



Australian Government

**BUILDING OUR FUTURE**



# **M12 Motorway**

Amendment Report – Appendix E

Aboriginal heritage  
supplementary technical memorandum

October 2020

# Memorandum



**Issued by** Andrew Costello (Senior Archaeologist, Jacobs)  
**Subject** M12 Motorway Aboriginal Heritage Supplementary Technical Memorandum  
**Client** Transport for New South Wales  
**Project** M12 Motorway  
**Date** October 2020

## 1. Introduction and background

### 1.1 Overview

Transport for New South Wales (TfNSW; formerly Roads and Maritime Services) proposes to build the M12 Motorway between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham (the project), over a distance of about 16 kilometres. The project would provide the main access from the Western Sydney International Airport at Badgerys Creek to Sydney's motorway network and is expected to be opened to traffic before the opening of the Western Sydney International Airport.

TfNSW is seeking approval under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to construct and operate the project. An environmental impact statement (EIS) was prepared to assess the potential impacts of the project and recommend management measures to appropriately address those impacts. The key features of the project as described in the EIS is provided in Section 1.1 of the amendment report. This EIS was placed on public exhibition from 16 October to 18 November 2019.

TfNSW proposes to amend the project following further design development since the exhibition of the EIS. The proposed changes include design changes and construction updates. These provide functional improvements to the design and improved integration with surrounding major transport infrastructure projects and potential future development. They also respond to issues raised in community and stakeholder submissions, and, in some instances, further reduce the potential impacts of the project as described in the EIS.

The proposed changes are described in **Section 1.2**.

### 1.2 Proposed changes

The proposed changes to the project as described in the EIS are summarised below and are described in detail in Chapter 3 and Chapter 4 of the amendment report:

- Amendments to the motorway-to-motorway interchange at the M7 Motorway, including:
  - Changes to Elizabeth Drive and Cecil Road intersections, proposed exit ramps, the Wallgrove Road connection to Elizabeth Drive and proposed shared user path realignments
  - The widening of Elizabeth Drive under the M7 Motorway and approaches
- An option to provide a new connection between the M12 Motorway and Elizabeth Drive near the M7 Motorway interchange

- Two new signalised intersections into the Western Sydney International Airport, with provisions for future connection to potential developments north of the Western Sydney International Airport
- Additional ancillary facilities to support the delivery of the project.

Refinements have also been made as part of the ongoing development of the project since the EIS was exhibited. Refinements are changes that are consistent with the parameters of the project description as described in the EIS. For completeness, however, these refinements have been factored into the amended construction and operational footprint and included in the impact assessment described in this supplementary technical memorandum. The refinements are described in Section 3.3 and Section 4.2 of the amendment report and include:

- Lowering the height of the M12 Motorway in and around the Western Sydney International Airport interchange
- Reduction in the scope of work associated with the M12 Motorway and The Northern Road intersection
  - This intersection would still be constructed, but the main infrastructure work would be delivered as part of The Northern Road upgrade project
- Relocation of utilities
- Changes to property access and acquisition
- Changes to drainage
- Adjustments to construction access, hours, haulage, timing and material quantities.

The project with all proposed changes is referred to as the amended project.

### 1.3 Amended project

#### 1.3.1 Overview

The amended project would continue to provide the main access from the Western Sydney International Airport at Badgerys Creek to Sydney's motorway network and be located between The Northern Road in the west and the M7 Motorway in the east. The amended project includes an option for a direct connection between the M12 Motorway and Elizabeth Drive at the eastern extent of the project. This option would include some realignment of Wallgrove Road and widening of Elizabeth Drive at the motorway-to-motorway interchange at the M7 Motorway to facilitate the connection. Therefore, two options are being proposed for the amended project at the interchange with the M7 Motorway.

The two options for the amended project would be consistent from The Northern Road in the west until Duff Road in the east. At the motorway-to-motorway interchange with the M7 Motorway, the project is proposed to be either:

- Option 1 – Without Elizabeth Drive connection
  - Interchange provides entry and exit ramps between the M12 Motorway and the M7 Motorway; in addition, it would maintain the existing connection of the M7 Motorway to Elizabeth Drive with new entry and exit ramps
- Option 2 – With Elizabeth Drive connection
  - Interchange as per option 1 and also provides entry and exit ramps between the M12 Motorway and Elizabeth Drive, Cecil Road and Wallgrove Road.

This section of the amended project is shown in **Figure 1-1**, with the Elizabeth Drive connection associated with option 2 shown in a different colour and detailed in inset A. The decision on which option would be built is dependent on funding being available to include

the Elizabeth Drive connection. This will be determined during the detailed design and construction phase of the project. The key features of each option are described in the following sections.

The proposed changes (see **Section 1.2**) would result in an amended construction footprint (**Figure 1-2**), and an amended operational footprint (**Figure 1-3**). The footprints would be the same for both options, with each footprint assuming the worst case scenario (ie option 2).

The assessment of potential impacts described in **Section 4** relates to the worst case scenario and covers both options, unless stated otherwise.

The key features of the amended project are listed in **Section 1.3.2** and include both options.

### **1.3.2 Key features of the amended project**

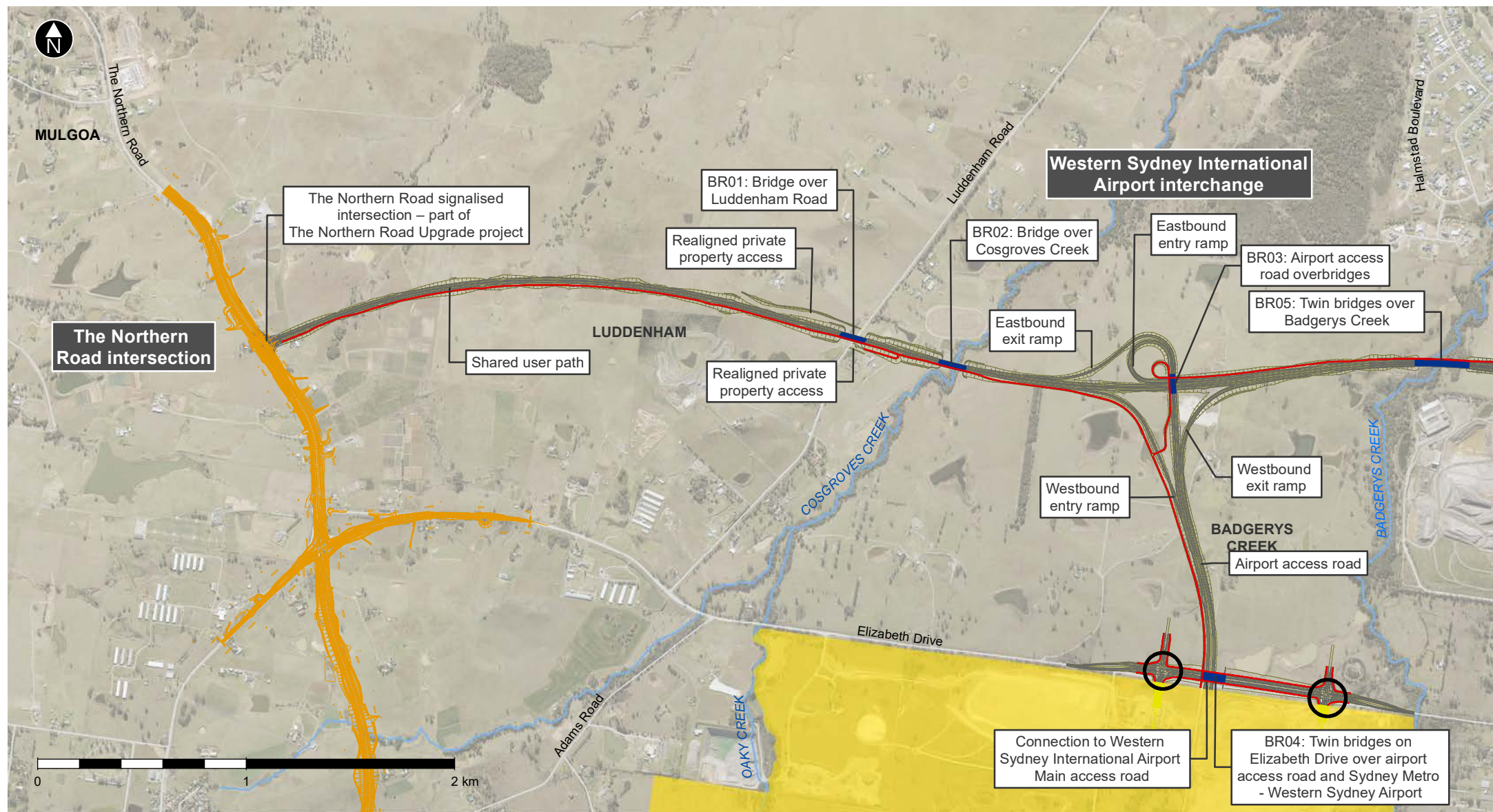
The key features of the amended project are listed below. Where the description of the proposed amended project key features differs from the description listed in the EIS (see Section 1.1 of the amendment report), those changes are shown in **bold** text:

- A new dual-carriageway motorway between the M7 Motorway and The Northern Road with two lanes in each direction with a central median allowing future expansion to six lanes
- Motorway access via three interchanges/intersections:
  - A motorway-to-motorway interchange at the M7 Motorway and associated works (extending about four kilometres within the existing M7 Motorway corridor) **with the following options:**
    - **Option 1 – without connection between the M12 Motorway and Elizabeth Drive**
    - **Option 2 – with connection between the M12 Motorway and Elizabeth Drive**
  - A grade-separated interchange referred to as the Western Sydney International Airport interchange, including a dual-carriageway four-lane airport access road (two lanes in each direction for about 1.5 kilometres) connecting with the Western Sydney International Airport Main Access Road
  - A signalised intersection at The Northern Road with provision for grade separation in the future
- Bridge structures across Ropes Creek, Kemps Creek, South Creek, Badgerys Creek and Cosgroves Creek
- A bridge structure across the M12 Motorway into the Western Sydney Parklands to maintain access to utilities, including the existing water tower and mobile telephone/other service towers on the ridgeline in the vicinity of Cecil Hills, to the west of the M7 Motorway
- Bridge structures at interchanges and at Clifton Avenue, Elizabeth Drive, Luddenham Road and other local roads to maintain local access and connectivity
- Inclusion of active transport (pedestrian and cyclist) facilities through provision of pedestrian bridges and an off-road shared user path, including connections to existing and future shared user path networks



- Modifications to the local road network, as required, to facilitate connections across and around the M12 Motorway including:
  - Realignment of Elizabeth Drive at the Western Sydney International Airport, with Elizabeth Drive overpassing the airport access road and rail infrastructure
  - **Two new signalised intersections from Elizabeth Drive into the Western Sydney International Airport, with provisions for future connection to potential developments to the north**
  - **Widening of Elizabeth Drive under the M7 Motorway and approaches**
  - Realignment of Clifton Avenue over the M12 Motorway, with associated adjustments to nearby property access
  - Relocation of the Salisbury Avenue cul-de-sac, on the southern side of the M12 Motorway
  - **Realignment of Wallgrove Road to connect to Cecil Road, including a connection between Elizabeth Drive and Wallgrove Road via Cecil Road with a signalised intersection with Elizabeth Drive**
- Adjustment, protection or relocation of existing utilities
- Ancillary facilities to support motorway operations, smart motorways operation in the future and the existing M7 Motorway operation, including gantries, electronic signage and ramp metering
- Other roadside furniture, including safety barriers, signage and street lighting
- Adjustments of waterways, where required, including Kemps Creek, South Creek and Badgerys Creek
- Permanent water quality management measures including swales and basin
- Establishment and use of temporary ancillary facilities, temporary construction sedimentation basins, access tracks and haul roads during construction
- Permanent and temporary property adjustments and property access refinements as required.

