New Dubbo Bridge

Addendum review of environmental factors

Transport for NSW

February | 2022

New Dubbo Bridge

Addendum review of environmental factors

Transport for NSW | February 2022

Prepared by Transport for NSW

Transport for NSW Publication Number: 22.023

ISBN: 978-1-922549-67-9

Document controls

Approval and authorisation

Title	New Dubbo Bridge Addendum Review of Environmental Factors
Accepted on behalf of Transport for NSW by:	Matthew Francisco
Signed:	
Dated:	25.2.2022.

Document status

Document status	Date	Prepared by	Reviewed by
Interim Draft 1 (Chapters 1,3,4,5)	26/11/2021	Carys Scholefield/ Keerthana Kanagalingam	Damien Wagner
Draft 1	10/12/2021	Carys Scholefield/ Keerthana Kanagalingam	Tim Colman
Draft 2	27/01/2022	Carys Scholefield/ Keerthana Kanagalingam	Nikki Wallace
Final	25/02/2022	Carys Scholefield	Damien Wagner

Executive summary

The proposed modification

Transport for NSW (TfNSW) proposes a modification to New Dubbo Bridge project as detailed in the project Review of Environmental Factors (REF) (Jacobs, May 2019) and supporting submission report (Jacobs, December 2019).

The proposed modification includes refinements to the New Dubbo Bridge structure, layout of the Newell Highway and project intersections, as well as changes to retaining wall and drainage structures, shared path and public access arrangements and landscaping and finishing work. The proposed modification would continue to support the objectives of New Dubbo Bridge.

The key design features of the proposed modification would include:

- The New Dubbo Bridge structure:
- Design changes to the bridge including increase in bridge length and associated additional piers to accommodate flow across the flood plain
- One additional pier within the channel of the Macquarie River
- Relocation and rationalisation of the retaining walls at the eastern bridge abutment

The highway alignment:

- Widening of the proposed Newell Highway along the horizontal curve west of the bridge to provide one metre wide centre line along this section and across the bridge
- Local widening of the proposed Newell Highway alignment to allow for the construction of the access stub into the potential residential area to the north-west
- Adjustment of the alignment of the northbound slip lane and flood route from Thompson Street to the proposed Newell Highway, and associated landscaping earthworks
- Removal of the existing U-turn bay south of the Railway Bridge on Whylandra Street
- Rationalisation of access and new driveway to properties near Riverside Church
- Additional maintenance access track from the proposed Newell Highway alignment extending to the weir on the western side of the Macquarie River
- Additional maintenance access track adjacent to the New Dubbo Bridge on the eastern side of Macquarie River
- Changes to the intersection turning lanes at the River Street/Bourke Street intersection, addition of the two-way right turn lane east of Bourke Street and associated changes to parking in River Street and Bourke Street
- Changes to the intersection of River Street, Darling Street and Brisbane Street
- Rationalisation of operational drainage infrastructure including drainage lines to Macquarie River and refinements to bridge drainage.

Active transport and landscaping:

- Development of the shared path, the footpaths and vehicle access in Wiradjuri Park to include a car parking area and an additional footpath along Macquarie River
- Provision of a shared path to the northern side of River Street, between Bourke and Brisbane Streets

- Extension of the project area to accommodate these and other minor design changes such as additional signage.

Other features of the proposed modification include:

- Refinements to ancillary facilities including an additional construction compound, and construction and use of a temporary sediment basin in Wiradjuri Park
- Change in piling methodology for the construction of the New Dubbo Bridge substructure to include larger piles and driven steel tube piles
- Additional piling work for barriers either side of the Railway Bridge on Whylandra Street
- Additional construction access route from Bunglegumbie Road
- Inclusion of a separate work package in the project description to facilitate work at the Victoria Street/Thompson Street intersection on the Mitchell Highway.

Construction is expected to commence around mid-2022 and would take about 48 months to build.

Need for the proposed modification

The current Emile Serisier Bridge on the Newell Highway has to be closed when floods larger than 1 in 5 year ARI occur. When the Emile Serisier Bridge is flooded, long delays are experienced in the Dubbo town centre as all traffic is diverted across the LH Ford Bridge, with the exception of PBS 3A heavy vehicles. The PBS 3A heavy vehicles are required to make a substantial detour to re-join the Newell Highway or break up their loads into B-Double configurations or smaller to cross LH Ford Bridge.

Improving flood immunity and route reliability, to reduce congestion and improve access for heavy vehicles along the Newell Highway was identified in the project REF as part of the strategic need for New Dubbo Bridge. This is in accordance with the Newell Highway Corridor Strategy (NSW Government, 2015).

The modified project would provide improved flood immunity, improve constructability and provide additional long-term benefits for the New Dubbo Bridge and the associated proposed Newell Highway. It is consistent with the strategic need for the project.

Proposal objectives

The objectives of the proposed modification are consistent with that outlined in the project REF. These include to:

- Improve route reliability of the Newell Highway for customers
- Improve PBS 3A heavy vehicle access along the Newell Highway and maintain heavy vehicle access west of Dubbo
- Improve the flood immunity of the Newell Highway to within the range of one in 50 to one in 100 ARI (including a flood bypass using the Mitchell Highway and Thompson Street)
- Achieve a travel time saving for local and through traffic during a flood event
- Provide heavy vehicle access from River Street to Mitchell Highway along the new River Street option within road design guidelines and standards.

Options considered

The progression of the detailed design from the concept design (as assessed in the project REF) has resulted in a number of design refinements across the project.

These design refinements have been discussed and assessed during Constructability, Value Engineering and Safety in Design Workshops, held progressively through each detailed design phase during 2020 and 2021. Key features were subject to further engineering analysis to determine the best option. These key features include:

- Extending the length of the bridge from 540 metres to 660 metres and associated additional instream bridge piers
- Relocation of the retaining wall on the eastern side of Macquarie River
- Additional operational drainage outlets to the Macquarie River.

The modified design and construction options were assessed against the original project objectives and key development criteria detailed in Section 2.3 of the project REF. The preferred option was chosen based its ability to best address the objectives of the proposal and support the relevant regional planning policies outlined in Section 2.1.2 of the project REF.

Statutory and planning framework

The proposed modification is subject to assessment under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). In line with Section 5.5 of the EP&A Act, this addendum review of environmental factors (REF) examines and takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the proposed modification. This addendum REF also considers Clause 228 of the Environmental Planning and Assessment Regulation 2000 and matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

A referral to the Australian Government Department of Agriculture, Water and the Environment (DAWE) under the EPBC Act is not required.

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) also applies to the proposed modification. Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

Transport for NSW is the determining authority for the proposed modification. This addendum REF fulfils Transport for NSW's obligation under Section 5.5 of the EP&A Act, including to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

Community and stakeholder consultation

The consultation strategy for the proposed modification remains consistent with the strategy described in Section 5.1 of the project REF. The Communications Engagement Plan (CEP) prepared for the approved project would be applied to the proposed modification.

Consultation with the Aboriginal community has been carried out throughout the project development process in accordance with the Transport for NSW Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) process.

Ongoing consultation will be required by the construction contractor and Transport for NSW to update local property owners, road users and councils of the modified project.

Environmental impacts

The proposed modification would have some additional environmental impacts and benefits to the project. These are discussed below.

Aboriginal heritage

Construction of the modified project would result in direct impacts to five further Aboriginal heritage sites (this is in addition to two Aboriginal heritage sites outlined in the project REF). These sites consist of three artefact scatters, one artefact site, one isolated artefact and one scarred tree. Four sites of these would be totally impacted, and one site (an artefact scatter) would be partially impacted. The Terramungamine grinding grooves may remain in place and would be avoided during construction work.

Operation of the modified project would not result in any further impacts to Aboriginal heritage.

Non-Aboriginal heritage

Construction of the proposed modification may have potential impacts to the existing Dubbo rail bridge over Macquarie River (Dubbo Railway Bridge), as piling work would occur within the safe working distance buffer (five metres) of the heritage item. Safeguards and mitigation measures, which include vibration monitoring, would be adopted to avoid or mitigate potential impacts.

Construction would also involve an additional operational drainage line along the Mount Olive heritage item curtilage. The presence of construction plant and equipment for the drainage line would temporarily impact views from the cottage. Archaeological deposits in this location have been deemed unlikely, therefore, impacts to archaeological significance of this heritage item are not anticipated as a result of the ground disturbance work.

The relocation of ancillary facility three as part of the proposed modification would result in the likely avoidance of construction impacts to potential remnants of a house built in 1900 located at 9 Brisbane Street.

Operation of the proposed modification would result in increased levels of signage and lighting around the Dubbo Railway Bridge. This would be consistent in scale and proportion around the highway signage and lighting, and therefore would not directly impact the heritage significance of the Bridge. There would also be some vegetation clearance associated with the operation drainage line in the Mount Olive curtilage, however, this is not expected to significantly affect the main river aspect of the cottage.

Biodiversity

Construction of the proposed modification would require additional clearance of 2.42 hectares of native vegetation. The total vegetation clearance for the modified project (which includes vegetation clearing outlined in the project REF) is 3.16 hectares. The impacted vegetation mostly includes River Red Gum Riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion. Safeguards and mitigation measures have been proposed to manage and minimise impacts where possible.

The proposed modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the *Biodiversity Conservation Act 2016* or *Fisheries Management Act 1994* and therefore a Species Impact Statement is not required.

The modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*.

Flooding and hydrology

Construction of the modified project may result in increases in five per cent AEP flood levels as a result of the inclusion of temporary fill within the floodplain. No residential, commercial or industrial building would be affected by increases in flood levels. Ancillary facilities 3, 4 and 5 of the modified project would be at risk of flooding as they are located either within, or partially within, the five percent AEP. Safeguards and management measures have been

proposed to manage impacts to these ancillary sites as well as to minimise impact on the Macquarie River and its capacity to convey flows in a flood event.

Operation of the modified project would have negligible changes in flood level for all events except for the one per cent and 0.05 per cent AEP events. In these two flood events, no buildings would be significantly impacted, and flood levels are considered tolerable. This is an improved scenario in comparison to the project REF. Overall, operation of the modified project would have an improved immunity from a ten per cent AEP flood event to a two per cent AEP flood event.

Contamination

Potential contamination impacts from construction of the modified project would generally be consistent with impacts identified in the project REF. The area proposed for ancillary facility 2 may contain very low levels of PFAS material, however, there is unlikely to be an exposure pathway of this material to workers as the ancillary facility will have a hard stand constructed to minimise worker exposure. Should any ground disturbance be required, it will be managed in accordance with the CEMP to minimise any potential risk.

Operation of the proposed modification would be managed under similar practices that are used at present to prevent any spillage or contaminant risk. As such, there is expected to be no additional operational impacts from the modified project during operation of the New Dubbo Bridge project.

Noise and vibration

Construction of the modified project would generally result in higher predicted noise levels at receivers compared to the project REF, and impact additional receivers. This is due to the adoption of additional, loud equipment for the works, and the extension of the construction footprint on Thompson Street. The exceedance of Noise Management Levels (NMLs) may also occur at receivers located beyond the Noise Catchment Areas (NCAs). Vibration impacts would be similar to that of the project REF, with additional receivers impacted as a result of the extended construction footprint. Safeguards and mitigation measures proposed in the project REF would be implemented to manage these impacts. Verification noise monitoring is also recommended to determine if additional noise management measures are required for potentially affected receivers located beyond the NCAs. The change in pile type from bored piles to driven steel tube pile will result in additional noise during construction.

Operation of the modified project would qualify nine buildings for consideration of at-property noise mitigation treatment. This is a reduction of two buildings compared to the approved project. Although these two buildings no longer meet the threshold for at-property treatment, they may still receive treatment due to previous undertakings by TfNSW. Further assessment of individual dwellings and consultation with landowners would be required to identify the specific acoustic treatments to be applied to each of these buildings.

Socio-economic

Construction of the proposed modification would result in some changes to the temporary lease area of properties described in the project REF. This includes a temporary lease of an additional private property located directly west of the Macquarie River. Temporary leases are required to provide construction access, construction land and for the installation of underground drainage pipes. These temporary leases are note expected to impact the overall use of properties.

Additional construction access would also be required along Bunglegumbie Road for the proposed modification. Minor delays and disruptions may occur from additional construction traffic on this road, which cause a minor inconvenience to motorists traveling along this route.

The extension of the construction footprint as a result of the modified project area may have amenity impacts for additional businesses on Victoria Street and Thompson Street, and additional residential homes on Thompson Street. Safeguards and mitigation measures have been proposed to manage and minimise amenity impacts where possible.

Operation of the proposed modification would require the permanent, partial strip acquisition of one additional private property located directly south of River Street and west of Brisbane Street. Partial acquisition of the land is not expected to impact on the overall use of the property. There would also be a loss in informal on street parking on a section of River Street. There is, however, on street parking available in nearby surrounding streets and many businesses provide parking capacity for customers, therefore the loss in parking is not expected to have significant impacts on local parking capacity.

Operation of the proposed modification would provide a number of beneficial impacts to access and connectivity. This is through an additional footpath along the western side of Brisbane Street, an extension of the footpath from Emile Serisier Bridge to the Newell Highway, a new driveway connecting to the Riverside Church, an upgrade of the intersection at Bourke Street and River Street, as well as a vehicle access point and additional car park for users of Wiradjuri Park.

Landscape and visual impacts

Construction of the modified project would result in activities that may temporarily impact in visual amenity. These activities include clearing of vegetation, generation of wastes and construction activities, including the operation of ancillary facilities. Temporary lighting would be required at some of the ancillary facilities and in the modified project area when night work is required, however, construction staging would result in these impacts not being spread across the entire modified project area at the one time. Generally, these impacts are consistent with the construction impacts described in the project REF.

There would be no change to the potential operational landscape character impacts identified for the approved project as a result of the proposed modification.

Traffic and transport

Construction of the modified project would introduce additional light and heavy construction vehicles along Bunglegumbie Road. The introduction of construction traffic along this route would have the potential to generate minor delays and disruptions to existing traffic flows along Bunglegumbie Road. Appropriate measures would be introduced through a Traffic Management Plan (TMP) in order to manage these impacts. Pedestrian and cycle infrastructure would also be impacted during construction, which would require diversions and the use of alternative existing and temporary paths, as per the project REF.

Operation of the modified project would improve traffic performance the Thompson Street/Whylandra Street intersection compared to the existing priority intersection and compared to the project REF. The modified Thompson Street/Whylandra Street and River Street/Bourke Street intersections would operate with acceptable Level of Service (either B or C) during the morning and evening peak. The proposed changes also include improvements to accesses on Thompson Street, especially for Riverside Church and for motorists using River Street. The proposed revisions to shared paths would result in an improvement in access for users, with future provision also provided. Access to Wiradjuri Park would be improved compared to the project REF.

Justification and conclusion

The proposed modification may result in some additional, minor, adverse environmental impacts. These impacts would be managed in accordance with the mitigation and management measures provided in this Addendum REF and the project REF.

The proposed modification is considered justified as it would improve flood immunity, improve constructability, and provide additional long-term improvements for the New Dubbo Bridge and the associated proposed Newell Highway.

Contents

1 Introduction 1
1.1 Proposed modification overview 1
1.2 Purpose of the report 5

2 Need and options considered 6
2.1 Strategic need for the proposed modification 6
2.2 Proposal objectives and development criteria 6
2.3 Alternatives and options considered 6
2.4 Preferred option 8

3 Description of the proposed modification 9
3.1 The proposed modification 9
3.2 Design 12
3.3 Construction activities 24
3.4 Ancillary facilities 27
3.5 Public utility adjustment 29
3.6 Property acquisition 30

4 Statutory and planning framework 36
4.1 Environmental Planning and Assessment Act 1979 36
4.2 Other relevant NSW legislation 40
4.3 Commonwealth legislation 45
4.4 Confirmation of statutory position 46

5 Consultation 47
5.1 Consultation strategy 47
5.2 Consultation outcomes 47
5.3 Ongoing or future consultation 48

6 Environmental assessment 49
6.1 Aboriginal heritage 49
6.2 Non-Aboriginal heritage 57
6.3 Biodiversity 61
6.4 Flooding and hydrology 79
6.5 Contamination 88
6.6 Noise and vibration 92
6.7 Socio-economic 107
6.8 Landscape character and visual impacts 112
6.9 Traffic and transport 116
6.10 Other impacts 118
6.11 Cumulative impacts 121

7 Environmental management 124
7.1 Environmental management plans 124
7.2 Summary of safeguards and management measures 125
7.3 Licensing and approvals 154

8 Conclusion 155
8.1 Justification 155
8.2 Objects of the EP&A Act 156
8.3 Ecologically sustainable development 159
8.4 Conclusion 160

9 Certification 161
10 References 162

List of Figures

Figure 1-1 Location of the proposed modification 3
Figure 1-2 The proposed modification 4
Figure 3-1 Key features of the proposed modification 11
Figure 3-2 Typical cross section of the proposed modification at New Dubbo Bridge 14
Figure 3-3 Modified pier arrangements across the New Dubbo bridge 15
Figure 3-4 Modified vertical alignment of New Dubbo Bridge 17
Figure 3-5 Modified Newell Highway/Thompson Street intersection 18
Figure 3-6 Modified layout schematic for River Street/Bourke Street 19
Figure 3-7 Modified Brisbane Street/Darling Street intersection 19
Figure 3-8 Operational spill basin design 23
Figure 3-9 Proposed property acquisition (1 of 3) 33
Figure 3-10 Proposed property acquisition (2 of 3) 34
Figure 3-11 Proposed property acquisition (3 of 3) 35
Figure 4-1 LEP land zoning 39
Figure 4-2 Crown land within and around the proposed modification area 44
Figure 6-1 AHIMS search results (Ozark 2021) 52
Figure 6-2 Biodiversity values and survey effort in the study area (1 of 3) 65
Figure 6-3 Biodiversity values and survey effort in the study area (2 of 3) 66
Figure 6-4 Biodiversity values and survey effort in the study area (3 of 3) 67
Figure 6-5 Flood map showing existing conditions during a one per cent AEP flood event 82
Figure 6-6 Flood mapping showing predicted conditions during a one per cent AEP flood event with the modified project 85
Figure 6-7 NML exceedance standard hours (Earthworks) 99
Figure 6-8 NML exceedance out of hours (intersections work and ancillary facilities) 100

List of Tables

Table 2-1 Overview of key modified design/construction options 7
Table 3-1 Proposed culverts 20
Table 3-2 Proposed water quality swales 21
Table 3-3 Additional staging activities 24
Table 3-4 Overview of indicative earthwork quantities 26
Table 3-5 Indicative construction ancillary facility details 27
Table 3-6 Proposed property acquisition 30
Table 3-7 Proposed temporary lease 32
Table 4-1 Dubbo LEP zone objectives 36
Table 6-1 Aboriginal heritage identified from previous studies 50
Table 6-2 Summary of significance assessment for Aboriginal heritage items that would be impacted by the proposal 53
Table 6-3 Summary of potential impact to Aboriginal heritage sites 54
Table 6-4 Safeguards and mitigation measures – Aboriginal heritage 55
Table 6-5 Heritage items within the study area 57
Table 6-6 Environmental safeguards and mitigation measures – non-Aboriginal heritage 60
Table 6-7 Vegetation condition classes and criteria 61
Table 6-8 Summary of vegetation survey effort 62
Table 6-9 Threatened species with a moderate likelihood of occurrence 69
Table 6-10 Direct impacts to native vegetation 71
Table 6-11 Impacts on potential threatened species habitat 72
Table 6-12 Biodiversity residual impacts and relevant offset thresholds 78
Table 6-13 TfNSW for NSW offset ratios and summary of proposal offset requirement 79

Table 6-14 Environmental safeguards and mitigation measures – flooding and hydrology 87
Table 6-15 Environmental safeguards and mitigation measures – contamination 91
Table 6-16 Proposed construction scenarios, timings and equipment for the modified project 93
Table 6-17 Count of receivers (all receiver types) at which construction noise is predicted to exceed NML 98
Table 6-18 Counts of receivers identified as eligible for additional mitigation 101
Table 6-19 Indicative count of buildings within safe working distances of vibration-intensive work 102
Table 6-20 Number of buildings that qualify for consideration of operational noise mitigation from the modified project 103
Table 6-21 Comparison of buildings nominated for at-property treatment 103
Table 6-22 Environmental safeguards and mitigation measures – noise and vibration 105
Table 6-23 Safeguards and management measures - socioeconomic 111
Table 6-24 Summary of landscape character zones for the modified project 112
Table 6-25 Assessed representative viewpoints 113
Table 6-26 Potential impacts on landscape character zones 114
Table 6-27 Visual impact assessment 114
Table 6-28 Potential impacts for the other environmental factors 119
Table 6-29 Other projects and developments within proximity of the modified project 121
Table 7-1 Summary of safeguards and management measures 125
Table 7-2 Summary of licensing and approval required 154
Table 8-1 Consideration of the objects of the EP&A Act 156

List of Appendices

Appendix A Consideration of clause 228(2) factors and matters of National Environmental Significance and Commonwealth land
Appendix B Statutory consultation checklists
Appendix C Aboriginal Cultural Heritage Assessment Report
Appendix D Addendum Statement of Heritage Impact
Appendix E Addendum Hydrology and Hydraulics Assessment
Appendix F Detailed Site Investigations Summary Report
Appendix G Addendum Construction Noise and Vibration Assessment
Appendix H Operational Traffic Noise Assessment

1 Introduction

1.1 Proposed modification overview

Transport for NSW proposes to modify the New Dubbo Bridge project including refinements to the New Dubbo Bridge structure, layout of the Newell Highway and project intersections, as well as changes to retaining wall and drainage structures, shared path and public access arrangements and landscaping and finishing work (proposed modification).

Key design features of the proposed modification comprise changes to:

- The New Dubbo Bridge structure:
    - Design changes to the bridge including increase in bridge length and associated additional piers to accommodate flow across the flood plain
    - One additional pier within the channel of the Macquarie River
    - Relocation and rationalisation of the retaining walls at the eastern bridge abutment
- The highway alignment:
    - Widening of the proposed Newell Highway along the horizontal curve west of the bridge to provide one metre wide centre line along this section and across the bridge
    - Local widening of the proposed Newell Highway alignment to allow for the construction of the access stub into the potential residential area to the north-west
    - Adjustment of the alignment of the northbound slip lane and flood route from Thompson Street to the proposed Newell Highway, and associated landscaping earthworks
    - Removal of the existing U-turn bay south of the Railway Bridge on Whylandra Street
    - Rationalisation of access and new driveway to properties near Riverside Church
    - Additional maintenance access track from the proposed Newell Highway alignment extending to the weir on the western side of the Macquarie River
    - Additional maintenance access track adjacent to the New Dubbo Bridge on the eastern side of Macquarie River
- Changes to the intersection turning lanes at the River Street/Bourke Street intersection, addition of the two-way right turn lane east of Bourke Street and associated changes to parking in River Street and Bourke Street
- Changes to the intersection of River Street, Darling Street and Brisbane Street
- Rationalisation of operational drainage infrastructure including drainage lines to Macquarie River and refinements to bridge drainage
- Active transport and landscaping:
    - Development of the shared path, the footpaths and vehicle access in Wiradjuri Park to include a car parking area and an additional footpath along Macquarie River

    - Provision of a shared path to the northern side of River Street, between Bourke and Brisbane Streets
- Extension of the project area to accommodate these and other minor design changes such as additional signage.

Other features of the proposed modification include:

- Refinements to ancillary facilities including an additional construction compound, and construction and use of a temporary sediment pond in Wiradjuri Park
- Change in piling methodology for the construction of the New Dubbo Bridge substructure to include larger piles and driven steel tube piles
- Additional piling work for barriers either side of the Railway Bridge on Whylandra Street
- Additional construction access route from Bunglegumbie Road
- Inclusion of a separate work package in the project description to facilitate work at the Victoria Street/Thompson Street intersection on the Mitchell Highway.

The location of the proposed modification is shown in Figure **1-1** and the proposed modification is shown in Figure 1-2. Chapter 3 describes the proposed modification in more detail.

A review of environmental factors (REF) was prepared for the New Dubbo Bridge project in May 2019 (referred to in this addendum REF as the project REF). The project REF was placed on public display between 27 May 2019 and 28 June 2019 for community and stakeholder comment. A submissions report, dated December 2019, was prepared to respond to issues raised. The project REF was determined on 11 December 2019.

