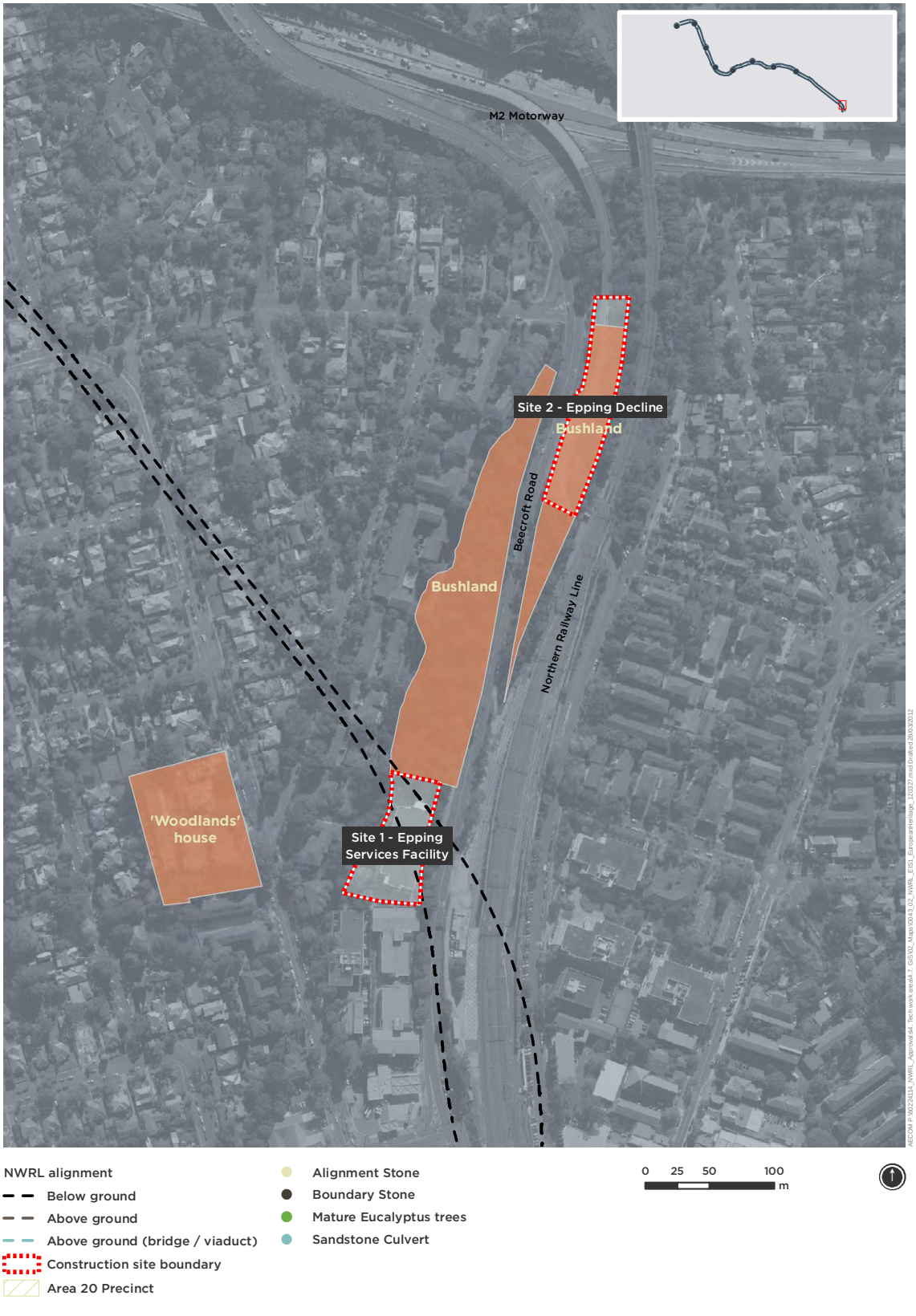


Figure 11.2 Potentially impacted European heritage items in the vicinity of construction site 3

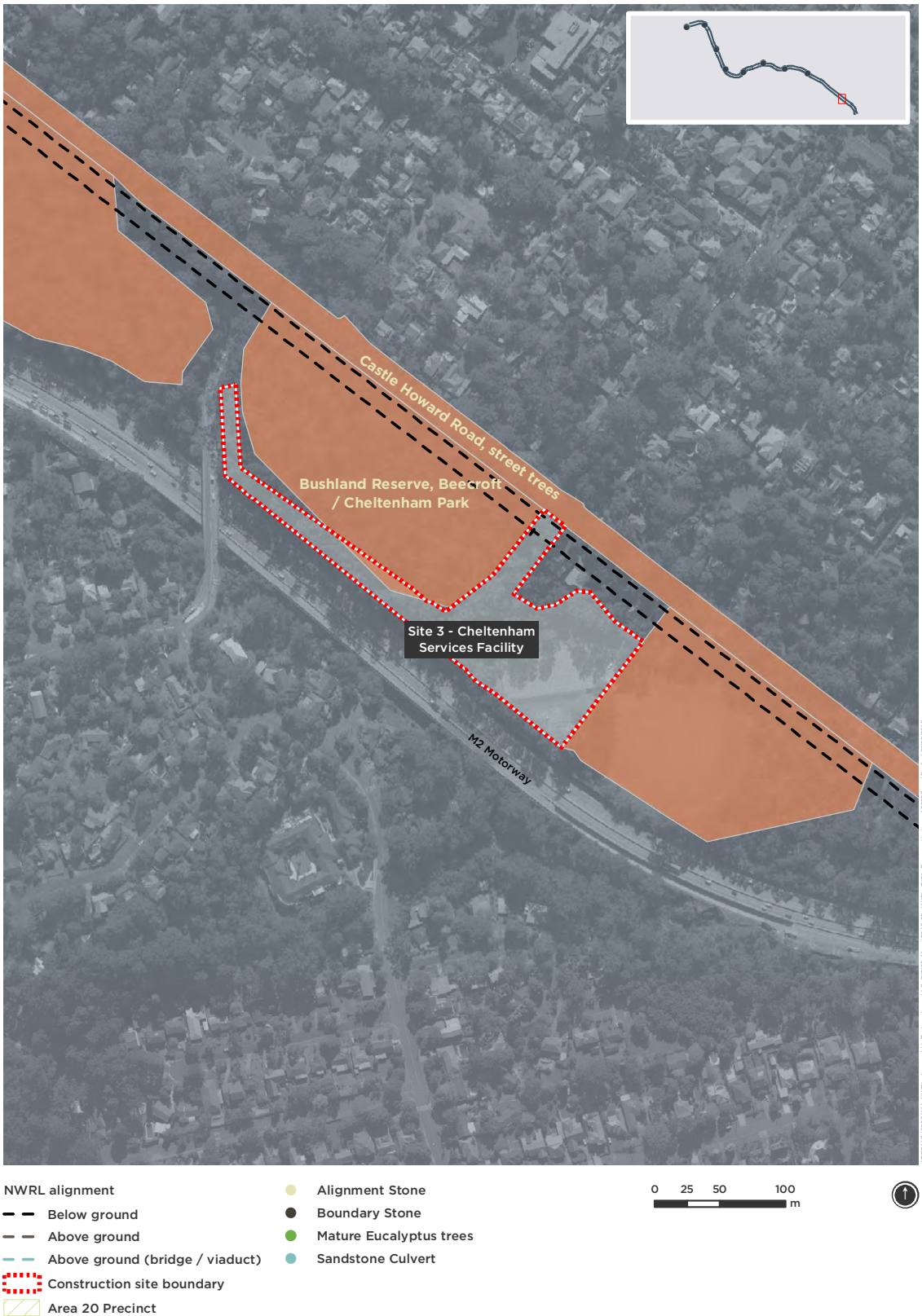


Figure 11.3 Potentially impacted European heritage items in the vicinity of construction site 4

Figure 11.4 Potentially impacted European heritage items in the vicinity of construction site 5

Figure 11.5 Potentially impacted European heritage items in the vicinity of construction site 6

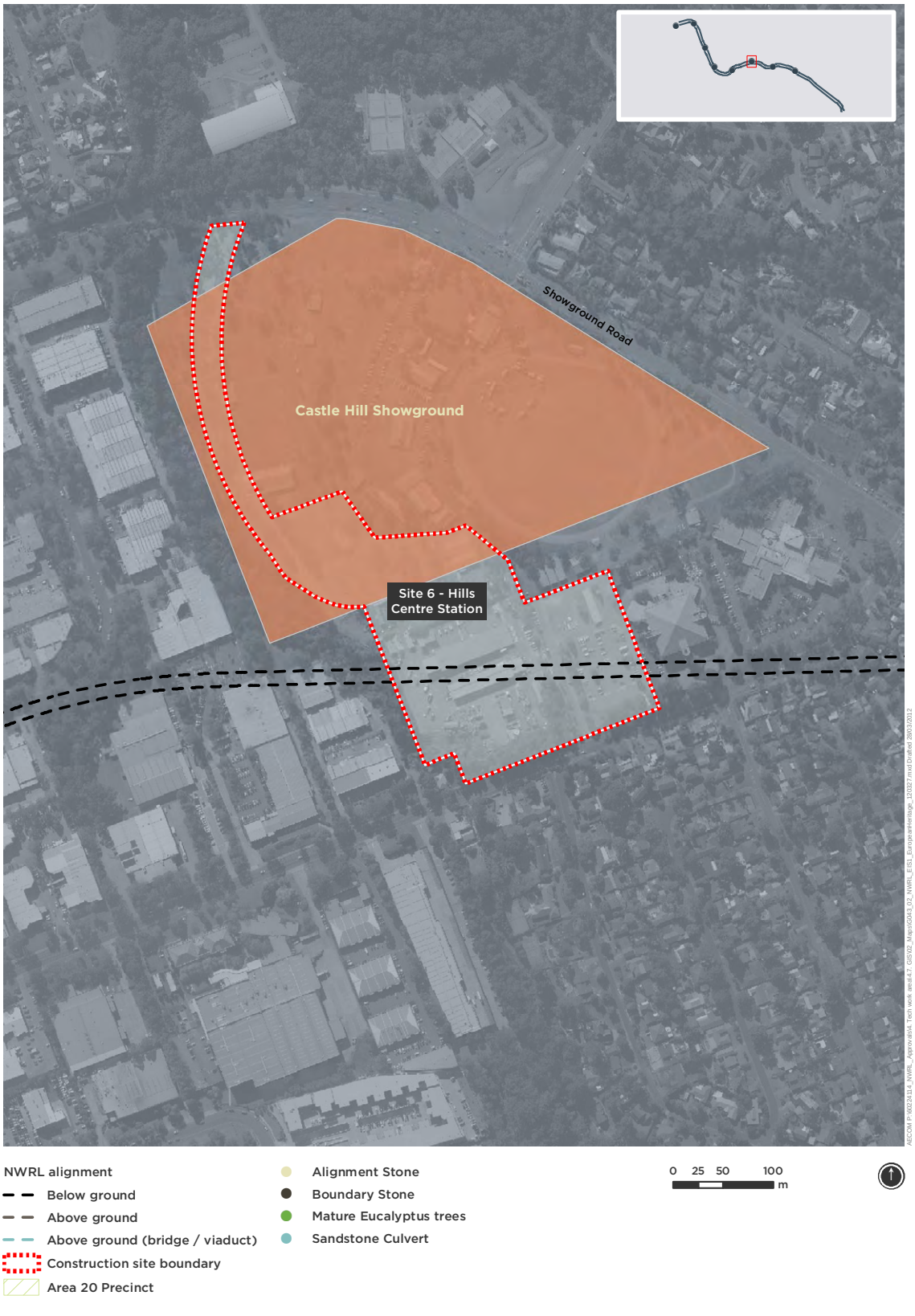


Figure 11.6 Potentially impacted European heritage items in the vicinity of construction sites 8, 9 and 10

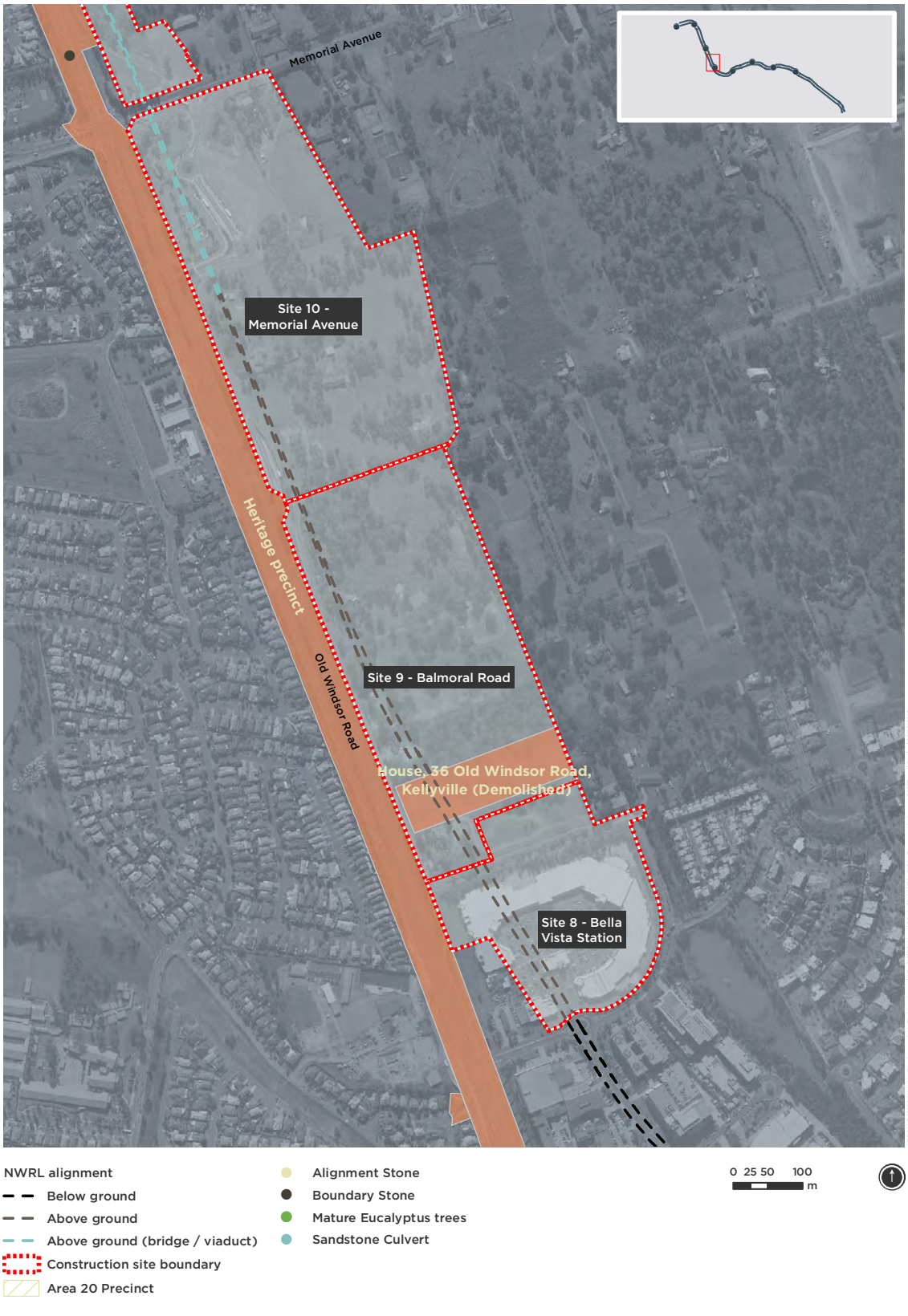


Figure 11.7 Potentially impacted European heritage items in the vicinity of construction sites 11 and 12

Figure 11.8 Potentially impacted European heritage items in the vicinity of construction sites 13 and 14

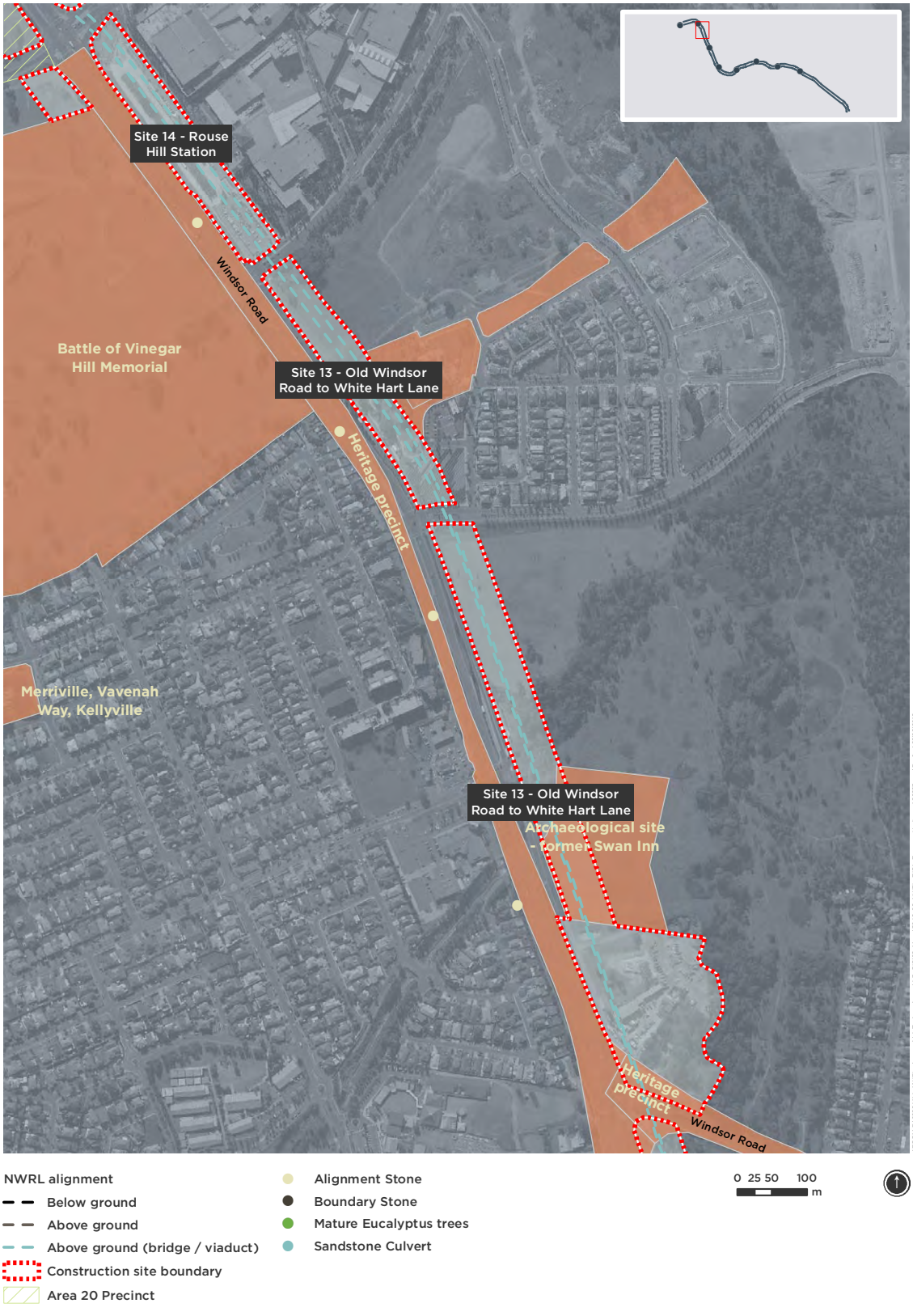


Figure 11.9 Potentially impacted European heritage items in the vicinity of construction sites 14, 15 and 16

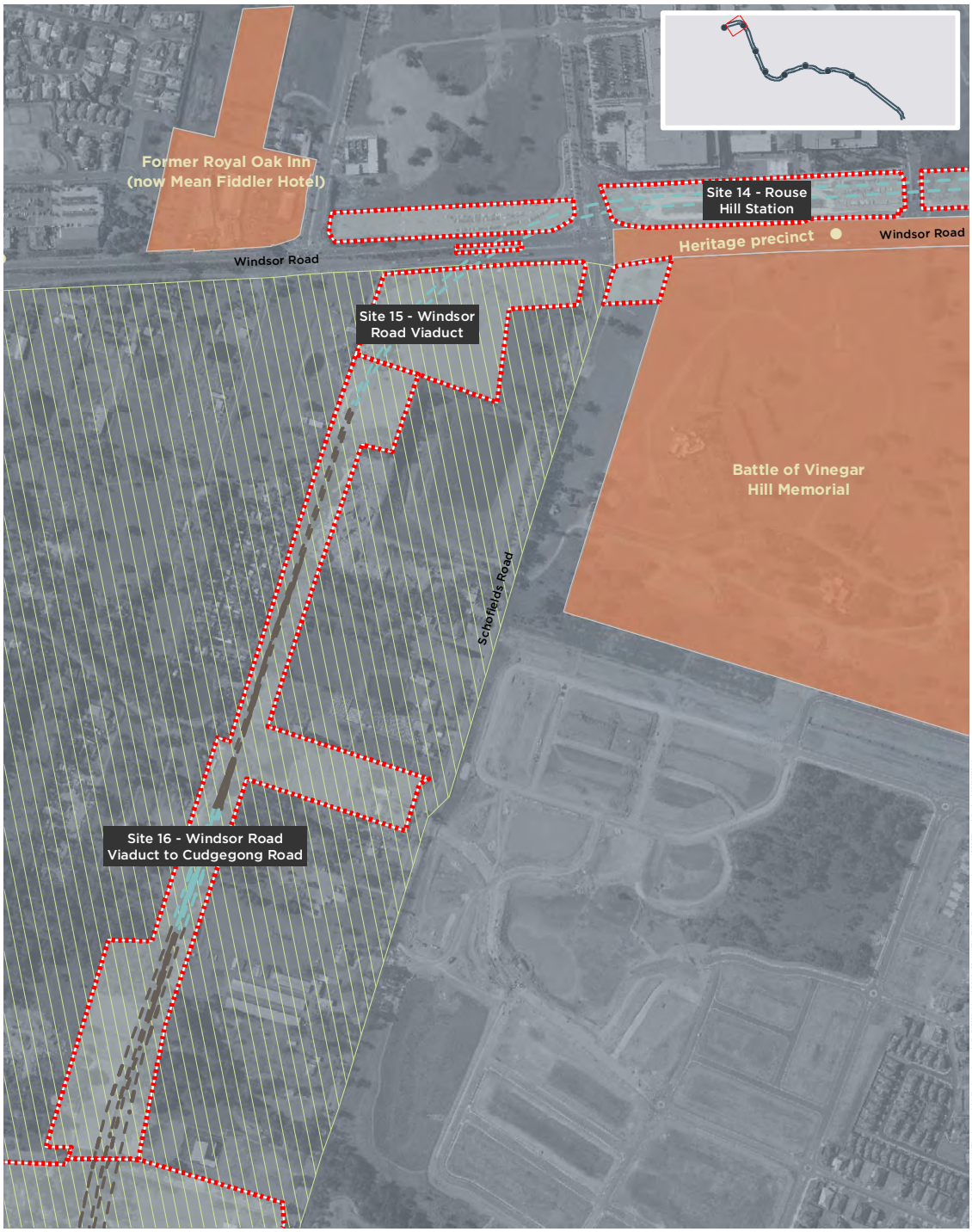
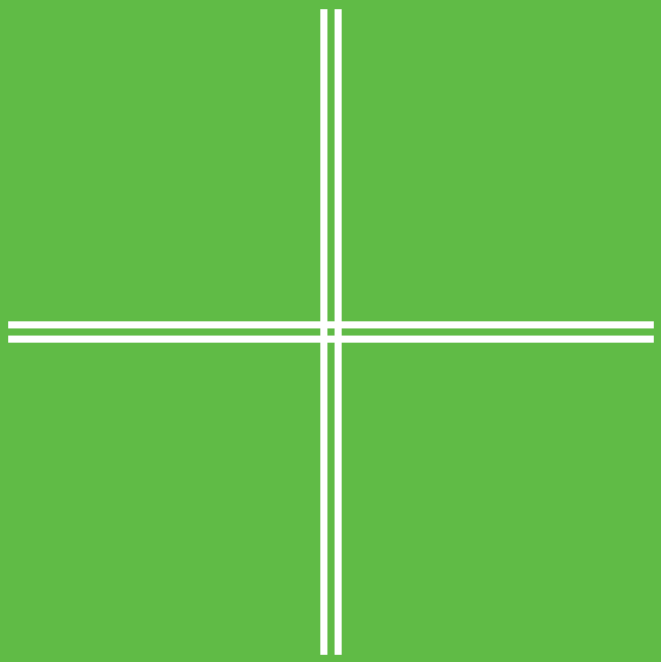
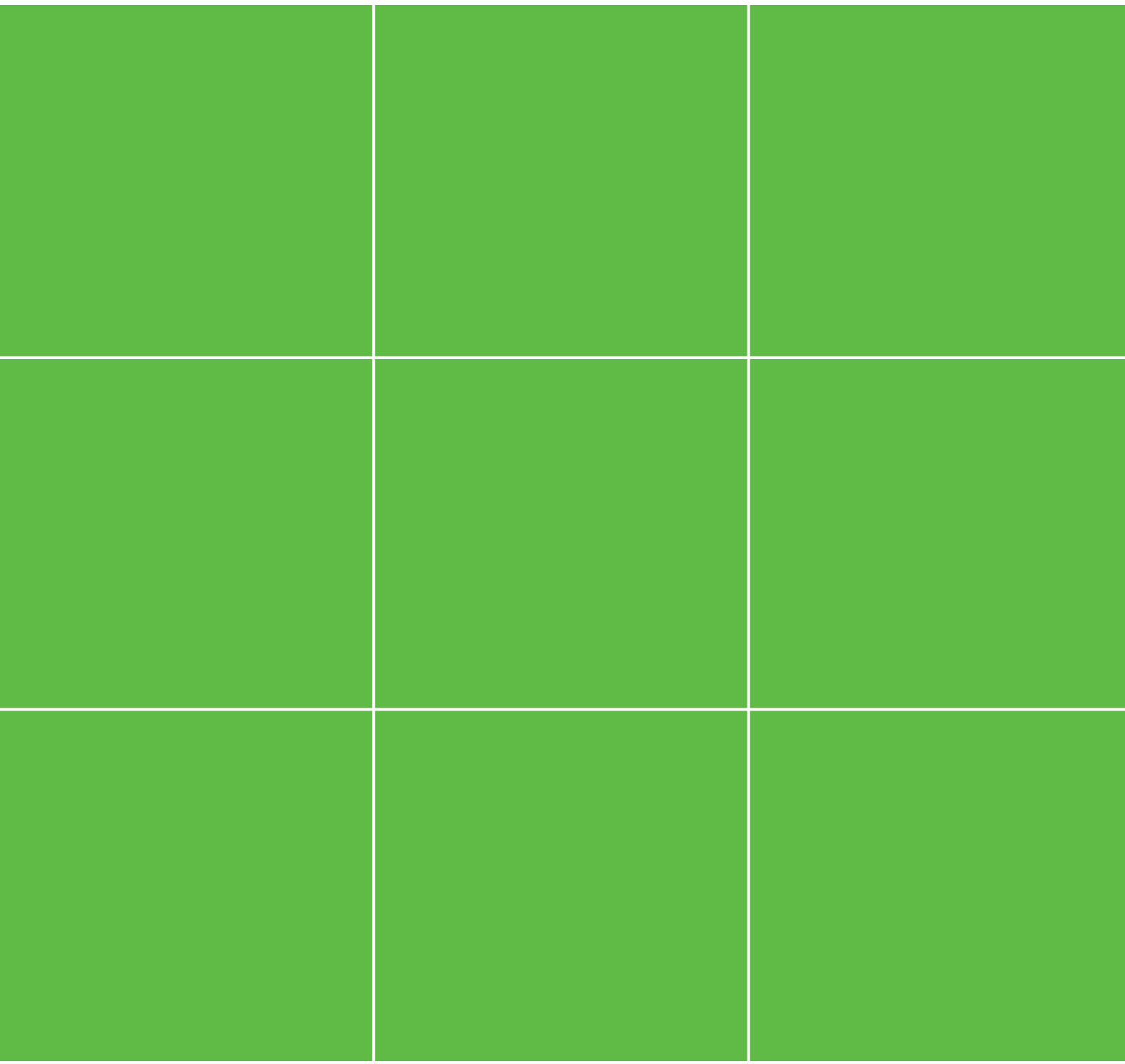


Figure 11.10 Potentially impacted European heritage items in the vicinity of construction site 17






12

12 INDIGENOUS HERITAGE

12.1 Introduction

An assessment of the potential impacts on Indigenous heritage within and surrounding the construction areas was prepared by Godden Mackay Logan (GML) and Jo McDonald Cultural Heritage Management (CHM) to support the EIS and has been included as Technical Paper 4. The Indigenous Heritage Assessment identifies Aboriginal heritage sites in the area, the potential impacts of the proposed Project on these sites and recommends mitigation measures for their management.