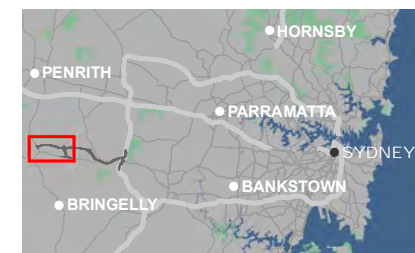
An overview of the amended project is shown in **Figure 1-1**.



- The amended project
- Existing roads
- Part of The Northern Road upgrade project
- Waterways
- Shared user path
- Bridges
- Western Sydney International Airport
- Signalised intersections into the Western Sydney International Airport  
Note: Indicative, subject to detailed design

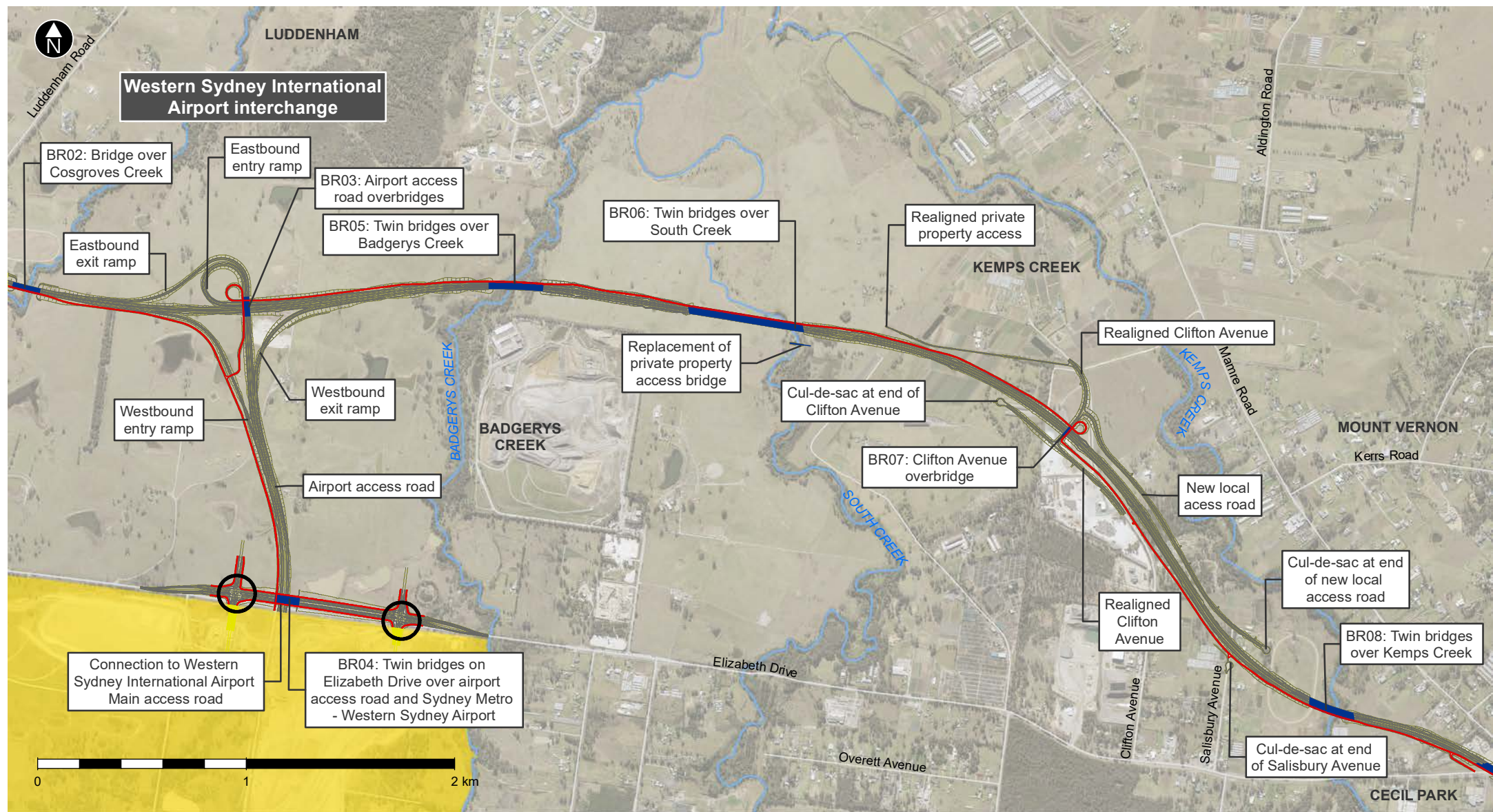


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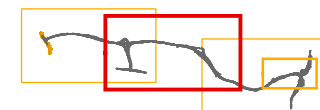


**Figure 1-1** Key features of the amended project

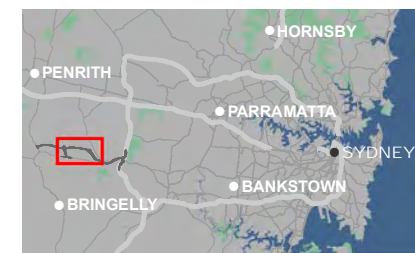




- The amended project
- Existing roads
- Western Sydney International Airport
- Shared user path
- Waterways
- Signalised intersections into the Western Sydney International Airport
- Note: Indicative, subject to detailed design
- Bridges

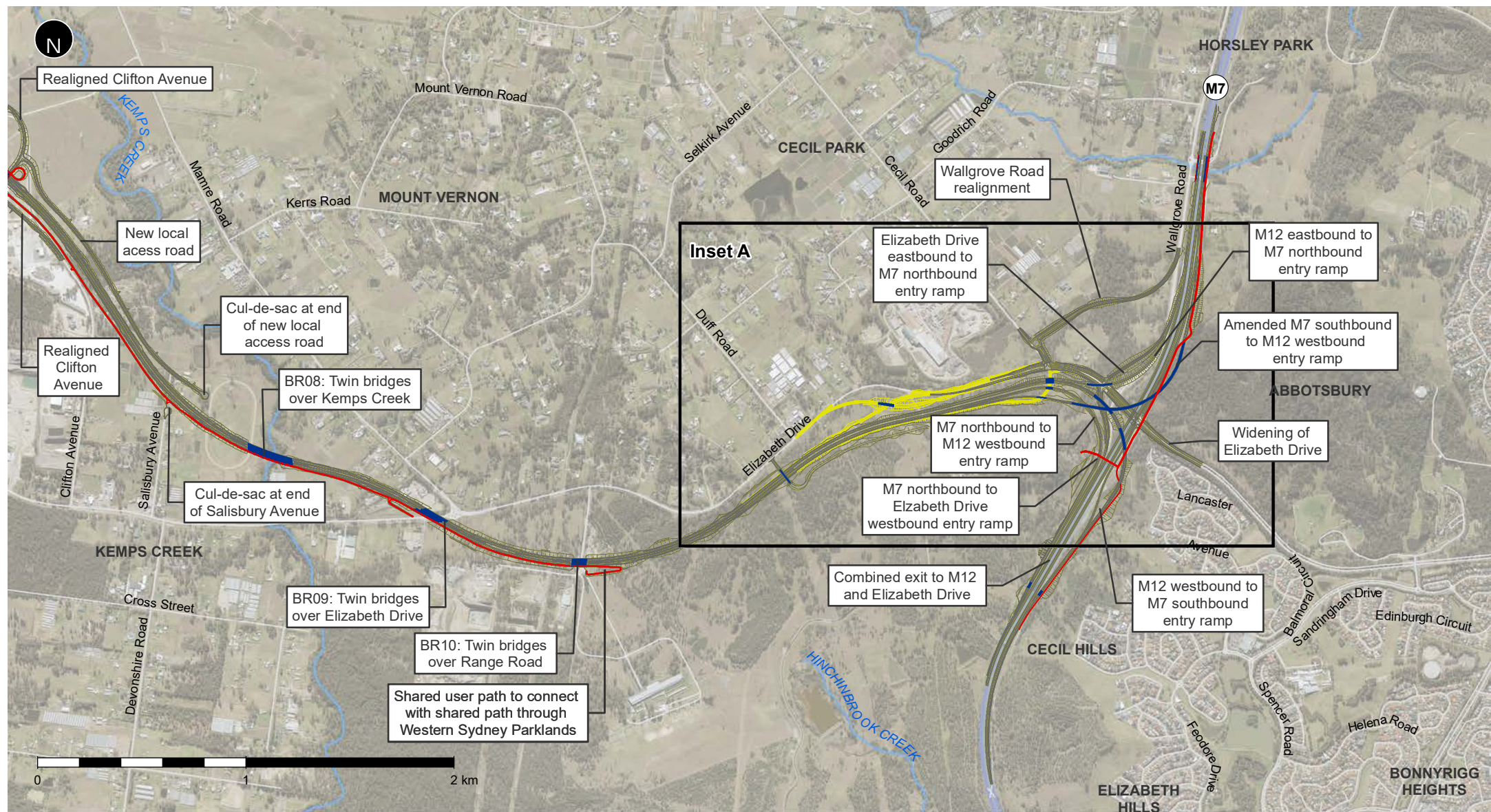


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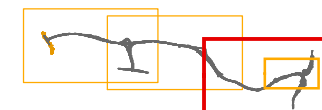