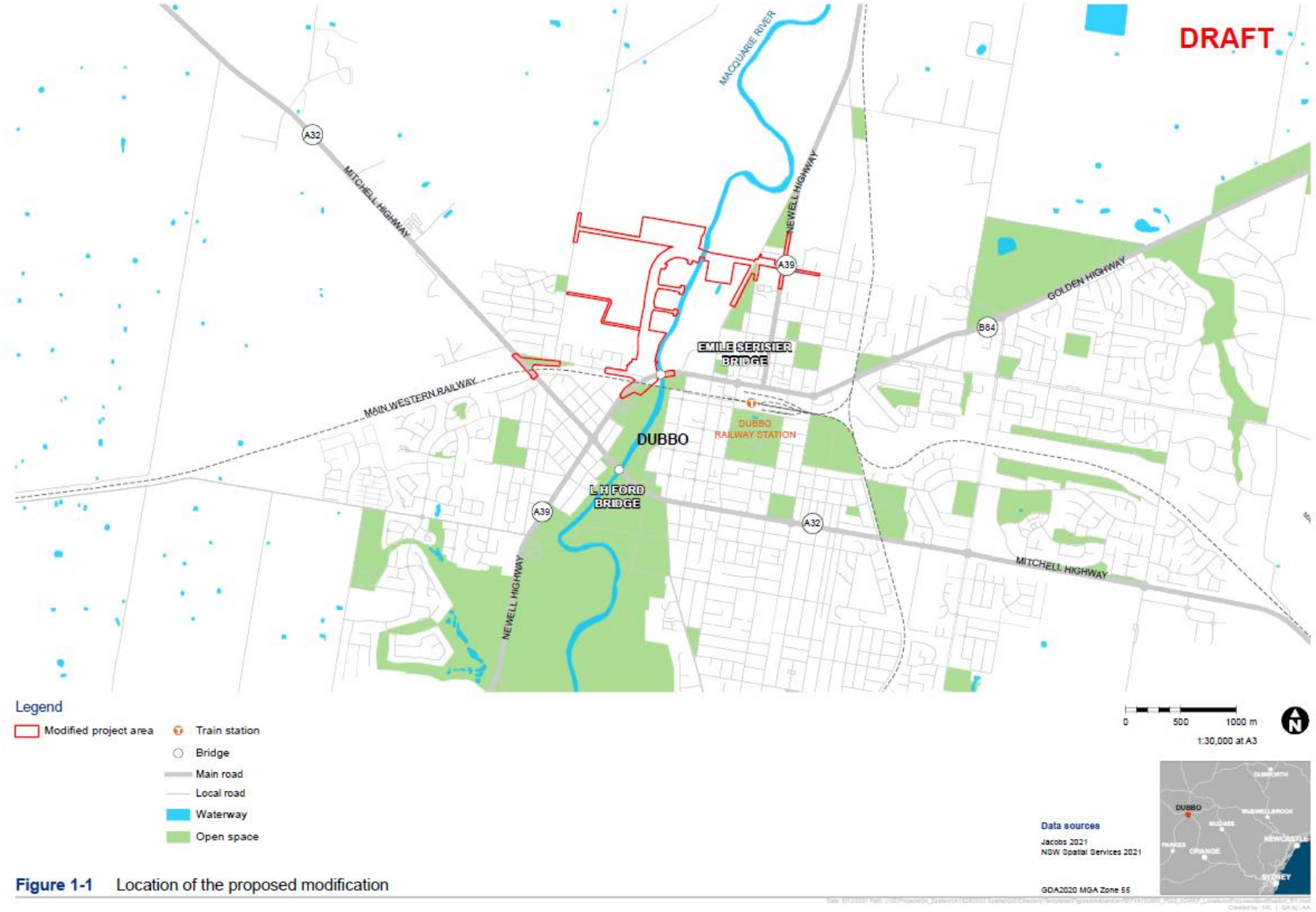


Figure 1-1 Location of the proposed modification

Figure 1-1 Location of the proposed modification

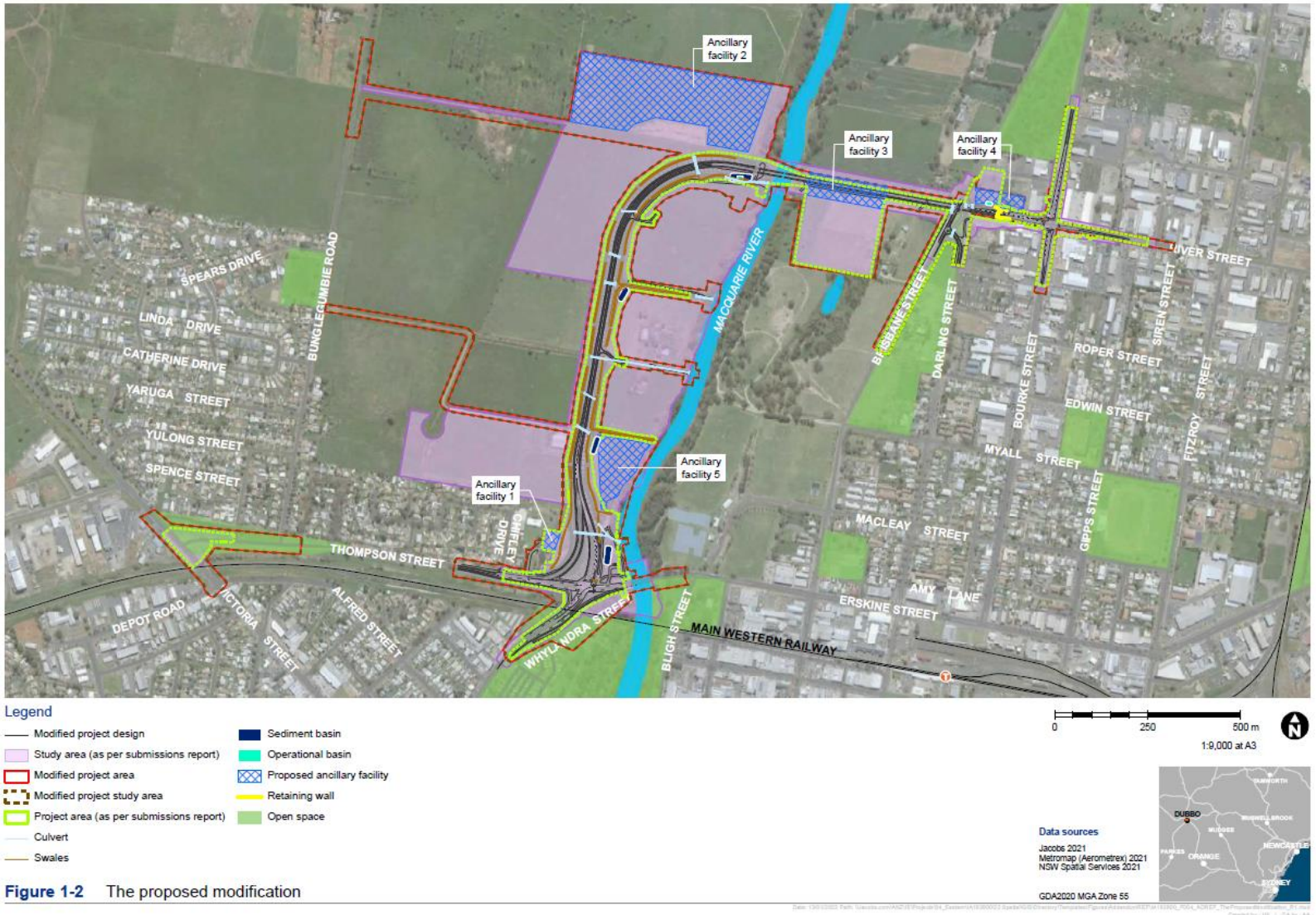


Figure 1-2 The proposed modification

Figure 1-2 The proposed modification

1.2 Purpose of the report

This addendum REF has been prepared by Jacobs on behalf of Transport for NSW Infrastructure and Place. For the purposes of this work, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This addendum REF is to be read in conjunction with the project REF and submissions report, where both documents form the approved project. The purpose of this addendum REF is to describe the proposed modification, to document and assess the likely impacts of the proposed modification on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been carried out in context of clause 228 of the Environmental Planning and Assessment Regulation 2000, *Is an EIS Required? Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979* (Is an EIS Required? guidelines) (DUAP, 1995/1996), Roads and Road Related Facilities EIS Guideline (DUAP, 1996), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In doing so, the addendum REF helps to fulfil the requirements of Section 5.5 of the EP&A Act including that Transport for NSW examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the addendum REF would be considered when assessing:

- Whether the proposed modification is likely to result in a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured
- The potential for the proposed modification to significantly impact any other matters of national environmental significance or Commonwealth land and therefore the need to make a referral to the Australian Government Department of Agriculture, Water and the Environment for a decision by the Australian Government Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2 Need and options considered

2.1 Strategic need for the proposed modification

Chapter 2 of the project REF addresses the strategic need for the project, the project objectives and the options that were considered. The proposed modification described and assessed in this addendum REF is consistent with the strategic need for the project.

The proposed modification is required to allow additional flow capacity across the Macquarie River flood plain during flood events to maintain reliability for local, commuter and heavy freight traffic through Dubbo during these events.

2.2 Proposal objectives and development criteria

Section 2.3 of the project REF identified the proposal objectives and development criteria that apply to the proposed modification. The modified project would continue to support the objectives of the New Dubbo Bridge project.

2.3 Alternatives and options considered

2.3.1 Methodology for selection of preferred option

The progression of the detailed design from the concept design (as assessed in the project REF) has resulted in a number of design refinements across the project.

These design refinements have been discussed and assessed during Constructability, Value Engineering and Safety in Design Workshops, held progressively through each detailed design phase during 2020 and 2021. These workshops were attended by representatives from Transport for NSW, members from Dubbo Regional Council, key utility providers and other key stakeholders during the development of the detailed design.

Detailed below are the key features of the proposed modification that involved further engineering analysis and selection of a preferred option:

- Extending the length of the bridge from 540 metres to 660 metres and associated additional instream bridge piers
- Relocation of the retaining wall on the eastern side of Macquarie River
- Additional operational drainage outlets to the Macquarie River.

2.3.2 Identified options

Table 2-1 below summaries the key modified design/construction options and their key features.

Table 2-1 Overview of key modified design/construction options

Modified design/ Construction option	Key features
Changes to the bridge design	• Extended 660 metre span comprised of 20 Super-T girders supported by 19 piers, including two in the Macquarie River channel • Refined piling design to maximise strength efficiencies • 6.1 metre vertical clearance at Brisbane Street • Construction methodology is likely to include temporary instream work platform, which may be cofferdam, rock barrage, or possibly the use of a temporary low level bridge and/or barge
Retaining wall design	• Integration of one retaining wall in previous design into the bridge substructure at the eastern abutment • Removal of one retaining wall at the eastern abutment in previous design • One retaining wall at the eastern abutment with a height of 4.7 metres and length of 26.6 metres
Localised changes to the horizontal alignment	• Localised widening of the proposed Newell Highway alignment on the western side of the bridge around the horizontal curve • Increase in southbound shoulder to allow for potential future construction of access stub to potential residential area to the north-west • Additional operational maintenance accesses • Additional private property access roads
Changes to the vertical alignment	• Reduction of the height of the western embankment of the proposed Newell Highway to an average of about 1.5 metres
Rationalisation of operation drainage outlets to the Macquarie River	• Removal of one drainage line and outlet • Addition of one drainage line and outlet
Modified ancillary sites	• Increase in size to accommodate materials handling and storage requirements • Location changes in some areas to accommodate leasing requirements • Location changes in some areas to avoid potential flooding impacts

2.3.3 Analysis of options

The above modified design/construction options were workshopped and assessed against the project objectives and key development criteria detailed in Section 2.3 of the project REF. A

review of these in comparison to a ‘do nothing approach’ and consideration of alternative design/construction methodology options was also carried out.

2.4 Preferred option

These modified design options were considered both in isolation and cumulatively. They are considered the preferred option(s) that best addresses the objectives of the proposal and supports the relevant regional planning policies outlined in Section 2.1.1 of the project REF.

3 Description of the proposed modification

3.1 The proposed modification

Transport for NSW proposes to modify the New Dubbo Bridge project including refinements to the New Dubbo Bridge structure, layout of the Newell Highway and project intersections, as well as changes to retaining wall and drainage structures, shared path and public access arrangements and landscaping and finishing work (proposed modification) The proposed key features of the modification are shown in Figure 3-1.

Key design features of the proposed modification comprise changes to:

- The New Dubbo Bridge structure:
    - Design changes to the main bridge span including increase in bridge length and associated additional piers to accommodate flow across the flood plain
    - One additional pier within the channel of the Macquarie River
    - Relocation and rationalisation of the retaining walls at the eastern bridge abutment
- The highway alignment:
    - Widening of the proposed Newell Highway along the horizontal curve west of the bridge to provide one metre wide centre line along this section and across the bridge
    - Local widening of the proposed Newell Highway alignment to allow for the construction of the access stub into the potential residential area to the north-west
    - Adjustment of the alignment of the north-bound slip lane and flood route from Thompson Street to the proposed Newell Highway, and associated landscaping earthworks
    - Removal of the existing U-turn bay south of the Railway Bridge on Whylandra Street
    - Rationalisation of access and new driveway to properties near Riverside Church
    - Additional maintenance access track from the proposed Newell Highway alignment extending to the weir on the western side of the Macquarie River
    - Additional maintenance access track adjacent to the New Dubbo Bridge on the eastern side of Macquarie River
- Changes to the intersection turning lanes at the River Street/Bourke Street intersection, addition of the two-way right turn lane in River Street east of Bourke Street and associated changes to parking in River Street and Bourke Street
- Changes to the intersection of River Street, Darling Street and Brisbane Street
- Rationalisation of operational drainage infrastructure including drainage lines to Macquarie River and refinements to bridge drainage
- Active transport and landscaping:
    - Development of the Shared User Paths, the footpaths and vehicle access in Wiradjuri Park to include a car parking area and an additional path along Macquarie River
    - Provision of the shared path to the north side of River Street, between Bourke and Brisbane Streets

- Extension of the project boundary to accommodate these and other minor design changes such as additional signage.

Other key project scope changes include:

- Refinements to ancillary facilities including an additional construction compound, and construction and use of a temporary sediment pond in Wiradjuri Park
- Change in piling methodology for the construction of the New Dubbo Bridge substructure to include larger piles and driven steel tube piles
- Additional piling work for barriers either side of the Railway Bridge on Whylandra Street (existing Newell Highway)
- Additional construction access route from Bunglegumbie Road
- Inclusion of a separate work package in the project description to facilitate work at the Victoria Street/Thompson Street intersection on the Mitchell Highway.

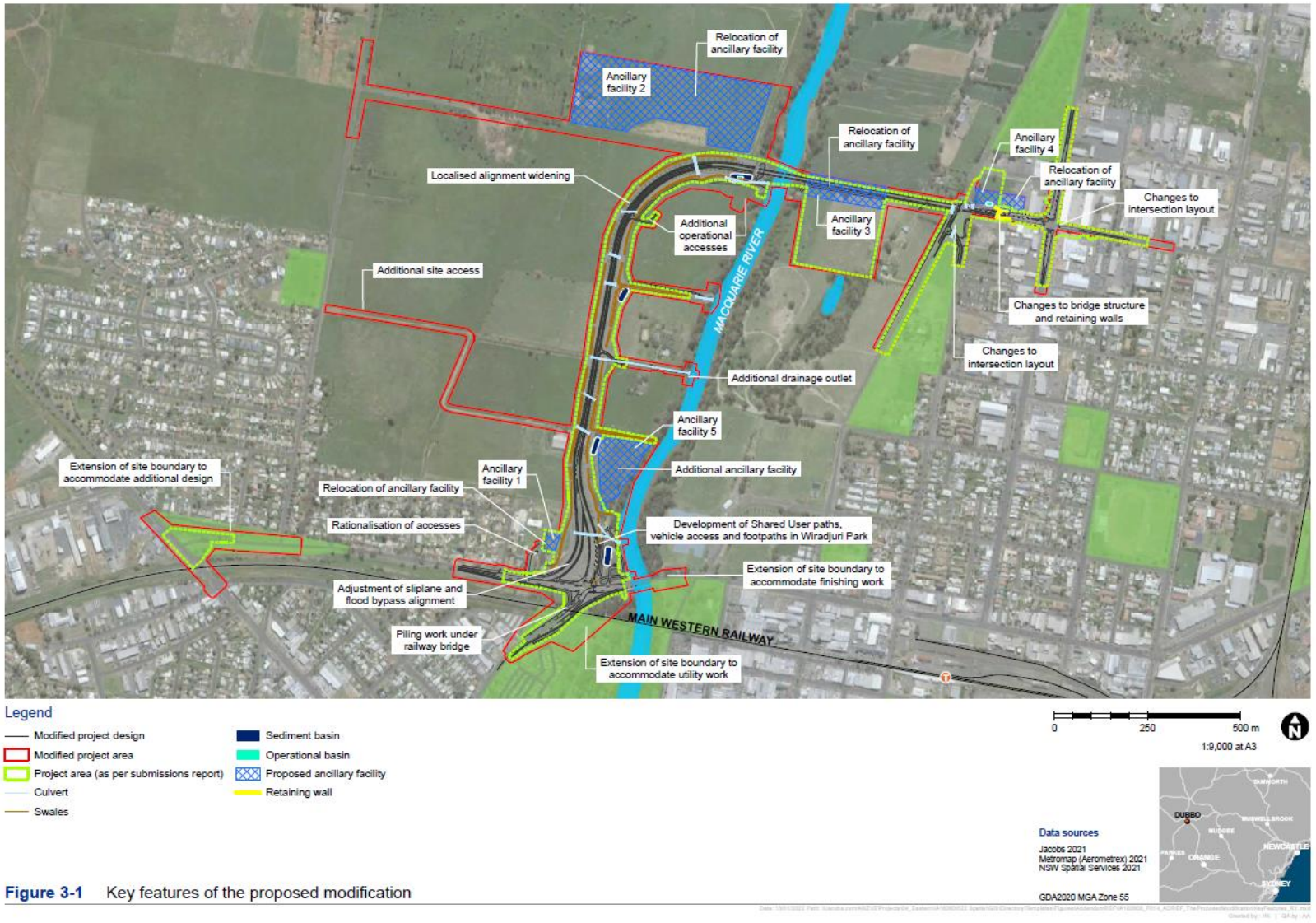


Figure 3-1 Key features of the proposed modification

Figure 3-1 Key features of the proposed modification

3.2 Design

3.2.1 Design criteria

Generally, there is no proposed change to the design criteria for the project as described in Section 3.2.1 of the project REF and Section 4.1.3 of the submissions report.

The only change is that the speed limit on the northbound flood bypass lane from Thompson Street has increased from 40 to 60 kilometres/hour. The speed limit on the southbound route would remain the same.

3.2.2 Engineering constraints

Key engineering constraints considered during the development of the proposed modified project include:

- Existing alignment: Proposed alignment needs to integrate with tie-ins to the existing alignment with the existing Emile Serisier Bridge and Dubbo Railway Bridge
- Flooding: The existing Newell Highway and Emile Serisier Bridge is subject to flooding. Planning of work stages will need to consider the potential for flooding during construction
- Crown Land: There are areas where the modified project area is within crown land, as such a road reserve would need to be acquired and established in these areas
- Access: Private property owners and residents would need to access their premises during construction. Maintaining property access would need to be considered during detailed design and construction
- Existing road connections: The existing Newell Highway intersects with number of local roads within the modified project area. These intersections would need to be adjusted to tie in with the proposed modification
- Staging of the modified project: The new Thompson Street/Whylandra Street intersection would generally be constructed within the alignment of the existing road corridor. This would pose staging challenges to maintain traffic flows in both directions and access to local roads and properties
- Utilities: Utilities in the modified project area would need to be relocated or protected during construction.

3.2.3 Main design features of the modification

Design feature 1: New Dubbo Bridge

The New Dubbo Bridge has been modified to increase the typical nearside shoulders of the carriageway to 2.5 metres and to include a one metre wide centre median. With the two 3.5 metre wide lanes, the proposed modification typically has a combined width of 13 metres between barriers, as shown in Figure 3-2. As per the project REF and submissions report, at the eastern end of the new bridge, the road cross section would be widened with an additional left turn lane, right turn lane and through lane.

The proposed modification includes an increase in the overall length of the New Dubbo Bridge design from 550 metres to about 660 metres, to provide a wider channel required to accommodate flow across the flood plain and reduce flood levels, as identified through additional flood modelling.

As a result, the modified New Dubbo Bridge would consist of an additional four spans of Super-T girders (20 spans in total) and an additional four piers (19 in total), as shown on Figure 3-3. The reconfiguration of the piers would result in one additional pier located within the channel of the Macquarie River, such that there would now be two instream piers.

The pier column profile has been modified from tapered to straight to simplify construction, improve aesthetics in line with urban design requirements and enhance material efficiency. The substructure of the modified New Dubbo Bridge is shown in Figure 3-2.

The support for piers of New Dubbo Bridge design has been refined in response to updated flood modelling and geotechnical information such that:

- Piers 1 to 6 comprise six 900 millimetre diameter piles per pier
- Piers 7-17 comprise a single row of three 1200 millimetre diameter piles per pier
- Piers 18 and 19 comprise a single row of three 1050 millimetre diameter piles per pier
- Abutment A comprises a single row of three 900 millimetre diameter piles
- Abutment B comprises eleven 900 millimetre diameter piles.

Deck expansion joints (finger plate deck joints) with a steel trough would be provided at both Abutments A and B, and at Piers 6, 12, and 17. There would be a strip seal joint at Abutment B. The maximum length between expansion joints is four spans (about 204.6 metres).

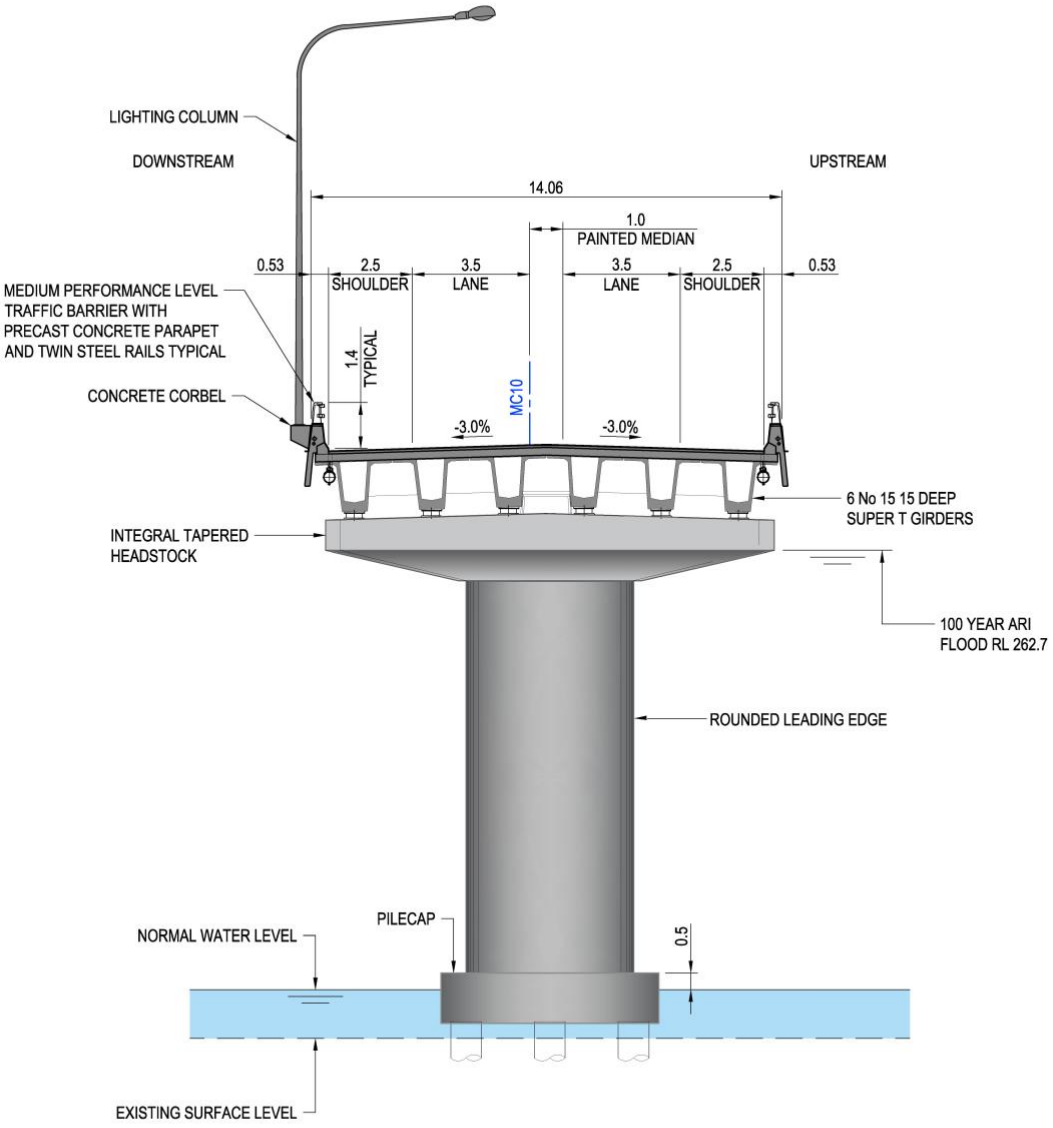


Figure 3-2 Typical cross section of the proposed modification at New Dubbo Bridge

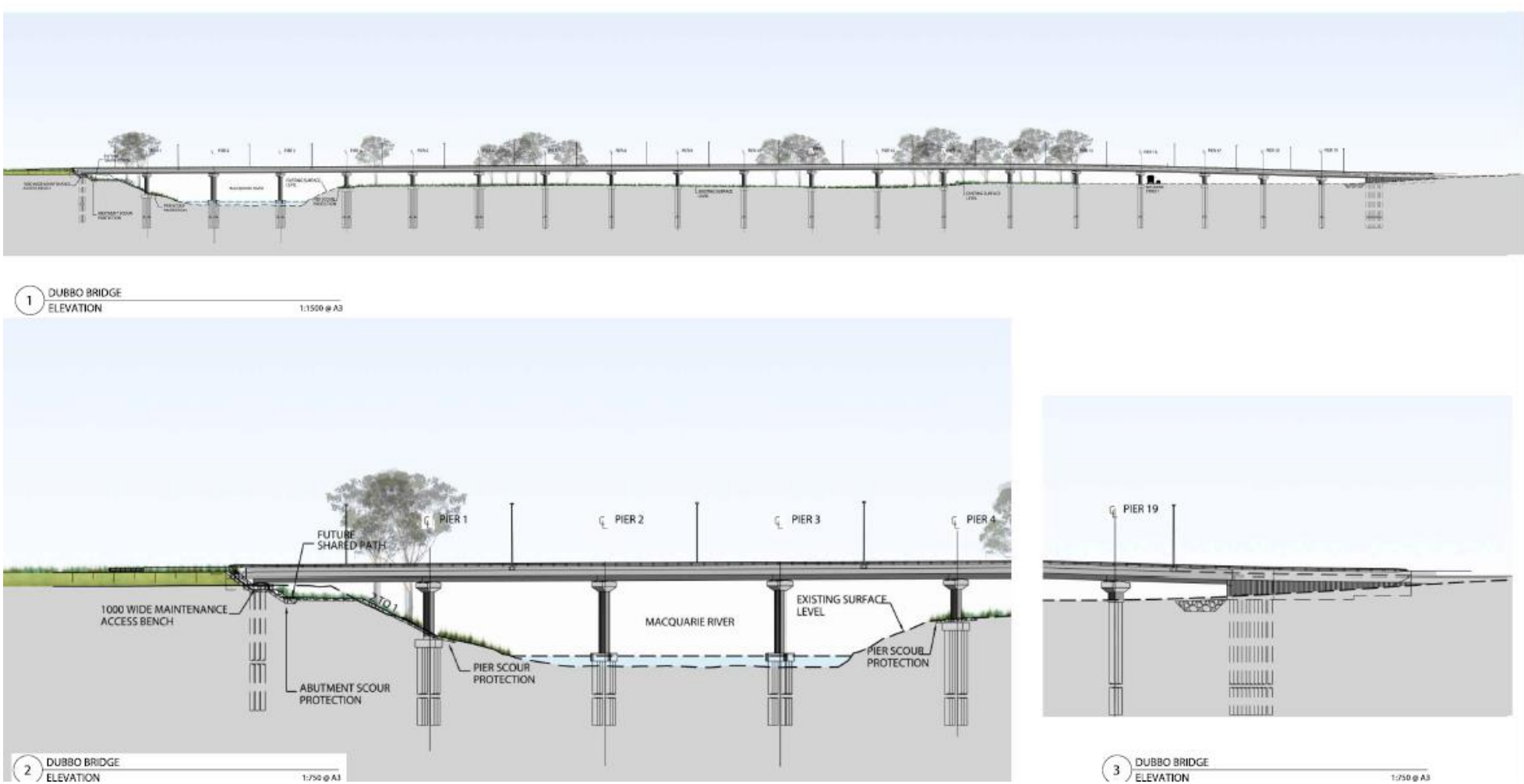


Figure 3-3 Proposed modified pier arrangements across the New Dubbo bridge

Design feature 2: Retaining walls

The arrangement of retaining walls on the eastern side of the New Dubbo Bridge has been modified as a result of the longer bridge span and wider deck. Section 3.2.3 of the project REF described six reinforced soil walls (RW01 to RW06), of which RW04 to RW06 were located at the eastern side of the bridge.