12.2 Director-General's Requirements, Conditions of Approval and Statement of Commitments

Table 12.1 sets out the Director General's Requirements (DGR), the Conditions of Approval (CoA) and Statement of Commitments (SoC) as they relate to Indigenous Heritage, and where in the project these have been addressed.

Table 12.1 Director-General's Requirements, Conditions of Approval and Statements of Commitment

Reference	Description	Addressed
DGR Reference	**Description**	**Addressed**
2 Aboriginal Cultural Heritage	The Environmental Assessment must include the following: Refer to the document titled Guideline to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011). Address all of the research components outlined in the Growth Centres Commission Methodology, in particular the assessment of social value to the local Aboriginal community. Detail the consultation process undertaken with the local Aboriginal community and detail how the views or cultural values of the Aboriginal community have been incorporated into the results and recommendations of the assessment. Letters from Aboriginal groups consulted for this project should be included where available. Note that EPA requests to be consulted regarding any proposed salvage works. Separate Indigenous Heritage from Non–Indigenous Heritage.	Chapter 12, Section 12.3, 12.4.3 and 12.6.4.
CoA Reference	**Description**	**Addressed**
3.14	The Proponent shall review the indigenous heritage impacts of the project considering cumulative impacts from surrounding development, consistent with: a) Steps 1 to 4 of the Protocol for Aboriginal Stakeholder Involvement in the Assessment of Aboriginal Cultural Heritage in the Sydney Growth Centres (Context Pty Ltd, 2006a) and the Precinct Assessment Method for Aboriginal Cultural Heritage in the Sydney Growth Centres (Context Pty Ltd, 2006a), for land within the North West Growth Centre; and b) Guideline for Aboriginal Cultural Heritage Impacts Assessment and Community Consultation (DECC July 2005), for all other areas. The Proponent shall identify mitigation priorities with consideration to the regional significance of impacts.	Section 12.3 and 12.6.

Reference	Description	Addressed
Statement of Commitments	**Description**	**Addressed**
33	The Indigenous Heritage protocol and methodology developed for the Growth Centres would continue to be applied as the project progresses, in consultation with DECC and relevant Indigenous groups	Section 12.3 and 12.6.
34	A detailed assessment would be undertaken in the vicinity of Aboriginal sites identified to have moderate to high archaeological potential. The assessment would identify areas to be avoided, construction related impacts and how these can be managed; and, where required, salvage excavation prior to any subsurface impact on the deposit. Advertising for interested parties would need to be undertaken prior to any subsurface investigation, in accordance with DECC requirements.	Section 12.5 and 12.6.

12.3 Assessment Methodology

The methodology for the Indigenous Heritage Report undertaken for the project included:

- Review of previous Aboriginal Archaeological Assessments, which were prepared during the preliminary stages of the project, including:
  - An initial impact assessment for the NWRL undertaken by Mills Archaeological and Heritage Services Pty Ltd in 2003.
  - A second preliminary assessment for the NWRL undertaken by Jo McDonald CHM Pty Ltd (Archaeological Assessment of Indigenous Heritage for the North West Rail Link) in 2006.

These reports identified a number of Aboriginal sites associated with the proposed route of the NWRL. Background information from these prior studies was used during the preparation of the Indigenous Heritage Report.

- Aboriginal consultation in line with the following policy documents:
  - DEC (2005) *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation.*
  - DECCW (2010) *Aboriginal cultural heritage consultation requirements for proponents.*

This consultation process involved:

- Stage 1: Notification of potential stakeholders and the registration of interested Aboriginal stakeholders. Details regarding the Aboriginal people or organisations identified in Stage 1 and a list of the Registered Aboriginal Parties (RAPs) are found in Tables 2.1 and 2.2 of Technical Paper 4.
- Stage 2: Presentation of information to all RAPs in the form of a project briefing, and written details of the proposed project, the proposed assessment methodology and background information. RAPs were requested to provide comments on the methodology. Those who

responded indicated their agreement either verbally or in writing (refer Appendix B of Technical Paper 4).

- Stage 3: Gathering information through field surveys with RAPs, recording of identified Aboriginal objects, determining areas of potential archaeological deposit and cultural heritage values, and discussing the required mitigation strategies. The outcomes of these surveys and consultation process formed the basis of the Draft Indigenous Heritage Report.
- Stage 4: Following TfNSW review of the draft Indigenous Heritage Report, each RAP was provided with the draft report for their review and feedback on the content, assessment and recommendations. The comments received were incorporated into the Indigenous Heritage Report.
- An assessment of the Aboriginal Heritage context including the ethnohistory of the NWRL study area.
- A review of previous Archaeological work including a review of the NSW Aboriginal Heritage Information Management System (AHIMS) library and additional reports held by GML and Jo McDonald CHM Pty Ltd. These reviews determined that:
  - Numerous archaeological surveys have been undertaken surrounding and within the study area, resulting in the recording of many Aboriginal sites.
  - A number of archaeological excavations have been undertaken, all of which have recovered subsurface material from buried deposits. Many of these Aboriginal sites have contained high artefact densities and a wide range of lithic artefacts and materials.
- Two searches of the AHIMS database of the area along the rail corridor with a 1km and 450m buffer surrounding the study area. The 1km buffer search revealed 220 sites and the 450m buffer search identified 132 sites. These identified sites were predominantly isolated artefacts or open artefact sites. The complete results of the AHIMS search are provided in Appendix C of Technical Paper 4.
- An assessment of previously recorded Aboriginal objects and/or places, which identified that the proposed construction sites contain 27 Aboriginal sites within them or very near to their impact zone.
- In addition to a review of the results from the previous surveys undertaken by Jo McDonald CHM Pty Ltd in 2006, additional field surveys of the proposed NWRL alignment were undertaken, which aimed to achieve the following:
  - Survey coverage of the Tallawong Stabling Area (excluding areas that have been recently extensively surveyed, such as Area 20; here the focus was on the relocation of previously recorded Aboriginal sites), focusing on areas where excavation and ground disturbance is proposed.
  - Identification and assessment of Aboriginal sites previously identified by Jo McDonald CHM Pty Ltd along the NWRL alignment.
  - Inspection of proposed rail stations with the RAPs.
  - Survey of construction sites along the proposed alignment.

The survey recording methods involved:

- Recording and plotting all located items of Aboriginal cultural heritage using a Garmin handheld GPS set to the GDA co-ordinate system.
- Compiling photographic records, GML site recording forms, sketch plans and diary descriptions.

Refer to the Indigenous Heritage Report for figures depicting the areas subject to archaeological surveys (Figures **4.1** to **4.20** of Technical Paper 4).

12.4 Existing Environment

The 27 known Aboriginal sites identified as being located within or in close proximity to the construction sites are detailed in **Table 12.2**. Newly recorded Aboriginal sites as a result of the field survey are not included in this count and will be registered on the AHIMS database.

Table 12.2 Previously recorded Aboriginal sites located within or very near to the NWRL construction sites.

Aboriginal site name / number	Construction site number	Aboriginal Site type
45-5-2861	4	Stone artefact concentration + Potential Archaeological Deposit (PAD)
45-5-3158	9, 10	Isolated find
Corner of Taggert Way and Balmoral Road	9, 10	Isolated find
45-5-0981/45-5-0989 very close to	10	Stone artefact concentration
45-5-3354	10	Stone artefact concentration
45-5-2027 very close to	11	Stone artefact concentration + PAD
45-5-2365	11	Stone artefact concentration
45-5-3064 very close to	11	Isolated find/open artefact scatter
45-5-0933	12	Stone artefact concentration + PAD
45-5-0961 very close to	13	Stone artefact concentration
45-5-2649 very close to	13	Isolated find
45-5-3188	13	Stone artefact concentration + PAD
45-5-0960 very close to	13, 14	Stone artefact concentration
45-5-2904	13, 14	PAD
45-5-2905	13, 14	PAD
45-5-3077	13, 14	Stone artefact concentration
45-5-0959 very close to	14, 15	Stone artefact concentration
45-5-3930	16	Isolated find
45-5-3931 very close to	16	Isolated find
45-5-3932 very close to	16	Stone artefact concentration
45-5-2805 (RH/SP15)	16	PAD
45-5-2756 very close to	17	Stone artefact concentration
45-5-3355	17	Isolated find
45-5-3392	17	Stone artefact concentration

Aboriginal site name / number	Construction site number	Aboriginal Site type
45-5-3517	17	Stone artefact concentration
45-5-3933 (RH/A20P 18)	17	PAD
RH/A20P PAD 5	17	PAD

The Indigenous Heritage Report assessed the landscape context of the study area in order to provide contextual information for use in developing a predictive model relating to the remains for evidence of Aboriginal occupation and use in the area. The landscape context considered included geology and geomorphic activity, landforms and landscape features, soils, hydrology, flora and fauna, land use history and erosion. The Indigenous Heritage Report also considered the evidence at a regional level for Aboriginal landscape use of the broader study area with the aim to highlight the main issues and regional character of Aboriginal land use and the material traces it has produced.

The landscape context, land use history, and regional and local archaeological patterns were assessed in order to provide a predictive statement for the likely occurrence of Aboriginal sites within the study area. It was determined that the most likely Aboriginal site types to be found within the study area would be open camp sites or artefact scatters and isolated finds. Other Aboriginal site types that may be located in the study area include shelter sites, shell middens, grinding grooves, art sites and scarred trees. Details regarding these types of Aboriginal sites and/or places and their potential location within the study area's landscape are provided in Table 3.3 of Technical Paper 4.

12.4.1 Physical Description of the Construction Sites

The Indigenous Heritage Report assessed each construction site in terms of its physical setting, level of impact, existing Aboriginal sites and archaeological potential.

Construction Sites 1 to 4 – Epping to Cherrybrook

Construction sites 1 and 2 (Services Facility and Epping Decline) are described as disturbed with a high level of ground surface impact arising from the processes of residential development and transport infrastructure.

It was determined that there is no potential for Aboriginal heritage in the NWRL impact zones at Epping due to the already developed nature of the area.

Construction site 3 (Cheltenham Services Facility) was assessed as having a low to moderate potential for Aboriginal objects, due to lack of previous disturbance and its landscape context. NWRL PAD 1 was assigned within this construction site.

Construction site 4 (Cherrybrook Station) contained a mixture of disturbed (from residential development) and undisturbed (containing dense vegetation) land. A registered Aboriginal site (45-6-2861, Stone Artefact Concentration [SAC]) was found to be located within the centre of this construction site, therefore this area was assessed as possessing a low to moderate potential for subsurface Aboriginal objects and PAD (NWRL PAD 2).

Construction Site 5 – Castle Hill Station

Construction site 5 (Castle Hill Station) is highly disturbed by landscaping, including gardens, lawns and exotic trees and the construction of the adjacent roads and bulk excavation around the buildings at the eastern end of Arthur Whitling Park. No Aboriginal objects and/or sites were observed within this construction site. It was determined that there was a very low potential for intact Aboriginal sites to be present at this construction site.

Construction Site 6 – Hills Centre Station

The eastern portion of construction site 6 has been heavily impacted by building and construction, parkland development, terracing, landscaping, construction of gardens and the showground ring, therefore it is considered to have no archaeological potential.

The western portion of construction site 6 has a moderate level of archaeological potential for Aboriginal objects to be located within a subsurface context. Development of construction site 6 would impact the area of NWRL PAD 3.

Construction Site 7 – Norwest Station

Construction site 7 is highly disturbed by modern buildings, cut and imported fills, roads and landscaping and was assessed as having a very low to no potential for intact Aboriginal sites.

Construction Site 8 – Bella Vista Station

Construction site 8 has already been highly impacted by development and the course of the creek bank along the northern end of Celebration Drive has been modified in the past. As such, this construction site was assessed as having very low to no potential for Aboriginal heritage sites.

Construction Site 9 – Balmoral Road (Bella Vista Station to Balmoral Road)

This construction site was found to have been impacted by housing development and service installations, however despite this, Aboriginal objects have previously been recorded within this construction site, and a new site (14 Cumbelege Lane (NWRL PAD 6)) was observed. As a result, construction site 9 was assessed as having archaeological potential associated with properties 82 (12 Cumbelege Lane) and 74 (2 Cumbelege Lane), which are described through the allocation of NWRL PADs 4 and 5.

Construction Site 10 – Memorial Avenue (Balmoral Road to Memorial Avenue)

In general, this construction site was found to have been subject to a low level of disturbance (primarily historical vegetation stripping). Site preparation for surrounding residential development and the Burns Road T-way station have resulted in significantly modified soil horizons. A number of Aboriginal sites have previously been recorded within and adjacent to this construction site (located within the construction site there are three separate stone artefacts sites). The current survey identified that the ridge top, hill slope and flat landforms (overlooking Elizabeth Macarthur Creek) have the potential for relatively undisturbed archaeological deposits. These landforms have been characterised through designation of NWRL PAD 7.

Construction Site 11 – Kellyville Station (Memorial Avenue to Samantha Riley Drive)

This construction site was found to have been impacted by the T-way car park, some residential development and historical vegetation stripping. Three Aboriginal sites had previously been

identified directly adjacent to this construction site and one (a stone artefact site with PAD) within its boundary. The assessment determined that this construction site has moderate archaeological potential for relatively undisturbed archaeological deposits.

Construction Site 12 – Samantha Riley Drive to Windsor Road

Some disturbances were identified at this construction site, including earthworks adjacent to Elizabeth Macarthur Creek, stockpiling or gravels, fills and concrete dumping, and native vegetation stripping. The area of PAD (PAD 9) associated with this site covers the whole construction site, due to the proximity of the creek and landforms suitable for Aboriginal occupation.

Construction Site 13 – Old Windsor Road to White Hart Drive

The northern portions for this construction site were found to contain several previously recorded Aboriginal sites, some of which have been subject to prior Section 90 consent. Aboriginal sites were not re-located due to limited ground surface visibility. Creek flat landforms 100m either side of the two creek lines (towards the south of this construction site) were found to have archaeological potential for relatively undisturbed archaeological deposits and have been designated as NWRL PAD 10.

Construction Site 14 – Rouse Hill Station

The majority of this construction site has been cleared and subject to extensive urban development. Section 90 permits have been previously granted for all lands in the Rouse Hill Town Centre and it was determined that there is no archaeological potential for intact Aboriginal sites to remain within the previously developed lands. The Caddies Creek Precinct was subject to archaeological salvage excavation in 2007, with the conservation outcome being the retention of all identified Aboriginal grinding grooves.

The south west portion of this construction site has not been developed. As such, it was determined that the lower slope landforms closer to Caddies Creek, retain a potential for further relatively undisturbed archaeological deposits – these areas have been designated as NWRL PAD 11.

Construction Site 15 – Windsor Road Viaduct

This construction site has had a low level of previous impact, including vegetation stripping and grazing. The ridge top and ridge spurs landforms in this site have potential to contain intact Aboriginal sites – designated as NWRL PAD 11. These locations would have provided good views to adjacent landforms and are located close to Caddies Creek and Second Ponds Creek, both locations with significant archaeological deposits.

Construction Sites 16 and 17 – Windsor Road Viaduct to Cudgegong Road, Cudgegong Road Station and Tallawong Stabling Yard

Prior survey work identified a number of Aboriginal sites and an area with PAD within these construction sites. Previous site disturbance was associated with residential development, farming, ploughing, cropping, grazing, dam construction, construction of farm tracks and vegetation stripping. The survey work identified a number of previously unrecorded Aboriginal sites, confirmed the presence of previously recorded Aboriginal sites and confirmed zones with PAD.

12.4.2 Aboriginal sites and areas with Potential Archaeological Deposits

The 2011 field survey of the 17 construction sites identified the following 35 Aboriginal Sites and areas with:

- 3 previously recorded sites that were re-located in 2011
- 17 previously recorded sites that were not re-located in 2011.
- 7 new Aboriginal sites recorded in 2011. Completed AHIMS site cards for these sites are included in Appendix D of the Indigenous Heritage Report, refer Technical Paper 4.
- 8 areas with PAD recorded in 2011.

Table 12.3 provides a summary of recorded Aboriginal sites and/or area with PAD associated with the NWRL's 17 construction sites (both recorded in this survey and previously). It is noted that these Aboriginal sites and PADs require heritage assessment and management before and during the construction of the NWRL. Two of these sites (45-5-3188 and 45-5-0961) have been subject to prior Section 90 consent and thus do not require future heritage management as they have been previously impacted by other developments and are deemed to be 'destroyed'. For additional details regarding these Aboriginal sites and PADs refer Technical Paper 4).

Table 12.3 Aboriginal sites and PAD requiring heritage assessment and management

Site / PAD	Aboriginal Site Type	Construction Site	Level of archaeological potential
NWRL PAD 1	PAD	3	Low to moderate
NWRL PAD 2 and 45-5-2861	Surface Area Concentration (SAC) with PAD	4	Low to moderate
NWRL PAD 3	PAD	6	Moderate
14 Cumbelege Lane (1) and PAD 6	SAC and PAD	9	Moderate to high potential
NWRL PAD 4	PAD	9	Moderate
NWRL PAD 5	PAD	9	Moderate
Corner of Taggert Way and Balmoral road	Isolated Find (IF)	10	None
NWRL PAD 7	PAD	10	Low to moderate
45-5-3354	SAC with PAD	10	Moderate to high potential
45-5-3158	IF	10	None
45-5-2365 and PAD 8	SAC with PAD	11	Low to moderate
NWRL PAD 9	PAD	11	Low to moderate
45-5-0933 (RH/CD9)	SAC with PAD	12	Moderate
NWRL PAD 10	PAD	13, 14	Low to moderate

Site / PAD	Aboriginal Site Type	Construction Site	Level of archaeological potential
45-5-3188	SAC with PAD	13	Unknown. This site has previously been destroyed.
NWRL PAD 11	PAD	14, 15	Low
45-5-2805 (RH/SP15)	SAC with PAD	16	High
45-5-3930	IF	16	Low
45-5-3931	IF	16	Low
59 Schofields Road	SAC with PAD	16/17	Moderate
65 Schofields Road 45-5-4112	IF	16/17	Low
45-5-3392	SAC with PAD	17	Moderate to high
45-5-3933 (RH/A20P 18)	SAC	17	None to Low
45-5-3355	SAC	17	None
RH/A20P PAD 5	PAD	17	Moderate
69 Schofields Road	SAC with PAD	16	Moderate to high
28 Tallawong Road	IF	17	Low

12.4.3 Significance Assessment

A significance assessment was undertaken to assess the Aboriginal heritage values of the study area in line with the four principal criteria (social, historical, scientific and aesthetic) of the Australian ICOMOS Burra Charter 1999 (the Burra Charter) and NSW Heritage Office *Assessing Heritage Significance 2001.*

Through consultation with the RAPs, investigation of the archaeological context of the study area and local region, and the field survey into account the heritage values in **Table 12.4** were determined:

Table 12.4 Summary of Aboriginal cultural heritage values

Value	Demonstrated characteristics	Grade of Significance
Social	The landscape through which the NWRL route traverses.	Moderate
	The physical Aboriginal sites and objects present within that landscape.	Moderate
	Rare and/or extensively destroyed site types – grinding grooves, scarred trees and stone objects.	High
Historic	Aboriginal heritage sites identified within the NWRL study area do not meet this criterion.	None
Scientific	The range of physical sites (and potentially areas with PAD).	Moderate
	Grinding groove sites (should they be present) and stratified occupation sites which demonstrate time depth of occupation.	High
Aesthetic	Aboriginal heritage sites identified within the NWRL study area do not meet this criterion.	None

Table 12.5 presents a summary of the scientific value for each known Aboriginal site located within the 17 construction sites.

Table 12.5 Summary of scientific value for each known Aboriginal site located within one of the NWRL's construction sites.

Site/PAD	Site type	Construction site	Level of archaeological potential	Grade of scientific value
NWRL PAD1	PAD	3	Low to moderate	Unknown, until excavated
45-5-2861 and NWRL PAD 2	SAC with PAD	4	Low to moderate	Low, until tested
NWRL PAD 3	PAD	6	Moderate	Unknown, until excavated
14 Cumbelege Lane (1) and NWRL PAD 6	SAC and PAD	9	Moderate to high	Moderate, but potentially high if the site possesses good condition and integrity with a dense archaeological deposit.
NWRL PAD 4	PAD	9	Moderate	Unknown, until excavated
NWRL PAD 5	PAD	9	Moderate	Until, until excavated
Corner of Taggert Way and Balmoral Road	IF	10	None	Low
NWRL PAD 7	PAD	10	Low to moderate	Unknown, until excavated
45-5-3354	SAC with PAD	10	Moderate to high	Moderate, but potentially high if the site possesses good condition and integrity with a dense archaeological deposit.
45-5-3158	IF	10	None	Low
45-5-2365 and NWRL PAD 8	SAC with PAD	11	Low to moderate	Low
NWRL PAD 9	PAD	11	Low to moderate	Unknown, until excavated
45-5-0933	SAC with PAD	12	Moderate	Moderate, but potentially high, should the site contain grinding grooves

Site/PAD	Site type	Construction site	Level of archaeological potential	Grade of scientific value
45-5-3188	SAC with PAD	13	Unknown. It is possible that this site has been previously destroyed	Unknown, until further investigated
NWRL PAD 10	PAD	13, 14	Low to moderate	Unknown, until excavated. High, should the site contain grinding grooves
NWRL PAD 11	PAD	14, 15	Low potential	Unknown, until excavated
45-5-2805 RH/SP15	SAC with PAD	16	High potential	Moderate, but potentially high if the site possesses good condition and integrity with a dense archaeological deposit
45-5-3930	IF	16	Low	Low
45-5-3931	IF	16	Low	Low
69 Schofields Road 45-5-4112	SAC with PAD	16	Moderate to high	Moderate, but potentially high if the site possesses good condition and integrity with a dense archaeological deposit
59 Schofields Road	SAC with PAD	16, 17	Moderate	Moderate
65 Schofields Road	IF	16, 17	Low	Low
45-5-3392	SAC with PAD	17	Moderate to high	To be determined through excavation.
45-5-3933 (RH/A20P 18)	SAC	17	None to low	Low
45-5-3355	SAC	17	None	Low
RH/AP20P PAD 5	PAD	17	Moderate	Unknown until excavated
28 Tallawong Road	IF	17	Low	Low

12.5 Potential Impacts

12.5.1 The Proposed Activity

The proposed activity within each of these 17 construction sites would result in complete removal of all top soil horizons and in most cases, deep excavation through the underlying bedrock. As such there is no potential for the retention of original intact soil horizons within any of the proposed construction sites.