**Figure 1-1** Key features of the amended project

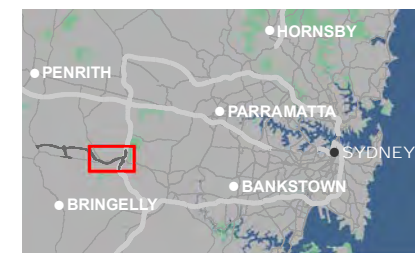




- The amended project
- The amended project (Elizabeth Drive connection)
- Shared user path
- Bridges
- Motorway
- Existing roads
- Waterways

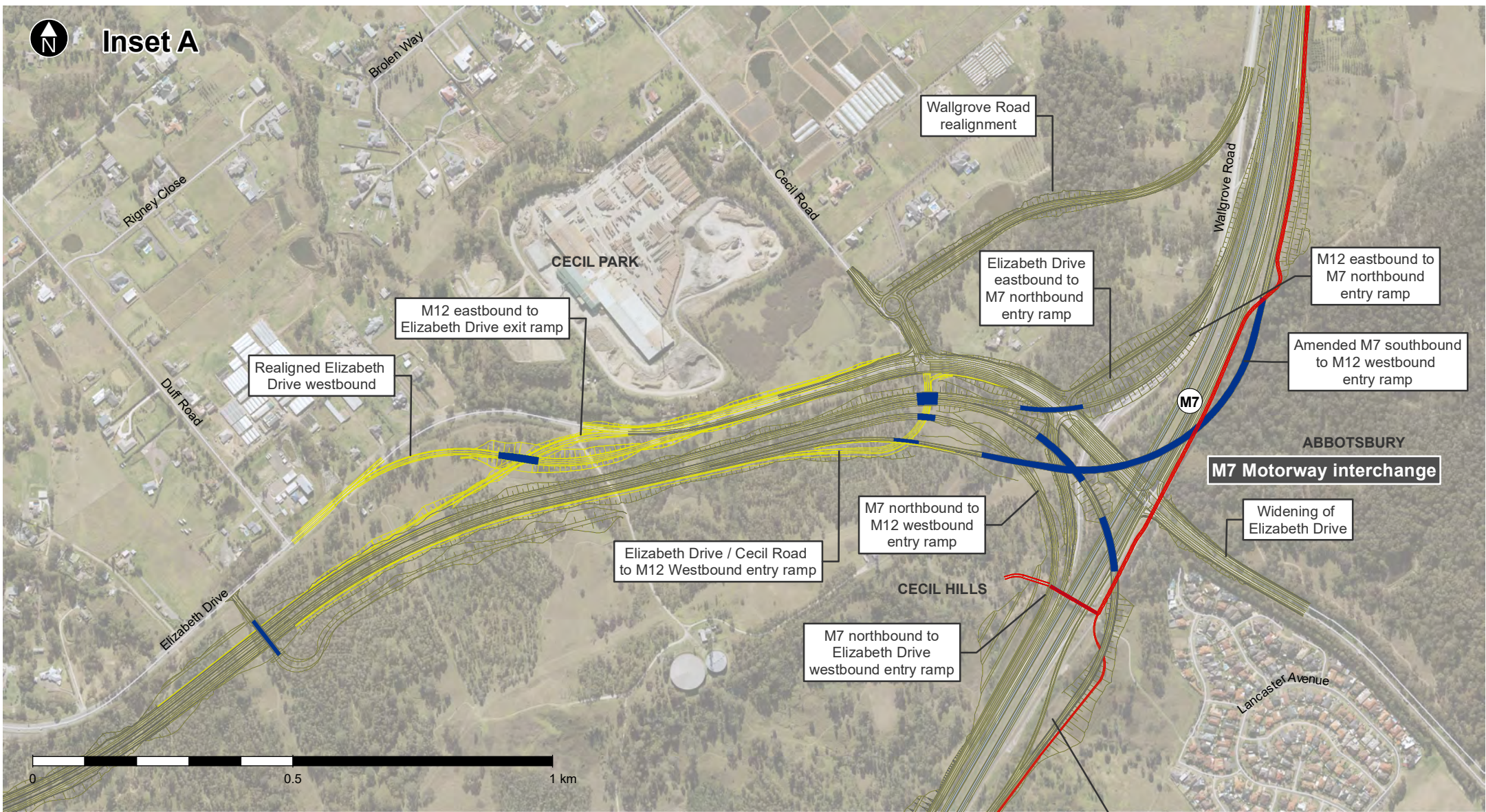


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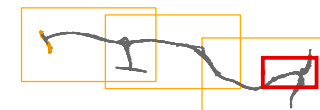


**Figure 1-1** Key features of the amended project

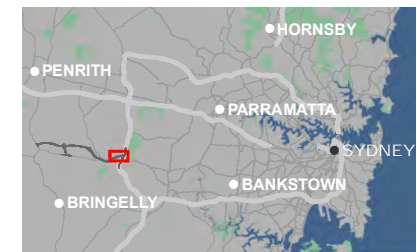




- The amended project
- The amended project with Elizabeth Drive connection
- Shared user path
- Bridges
- Motorway
- Existing roads

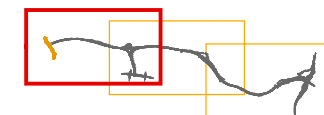
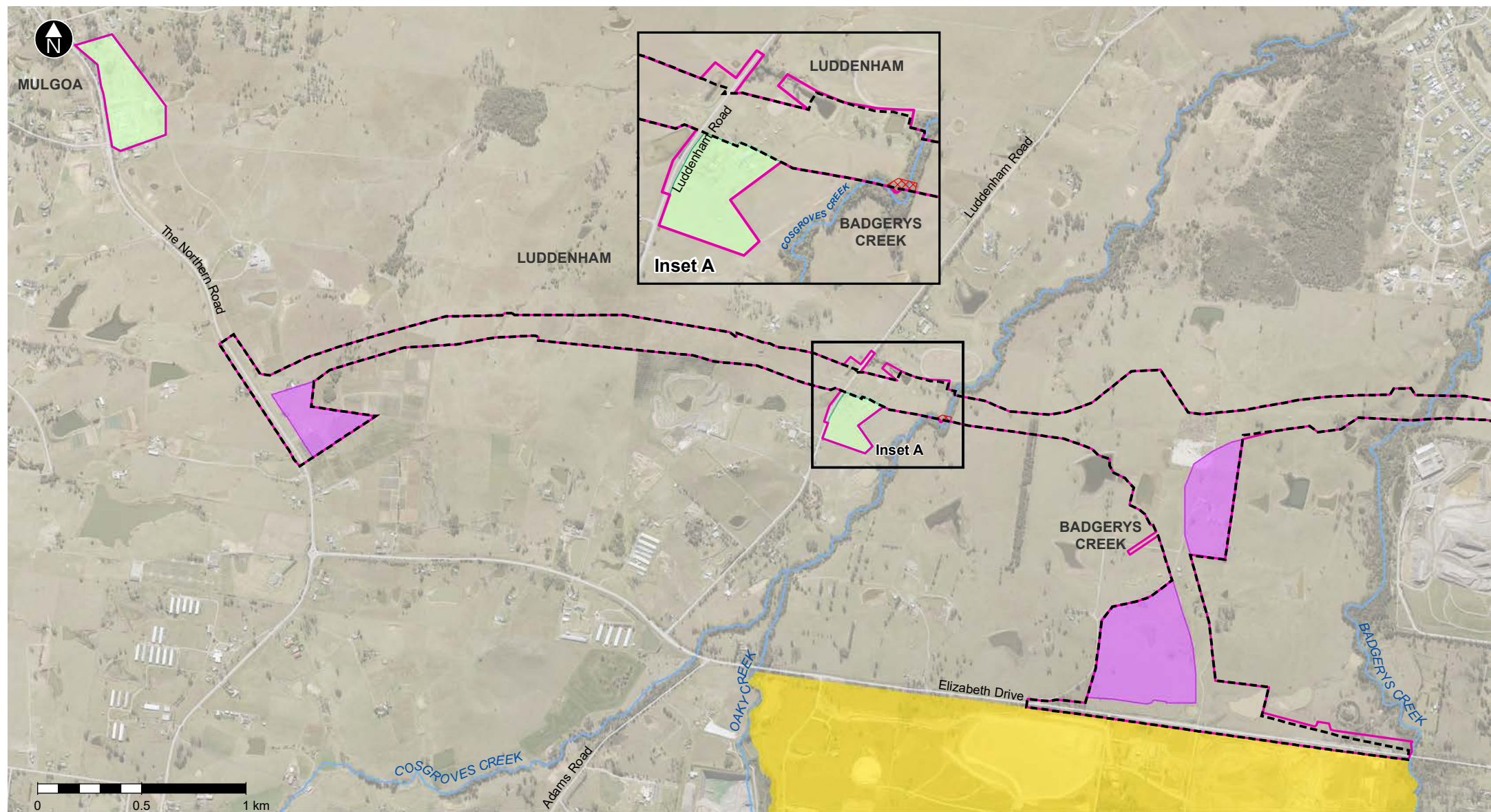


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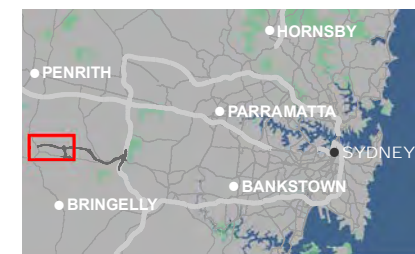