Retaining wall RW04 is no longer required given the reduced clearance between the bridge and existing ground levels. The function of RW05 has been integrated into the bridge substructure. RW06 is now the only retaining wall proposed on the eastern side of the bridge. The dimensions of this retaining wall would have a maximum height of 4.7 metres and length of 26.6 metres. Given the increase in bridge span, and relocation of the eastern bridge abutment, the location of the retaining wall has also moved eastwards to adjoin the modified eastern abutment (Abutment B).

Design feature 3: Horizontal alignment

The horizontal alignment design is generally as described in Section 3.2 of the project REF and Section 4.2 of the submissions report. However, on the proposed Newell Highway alignment, the 1.0 metre wide centre line has been extended on the western side of the bridge around the horizontal curve. The proposed Newell Highway southbound shoulder width has been increased in this section of the alignment, to allow for the potential future construction of the access stub into the potential residential area to the north-west.

Section 4.1.4 of the submissions report describes the northbound slip lane and flood bypass lane. The horizontal alignment has been modified through the detailed design process to a larger horizontal curve in order to achieve a higher design speed.

The proposed modification also includes the removal of the existing U-turn bay south of the Railway Bridge on Whylandra Street. Accesses along Thompson Street near the entry to the northbound slip lane have been rationalised. This has resulted in a combined access road to the properties near Riverside Church.

An additional access track has been provided from the proposed Newell Highway alignment extending to the weir on the western side of the Macquarie River. On the eastern side of the river, there is also an additional access track provided, adjacent to the New Dubbo Bridge.

Design feature 4: Vertical alignment

The majority of the vertical alignment design is as described in Section 3.2 of the project REF.

However, in the detailed design the vertical alignment of the Newell Highway parallel to the Macquarie River has been revised to reduce the embankment height to an average embankment height of about 1.5 metres above stripped surface.

The vertical alignment of the New Dubbo Bridge has also been slightly modified such that from the western embankment the bridge would rise on a 0.5 per cent grade, with a crest just west of Brisbane Street, where the alignment then dips down to River Street on a three per cent grade as shown in Figure 3-4. The modified vertical bridge alignment provides flood immunity up to the one per cent average exceedance probability (AEP) flood event (sometimes referred to as the 1 in 100 year flood event), and an increased minimum vertical clearance over Brisbane Street of 6.1 metres.

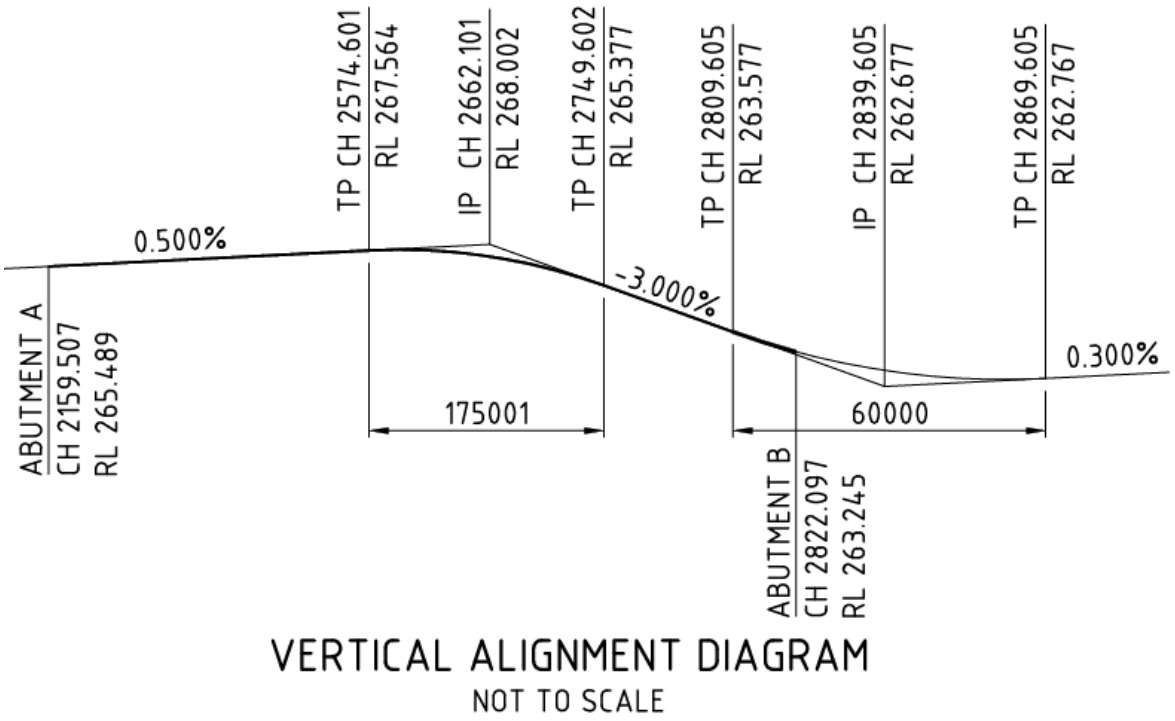


Figure 3-4 Modified vertical alignment of New Dubbo Bridge

The level of the northbound slip lane and flood bypass matches the Thompson Street level and rises to above the two per cent AEP flood level before joining the levels of the Newell Highway. Additional earthworks are proposed to provide continuous grading between the main intersection and the flood bypass lane.

Design feature 5: Intersections

Whylandra Street (Newell Highway)/Thompson Street

The modified design for the Newell Highway/Thompson Street intersection is shown on Figure 3-5. In addition to the horizontal alignment changes to the northbound slip lane and flood bypass lane, the speed limit on the northbound flood route from Thompson Street has also increased from 40 to 60 kilometres/hour. The speed limit on the southbound route would remain the same. The Newell Highway / Thompson Street intersection has been modified to provide access into Wiradjuri Park.

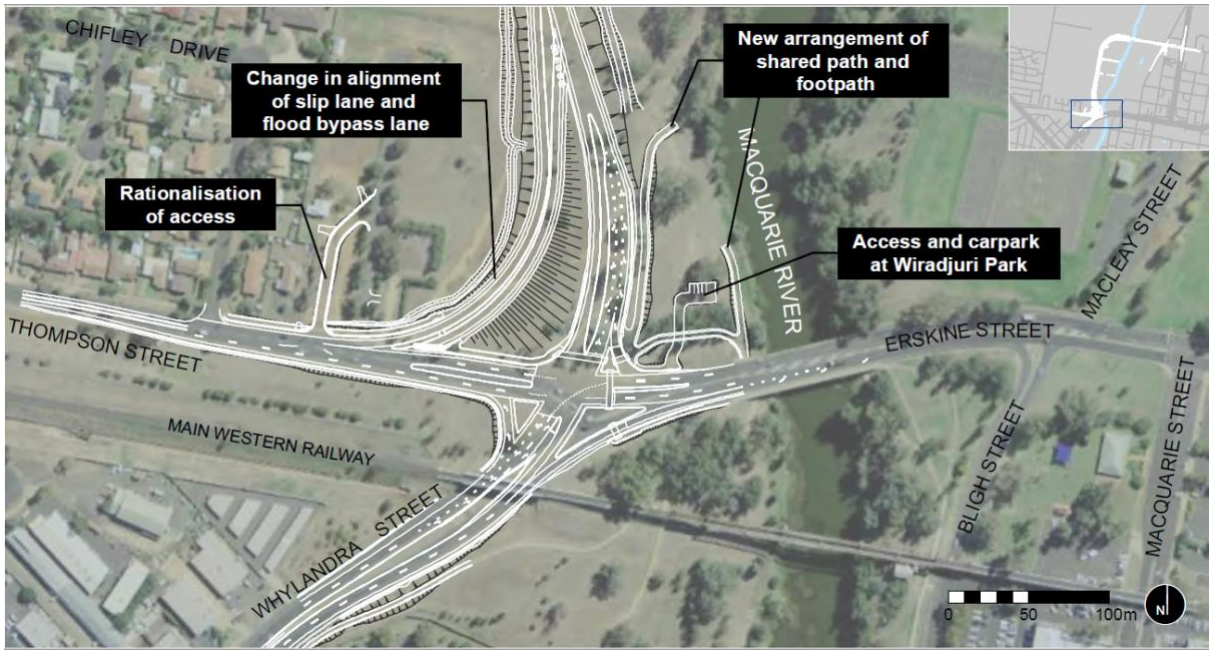


Figure 3-5 Modified Newell Highway/Thompson Street intersection

Bourke Street/River Street

The layout of the Bourke Street/River Street intersection has been modified, as shown in Figure 3-6. Proposed changes to the intersection include:

- Provision of a new dedicated right turn lane from River Street to southbound on Bourke Street
- Removal of the merging lane eastbound along River Street to the east of the intersection
- Addition of a two-way right-turning lane (a lane used for turning right by both directions of traffic) in the median of River Street to the east of the intersection, to provide access to the properties along River Street
- Removal of the dedicated left turn lane from River Street to the southbound direction in Bourke Street
- Removal of informal on-street parking area on River Street located between Brisbane Street and Bourke Street.

Figure 3-6 Modified layout schematic for River Street/Bourke Street

Brisbane Street/Darling Street

The alignment of Darling Street has been reconfigured slightly through detailed design in order to tie into the existing Brisbane Street. Work at this tie in would be carried out as an early work package and detailed design and construction planning is ongoing, separate to the main project. The updated layout and additional area required is shown in Figure 3-7.

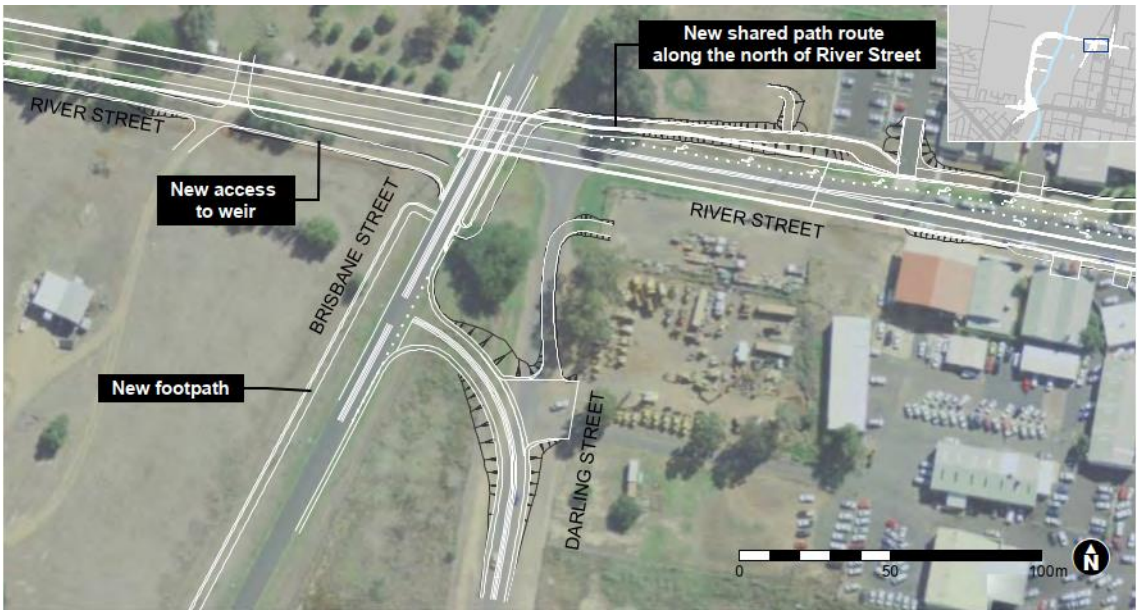


Figure 3-7 Modified Brisbane Street/Darling Street intersection

Victoria Street/Thompson Street

The project area has been modified around the Victoria Street/Thompson Street intersection of the Mitchell Highway to allow for additional civil works and drainage infrastructure requirements. Works at this intersection would also be carried out as an early works package and detailed design and construction planning is ongoing, separate to the main project. However, it is anticipated that the intersection would be relocated slightly to the west resulting in additional area required for this work, as shown in Figure 1-2. As such, this addendum REF includes this additional area but consideration of further design changes at

this intersection within this extended area would be subject to a separate planning approvals process.

Design feature 6: Drainage

Cross drainage

As per the project REF, the drainage design would aim to use the existing drainage outlets as discharge points. The inlet or outlet of the existing culverts or the existing water courses would be the points of discharge for the proposed modification. However, new discharge points would be required at some new locations, particularly along the eastern side of the modified project to discharge to the Macquarie River. Where required, scour protection would be provided at the culvert inlet and outlets.

The drainage design has been refined such that eight drainage culverts would be required (one less than assessed in the project REF) to cater for cross drainage of the existing catchment flows from the eastern side of the road to Macquarie River. The revised location of the culverts is provided on Figure 1-2 and description is provided in Table 3-1.

Table 3-1 Proposed culverts

Chainage	Size (millimetres)	Length (metres)
880	3 x 900 reinforced concrete pipe (RCP)	71.4
	1 x 1350 RCP	19.0
905	1 x 1350 RCP	39.4
	2 x 1800 RCP	31.2, 4.1
1180	3 x 900 RCP	37.2
1270	2 x 750 RCP	31.2
1370	4 x 1800 RCP	68.7, 56.9, 45.7, 53.0
1570	3 x 1200 RCP	26.4
	3 x 900 RCP	44.0
1650	3 x 750 RCP	27.6
1780	2 x 750 RCP	37.2
2000	4 x 750 RCP	44.4
2080	2 x 1200 RCP	20.0
	2 x 1200 RCP	37.3
	3 x 900 RCP	10.2
2700	3 x 300 RCP	9.6
2730	3 x 1200(W) x 450(H) RCBC	18.5
	3 x 300 RCP	7.3

Pavement drainage

There is no change to pavement drainage design strategy described in Section 3.2 of the project REF for the modified project.

Bridge deck drainage

The drainage system on the bridge would consist of scupper drains. Further detailed design of the bridge deck drainage is currently being carried out to ensure integration across the main bridge structure. The scupper drains would be connected to longitudinal pipes that would either discharge into operational sediment basins located at each end of the New Dubbo Bridge, or be connected to vertical pipes at Piers 6 and 17, to convey water down to ground level where it would be discharged to the flood plain of the Macquarie River and the local Brisbane Street catchment, respectively.

Open channels and swales

As per the project REF, open channels would be required to direct surface runoff away from the road pavements, direct road runoff to water quality treatment facilities, direct uncontaminated water around water quality treatment facilities and direct flows from pavement drainage outlets to drainage culverts. Channels would be provided on both the toe and the top of the new road embankment where the existing ground surface falls towards the embankment.

Vegetated swales would generally be located at the toe of the road batter and convey road pavement runoff to downstream creeks. The operation drainage design has been refined such that typically, the swales would have a wider two metre base and a 0.5 metre depth, with side slopes of up to 1 in 4 gradient. The revised location of the swales is shown in Figure 3-1and described in Table 3-2. The swale name represents the location by referring to the road chainage and the side of the road that the swale is to be located on. The receiving waterway for all swales would be the Macquarie River.

Table 3-2 Proposed water quality swales

Swale name	Swale length (metres)
SWL00L	197
SWL881R	250
SWL900L	250
SWL1180L	39
SWL1180R	96
SWL1220L	55
SWL1270L	57
SWL1270R	99
SWL1325L	50
SWL1370L	122
SWL1405R	170
SWL1485L	90
SWL1570L	50.6

Swale name	Swale length (metres)
SWL1570R	71
SWL1650R	96
SWL1685L	90.21
SWL1780R	199
SWL2000L	249
SWL1780L	172

Water quality and spill basins

In addition to the operational basin described in Section 3.2 of the project REF, an operational spill basin is proposed at the western end of the New Dubbo Bridge due to the low risk of a large spill occurring on the main bridge deck. The spill basin would be able to capture and accidental spill of up to 30 cubic metres of liquid.

The design of the operational spill basins is provided in Figure 3-8.

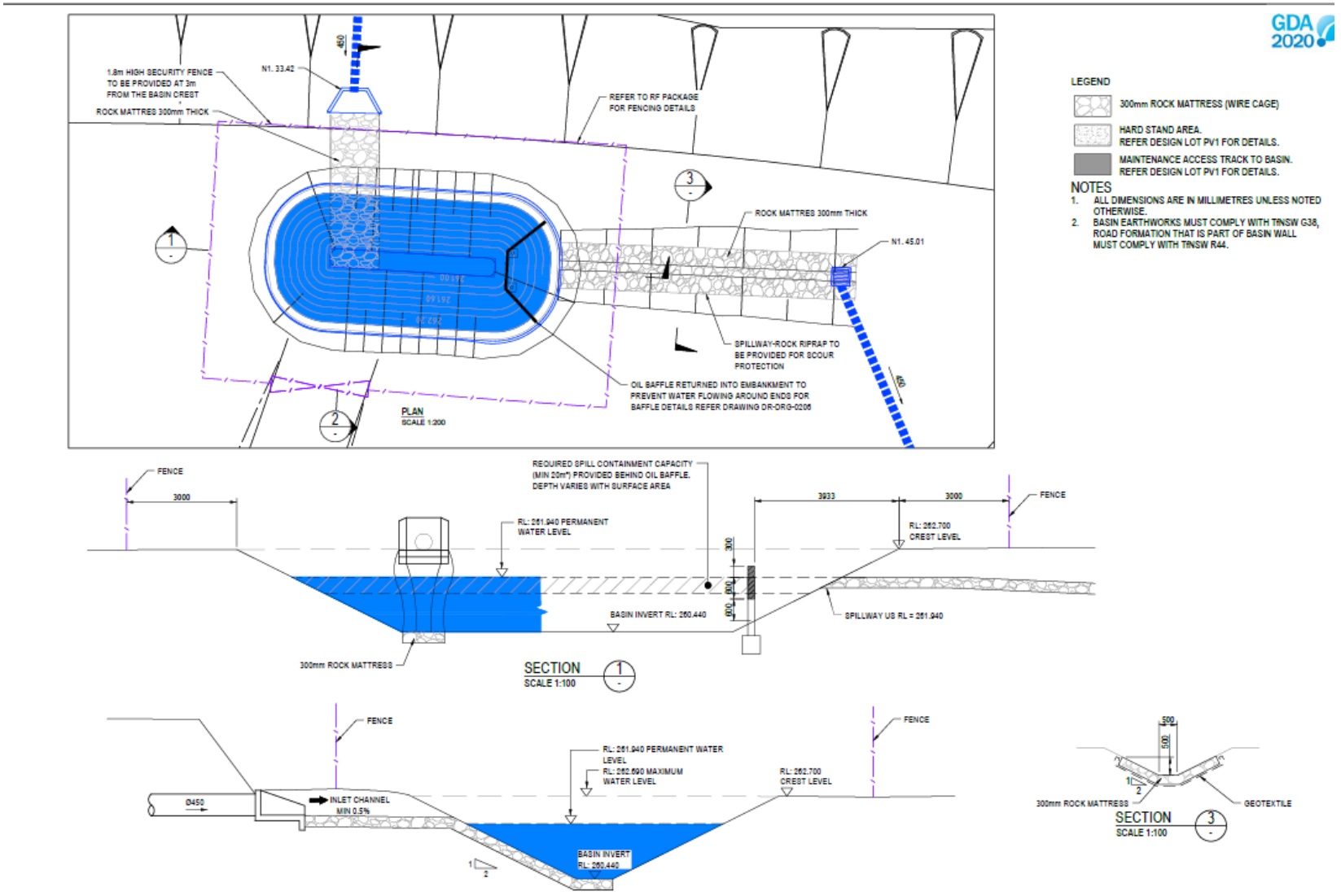


Figure 3-8 Operational spill basin design

Design feature 7: Active transport facilities

The following changes are proposed to the active transport elements of the project, as shown on Figure 3-1:

- Extension of the footpath from Emile Serisier bridge to the proposed Newell Highway/ Thompson Street intersection on the south side of Whylandra Street
- Reduction of the shared path along the proposed Newell Highway alignment adjacent to Wiradjuri Park with provision for future extension, and addition of a footpath connection to the existing pontoon
- Additional footpath along the western side of Brisbane Street
- Provision of a shared path to the north side of River Street between Bourke Street and Brisbane Street.

Design feature 8: Safety barriers

As per the project REF, safety barriers would be provided to protect against roadside hazards, typically the presence of roadside cuttings, steep batters and culvert headwalls.

The design of the pier protection barrier either side of the Main Western Rail Line Underbridge at Whylandra Street has been updated such that it would include 15 1050 millimetre diameter reinforced concrete piles. These piles would be bored and then the concrete cast in place.

3.3 Construction activities

3.3.1 Work methodology

Construction activities would be guided by a construction environmental management plan (CEMP) to ensure work is carried out to Transport for NSW specifications within the specified work area. The proposed work methodologies are described below.

The proposed construction work and methodology is indicative and detailed construction staging plans and methods would be determined by the construction contractor(s). In the event that the construction activities result in any environmental impacts additional to that assessed in the project REF and this addendum REF, further environmental assessment would be required to be carried out and approved by Transport for NSW.

In addition to the staging set out in Section 3.3.1 of the project REF, the activities set out in would be required:

Table 3-3 Additional staging activities

Stage	Proposed construction work	Changes to traffic conditions	Changes from project REF
Zone 1: Thompson Street/Whylandra Street (Newell Highway)			
4	Construct pier protection barrier either side of the Main Western Rail Line Underbridge at Whylandra Street , including bored piling	As per project REF	Addition of bored piling to construction methodology

Stage	Proposed construction work	Changes to traffic conditions	Changes from project REF
Zone 2. New Newell Highway alignment			
1	Construction of drainage along the new alignment, including bored piling for headwalls of the outlets into Macquarie River	As per project REF	Addition of bored piling to construction methodology for headwalls
Zone 3: New Dubbo Bridge			
2	Construct temporary access road and crane pad extended at each pile cap location. Temporary access for in-stream work may include use of cofferdam, construction of temporary rock barrage, or possibly a temporary low level bridge and/or barge.	As per project REF	Project REF included the use of non-specific temporary in-stream rock platform for pier construction

The final construction staging methodology would potentially be refined during the detailed construction planning process.

3.3.2 Construction hours and duration

Consistent with the project REF, construction work would be expected to start around mid-2022 and take about 48 months to build. The majority of construction work would generally be carried out during standard work hours, as follows:

- Monday to Friday 7:00am to 6:00pm
- Saturday 8:00am to 1:00pm
- Sunday and public holidays, no work.

To minimise disruption to the local traffic network and along the Newell Highway, it is anticipated that out of hours work would be required at nights. All work would be as allowable in accordance with road occupancy licence (ROL) requirements.

During scheduled night work, potentially impacted sensitive receivers would be consulted and kept informed of construction progress to minimise any impacts. In addition, management and mitigation measures detailed within the CEMP would be implemented as required to further mitigate any construction impacts. This includes the development of an out-of-hours work protocol which would govern the management of work outside standard work hours.

The work would be carried out in accordance with the *Noise Criteria Guidelines* (Roads and Maritime, 2015) and *Construction Noise and Vibration Guideline* (Roads and Maritime, 2016). Prior advice would be given to the community regarding work hours, and any planned construction work that is proposed to be carried out outside standard work hours.

A construction noise and vibration assessment has been carried out for the proposed modification. Refer to Section 6.6 and Appendix G for details.

3.3.3 Plant and equipment

An indicative list of plant and equipment is provided below. The final equipment and plant requirements would be determined by the construction contractor:

- Excavators
- Scrapers
- Water carts
- Pulvi-mixers (stabilisers)
- Bobcats
- Bitumen-sprayer trucks
- Truck-mounted lime spreaders
- Pavement laying machine
- Bulldozers
- Concrete saws
- Hand tools
- Rollers
- Trucks (tippers)
- Articulated trucks
- Graders
- Loaders
- Backhoes
- Aggregate spreader trucks
- Asphalt shuttle buggy
- Cranes – various sizes
- Various piling rigs
- Concrete pumps
- Light vehicles
- Milling machine
- Vibratory hammer
- Vibrating screed
- Shuttle buggy.