12.5.1 Proposed Conservation of Heritage Sites

There would be no opportunity within the 17 construction sites for conservation of, or avoidance of impacts to, known Aboriginal sites and/or areas with archaeological potential.

However, the footprints of a number of Aboriginal heritage sites extend outside the boundaries of the construction sites. It is noted that the area of an Aboriginal site that extends outside the boundary of a construction site has the potential to be avoided by all impacts with the result that conservation of portions of some Aboriginal sites may be possible.

12.5.1 Proposed Impacts to Heritage Sites

The proposed activity would remove all soil that bears, or has the potential to bear, Aboriginal objects within each of the NWRL's 17 construction sites. Sandstone bedrock associated with creek corridors which, in association with Caddies Creek, has the potential to contain grinding grooves would be modified by the proposed activity. Construction of the proposed NWRL would therefore result in an impact (either complete and/or partial destruction) to 27 identified Aboriginal sites and areas with PAD. The degree of impact depends upon the size of each Aboriginal site and how far it extends outside each of the construction sites.

12.5.2 Summary of Sites and Impacts

Impacts and their consequences for all of the known Aboriginal sites, places, landscape, values and areas of archaeological potential are detailed in **Table 12.6**.

Table 12.6 Summary of Aboriginal sites, impacts of the NWRL and consequences

Site/PAD	Site type	Construction site	Type of harm	Degree of harm	Consequence of harm
NWRL PAD1	PAD	3	Direct	Partial	Partial loss of value
45-5-2861 and NWRL PAD 2	SAC with PAD	4	Direct	Partial	Partial loss of value
NWRL PAD 3	PAD	6	Direct	Partial	Partial loss of value
14 Cumbelege Lane (1) and NWRL PAD 6	SAC and PAD	9	Direct	Total	Total loss of value
NWRL PAD 4	PAD	9	Direct	Total	Total loss of value
NWRL PAD 5	PAD	9	Direct	Total	Total loss of value
Corner of Taggert Way and Balmoral Road	IF	10	Direct	Total	Total loss of value
NWRL PAD 7	PAD	10	Direct	Near total	Near total loss of value
45-5-3354	SAC with PAD	10	Direct	Total	Total loss of value
45-5-3158	IF	10	Direct	Total	Total loss of value
45-5-2365 and NWRL PAD 8	SAC with PAD	11	Direct	Partial	Partial loss of value
NWRL PAD 9	PAD	11	Direct	Total	Total loss of value
45-5-0933	SAC with PAD	12	Direct	Near total	Near total loss of value

Site/PAD	Site type	Construction site	Type of harm	Degree of harm	Consequence of harm
45-5-3188	SAC with PAD	13	Direct	Total	Total loss of value
NWRL PAD 10	PAD	13, 14	Direct	Partial	Partial loss of value
NWRL PAD 11	PAD	14, 15	Direct	Partial	Partial loss of value
45-5-2805 RH/SP15	SAC with PAD	16	Direct	Partial	Partial loss of value
45-5-3930	IF	16	Direct	Total	Total loss of value
45-5-3931	IF	16	Direct	Total	Total loss of value
69 Schofields Road	SAC with PAD	16	Direct	Total	Total loss of value
59 Schofields Road	SAC with PAD	16, 17	Direct	Total	Total loss of value
65 Schofields Road	IF	16, 17	Direct	Total	Total loss of value
45-5-3392	SAC with PAD	17	Direct	Total	Total loss of value
RH/A20P 18	SAC	17	Direct	Total	Total loss of value
45-5-3355	SAC	17	Direct	Total	Total loss of value
RH/AP20P PAD 5	PAD	17	Direct	Total	Total loss of value
28 Tallawong Road	IF	17	Direct	Total	Total loss of value

12.6 Management and Mitigation Measures

The Environmental Management Framework, provided in Appendix C, details the environmental, stakeholder and community management systems and processes for the construction of the NWRL.

Impacts to seven of the 27 impacted Aboriginal sites (including PADs) could be reduced with the implementation of an appropriate mitigation strategy. Mitigation measures have been developed to avoid, reduce and manage identified potential impacts on Indigenous Heritage, including avoiding and minimising harm, development of an Aboriginal Heritage Management Plan (AHMP), educating site workers, undertaking archaeological test and salvage excavation and public interpretation. Mitigation measures are presented in **Table 12.7**.

Ground surface impacts within the 17 construction sites are generally unavoidable. However impacts outside the boundaries of the construction sites could be avoided by implementation of a strategy of Aboriginal site avoidance specific to seven of the recorded Aboriginal sites. While all impacts could not be prevented, portions of these seven sites could be avoided and thus conserved intact for future generations.

Prior to site works the boundary of the works at each Aboriginal site would be delineated where feasible with a physical barrier and a sign erected to prevent accidental access. All areas with Aboriginal sites which are to be conserved would have zero vehicle access across their extent and no earthworks or stockpiling of materials would occur within their boundaries. A site induction protocol would be implemented to ensure that all work personnel are aware of their responsibilities in this regard.

Table 12.7 Indigenous Heritage Mitigation Measures

No.	Mitigation Measure	Applicable Sites*
IH1	Basic Phase 1[1] archaeological excavation would be undertaken prior to construction in the areas of impact. Phase 2[2] archaeological excavation would be carried out prior to construction in any locations deemed appropriate by the Phase 1[1] excavations.	3, 4, 10,11 and 13 – 15
IH2	Detailed Phase 1[1] archaeological excavation in the areas of impact. Possibly Phase 2[2] archaeological excavation in any locations deemed appropriate by the Phase 1[1] excavations.	6, 9, 10, 12, 16 and 17
IH3	The boundary of the construction sites would be fenced to prevent construction personnel entering PAD or known sites outside the construction footprint.	3, 4, 6 and 11 –16
IH4	The Indigenous Heritage component of the site induction would include information on: Aboriginal heritage conservation areas and/or no-go zones for each construction site. The legislation and penalties for impacting Aboriginal heritage objects would be conveyed to all construction managers and personnel.	1 – 17
IH5	TfNSW would consider permanent public interpretation within at least one of the new railway stations following development if an extensive and high value archaeological deposit were to be uncovered during the excavation of a site.	3, 4, 6 and 9 –17

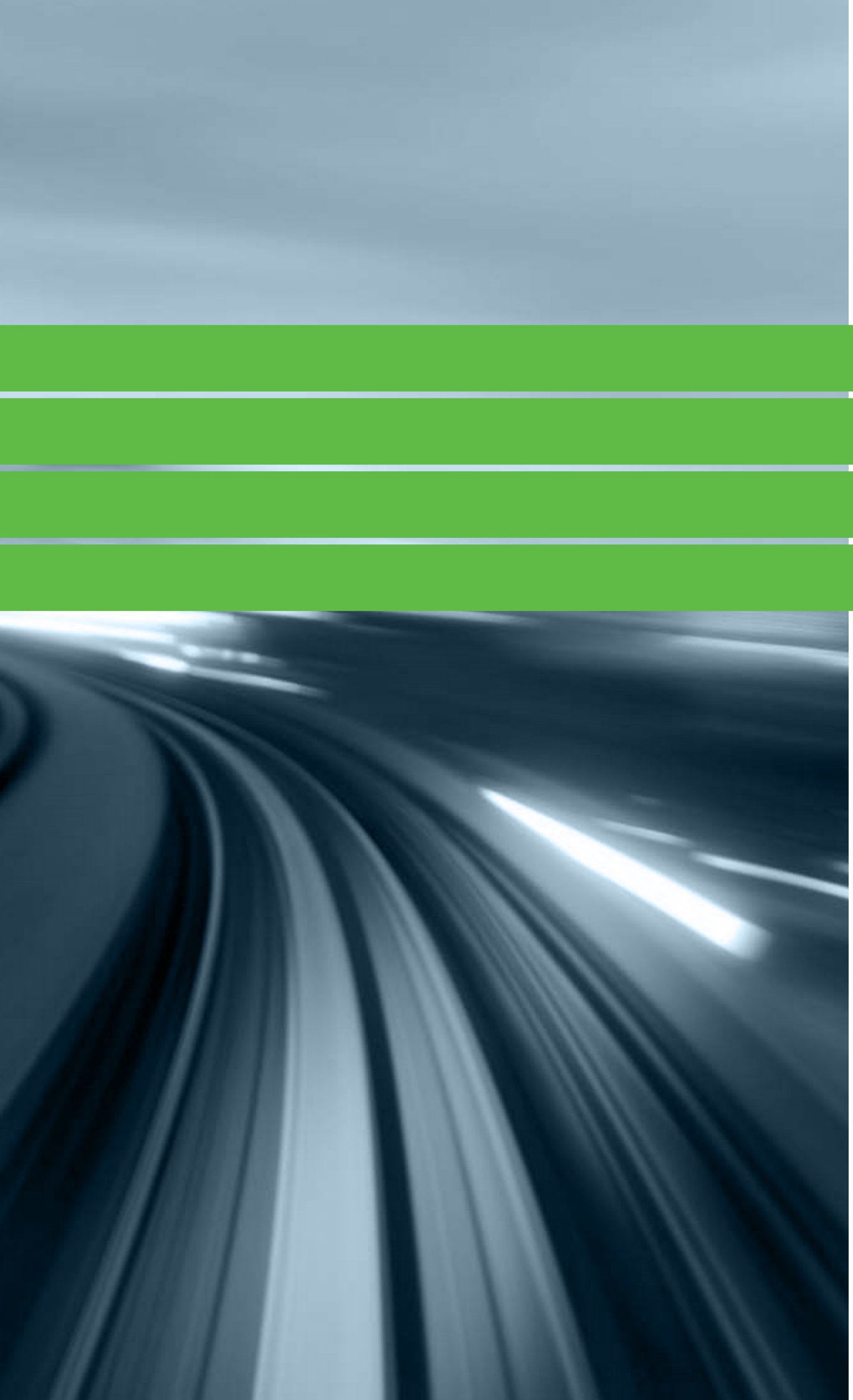
1 A two-phase investigation should be undertaken for each of the 27 Aboriginal heritage sites/PADs. Basic Phase 1 would undertake determination of the extent, content, condition and integrity of each site/PAD. For sites/PADs assessed to have a low to moderate level of potential, a basic grid of test units would be sampled to determine whether the site contains a deposit worthy of more detailed investigation. Detailed Phase 1 would involve a more detailed initial stage of investigation for Sites/PADs with a moderate or high level of archaeological potential.

2 Subject to an assessment of the results from Phase 1 (by the archaeologist and Aboriginal representatives), excavation may move into Phase 2—an open area excavation of any significant deposits present. The need for and/or extent of Phase 2 cannot be determined for any site/PAD until Phase 1 has been completed. Following Phases 1 and 2, an excavation report would be prepared for the sites (combining the results of all excavation together in one report). This report would be provided to the RAPs and OEH for public record. Post-impact AHIMS cards would be completed for all sites subject to archaeological excavation; and these must be submitted to the OEH AHIMS registrar.

3 This Aboriginal site may be subject to some test excavation by the RMS (in 2012). This work may alter the required scope of work for the NWRL.

Site 1 - Epping Services Facility, Site 2 - Epping Decline, Site 3 - Cheltenham Services Facility, Site 4 - Cherrybrook Station, Site 5 - Castle Hill Station, Site 6 - Hills Centre Station, Site 7 - Norwest Station, Site 8 - Bella Vista Station, Site 9 - Balmoral Road, Site 10 - Memorial Avenue, Site 11 - Kellyville Station, Site 12 - Samantha Riley Drive to Windsor Road, Site 13 - Old Windsor Road to White Hart Drive, Site 14 - Rouse Hill Station, Site 15 - Windsor Road Viaduct, Site 16 - Windsor Road Viaduct to Cudgegong Road, Site 17 - Cudgegong Road Station and Tallawong Stabling Facility, and Tunnels

13



13

LOCAL BUSINESS IMPACTS

13.1 Introduction

A local business impact assessment was undertaken for the major civil construction works for NWRL.

The purpose of the assessment was to identify and provide an assessment of the potential impacts on local businesses in the immediate vicinity of the Project during the major civil construction works. A qualitative assessment of the expected issues has been undertaken to determine the sources, types and direction of potential business impacts. Details of the assessment are provided below.

Overall, the project would become a major employer and user of goods and services during the construction phase. It is estimated that the project would support more than 16,200 jobs during construction (NSW Government 2011a) and inject $25 billion (directly and indirectly) into the NSW economy (NSW Government 2011b). Professions and trades would include, among others, engineers, draftsmen, environmental scientists, designers, electricians, plumbers, carpenters, bricklayers, drivers, storepersons, crane operators, dogmen, riggers, security guards and labourers.

13.2 Methodology

13.2.1 Director-General's Requirements, Conditions of Approval and Statement of Commitments

Table 13.1 sets out the Director-General's Requirements, the Conditions of Approval and Statement of Commitments as they relate to local business impacts, and where in the EIS these have been addressed.

Table 13.1 Director-General's Requirements, Conditions of Approval and Statement of Commitments

DGR Reference	Description	Addressed
N/A		
CoA Reference	**Description**	**Addressed**
N/A		
Statement of Commitments	**Description**	**Addressed**
Potential business impacts identified and considered as part of design development.	45. An assessment of the potential impacts and benefits of construction and operation on adjacent businesses would be undertaken in consultation with business owners during the design phase.	Potential construction impacts in Section 13.4. Potential operation impacts in EIS 2. Consultation in Chapter 5.

The assessment of local business impacts during the construction phase of the NWRL comprised:

- An overview of LGAs affected by the Project with a focus on profiling key business characteristics including the number of businesses by employment and turnover.
- A business survey along the NWRL corridor from Epping Station to Tallawong Stabling Facility to identify and document existing businesses at each construction site that may be affected by the major civil construction works.
  - The identification of businesses was limited to those businesses that were visually identifiable. As such, the survey only represents a sample of businesses at a specific locality. It is noted that low rise commercial buildings have not been included in the business surveys.
  - Businesses were classified in accordance with ABS (2006).
- Identification and assessment of the potential impacts (positive and negative) on businesses during the major civil construction works.
- Identification and discussion of mitigation measures (general and specific) that would assist in alleviating potential negative impacts associated with the major civil construction works.

13.3 Existing Environment

13.3.1 Introduction

The NWRL spans three Local Government Areas (LGAs): Hornsby Shire, The Hills Shire and Blacktown City. A summary of the construction sites and the corresponding LGAs is provided in **Table 13.2**.

Table 13.2 LGAs and Construction Sites

Local Government Area (LGA)	Construction Site
Hornsby Shire	1. Epping Services Facility
	2. Epping Decline
	3. Cheltenham Services Facility
	4. Cherrybrook Station
The Hills Shire	5. Castle Hill Station
	6. Hills Centre Station
	7. Norwest Station
	8. Bella Vista Station
	9. Balmoral Road
	10. Memorial Ave
	11. Kellyville Station
	12. Windsor Road/Old Windsor Road
	13. Old Windsor Road/Whitehart Drive
	14. Rouse Hill Station
Blacktown City	15. Windsor Road Viaduct*
	16.Windsor Road Viaduct to Cudgegong Road
	17. Cudgegong Road Station and Tallawong Stabling Facility

* Site 15 is also located within the Hills Shire LGA (boundary of the two LGAs is Windsor Road)

A summary of the key business characteristics of each LGA affected by the Project is provided in the following sections. Businesses are classified by employment and turnover based on counts of businesses using ABS (2009) data. Business categories by employment and turnover size are as follows:

- Employment size
  - Small: businesses with 1-19 employees.
  - Medium: businesses with 20-99 employees.
  - Large: businesses with at least 100 employees.
- Turnover size
  - Small: businesses with an annual turnover of less than $100,000.
  - Medium: businesses with an annual turnover of more than $100,000 and less than $500,000.
  - Large: businesses with an annual turnover of over $500,000.

The combined data of these LGAs provides an appreciation of the wider operating environment for business in the region.

13.3.2 Hornsby Shire

Hornsby Shire covers a total area of 510 km^2 and is the second largest LGA in Sydney. ABS (2011) data recorded a population of 164,034 in 2010, representing approximately 3.6% of total population in Sydney. From 2005 to 2010, it is estimated that the population grew by 0.9%.

The following is noted about the business environment of Hornsby Shire:

- **Table 13.3** shows that the majority of businesses in the Hornsby Shire are categorised as being small employers which account for 94.1% of total businesses.
- Almost half of all businesses in Hornsby Shire are also categorised as having a small turnover while 35.5% of all businesses produce a medium turnover. Businesses with a high turnover represent a relatively high proportion (14.6%) relative to The Hills Shire and Blacktown City LGAs.

Table 13.3 Number of businesses by employment and turnover size – Hornsby Shire

Size	Local Businesses by Employment Size		Local Businesses by Turnover Size	
	%	Top Industry	%	Top Industry
Small	94.1%	Professional, Scientific and Technical Services	49.9 %	Professional, Scientific and Technical Services
Medium	5.2 %	Accommodation and Food Services	35.5 %	Professional, Scientific and Technical Services
Large	0.7 %	Wholesale Trade	14.6 %	Construction

Source: ABS (2009)

13.3.3 The Hills Shire

The Hills Shire is a predominantly residential and semi-rural LGA with minor commercial and industrial land use. The Shire covers an area of 380 km^2. Based on ABS (2011) data, approximately 179,716 residents resided in the LGA, which represented approximately 3.9% of Sydney's total population. The LGA has experienced steady population growth from 2005 to 2010, growing by 2.0% over this period.

The Hills Shire contains the predominant commercial, high tech employment and high end retail activity for the North West including:

- The Norwest Business Park which houses the headquarters of some of Australia's leading brands, including Woolworths.
- Castle Towers, a major regional shopping centre which has plans to expand.
- A major automotive / commercial / bulky goods / light industrial area centred around Victoria Avenue, Castle Hill and the overall Castle Hill Trading Zone.

The following is noted about the business environment of The Hills Shire:

- The dominant businesses by employment size are small businesses (92.7%) mainly in construction with the remaining 7.3% of businesses classed as medium size employers in manufacturing. Based on the ABS data no large employers were registered within the Hills Shire although it is noted businesses that display this characteristic are present (for example Woolworths Headquarters and ResMed). The top industry in each employment size category is shown in **Table 13.4**.
- Businesses with a small turnover comprise the largest share (53.9%) of businesses in the Hills Shire. Medium turnover businesses account for 36.2%, while large turnover businesses account for the remainder. The top industry in each turnover size category is shown in **Table 13.4**.

Table 13.4 Number of businesses by employment and turnover size – The Hills Shire

Size	Local Businesses by Employment Size		Local Businesses by Turnover Size	
	%	Top Industry	%	Top Industry
Small	92.7%	Construction	53.9 %	Construction
Medium	7.3 %	Manufacturing	36.2 %	Construction
Large	0 %	NA	9.9 %	Construction and Retail

Source: ABS (2009)

13.3.4 Blacktown City

Blacktown City LGA covers an area of 247 km^2 and is predominantly residential, commercial and semi-rural in character. ABS (2011) recorded the population of Blacktown City to be 307,816 in 2010 which is 6.7% of the total population in Sydney. It is currently the most populous and fastest growing LGA in NSW as a whole (ABS 2011).

The following is noted about the business environment of Blacktown City:

- Small businesses (94%) are the preferred model for employment in Blacktown mainly in the construction industry.
- Blacktown City like both Hornsby Shire and The Hills Shire has a large proportion of businesses with a small turnover (52.4%) as shown in **Table 13.5**.

Table 13.5 Number of businesses by employment and turnover size – Blacktown City

Size	Local Businesses by Employment Size		Local Businesses by Turnover Size	
	%	Top Industry	%	Top Industry
Small	94.0 %	Construction	52.4 %	Construction
Medium	5.6 %	Manufacturing	34.1 %	Construction
Large	0.4 %	Wholesale	13.5 %	Construction

Source: ABS (2009)

13.3.5 Implications

A summary of the top three industries in the Project area based on a count of total businesses by employment and turnover in each LGA is provided in **Table 13.6**.

Table 13.6 Top three industries with highest proportion of employment and turnover

LGA	Top three number of businesses by employment	Top three number of businesses by turnover
Hornsby Shire	▪ Professional, Scientific & Technical ▪ Retail Trade ▪ Construction	▪ Professional, Scientific & Technical ▪ Construction ▪ Rental, Hiring & Real Estate Services
The Hills Shire	▪ Other services ▪ Manufacturing ▪ Financial & Insurance Services	▪ Construction ▪ Professional, Scientific & Technical ▪ Rental, Hiring & Real Estate Services
Blacktown City	▪ Other services ▪ Manufacturing ▪ Wholesale trade	▪ Construction ▪ Professional, Scientific & Technical ▪ Rental, Hiring & Real Estate Services
Total	▪ Other services ▪ Manufacturing ▪ Professional, Scientific & Technical	▪ Professional, Scientific & Technical ▪ Construction ▪ Rental, Hiring & Real Estate Services

The following observations are made:

- Construction businesses comprise a large proportion of the businesses in the region. This provides a strong foundation for these businesses to support the construction of the Project as demand for construction related services and workers in the region increases.
- Other industries that make up a large proportion of businesses in the region, such as Rental, Hiring and Real Estate Services and Accommodation and Food Services are also likely to benefit from increased economic activity during construction.
- Although some industries in the region may potentially be negatively affected by construction works the impacts are likely to be negligible because of the nature of their operations. Examples of these types of industries may include businesses operating in the Professional, Scientific and Technical Service industry and Financial and Insurance Services industry. This is because these businesses tend to be less reliant on passing trade and/or quality of the operating environment (eg customers seeking to use accountancy services are likely to continue to use these services regardless of the construction related works).
- Other businesses predominant in the region, such as Retail Trade in Hornsby Shire, tend to be located further north of the LGA and are unlikely to be affected by construction works.
- Retail traders within the Hills Shire that service the daily needs of construction related workforce (eg major retail supermarkets and food outlets) may experience an increase in demand for their goods and services.

- Wholesale trade businesses are also expected to have minimal disruptions, as they are not dependent on attracting a high proportion of passing trade. However, disruptions associated with accessibility to and from these businesses may affect the transport efficiency of suppliers and deliveries to retailers.

13.4 Potential Impacts

The assessment of the potential impact on local businesses during the major construction works included the following:

- Identification of the potential impacts (positive and negative) on local businesses during the major civil construction phase of the Project.
- Identification and classification of existing businesses in the immediate vicinity of the Project that may be affected by the major civil construction works based on targeted site surveys at each construction site.
- Assessment of the type, direction and magnitude of potential impacts by qualitatively discussing the impacts at each of the construction sites.

13.4.1 Local Business Impact Drivers

Negative Sources and Implications

The potential negative impacts of the Project on local businesses would vary depending on the location and the type of business. In this regard, a set of common negative sources of impact were applied at each construction site to assess the type and magnitude of impacts that would affect the operation of local businesses as follows:

- Reduced accessibility – Accessibility to business enterprises relates to the ease that customers and/or suppliers can gain access to the businesses within the proposed construction area. Reduced accessibility as a result of construction works could be caused by street closures and increased traffic congestion due to heavy vehicle movements. Loss of car parking availability due to construction access and all day parking by construction workers may occur unless effectively managed (refer to Chapter 9).
- Poorer visibility – Visibility to passing traffic is important to some businesses, particularly those that are reliant on passing trade such as service stations and take-away food outlets. Poor visibility of businesses could result from a number of construction related activities including visual disruption associated with construction machinery, frequent construction vehicle movements along the local road system, construction fencing, material stockpiling and construction sites in the area.
- Reduced quality in operating amenity – The operating amenity of the locations may be affected by construction activity resulting in noise, air and vibration disturbances to local businesses. For example, noise and vibration has the potential to negatively affect employee productivity, interaction with customers and workplace ambience. Reduced operating amenity would have greater implications for those businesses that rely on serene environments such as outdoor dining.

In summary, these negative sources of impacts may have the effect of reducing trade and commerce for existing businesses unless appropriately managed.

In some instances, where the impact is particularly severe, displacement and/or relocation of workers could also occur as a result of a reduction in trade and commerce.

Positive Sources and Implications

The key positive sources of impact relate to the expenditure made by government to construct the Project. This economic stimulus benefits local business principally through expenditure made by construction businesses and associated workers to build and support the development of the Project.

In particular, businesses that may directly benefit from construction of the Project may include local construction contractors and those businesses who service the construction industry such as food and beverage retailers, accommodation providers, and other retail outlets that would cater to the day-to-day needs of the construction workforce. In addition, as many of the civil construction workforces are likely to live in the three LGAs, the overall wealth and/or disposable income of the community is expected to grow.