**Figure 1-1** Key features of the amended project



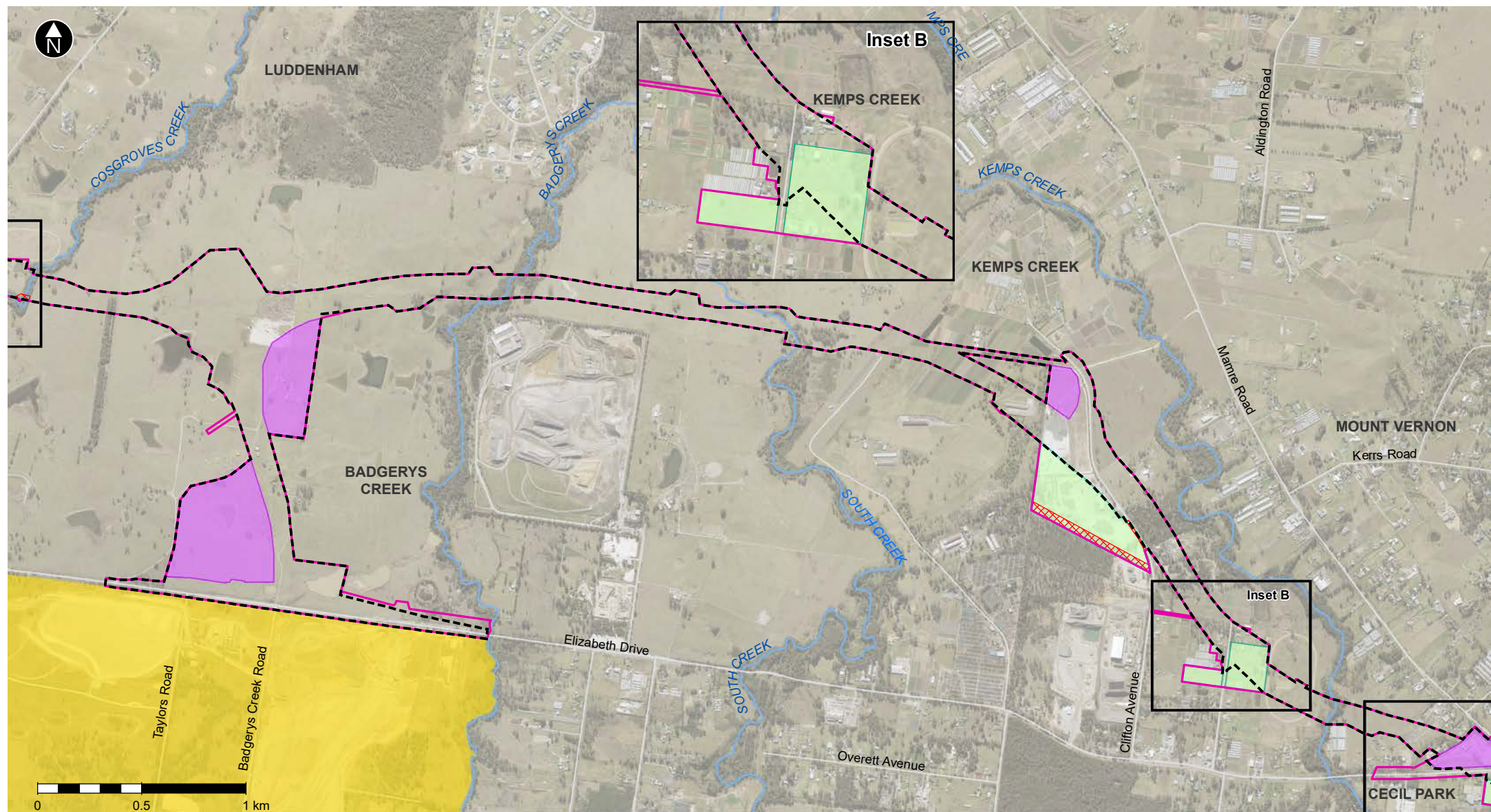


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**Figure 1-2** Construction footprints of the amended project and the project as described in the EIS

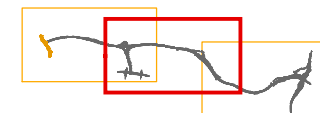




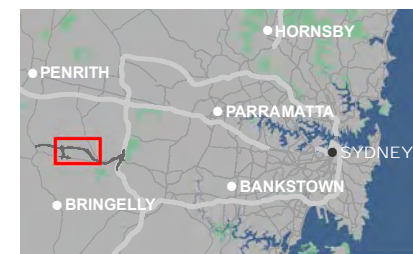
- The project construction footprint as per the EIS
- The amended project construction footprint
- The amended project exclusion zones

- Ancillary facilities as per the EIS
- Additional ancillary facilities
- Western Sydney International Airport

- Waterways
- Motorway
- Existing roads

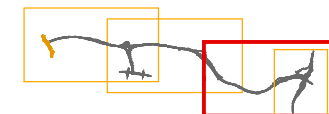
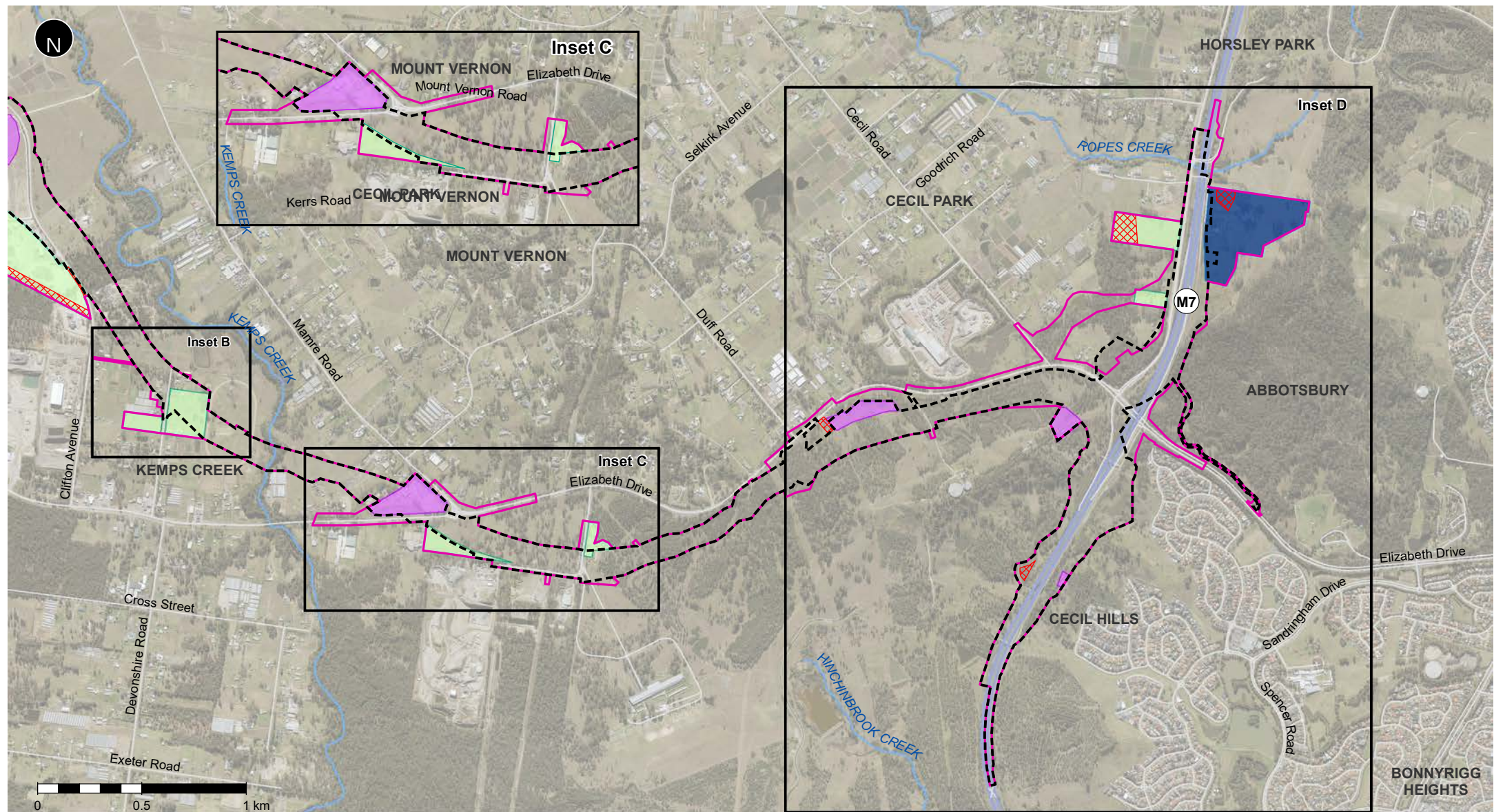


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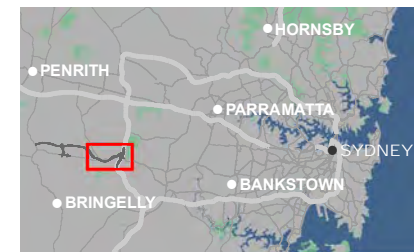