3.3.4 Earthworks

The approach to earthworks has been considered and volumes have been refined during the detailed design process to reduce excavations required in some areas. However, the proposed modification also includes some additional excavation in other areas associated with drainage outlets.

Overall the modified project is expected to require slightly reduced volumes of earthworks from those calculated in the project REF, as shown in Table 3-4.

Table 3-4 Overview of indicative earthwork quantities

Material	Project REF volume (m^3)		Modified project volume (m^3)	
	Western side of the Macquarie River	Eastern side of the Macquarie River	Western side of the Macquarie River	Eastern side of the Macquarie River
Top soil	15,700	1,000	14,500	2,300
Excavation (cut) volume	14,700	7,000	30,400	1,000
Fill volume	63,200	11,500	61,500	7,200
Imported volume	50,000	5,200	30,000	6,000

3.3.5 Source and quantity of materials

Consistent with the approved project, the following materials would be required:

- Earthwork materials (e.g. sand, gravel, topsoil, general fill material) and selected material for road formation
- Bitumen and aggregates (e.g. stone, sand, gravel) for pavement work

- Binders to stabilise and treat the road formation and culvert bases
- Cement and aggregates (e.g. fly ash, gravel, crushed rock) for concrete used in drainage construction, pavement construction, and miscellaneous work such as barrier kerbs, kerbs and gutters, paving and signpost footings
- Precast concrete elements for bridge and drainage construction (culverts, pits pipes and headwalls) and miscellaneous work
- Steel for barrier railings and reinforcement in concrete.

Where possible, construction would reuse as much of the existing pavement and road formation material as possible to minimise the imported material needs of the proposed modification. Consideration would also be given to the modified subgrade material. Material would also be sourced from other projects around Dubbo and/or appropriately licensed facilities.

3.3.6 Construction traffic and access

Construction traffic volumes would remain consistent with those described in Section 3.3.6 of the project REF.

During construction a number of construction vehicles and machinery would require access to the modified project area. In addition to the construction access identified in Section 3.3.6 of the project REF, construction vehicles would access the modified project area west of the Macquarie River via the access track from Bunglegumbie Road, between Catherine Drive and Spears Drive, as shown on Figure 3-1. Access along the existing access track west from Bunglegumbie Road (to the north of Spears Drive) may be used initially to establish ancillary facility 2, as well as during construction.

3.4 Ancillary facilities

The four proposed project ancillary facility sites have been modified and revised in location and size to better facilitate constructability and material handling and storage during construction. An additional ancillary facility has also been proposed.

The location of each ancillary facility is shown on Figure 3-1 and their expected general use is detailed in Table 3-5. The exact location and use of each facility would be confirmed by the construction contractor before the start of construction.

Table 3-5 Indicative construction ancillary facility details

Site ID	Location	Size (m^2)	Proposed activities	Changes to the project REF
1	Lot 2 DP1039425	2,100	• Stockpile area • Plant and equipment parking area • Material laydown and storage area • Chemical storage and equipment refuelling.	Within the same Lot, but location has moved north-west from the corner of Thompson Street and Whylandra Street as identified in the submissions report
2	Western side of Macquarie River	85,000	• Stockpile area • Plant and equipment parking area • Material laydown and storage area	Increased in size and location has moved northwest from the project alignment as

Site ID	Location	Size (m^2)	Proposed activities	Changes to the project REF
	Lot 2 DP958250		• Site office, parking, first aid post, daytime deliveries • Arrival and departure of office staff, workforce and daytime deliveries to the site • Chemical storage and equipment refuelling • Plant storage and construction parking • Delivery of excavated material from site by tipper trucks • General stockpile management and loading of final product into tipper trucks for delivery to site • General delivery of other construction materials for storage. • PSC Girders	identified in the submissions report
3	Eastern side of the Macquarie River. Within the river access road within Lot 261 DP575016.	13,000	• Stockpile area • Plant and equipment parking area • Material laydown (including bridge components) and storage area • Daytime deliveries • Arrival and departure of workforce and daytime deliveries to the site • Plant storage and construction parking • Delivery of excavated material from site by tipper trucks • General stockpile management and loading of final product into tipper trucks for delivery to site • General delivery of other construction materials for storage	Reduced in size and location has moved north from Lot 216 DP 575016
4	Lot 142 DP1201156	4,800	• Site office and parking area • Stockpile area • Plant and equipment parking area • Material laydown and storage area • Chemical storage and equipment refuelling	Reduced in size, as previously included area within Lot 141 DP1201156
5	Lot 5 DP250606	16,000	• Stockpile area • Plant and equipment parking area • Material laydown and storage area • Chemical storage and equipment refuelling	Additional facility as part of the proposed modification

It is anticipated that the ancillary facilities would be predominantly used during standard construction hours. In some instances, however, these facilities may need to be used outside of standard construction hours to facilitate construction activities. In these instances, appropriate management measures would be implemented in accordance with the CEMP and consultation would occur with potentially impacted receivers to minimise impacts.

The stockpile areas would be established and managed in accordance with the Stockpile Site Management Guideline (Roads and Maritime, 2015) QA specification R44-Earthworks - IC-QA-R44 (Roads and Maritime, 2011a), also G36, G38 and R178. Where possible the stockpile areas would be located:

- Not prone to flash flooding
- More than 40 metres from a watercourse
- More than 50 metres from the nearest dwelling
- In previously disturbed areas that do not require the clearing of native vegetation
- In plain view of the public to deter theft and illegal dumping
- Outside the drip line of trees and on level ground wherever possible.

Sites would be securely fenced with temporary fencing. Signs would be erected advising the general public of access restrictions. Upon completion of construction, the ancillary facilities, work areas and stockpiles would be removed, and the sites would be cleared of all rubbish and materials and rehabilitated.

Ancillary facilities would be established as detailed in Table 3-5. Where amendments or additional ancillary facilities are identified during construction, the contractor would consult with TfNSW's Senior Environment and Sustainability Officer to confirm the suitability of the proposed amendment or additional facility, and whether any additional environmental assessment is required.

3.4.1 Construction sediment basins

Up to four sediment basins are proposed as the primary mechanism to capture and treat all runoff from all disturbed areas within the modified project area before discharging into the receiving waterway (i.e. the Macquarie River). The location of these sediment basins remains as described in Section 3.4.1 of the project REF.

3.5 Public utility adjustment

Transport for NSW has been consulting with public utility authorities as part of the design process to identify and locate existing utilities and incorporate utility authority requirements for relocations and/or adjustments. These utilities would need to be relocated or protected as part of the proposed modification. The extent of the relocations of these utilities would not be known until a detailed design has been completed, and depending on procurement approach, the contractor(s) engaged for the construction of this modified project. All utilities to be adjusted, which are located within the area to be impacted by the proposed modification, are considered to be part of the assessment in this addendum REF. However, any adjustments that extend beyond the modified project area may require a separate environmental assessment.

Electrical supply

There is an Essential Energy overhead to underground network on the northern verge of Thompson Street, which is linked to a near switching station. The network pole and switching station would need to be relocated.

The existing Essential Energy overhead house service connections would be modified to connect to the proposed underground network, which may involve the installation of private poles with approval from the landowners.

The Essential Energy overhead network at Brisbane Street/River Street/Bourke Street would be relocated underground to avoid clearance issues with the bridge structure, and would follow the alignment of the proposed shared path on the northern verge of River Street. A pad mounted substation is proposed on the north west corner of River Street and Bourke Street and easement is required for this substation.

In addition, the existing poles supporting the overhead network on the eastern verge of Bourke Street would need to be relocated.

Gas

The existing Jemena Gas Country main along Thompson Street is to be relocated at the crossing of Chifley Drive and at the proposed Riverside Church driveway. The existing gas main crossing Bourke Street/River Street (east to west) is to be relocated further south of the intersection.

Telecommunications

Work relating to Optus, Telstra and NextGen utilities remain as per the project REF.

The existing NBN cable that crosses the proposed Church Driveway in a north–south direction (north of Church Driveway/Thompson Street intersection) is to be relocated.

Water

Multiple subsoil drainage pipes south of the intersection of Thompson Street/Whylandra Street would be removed. Two water mains along Newell Highway (on the western bank of Macquarie River) would be relocated.

3.6 Property acquisition

Property acquisitions for the approved project are set out in Section 3.6 of the project REF. The proposed modification would require property acquisition as set out in Table 3-6. Area ID 01, 03 and 18 identified in the project REF would no longer be required. Area ID 19 and Area ID 20 are additional properties that are being acquired.

Table 3-6 Proposed property acquisition

Area ID	Total area (m^2)	Acquisition type	Current owner	Lot and DP	Land use zone (LEP)
01	0	No longer required	-	-	-
02	3345	Partial	Public	Lot 4 DP1114367	Public Recreation/ Recreational Waterways
03	0	No longer required	-	-	-
04	3733	Partial	Private	Lot 11 DP 810239	Low Density Residential/ Public Recreation

Area ID	Total area (m^2)	Acquisition type	Current owner	Lot and DP	Land use zone (LEP)
05	172	Partial	Public	Lot 1 DP 1039425	Public Recreation
06	29260	Partial	Crown	Lot 2 DP 1039425	Public Recreation
07	15595	Partial	Private	Lot 5 DP 250606	Low Density Residential/ Public Recreation
08	14515	Partial	Private	Lot 4 DP 250606	Public Recreation
09	14420	Partial	Private	Lot 31 DP 1219695	Low Density Residential
10	19188	Partial	Public	Lot 2 DP 250606	Low Density Residential/ Public Recreation
11	24679	Partial	Public	Lot 1 DP 250606	Low Density Residential/ Public Recreation
12	950	Partial	Public	Lot 2 DP 34102	Public Recreation
13	1275	Partial	Private	Lot 28 DP 62022	Environmental Management
14	1135	Partial	Private	Lot 1 DP 715877	Environmental Management
15	1825	Partial	Public	Lot 142 DP 1201156	Enterprise Corridor/ Environmental Management
16	734	Partial	Private	Lot 13 DP 854110	Enterprise Corridor
17	90	Partial	Private	Lot 1 DP 538701	Enterprise Corridor
18	0	No longer required	-	-	-
19	660	Easement	Private	Lot 100 DP 261729	Low Density Residential
20	3300	Partial	Private	Lot 261	Low Density Residential

Area ID	Total area (m^2)	Acquisition type	Current owner	Lot and DP	Land use zone (LEP)
				DP 575016	

As shown in Table 3-7, up to nine properties would be leased temporarily during construction of the proposed modification. There are two properties from the project REF which would no longer be leased (Lot 2 DP250606 and Lot 1 DP250606) and two additional properties that would be leased (Lot 32 1219695 and Lot 5 250606). The area for the remaining leased properties has been amended for the modified project. The need for lease arrangements would be confirmed by the contractor and consultation regarding agreements would be carried out with the identified landowners and Transport for NSW before the start of work. Following construction, land occupied by construction work, but not required for the ongoing operation of the modified project, would be reinstated to its pre-construction use.

Table 3-7 Proposed temporary lease

Lease use	Total area (m^2)	Current owner	Lot and DP	Land use zone (LEP)
Construction sediment basin	1520	Private	Lot 5 DP250606	Low Density Residential/ Public Recreation
Construction of drainage pipe	1572	Private	Lot 4 DP 250606	Public Recreation
Construction of bridge	200	Public	Lot 28 DP 62022	Environmental Management
Construction of drainage pipe and outlet to river	1524	Private	Lot 31 DP 1219695	Low Density Residential/Public Recreation
Construction of drainage pipe and outlet to river	1400	Private	Lot 32 DP 1219695	Low Density Residential/Public Recreation
Ancillary facility 1	2173	Public	Lot 2 DP 1039425	Low Density Residential/ Public Recreation
Ancillary facility 2	84941	Public	Lot 2 DP 958250	Public Recreation
Ancillary facility 3	9768	Private	Lot 261 DP 575016	Low Density Residential
Ancillary facility 5	15749	Private	Lot 5 DP 250606	Environmental Management

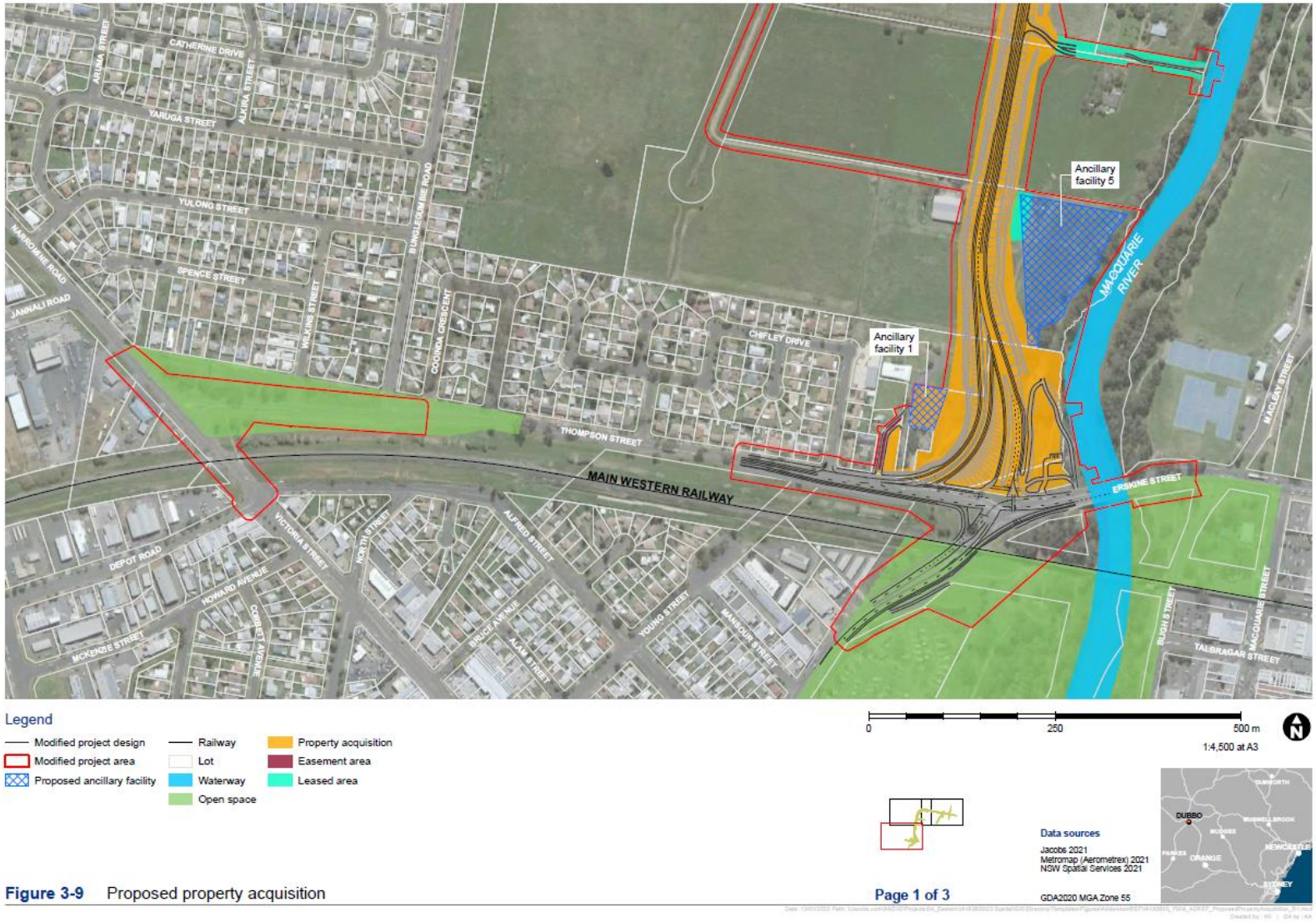


Figure 3-9 Proposed property acquisition

Figure 3-9 Proposed property acquisition (1 of 3)

Figure 3-10 Proposed property acquisition (2 of 3)

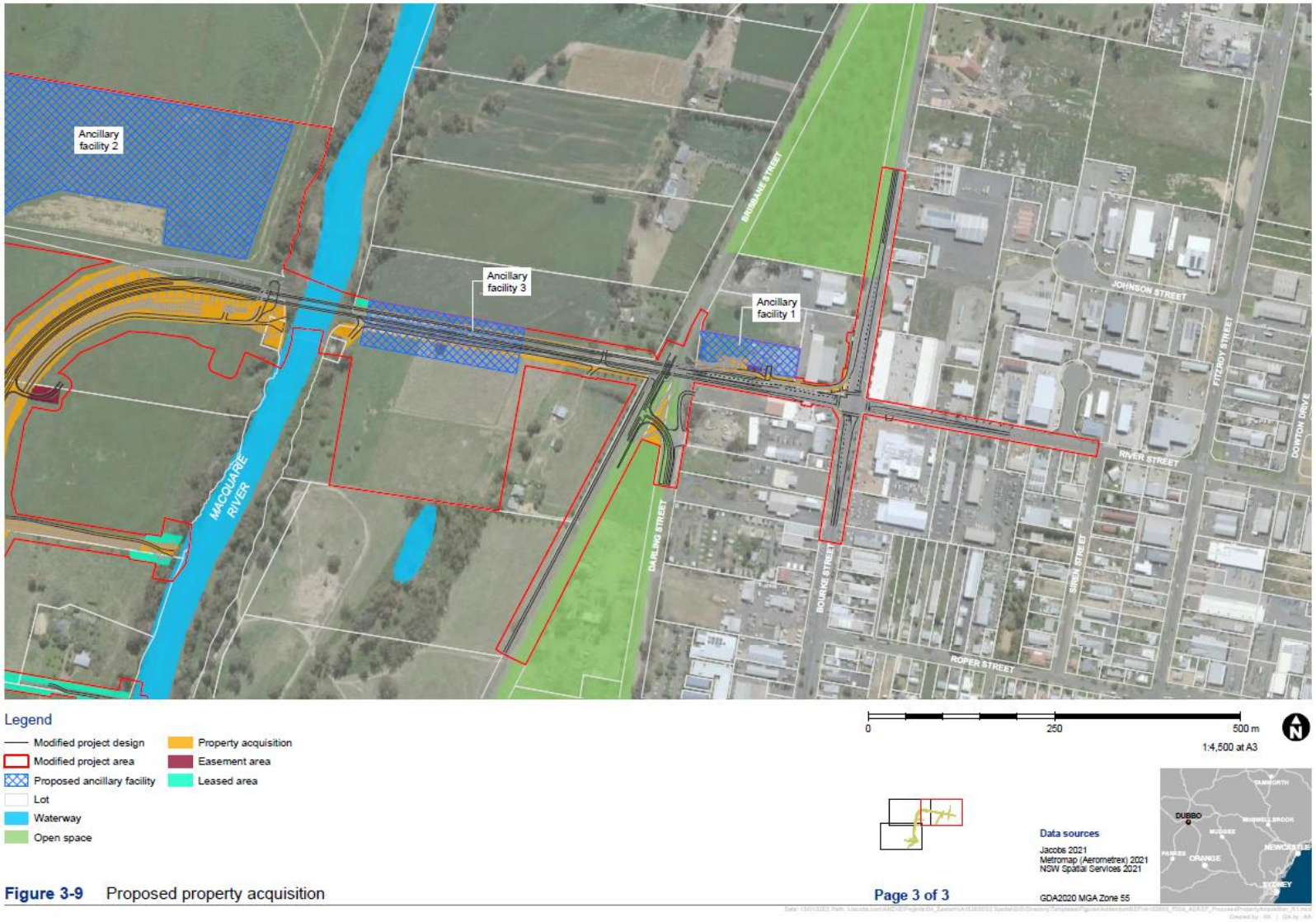


Figure 3-9 Proposed property acquisition

Figure 3-11 Proposed property acquisition (3 of 3)

4 Statutory and planning framework

This chapter provides the statutory and planning framework for the proposed modification and considers the provisions of relevant state environmental planning policies, local environmental plans and other legislation.

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) aims to facilitate the effective delivery of infrastructure across the State.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposed modification is for a road and is to be carried out by Transport for NSW, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

The modified project is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP), State Environmental Planning Policy (State and Regional Development) 2011 or State Environmental Planning Policy (State Significant Precincts) 2005.

Part 2 of ISEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development.

Consultation, including consultation as required by ISEPP (where applicable), is discussed in chapter 5 of this addendum REF.

4.1.2 Local Environmental Plans

Dubbo Local Environment Plan 2011

The proposed modification is located within the Dubbo local government area (LGA) and is primarily regulated by the Dubbo Local Environmental Plan 2011 (Dubbo LEP).

The land use objectives for zones under the LEP, and the proposed modifications consistency with those objectives, are detailed in Table 4-1.

Table 4-1 Dubbo LEP zone objectives

Zone	Objective	Consistency of the proposed modification with the zone objective
SP2 Infrastructure	• To provide for infrastructure and related uses • To prevent development that is not compatible with or that may detract from the provision of infrastructure	The proposed modification would improve the project's compatibility with the provision of infrastructure. It would continue to provide a new bridge and upgraded road related infrastructure, to improve travel times,

Zone	Objective	Consistency of the proposed modification with the zone objective
		safety within the area and improved connectivity during flooding events less than 1 in 10 ARI.
RE1 Public Recreation	• To enable land to be used for public open space or recreational purposes • To provide a range of recreational settings and activities and compatible land uses • To protect and enhance the natural environment for recreational purposes • To provide for facilities and amenities to enhance the use of public open space	The proposed modification would slightly reduce the central median planting area in Wiradjuri Park. It would, however, continue to improve links between existing open space areas through the inclusion of additional shared path arrangements.
R2 Low Density Residential	• To provide for the housing needs of the community within a low density residential environment • To enable other land uses that provide facilities or services to meet the day to day needs of residents • To ensure development is consistent with the character of the immediate locality • To encourage low density housing within a landscaped setting on the fringe of the Dubbo urban area	The proposed modification would continue to improve access to and from residential areas in Dubbo. It would continue to maintain the efficiency of the road network, and help to enable other land uses by providing additional future proofing of access of the alignment to the future development.
B6 Enterprise corridor	• To promote businesses along main roads and to encourage a mix of compatible uses • To provide a range of employment uses (including business, office, retail and light industrial uses) • To maintain the economic strength of centres by limiting retailing activity • To provide for residential uses, but only as part of a mixed use development • To improve the presentation of the major access corridors into Moree	The proposed modification would provide additional long term benefits to the project and as a result, would improve travel times for motorists and other road users travelling along the Newell Highway.
E3 Environmental Management	• To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values • To provide for a limited range of development that does not have an adverse effect on those values	The proposed modification would improve combability of the project with existing flood hazards. The proposed modification has been designed to

Zone	Objective	Consistency of the proposed modification with the zone objective
	• To ensure development is compatible with the flood hazard of the Macquarie and Talbragar Rivers • To ensure development does not create outbreaks of saline lands or exacerbate the existence of existing saline lands	minimise impacts on environmental values where possible.
IN2 Light Industrial	• To provide a wide range of light industrial, warehouse and related land uses • To encourage employment opportunities and to support the viability of centres • To minimise any adverse effect of industry on other land uses • To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area • To support and protect industrial land for industrial uses • To recognise the Depot Road and McKenzie Street industrial area as providing start up and transport related development opportunities	The proposed modification has been designed to minimise impacts on the industrial area of the land.
W2 Recreational Waterways	• To protect the ecological, scenic and recreation values of recreational waterways • To allow for water-based recreation and related uses • To provide for sustainable fishing industries and recreational fishing	The proposed modification would include larger bores, driven piles and an additional instream pier for bridge construction, which may result in minor impacts to the recreational values of Macquarie River. This impact would be insignificant to the recreational value of Macquarie River in the long term.

The consent requirements of the Dubbo LEP would not apply to the proposed modification as, under ISEPP, the proposed modification is permitted without consent of the council and may be determined under Division 5.1 of the EP&A Act. The land zoning which the proposed modification falls within is shown in Figure **1-1**.

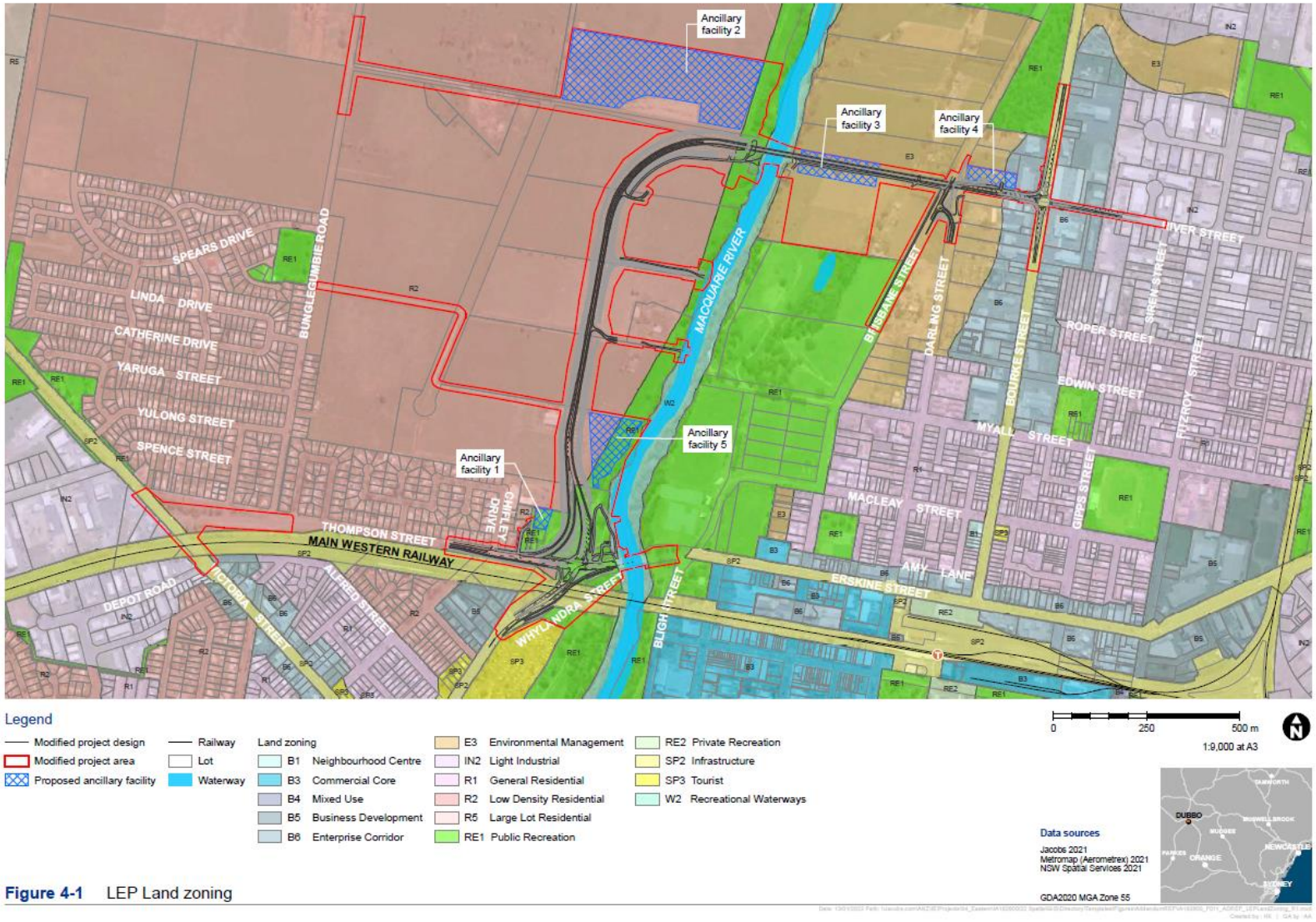


Figure 4-1 LEP Land zoning

Figure 4-1 LEP land zoning

4.2 Other relevant NSW legislation

4.2.1 Protection of Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997 (*POEO Act) provides the legal framework for the management of air, noise, water and waste pollution. Under section 48 of the POEO Act, scheduled activities (as defined in Schedule 1 of the Act) require an Environment Protection Licence (EPL).