Principally, the positive sources of impact are expected to be reflected by:

- **Increased trade** – reflecting an increase in the demand for goods and services due to construction activity.
- **Increased income** – reflecting increased value of wages paid to workers as a result of increased demand for labour resources to construct the Project.
- **Increased employment** – reflecting the increase in the number of workers engaged to construct the Project.

These positive sources of impacts on gross regional product, income and employment may be 'direct', 'indirect', 'induced' or 'dynamic'. That is:

- Direct impacts would relate to those businesses directly affected by construction (eg local food outlets and retailers benefiting from increased patronage during the operation of the NWRL);
- Indirect impacts would relate to those businesses supplying direct businesses (eg increased demand for the goods and services businesses which supply food outlets and retailers);
- Induced impacts would relate to those businesses affected by the spending of incomes by direct and indirect workers (eg spending by food outlet and retail employees on other businesses); and
- Dynamic impacts would relate to how the NWRL would shift population, workforce, labour costs and prices (eg the role of the NWRL in improving the productivity of businesses and in attracting economic activities such as inward investment and population).

In effect, the sum of all these effects could be expected to be the total economic impact of the NWRL on local businesses. Specific economic benefits associated with the operation of the project including wider economic benefits would be considered in EIS 2.

Identification and assessment of the potential impacts (positive and negative) on businesses during the major civil construction works at each construction site are identified in the following sections.

13.4.2 Epping Services Facility and Epping Decline (Sites 1 and 2)

The major civil construction works are situated adjacent to the established town centre of Epping which provides a mix of smaller scale retail, cafes, restaurants, health services and community facilities.

Epping Services Facility is ultimately proposed for tunnel ventilation and as an emergency access and egress facility. The Epping Decline site would be utilised to provide vehicular access to the proposed running tunnels and would be a temporary site used during construction only. The following construction activities, structures and equipment may affect local businesses:

- Access and egress of light and heavy vehicles to both sites would be via Beecroft Road with the possibility of 24 hour 7 days a week vehicle movement.
- Visual components including acoustic sheds, workshop building, laydown areas, water treatment plants and construction hoardings (up to 3m high) enclosing each site.
- Noise, vibration and air disturbances from construction vehicles and machinery, shaft and decline excavations, spoil removal and associated activities.
- During the major civil construction works, the workforce would be approximately 40 at the services facility site and 20 at the decline site, during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works at Epping is shown in **Figure 13.1**.

Business Survey

A sample count of local businesses in the vicinity of Beecroft Road at Epping was undertaken. The survey identified that the following businesses may be impacted by the major civil construction works:

- Retail (19)
- Accommodation, cafes and restaurants (41)
- Transport and storage (2)
- Finance and Insurance (4)
- Property and Businesses Services (10)
- Health and Community Services (13)
- Personal and other services (20)

The low rise commercial businesses that lie directly to the north and south of the Epping Services Facility site were not included in the business survey.

Negative impacts due to construction related works

- Poorer accessibility to businesses during the construction works may occur as a result of heavy vehicle movements into and out of the sites along Beecroft Road. However, Chapter 9 (Construction Traffic) indicates that additional truck movements in the vicinity of Epping would be acceptable.
- Visibility to the businesses located in the town centre should not be affected during construction as the sites are located some distance away from these businesses.

- Businesses may experience a reduction in operating amenity during construction works. In particular, outdoor cafes, food outlets and eateries stand to be most affected due to noise and air impacts. It is noted these businesses would already experience reduced amenity from traffic on Beecroft Road. Chapter 10 (Construction Noise and Vibration) indicates that noise impacts would be within acceptable levels. Section 19.1 (Air Quality) identifies effective mitigation measures for controlling dust.
- Low rise commercial buildings lie directly south and east of the Epping Services site. During construction these businesses may experience a reduction in the quality of the operating amenity as a result of potential noise and vibration disturbances.

Positive impacts due to construction related stimulus

- Retail, accommodation, cafes, restaurants and the health and community services sector are expected to benefit from increased expenditure within the area due to increased patronage from construction workers.
- Cafes, restaurants and eateries, which account for the highest number of businesses in this locality, would stand to benefit the most during construction. The increase in trade may subsequently lead to increased employment and incomes for businesses and employees.
- The 7/11 service station at the corner of Beecroft and Carlingford Roads may encounter increased demand for convenience goods.

13.4.3 Cheltenham Services Facility (Site 3)

The major civil construction works at Cheltenham are located in a predominantly residential area.

The Cheltenham site would ultimately provide tunnel ventilation and emergency access and egress from the tunnels between Epping and Cherrybrook stations. The following construction activities, structures and equipment may affect local businesses:

- Access and egress of light vehicles to the site would be via Castle Howard Road. Heavy vehicle access and egress would be via either Kirkham Street or the M2 Motorway.
- Visual components including an acoustic shed, workshop building, laydown areas, water treatment plant and construction hoardings (up to 3m high) enclosing the site.
- Noise, vibration and air disturbances from construction vehicles and machinery, shaft excavation, spoil removal and associated activities.
- During the major civil construction works, the workforce at the site would be approximately 40 during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works at Cheltenham is shown in **Figure 13.2**.

Business Survey

No local businesses were identified during the survey conducted in the immediate vicinity of the construction site along Castle Howard Road.

Negative and positive impacts

No negative impacts on local businesses are anticipated from the construction works at Cheltenham.

The cluster of small businesses and eateries located at Beecroft Station may experience additional demand and positive flow-on effects from the construction works at Cheltenham.

13.4.4 Cherrybrook Station (Site 4)

Development surrounding the proposed Cherrybrook station is predominantly residential, however, a number of community and educational facilities are in close proximity to the construction site.

Extensive civil construction works would be undertaken at the Cherrybrook Station site. The following construction activities, structures and equipment may affect local businesses:

- Access and egress of heavy vehicles to the site would be via a dedicated right turn lane at a signalised intersection, likely to be located at the existing Glenhope Road intersection with Castle Hill Road. Light vehicles entry and exit would be required from Franklin Road at a signalised intersection on Castle Howard Road.
- Visual components including an acoustic shed, TBM services, workshop building, laydown areas, water treatment plant and construction hoardings (up to 6m high) enclosing the site.
- Noise, vibration and air disturbances from construction vehicles and machinery, station excavation, spoil removal and associated activities.
- During the major civil construction works, the workforce at the site would be approximately 100 during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works at Cherrybrook is shown in **Figure 13.3**.

Business Survey

The business survey conducted along Franklin and Castle Hill Roads identified that the following businesses may be impacted by the major civil construction works:

- Health and community services (3)
- Education (1)

Negative impacts due to construction related stimulus

The identified businesses may experience a minor reduction in operating amenity during the construction period due to the effects of noise and vibration disturbances from construction activities. Chapter 10 (construction Noise and Vibration) identifies effective mitigation measures for controlling noise and vibration.

Positive impacts due to construction related stimulus

Two clusters of local businesses are located within approximately two kilometres of the construction site. One at Shepherds Drive to the northeast and the other at Coonara Avenue to the southwest. These businesses may experience increased patronage from workers during construction works.

13.4.5 Castle Hill Station (Site 5)

The proposed Castle Hill Station is situated within a major retail precinct. Castle Towers Shopping Centre, located to the north west of the construction site, is one of the more prominent shopping centres in North West Sydney.

Extensive civil construction works would be undertaken at the Castle Hill Station site with the major works involving a station excavation, launch of the road header and spoil removal. The following construction activities, structures and equipment may affect local businesses:

- Access and egress of light and heavy vehicles to the site would be via Old Northern Road and McMullen Avenue. Construction activities would also require the partial closure of Old Northern Road and the relocation of the local bus interchange and layover.
- Visual components including an acoustic shed, cranes, workshop building, lay down areas, water treatment plant and construction hoardings (up to 3m high) enclosing the site.
- Noise, vibration and air disturbances from construction vehicles and machinery, station excavation, spoil removal and associated activities.
- During the major civil construction works, the workforce at the site would be approximately 30 during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works at Castle Hill is shown in **Figure 13.4**.

Business Survey

The survey of all local businesses along Old Northern Road and within the Castle Hill Piazza precinct identified the following businesses:

- Retail (25)
- Accommodation, cafes and restaurants (26)
- Transport and storage (3)
- Finance and Insurance (6)
- Property and Businesses Services (2)
- Education (1)
- Health and Community Services (8)
- Personal and other services (12)

An overview of the businesses located within the Castle Towers Shopping centre found that out of the 339 retail stores within the centre, approximately 10% consisted of food outlets and eateries.

Negative impacts due to construction related works

- Construction works would adversely affect the accessibility of some local businesses within the area. The Castle Towers Shopping Centre is adjacent to the construction site and has one of its entrances to its parking facilities on Old Castle Hill Road. However, as construction vehicles are not proposed to enter/exit the construction site from Old Castle Hill Road near these entries/exits, the centre's car parks would not be impacted by construction works. It is proposed to relocate the bus stop and layover from Old Northern Road onto Old Castle Hill Road.

- There may be a reduction in available parking for staff and customers of the Castle Tower Shopping Centre should construction workers utilise shopping centre car parking during the construction works. This issue is addressed in Chapter 9 (Construction Traffic).
- Cafes, restaurants, eateries and small retailers along Old Northern Road may experience a loss of passing trade during the period of partial closure of Old Northern Road.
- Retailers and cafes, restaurants and eateries along Old Castle Hill Road may experience poor visibility during construction from placement of the hoarding along the construction site boundary.
- Restaurants, particularly those situated within the outdoor Castle Hill Piazza precinct, are likely to experience poorer visibility by virtue of construction vehicle movements. These businesses, which depend on the visibility of passing traffic and pedestrians for their viability, are the most likely to experience and impact during construction works.

Positive impacts due to construction related stimulus

- During construction works a small to moderate increase in the demand for goods and services may be expected. The businesses which are most likely to experience this demand are the eateries, food outlets and local retailers along Old Northern Road and within Castle Towers Shopping Centre due to the flow-on effects of construction workers.
- Similarly, health and community services (chemist and medical centre) may also experience increased demand from the flow on effects associated with construction worker activity.
- Overall, it is expected that construction related works would induce a rise in incomes for local businesses (by the spending of direct and indirect workers), as well as generate additional employment opportunities for these businesses owing to the need to service the additional demand.

13.4.6 Hills Centre Station (Site 6)

The major civil construction works are located within a mixed land use area consisting of residential, industrial, civic and community uses. The construction site is situated in close proximity to Castle Hill Showground, the Hills Shire Council Chambers and the Hills Centre for performing Arts. The construction site is situated adjacent to the Castle Hill Trading Zone which provides retail outlets and other community infrastructure.

The following construction activities, structures and equipment may affect local businesses:

- Access and egress of light and heavy vehicles to the site is proposed to be via Showground and Carrington Roads.
- Visual components including an acoustic shed, TBM services, workshop building, laydown areas, water treatment plant and construction hoardings (up to 3m high) enclosing the site.
- Noise, vibration and air disturbances from construction vehicles and machinery, station excavation, spoil removal and associated activities.

- During the major civil construction works, the workforce at the site would be approximately 100 during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works at The Hills Centre is shown in **Figure 13.5**.

Business Survey

The business survey addresses the area surrounding the construction site, the Castle Hill Trading Zone and The Hills Homemaker Centre. Owing to the vast number of businesses at this locality, a detailed survey was not undertaken. However, an overview of the businesses is provided below.

The site verification was conducted mainly along Victoria Avenue and the adjacent roads. The area mainly consisted of retail outlets and other social community infrastructure. Businesses include education (Hills College TAFE, Carrington Pre-School Long Day Care), health and community services (Castle Hill Baptist Church) and retail (eg The Hills Homemaker Centre, Car sales yards – Holden, Ford, Mitsubishi, Toyota).

An overview of The Hills Homemaker Centre located to the north west of the proposed construction site found that out of the 86 stores within the centre approximately 11% accounted for cafe and restaurants, 87% were retail with the remaining 2% being of the finance sector. Additionally the Castle Hill Tavern is located east of the works.

Negative impacts due to construction related works

- The Hills Shire Council Chambers and the Hills Centre for Performing Arts may experience reduced accessibility and reduced quality in the operating environment during the construction works. Construction worker related car parking may also reduce the availability of customer car-parking, causing disruptions to the ease of customer access.
- It is expected that during construction the education centres (such as Hills College TAFE and Carrington Pre-School Long Day Care) and the health and community centres (such as Castle Hill Baptist Church) may experience a minor reduction in the quality of the operating amenity resulting from noise, vibration and dust impacts. Chapter 10 (Construction Noise and Vibration) and Chapter 19.1 (Air Quality) identify effective mitigation measures for controlling these potential impacts.

Positive impacts due to construction related stimulus

- Certain businesses within The Hills Homemaker Centre and Castle Hill Tavern may experience increased trade. Food outlets and eateries may have increased flow-on effects from the construction workforce.

13.4.7 Norwest Station (Site 7)

The major civil construction works would be located within the existing Norwest Specialised Centre, adjacent to Norwest Market Town Shopping Centre. Norwest performs a vital economic and employment role and has a metropolitan wide influence.

The civil construction works at Norwest Station would include excavation of the station cavern. The following construction activities, structures and equipment may affect local businesses:

- Access and egress to the site is proposed to be directly on and off both Brookhollow Avenue to the construction support site and Norwest Boulevard to the station box excavation in the median.
- Visual components including a workshop building, laydown areas, water treatment plant and construction hoardings (up to 3m high) enclosing the site.
- Noise, vibration and air disturbances from construction vehicles and machinery, station excavation, spoil removal and associated activities.
- During the major civil construction works, the workforce at the site would be approximately 20 during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works at Norwest is shown in **Figure 13.6**.

Business Survey

The site survey identified businesses impacted during construction works to be located directly north and north west of the proposed works. These businesses include:

- Retail (10)
- Accommodation, cafes and restaurants (16)
- Transport and storage (1)
- Finance and Insurance (3)
- Property and Businesses Services (2)
- Health and Community Services (5)
- Cultural and Recreational Services (1)
- Personal and other services (7)

The low rise commercial businesses adjacent to the site were not included in the business survey owing to the large number of commercial businesses in the area.

Negative impacts due to construction related works

- Accessibility to businesses located along Norwest Boulevard may be negatively impacted during construction due to temporary road changes, heavy vehicle movements and a reduction in available car parking. Chapter 9 (Construction Traffic) identifies effective mitigation measures for minimising disruption and maintaining access to businesses.
- During construction it is possible that Hill Song Church, located to the west of the construction site, would experience reduced accessibility and operating amenity. Chapter 10 (Construction Noise and Vibration) indicates that noise impacts would be within acceptable levels.
- The Shell Service station and retailers within the Norwest Market Town shopping centre would be less visible to passing trade.

- Retailers, cafes and restaurants may also experience negative impacts during construction. As various stages of construction would occur along Norwest Boulevard, an increase in traffic congestion may occur due to the works.
- Operating amenity for finance and insurance businesses may be impacted during construction as the businesses are situated in close proximity to the works. Noise and vibration during construction has the potential to negatively affect employee productivity in these industries. Additionally, these businesses may at times be harder to access and there may be a reduced level of car parking. Chapter 9 (Construction Traffic) and Chapter 10 (Construction Noise and Vibration) identifies effective mitigation measures for controlling potential impacts.
- Outdoor cafes and restaurants within the Norwest Market Town shopping centre may experience noise, air and vibration disturbances during construction works. Chapter 10 (Construction Traffic) and Chapter 19.1 (Air Quality) identifies effective mitigation measures for controlling these potential impacts.

Positive impacts due to construction related stimulus

- Although accessibility to businesses may be impacted during construction, this may be offset in part by the positive flow on effects associated with construction activities.
- Industries which would most likely benefit from construction are the cafes, restaurants, eateries and retail outlets catering for the day-to-day needs of the construction workforce (eg large retail supermarkets, fruit/vegetable markets).
- During construction works, a small to moderate increase in sales and demand may be expected in these industries as a result of the flow-on effects from construction workers in the area.

13.4.8 Bella Vista Station (Sites 8 and 9)

The major civil construction works are located to the north of the western extent of the Norwest Specialised Centre.

Bella Vista Station (Site 8) would accommodate the construction of a station box. The Balmoral Road site (Site 9) would accommodate a concrete batch plant and precast facility to support the tunnelling components of the project. The following construction activities, structures and equipment may affect local businesses:

- Access and egress to the sites is proposed to be directly on and off Celebration Drive and Balmoral Road.
- Visual components including an acoustic sheds for station excavation and batch plant, workshop buildings, cranes, laydown areas, water treatment plant and construction hoardings enclosing the sites.
- Noise, vibration and air disturbances from construction vehicles and machinery, station excavation, spoil removal and concrete batch plant and precast facility activities.
- During the major civil construction works, the workforce would be approximately 100 at the Bella Vista Station site and 100 at the Balmoral Road site, during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works at Bella Vista is shown in **Figure 13.7**.

Business Survey

The construction works would acquire the Totally Home shopping centre. The businesses along Celebration Drive are predominantly low rise commercial estates and were not included in the business survey. Two local businesses along Old Windsor Road which are likely to be impacted during construction works are:

- McDonalds
- BP service station

Negative impacts due to construction related works

- Accessibility to the McDonalds and BP service station would be significantly affected as a result of construction works. The entrance to these businesses, through the Totally Home shopping centre (to be demolished as part of the works), would be removed and relocated which may lead to a reduction in trade. However, access to these businesses would be relocated to provide the same level of access.
- Movement of heavy construction vehicles on Celebration Drive may potentially reduce the accessibility for businesses south of the construction works.
- Both the McDonalds and the BP service station may experience visual impacts associated with the construction elements and machinery due to their close proximity to the construction site. However, appropriate design of construction hoardings and the acoustic shed would aim to mitigate these potential impacts.
- Additional noise, vibration and air disturbance impacts may reduce the amenity for patrons of McDonalds. Chapter 10 (Construction Noise and Vibration) and Chapter 19.1 (Air Quality) identifies effective mitigation measures for controlling these potential impacts.
- Low rise commercial businesses along Celebration and Lexington Drives (eg Woolworths headquarters, Fitness First, ResMed) may experience a reduction in their operating environment resulting from the construction works. Chapter 10 (Construction Noise and Vibration) and **Chapter 19.1** (Air Quality) identify effective mitigation measures for controlling these potential impacts.

Positive impacts due to construction related stimulus

- The closeness of construction works to McDonalds and the BP service station may partially off-set the negative effects identified above as a slight increase in business related sales may be experienced.

13.4.9 Kellyville Station (Sites 10, 11 and 12)

Major civil construction works in the vicinity of Kellyville Station are located in a predominantly residential and rural area.

The Memorial Avenue site (Site 10) would be utilised as a staging point for the construction of the elevated concrete viaduct and for a second concrete batching plant. Kellyville Station (Site 11) would involve civil works associated with construction of the elevated viaduct station. The section of alignment between Samantha Riley Drive and Windsor Road (Site 12) would involve general civil works associated with construction of the viaduct. The following construction activities, structures and equipment may affect local businesses:

- Access and egress to the sites is proposed to be via Memorial Avenue, Balmoral Road, Samantha Riley Drive and Windsor Road.
- Visual components including workshop buildings, cranes, concrete batch plant and precast facility and laydown areas.
- Noise, vibration and air disturbances from construction vehicles and machinery, general civil works, concrete batch plant and precast facility activities and associated activities.
- During the major civil construction works, the workforce would be approximately 180 at the Memorial Ave site, 106 at the Kellyville Station site and 56 at the Samantha Riley Drive to Windsor Road site, during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works at Kellyville is shown in **Figure 13.8**.

Business Survey

A survey was undertaken of businesses adjacent to the construction site along Old Windsor Road. Businesses in the area are located on Old Windsor Road in the vicinity of Miami Street. These businesses include:

- Accommodation, cafes and restaurants (3)
- Personal and other services – car wash (1)
- Retail – Caltex service station (1)

Negative impacts due to construction related works

- The identified businesses may experience minor traffic congestion due to construction vehicle movements, however, the impact is likely to be negligible as the businesses are located on the opposite side of a major road (Old Windsor Road).
- Reduced operating amenity may be experienced at the cafes and restaurants (for example Hungry Jacks and the Outback Steakhouse) due to increased noise. The Caltex service station and car washing business may be impacted by an increase airborne dust. Chapter 10 (Construction Noise and Vibration) and Chapter 19.1 (Air Quality) identify effective mitigation measures for controlling these potential impacts.

Positive impacts due to construction related stimulus

- The cafes, restaurants and service station at this location (in particular the Hungry Jacks and Caltex service station) would most likely experience an increase in demand due to the presence of construction workers in the area.

13.4.10 Rouse Hill Station (Site 13 and 14)

The major civil construction works are in close proximity to the Rouse Hill Town Centre, a major retail and service centre located on the edge of the North West Growth Centre.

The section of alignment between Old Windsor Road and White Hart Drive (Site 13) would involve general civil works associated with construction of the viaduct. Rouse Hill Station (Site 14) would involve civil works associated with the construction of an elevated viaduct station. The following construction activities, structures and equipment may affect local businesses:

- Access to and egress from the site would be from Windsor Road, with one access and egress point located near White Hart Drive and one near Rouse Hill Drive. An internal access road would be provided through the site between these two points.
- Visual components including workshop buildings and laydown areas.
- Noise, vibration and air disturbances from construction vehicles and machinery and general civil works.
- During the major civil construction works, the workforce would be approximately 112 at the Old Windsor Road to White Hart Drive site and 50 at the Rouse Hill Station site, during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works at Rouse Hill is shown in **Figure 13.9**.

Business Survey

A site verification of the businesses at the Rouse Hill Town Centre was undertaken, with the predominant business types being retail, food outlets and eateries. A count was conducted on the businesses located within the Rouse Hill site, these businesses included:

- Retail Trade (132)
- Accommodation, cafes and restaurants (47)
- Health and community services (14)
- Finance (8)
- Professional Services (4)
- Other (17).

A small cluster of businesses is also located south of the Rouse Hill Town Centre along Windsor Road in the vicinity of Merriville Road. These businesses include:

- Accommodation, cafes and restaurants (2) – McDonalds and Ettamogah Pub
- Retail Trade (2) – Dan Murphy and Caltex service station.

Negative impacts due to construction related works

- Accessibility to the businesses, located adjacent to the station construction at the Rouse Hill Town Centre, is expected to be reduced due the erection of construction fencing and heavy vehicle movements along Windsor Road. Construction workers may also use existing available car spaces in the Rouse Hill Town Centre.
- The erection of construction fencing, height of material stockpiles and frequent movement of large heavy machinery result in businesses such as cafes and restaurants, located adjacent to the station construction site being less visible to passing trade.
- A reduction in operating amenity may also be experienced by some businesses in close proximity to the construction site at Rouse Hill Town Centre. In particular, cafes and restaurants on the outskirts of the town centre, which are predominantly set in an outdoor setting, are most likely be affected by noise, air and vibration impacts. Chapter 10 (Construction Noise and Vibration) and Chapter 19.1 (Air Quality) identifies effective mitigation measures for controlling these potential impacts.
- The cafes and restaurants in the vicinity of Merriville Road are likely to experience minor disruptions to their operating amenity. These businesses are unlikely to be impacted by visibility or access issues as they are located on the opposite side of Old Windsor Road.

Positive impacts due to construction related stimulus

- The cafes, restaurants and eateries within the immediate vicinity of the construction works are expected to experience an increase in demand for goods and services from construction workers.
- Health and community services and retailers catering for everyday needs (eg Chemist, supermarkets) may also experience increased demand for goods from construction workers.

13.4.11 Cudgegong Road Station and Tallawong Stabling Facility (Sites 15, 16, 17)

The major civil construction works are located in a predominantly rural area with low density residential neighbourhoods south of the proposed construction works.

This section of alignment would comprise general civil works associated with construction of the viaduct structure, Cudgegong Station and Tallawong Stabling Facility. The following construction activities, structures and equipment may affect local businesses:

- Access and egress to the sites is proposed to be via Cudgegong Road, Tallawong Road and Schofields Road.
- Visual components including workshop buildings, lay down areas and construction fencing enclosing the sites.
- Noise, vibration and air disturbances from construction vehicles and machinery and general civil works along the alignment.
- During the major civil construction works, the workforce would be approximately 240 for this section of the alignment, during the peak construction period. Further jobs would also be indirectly created by the project.

The location of local businesses relative to the construction works is shown in **Figure 13.9**.

Business Survey

A survey conducted along Schofields Road identified no businesses in the immediate vicinity of the proposed construction works. However, it is noted that a planned neighbourhood centre is located adjacent to the proposed station. It is not envisaged that any businesses would be operating by the time construction activities take place.

Positive and negative impacts

No negative impacts on local businesses are anticipated for the construction works along Schofields Road.

During the construction period, workers may travel to Rouse Hill Town Centre which is located 1.5 km east of the works. Certain types of businesses (such as food and beverage retailers) in the Rouse Hill Town Centre may therefore experience positive flow on effects as a result of worker related expenditure in the vicinity.

13.4.12 Summary of Potential Negative impacts due to construction related works

For all of the localities surveyed, the potential negative impacts arising from a loss of accessibility, reduced visibility and reduced operating amenity to local businesses are not expected to be detrimental and would generally be confined to a small area.