**Figure 1-2** Construction footprints of the amended project and the project as described in the EIS



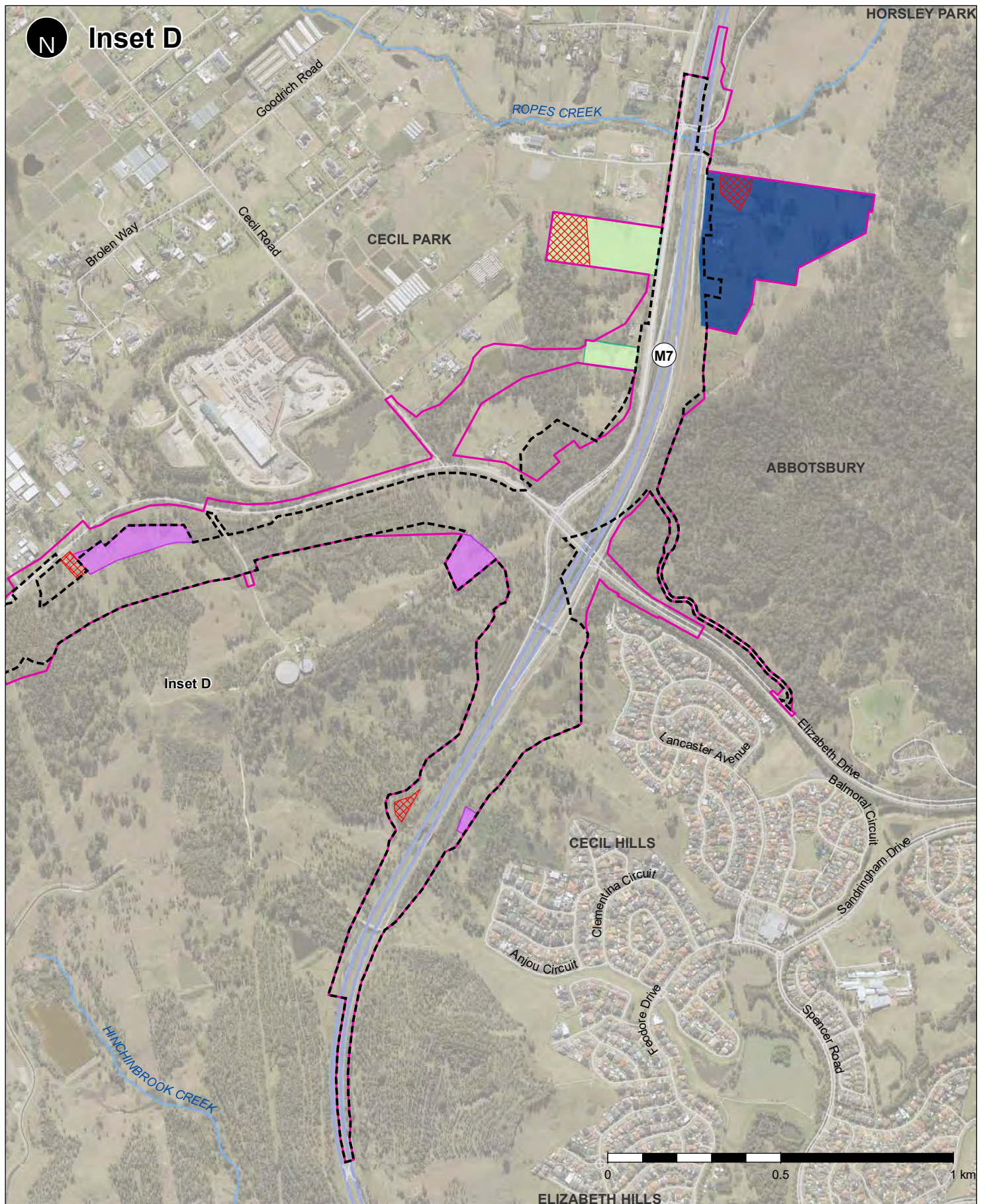


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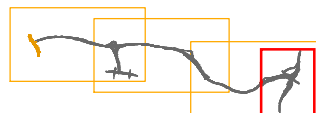


**Figure 1-2** Construction footprints of the amended project and the project as described in the EIS

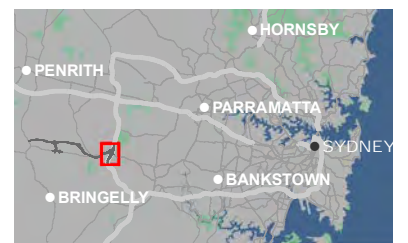




- The project construction footprint as per the EIS
- The amended project construction footprint
- The amended project exclusion zones
- Ancillary facilities as per the EIS
- Additional ancillary facilities
- Amended ancillary facilities

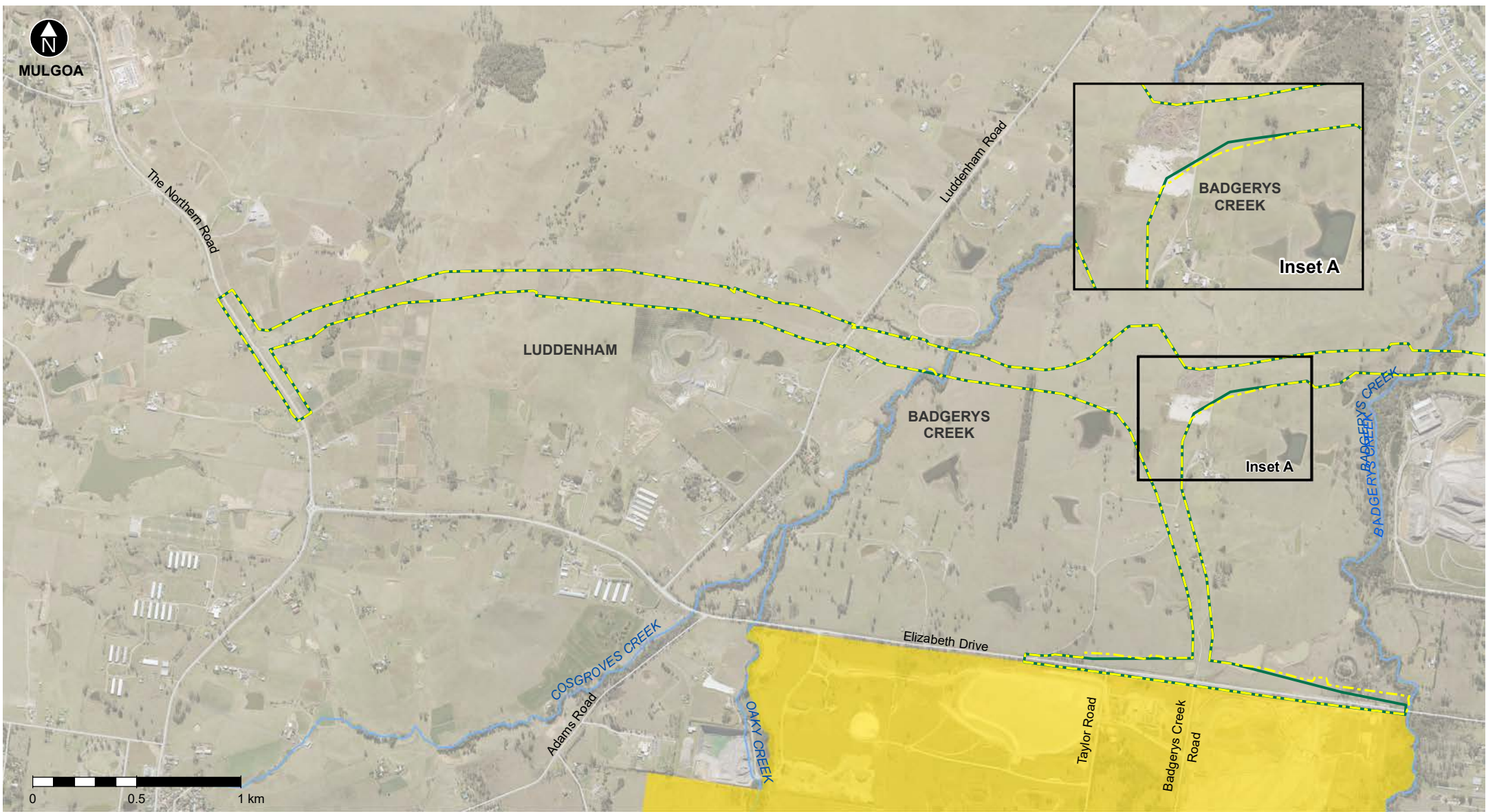


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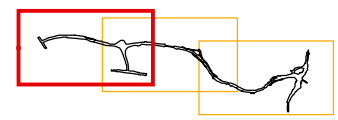


**Figure 1-2** Construction footprints of the amended project and the project as described in the EIS

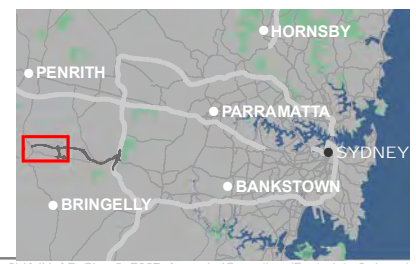




- The project operational footprint as per the EIS
- The amended project operational footprint
- ~~~~~ Waterways
- Western Sydney International Airport
- Existing roads

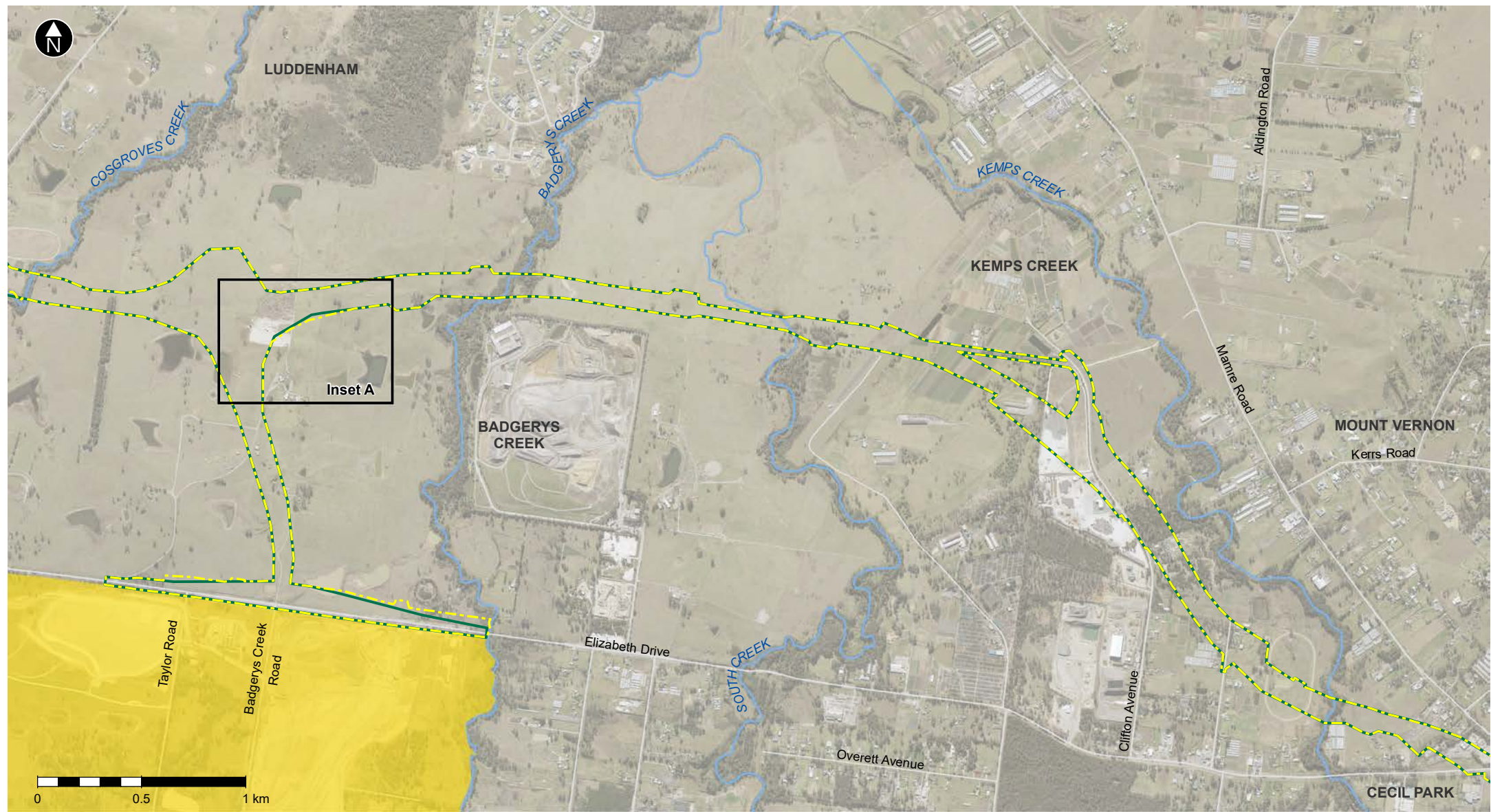


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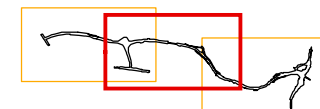


**Figure 1-3** Operational footprints of the amended project and the project as described in the EIS

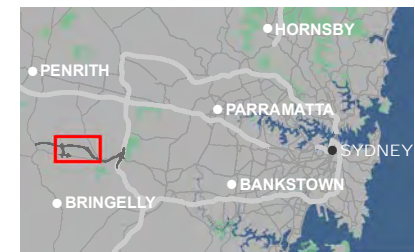




- The project operational footprint as per the EIS
- The amended project operational footprint
- ~~~~~ Waterways
- Western Sydney International Airport
- Existing roads