The list of Schedule 1 activities that would be most relevant to the proposed modification include '*Road construction for the – the existence of 4 or more traffic lanes (other than bicycle lanes or lanes used for entry or exit) for a continuous length of at least— 5 kilometres—where the road is not in a metropolitan area and is classified, or proposed to be classified, as a main road, freeway or tollway under the* Roads Act 1993.'

Since the modified project would only involve 2.2 kilometres of road, an EPL is not required in relation to this activity.

The list of Schedule 1 activities that would be most relevant to the proposed modification include *'crushing, grinding or separating materials'* under clause 16.

Although the proposed modification would involve the crushing, grinding and separating of materials, clause 16 states that this is only considered a scheduled activity if more than 150 tonnes of material are processed per day. As the modified project is unlikely to process this quantity of material, an EPL is not required in relation to this activity.

4.2.2 Roads Act 1993

The *Roads Act 1993* (Roads Act) provides for the classification of roads. It provides for the declaration of Transport for NSW and other public authorities as roads authorities for both classified and unclassified roads. It also regulates the carrying out of various activities in, on and over public roads.

Under Section 138(1) of the Roads Act, consent from the road authority is required for carrying out various activities in, on and over public roads. The Newell Highway/Bourke Street, Whylandra Street and Victoria Street are classified roads which require consent from the road authority (TfNSW) to proceed. Approval would be sought for a road occupancy licence for the temporary closure of traffic lanes and, if required, the movement of over-sized vehicles during construction.

Brisbane Street, River Street, Darling Street and Thompson Street are unclassified roads where the Dubbo Regional Council is the road authority. Consent to carry out work on unclassified roads is not required as per Schedule 2 clause 5(1) of the Roads Act. However, a road occupancy licence would need to be obtained as necessary prior to construction commencing.

The modified project includes the construction of a bridge across navigable waters which is authorised under section 78. However, under section 79, a notice of proposal must be published in a local newspaper prior to the construction of the bridge and must include:

a) the place at which, and the times during which, a plan of the proposed construction is available for inspection by members of the public, and

b) a statement that any person is entitled to make submissions to Transport for NSW with respect to the proposal, and

c) an indication of the manner in which, and the period (being at least 28 days) within which, any such submission should be made.

Transport for NSW must ensure that copies of the proposal are available for inspection by members of the public at the place, and during the times, specified in the notice.

4.2.3 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017, repealing the Threatened Species Conservation Act 1995. The BC Act seeks to conserve biological diversity and promote ecologically sustainable development (ESD); to prevent extinction and promote recovery of threatened species, populations and ecological communities; and to protect areas of outstanding biodiversity value. The BC Act provides a listing of threatened species, populations and ecological communities, areas of outstanding biodiversity value, and key threatening processes.

Part 7 of the BC Act requires that the significance of the impact on threatened species, populations and endangered ecological communities listed under the BC Act or *Fisheries Management Act 1994* (FM Act), are assessed using a five-part test. Where a significant impact is likely to occur, a SIS or Biodiversity Assessment Report (BAR) must be prepared in accordance with the Director-General's requirements.

An assessment of the potential impact of the modified project to biodiversity is provided in Section 6.3.

The project REF identified the following threatened biodiversity listed on the BC Act as known to occur or considered likely to occur in the study area:

- 23 threatened flora and/or fauna species
- One terrestrial threatened ecological community.

The potential impact of the proposed modification on the threatened species, threatened ecological community and their habitats have been assessed via the application of the Five Part Test under the BC Act as appropriate. The proposed modification is unlikely to have a significant impact on these species.

4.2.4 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) is the primary legislation dealing with Aboriginal cultural heritage in NSW. Items of Aboriginal cultural heritage (Aboriginal objects) or Aboriginal places (declared under Section 84) are protected and regulated under the NPW Act. Aboriginal objects are protected under section 86 of the Act. Under section 90(1) of the Act the Director-General may issue an Aboriginal heritage impact permit (AHIP) for an activity which would harm an Aboriginal object.

An assessment of the potential impacts on Aboriginal cultural heritage is provided in the ACHAR (Appendix C) which is summarised in Section 6.1. The assessment concluded that seven Aboriginal archaeological sites would be impacted because of the modified project and an AHIP to permit harm to Aboriginal objects in the modified project area will be required.

4.2.5 Fisheries Management Act 1994

The *Fisheries Management Act 1994* (FM Act) aims to conserve, develop and share the fisheries resources of the State for the benefit of present and future generations, including conserving fish stocks and key fish habitats and promoting ecologically sustainable development. The FM Act applies to all waters within the limits of the State, except where Commonwealth legislation applies.

Threatened species, populations and ecological communities of fish and marine vegetation are protected under the FM Act. In addition, an object of the FM Act is to conserve key fish

habitat. Permits from NSW Department of Primary Industries (DPI) – Fisheries are required for certain impact in key fish habitat, including blocking of fish passage.

As detailed in the project REF, construction of the modified project would meet the definition of reclamation work under section 198A of FM Act, as construction of the additional piers would involve '*depositing any such material on water land for the purpose of constructing anything over water land*.'

Transport for NSW would be required to consult with DPI prior to undertaking this reclamation work, as defined under Section 199 of the FM Act.

In addition to the requirements of Section 199 and depending on construction methodologies developed, a permit may be required under Section 219 of the FM Act regarding blockage of fish passage. Section 219 requires a permit for any work carried out by a public authority that could result in the temporary or permanent blockage of fish passage within a waterway.

4.2.6 Heritage Act 1997

The *Heritage Act 1977* (Heritage Act) aims to protect items of State and local heritage significance and outlines the process for the approval of development that may impact on items of heritage significance.

Matters protected under the Act include items subject to an Interim Heritage Order and items listed on the State Heritage Register, the heritage schedules of local council Local Environmental Plans (LEPs), and the heritage and conservation registers established under section 170 of the Act by NSW Government agencies (section 170 Registers). The Act also provides for the protection of archaeological 'relics', being any deposit, object or material evidence that relates to the non-Aboriginal settlement of NSW and is of State or local heritage significance. Under section 57(1), approvals are required for work to a place, building, work, relic, moveable object, precinct, or land listed on the State Heritage Register (SHR). An excavation permit under section 139 is required to disturb or excavate any land containing or likely to contain a relic.

Investigations of the proposed modification's potential to interact with or impact on items of heritage significance are documented in the Addendum Statement of Heritage Impacts (SoHI) (Appendix D) which is summarised in Section 6.2. The assessment concluded that the proposed changes to the project would not result in significant impacts to heritage items.

4.2.7 Water Management Act 2000

The *Water Management Act 2000* (WM Act) regulates certain activities in, on or under waterfront land. A controlled activity approval under the WM Act would be required for certain types of developments and activities carried out in, on or under waterfront land. Waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 metres of the highest bank of the river, lake or estuary. Under the WM Act, a controlled activity includes the erection of a building or the carrying out of work (within the meaning of the EP&A Act).

The *Water Sharing Plan for Macquarie Unregulated and Alluvial Water Sources 2012* applies to the modified project.

Licensing

The licensing requirements detailed in the project REF would be applicable to the proposed modification. No additional licensing requirements would be required for the proposed modification.

Aquifer interference policy

The modified project is not expected to reduce the groundwater resource pool by three mega litres per year or at a rate of greater than five litres per second, and therefore a license is not required.

Transport for NSW would continue to consult with the NSW Office of Water to ensure that all applicable licences and/or approvals for any impacts to surface and ground water are obtained prior to construction.

4.2.8 Land Acquisition (Just terms Compensation) Act 1991

The proposed modification would require strip acquisition of private and publicly owned land. Details regarding property acquisition for the modified project are outlined in Section 3.6. All property acquisitions would be carried out in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*, which aims to guarantee just compensation terms for land that is acquired by an authority of the State.

Transport for NSW would continue to consult with affected landowners during the development of the proposed modification.

4.2.9 Crown Land Management Act 2016

The *Crown Land Management Act 2016* provides the legislative framework for the administration of land that is vested in the Crown in NSW. Ministerial approval is required to grant a 'lease, licence, permit, easement or right of way over a Crown Reserve'.

The strip acquisition of Crown land outlined in the project REF would be applicable to the proposed modification. No additional Crown land would be required as a result of the modified project. The area of Crown land that would be acquired is shown in.

A community engagement strategy (CES) was required for the project for the lease of Macquarie River (a crown waterway) and some Crown land. This would be applicable to the proposed modification. Transport for NSW would continue to discuss the proposed modification with the Department of Industry (Crown Lands Division).

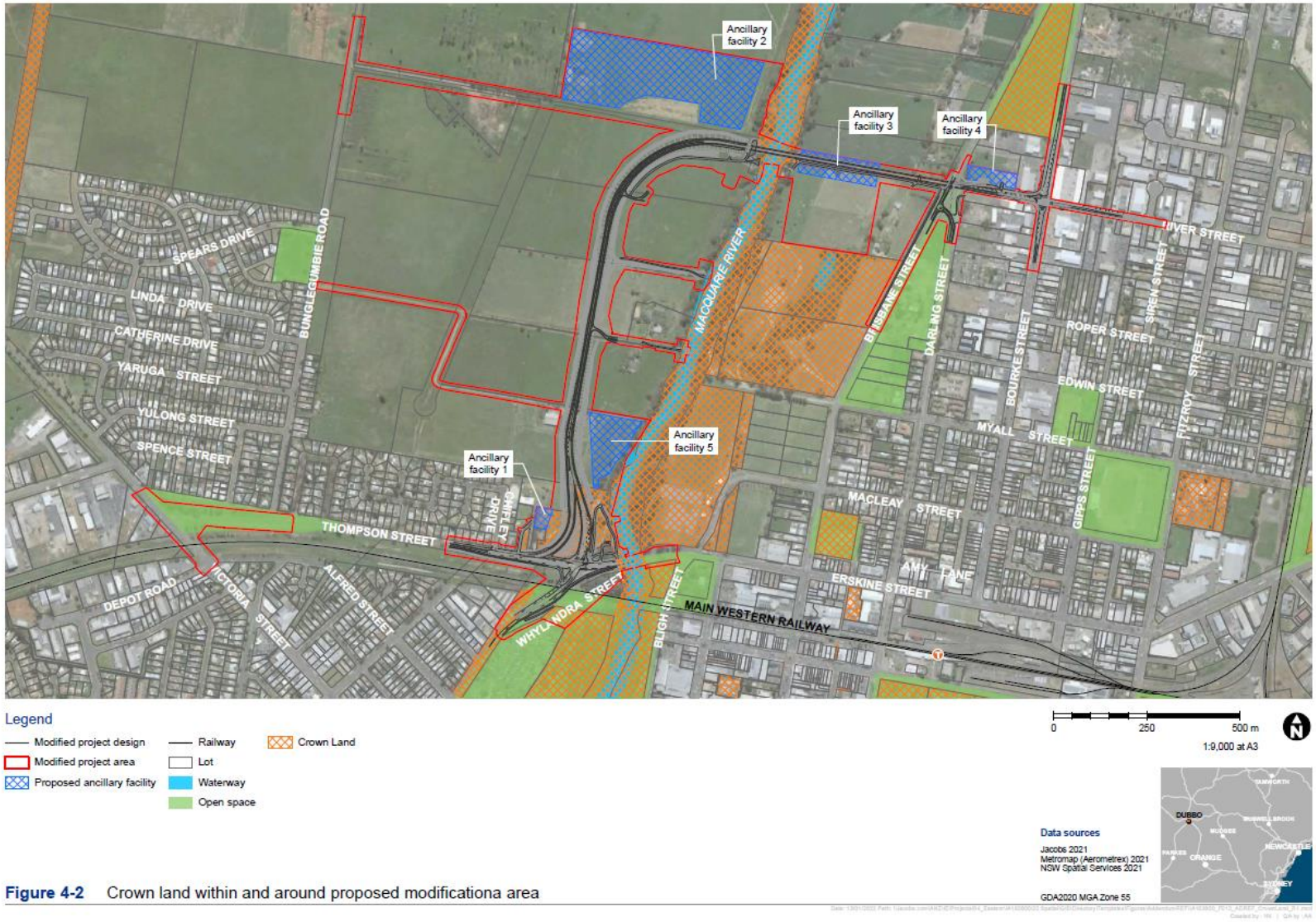


Figure 4-2 Crown land within and around proposed modificationa area

Figure 4-2 Crown land within and around the proposed modification area

4.2.10 Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) and its subordinate legislation commenced on 1 July 2017. The Biosecurity Act replaces wholly or in part 14 separate pieces of biosecurity related legislation including the Noxious Weeds Act 1993. Under the Biosecurity Act, all plants, including weeds are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

The Biosecurity Act and regulations provide specific legal requirements for high risk activities and State level priority weeds. Three weeds of particular concern were recorded in the study area.

4.2.11 Waste Avoidance and Resource Recovery Act 2001

The purpose of the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) is to develop and support the implementation of regional and local programs to meet the outcomes of a State-wide strategy for waste avoidance and resource recovery. It also aims to 'minimise the consumption of natural resources and final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste'.

Waste generation and disposal reporting would be carried out during the construction and operation of the modified project. Procedures would be implemented during construction in an attempt to promote the objectives of the Act.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act a referral is required to the Australian Government for proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in Appendix A and Chapter 6.

A referral is not required for proposed road actions that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Potential impacts to these biodiversity matters are also considered as part of Section 6.3.

Findings – matters of national environmental significance (other than biodiversity matters)

The assessment of the proposed modification's impact on matters of national environmental significance and the environment of Commonwealth land found that there would be no change to the findings of the determined activity and would be unlikely to cause a significant impact on matters of national environmental significance or the environment of Commonwealth land. A referral to the Australian Government Department of Agriculture, Water and the Environment is not required.

4.3.2 Native Title Act 1993

The main objective of the Native Title Act 1993 is to recognise and protect native title. A successful native title claim results in the recognition of the particular rights, interests or uses claimed by the registered party. If a native title claim is recognised under the Act, any actions

by Government on that land must be consistent with the claim. Searches of the register maintained by the National Native Title Tribunal indicate there are no native title claims registered with respect to the land within the modified project area.

4.4 Confirmation of statutory position

The proposed modification is categorised as development for the purpose of a road and is being carried out by or on behalf of a public authority. Under clause 94 of ISEPP the proposed modification is permissible without consent. The proposed modification is not State significant infrastructure or State significant development. The proposed modification can be assessed under Division 5.1 of the EP&A Act. Consent from Council is not required.

Transport for NSW is the determining authority for the modified project. This addendum REF fulfils Transport for NSW's obligation under section 5.5 of the EP&A Act to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

5 Consultation

5.1 Consultation strategy

The consultation strategy for the proposed modification remains consistent with the strategy described in Section 5.1 of the project REF. The Communications Engagement Plan (CEP) prepared for the approved project would be applied to the proposed modification.

5.2 Consultation outcomes

Consultation with the following stakeholders occurred during the development of the detailed design (including the elements of the proposed modification):

- Dubbo Regional Council – regarding access to the future development site north-west of Dubbo, pedestrian access, and to provide general project updates on benefits, features, design and funding
- Residents and landowners – regarding:
    - The height of the western embankment of the proposed Newell Highway
    - Property adjustments and accesses
    - General project updates and progress
- Businesses – regarding property adjustment and accesses, and to provide general project updates and progress
- Utility providers – regarding required adjustments and potential impacts on the network during investigation activities
- Freight industry – regarding potential impacts on the road network during investigation activities
- Emergency services - regarding potential impacts on the road network during investigation activities
- Local community – a project update information sheet was displayed on the project website and in letterbox drop to local residents in July 2021.

5.2.1 Aboriginal community consultation

Consultation with the Aboriginal community has been carried out throughout the project development process in accordance with the Transport for NSW Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) process. This section outlines consultation carried out since the submissions report in 2019. Further detail is provided in Appendix C.

Three Aboriginal Focus Group (AFG) meetings were held during August and September 2021, to which all Registered Aboriginal Parties (RAPs) were invited. Further meetings and phone calls with RAPs occurred following attendance from one RAP at the third meeting in September 2021.

As part of the assessment of potential impacts on Aboriginal heritage, additional site survey of the proposed modified project site was carried out in September/October 2021 with participation from RAPs. This included a meeting with RAPs after the fieldwork was completed to discuss Aboriginal heritage management.

A draft of the Aboriginal Cultural Heritage Assessment Report (ACHAR), which forms part of the addendum REF (Refer to Section 6.1 and Appendix C) was provided to registered

aboriginal stakeholders for a 28-day review and comment period. No further comments were received.

5.2.2 Consultation under ISEPP

A Statutory consultation checklist has been completed for the modified project and is included in Appendix B.

5.3 Ongoing or future consultation

Ongoing consultation will be required by the construction contractor and Transport for NSW to update local property owners, road users and councils of the modified project. Consultation activities will include:

- Project information provided through the project website: https://www.rms.nsw.gov.au/projects/western-nsw/dubbo-bridge/index.html
- Consultation with Dubbo Regional Council, the freight industry and local bus companies will be ongoing in relation to staging plans, traffic management, and temporary road closures
- Property owners identified will continue to be consulted about property acquisition and adjustment requirements
- All directly affected property owners and freight providers/industry using the highway will be consulted before the start of construction and changes to access for private properties (if required)
- Start of construction notification will be carried out via letter box drop to a number of residents around the modified project a minimum of five days prior to the commencement of construction. Start of construction notification will also be provided to the local council and emergency services
- Notifications will be published online and on social media before the start of work detailing the likely timing of the modified project, potential changes to traffic conditions and project management contact details to open communication channels to provide further details or address complaints
- Variable message signs (VMS) will be used along the local road network around the modified project to inform motorists using this road of the work and potential disruption to the road. The VMSs will be deployed a minimum of five days prior to the start of construction
- Consultation with Dubbo Regional Council and Aboriginal community regarding Wiradjuri Park.

6 Environmental assessment

This section of the addendum REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposed modification of the New Dubbo Bridge project. All aspects of the environment potentially impacted upon by the proposed modification are considered. This includes consideration of the factors specified in the guidelines *Roads and Related Facilities EIS Guideline* (DUAP, 1996) and *Is an EIS required?* (DUAP, 1999) as required under clause 228(1) of the Environmental Planning and Assessment Regulation 2000. The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are also considered in Appendix A

Site-specific safeguards and management measures are provided to ameliorate the identified potential impacts.

6.1 Aboriginal heritage

A Stage 3 PACHCI (Transport for NSW Procedure for Aboriginal Cultural Heritage Consultation and Investigation) was carried out and includes an updated ACHAR of the potential construction and operational impacts from the proposed modified project. The ACHAR is provided in Appendix C and is summarised below.

6.1.1 Methodology

The methodology for the assessment of potential impacts on Aboriginal heritage involved:

- Desktop investigation, including Native Title and Aboriginal Heritage Information System (AHIMS) database searches, as well as consideration of previous archaeological survey reports within and adjacent to the study area
- Site survey of the modified project area, with representation from the RAPs
- Consultation with RAPs and stakeholders
- Assessment of Aboriginal heritage relevant to the study area
- Identification and assessment of potential impacts on Aboriginal heritage as a result of the modified project
- Review and identification of the need for any additional or revised mitigation measures compared to the project REF.

6.1.2 Existing environment

The existing environment of the modified project area is consistent with the existing environment described in Section 6.4.2 of the project REF. This is summarised below.

Landscape context

The topography of the modified project area consists of flat floodplains that are associated with the Macquarie River. The modified project area is in two different landscape units as described by Mitchell (2002). Large sections of the modified project area are located along the western and eastern banks of the Macquarie River, a well-watered location that would have provided substantial subsistence for traditional Aboriginal people.

Prior to European settlement, the study area would have been forested, providing rich resources of plants and animals.

Land use history

Since European occupation of the Central Tablelands from the 1800s, the land within the modified project area has been subject to clearing, cropping, agricultural activities, sewage treatment infrastructure, some housing development, and the construction of various linear infrastructure services lines.

The establishment of the grazing and cropping industry involved widespread clearing of native vegetation and ground surface disturbance through the introduction of hard hoofed animals and plough disturbance to plant crops. The bulk of cropping and agricultural activity occurs along the western banks of the Macquarie River near the modified project area, as these flats and floodplains provided ideal soil conditions.

Review of historic aerial photographs shows most of the project area is within land that has undergone surface and subsurface disturbance from various European activities, which decreases the possibility of *in-situ* subsurface Aboriginal objects. In addition to these disturbances, the Macquarie River frequently floods, causing soil hydrological disturbance from scouring and redeposition. This can result in the loss/disturbance of primary context stone artefact sites.

AHIMS search results

A search of AHIMS was conducted on 10 November 2021 to identify registered (known) Aboriginal sites or declared Aboriginal places within or adjacent to the modified project area. The search applied a ten square kilometre search area centred on the modified project area. A total of 116 Aboriginal archaeological sites have been previously registered within the search area. No areas of potential archaeological deposit (PAD) were identified. Six of the Aboriginal archaeological sites are within the modified project area. The search results are shown in Figure 6-1 below. The AHIMS data shows modified trees (carved or scarred) are the dominant site category near the modified project area.

A search for Aboriginal heritage within other sources of information, including previous studies, in or near the modified project area was also conducted. The findings are summarised in Table 6-1.

Table 6-1 Aboriginal heritage identified from previous studies

Study	Scope	Aboriginal heritage identified
Archaeological Assessment of the Proposed Dubbo Sewage Transfer Pipeline (Kelton 2000)	The study area for the pipeline was adjacent to the western bank of the Macquarie River, never further than approximately 75 metres from the bank. The pipeline transects the modified project area at multiple points.	Three artefact scatters (TP-OS-1 [36-1-0299], TP-OS-2 [36-1-0300] and TP-OS-3 [36-1-0301]), one of which one (TP-OS03) is within the modified project area. Kelton did note that pipeline easement he assessed did traverse a 'potentially archaeologically sensitive area'.
Archaeological Monitoring of Sewage Pipeline (Nolan 2000 and 2001)	Archaeological monitoring was carried out during construction for the West Dubbo-Troy Sewage Transfer Pipeline.	Five sites recorded, one of which SP-OS-05 (36-1-0400) is within the modified project area.
Dubbo LGA Study Stage 2 (OzArk 2007)	Assessment of land that had not been previously surveyed in areas	Six new sites were recorded, and four of the nine previously

Study	Scope	Aboriginal heritage identified
	slated for future growth by the Dubbo City Council. Survey area from this study overlaps with most of the modified project area, north of Wiradjuri Park.	recorded sites were located during the assessment. Four of these sites (DLGA-ST-06 [36-1-0551]; DLGA-OS-15 [36-1-0552]; DLGA-IF-07 [36-1-0554] and DLGA-IF-10 [36-1-0555]) are within the modified project area. Site DLGA-ST-07 [36-1-0550] is adjacent to but outside the modified project area.
Previous assessments for the New Dubbo Bridge (Everick 2016 and 2019)	The field survey for the New Dubbo Bridge road alignment was carried out by Everick in 2016. In 2018, test excavations were carried out at these PAD locations and other identified archaeologically sensitive areas as requested by RAPs.	No Aboriginal objects were identified by the field survey. Four PADs were recorded along the alignment: PAD 2-1; PAD 2-2; PAD 2-3; and PAD 2-4. The test excavation program concluded that archaeological sites in the vicinity were likely to be to the east of the modified project area, closer to the Macquarie River.