Primary concerns for the businesses relate to movements of heavy vehicles into and out of the construction sites, as well as parking availability on surrounding streets potentially affecting customers and staff accessibility. However, it is noted that the traffic, site access and egress proposed for each construction site have been designed to minimise the risk of reduced accessibility (refer Chapter 9 Construction Traffic).

Local businesses that are most likely to be affected due to their proximity to the construction sites are as follows:

- Castle Hill Station. Frequent construction vehicle movements and nearby construction activities would give rise to noise and vibration disturbances to retailers, cafes and restaurants in close proximity to the construction site as well as having an impact on the visual amenity of the area. Businesses within the outdoor Castle Hill Piazza precinct are most likely to be negatively impacted unless adequately managed.
- Norwest Station. Construction works are expected to have a particular impact on the Shell service station located on Norwest Boulevard. Construction works along Norwest Boulevard may also affect accessibility to the station potentially leading to a loss in passing trade unless adequately managed.
- Bella Vista Station. Accessibility to the two businesses, McDonalds and BP service station, would be compromised by the construction works through acquisition of one of the existing access way through the Total Homemaker shopping centre. Alternative access would be provided.
- Rouse Hill Station. Local businesses in close proximity to the construction works may experience reduced visibility due to erection of construction fencing and material stockpiling. Businesses may experience a loss in passing trade.

13.4.13 Summary of Potential Positive impacts due to construction related stimulus

The potential positive impacts associated with civil construction are expected to be experienced across all locations. Industries which are most likely to experience the positive impacts due to flow on effects from the construction workforce are those that cater for the day-to-day needs of the workforce, such as take-away food outlets, cafes, restaurants and retail.

Businesses in the following localities are most likely to benefit from construction worker related activity, and hence increased trade:

- Cherrybrook, Castle Hill, Hills Centre, Norwest, Bella Vista and Rouse Hill sites as these construction sites would be highly capital and labour intensive driven by TBM, precast facilities works and/or station construction.
- Kellyville and Rouse Hill would have labour intensive needs associated with the construction of stations and viaduct. As an example, a small to moderate increase in demand might be expected for the eateries on Old Windsor Road (Kellyville) due to the flow-on effects of the construction workforce.
- Civil works at Tallawong Stabling Facility would also induce positive impacts for local businesses. This could be expected to result in an increase in cafe, restaurant and eatery activity, specifically for Rouse Hill Town Centre. Health and community services, as well as retailers, may also experience an increase in demand for goods and services.

The positive long term economic benefits associated with the project once the rail link is in operation will be considered in EIS 2.

13.5 Mitigation Measures

The Environmental Management Framework, provided in **Appendix C**, details the environmental, stakeholder and community management systems and processes for the construction of the NWRL.

Mitigation measures have been developed to avoid, reduce and manage identified potential impacts. These mitigation measures and their application to the construction sites for the NWRL are presented in **Table 13.7**.

In addition to the mitigation measures identified in **Table 13.7**, measures outlined in other EIS chapters would assist in alleviating the potential negative sources of construction impacts that may affect the day-to-day operation of businesses. These include:

- **Accessibility** – Appropriate way-finding signage would be provided to ensure drivers' understanding of access to local businesses adjacent to construction works including signage related to parking for stopping motorists (as detailed in Chapter 9 Construction Traffic).
- **Construction worker parking** – Construction worker parking areas would be planned to minimise impact of parking availability for customers and staff of local businesses (as detailed in the Chapter 9 Construction Traffic).
- **Operating amenity** – Chapter 10 (Construction Noise and Vibration) and Chapter 19.1 (Air Quality) identify effective mitigation measures for controlling potential operating amenity impacts.

Table 13.7 Local Business Mitigation Measures

No.	Mitigation Measure	Applicable Sites*
LB1	A business consultation group would be formed to monitor, consider and provide business specific advice to manage the impacts during construction. Members of the consultation group may include representatives from local councils, and the NSW chamber of commerce and industry.	1 – 17
LB2	The project has employed specialist Place Managers to act as a single, identifiable and direct point of contact for local residents, business people and community groups with the project. Place Managers and/or would work closely with all affected local business to help ensure timely responses to queries.	1 – 17
LB3	A business impact risk register would be developed to identify, rate and help manage the specific impacts associated with construction related works for individual businesses.	1 – 17
LB4	A toll free number and website would be maintained to enable business owners and/or operators to receive prompt responses to their concerns, access information and view assistance measures in place during construction related works.	1 –17

*Site 1 - Epping Services Facility, Site 2 - Epping Decline, Site 3 - Cheltenham Services Facility, Site 4 - Cherrybrook Station, Site 5 - Castle Hill Station, Site 6 - Hills Centre Station, Site 7 - Norwest Station, Site 8 - Bella Vista Station, Site 9 - Balmoral Road, Site 10 - Memorial Avenue, Site 11 - Kellyville Station, Site 12 - Samantha Riley Drive to Windsor Road, Site 13 - Old Windsor Road to White Hart Drive, Site 14 - Rouse Hill Station, Site 15 - Windsor Road Viaduct, Site 16 - Windsor Road Viaduct to Cudgegong Road, Site 17 - Cudgegong Road Station and Tallawong Stabling Facility, and Tunnels

Figure 13.1 Epping Services Facility and Epping Decline – Local Businesses

Figure 13.2 Cheltenham Services Facility – Local Businesses

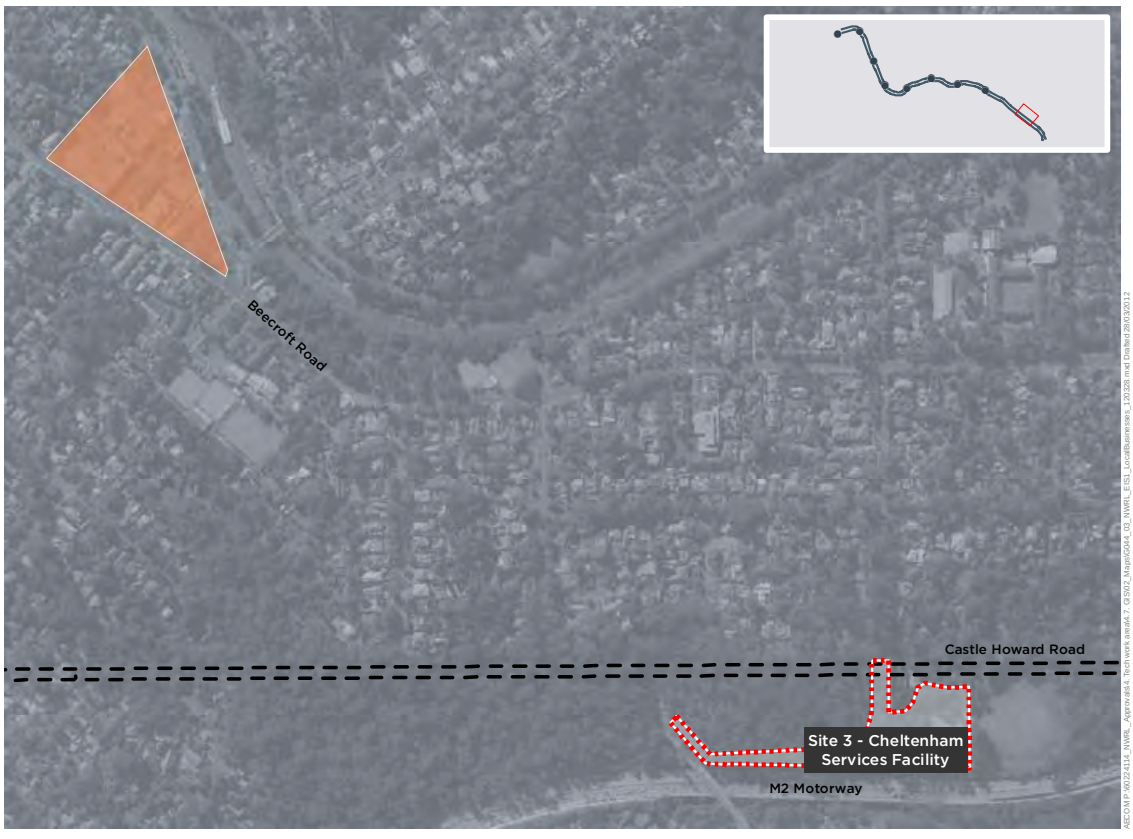


Figure 13.3 Cherrybrook Station – Local Businesses

Figure 13.4 Castle Hill Station – Local Businesses

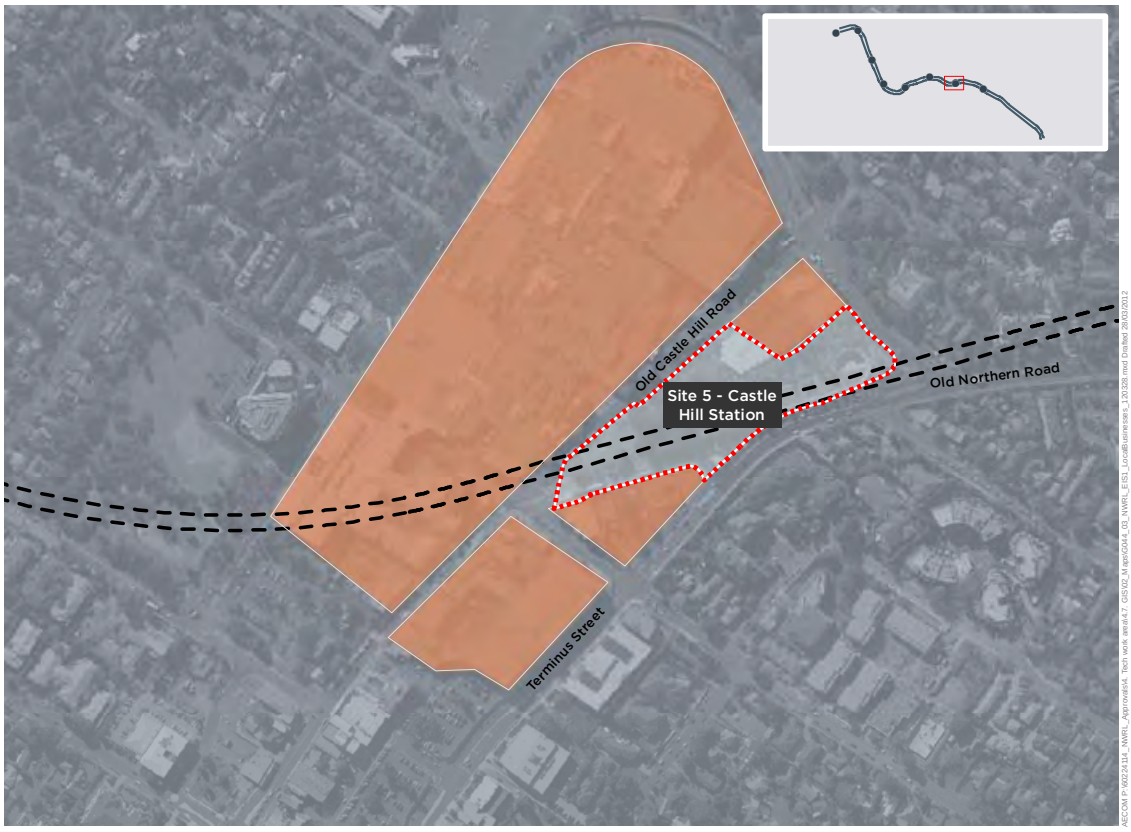


Figure 13.5 Hills Centre Station – Local Businesses

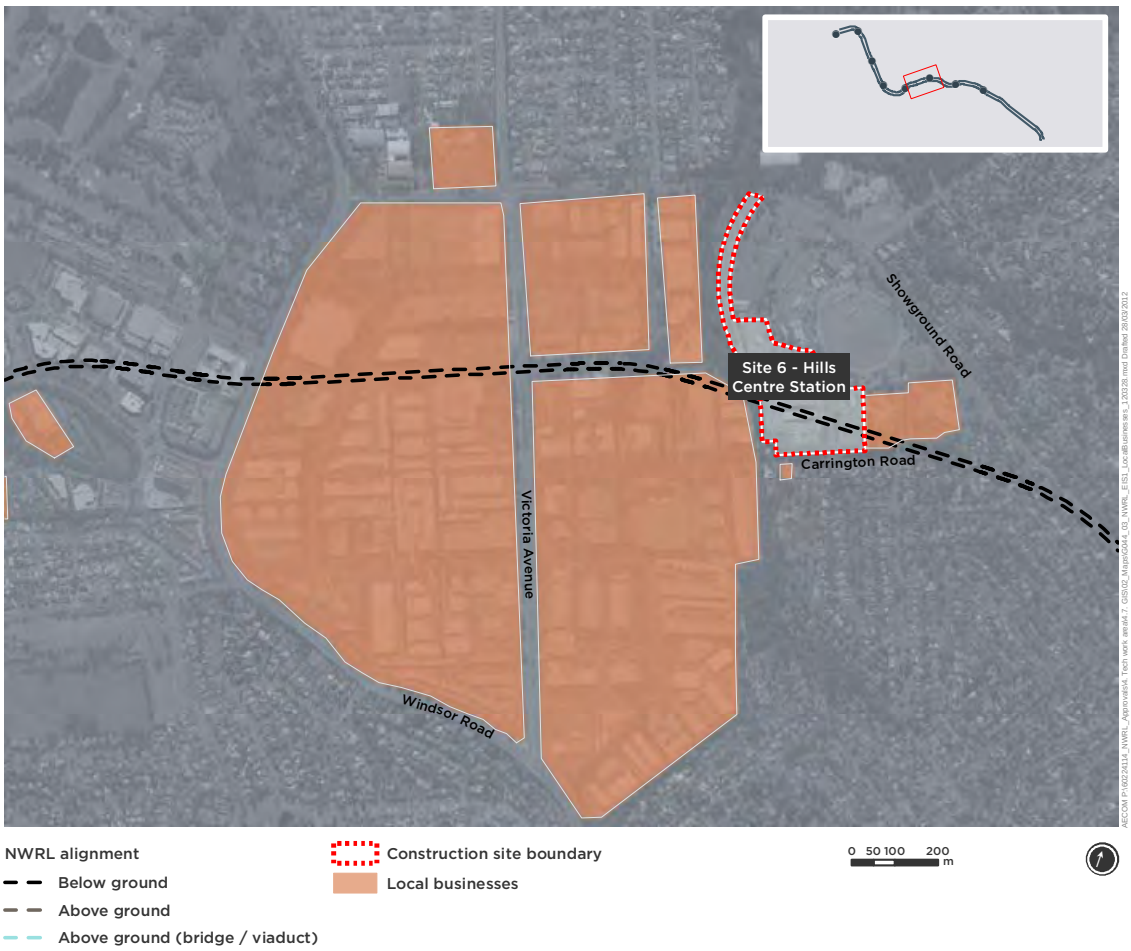


Figure 13.6 Norwest Station – Local Businesses

Figure 13.7 Bella Vista Station – Local Businesses

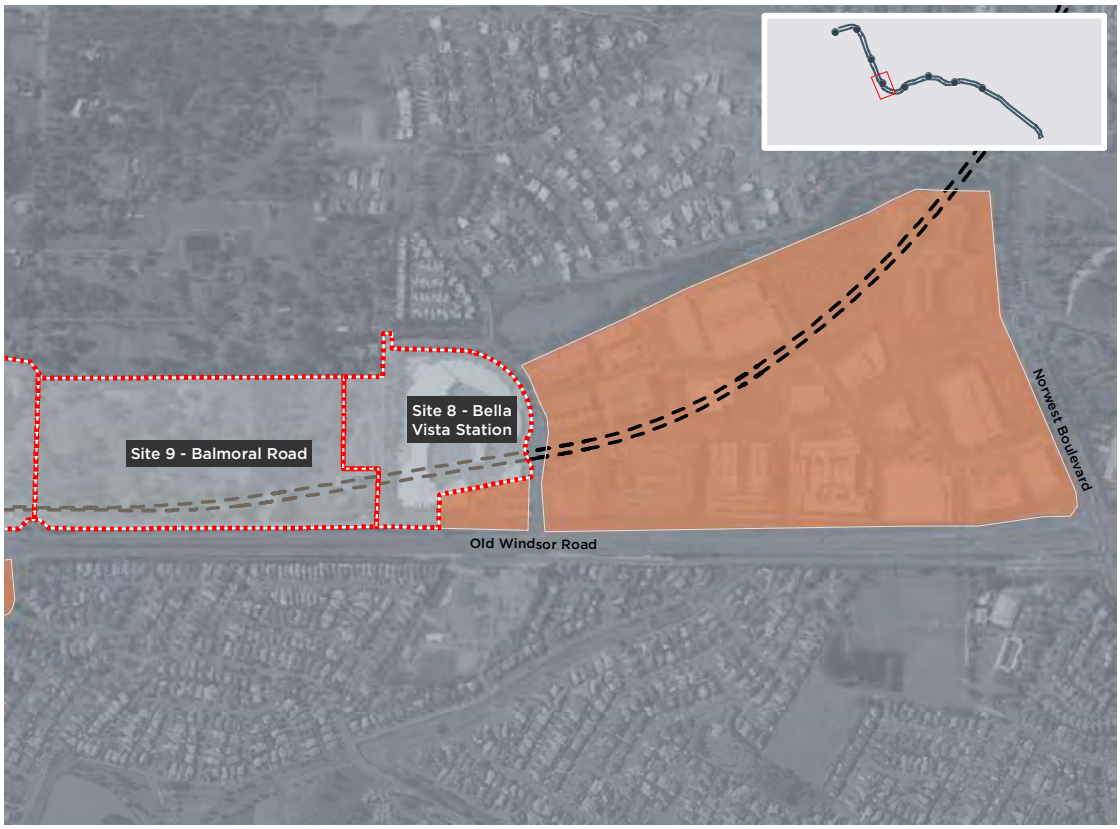


Figure 13.8 Kellyville Station – Local Businesses

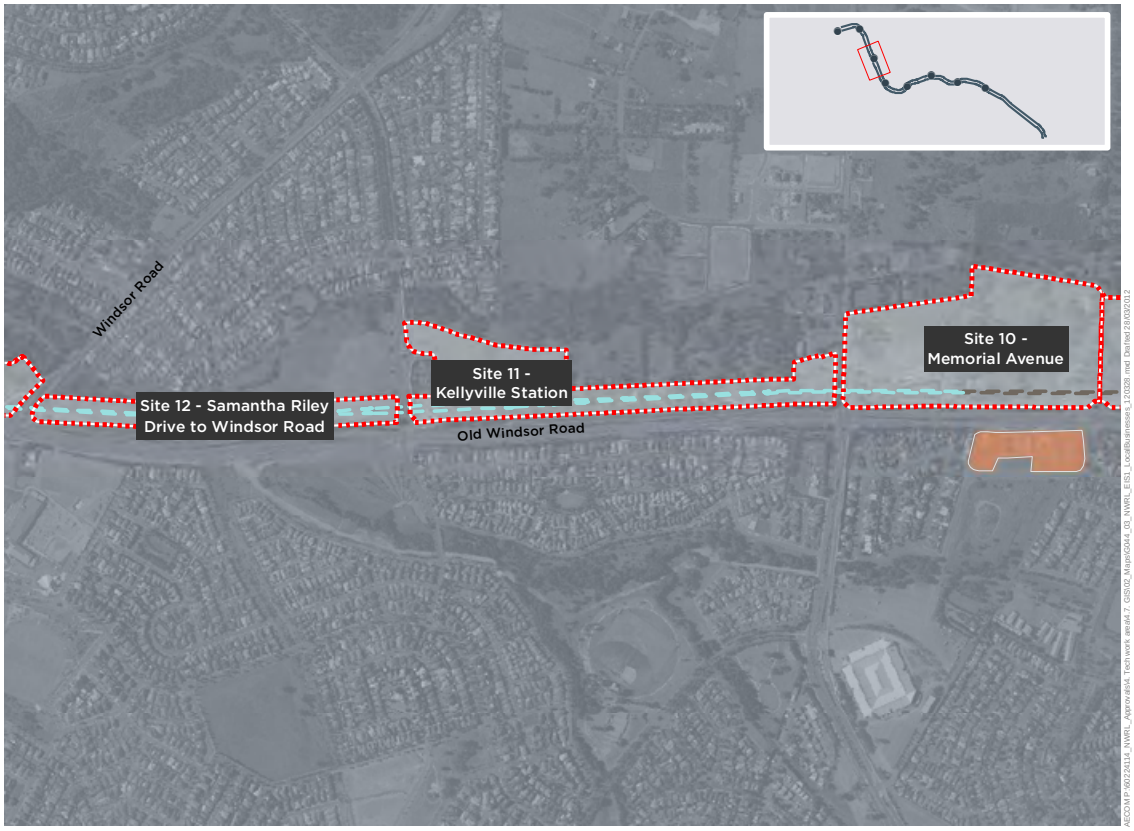
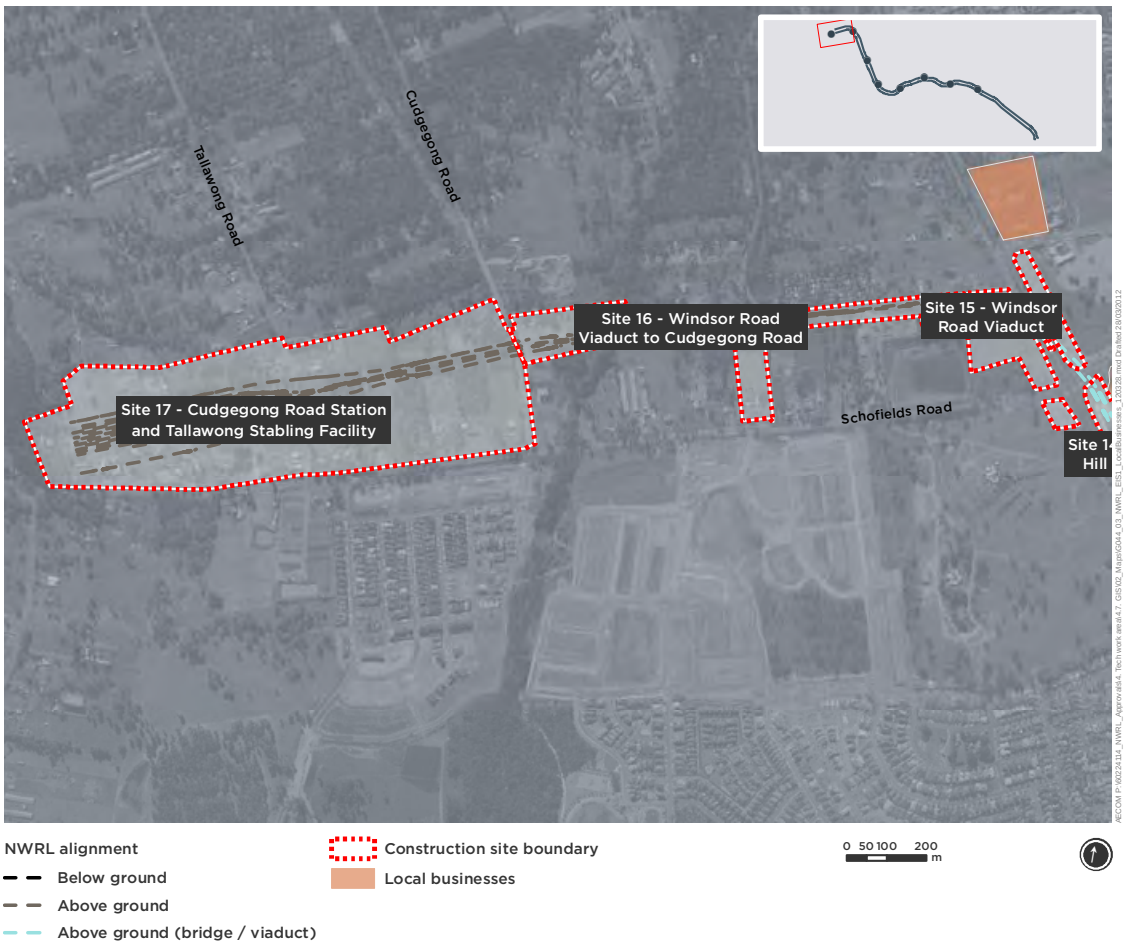


Figure 13.9 Rouse Hill Station, Cudgegong Road Station and Tallawong Stabling Facility – Local Businesses



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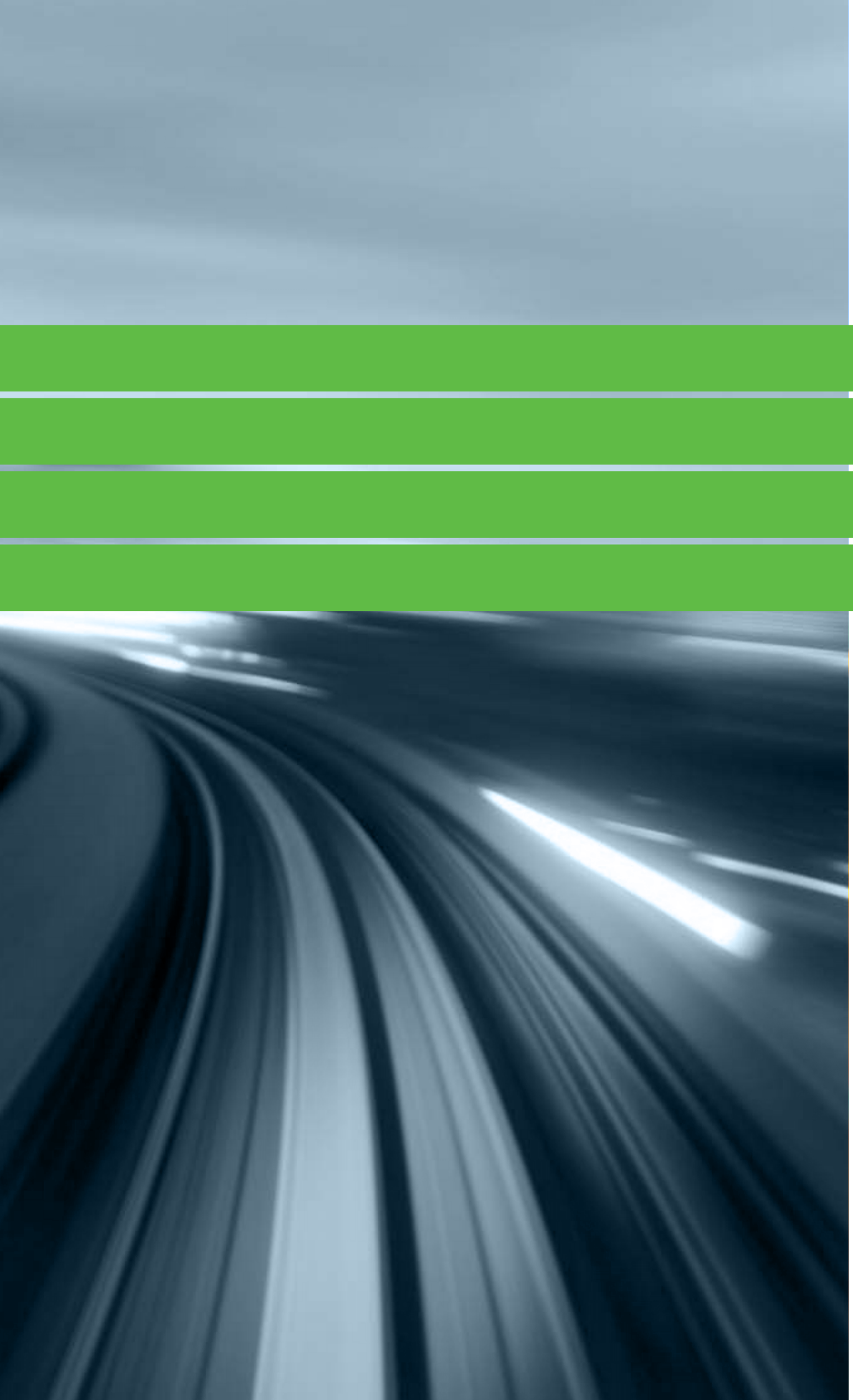

14 LAND USE AND COMMUNITY FACILITIES

14.1 Introduction

The relationship between NWRL and current and potential future land uses is primarily being addressed through a parallel master planning and land use integration process. These will be considered in EIS 2.