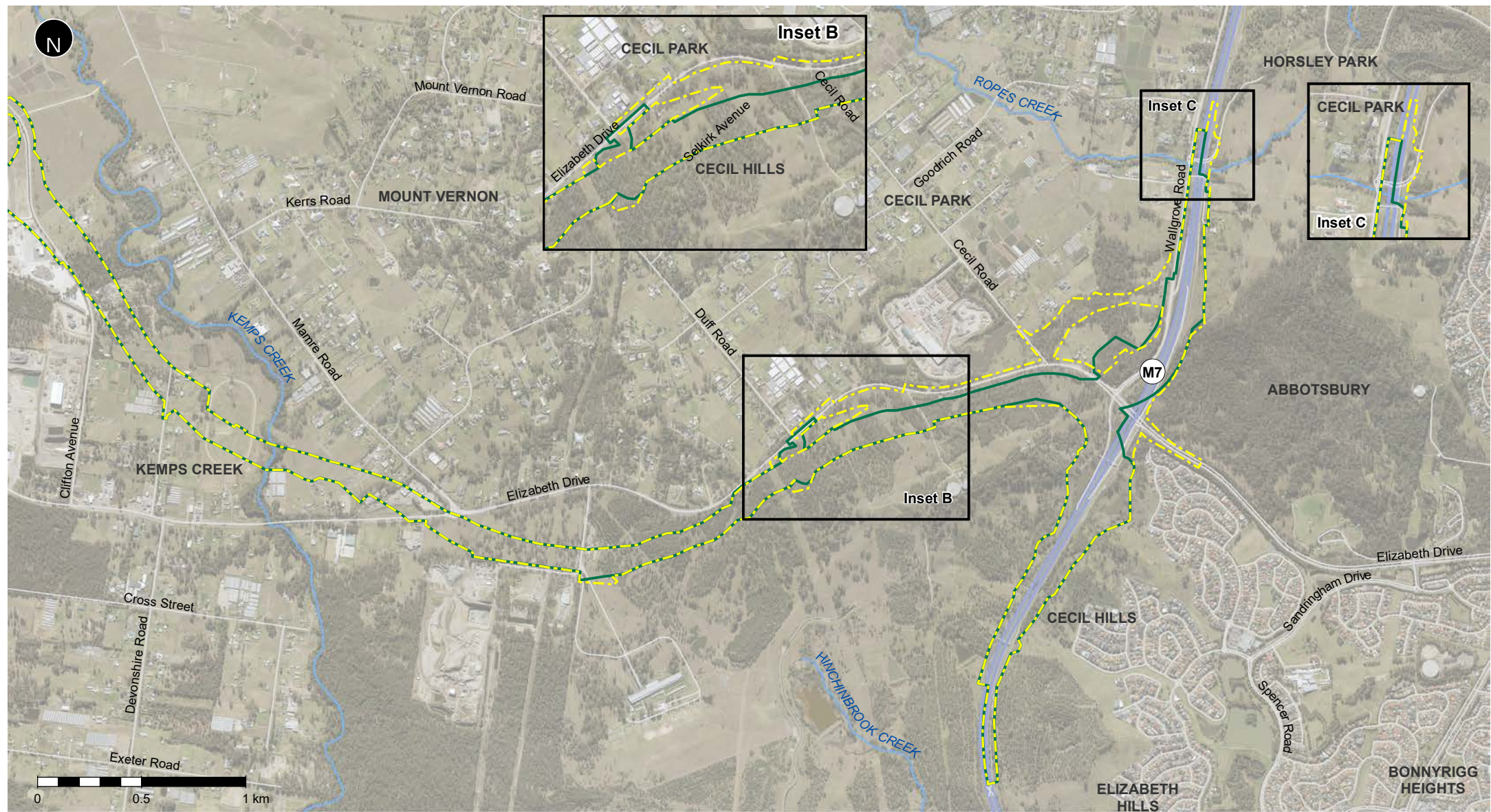


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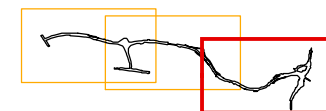