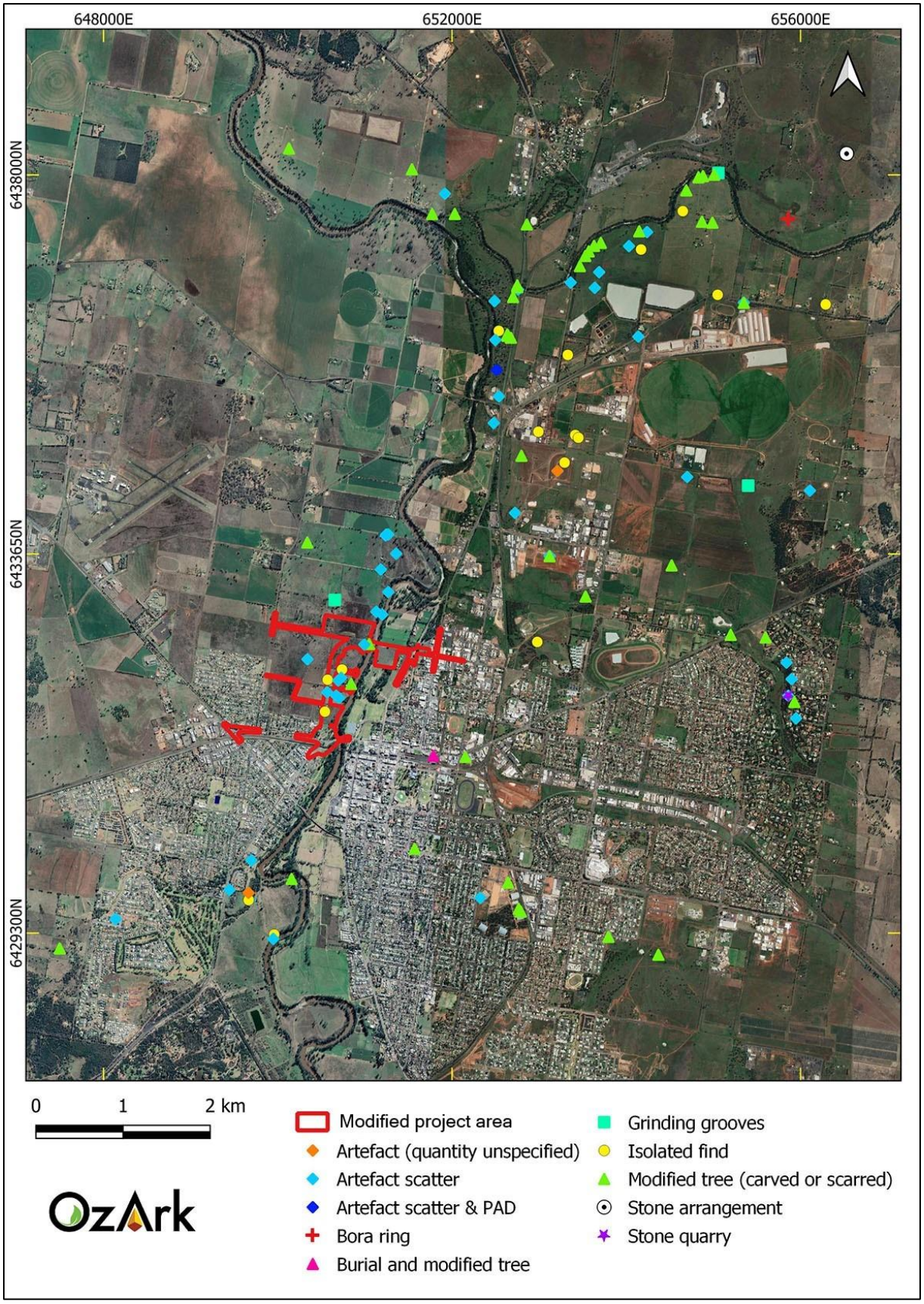


Figure 6-1 AHIMS search results (Ozark 2021)

Summary of significance assessment

Review of background information, Aboriginal community consultation and archaeological assessment has resulted in the identification of six additional Aboriginal archaeological sites to the Aboriginal heritage items outlined in Section 6.4.2 of the project REF. This includes one site [DLGA-ST-07 (36-1-0550)], which is in proximity of the modified project area, but is not likely to be impacted.

It is also noted that one site [DLGA-OS-11 (36-1-0553)] identified in the project REF has not been identified by the investigations for the modified project area. Descriptions of the additional sites identified are provided in the ACHAR (Appendix C).

A significance assessment was carried out for the sites identified as being likely to be impacted by the modified project, using the criteria as identified in Section 6.4.2 of the project REF. A summary of the significance assessment is presented in Table 6-2.

Table 6-2 Summary of significance assessment for Aboriginal heritage items that would be impacted by the modified project

Site name	AHIMS ID	Site type	Significance criteria			
			Social or cultural value	Scientific Value	Aesthetic Value	Historic Value
Bunglegumbie Road 01	36-1-0751	Isolated artefact	High	Low	Low	Nil
DLGA-OS-15	36-1-0552	Artefacts (12)	High	Low	Low	Nil
DLGA-IF-07	36-1-0554	Artefacts (2)	High	Low	Low	Nil
DLGA-IF-10	36-1-0555	Isolated artefact	High	Low	Low	Nil
SP-OS-05	36-1-0400	Artefact scatter	High	Low	Low	Nil
DLGA-ST-06	36-1-0551	Scarred tree	High	Low-Moderate	Low-Moderate	Nil
TP-OS-03	36-1-0301	Artefact scatter	High	Variable	Low	Nil
Terramungamine grinding grooves	N/A	Relocated artefact	High	Low	Low	Moderate

6.1.3 Potential impacts

Construction

In addition to the two Aboriginal heritage items outlined in Section 6.4.3 of the project REF (not including DLGA-OS-11), five further Aboriginal heritage sites would be impacted by the proposed modification. Registered Aboriginal heritage sites impacted by the modified project are summarised in Table **6-3** (heritage sites identified in the project REF are shaded grey).

The Terramungamine grinding grooves may remain in place and be avoided during construction work.

Table 6-3 Summary of potential impact to Aboriginal heritage sites[1]

Site Name	AHIMS ID	Type of harm	Degree of harm	Consequence of harm
SP-OS-05	36-1-0400	Direct	Total	Total[2]
TP-OS-03	36-1-0301	Direct	Partial	Partial
DLGA-ST-06	36-1-0551	Direct	Total	Total
DLGA-OS-15	36-1-0552	Direct	Total	Total
DLGA-IF-07	36-1-0554	Direct	Total	Total
DLGA-IF-10	36-1-0555	Direct	Total	Total
Bunglegumbie Road 01	36-1-0751	Direct	Total	Total

Note: 1. Aboriginal archaeological sites identified in the project REF are shaded grey, additional sites due to the modified project area are not shaded. 2. 'Total' consequence of harm refers to complete destruction of site.

Impact to seven sites (two from the project REF and five from the proposed modification) would be unavoidable: six sites would be totally impacted, while TP-OS-03 (36-1-0301) would be partially impacted. In accordance with the management and mitigation of impacts to Aboriginal cultural heritage, an AHIP to permit harm to Aboriginal objects in the modified project area will be required.

Operation

The operation of the modified project would not result in any further impacts to Aboriginal heritage.

6.1.4 Safeguards and management measures

The proposed additional and/or modified environmental safeguards and management measures to those for the approved project (i.e. those presented in the submissions report) are provided in Table 6-4. Any additional wording has been underlined, and deleted measures, or parts of measures, have been struck out. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

Table 6-4 Safeguards and mitigation measures – Aboriginal heritage

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
AB1	Impacts to Aboriginal Heritage	An AHIP for harm to ~~DLGA-OS-11 (36-1-0553)~~ SP-OS-05 (36-1-0400), DLGA-ST-06 (36-1-0551), DLGA-OS-15 (36-1-0552), DLGA-IF-07 (36-1-0554), DLGA-IF-10 (36-1-0555), Bunglegumbie Road 01 (31-1-0751), TP-OS-03 (36-1-0301) (partial)~~the relocation of Terramungamine grinding grooves will be obtained prior to subsurface works commencing~~. The AHIP will be provided for the following: • Salvage of artefacts from recorded sites in the ~~proposal~~ modified project area and reburial in a in a location agreed by RAPs and recorded on AHIMS • Harm without salvage for all objects identified within the ~~proposal~~ modified project area • Retention of topsoils from an area of 100m^2 around the recorded Aboriginal sites to a designated conservation area near the ~~proposal~~ modified project as agreed with RAPs • Repatriation of the Terramungamine Grinding Grooves to a location agreed by RAPs.	TfNSW	Detailed design/Pre-construction	Additional safeguard
AB2	Aboriginal Heritage	Where impacts can be avoided (e.g. retention of ~~If the~~ Terramungamine Grinding Grooves ~~can be retained~~ within Wiradjuri Park or avoidance of majority of site TP-OS-03 (36-1-0301)) an exclusion zone/fencing will be installed to protect the site before construction. TfNSW will continue to consult with the RAPs. ~~Where the Terramungamine grinding grooves cannot be retained, an AHIP to relocate the Terramungamine grinding grooves will be required before subsurface work begins.~~	Contractor	Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
AB4	Additional Aboriginal heritage impacts	Any further impacts proposed beyond those assessed in this addendum REF or beyond the ~~proposal~~ modified project area must be subject to further assessment and consultation with Aboriginal stakeholders, consistent with the process in this report.	TfNSW	Construction	Additional safeguard

6.2 Non-Aboriginal heritage

An addendum Statement of Heritage Impact (SoHI) was prepared to identify the potential impacts to non-Aboriginal heritage items from the construction and operation of the proposed modification. The addendum SoHI is provided in Appendix D and summarised below.

6.2.1 Methodology

A search of federal, state and local non-Aboriginal heritage registers was carried out on 30 November 2021. The area searched was completed for the modified project area.

The assessment has been limited to a desktop assessment only of the proposed modifications additional to those previously assessed, with no site inspection carried out.

6.2.2 Existing environment

This existing environment of the proposed modification area is consistent with the existing environment described in Section 6.5.2 of the project REF. This information is summarised below.

Dubbo includes many items and features of State and National significance. These items and features record the physical evolution of a country town and its rural hinterland, with its own special characteristics deriving from climate, early isolation and changing economic circumstances. Representative buildings survive from all major periods in Dubbo, many of which are essentially intact, together with archaeological evidence of historic interest.

Dubbo's architecture is notable for its departure from period fashions and the persistence of early vernacular features. Many rural homesteads are examples of early pastoral development and are exceptional for their age, style, history and state of preservation. Many excellent nineteenth and early twentieth century building examples are located in the central urban area, while suburban areas feature houses of a distinctly local character. Scenic rural landscapers and urban landscape features like the Macquarie River foreshores provide an outstanding setting for many heritage items, and development generally.

Six heritage items were previously identified in Section 6.5.3 of the project REF as being potentially impacted by the approved project. Two of these heritage items have been identified in this assessment, as potentially experiencing additional impacts by the proposed modification. These items are listed in Table 6-5. The locations of these heritage items are shown in Appendix D.

Table 6-5 Heritage items within the study area

Item name	Heritage register	ID number	Instrument number (Dubbo LEP 2011)	Distance from the proposed modification	Significance
Dubbo rail bridge over Macquarie River	SHR	50119974	I19	Intersecting	State

Item name	Heritage register	ID number	Instrument number (Dubbo LEP 2011)	Distance from the proposed modification	Significance
'Mount Olive' – 6 Bunglegumbie Road	LEP	152049	I62	Intersecting	Local

6.2.3 Potential impacts

Construction

Potential impacts on the other four heritage items previously assessed in Section 6.5.3 of the project REF would generally be consisted with the project REF. These items are therefore not considered further in this assessment.

As per the project REF, and consistent with the current Newell Highway corridor, the modified project would use the existing Dubbo rail bridge over Macquarie River (Dubbo Railway Bridge). During construction, views to the heritage listed Dubbo Railway Bridge may be temporarily impacted due to the presence of construction plant and equipment.

As part of the proposed modification, the construction methodology for the proposed pier protection barrier around the abutments of the Dubbo Railway Bridge would now include piling work within five metres of the heritage item. Five metres is the safe working distance buffer prescribed in the project REF for piling works, in order to preserve the structural integrity of heritage structures (see Section 6.2.4 of the project REF). Therefore, there would be a potential impact to the Dubbo Railway Bridge from the work associated with the proposed modification. In order to avoid or monitor and mitigate any potential impact, the management measures described in Section 7.2 of the project REF should be adopted for the modified project. This includes vibration monitoring for the duration of vibration intensive works, and where vibration reaches levels that may result in damage to the structure, works would be ceased and revised to minimise vibration impacts.

The rationalisation of drainage as part of the proposed modification includes the construction of an additional operational drainage line from the Proposed Newell Highway alignment to Macquarie River, along the edge of the Mount Olive heritage item curtilage. The proposed work would result in temporary impacts on views from the cottage due to the presence of construction plant and equipment. Historical research suggests that archaeological deposits in this location are unlikely and therefore impacts to the archaeological significance of the heritage item are not anticipated as a result of the additional ground disturbance for the proposed work. However, as per the project REF, the Transport for NSW Unexpected Finds Protocols (Roads and Maritime Services 2015, Transport for NSW 2019) will be applied during construction of the proposed modification.

It should also be noted that the remnants of the house built in 1900, located at 9 Brisbane Street, was identified as an item of concern in the submissions report. Although this item was not listed as an item of environmental heritage on Schedule 5 of the Dubbo LEP, nor was it found in the database reviews, it was to be treated as an unexpected heritage item if found. This item was initially located near ancillary facility three, however, due to relocation of ancillary facility three as part of the proposed modification, impacts to this item are likely to be avoided.

Operation

The proposed drainage work within the curtilage of Mount Olive would be temporary and the area would be reinstated to its pre-construction state once the drainage infrastructure has been installed. Some vegetation clearance associated with the headwall of the drainage outlet would be required, but this is not expected to significantly affect the main river aspect of the cottage. Therefore, there would be no direct impact associated with this proposed change during operation of the modified project.

The piling work in the Dubbo Railway Bridge underpass would also be temporary. The barriers installed as a result of piling work would be consistent with the existing highway infrastructure of the underpass. As per the approved project, levels of signage and lighting would increase around the Dubbo Railway Bridge, but this would be consistent in scale and proportion with the existing highway signage and lighting. Therefore, there would be no direct impact on the Bridge associated with operation of the modified project.

6.2.4 Safeguards and management measures

The proposed additional and/or modified environmental safeguards and management measures to those for the approved project (i.e. those presented in the submissions report) are provided in Table 6-6. Any additional wording has been underlined, and deleted measures, or parts of measures, have been struck out. This is inclusive of environmental safeguard and mitigation measure NAH2 below, which has been amended to include updated guidelines. Other safeguards and management measures that would address vibration impacts are identified in Section 6.6. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

Table 6-6 Environmental safeguards and mitigation measures – non-Aboriginal heritage

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NAH2	Non-Aboriginal heritage	• *The Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) and *Unexpected Heritage Finds Guideline* (TfNSW, 2019) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered • Work will only re-commence once the requirements of that Procedure have been satisfied.	Contactor	Detailed design/ pre-construction	Core standard safeguard H2 Section 4.10 of QA *G36 Environment Protection*
NAH5	Vibration	It is not considered that the ~~proposal~~ modified project will result in significant impacts from construction vibration during construction. However, as a precautionary measure it is recommenced that impacts from vibration to the Dubbo Lattice Railway Bridge, Mount Olive Cottage and "Tantallon" residence are managed as part of the CEMP for the modified project ~~proposal~~, including vibration monitoring as appropriate by a suitably qualified specialist. Engineering advice should be sought to develop an appropriate method of vibration monitoring for these structures.	Contractor	Construction	Additional safeguard
NAH8	Non-Aboriginal heritage	This potential impact has now been avoided due to relocation of the ancillary facility 3. If a potential impact is likely, the remnants of the house on 9 Brisbane Street would be located prior to construction commencing.	Contractor	Pre-construction	Additional safeguard

6.3 Biodiversity

This section outlines the biodiversity values and potential biodiversity impacts from the construction and operation of the proposed modification.

6.3.1 Methodology

Desktop assessment

The existing environment of the proposed modification is largely similar to the existing environment of the project REF. An updated background review of existing information was carried out in order to include areas in the proposed modification that have not been previously assessed. The review focussed on database searches, relevant ecological reports and relevant spatial data pertaining to the modified project area.

The review was used to assess the likelihood of occurrence of threatened species, threatened ecological communities (TECs) and important habitats for terrestrial and aquatic threatened species and migratory species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act), NSW *Fisheries Management Act 1994* (FM Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in the modified project area.

The following sources of information were interrogated:

- EPBC Act Protected Matters Search Tool (PMST) (DAWE, 2021) with 10 x 10 kilometres search area
- BioNet: DPIE Atlas of NSW Wildlife (10 x 10 kilometre search area) and Threatened Biodiversity Data Collection (TBDC) (BCD, 2020)
- The State Vegetation Map: CentWestLachSVM_v1p4_PCT_E_4468 (OEH, 2018)
- Biodiversity Values Map (BVM) and Vegetation Information System (VIS)
- BOM Atlas of Groundwater Dependent Ecosystems (GDE)
- New Dubbo Bridge - Biodiversity Assessment Report (BAR) (2019).

Preliminary determinations from NSW Threatened Species Scientific Committee and the Commonwealth annual final priority assessment list (FPAL) of nominated species and ecological communities were also reviewed. At the time of writing, there are no preliminary or provisional listings of relevance to the proposed modification.

Field survey

A rapid field survey was carried out on 18 November 2021 by an experience and qualified ecologist to identify biodiversity values within the additional areas associated with the proposed modification. The rapid data collection was carried out to assess areas of exotic vegetation in paddocks and around urban areas. Field survey effort was limited to the collection of information about dominant native species, estimate cover and abundance.

One vegetation integrity plot was carried out in accordance with the Biodiversity Assessment Method (BAM) (2020). Vegetation condition was categorised into the following condition classes, namely, Moderate to Poor, Poor and Very Poor (Table 6-7).

Table 6-7 Vegetation condition classes and criteria

Condition Class	
Moderate to Poor	Vegetation has retained a native canopy or the canopy cover is showing occasional signs of regeneration or a derived native grassland with little to no canopy. There is generally a low to

Condition Class	
	moderate diversity of native groundcover species. The understorey and groundcover layers of this condition are co-dominated by exotic species generally exhibit between 10 and 49 per cent foliage cover. The mid and low stratums have been structurally modified.
Poor	Vegetation has retained a native canopy or the canopy cover is showing occasional signs of regeneration or a derived native grassland with little to no canopy. The understorey and groundcover layers of this condition are absent and/or the understorey is generally dominated or co-dominated by exotic species (i.e. foliage cover >50%). Native species diversity is generally relatively low and the mid and low stratums have been structurally modified.
Very Poor	Exotic vegetation with trees and shrubs or exotic species dominated grassland.

A summary of vegetation survey effort, outlining the number of vegetation zones and respective number of vegetation integrity plots sampled in accordance with the BAM (2016 & 2020) within the modified project area in 2018 and 2021 is presented in Table **6-8**. Plot locations are shown in Figure 6-14.

Table 6-8 Summary of vegetation survey effort

Plant community type (PCT)	Condition class	Area (ha) in modified project area	No. plots in 2018	No. plots in 2021
River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (78)	Moderate to Poor	2.75	2 plots (P01, P03)	-
Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion (202)	Moderate to Poor	0.11	1 plot (P04)	-
Derived grassland of the NSW South Western Slopes (796)	Poor	0.1	1 plot (P06)	-
	Moderate to Poor	0.1	-	1 plot (P07)
Common Reed - Bushy Groundsel aquatic tall reedland grassland wetland of inland river systems (181)	Moderate to Poor	0.1	1 plot (P02)	-
Total		**3.16**	**5**	**1**

Limitations

Biodiversity recorded from this study should not be seen to be comprehensive, but rather representation of the species present at the time of the survey. A period of several seasons or years is often needed to identify all the species present in an area, especially as some species are only apparent at certain times of the year (e.g. orchids or migratory birds) and require specific weather conditions for optimum detection (e.g. breeding and flowering periods). The conclusions of this report are therefore based upon available data and limited field survey and are indicative of the environmental condition of the subject sites at the time of the survey. It should be recognised that site conditions, including the presence of threatened species, can change with time.

Weather conditions were suitable for detecting most native flora species following average rainfall three months preceding survey. The conditions for 2021 biodiversity survey were remarkably different compared to the severe drought conditions experienced during the 2018 biodiversity survey.

The vegetation within the modified project area has been assigned to a PCT where possible as listed in the VIS database based on the observed species composition, vegetation structure, landscape position, and underlying geology and soils. The mapping provided in this report is supported by limited ground observations and quantitative data.

6.3.2 Existing environment

The area surrounding the modified project is predominately cleared land that has been used for cropping and grazing. Some locations have been replanted with native and exotic tree species. Details of the existing biodiversity in the modified project area are outlined below.

Plant community types

Previous biodiversity surveys in 2018 identified four Plant Community Types (PCT) in the project area:

- River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (PCT 78)
- Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion (PCT 202)
- Derived grassland of the NSW South Western Slopes (PCT 796)
- Common Reed - Bushy Groundsel aquatic tall reedland grassland wetland of inland river systems (PCT 181).

Vegetation within the additional areas associated with the proposed modification is mostly comprised of open exotic grassland (41.5 hectares) and/or with a planted canopy of native or exotic trees (3.8 hectares). Parts of the exotic grassland fringing the river with River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (PCT 78) contained partial cover of native perennial grass *Paspalidium aversum*, however much of the cover was comprised of exotic perennial grasses such as *Bromus* spp. and *Cenchrus clandestinus* as well as annual exotic species.

Two small patches of Derived grassland of the NSW South Western Slopes (PCT 796) comprising 0.33 hectares were identified within the additional areas associated with the proposed modification. These are located at the junction of Thompson Street and Mitchell highway, and near Bunglegumbie Road. Both patches are highly modified as either an open grassland or grassland with native planted trees and vary in condition between Poor and Moderate to Poor (see Figure 6-2).

A floristic vegetation integrity plot (Plot 1-7) was carried out within the moderate to poor PCT 796 patch to determine PCT allocation and vegetation integrity. Although this patch is located on a road verge next to Thompson Street with established planted native trees, the groundcover is dominated by native grasses such as *Austrostipa scabra*, *Chloris truncata* and *Rytidosperma* spp. It also contains native forbs such as *Plantago varia*, *Vittadinia gracilis*, *Einadia nutans* and *Dichondra repens*. The patch is located on Jurassic Piliga sandstone within proximity to the Macquarie River tertiary floodplain. However, assigning a PCT has proven difficult due to modified state of the patch. The site evidence indicates that the patch was potentially associated with a Grassy Woodland vegetation formation based on typical grass and forb species detected in the groundcover. Review of the state vegetation map (OEH, 2018) along with geology and landform information within the locality suggests the patch may have comprised the following PCTs:

- White Cypress Pine woodland on sandy loams in central NSW wheatbelt (PCT70)
- Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion (PCT81)
- White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (PCT267).

Due to the high level of disturbance history of the patch, there is little to no evidence to determine whether the patch is associated with a threatened ecological community (TEC).