The assessment presented here considers the impact of the major civil construction works on existing land uses, known future land uses and community facilities.

14.2 Methodology

Table 14.1 sets out the Director-General's Requirements (DGR), the Conditions of Approval and Statement of Commitments as they relate to land use planning and community facilities, and where in the project these have been addressed.

Table 14.1 Director-General's Requirements, Conditions of Approval and Statement of Commitments

Reference	Description	Addressed
Project Design Received 3 Feb 2012	Interaction with future land use plans in relation to underground components of the project, in consultation with relevant Councils, including the Epping Town Centre Study.	Consultation in **Chapter 5**. Planned future development in Section 14.4.

Reference	Description	Addressed
CoA Reference	**Description**	**Addressed**
Project Design	2.1 The Proponent shall in consultation with relevant Government agencies, relevant Councils and relevant stakeholders, ensure that underground components of the project are designed with regard to existing and/ or planned future underground utilities and infrastructure including the planned extension of the M2 Motorway.	Consultation in **Chapter 5**. Utility adjustments and Protection in Section 7.10.2. Traffic Management in Section 7.10.4. Major road modifications in Section 7.10.5. Public transport modifications in Section 7.10.6.
	2.2 The Proponent shall in consultation with relevant Councils and relevant Government agencies including (but not necessarily limited to) the GCC, MoT, the Department, Landcom, ensure that surface components of the project are integrated with surrounding landuse (existing and planned future, as relevant) as far as reasonable and feasible, consistent with the objectives of Integrated Land Use and Transport (DUAP 2001 or as updated), to minimise the potential for landuse conflicts. In particular: design of Castle Hill station shall consider the Castle Hill Draft Master Plan (or as updated); and Kellyville and Rouse Hill Stations and stabling facilities are to be integrated with the precinct planning for the Burns Road Release Area, Rouse Hill Regional Centre and the Area 20 precinct of the North West Growth Centre, as relevant.	Consultation in **Chapter 5**. Planned future development in Section 14.4. Long term integration and compatibility of land use surrounding each station will be considered in EIS 2.
	2.4 The Proponent shall ensure that station precincts across the project provide a high degree of accessibility to all modes-of-access, consistent with the objectives of *Integrated Land Use and Transport* (DUAP 2001 or as updated).	Accessibility to stations will be considered in EIS 2.

Reference	Description	Addressed
Project applications and specific requirements	3.1c An updated assessment of statutory matters, where the project affects land that has not already been identified in the documents referred to in conditions 1.1 (a) to (d)	**Chapter 3**
Property and Land use	3.2 The Proponent shall confirm the footprint of the project with respect to alignment, station precincts and ancillary infrastructure as far as reasonable and feasible, and describe the landuse impacts on existing and planned future use associated with any additional land take.	Construction footprint of major civil construction works in **Chapter 7**. Land use impacts in Sections 14.4 and 14.5 and EIS 2
Statement of Commitments	**Description**	**Addressed**
Land use, property and infrastructure planning	6. Consultation with Councils, the Growth Centres Commission, RailCorp and other relevant stakeholders would be undertaken to ensure environmental planning instruments reflect planning, construction and operation of the project and include integrated planning provisions for appropriate development controls within the vicinity of the rail line and stabling facility.	Consultation in **Chapter 5**.
	7. Land use and property impacts of the project, including construction sites and all ancillary facilities, would be further assessed in consultation with Councils and surrounding landowners.	Land use and property impacts in Sections 14.4 and 14.5. Consultation in **Chapter 5**.
	8. A Land Asset Management Strategy to address 'land surplus to use', post construction would be developed jointly with the Department of Planning (Land Management Branch) in consultation with Councils, Growth Centres Commission and RailCorp. This strategy would investigate opportunities for land amalgamation of parcels severed by the project and identify opportunities for development that is consistent with surrounding land use planning.	EIS 2

Reference	Description	Addressed
	9. Consultation with relevant Councils, government agencies, utility providers, land owners and communities involved in the planning of precincts in the vicinity of each station would be undertaken with the aim of encouraging transit-orientated development around each station. The role of each station within the context of provision of public transport services would be established, including the need and capacity of park and ride facilities, establishing connections with other transport modes (including the potential for integrated ticketing), and integrating pedestrian and cyclist facilities.	Consultation in **Chapter 5**. Precinct planning in EIS 2.
	10. Further investigations would be undertaken with respect to the planned expansion of the Castle Hill Shopping Centre and integration of the project with the Castle Hill Draft Master Plan	Expansion of Castle Hill shopping centre in Section 14.4.2. Consultation in **Chapter 5**. Cumulative impacts in **Chapter 20**. Land use integration in EIS 2.

The assessment of impacts from construction works on land use and community facilities for the Project has been carried out by undertaking the following key tasks:

- Providing an overview of the existing character and land use in the immediate vicinity of the construction sites.
- Identifying key community facilities that would be either directly or indirectly impacted by the major civil construction works.
- Identifying the planned future development within the project area that may be impacted by the civil construction works.
- Identifying potential land use and community impacts associated with the civil construction works focussing on the direct impacts of the construction footprint.
- Compilation of mitigation measures (general and specific) that would assist in reducing the land use and community impacts.

14.3 Existing Environmental Conditions

14.3.1 Overview

The NWRL spans a number of land uses including residential, commercial, industrial and open space / conservation land uses.

A summary of land use at construction sites and in the immediate vicinity of the rail alignment along with zoning is described in the following sections. Details are also provided of those facilities that would be aquired as part of the construction footprint.

Zoning

Land use zoning within and adjacent to the NWRL alignment is provided in:

- *Hornsby Shire Local Environmental Plan 1994* (Hornsby LEP 1994).
- *Baulkham Hills Local Environmental Plan 2005* (Baulkham Hills LEP 2005).
- *Blacktown Local Environmental Plan 1988* (Blacktown LEP 1988).

Hornsby Shire Council and The Hills Shire Council have drafted new LEPs for their LGAs. These draft plans are:

- *Draft Hornsby Local Environmental Plan 2011 (*Draft Hornsby LEP 2011*).*
- *Draft The Hills Local Environmental Plan 2010* (Draft The Hills LEP 2010).

In the following sections land zoning, under both the current and draft LEPs, is identified for the construction footprint at each site.

In addition to statutory planning at a local level, Councils and State agencies have prepared masterplans for certain areas such as Epping Town Centre. These are also discussed in the following sections.

14.3.2 Epping Services Facility (Site 1) and Epping Decline (Site 2)

Existing Character and Land Use

The construction works for the proposed Epping Services Facility and the Epping Decline would be located along Beecroft Road within the established town centre of Epping.

The footprint of the proposed Epping Services Facility would be located on commercial land. The footprint for the proposed Epping Decline site would be located predominantly on hardstand associated with the former M2 motorway bus ramp and some vegetation.

Epping commercial area is centred around the railway station which provides a mix of smaller scale retail, cafes, restaurants, heath services and community facilities. The Epping Town Centre Study identifies opportunities for the town centre to accommodate increased residential and employment growth (refer Section 14.4.1). The proposed sites at Epping are within the area identified by this study.

The surrounding residential suburbs of Epping, North Epping and Cheltenham consist primarily of lower density dwellings with some medium and high density residential development surrounding the town centre and station.

Sites 1 and 2 are separated by Beecroft Road, and the Northern Railway Line is to the east. The M2 motorway runs east to west to the north of the proposed Epping Decline construction site. Areas of open space are scattered along these infrastructure corridors.

Existing land use in the immediate vicinity of the proposed services facility and decline site is shown in **Figure 14.1**.

Community

A number of community facilities, shown on **Figure 14.1**, are in close proximity to the proposed construction sites including the Essex Street Scout Hall, places of worship (Epping Uniting Church and Epping Baptist Church) and educational establishments (Arden Anglican School and Our Lady Help of Christians Primary School).

The Emmaus Bible College would be acquired as part of the construction footprint for the proposed Epping Services Facility.

Zoning

Under the Hornsby LEP 1994, Epping Services Facility construction site is zoned as Business B (Special) and Epping Decline construction site is zoned as Special Uses B (Transport Corridor).

Under the Draft Hornsby LEP 2011, Epping Services Facility construction site is proposed to be rezoned as B2 (Local Centre) and Epping Decline construction site is proposed to be rezoned as SP2 (Infrastructure).

To facilitate the Epping Town Centre Study a modification to the zoning around the town centre would be required (refer Section 14.4.1).

14.3.3 Cheltenham Services Facility (Site 3)

Existing Character and Land Use

The proposed Cheltenham Services Facility would be located in an area between Castle Howard Road and the M2 Motorway. The footprint of the proposed construction site would be located in an area of open space incorporating the Netball courts at Cheltenham Oval and some vegetation associated with Beecroft Reserve.

There is no designated employment uses within the immediate area.

The Cheltenham locality is characterised by low density residential dwellings surrounded by areas of established vegetation, open space and recreational areas. The main infrastructure corridor associated with the M2 motorway is to the south of the proposed construction site.

Existing land use in the immediate vicinity of the proposed services facility is shown in **Figure 14.2**.

Community

In the immediate vicinity of the construction site of the proposed services facility there are a number of community facilities including Beecroft Nursing Home, Chesalon Care Beecroft, an aged care facility, Beecroft Reserve and Cheltenham Oval as shown in **Figure 14.2**.

The construction footprint would require the acquisition of the netball courts at Cheltenham Oval and parts of Beecroft Reserve. These community facilities are described in further detail below.

Cheltenham Oval
Cheltenham Oval, constructed in the 1930s and located on Castle Howard Road, provides a venue for active recreation offering an oval, netball courts, a playground and cricket nets. The oval is primarily used as a soccer field during the winter months and for cricket matches during summer. The four netball courts are used throughout the year. All sporting facilities are utilised by a number of different clubs and sporting associations.

Beecroft Reserve
Beecroft Reserve, situtated to the north west of Cheltenham Oval, is an important bushland reserve for surrounding residents. Hornsby Shire Council declared the reserve a Wildlife Protection Area in 2006 and the site comprises Coastal Shale Sandstone Forest and Sydney Turpentine Ironbark Forest which is listed under both the TSC Act and EPBC Act.

The bushland reserve has a number of active and passive recreational uses including walking and mountain biking tracks. The reserve is an active bush regeneration site where the community participates in activites to restore the local bushland within the reserve.

Additionally, the bushland is a significant element of the local landscape, providing a visual screen from the M2 for some residences and a pleasing view for passengers travelling on the M2.

Zoning
Under the Hornsby LEP 1994, Cheltenham Services Facility construction site is zoned as Open Space A (Public Recreation – Local).

Under the Draft Hornsby LEP 2011, Cheltenham Services Facility construction site is proposed to be rezoned as RE1 (Public Recreation).

14.3.4 Cherrybrook Station (Site 4)

Existing Character and Land Use
Cherrybrook Station would be located on the corner of Castle Hill, Robert and Franklin Roads within the Cherrybrook residential neighbourhood. The construction footprint for the proposed Cherrybrook Station is currently residential blocks of land incorporating wide grassed areas and exotic native vegetation. Much of the location is currently low density developed, set back behind rows of houses fronting Castle Hill Road.

The Cherrybrook locality is characterised by low density dwellings surrounded by established vegetation, green open space and corridors, and an undulating topography. Some new pockets of medium density housing (townhouses) also exist.

A high voltage (132kV) transmission line crosses the site to the east with one of the transmission towers located within the construction footprint.

Castle Hill Road, to the south of the site, connects Castle Hill to the west and West Pennant Hills to the east.

Existing land use in the immediate vicinity of the proposed Cherrybrook Station site is shown in **Figure 14.3**.

Community

A number of educational establishments are located in close proximity to the construction site including Tangara Infants School, Tangara School for Girls and Inala Rudolf Steiner School. Other community facilities include two childcare centres and an adult day care service as shown in **Figure 14.3**.

An additional childcare facility, on the corner of Castle Hill and Robert Roads would be acquired as part of the construction footprint for the proposed Cherrybrook Station.

Zoning

Under the Hornsby LEP 1994, Cherrybrook Station construction site is zoned as Residential A (Low Density).

Under the Draft Hornsby LEP 2011, Cherrybrook Station construction site is proposed to be rezoned as R2 (Low Density Residential).

14.3.5 Castle Hill Station (Site 5)

Existing Character and Land Use

The proposed Castle Hill Station is situated in the core of Castle Hill within a major retail precinct within The Hills Shire. The footprint of the construction site would be located on land utilised as open space associated with Arthur Whitling Park, part of Old Northern Road reserve and one commercial property on Old Castle Hill Road.

The construction site would be located adjacent to both the Castle Towers and Castle Mall shopping centres and there are a number of independent businesses and offices located within close proximity to the construction site. An extension of Castle Towers Shopping Centre to the west of Pennant Street (approved by Council February 2011) is planned for the area (refer Section **14.4.2**).

The Castle Hill locality is highly urbanised with large scale shopping centres, pedestrian focussed malls and retail streets. The retail precinct is surrounded by residential uses, mainly consisting of single detached dwellings on larger blocks with some higher density living options such as townhouses and apartments integrated through infill development.

The area is also a major throughfare for traffic and public transport services. A bus interchange is located on Old Castle Hill Road providing frequent bus services throughout the LGA and neighbouring regions and a layover facility. Old Northern Road, to the south of the construction site is a 'bus only' road and is used as a bus stop and layover facility.

Existing land use in the immediate vicinity of the proposed Castle Hill Station site is shown in **Figure 14.4**.

Community Facilities

A number of community facilities are located in close proximity to the construction site including Castle Hill Community Information Centre, Castle Hill Police Station, Castle Hill Senior Citizens Centre, St Bernadette's School, Castle Hill Public School, Hills Adventist College, Castle Hill Adventist Church and a childcare as shown in **Figure 14.4**.

The construction footprint for the Castle Hill Station site would temporarily require Arthur Whitling Park. Characteristics of the park are described below.

Arthur Whitling Park
Arthur Whitling Park is of significance to the residents of The Hills Shire providing an area of open space in a retail environment.

The northern end of the park contains a war memorial incorporating a Cenotaph and Remeberance Pool. Other monuments and memorials are located throughout the park including a railway heritage structure, a "Lone Pine" tree and memorials to prominent local community figures. The park holds annual Anzac Day services and other ceremonies. Refer to Section **11.5.4** for information on the historic significance of Arthur Whitling Park.

The park is used as a lunch time respite venue and is also a popular location for weddings and photographs.

Zoning
Under the Baulkham Hills LEP 2005, Castle Hill Station construction site consists of a number of zones including: Open Space 6(a) (Existing and Proposed Public Recreation), Business 3(b) (Commercial) and Special Uses 5(b) (Existing and Proposed Roads).

Under the Draft The Hills LEP 2010, Castle Hill Station construction site is proposed to be rezoned as RE1 (Public Recreation), R1 (General Residential), B4 (Mixed Use) and R4 (High Density Residential).

14.3.6 Hills Centre Station (Site 6)

Existing Character and Land Use
The proposed Hills Centre Station site is bounded by Carrington and Showground Roads. The construction footprint would be located on open space land associated with the Castle Hill showground complex and the The Hills Shire Council depot.

The locality has a diverse character influenced by its proximity to industrial, civic, residential and community uses.

To the west of the site is the Castle Hill light industrial land accommodating factory units, motor vehicle sales, motor vehicle repair, small scale manufacturing, bulky goods retailing, and warehousing. The area also provides an urban support function containing indoor recreation facilities (tenpin bowling, gymnasiums) hotels and motels, and a motor registry.

All of the residential development in the vicinity of the site is established low density low rise in the suburb of Castle Hill. Open space areas, supporting both passive and active recreation, and a number of community facilities are scattered throughout the area.

Existing land use in the immediate vicinity of the proposed Hills Centre site is shown in **Figure 14.5**.

Community Facilities

The proposed Hills Centre station is surrounded by a number of community facilities including Castle Hill Showground, Fred Caterson Recreation Reserve, The Hills Shire Council Chambers and Depot, The Hills Centre, Carrington Road Pre-School and Life Church Castle Hill as shown in **Figure 14.5**.

The construction footprint for the proposed Hills Centre station would aquire the Council Depot, the carpark associated with the Hills Centre and part of the Castle Hills showground. These facilities are described below.

The Hills Centre

The Hills Centre for Performing Arts is a venue which stages music, dance and theatre performances, corporate events, exhibitions and expos and functions. The facilities include a concert theatre, a boardroom, studios and an outdoor amphitheatre.

The centre has a community focus, running a variety of community based programs including dance and creative arts schools, parenting classes and other information sessions. The venue is used by schools, community groups and professional music producers as well as private organisations.

Castle Hill Showground

The showgrounds are significant to the residents of The Hills Shire, providing a venue for events such as horse shows, large corporate events, community and club events, trade fairs and shows and markets. Facilities available include a variety of grassed areas, pavilions, grandstands, spectator seating, stables, food service facilities office facilities and parking.

Castle Hill Showgrounds hosts a variety of events throughout the year spanning a spectrum of interest types and audiences. Events include the Annual Castle Hill Agricultural Show and the Annual Scottish Highland Gathering. A number of other regular activities are held at this location including the Hawkesbury Harvest Farmers Markets, animal and car club functions and sporting competitions.

Zoning

Under the Baulkham Hills LEP 2005, The Hills Centre Station construction site is zoned as Open Space 6(a) (Existing & Proposed Public Recreation) and Special Uses 5(a) (Existing & Proposed).

Under the Draft The Hills LEP 2010, The Hills Centre Station construction site is proposed to be rezoned as RE1 (Public Recreation), B2 (Local Centre), B6 (Enterprise Corridor) and R1 (General Residential).

14.3.7 Norwest Station (Site 7)

Existing Character and Land Use

The proposed Norwest Station would be located in the existing specialised centre of Norwest. The construction footprint for the proposed station would be located on Norwest Boulevard and two existing commercial buildings. The station would be located adjacent to Norwest Marketown Shopping Centre and within close proximity to the Hillsong Church, numerous businesses and some Bella Vista residences.

Norwest is a major employment area characterised by large format commercial buildings within a modern landscaped setting. Norwest Specialised Centre provides amenities, such as childcare, restaurants, gyms and parklands and contains some residential and other complementary land uses such as retail (Bunnings and Norwest Marketown).

Norwest is highly accessible by road with direct access to the M7 Motorway and the major regional roads of Windsor Road and Old Windsor Road perpendicular to the main spine of Norwest Boulevard.

Whilst the vast majority of housing in the Norwest area is single detached dwellings, there are some medium density options being developed currently in the form of townhouses and apartments.

Existing land use in the immediate vicinity of the proposed Norwest Station site is shown in **Figure 14.6**.

Community Facilities

A number of community facilities are located in the immediate vicinity of the proposed station including Hillsong Church, Covent of St Joseph and facilities within the Norwest Marketown Shopping Centre (for example a childcare centre) as shown in **Figure 14.6**.

No community facilities would be acquired as part of the construction footprint for the proposed Norwest Station.

Zoning

Under the Baulkham Hills LEP 2005, Norwest Station construction site is zoned as Employment Area 10(a) (Business Park).

Under the Draft The Hills LEP 2010, Norwest Station construction site is proposed to be rezoned as B7 (Business Park) and B2 (Local Centre).

14.3.8 Bella Vista Station (Site 8), Balmoral Road (Site 9), Memorial Ave (Site 10)

Existing Character and Land Use

The proposed Bella Vista Station would be located on the corner of Old Windsor Road and Celebration Drive on the site currently occupied by the Totally Home Centre bulky goods retail complex. The site is located to the north of the western extent of Norwest Specialised Centre with frontage to Old Windsor Road.

The Bella Vista Station area is characterised by large format commercial buildings, which are generally newer and taller than the older part of Norwest to the east, and newer residential lands to the east.

Residential land to the east of the proposed station is mostly low density residential with small pockets of medium density townhouse development. Lands to be north and north east are currently rural in character and will be developed to low-medium density residential uses as part of the Balmoral Road Release Area (refer Section 14.4.3). A few businesses and recently developed low density residential areas are located to the west of Old Windsor Road in the suburb of Glenwood within Blacktown LGA

On the corner of Old Windsor Road and Memorial Avenue is the T-way station (Burns Station), with existing parking capacity for approximately 160 cars. The T-way provides a key transport link through this area between Rouse Hill and Parramatta.

Existing land use from the proposed Bella Vista Station to Memorial Avenue is shown in **Figure 14.7**.

Community Facilities

Community facilities in the immediate vicinity of the construction site include Emmanuel Baptist Church, Anglican Technical College Western Sydney, Glenwood High School and Glenwood South Childcare as shown in **Figure 14.7**.

No community facilities would be acquired as part of the construction footprint from the proposed Bella Vista Station to Memorial Avenue.

Zoning

Under the Baulkham Hills LEP 2005, the construction site is zoned as Employment Area 10(a) (Business Park), Special Uses 5(a) (Existing and Proposed) and Residential 2(a4) (Rouse Hill Regional Centre).

Under the Draft The Hills LEP 2010, the construction site is proposed to be rezoned as B5 (Business Development) and SP2 (Infrastructure) and R1 (General Residential).

Parts of the Balmoral Road Release Area have been identified and zoned as land for railway purposes in line with the original concept approval for the NWRL. Modifications to the horizontal alignment may require integration of the proposed NWRL with the land release area (refer Section 14.4.3).

14.3.9 Kellyville Station (Site 11), Samantha Riley Drive (Site 12), Old Windsor Road (Site 13)

Existing Character and Land Use

The proposed Kellyville Station is located on the southern side of Samantha Riley Drive at the intersection with Old Windsor Road. The site would encompass a T-way car park and bus station, open space and scattered residential properties.

The area to the east of Old Windsor Road is currently agricultural, with some residences located on large blocks of land. The land consists of open plains with some remnant Cumberland Plain woodland coverage and is bordered by the drainage gully of Elizabeth Macarthur Creek. Mixed use low-medium residential and commercial areas are planned, which include the Balmoral Road Release Area (refer Section 14.4.3) to the east of Kellyville Station. The area to the north east of the station and in the vicinity of Sanctuary Drive has been developed as low density residential.

Recently developed low density residential areas are located to the west of Old Windsor Road in the suburbs of Stanhope Gardens and Kellyville Ridge. These suburbs are connected by cycle and walking paths in open space areas. These residential areas are bordered by Caddies Creek drainage line and associated floodplain.