**Figure 1-3** Operational footprints of the amended project and the project as described in the EIS

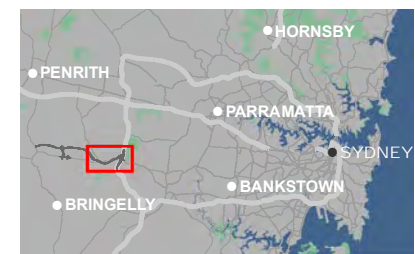




- The project operational footprint as per the EIS
- The amended project operational footprint
- ~~~~~ Waterways
- Motorway
- Existing roads



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**Figure 1-3** Operational footprints of the amended project and the project as described in the EIS

## 1.4 Purpose of document

This supplementary technical memo has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) issued 30 October 2018 to support the amendment report. The purpose of this memo is to identify and assess the potential construction, operation and cumulative Aboriginal cultural heritage impacts of the amended project, including an assessment of the proposed changes against the impacts documented in the EIS. Where required, this document recommends changes or feasible and reasonable additions to the management measures described in the EIS.

## 2. Assessment methodology

### 2.1 Introduction

The methodology for the supplementary Aboriginal heritage assessment was prepared in accordance with the policy and planning setting detailed in Section 7.5.1 of the EIS, and consistent with the methodology outlined in Section 7.5.2 of the EIS. This assessment focuses on the changes in potential impacts to Aboriginal cultural heritage associated with the changes in construction and operational footprints as a result of the proposed changes. The assessments detailed in **Chapter 4** relate to both options identified in **Section 1.3**, unless stated otherwise.

The assessment involved the following:

- Desktop assessment
- Site investigation
- Refinement of boundaries of Aboriginal sites identified in the EIS
- Preparation of significance assessments
- Assessment of potential Aboriginal heritage impacts that may result due to the construction and operation of the amended project and, if required, identification of additional environmental management measures, or updates to existing measures proposed in the EIS.

The construction footprint encompasses the operational footprint. Considering ground disturbance would occur during construction, this assessment has focused on changes to the construction footprint only.

Each step of the methodology is described in the following sections.

### 2.2 Study area

The broader study area as described in Section 7.5.2 the EIS has not changed and is applicable for the purposes of this assessment. The detailed investigation area described in the EIS has also not changed, as this referred to the area where further detailed investigations were undertaken for the purpose of the EIS. As a result, this assessment focuses on changes to the construction footprint presented in the EIS.

The amended construction footprint is about 87 hectares larger than the construction footprint described in the EIS. The area covered by the site investigation for this assessment includes any areas of Aboriginal heritage sensitivity which are in the 91 hectare area within the amended construction footprint but outside of the construction footprint as described in the EIS. This is referred to as the site investigation area for the supplementary assessment and is shown in **Figure 2-1**.

FIGURE REDACTED

**Figure 2-1** Site investigation area for supplementary assessment

## **2.3 Desktop review**

The desktop assessment involved comparative analysis of the additional areas within the amended construction footprint (i.e. the areas that are outside of the construction footprint as described in the EIS), against known or potential areas of Aboriginal heritage sensitivity. These areas may either be areas where there are previously recorded Aboriginal sites, or areas that have the potential to contain unrecorded sites due to certain landscape features and/or the absence of evidence of past disturbance. Prior to fieldwork, a search of the Aboriginal Heritage Information Management System (AHIMS) database was carried out for these areas. A review of AHIMS data from site records and relevant past Aboriginal heritage assessment reports was also carried out.

Results of the desktop review are detailed in **Section 3.2**.

## **2.4 Site investigation**

A site investigation for this supplementary assessment was carried out on 24 January 2020 in the site investigation area as discussed in **Section 2.2** and presented in **Figure 2-1**. Steve Randall (Deerubbin Local Aboriginal Land Council (LALC)) and Lee Davison (Aboriginal Cultural Heritage Officer, TfNSW) accompanied Andrew Costello Senior Archaeologist, (Jacobs) during the site investigation.

The site investigation was conducted in a manner allowing inspection of all ground to confirm either the presence of Aboriginal heritage objects, to document vegetation cover or to identify ground exposures and significant ground disturbance. Vegetation cover can obscure surface artefacts so opportunistic inspection of exposed ground areas was conducted to determine the extent of surface density of Aboriginal artefacts.

Results of the site investigation are detailed in **Section 3.2.3**.

## **2.5 Aboriginal site boundary refinements**

As part of the assessment undertaken for the EIS, surveys and test excavations were carried out within the detailed investigation area to verify the locations, and determine the extent of previously recorded Aboriginal sites and areas of potential archaeological deposits identified during the desktop assessment. The test excavations resulted in a revised list of Aboriginal sites and revisions of site complex boundaries within the detailed investigation area.

However these site boundaries were quite broad, and included areas that have evidence of significant past disturbance and are therefore unlikely to contain *in situ* archaeological deposits. As part of this supplementary assessment, the boundaries of these sites have therefore been revised to exclude areas that are unlikely to contain archaeological deposits. This included areas occupied by dams, roads and buildings.

## **2.6 Significance assessment**

Significance assessments were prepared for Aboriginal sites identified within the additional areas of construction footprint assessed in this supplementary assessment. The significance assessment was carried out in accordance with the Australian International Council on Monuments and Sites (ICOMOS) Burra Charter described in Section 7.5.2 of the EIS.

The significance assessments carried out for this supplementary assessment are detailed in **Section 3.3**.



### **3. Existing environment**

#### **3.1 Landscape context**

Section 7.5.3 of the EIS provides a detailed description of the existing environment including geomorphology, hydrology, climate, and vegetation in the greater Sydney region. The existing environment has not changed since the preparation of the EIS.

In summary, the amended construction footprint is located on the Cumberland Plain, a relatively flat, low lying subregion of the Sydney Basin. The Cumberland Plain is a depression characterised by the middle Triassic Wianamatta group of shales with interleaved Minchinbury sandstone. The weathering of the sedimentary geology gives rise to a primarily flat to rolling hill topography.

Four major landscape patterns have been identified within the amended construction footprint and they reflect variation in topography and soils derived from geomorphological differences; Luddenham rolling hills, Cecil Hills, creek flats and gentle slopes.

The hydrology of the region is dominated by South Creek and its major tributaries, Cosgroves Creek, Badgerys Creek, and Kemps Creek. All four of these waterways are identified as fourth order watercourses (Strahler stream order system) and they flow north.

The diversity and abundance of vegetation within the amended construction footprint has been significantly diminished through agricultural land use practices. Wide scale clearing of native vegetation has been ongoing since the arrival of European settlers. As such, only sporadic areas of native vegetation remain, including: Shale Hills Woodland, Shale Plains Woodlands and Alluvial Woodland.

#### **3.2 Existing Aboriginal heritage**

The assessment undertaken for the EIS identified 19 Aboriginal heritage sites and complexes within the construction footprint presented in the EIS following test excavations. These sites and complexes are presented in **Figure 3-1**, however noting that this figure presents the refined site boundaries that have removed areas that have evidence of significant past disturbance and therefore are unlikely to contain in situ deposit as discussed in **Section 2.5**. These excised polygons are considered to be of low archaeological potential for early works activities and do not require additional investigation or any further archaeological clearance. These refined boundaries were defined and confirmed in consultation with the Deerubbin LALC and TfNSW in accordance with the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) Stage 2 (Roads and Maritime 2011) process.

Refer to Section 7.4 of the EIS for further information about the methodology and results of the test excavations undertaken for the EIS. An additional seven sites were identified within the EIS detailed investigation area but outside the construction footprint presented in the EIS.

The desktop review carried out for this supplementary assessment confirmed that two of these sites, namely PAD-OS-7 and KC/ED2 would now be located within the amended construction footprint (see **Figure 3-1**). This brings the number of sites and complexes within the amended construction footprint to 21. These two additional sites that would fall within the footprint are described in the sections that follow.



FIGURE REDACTED

**Figure 3-1** Mapping amended construction footprint and Aboriginal heritage sites

FIGURE REDACTED

**Figure 3-1** ap s o ing amended onstru tion footprint and Aboriginal eritage sites

FIGURE REDACTED

**Figure 3-1** ap s o ing amended onstru tion footprint and Aboriginal eritage sites

### 3.2.1 PAD-OS-7

PAD-OS-7 is located near Ropes Creek, adjacent to the M7 Motorway, Villiers Road and Wallgrove Road in the north-east of the amended construction footprint. It is associated with the previously registered AHIMS site 45-5-2721. The site was recorded in 2002 and associated with a hillcrest terrace on an upper tributary of Ropes Creek. Ninety-five test pits were excavated during an archaeological assessment related to an equestrian centre development, and a total of 34 artefacts were recovered from the excavations. Eighteen of these artefacts were recovered from the southern hillcrest that would be closest to the amended construction footprint.

### 3.2.2 KC/ED2

KC/ED2 is located adjacent to the Western Sydney Parklands Wylde Mountain Bike trail, along Elizabeth Drive. It is registered as AHIMS site 45-5-2310, and was recorded in 1995 as part of an upgrade to Elizabeth Drive. The site comprises eight artefacts which were exposed during the excavation of a telecommunications trench and were damaged during bulldozing works and several could not be confirmed as being artefactual. The site context is highly disturbed as the installation of services and drains would have removed the intact topsoil.

According to AHIMS site card and original site recording these artefacts were exposed along an existing vehicle track, however these artefacts were not located during the site investigations for the EIS or amended project.

The AHIMS site card notes the artefacts are slightly damaged and the scatter encompassed an approximate 80 metres of the track. The artefacts included one yellow mudstone backed blade, one quartzite fragment, one silcrete flaked piece, one dark green mudstone flake, one yellow mudstone flaked piece, one fine grained siliceous core, one fine grained siliceous truncated flake and one fine grained siliceous piece with a negative scar.

The track and surrounding area is disturbed as a result of bulldozing associated with the transmission line and cable installation.

### 3.2.3 Site investigation results

Several properties within the amended construction footprint were inspected during the survey (see **Figure 2-1**). The potential impacts to Aboriginal cultural heritage were assessed based on archaeological sensitivity and in reference to previously recorded Aboriginal cultural material documented in archaeological literature pertaining to the area.

No surface artefacts were identified during the survey.

The landform around Ropes Creek and PAD-OS-7 (AHIMS site 45-5-2721) was inspected as part of the site investigation (see **Figure 3-2** to **Figure 3-7**). The landform that was subject to test excavation carried out as part of the EIS was observed to extend further south than the original site recording documented. As a result, the PAD site boundary was extended to better reflect the potential for sub-surface artefacts to occur within the amended construction footprint (see **Figure 3-10**).

The area along Elizabeth Drive was inspected where the amended construction footprint partially intersects the southern portion of KC/ED2 (AHIMS site 45-5-2310). No artefacts were observed within the areas in the amended construction footprint and the area was found to be highly disturbed (see **Figure 3-8** and **Figure 3-9**). The site area is an 80 metres easement adjacent to the southern side of Elizabeth Drive and is now just over 30 metres outside the amended construction footprint. The boundary for this site was therefore also

subsequently adjusted to more accurately reflect its location. As a result, the site would no longer be located within the amended construction footprint (see **Figure 3-11**).

No other Aboriginal archaeological material was identified within the site investigation area for the supplementary assessment.

These refined boundaries were defined and confirmed in consultation with the Deerubbin LALC and TfNSW in accordance with the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) Stage 2 (Roads and Maritime 2011) process.



Figure 3-2: Facing south from Ropes Creek toward terrace defined as an area of PAD-OS-7



Figure 3-3: Facing south from Ropes Creek PAD-OS-7





Figure 3-4: Photo facing south showing ground surface visibility at PAD-OS-7



Figure 3-5: Photo facing west toward Wallgrove Road from PAD-OS-7



Figure 3-6: Photo taken from Villiers Road under Wallgrove Road facing east toward PAD-OS-7



Figure 3-7: Photo taken from Villiers Road under Wallgrove Road facing north





Figure 3-8: Photo facing east from KC/ED2



Figure 3-9: Photo facing west toward Elizabeth Drive from KC/ED2

FIGURE REDACTED

**Figure 3-10** Updated PAD-OS-7 boundary



FIGURE REDACTED

**Figure 3-11** Updated KC/ED2 boundary

### 3.3 Significance assessments

The EIS completed significance assessments only for Aboriginal heritage sites that are either:

- Within the construction footprint
- With a portion of the site boundary within the construction footprint
- Where the potential for inadvertent impacts warrants management measures to be developed to minimise to these impacts.

Significant assessments have been prepared for the two Aboriginal sites which were initially identified to now be located within the amended construction footprint (see **Section 3.2**), noting that KC/ED2 would no longer fall inside the amended construction footprint due to the refinement of its boundary. These assessments are detailed in **Table 3-1** and **Table 3-2**.

Table 3-1 Significance assessment for AHIMS site 45-5-2721 (PAD-OS-7)

| Criterion                         | Assessment  |
|-----------------------------------|---|
| Social significance               | The RAP representatives confirmed during consultation undertaken for the M12 Motorway EIS, that all Aboriginal cultural heritage objects, sites and values in the construction footprint are considered to be of <b>high social significance</b> . The site has a high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people.   |