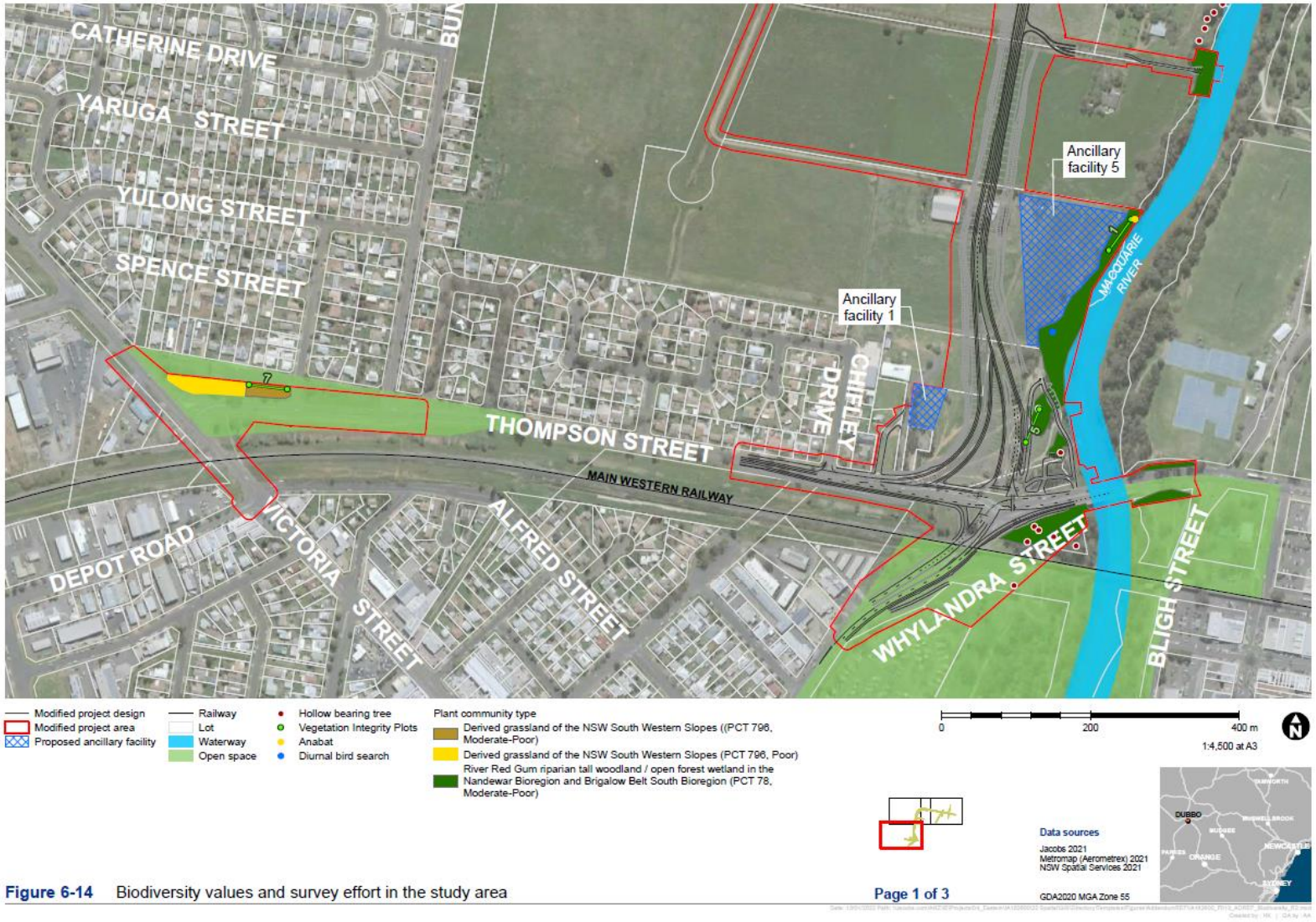


Figure 6-2 Biodiversity values and survey effort in the study area (1 of 3)

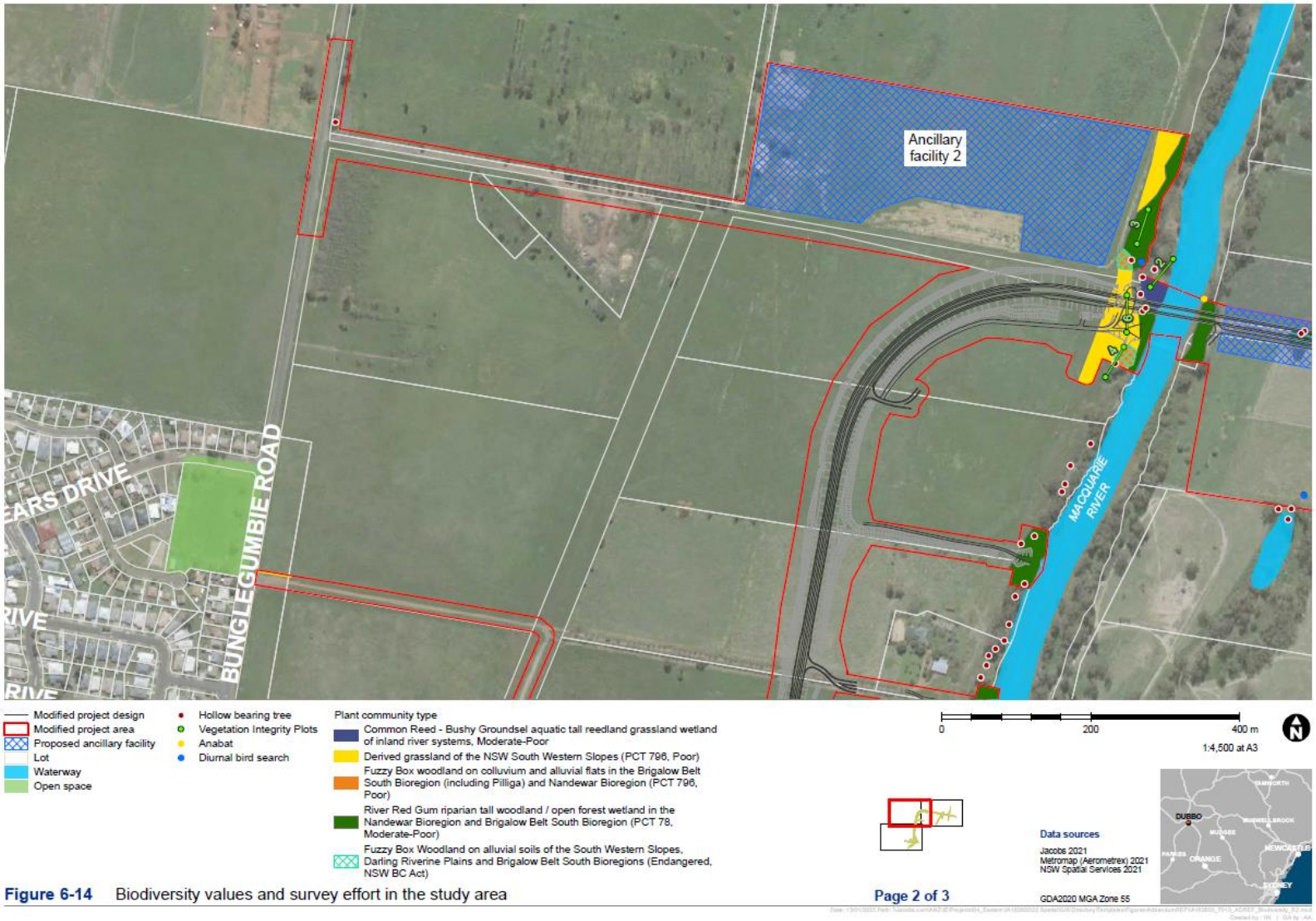


Figure 6-3 Biodiversity values and survey effort in the study area (2 of 3)

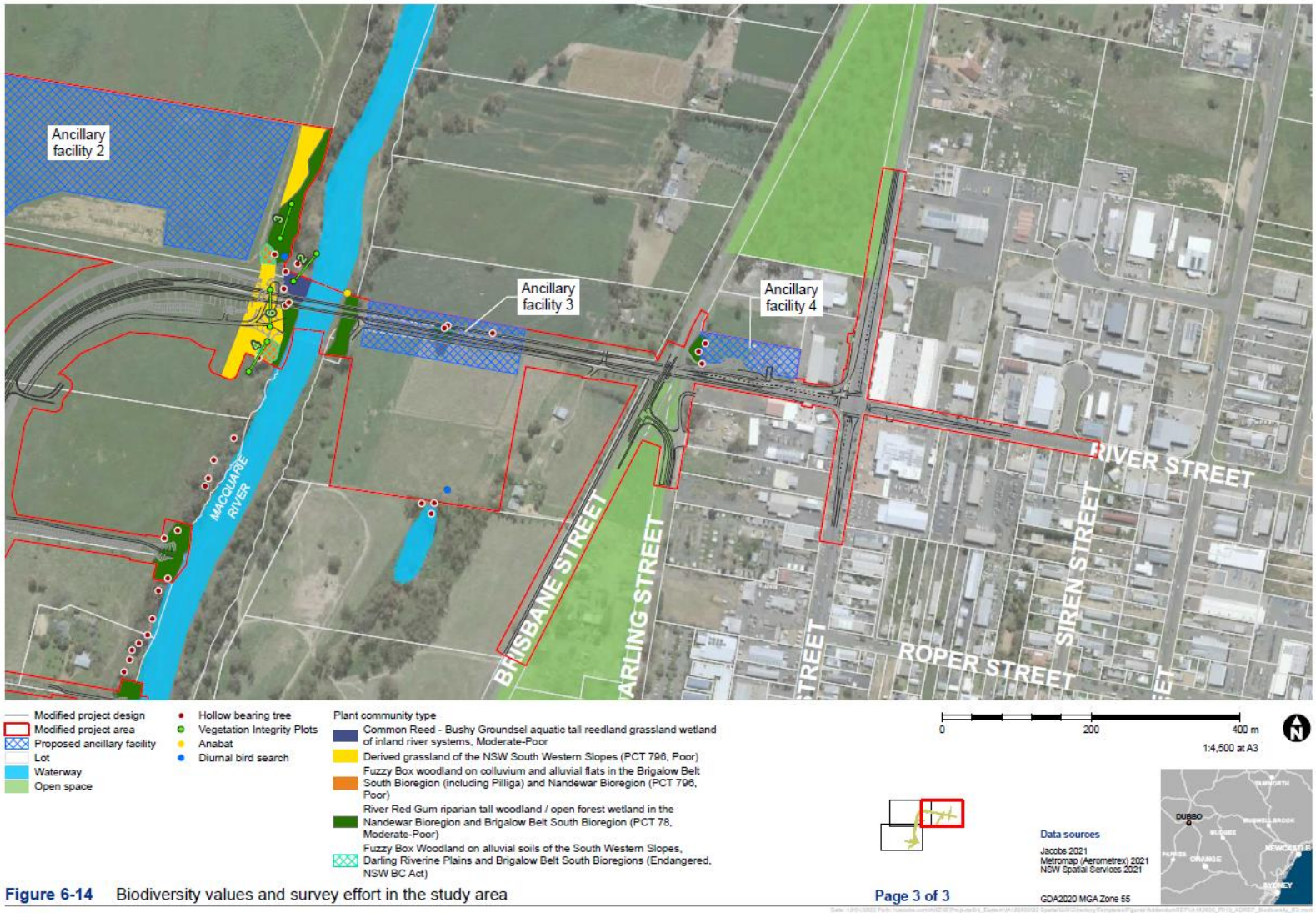


Figure 6-4 Biodiversity values and survey effort in the study area (3 of 3)

Fauna habitat

Previous biodiversity surveys conducted in 2018 were checked for the modified project area. The following fauna habitat were identified in the modified project area:

- Emile Serisier Bridge contained numerous clay nests made by Fairy Martin (*Petrochelidon ariel*), which provide potential habitat for hollow-roosting microbats. roosting bats are likely to occupied nearby habitats with numerous suitable hollows, waterways and direct fly paths.
- The anabat recorded five bat species, mostly tree roosting species comprising Gould's Wattled Bat (*Chalinolobus gouldii*), Large Forest bat (*Vespadelus darlingtonia*), Chocolate Wattled Bat (*Chalinolobus morio*), free-tailed bats species (*Mormopterus* spp.) and vesper bat species (*Nyctophilus* spp).
- Remnant *Eucalyptus camaldulensis* (River Red Gum) with small to large hollows, other isolated remnant trees, small patches of planted indigenous trees and other planted trees and shrubs provide the majority of foraging and shelter habitat in the modified project area. Although the habitat is mostly dominated with exotic groundcover.

There was limited fauna habitat observed from the 2018 surveys which were within the additional areas associated with the proposed modification. Planted trees and shrubs provide shelter and refuge for resident and vagrant fauna species, mainly birds. Two hollow bearing trees were identified in the proposed modification comprising possible small hollows around five centimetre wide in a *Brachychiton populneus* (Kurrajong) along Bunglegumbie Road, and a large *E. camaldulensis* (River Red Gum) in the park near Whylandra Street (see Figure 6-2). These hollows are suitable for small common birds, and potentially roosting microbats.

Threatened ecological communities

Previous biodiversity surveys in 2018 identified the following TECs in the modified project area:

- Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions listed endangered under the BC Act
- The aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River (Lowland Darling River EEC) which is listed as an endangered ecological community under the FM Act.

Within the modified project area, there are 0.11 hectares of Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions TEC.

Due to the disturbance history of existing vegetation in the additional areas associated with the proposed modification, no other TECs were identified from the 2018 surveys.

Threatened flora and fauna

No threatened flora and/or fauna species were detected during surveys. However, 24 threatened species are considered as having a moderate likelihood of occurring within the modified project area based on identified habitat features (refer to Table 6-9). One species that was considered in the project REF (Brown Treecreeper) has been removed from consideration for the modified project. Two additional species (Slender Darling-pea and Dusky Woodswallow) have been considered for the modified project and are depicted in bold font in Table 6-9.

Threatened species habitat in the areas associated with the proposed modification is considered minimal. Only the identified hollow bearing trees have potential to support roosting and breeding habitat for threatened species such as microbats and other hollow dependent fauna. Other areas only provide marginal foraging habitat.

Table 6-9 Threatened species with a moderate likelihood of occurrence

Species name	Common name	Status			Likelihood of occurrence in the modified project area
		EPBC Act	BC Act	FM Act	
Diuris tricolor	Pine Donkey Orchid		V		Moderate
Swainsona murrayana	**Slender Darling-pea**	**V**	**V**		**Moderate**
Saccolaimus flaviventris	Yellow-bellied Sheath-tail Bat		V		Moderate
Chalinolobus picatus	Little Pied Bat		V		Moderate
Miniopterus orianae oceanensis	Large Bent-winged Bat		V		Moderate
Nyctophilus corbeni	Corben's Long-eared Bat	V	V		Moderate
Pteropus poliocephalus	Grey-headed Flying Fox	V	V		Moderate
Anseranas semipalmata	Magpie Goose		V		Moderate
Artamus cyanopterus cyanopterus	**Dusky Woodswallow**		**V**		**Moderate**
Chthonicola sagittata	Speckled Warbler		V		Moderate
Daphoenositta chrysoptera	Varied Sittella		V		Moderate
Glossopsitta pusilla	Little Lorikeet		V		Moderate
Polytelis swainsonii	Superb Parrot	V	V		Moderate
Pomatostomus temporalis temporalis	Grey-crowned Babbler		V		Moderate
Stagonopleura guttata	Diamond Firetail		V		Moderate
Falco subniger	Black Falcon		V		Moderate
Circus assimilis	Spotted Harrier		V		Moderate
Hieraaetus morphnoides	Little Eagle		V		Moderate

Species name	Common name	Status			Likelihood of occurrence in the modified project area
		EPBC Act	BC Act	FM Act	
Ninox connivens	Barking Owl		V		Moderate
Tandanus tandanus	Eel Tailed Catfish			E	Moderate
Maccullochella macquariensis	Trout Cod	E		E	Moderate
Maccullochella peelii	Murray Cod	V			Moderate
Ambassis agassizzi	Olive Perchlet			EP	Moderate
Bidyanus bidyanus	Silver Perch	E		V	Moderate
EP = Endangered Population, E = Endangered, V = Vulnerable					

Wildlife connectivity corridors and habitat fragmentation

Vegetation and fauna habitat within the proposed modification does not provide important wildlife connectivity. As noted in the 2018 BAR, the key wildlife corridor in the modified project area is the Macquarie River and associated riparian vegetation.

Aquatic surface water ecosystems and fish habitat

Previous biodiversity surveys in 2018 identified the following aquatic habitat in the modified project area:

- The Macquarie River is a greater than 5th order stream (Strahler) and contains suitable habitat for numerous threatened fish including the Eel Tailed Catfish (*Tandanus Tandanus*), Silver Perch (*Bidyanus bidyanus*), Trout Cod (*Maccullochella macquariensis*) and Olive Perchlet (*Ambassis agassizzi*)
- The upstream section of the Macquarie River also contains substantial overhanging vegetation, predominantly S*alix babylonica* (Willow) and patches of *Phragmites australis* (Common reed) and *Typha orentalis* (Bulrush) were observed on the in the modified project area. A small amount of undercutting occurs along the majority of the river bank and overhanging vegetation including *Casuarina cunninghamiana* (River Sheoak) is present sporadically along the bank of the Macquarie River.

No aquatic habitats occur within the additional areas for the proposed modification.

Groundwater dependent ecosystems

The BOM's Atlas of GDE mapped the Macquarie River as an unclassified potential Aquatic GDE and a high potential terrestrial GDE. Land next to the Macquarie River up to a distance of about 80 metres from the river was also mapped as a high potential terrestrial GDE.

Weed and pest species

Weed and pest species in the modified project area is generally consistent with the project REF. It is currently known or likely habitat for a range of pest species including foxes (Vulpes vulpes) and rabbits (Oryctolagus cuniculus).

Three weeds of particular concern include Lycium ferocissimum (African boxthorn), Dolichandra unguis-cati (Cat's claw creeper) and Harrisia species (Harrisia cactus) were recorded in the modified project area.

6.3.3 Potential impacts

Construction

Removal of native vegetation

This report has assessed the modified project area for its biodiversity values as a worst-case impact to allow the detailed design to shift if necessary, without the need to modify the project again. The project biodiversity offset obligations are revised in Section 6.3.5.

The direct impact associated with vegetation and habitat removal has been calculated using the modified project area. The modified project would comprise a total clearing of 3.16 hectares of native vegetation. The area of impact on native vegetation has increased by 2.42 hectares since the project REF based on the modified project area. Most of this increase will impact River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (78) in areas with the modified drainage lines near the river, in park land at the eastern end of Thompson Street and other patches along the western side of the river (Table 6-10).

Table 6-10 Direct impacts to native vegetation

Plant community type (PCT)	Condition class	TEC	Impact area (ha) in modified project area	Change in impact area compared to project REF
River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (78)	Moderate to Poor	N/A	2.75	+2.28
Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion (202)	Moderate to Poor	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions (endangered, BC Act)	0.11	+0.09
Derived grassland of the NSW South Western Slopes (796)	Poor	N/A	0.10	-0.09
	Moderate to Poor		0.10	0
Common Reed - Bushy Groundsel aquatic tall reedland grassland wetland	Moderate to Poor	N/A	0.10	+0.04

Plant community type (PCT)	Condition class	TEC	Impact area (ha) in modified project area	Change in impact area compared to project REF
of inland river systems (181)				
Total			**3.16**	**+2.42**

Removal of threatened ecological communities

There are around 0.11 hectares of Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions TEC (listed endangered under the BC Act) within the modified project area. Although not all locations of this TEC are likely to be impacted by the project, this is an increased worst case impact of +0.09 hectares.

Removal of threatened species and habitat

All native vegetation has potential to provide habitat to threatened species, particularly patches in higher condition or with trees for shelter, food resources and hollow bearing trees with roosting or nesting opportunities. An additional 15 hollow bearing trees to that described in the project REF may be removed for the modified project (23 total). This includes mostly River Red Gum trees and one Kurrajong tree.

All threatened species have a moderate likelihood of occurring in the modified project area and are shown in Table 6-11. The condition of habitats for potential threatened native flora is minimal. However, the survey timing for associated threatened flora was not suitable during November 2021 survey, therefore potential habitat is assumed.

Table 6-11 Impacts on potential threatened species habitat

Plant community type (PCT)	Threatened species name	Impact area (ha) in modified project area	Change in impact area compared to the project REF
River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (78)	• Grey-crowned Babbler • Spotted Harrier • Grey-headed Flying Fox • Dusky Woodswallow • Speckled Warbler • Little Eagle • Barking Owl • Little Pied Bat • Yellow-bellied Sheathtail-bat • Varied Sittella • Diamond Firetail • Black Falcon • Little Lorikeet	2.75	+2.28

Plant community type (PCT)	Threatened species name	Impact area (ha) in modified project area	Change in impact area compared to the project REF
	• Corben's Long-eared Bat • Large Bent-winged Bat • Superb Parrot • Magpie Goose		
Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion (202)	• Grey-crowned Babbler • Dusky Woodswallow • Speckled Warbler • Little Eagle • Yellow-bellied Sheathtail-bat • Varied Sittella • Diamond Firetail • Black Falcon • Little Lorikeet • Large Bent-winged Bat • Corben's Long-eared Bat • Superb Parrot • Grey-headed Flying Fox	0.11	+0.09
Derived grassland of the NSW South Western Slopes (796)	• Diuris tricolor • Swainsona murrayana • Grey-crowned Babbler • Dusky Woodswallow • Speckled Warbler • Little Eagle • Diamond Firetail • Black Falcon	0.20	-0.09
Common Reed - Bushy Groundsel aquatic tall reedland grassland wetland of inland river systems (181)	• Spotted Harrier • Dusky Woodswallow • Little Eagle • Little Pied Bat • Yellow-bellied Sheathtail-bat • Diamond Firetail • Black Falcon • Corben's Long-eared Bat	0.10	+0.04

Aquatic impacts

There is potential for impacts on aquatic biodiversity during the construction of the proposed modified project, given the proximity to the Macquarie River. The impacts to the bed of the river during the bridge construction remains the same as the project REF. The construction of the modified drainage lines have potential to impact on downstream water quality and increase turbidity and sedimentation from the work, tannins from mulch, and accidental spills/leaks. This may also increase impact on riparian or aquatic vegetation, logs or other habitat structures. Slight increase in the obstruction to fish passage and changes to hydrology. The clearing of vegetation on floodplain would remove an additional 2.01 hectares of habitat of the Lowland Darling River EEC to that described in the project REF. This is a total removal of 2.75 hectares for the modified project. Consistent with the REF, this is considered a small area of habitat.

Fauna mortality

Fauna injury or death has the greatest potential to occur during construction when vegetation clearing would take place. The extent of this impact would be proportionate to the extent of vegetation that is cleared. Less mobile species (e.g. ground dwelling reptiles), or those that are nocturnal and nest or roost in trees during the day (e.g. arboreal mammals and microbat species), may find it difficult to rapidly move away from the clearing activities when disturbed. The modified project area is likely to contain a number of arboreal species (e.g. possums) and, consistent with the project REF, nesting birds that may be injured or killed during vegetation removal in vegetation along the river, particularly in large trees with hollows. Reptiles, frogs and invertebrates may also be injured or killed during construction as habitat is cleared.

Entrapment of wildlife in any trenches or pits that are dug is a possibility if the trenches are deep and steep sided. Wildlife may also become trapped in or may choose to shelter in machinery that is stored in the modified project area overnight. If these animals were to remain inside the machinery, or under the wheels or tracks, they may be injured or may die once the machinery is in use.

There is a chance of fauna mortality occurring during the construction phase of the modified project through vehicle collision (i.e. roadkill). Vehicle collision is a direct impact that reduces local population numbers. Mammals, reptiles, amphibians and birds are all at risk of vehicle strike. As there are no definitive data on current rates of roadkill or fauna population densities in the modified project area, the consequences of vehicle strike on local populations are unknown.

Ancillary facilities

Proposed ancillary facilities are located in exotic grassland used for pasture livestock grazing and council activities and areas of parkland with planted shrubs and trees. Direct impacts to biodiversity are unlikely to occur if kept within the proposed modified project area. In order to minimise the transport of sediments and pollutants from ancillary facilities, the sites are best located on flat ground that do not require vegetation clearance, away from overland flowpaths and in areas of high topography with minimal upstream catchment.

Operation

Wildlife connectivity corridors

Consistent with the project REF, the modified project area is already highly fragmented but retains a wildlife corridor along the river. The loss of trees and habitats would contribute to an increase in isolation of habitats through loss of some small stepping-stone patches, narrowing and degradation of linear patches of vegetation, and an increased distance between habitats on to the river from the westside. This impact would be of low magnitude

and targeted mitigation measures to restore habitat connectivity and thereby address this impact are considered necessary.

There would be no change to impacts on wildlife connectivity corridors as a result of the operation of the proposed modification.

Edge effects

The modified project would be built in an area that is currently subject to a high level of edge effects from agricultural activity, the existing roadways and other development. The vegetation patches within the modified project area are affected by high weed invasion and other edge effects along existing patch edges and roadsides.

There are likely to be additional edge effects resulting from the proposed modification as the new edges would typically be in areas only currently experiencing low to moderate weed invasion and other edge effects in areas along the river.

Injury and mortality

Numerous macropods were observed on the west side of the river, including Eastern Grey Kangaroo and Common Wallaroo during the project REF assessment. Vehicle collision is a direct impact that reduces local population numbers. Mammals, reptiles, amphibians and birds are all at risk of vehicle strike. Consistent with the project REF, as there are no definitive data on current rates of roadkill or fauna population densities in the modified project area, the consequences of vehicle strike on local populations are unknown.

Invasion and spread of weeds

The modified project area contains numerous species of weeds in high cover and abundance, particularly on agricultural land with exotic grassland and along minor roads and tracks. It is not anticipated that the modification will change impacts to invasion and the spread of weeds. The spread and proliferation of weeds will be managed during construction, as per the project REF.

Invasion and spread of pests

Consistent with the project REF, construction activities have the potential to disperse pest species out of the modified project area across the surrounding landscape but the magnitude of this impact would be low and mitigation measures are not likely to be effective and are not deemed necessary.

There would be no change to impacts to invasion and spread of pests as a result of the operation of the proposed modification. Invasion and spread of pathogens and disease

Several pathogens known from NSW have potential to impact on biodiversity as a result of their movement and infection during construction. Of these, three are listed as a key threatening process under either the EPBC Act and/or BC Act including:

- Dieback caused by Phytophthora (Root Rot; EPBC Act and BC Act)
- Infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis (EPBC Act and BC Act)
- Introduction and establishment of exotic Rust Fungi of the order Pucciniales on plants of the family Myrtaceae (BC Act).

While these pathogens were not observed or tested for in the modified project area, the potential for pathogens to occur should be treated as a risk during construction. As per the project REF, the most likely causes of pathogen dispersal and importation associated with the modified project include earthworks, movement of soil, and attachment of plant matter to vehicles and machinery during all project phases (construction and operation).

Changes to hydrology and aquatic impacts

The proposed modified project will involve the bridge construction and increased elevation of the road surface. This may cause changes to the duration and extent of inundation of areas in the vicinity of waterways. As per the project REF, these changes are considered likely to only impact relatively small areas. They are unlikely to result in the loss of native vegetation but may cause changes in the relative abundance of species. For instance, if areas are more frequently inundated, sedges and other semi-aquatic plants are likely to proliferate relative to dryland grass species and forbs.

As per the project REF, the roads and bridge would be sealed, cleared areas landscaped and scour protection installed. During the operational phase of the project there would be no exposed topsoil and therefore little or no risk of soil erosion and subsequent transport of sediment into nearby receiving waterways. Water quality risks that may impact aquatic biodiversity during operation would instead be associated with runoff of pollutants from new road surfaces, accidental spills, increased impervious areas and permanent structures within waterways. Through the implementation of appropriate design and management these risks are unlikely.

There would be no change to impacts on aquatic biodiversity as a result of the operation of the proposed modification.

Noise, light and vibration

Consistent with the project REF, considering the existing levels of noise and vibration from the existing Newell Highway and other roads by vehicles, it is unlikely there would be a significant increase in noise and vibration during operation of the road that would result in any increased impacts to biodiversity within the modified project area. There is however potential for impacts to fauna from noise and vibration during construction, which may result in fauna temporarily avoiding habitats adjacent to the construction. The magnitude of this impact would be low and mitigation measures are not deemed necessary.

Lighting would be used at night to enable work to be completed that may result in impacts to nocturnal fauna. Nocturnal species such as possums and microbats may avoid the habitat in the modified project area during construction as temporary ‘daylight’ conditions would be created by the mobile lighting system. Consistent with the REF, this impact is considered temporary and would not have long lasting effects on the biodiversity of the modified project area. The magnitude of this impact would be low and mitigation measures are not deemed necessary.

There would be no change to noise, light and vibration impacts on biodiversity as a result of the operation of the proposed modification.

Groundwater dependent ecosystems

As per the project REF, the proposed development’s influence on groundwater levels is anticipated to be limited to localised changes in the area of bridge footings which are beneath the water table. Deep footings which intersect the groundwater level in the alluvial material would likely lead to some minor localised increase in groundwater level up-gradient of the footing due to flow obstruction. Such changes are not expected to affect the local groundwater flow system, alter groundwater/surface water exchange with the Macquarie River or impact surrounding bores.