A limited number of businesses are scattered along Windsor Road/Old Windsor Road.

Existing land use in the immediate vicinity of this section of the alignment is shown in **Figure 14.8** and **Figure 14.9**.

Community Facilities

A number of community facilities are located in the immediate vicinity of the construction footprint including educational establishments (John XXIII Catholic Primary School and Kellyville Ridge Public School), ABC Childcare facility, Kellyville Ridge Pre-School and Long Day Care, Mungerie House Rouse Hill Visitor Information Centre and Castlebrook Lawn Cemetery and Crematorium as shown in **Figure 14.9**.

No community facilities would be acquired as part of the construction footprint for this section of the alignment.

Zoning

Under the Baulkham Hills LEP 2005 this section of construction site traverses a number of zones including Employment Area 10(a) (Business Park), Special Uses 5(a) (Existing & Proposed), Special Uses 5(b) (Existing & Proposed Roads), Business 3(b) (Commercial), Residential 2(a4) (Rouse Hill Regional Centre) and Business 3(a) (Retail).

Under the Draft The Hills LEP 2010 this section of construction site traverses a number of zones including B7 (Business Park), SP2 (Infrastructure), R1 (General Residential), R3 (Medium Density Residential) and B6 (Enterprise Corridor).

Parts of the Balmoral Road Release Area have been identified and zoned as land for railway purposes in line with the original concept approval for the NWRL. Modifications to the horizontal alignment may require integration of the proposed NWRL with the land release area (refer Section 14.4.3).

14.3.10 Rouse Hill Station (Site 14), Windsor Road Viaduct (Site 15), Cudgegong Road (Site 16)

Existing Character and Land Use

The proposed Rouse Hill Station is located directly west of the Rouse Hill Town Centre adjacent to Windsor Road. Rouse Hill Town Centre is a large and newly developed mixed use retail centre located on the edge of the North West Growth Centre.

There is planned future development of the Rouse Hill Town Centre with the Northern Frame works immediately north of the existing commercial centre (refer Section 14.4.4).

The area surrounding the Rouse Hill Town Centre is currently being developed largely as a residential area as part of the North West Growth Centre. The Ponds area is currently being developed and is separated from Windsor Road by the Castlebrook Lawn Cemetery and Crematorium. There is planned future development in the Area 20 precinct (refer Section 14.4.5) which currently consists of rural land uses as well as areas of remnant bushland and a creek corridor.

Major roads provide vehicular access to the area with Windsor Road providing direct access to Old Windsor Road, the M7 and M2. A major bus interchange is located on the perimeter of the Rouse Hill Town Centre which is boosted by the T-way providing services to Parramatta and Blacktown.

Existing land use in the immediate vicinity of this section of the alignment is shown in **Figure 14.10**.

Community Facilities

A number of community facilities are located within the Rouse Hill Town Centre including North West Community College. Castlebrook Lawn Cemetery and Crematorium is located opposite the proposed Rouse Hill Station. The OK Caravan Park, located off Corral Drive, Rouse Hill is immediately north of the proposed alignment.

No community facilities would be acquired as part of the construction footprint for this section of the alignment.

Zoning

Under the Baulkham Hills LEP 2005, Rouse Hill Station is zoned as Business 3(a) (Retail). Under the Draft The Hills LEP 2010, Rouse Hill Station is proposed to be rezoned as B4 (Mixed Use).

The section of alignment from the west of Old Windsor Road to Cudgegong Road is in Blacktown LGA within the Area 20 precinct. Zoning for this area is provided under SEPP *(Sydney Region Growth Centres) 2006*. The construction footprint for this section of alignment would traverse a number of zones including SP2 (Infrastructure), R3 (Medium Density Residential) and RE1 (Public Recreation).

Zoning within the Rouse Hill Town Centre already reflects the future planned expansion of the town centre. The Area 20 precinct was rezoned for urban development in October 2011. With the exception of the south east corner of the precinct where the alignment traverses residential and open space zoning, this rezoning provides for the NWRL corridor for this section of the alignment (refer Section 14.4.5).

14.3.11 Cudgegong Road Station and Tallawong Stabling Facility (Site 17)

Existing Character and Land Use

The proposed Cudgegong Station and Tallawong Stabling Facility are located in the North West Growth Centre, adjacent to Cudgegong Road on the northern side of Schofields Road. Tallawong Stabling Facility would be situated to the west of Cudgegong Road, across both sides of Tallawong Road.

The character of the area is typified by rural lands to the north of Schofields Road. New low density residential housing is currently underway south of Schofields Road in The Ponds area and further west.

The station and part of the stabling facility are within the Area 20 precinct which is a planned residential development focussed around Rouse Hill Town Centre (refer Section 14.4.5). The station is located within the Cudgegong Station Special Area (Clause 6.5 of Appendix 6 of SEPP (Sydney Region Growth Centres) 2006).

Existing land use in the immediate vicinity of the proposed station and stabling facility is shown in **Figure 14.11**.

Community Facilities

No community facilities are located in the immediate vicinity of the construction works or would be acquired as part of the construction footprint for this section of the alignment.

Zoning

Sections of the alignment within Area 20 are zoned as SP2 (Infrastructure). Sections outside the Area 20 precinct are zoned as 1(a) Rural under Baulkham Hills LEP 2005.

The Area 20 site rezoning includes the Cudgegong Station Special Area (refer Section 14.4.5). The rezoning provides for the proposed NWRL corridor, railway station, and commuter car parks and supporting facilities.

14.4 Planned future development

Strong housing and employment growth is forecast in the North West Subregion (covering The Hills and Blacktown LGAs), with more modest growth in the North Subregion (covering Hornsby LGA). A number of future planning projects are in the vicinity of the study area including:

- Epping Town Centre Study.
- Castle Towers Expansion.
- Balmoral Road Release Area.
- Rouse Hill Town Centre Northern Frame.
- Area 20.

The future planning projects were identified taking into account location (ie plans located in close proximity to the major civil construction works) and whether the NWRL Project would have implications for these future planning projects.

A brief description of each project, its location and their interaction with the project is provided in the following sections.

14.4.1 Epping Town Centre

The Epping Town Centre Study was prepared in July 2011 for Hornsby Shire Council, Parramatta City Council and the DP&I. The study area covers approximately 247 hectares, including the rail corridor. The area is based on the nearest road outside the 800 metre radius from Epping Railway Station, which reflects a 10 minute walking distance to the centre.

The study identifies opportunities for the Epping Town Centre to accommodate increased residential and employment growth to fulfil its role as a Town Centre. It also recommends traffic and public domain improvements to facilitate the growth. The study concludes by recommending zoning changes, increased floor space ratios and heights, heritage controls and public domain improvements to accommodate the forecast desired population increase.

The proposed Epping Services Facility and underground tunnel alignment would be located within the area identified by the Epping Town Centre Study.

The study recommends the erection of multi storey mixed use buildings in the town centre and it is anticipated that multi storey underground car parking would be required to support these buildings. As such, there is potential for the depth of the NWRL tunnel alignment to have implications for the study and its recommendations. Additionally, the study recommends the erection of an eight storey high multi storey mixed use building on the proposed Epping Services Facility site which would also have implications for the study and its recommendations.

Consultation with Hornsby Shire Council and Parramatta City Council has been undertaken to discuss the implications of the Project on implementing the recommendations of the study (refer **Chapter 5**). Consultation would be ongoing during the development of EIS 2.

14.4.2 Expansion of Castle Towers Shopping Centre

Expansion of the existing Castle Towers Shopping Centre at Castle Hill would include two sites. The first site involves upgrading and expansion of the existing centre building between Old Northern Road, Showground Road, Castle Street and Pennant Street. The other site would entail new buildings next to Castle Grand, bounded by Kentwell Avenue, Castle Street, Pennant Street and Showground Road. The expansion would include a new cinema complex, an eat-street area, additional carparking spaces and additional department stores, supermarkets, restaurants and retail stores.

The proposed station and underground alignment would be located in close proximity to the expansion of the Castle Towers Shopping Centre. Consultation with the Castle Towers Centre Management and development group has been undertaken to discuss the interaction of the NWRL with the expansion. Further meetings are scheduled during the development of EIS 2.

Cumulative impacts of NWRL and the expansion of Castle Towers Shopping Centre are considered in **Chapter 20**.

The Castle Hill Draft Master Plan is informing the design of the project. A Departmental Precinct Land use Group has been formed to oversee development of precinct plans for stations and address long term opportunities to improve connectivity and enable future transit orientated development (refer **Chapter 5**). Consultation with this group and other relevant stakeholders has been undertaken would be ongoing during the development of EIS 2 (refer **Chapter 5**).

14.4.3 Balmoral Road Release Area

The Balmoral Road Release area is located within The Hills Shire LGA in the vicinity of Balmoral Road and Memorial Avenue (refer **Figure 14.12**). The area is approximately 500 hectares and will accommodate 6,000 dwellings when fully developed with a mix of housing types including single detached dwellings, dual occupancies, villas, town houses, shop top housing and apartment buildings. The area will be integrated with public transport corridors, open space, community facilities and employment opportunities.

Parts of the land release area have been identified and zoned as land for railway purposes by the Baulkham Hills LEP in line with the original concept approval for the NWRL project (refer **Figure 14.12**). However, the design and configuration of the NWRL project has been refined, as a result of further strategic planning and project development. The horizontal alignment has been moved to abut the eastern side of the North-West T-way in the vicinity of Balmoral Road and Memorial Avenue (refer **Chapter 6**). These changes reduce the construction impacts and optimise the government owned land available for development within the Balmoral Road precinct.

Consultation regarding the interaction of the NWRL in relation to planning in the Balmoral Road precinct with key Council and agency stakeholders has been undertaken (refer **Chapter 5**). Further workshops will be held with relevant stakeholders to discuss master planning and urban design issues relating to station precincts and integrated land use planning issues associated with the Balmoral Road Release area.

14.4.4 Rouse Hill Town Centre Northern Frame

Rouse Hill is designated in the *Metropolitan Plan for Sydney 2036* as a planned Major Centre. It is currently being developed to serve greenfield development areas in the North West Growth Centre. Stage 1 of Rouse Hill Major Centre has been completed and is open to the public.

Growth of the centre is set to continue throughout the life of the strategy as the development of the North West Growth Centre is realised. Mixed use development of the Northern Frame is planned which is located on the land immediately north of the existing Rouse Hill Town Centre).

Consultation with relevant stakeholders regarding the implications of NWRL on the Rouse Hill Town Centre has been undertaken and further consultation is scheduled (refer **Chapter 5**).

Cumulative impacts of NWRL and the Rouse Hill Town Centre Northern Frame works are considered in **Chapter 20**.

14.4.5 Area 20

Area 20 is located opposite to the Rouse Hill Town Centre (refer **Chapter 6.14**). A section of the study area from the intersection of Windsor Road and Schofields Road to Tallawong Stabling Facility is located within the Area 20 precinct.

The Area 20 precinct was rezoned for urban development in October 2011 and the rezoning provides for the proposed NWRL corridor, railway station, and commuter car parks and supporting facilities (refer **Figure 6.2**).

The current project is generally consistent with the land use planning in Area 20, however, the vertical alignment has been refined as a result of further strategic planning and project development. The primary design change is that Rouse Hill Station is now an elevated station and a viaduct passes over Windsor Road. Current zoning in the vicinity of Windsor and Schofields Roads assumes an underground rail tunnel with planned open space and residential development over the rail alignment.

Clause 6.5 *Development in special area – Cudgegong Station Area* of Appendix 6 (Area 20 Precinct Plan) of the SEPP (Sydney Region Growth Centres) 2006 sets out development requirements within the vicinity of the proposed Cudgegong Road Station. The proposed corridor for NWRL, including Cudgegong Station and Tallawong Stabling Facility is generally consistent with what is provided for the Cudgegong Station Area of the precinct plan.

The NWRL Project Team has held a number of meetings with the DP&I regarding the integration of the NWRL with the Area 20 Precinct Plan (refer **Chapter 5**). Further design workshops will be held with TfNSW, DP&I and Blacktown City Council to refine the precinct planning around the Cudgegong Road Station and to revise proposed future local streets within the NWRL rail corridor between Rouse Hill and Second Ponds Creek.

14.5 Identification of impacts

The potential for land use and community impacts associated with the civil construction works would focus on and around the construction sites along the proposed alignment. Potential impacts on land use include:

- Direct land use changes at construction sites and the above ground alignment.
  All construction sites would produce a significant land use change. The land would change in use from a residential, commercial, open space and/or rural setting to a construction site. The land use change would be in place for the duration of the construction works at each site. The construction period would vary at each site depending on the construction timetable and methodologies employed.
- Acquisition and demolition of 92 residential, commercial and other buildings. These properties would lie within the footprint of the construction sites (refer Section **7.10.12**).
- Impact of construction works on known future land use planning developments in the study area. In particular these include Epping Town Centre, Castle Towers Expansion, Balmoral Road Release Area, Rouse Hill Town Centre Northern Frame and the Area 20 precinct.
- Land severance. Construction activities have the potential to physically divide a community. Construction of rail infrastructure can create physical barriers interrupting established social linkages, connections and travel patterns. However, this potential impact is likely to be minimal for the project. In established urban areas, the project would be located in a tunnel and the above ground works would be located in the vicinity of existing regional road infrastructure (Old Windsor Road/Windsor Road). There is the potential for permanent land fragmentation between the proposed Area 20 Precinct alignment and Schofields Road by the addition of an additional physical barrier.

The potential impacts on community facilities include:

- Loss of community facilities located within the construction footprint. Community facilities promote cohesion and interaction among community members. Key community assets in the study area that would be directly impacted by construction works include Cheltenham Netball Courts, a childcare facility at Cherrybrook, Arthur Whitling Park and facilities within the Castle Hill Showground precinct.
- Disruption to the access, use and amenity (noise and vibration, changes to traffic and parking, visual, and air quality) of community facilities in the immediate vicinity of the construction sites.
- Modifications and / or relocation of existing public utility infrastructure such as roads, pedestrian ways, bus stops, car parking and other transport access points would have implications for commuter traffic. The two T-way car parking facilities along Old Windsor Road along with the major bus interchanges at the proposed Rouse Hill and Castle Hill stations would need to be relocated during the construction works.

A summary of direct land use and community impacts at the each construction site as a result of the major civil construction works is provided in **Table 14.2**.

The construction of the Project has the potential to act as a catalyst for development in the surrounding areas due to the presence of the stations. The impacts associated with the likely land use changes in nearby areas as a result of the Project will be considered in EIS 2.

Table 14.2 Potential land use and community impacts

Site	Direct Impacts on existing land use and community facilities
Epping Services Facility (Site 1)	**Land use and property:** ▪ Land at the proposed services facility would change from a commercial area to a construction site for the duration of the construction period, approximately 24 months. ▪ The total land area required during construction would be approximately 3,400 m^2. ▪ Construction works would directly impact at least one commercial building, with associated construction works impacting on an additional three commercial buildings. As such, the services facility may require the demolition and permanent acquisition of up to four commercial buildings. ▪ The services facility is proposed to be constructed within the area identified by the Epping Town Centre Study. Modifications to the future town planning of Epping would be required to accommodate the facility. **Community:** ▪ No community facilities would be acquired as part of the construction footprint. ▪ Surrounding community assets including places of worship (Epping Uniting Church and Epping Baptist Church), educational establishments (Arden Anglican School and Our Lady Help of Christians Primary School) and Essex Street Scout Hall may experience reduced amenity during construction works. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**).
Epping Decline (Site 2)	**Land use and property:** ▪ Land at the proposed decline site would become a construction site for the dyration of the construction period (approximately 30 months) ▪ The proposed works are within the area identified by the Epping Town Centre Study. Modifications to the future town planning of Epping may be required. **Community:** ▪ Surrounding community assets including places of worship (Uniting Church and Epping Baptist Church), educational establishments (Arden Anglican School and Our Lady Help of Christians Primary School) and Essex Street Scout Hall may experience reduced amenity during construction works. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**).

Site	Direct Impacts on existing land use and community facilities
Cheltenham Services Facility (Site 3)	**Land use and property:** ▪ Land at the proposed services facility would change from an open space to a construction site for the duration of the construction period, approximately 12 months. ▪ The total land area required during construction would be approximately 12,000 m^2. ▪ Construction works would require demolition of Cheltenham Netball Courts and associated facilities and the removal of vegetation within Beecroft Reserve. No residential or commercial properties would be acquired at this location. ▪ There are no known future land use plans in the immediate vicinity of the proposed services facility. **Community:** ▪ Construction works would result in the loss of an active recreation venue due to the demolition of Cheltenham Netball Courts, cricket nets and playground. ▪ Cheltenham Oval would not be directly impacted by the proposed works, however, users of the oval may experience reduced amenity during construction works. ▪ The construction footprint has potential implications for the walking trails and bike tracks within Beecroft Reserve. ▪ Users of Beecroft Reserve may experience reduced amenity during the construction works. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**), Ecology (**Chapter 15**) and Air Quality (**Chapter 19**).

Site	Direct Impacts on existing land use and community facilities
Cherrybrook Station (Site 4)	**Land use and property:** ▪ Land at the proposed station would change from residential to a construction site for approximately 42 months, the duration of the construction period. ▪ The total land area required during construction would be approximately 75,000 m^2. ▪ Construction works would require permanent acquisition of 28 residential properties and one commercial property. ▪ There are no known future land use plans in the immediate vicinity of the proposed station. **Community:** ▪ The construction footprint would require acquisition and demolition of one childcare facility located at the corner of Castle Hill Road and Robert Street. ▪ Community facilities such as Tangara Infants School, Tangara School for Girls, Inala Rudolf Steiner School, Kindalin Early Childhood Learning, Playdays Pre-School and Inala Dilkara Adult Day Service may experience reduced amenity during the construction period. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**).

Site	Direct Impacts on existing land use and community facilities
Castle Hill Station (Site 5)	**Land use and property:** ▪ Land at the proposed site would change from open space to a construction site for the duration of the construction works, approximately 39 months. ▪ The total land area required during construction would be approximately 18,000 $m^{2.}$ ▪ Construction works would require the use of Arthur Whitling Park, part of the Old Northern Road reserve and demolition of two buildings. ▪ Potential interaction of the NWRL with the future expansion of the Castle Towers Shopping Centre. ▪ Cumulative impacts associated with the overlapping of construction works associated with the expansion of Castle Towers Shopping Centre are considered in **Chapter 20**. **Community:** ▪ Temporary loss of an open space area (Arthur Whitling Park) during construction within a predominantly retail environment which is used for a variety of passive recreation activities. ▪ Temporary impact on the local heritage of the area due to removal of war memorial and other monuments, structures and memorials located within Arthur Whitling Park. Events and ceremonies associated with these memorials would also be impacted during construction. ▪ Potential amenity impacts on community facilities in close proximity to the construction works including Castle Hill Senior Citizens Centre, Castle Hill Community Information Centre and St Bernadette's School. Assessments of these impacts are provided in the following chapters; Traffic (Chapter 9), Noise and Vibration (Chapter 10) and Air Quality (Chapter 19). ▪ Acquisition of the bus stop on Old Northern Road between Crane Road and Terminus Street during the construction works would have implications for commuter traffic.

Site	Direct Impacts on existing land use and community facilities
Hills Centre Station (Site 6)	**Land use and property:** ▪ Land use would change from an open space and community area to a construction site for the duration of the construction works, approximately 36 months. ▪ The total land area required during construction would be approximately 65,000 m^2. ▪ Construction works would require temporary possession of areas associated with the Castle Hill showground complex and The Hills Shire Council Depot. ▪ Construction works would require the acquisition of 11 commercial properties. ▪ There are no known future land use plans in the immediate vicinity of the proposed station. **Community:** ▪ Temporary loss of parts of Castle Hill Showground with the removal of a small number of pavilions and other infrastructure during construction works. The majority of the showground would still be accessible by local residents. ▪ Acquisition of The Hills Council Depot during construction works. ▪ Disruption to the car parking facilities and amenity of The Hills Centre for Performing Arts and Carrington Road Pre-School. Amenity impacts are discussed in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**).
Norwest Station (Site 7)	**Land use and property:** ▪ Land use would change from a commercial area to a construction site for the duration of the construction works, approximately 24 months. ▪ The total land area required during construction would be approximately 21,000 $m^{2.}$ ▪ Construction works would require permanent acquisition of five commercial properties. ▪ There are no known future land use plans in the immediate vicinity of the proposed station. **Community:** ▪ No direct impacts on community facilities are anticipated. ▪ Surrounding community assets including Hillsong Church may experience reduced amenity during construction works. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**).

Site	Direct Impacts on existing land use and community facilities
Bella Vista Station (Site 8)	**Land use and property:** ▪ Land use would change from a commercial area to a construction site for approximately 30 months, the duration of the construction works. ▪ The total land area required during construction would be approximately 63,000 m^2. ▪ Construction works would require the demolition of buildings and acquisition of the Totally Home Centre site. ▪ There are no known future land use plans in the immediate vicinity of the proposed station. **Community:** ▪ No direct impacts on community facilities are anticipated. ▪ Community facilities including Emmanuel Baptist Church and Anglican Technical College Western Sydney may experience reduced amenity during the construction works. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**).
Balmoral Road (Site 9)	**Land use and property:** ▪ The land would change from rural to a construction site for the duration of the construction works, approximately 30 months. ▪ The total land area required during construction would be approximately 190,000 m^2. ▪ Construction works would require the acquisition of four residential properties. **Community:** ▪ No direct or indirect impacts on community facilities are anticipated at this construction site.
Memorial Avenue (Site 10)	**Land use and property:** ▪ The land would change from rural to a construction site for the duration of the construction works, approximately 30 months. ▪ The total land area required during construction would be approximately 120,000 m^2. **Community** ▪ No direct impacts on community facilities are anticipated. ▪ Temporary relocation of T-way car park to the eastern side of the bus station during construction works would have implications for commuter traffic accessing the T-way.

Site	Direct Impacts on existing land use and community facilities
Kellyville Station (Site 11)	**Land use and property:** ▪ The land would change to a construction site for the duration of the construction works, approximately 18 months. ▪ The total land area required during construction would be approximately 100,000 m^2. **Community** ▪ No direct impacts on community facilities are anticipated ▪ Temporary relocation of bus T-way car park during construction works would have implications for commuter traffic accessing the T-way.
Samantha Riley Drive to Windsor Road (Site 12)	**Land use and property:** ▪ Land would change to a construction site for approximately 24 months. ▪ The total land area required during construction would be approximately 50,000 m^2. ▪ There are no known future land use plans in the immediate vicinity of the proposed alignment. **Community:** ▪ No direct impacts on community facilities are anticipated. ▪ Nearby community facilities, including John XXIII Catholic Primary School may experience reduced amenity during the construction period. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**).
Old Windsor Road to White Hart Drive (Site 13)	**Land use and property:** ▪ The land in this area would change to a construction site for the duration of construction works, approximately 24 months. ▪ The total land area required during construction would be approximately 97,000 m^2. ▪ There are no known future land use plans in the immediate vicinity of the proposed alignment. **Community:** ▪ No direct impacts on community facilities are anticipated. ▪ Nearby community facilities, including John XXIII Catholic Primary School and Mungerie House Rouse Hill Visitor Information Centre may experience reduced amenity during the construction period. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**).

Site	Direct Impacts on existing land use and community facilities
Rouse Hill Station (Site 14)	**Land use and property:** ▪ Land would change from a commercial area to a construction site for approximately 18 months, the duration of the construction works. ▪ The total land area required during construction would be approximately 18,000 m^2. ▪ No residential or commercial properties would be acquired at this location. ▪ Mixed use development adjacent to existing Rouse Hill Town Centre is proposed. A proposed station at Rouse Hill would support this land use planning. ▪ Cumulative impacts associated with the overlapping of construction works from the Rouse Hill Town Centre Northern Frame are considered in **Chapter 20**. **Community:** ▪ No direct impacts on community facilities are anticipated. ▪ Community facilities in close proximity to the construction works, including Castlebrook Lawn Cemetery and Crematorium and facilities within the Rouse Hill Town Centre, may have reduced amenity during the construction period. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**). ▪ Relocation of the bus station adjacent to Windsor Road at Rouse Hill Town Centre would have implications for commuter traffic.

Site	Direct Impacts on existing land use and community facilities
Windsor Road Viaduct (Site 15)	**Land use and property:** ▪ Land in the area would change to a construction site for the duration of construction works, approximately 27 months. ▪ The total land area required during construction would be approximately 61,000 m^2. ▪ This section of the alignment is within the Area 20 precinct. Although the Project is generally consistent with land use planning in the precinct, the vertical alignment at the corner of Windsor Road and Schofields Road has been modified as part of the current Project. The main change is that Rouse Hill Station is now an elevated station and a viaduct passes over Windsor Road. Current zoning in the area assumes an underground rail tunnel with planned open space and residential development over the rail alignment (refer Section 14.4.5). **Community:** ▪ The construction footprint within the north east corner of Castlebrook Lawn Cemetery and Crematorium is not anticipated to have a significant impact on the community. ▪ Community facilities in close proximity to the construction works, including Castlebrook Lawn Cemetery and Crematorium and facilities within the Rouse Hill Town Centre may have reduced amenity during the construction period. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**).