| Historical significance           | The historical and ethnographic sources described in the EIS (Section 5.2) report demonstrate occupation of the construction footprint by Aboriginal peoples from the contact period through to the present. However, no historical references that link Aboriginal individuals to the specific area encompassed by this site have been sourced. In the context of this broad association of the Aboriginal history of the construction footprint with this specific site, <b>historical significance is considered low</b> .   |
| Scientific significance           | This site contains a low density distribution of sub-surface stone artefacts. The integrity of the site is low as a result of historic and ongoing agricultural activities. The site has low representativeness/rarity value as it is considered to have a low density sub-surface distribution of stone artefacts, which are relatively common in the landscape. The site has low-moderate research and educational potential pertaining to the manner in which Aboriginal populations lived in the area. The site is assessed as having <b>low-moderate scientific significance</b> . |
| Aesthetic significance            | The artefacts that define the site are a sub-surface scatter which is not visible. The surface of the site is cleared and heavily modified agricultural land, which retains some visual connection to Ropes Creek. The site is considered of <b>moderate aesthetic significance</b> .   |
| Summary statement of significance | Overall, PAD-OS-7 is of <b>low significance</b> at a local level as it provides limited evidence of the use of the area by Aboriginal people. The site has low-moderate scientific significance as the integrity and structure of the site is low-moderate due to disturbance as a result by agricultural activities. The site has low representativeness/rarity due to the presence of stone artefacts in a deep alluvial profile. The site has low-moderate research and educational potential pertaining to the manner in which Aboriginal populations lived in the area.            |

Table 3-2 Significance assessment for AHIMS site 45-5-2310 (KC/ED2)

| Criterion                         | Assessment   |
|-----------------------------------|--|
| Social significance               | The RAP representatives confirmed during consultation undertaken for the M12 Motorway EIS, that all Aboriginal cultural heritage objects, sites and values in the construction footprint are considered to be of <b>high social significance</b> . The site has a high social significance at the local level as it provides tangible evidence of the use of the area by Aboriginal people.  |
| Historical significance           | The historical and ethnographic sources described in Section 5.2 of the EIS demonstrate occupation of the construction footprint by Aboriginal peoples from the contact period through to the present. However, no historical references that link Aboriginal individuals to the specific area encompassed by this site have been sourced. In the context of this broad association of the Aboriginal history of the construction footprint with this specific site, <b>historical significance is considered low</b> .  |
| Scientific significance           | This site contains a low-density distribution of stone artefacts. The integrity of the site is low as a result of historic and ongoing infrastructure and transport development activities. The site has low representativeness/rarity value as it is considered to have a low-density distribution of stone artefacts which have been disturbed and damaged by past activity. The site has low research and educational potential pertaining to the manner in which Aboriginal populations lived in the area. The site is assessed as having <b>low scientific significance</b> . |
| Aesthetic significance            | The artefacts that define the site are a surface scatter which was not visible at the time of inspection, despite good surface visibility in areas of exposure and deflation. The surface of the site is cleared and is a heavily modified road easement. The site is considered of <b>low aesthetic significance</b> .  |
| Summary statement of significance | Overall, KC/ED2 is of <b>low significance</b> at a local level as it provides limited evidence of the use of the area by Aboriginal people. The site has low scientific significance as the integrity and structure of the site is low due to disturbance as a result by infrastructure and road building activities. The site has low representativeness/rarity due to the presence of surface artefacts in a disturbed context. The site has low research and educational potential pertaining to the manner in which Aboriginal populations lived in the area.                  |

#### 4. Assessment of potential impacts

This section provides an assessment of the potential Aboriginal heritage impacts that may result due to the construction and operation of the amended project. These impacts are discussed in relation to the Aboriginal heritage impacts documented in the EIS.

The assessment of potential impacts described in this section is based on the amended construction and operational footprints and hence relates to both options unless stated otherwise.

##### 4.1 Construction impacts

The EIS identified 19 Aboriginal heritage sites that would be subject to direct harm as a result of the construction of the project. This comprised 11 sites subject to partial harm and eight to total harm. Aboriginal heritage impacts associated with the amended project have been updated to reflect the identification of an expanded Aboriginal heritage site boundary within the amended construction footprint.

The PAD-OS-7 site is associated with a previously registered AHIMS site 45-5-2721, which was previously located 130 metres outside of the construction footprint assessed in the EIS. As such, this site was assessed in the EIS as not being subject to any harm or loss of value from the project as described in the EIS. However PAD-OS-7 would now be located within the amended construction footprint, including undisturbed areas of deposit considered likely to contain Aboriginal objects.

The revision and expansion of the amended construction footprint (when compared to the project as described in the EIS) in this location is due to changes at ancillary facility 9 (AF9). This amended ancillary facility is required to support the delivery of the M7 Motorway interchange and associated enabling works along Elizabeth Drive.

The PAD-OS-7 site will be avoided by the erection of an exclusion zone and appropriate barrier / fencing provided along the portion of the site that extends closest to, and extending into the amended construction footprint, with visible signage notifying construction personnel to avoid ground impacts. See revised environmental management measures in **Section 5**.

The boundary of KC/ED2 (AHIMS site 45-5-2310) has been refined and is now located 30 metres to the east of the amended construction footprint (see **Section 3.2.3**). The revision and expansion of the amended construction footprint (when compared to the project as described in the EIS) in this location is to enable utility relocations along Elizabeth Drive.

Despite this, the track and surrounding area is disturbed as a result of bulldozing associated with the transmission line and cable installation, and subsequently there are no areas of potential archaeological deposit associated with this site. This site is therefore unlikely to be impacted by the amended project.

There would be no additional impact to Aboriginal cultural heritage values as a result of the amended project when compared to the EIS given the general similarity in construction footprint, construction activities and implementation of management measures. Similarly, the 19 Aboriginal sites identified within the construction footprint as presented in the EIS would not experience any additional impacts as a result of the amended construction footprint.

Overall, impacts to Aboriginal heritage as a result of the amended project would be consistent with those presented in the EIS. The additional seven Aboriginal sites located outside of the construction footprint presented in the EIS, but within the detailed investigation area are not expected to be impacted provided the management measures outlined in **Section 5** are adequately implemented.

#### **4.2 Operational impacts**

Aboriginal heritage impacts (either direct or indirect) associated with the operation of the amended project are not anticipated, as impacts are related to construction activities and associated ground disturbance. This is consistent with the EIS assessment.

#### **4.3 Cumulative impacts**

The cumulative Aboriginal heritage impacts are likely to remain unchanged from the assessment undertaken as part of the EIS (see Section 7.5.5 of the EIS). Overall, there is likely to be moderate cumulative Aboriginal cultural heritage impacts associated with the amended project and the other ongoing and planned developments in the area.

## 5. Revised environmental management measures

Aboriginal heritage impacts associated with the amended project are generally consistent with impacts described in the EIS and would therefore be managed through the implementation of the proposed management measures described in Section 7.5.6 of the EIS.

Revised management strategies for Aboriginal heritage are outlined in **Table 5-1**, with **bold** text used to indicate new additions. These strategies are consistent between the two options. In summary, active protection in the form of an exclusion zone will now be required on the boundary of PAD-OS-7 (AHIMS site 45-5-2721). The intent is to avoid impacts to the portion of the site inside the amended construction footprint.

Table 5-1 Management strategies to be applied to Aboriginal sites

| Management strategy                   | Strategy description  | Site  |
|---------------------------------------|---|---|
| Active avoidance                      | Carry out investigations during detailed design to maximise the retention of intact cultural deposits, particularly those within the CHRP and sites located under the elevated structures over Badgerys Creek and South Creek.  | CHRP, BCW, BCE, SCW T1, SCW T2, SCE   |
| Passive avoidance                     | No active protection measures required due to a lack of direct impacts or low archaeological significance.  | KCE, CP AS1, P-CP9, PAD-OS-7, PAD-OS-5, DLC2, M12A5, KC/ED2                     |
| Active protection                     | Protection provided in the form of fencing along the edge of the construction footprint closest to the site with signage notifying construction personnel to avoid ground impacts.  | CCW, CCE T1, CCE T2, CCE T3, BWB, BCW, BCE, SCW T1, SCW T2, SCE, KNW, KCW, CHRP |
| <b>Active protection</b>              | <b>Protection will be provided in the form of an exclusion zone and appropriate barrier / fencing along the portion of AHIMS site 45-5-2721 (PAD-OS-7) that extends into the construction footprint, with visible signage notifying construction personnel to avoid ground impacts.</b>   | <b>AHIMS site 45-5-2721 (PAD-OS-7)</b>  |
| Salvage collection                    | Salvage collection is warranted at those Aboriginal sites in the construction footprint where stone artefacts were recorded on the surface. Salvage collection is to record MGA coordinates of each artefact by GPS and relevant artefact attributes consistent with the broader archaeological salvage analysis. Salvage collection will be carried out by a suitably qualified archaeologist.     | BCE, SCW T2, KCW, PCP8, CHRP, RR, M12A1, Isolated Artefact 4, TNR-AFT-14        |
| Salvage excavation                    | Salvage excavation is warranted at those Aboriginal sites that were assessed as having high scientific and high overall significance. Salvage excavation will be carried out by a suitably qualified archaeologist.   | CCW, BWB, BCW, SCW T1, SCW T2, SCE, KCW, CHRP                                   |
| <b>Archaeological test excavation</b> | <b>If construction restrictions result in impacts to area of PAD associated with AHIMS site 45-5-2721 (PAD-OS-7), archaeological test excavation is required, to be conducted in accordance with Requirement 16a of the Code of Practice (DECCW 2010), Stage 2 PACHCI (Roads and Maritime 2011) and in consultation with RAPs. This will only be a requirement if avoidance cannot be achieved.</b> | <b>AHIMS site 45-5-2721 (PAD-OS-7)</b>  |

Revised environmental management measures for potential Aboriginal heritage impacts are outlined in **Table 5-2**. **Bold** text has been used to indicate new additions to the environmental management measures as described in the EIS. Where there are no changes to environmental management measures, they are not replicated in **Table 5-2**. These measures are consistent between the two options.

Table 5-2 Revised environmental management measures (Aboriginal heritage)

| Impact                                  | Reference | Environmental management measure  | Responsibility            | Timing   |
|---|-----------|---|---------------------------|--|
| Impacts on identified cultural deposits | AH08      | <b>Exclusion zones will be set up in the form of an appropriate barrier / fencing along the portion of AHIMS site 45-5-2721 (PAD-OS-7) that extends into the construction footprint, with visible signage notifying construction personnel to avoid ground impacts</b>  | <b>Contractor / TfNSW</b> | <b>Prior to construction and during construction</b> |
|   | AH09      | <b>Archaeological test excavation will be carried out at PAD-OS-7 in the instance that construction restrictions result in impacts to that site. Test excavations would be conducted in accordance with Requirement 16a of the Code of Practice (DECCW 2010) , Stage 2 PACHCI (Roads and Maritime 2011) and in consultation with RAPs</b> | <b>Contractor / TfNSW</b> | <b>Prior to construction</b>                         |

## 6. Conclusion

This supplementary Aboriginal heritage assessment for the amended project has determined the following:

- The number of Aboriginal heritage sites directly impacted by the project would remain as per the EIS (19 sites)
- The boundaries of two Aboriginal sites, PAD-OS-7 (AHIMS site 45-5-2721) and KC/ED2 (AHIMS site 45-5-2310), were refined as a result of site investigations
- One additional Aboriginal site, PAD-OS-7 (AHIMS site 45-5-2721), would be located within the amended construction footprint
- One Aboriginal site, KC/ED2 (AHIMS site 45-5-2310) with its refined boundary, would now be located closer to the amended project construction footprint
- Active protection will be provided in the form of an exclusion zone and appropriate barrier / fencing along the portion of PAD-OS-7 that extends into the construction footprint, with visible signage notifying construction personnel to avoid impacts on this site
- Cumulative impacts resulting from the amended construction footprint remain consistent with those identified in the EIS, in which a moderate cumulative Aboriginal cultural heritage impact is anticipated, associated with the project and the other ongoing and planned developments in the area
- Two new environmental management measures, AH08 and AH09, would be required to manage impacts on identified cultural deposits, in the form of exclusion zones, and archaeological test excavation and further consultation with project RAPs if impacts to PAD-OS-7 cannot be avoided.

It has been concluded that the amended project would not lead to any additional unacceptable Aboriginal heritage impacts to those defined in the EIS (see Section 7.5.4 of the EIS) provided the active protection management strategy outlined in **Table 5-1** and the revised environmental management measures outlined in **Table 5-2** are implemented. This conclusion is based on the assessment of potential impacts to Aboriginal heritage items during both construction and operational stages, including potential cumulative impacts, of both options 1 and 2 of the amended project.

## **7. References**

DECCW 2010b Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW, Sydney.

Roads and Maritime 2011 Procedures for Aboriginal and Cultural Heritage Consultation and Investigation. Sydney

Roads and Maritime Services 2019 M12 Motorway: Environmental impact statement. Appendix I Aboriginal Cultural Heritage Assessment Report, Report prepared for TfNSW, Sydney.

Roads and Maritime Services 2019 M12 Motorway: Environmental impact statement. Sydney.