Site	Direct Impacts on existing land use and community facilities
Windsor Road Viaduct to Cudgegong Road (Site 16)	**Land use and property:** ▪ Land in the area would change from rural to a construction site for the duration of construction works, approximately 15 months. ▪ The total land area required during construction would be approximately 83,000 m^2. ▪ Potential severance of future Area 20 Precinct communities by the addition of an additional physical barrier (additional to Schofields Road). As planning for Area 20 assumes the rail line and appropriate roads and other connections, land severance is likely to be minimal. **Community:** ▪ The OK Caravan Park, Rouse Hill may experience reduced amenity during the construction period. Assessments of these impacts are provided in the following chapters; Traffic (**Chapter 9**), Noise and Vibration (**Chapter 10**) and Air Quality (**Chapter 19**). ▪ No direct or indirect impacts on community facilities are anticipated.
Cudgegong Road Station to Tallawong Stabling Facility (Site 17)	**Land use and property:** ▪ Land in the area would change from rural to a construction site for approximately 24 months, the duration of the construction period. ▪ The total land area required during construction would be approximately 590,000 m^2. ▪ Construction works would require the permanent acquisition of 22 residential properties. ▪ Potential severance of future Area 20 Precinct communities by the addition of an additional physical barrier (additional to Schofields Road). As planning for Area 20 assumes the rail line and appropriate road and other connections, land severance is likely to be minimal. **Community:** ▪ No direct or indirect impacts on community facilities are anticipated.

14.6 Mitigation measures

The Environmental Management Framework, provided in Appendix C, details the environmental, stakeholder and community management systems and processes for the construction of the NWRL.

Mitigation measures have been developed to avoid, reduce and manage identified potential impacts. These mitigation measures and their application to the construction sites for the NWRL are presented in **Table 14.3**. In addition to the mitigation measures identified in **Table 14.3**, measures outlined in other EIS chapters would assist in alleviating land use and community facility impacts. These include:

❖ **Amenity** – **Chapter 9** (Construction Noise and Vibration) and **Chapter 19** (Air quality) identify effective mitigation measures for controlling potential operating amenity impacts on community facilities.

- **Transport** – **Chapter 10** (Construction Traffic) identifies effective mitigation measures for the relocation of bus stops at the proposed Castle Hill and Rouse Hill Stations.
- **European Heritage** – **Chapter 11** (European Heritage) identifies effective mitigation measures relating to the reinstatement of Arthur Whitling Park.

The long term integration and compatibility of land use surrounding each station is considered in EIS 2.

Table 14.3 Land Use and Community Facilities Mitigation Measures

No.	Mitigation Measure	Applicable Sites*
LC1	Liaison would continue with statutory organisations, DP&I and local Councils to ensure the Project is integrated with local and regional land use planning, and that environmental planning instruments reflect the planning, construction and operation of the Project, and include integrated planning provisions to enhance potential future development.	All
LC2	Consultation would continue with the community throughout the project planning and construction phases to ensure that community members have adequate information about the project, the timing and scope of activities in their local area and impacts on their local facilities and recreational areas. Area specific Place Managers have been allocated to undertake this ongoing consultation.	All
LC3	Further consultation regarding the implications of the Project in relation to the Epping Town Centre Study would be undertaken with Hornsby Shire Council, Parramatta City Council and DP&I.	1 and 2
LC4	Consultation with Cheltenham Oval user groups would be undertaken as part of identifying appropriate post-construction configuration and facilities for sporting activities.	3
LC5	Consultation with stakeholders of Beecroft Reserve would be undertaken as part of identifying appropriate adjustments to walking trails both during construction (temporary adjustments) and operational phases (permanent adjustments). Enhancements or modifications to the trail network would also be considered as part of this process.	3
LC6	Consultation with schools near the Cherrybrook site would be undertaken to develop specific mitigation measures to reduce impacts on their operation and amenity.	4
LC7	Consultation would be undertaken with the Castle Hill RSL sub branch and The Hills Shire Council regarding appropriate management of the war memorial in Arthur Whitling Park. This would include consideration of possible temporary relocation and an appropriate long term solution.	5

No.	Mitigation Measure	Applicable Sites*
LC8	Activities occurring in Showground buildings and pavilions to be acquired as part of the construction footprint would be re-accommodated within the Showground precinct or as otherwise agreed with the Showground Trust.	6
LC9	Consultation with Hillsong Church would be undertaken prior to construction to identify specific mitigation measures to reduce operational and amenity impacts.	7
LC10	Consultation with Emmanuel Baptist Church and Anglican Technical College Western Sydney would be undertaken prior to construction to identify specific mitigation measures to reduce operational and amenity impacts.	8
LC11	Consultation regarding the implications of the Project in relation to the Balmoral Road Release Area would be undertaken with The Hills Shire Council.	9 – 11
LC12	Consultation would be undertaken with relevant stakeholders regarding the implications of the project on the Rouse Hill Town Centre Northern Frame works.	14
LC13	Consultation regarding the implications of the project on the proposed land use plan for Area 20 would be undertaken with DP&I, Blacktown City Council and relevant stakeholders.	15 – 17

Site 1 - Epping Services Facility, Site 2 - Epping Decline, Site 3 - Cheltenham Services Facility, Site 4 - Cherrybrook Station, Site 5 - Castle Hill Station, Site 6 - Hills Centre Station, Site 7 - Norwest Station, Site 8 - Bella Vista Station, Site 9 - Balmoral Road, Site 10 - Memorial Avenue, Site 11 - Kellyville Station, Site 12 - Samantha Riley Drive to Windsor Road, Site 13 - Old Windsor Road to White Hart Drive, Site 14 - Rouse Hill Station, Site 15 - Windsor Road Viaduct, Site 16 - Windsor Road Viaduct to Cudgegong Road, Site 17 - Cudgegong Road Station and Tallawong Stabling Facility. and Tunnels

Figure 14.1 Land use and community facilities – Epping services facility and Epping decline sites

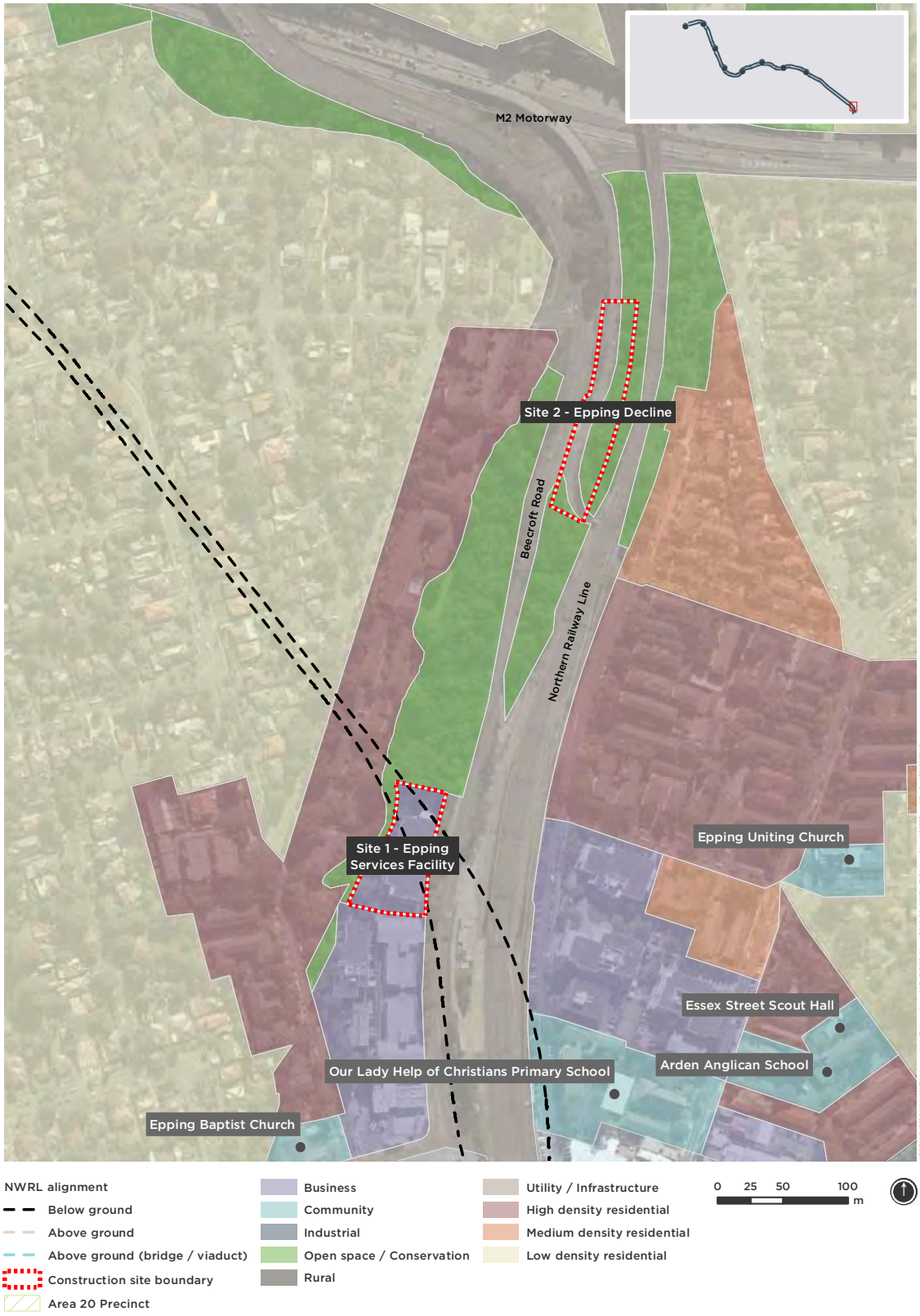

Figure 14.2 Land use and community facilities – Cheltenham services facility site

Figure 14.3 Land use and community facilities – Cherrybrook station site

Figure 14.4 Land use and community facilities – Castle Hill station site

Figure 14.5 Land use and community facilities – Hills Centre station site

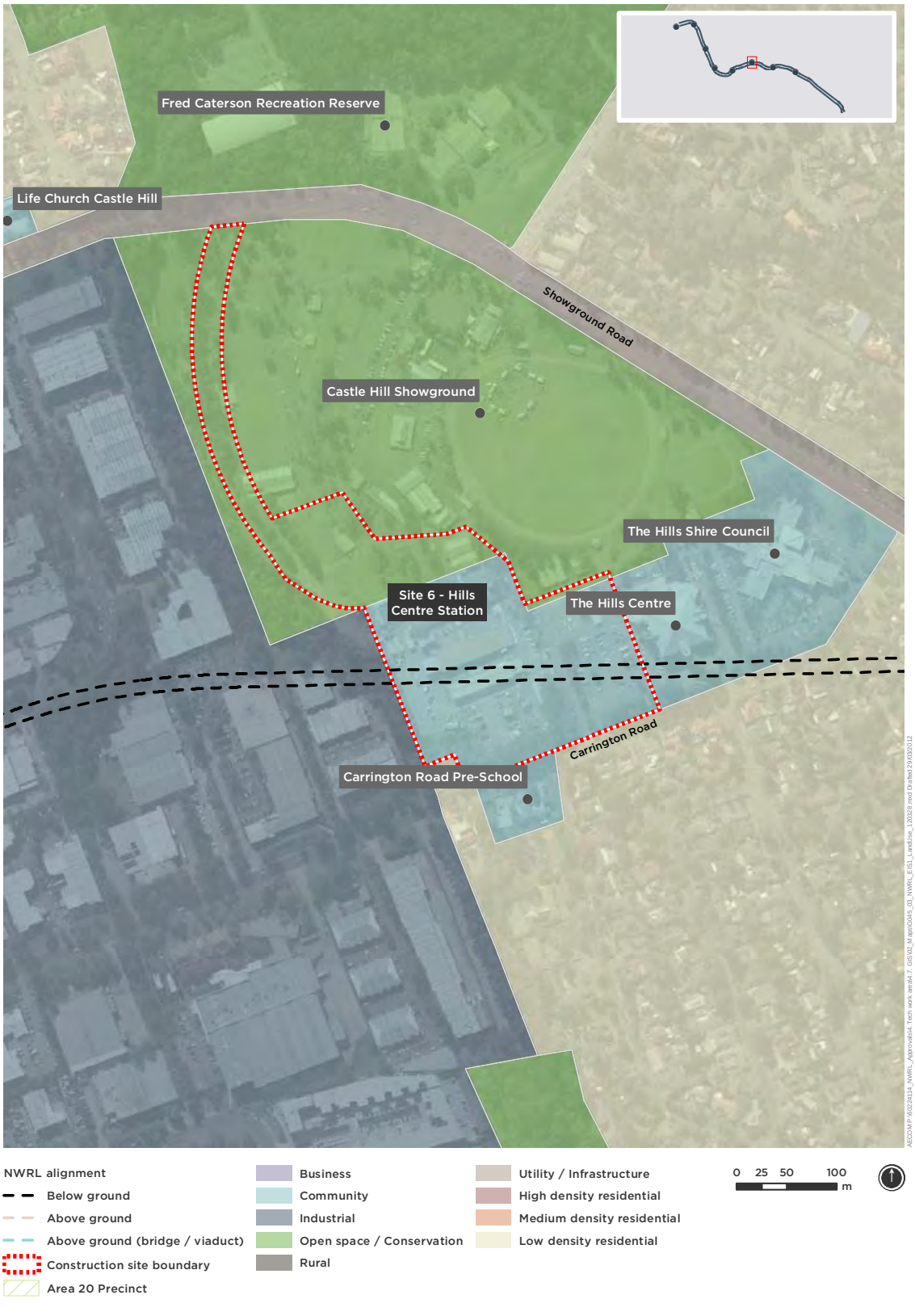

Figure 14.6 Land use and community facilities - Norwest station site

Figure 14.7 Land use and community facilities – Bella Vista station, Balmoral Road and Memorial Avenue sites

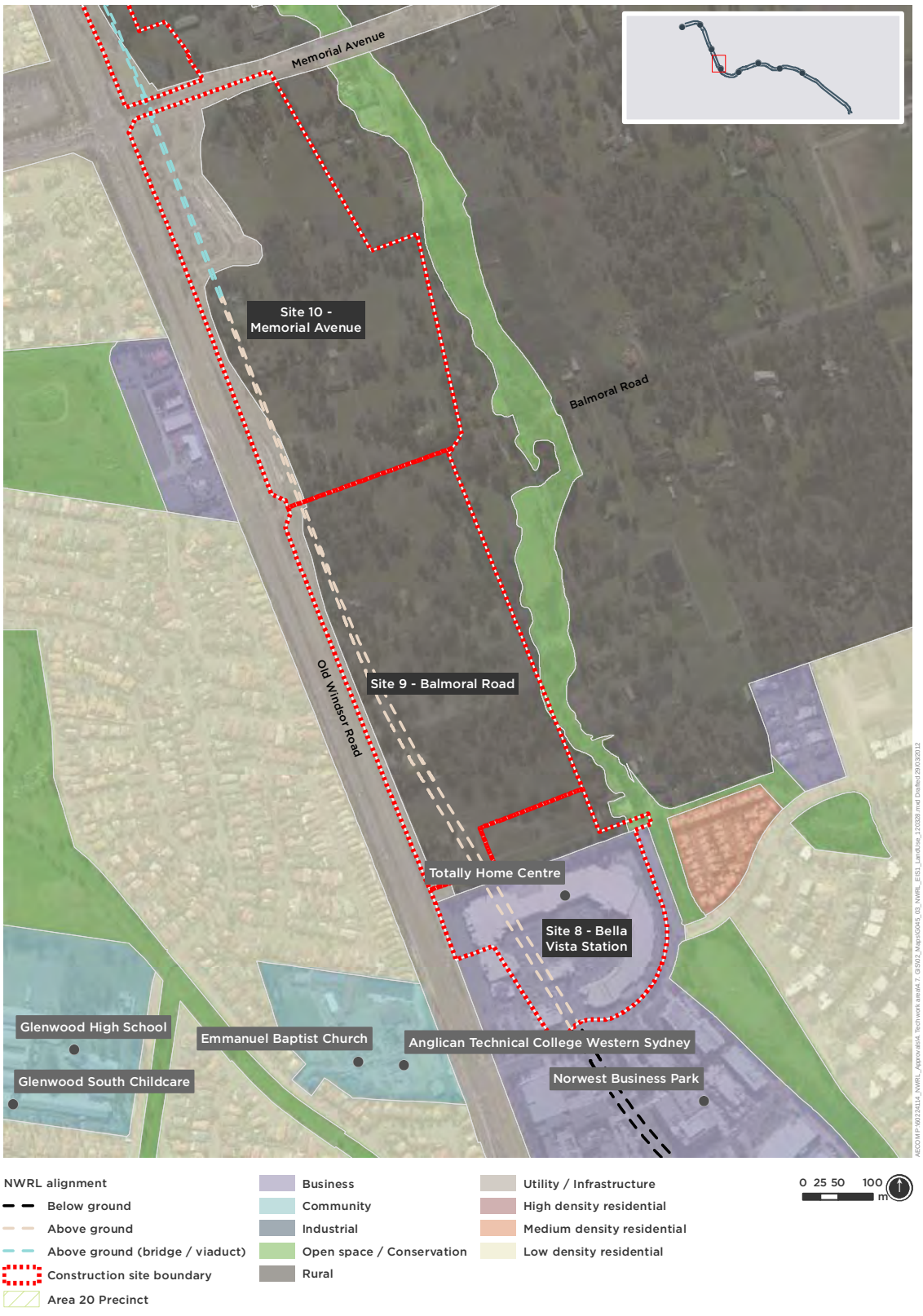

Figure 14.8 Land use and community facilities – Kellyville station and Samantha Riley Drive sites

Figure 14.9 Land use and community facilities – Old Windsr Road site

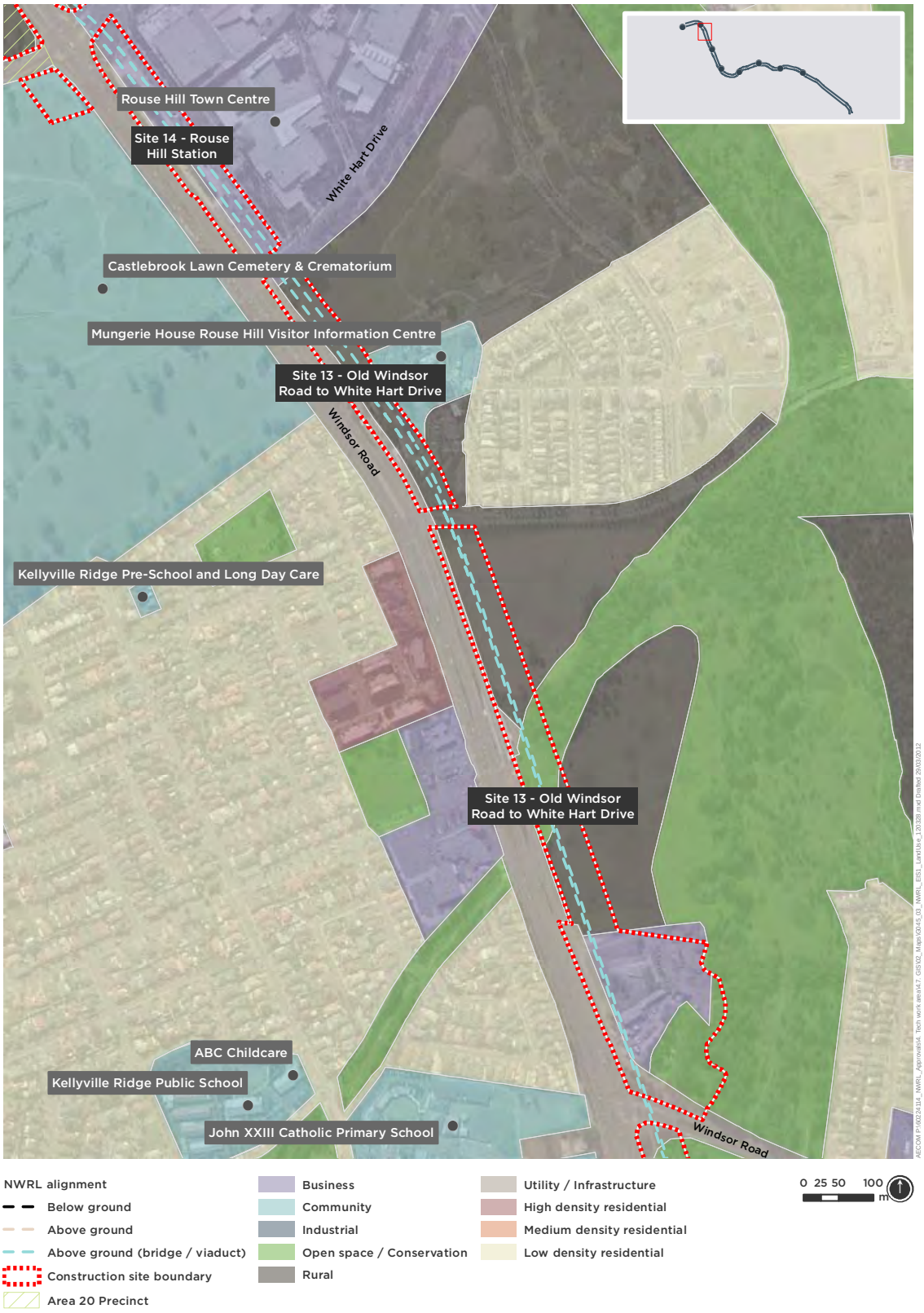

Figure 14.10 Land use and community facilities – Rouse Hill station, Windsor Road viaduct and Cudgegong Road sites

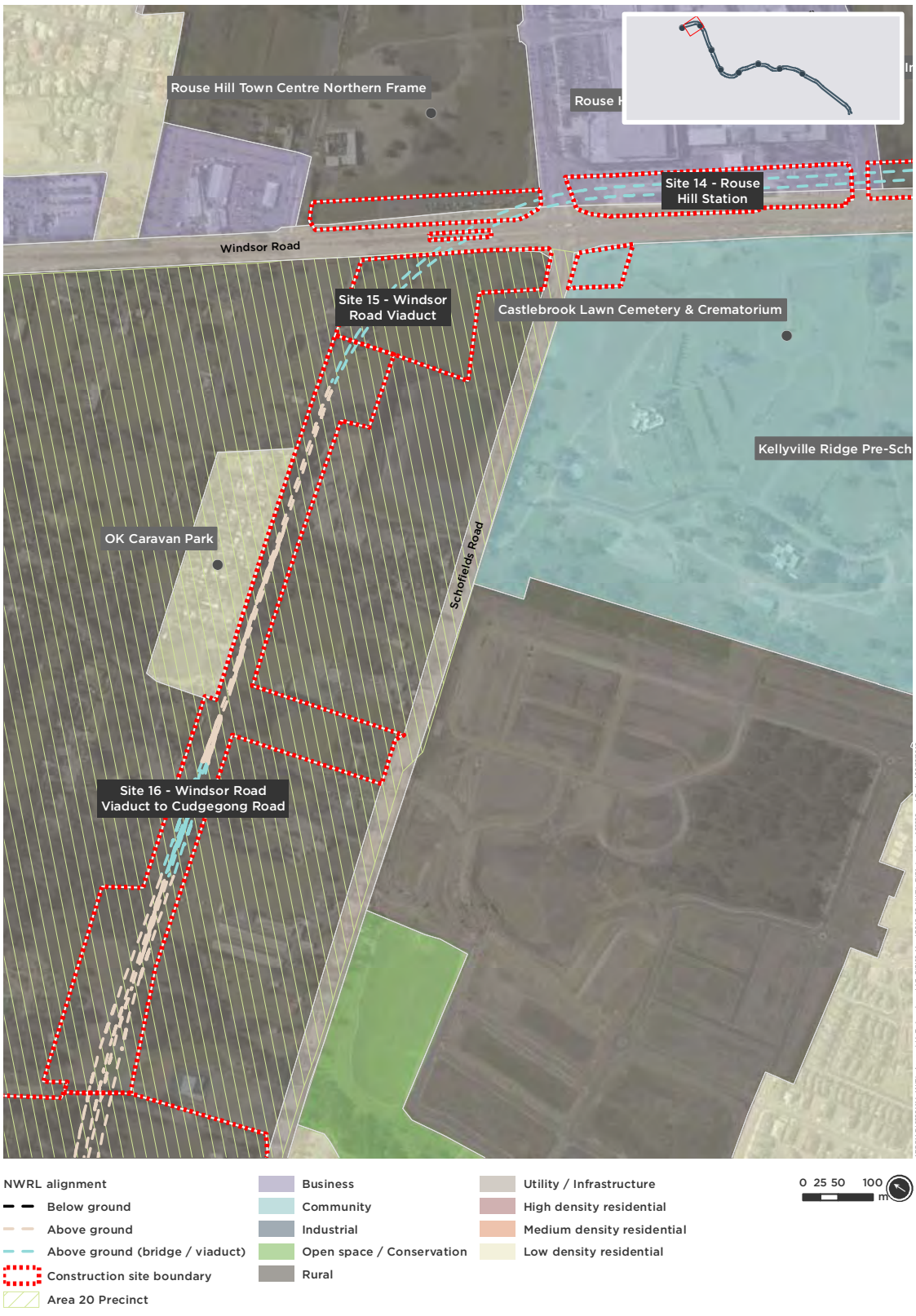

Figure 14.11 Land use and community facilities – Cudgegong Road station and Tallawong stabling facility sites

Figure 14.12 Balmoral Road Release Area