The potential changes to groundwater level are considered unlikely to impact local GDEs. Potential impacts to groundwater quality could affect the health of GDEs and the quality of the groundwater discharge the Macquarie River.

Conclusion on significance of impacts

Although there would be an increase in the area of impact to River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

(78) which provides potential habitat to threatened species, the primary work of the project is likely to avoid most of the known areas of high biodiversity values such as large trees and hollow bearing trees where possible.

The proposed modification is not likely to significantly impact threatened species, populations or ecological communities or their habitats, within the meaning of the BC Act or FM Act and therefore a Species Impact Statement is not required.

The modification is not likely to significantly impact threatened species, populations, ecological communities or migratory species, within the meaning of the EPBC Act.

6.3.4 Safeguards and management measures

No changes are proposed to the contamination environmental safeguards and management measures presented in the submissions report as a result of the proposed modification. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

6.3.5 Biodiversity offsets

The Transport *Guideline for Biodiversity Offsets* (Roads and Maritime, 2016) was used to consider biodiversity offsets for the modified project. Residual impacts to biodiversity values in the modified project area relevant to the offsetting thresholds, include:

- Works involving the clearing of >1 hectare of nationally listed threatened species habitat in moderate condition, such as foraging habitat for Grey-headed Flying Fox, Corben's Long-eared Bat and potential breeding habitat for Superb Parrot.

Other residual impacts do not meet the offsetting thresholds for the following activities:

- The work would not involve the clearing of national or NSW listed critically endangered ecological communities in moderate to good condition
- The work would not involve the clearing of national listed threatened ecological communities
- The work would not involve the clearing of more than 5 hectares of an endangered or vulnerable ecological community
- The work would not involve the clearing of NSW listed threatened species habitat where the species is a species credit species as defined in the Threatened Species Profile Database (TSPD)
- The work would not involve the clearing of >5 ha of NSW listed threatened species habitat where the species is an ecosystem credit species as defined in the TSPD.

The Macquarie River is classified as Type 1 highly sensitive key fish habitat, however, the modified project is unlikely to cause a net loss of habitat.

To avoid offset duplication, once a particular area of threatened ecological community or threatened species habitat has been considered for offsets that area cannot be counted again with a different threatened ecological community or threatened species habitat.

This biodiversity assessment identifies that the modified project is not likely to have a significant impact on threatened biodiversity listed under the BC Act and EPBC Act (see Appendix C and D of the 2019 BAR). Therefore, no like-for-like offsets for MNES are required.

Transport for NSW would provide biodiversity offsets or where offsets are not reasonable or feasible, supplementary measures for impacts that exceed the thresholds in Table **6-12**.

Table 6-12 Biodiversity residual impacts and relevant offset thresholds

Zone/ Condition	PCT	Threatened species habitat of ecosystem credit species (ha)	Offset threshold and applicability
Moderate to Poor	River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (78)	Grey-headed Flying Fox (2.75 ha) Corben's Long-eared Bat (2.75 ha) Superb Parrot (2.75 ha)	Applies to 2.75 ha of nationally listed species habitat in moderate to poor condition
Moderate to Poor	Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion (202)	Grey-headed Flying Fox (0.11 ha) Corben's Long-eared Bat (0.11 ha) Superb Parrot 0.11 ha)	Applies to 0.11 ha of nationally listed species habitat in moderate to poor condition
Moderate to Poor	Derived grassland of the NSW South Western Slopes (796)	*Diuris tricolor* (0.10 ha) *Swainsona murrayana* (0.10 ha)	Applies to 0.10 ha of nationally listed species habitat in moderate to poor condition
Poor		N/A	
Moderate to Poor	Common Reed - Bushy Groundsel aquatic tall reedland grassland wetland of inland river systems (181)	Corben's Long-eared Bat (0.10 ha)	Applies to 0.10 ha of nationally listed species habitat in moderate to poor condition
Total impacts requiring offsets			**3.06 ha of nationally listed species habitat**

According to the TfNSW guidelines for offset ratios, a suitable offset for the loss of 3.06 hectares of nationally listed threatened species habitat would be a 3:1 ratio. This would result in an offset requirement of 9.18 hectares for the nationally listed threatened species habitat in moderate condition.

Table 6-13 TfNSW for NSW offset ratios and summary of proposal offset requirement

Impact type	Ratio	Offset requirement
Loss of NSW listed critically endangered ecological communities (CEEC)	Offset at a ratio of 4:1 where the offset sites are in moderate to good condition Offset at a ratio of 8:1 where the offset sites are in poor condition including rehabilitation sites	Not applicable
Loss of threatened fauna species	Offset area of habitat lost at a ratio of 3:1	8.88 hectares of nationally listed fauna species habitat
Loss of threatened flora species	Offset individuals lost at a ratio of 3:1	0.30 hectares of nationally listed flora species habitat. Under the BAM, offsets are calculated by area rather than number of individuals for this species.

Biodiversity Offset Strategy

The final offset requirement for the modified project would be determined during detailed design and development of the offset package. During the detailed design phase, the modified project area may change from the modified project area assessed in this report. This may result in a different offset requirement for the project than what is presented in this report.

6.4 Flooding and hydrology

The *New Dubbo Bridge Addendum Hydrology and Hydraulics Assessment* (Jacobs, 2021) was prepared to identify the potential flooding and hydrology impacts from the construction and operation of the modified project. The assessment is provided in Appendix E and summarised below.

6.4.1 Methodology

The methodology for the flooding and hydrology assessment involved:

- A review of background information and previous flooding assessment, including those outlined in the project REF
- A review of the proposed modification and performance objectives relevant to drainage and flooding
- Flood modelling to characterise existing flooding conditions and drainage patterns at the modified project site
- Update to the TUFLOW model used in the project REF to include the proposed modifications

- Flood modelling to quantify flood behaviour and potential flood impacts of the construction and operational phase of the modified project
- Modelling of climate change to quantify changes to flood behaviour with increased rainfall for the operational phase of the modified project
- Qualitative assessment of potential impacts on hydrology
- Review and identify the need for additional or revised mitigation measures compared to the approved project.

Flood modelling

The TUFLOW (a flooding simulator) flood model was updated for the modified project. The modelling assumptions applied to the assessment of the modified project are described in Appendix E.

During the construction phase, five construction compound sites have been proposed within the modified project area, as shown in Figure 3-1. The construction phase model was run for the five per cent AEP flood event at these sites. As the construction period is temporary, an upper limit AEP was selected for this short period. Construction compounds are to be placed on filled pads to above the five per cent AEP flood level where required.

The operational phase model was run for 20 per cent, 10 per cent, five per cent, two per cent, one per cent, 0.5 per cent and 0.05 per cent AEP and Probable Maximum Flood (PMF) events.

6.4.2 Existing environment

The existing environment of the modified project is generally consistent with that outlined in Section 6.5.2 of the project REF. It is described in Appendix E and summarised below.

Catchment

The Macquarie River has a catchment area of approximately 19,800 kilometres squared at the location of the New Dubbo Bridge. The flow in the Macquarie River is controlled by the Burrendong Dam which is located 60 kilometres upstream of Dubbo. The Talbragar River is a major tributary of the Macquarie River which enters from the east and has its confluence with the Macquarie River approximately seven kilometres downstream of the New Dubbo Bridge. The Talbragar River has a catchment area of approximately 4,960 km^2 at the catchment outlet.

The catchment in the vicinity of Dubbo is characterised by fertile river flats typically located on the inside of river bends. Upper areas of the catchment are generally undulating to hilly and consist of a mixture of grazing land and remnant bushland.

Existing flood conditions

Flood mapping provided in Appendix E shows that a large area of Dubbo town centre is inundated in the two per cent AEP and one per cent AEP events (see Figure 6-5). Flooding for the five per cent AEP event results in out of bank flooding with flooding extending to low-lying areas within Dubbo and affecting commercial premises located on right bank of the Macquarie River near Dubbo town centre. Flooding within the 20 per cent AEP is mostly contained within the banks of Macquarie River. During the 0.05 per cent AEP and PMF events, flooding extends out to a total width of 1.6 to 1.7 kilometres, which would impact Dubbo Town centre.

In the one per cent AEP event, flooding in the Macquarie River and its floodplain is categorised as very high hazard that is unsafe for people and vehicles. There are areas of lower flood hazard, generally on the fringes of the floodplain. However, flood hazards in

Dubbo Town Centre have been identified as posing a risk to vehicles and pedestrians. The existing Newell Highway crossing of the Macquarie River and its approaches are affected by high flood hazards.

In the PMF event, the large majority of the flood extent is accompanied by extremely high flood hazard rating, with only the minor fringes of the flood extent having low and moderately high flood hazard.

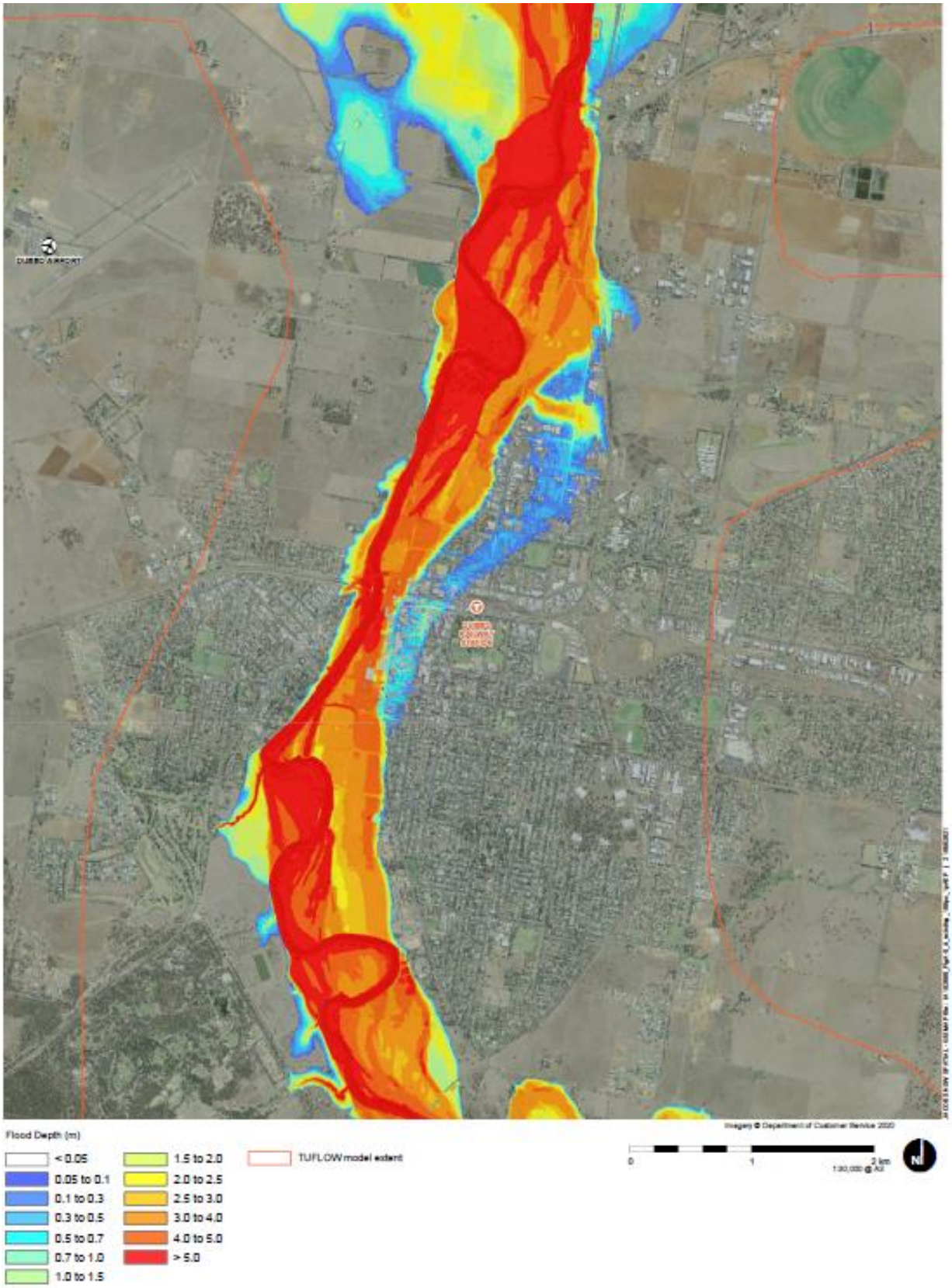


Figure 6-5 Flood map showing existing conditions during a one per cent AEP flood event

6.4.3 Potential impacts

Construction

Flooding impacts

As per the project REF, a number of construction activities would have the potential to impact flooding. The inclusion of any temporary fill within the floodplain (such as stockpiles) would reduce floodplain storage, which could result in increased flood levels. A temporary instream work platform such as cofferdam or rock barrage would also have the potential to impact on flood levels as it would partially block the in-stream flow.

Potential flooding impacts during construction of the modified project would be minor. Increases in five per cent AEP flood levels of 0.011 – 0.017 metres typically (up to 0.025 metres locally) are predicted to occur, affecting open areas and rural land. These flood levels would impact three sheds on rural residential property downstream of the modified project, and several non-habitable, non-residential buildings. No residential, commercial or industrial buildings are affected by increases in flood levels.

Appropriate management measures would be in place during construction to ensure minimal impact on the Macquarie River and its capacity to convey flows in the event of a flood. This would include reducing the extent of the instream work platform, reducing the size of ancillary facility 3, which is located on the floodplain, and minimising the proportion of this ancillary facility used for stockpiling.

Ancillary facilities 3, 4 and 5 of the modified project would be at risk of flooding as they are located either within, or partially within, the five percent AEP (relevant AEP for temporary sites) flood level extent . Ancillary facilities 1 and 2 are no longer considered to be at risk of flooding as they are not located within this AEP flood level extent. Management measures for impacted sites would include partly raising ancillary facility 3 with fill above the floodplain and filling the existing drainage flow path running through ancillary facility 5. Appropriate site drainage would be provided to cater for drainage of local catchment runoff through the site and around the filled area. All ancillary facilities would include appropriate erosion and sediment control measures to minimise the sediment that could be transported into Macquarie River.

Hydrology

In the construction phase there may be partial blockage of the river channel by an instream work platform for the construction of the in-channel piers of the bridge. This construction activity would still allow for conveyance of day-to-day river flows, which would minimise the risk of impact to the hydrologic regime of the river.

Operation

Changes in flood levels

Thirteen locations were selected for reporting flood level changes at specific locations in Dubbo where model results indicate flood level changes. The flood model for the modified project as summarised in Appendix E indicates that there would be negligible flood level changes for the 20 per cent, 10 per cent, five per cent, two per cent AEP events and existing buildings would not be impacted. This is an improved scenario compared to the project REF, as a result of the wider channel created by lengthening the bridge span for the modified project.

Flood mapping is provided in Appendix E for all flooding events. In the one per cent AEP flood event, the Riverside Church property on Thompson Street would exceed 0.01 metres. However, flood levels would be below existing floor levels.

The flood levels observed in the 0.05 per cent AEP and PMF events are similar to those estimated for other major infrastructure projects in NSW for these very rare/extreme events and given the rarity and magnitude of these flood events these flood levels could be considered tolerable.

Changes in flood velocity

The modelling indicates minor localised changes in flood velocities at the new bridge piers, abutments and at the new Thompson Street/Newell Highway intersection and flood bypass route. The velocities would increase from 0.8 m/s in the existing case up to 1.3 metres/second as a result of the modified project in the one per cent AEP event. The increases in flood velocities are not expected to significantly increase the potential of scour and erosion.

There are no increases in flow velocities of the Macquarie River upstream of the New Dubbo Bridge expected with the proposed modified project. The model indicates there would be minor reductions in maximum velocities expected in the main channel, at the left bank and the right bank floodplain upstream of the modified project.

Change in flood hazard

In the one per cent AEP event, there would be a negligible change in the overall flood hazard rating due to minor change in flood levels as a result of the modified project.

In the PMF, there are minor incremental increases in the extent of the high flood hazard areas as a result of the modified project, which is a result of the increase in flood depths of up to 0.3 metres typically (up to 0.41 metres localised), for the area upstream of the modified project. The minor increase in the high hazard extent is not expected to have a material impact, given the large areas already impacted by high hazard in the existing situation. The impact is reduced from the project REF as a result of the proposed changes to bridge design.

Overall, the minor changes in flood hazard are not considered to materially increase the overall flood risk. There are no new flood flow paths as a result of the increased flood levels in these events.

Change in duration of inundation

There would be negligible change in duration of inundation as a result of the modified project. This is consistent with the project REF and reflects the generally minimal obstruction to flow in the Macquarie River and floodplain posed by the modified project.

Immunity of the modified project

The operational phase model result shows that the modified project would not be impacted by flooding during a one per cent AEP flood event except at two locations:

- The flood bypass route at Thompson Street/Whylandra Street intersection, which would be impacted by flooding during a two per cent AEP flood event
- The shared path at the western river overbank area, which would be impacted during a ten per cent AEP flood event.

Overall, the modified project would have an improved immunity from a ten per cent AEP event to a two per cent AEP flood event.

Hydrology

The modified project during operation would not result in damming or permanent impedance of day-to-day river flows.

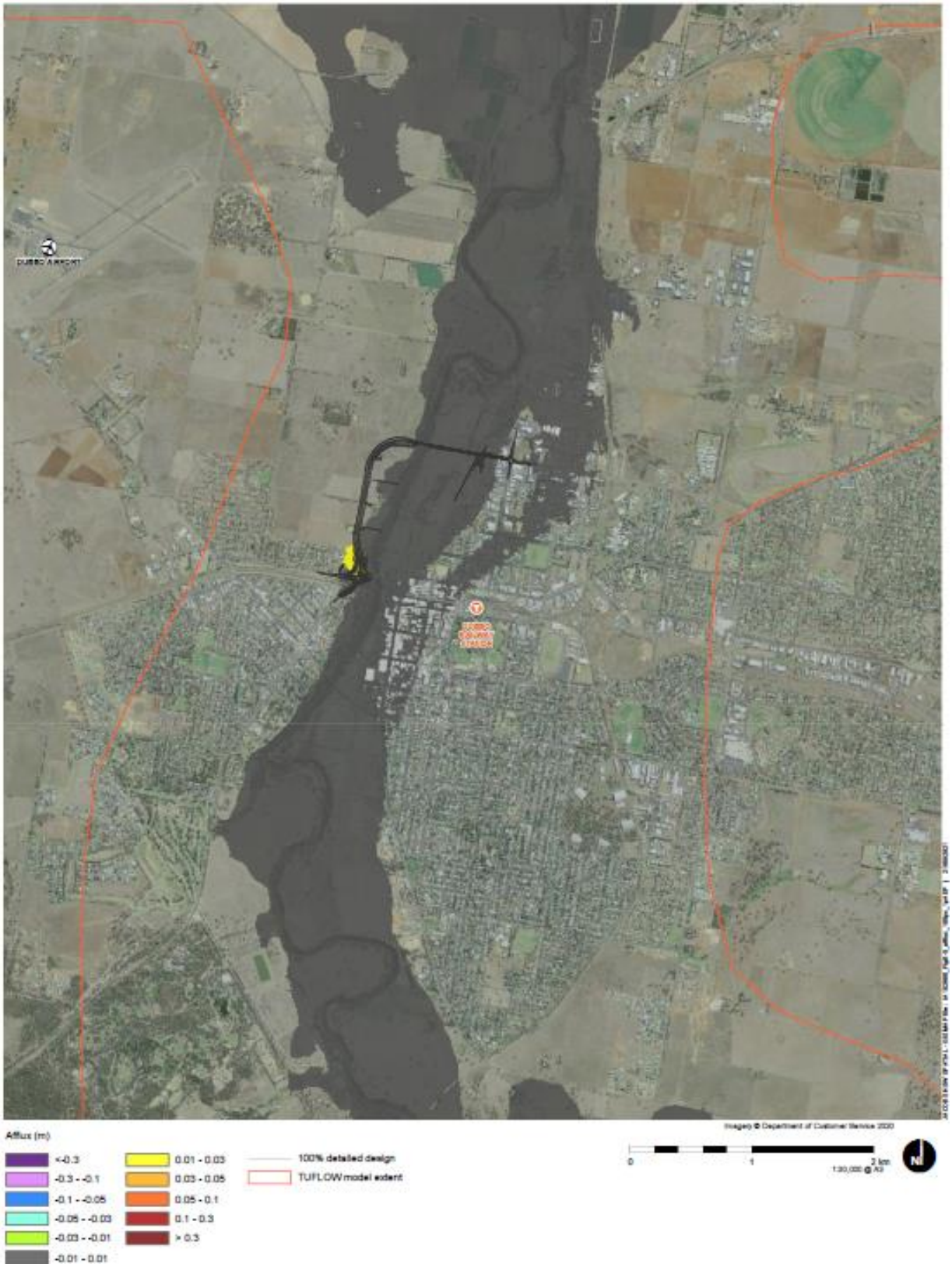


Figure 6-6 Flood mapping showing predicted conditions during a one per cent AEP flood event with the modified project

6.4.4 Safeguards and management measures

The proposed additional and/or modified environmental safeguards and management measures to those for the approved project (i.e. those presented in the submissions report) are provided in Table 6-14. Any additional wording has been underlined, and deleted measures, or parts of measures, have been struck out. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

Table 6-14 Environmental safeguards and mitigation measures – flooding and hydrology

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
HSF13	Ancillary facilities (Construction compounds)	• Appropriate management measures would be in place during construction to ensure minimal impact on the Macquarie River and its capacity to convey flows in the event of a flood, including minimising the extent of temporary in-channel work platforms • All ancillary facilities would include appropriate erosion and sediment control measures to minimise the sediment that could be transported into Macquarie River • Consideration will be given to reducing the size of the ancillary facility ~~2~~3 • Ancillary facility ~~facilities 1 and~~ 3 will be partly raised to achieve five per cent AEP flood immunity • The existing drainage flow path in ancillary facility 5 will be filled and appropriate site drainage provided.	Contractor	Pre-construction/ Construction	Additional safeguard
HSF16	Scour impacts during construction	Appropriate bank and bed scour protection will be considered to minimise the scour risk and potential of the Macquarie River channel bed or banks as a result of the temporary in-river coffer dam and work platform.	Contractor	Construction	Additional safeguard

6.5 Contamination

The potential impacts on contamination from the construction and operation of the proposed modification on contamination are assessed below, as informed by contamination investigations summarised in *New Dubbo Bridge - Detailed Contamination and Waste Classification Assessment Summary Report* (Jacobs, 2021) provided in Appendix F.

6.5.1 Methodology

Information from the following sources was reviewed and used to inform the assessment of potential contamination impacts:

- A review of the project REF investigations
- Results of site inspections, field sample capture and laboratory analysis of shallow soil samples for potential contaminants of concern
- Results of non-destructive digging (NDD) using specialised hydraulic excavations, and Ground Penetrating Radar (GPR) techniques.

Human health risk screening criteria, ecological risk screening criteria and waste classification criteria were applied to samples from laboratory analytical results to identify any additional potential contamination risks or additional potential contamination impacts.

6.5.2 Existing environment

The existing environment of the modified project is generally consistent with that outlined in Section 6.9.2 of the project REF.

The *New Dubbo Bridge – Preliminary site investigation report* (PSI) (Jacobs, 2019) informed the project REF contamination assessment. The project REF identified a number of activities carried out on and/or adjacent to the modified project area that considered to pose a moderate contamination risk. These include:

- Potential contamination into groundwater from a number of petrol filling station point sources located onsite and within one kilometre of the study area
- Potential contamination associated with unauthorised dumping, including household and building material waste
- Potential contamination associated with degradation of asphalt roads and runoff from earth mounds of imported fill material, likely from an industrial source
- Farmland and agricultural related activities.

Other Areas of Environmental Interest (AEIs) were considered to represent a low (potential contamination) risk in consideration of potential construction activities and the likely localised nature of the associated contamination (if present). The project REF recommended that intrusive contamination investigations be carried out in the vicinity of the project to quantify the exposure risk.

Detailed Site Investigations

Accordingly, since preparation of the project REF, a Detailed Site Investigations Summary Report has been prepared to summarise contamination investigations (Appendix F). This includes results from the geotechnical assessment program and area-specific investigations.

Geotechnical investigations

Soil samples were progressively collected and analysed for potential contaminants of concern between January and November 2021 as part of the geotechnical assessment

program. Typically, soil contamination samples were collected during geotechnical drilling and test pitting campaigns where the project REF assessment may have indicated a potential higher contamination risk where geotechnical work were programmed. In total, 37 soil samples were collected for potential contaminants of concern across the modified project area as part of the geotechnical work, and analysed at the National Association of Testing Authorities (NATA Australia) analytical laboratory.

Based on the results of the geotechnical field work, several additional potential contamination risks were identified. These included:

- Potential asbestos cement irrigation pipes buried across the agricultural paddocks associated with the alignment of the proposed Newell Highway (paddocks within DP250606 and DP1219695 alignments);
- Potential metals, Asbestos-Containing Material (ACM), hydrocarbon and herbicide/pesticide contamination in shallow soils at a machine shop and residence within the proposed Newell Highway alignment;
- Potential metals, ACM, hydrocarbon and herbicide/pesticide contamination in shallow soils at a proposed new stormwater and drainage outlet at the East foreshore of the Macquarie River (Site 7 – Drainage Outlet); and
- Potential metals, ACM, hydrocarbon, herbicide/pesticide and PFAS (per- and poly-fluoroalkyl substances) soil contamination risks associated with a Dubbo Council property (Site 9 – Proposed Access Track and Site Compound).

Area specific investigations

Area-specific investigations were carried out at the potential contamination sites identified from previous investigations (agricultural paddocks, machine shop and residence within the Newell Highway alignment, Site 7, Site 9) shown in Appendix F. In October 2021, soil sampling was carried out and non-destructive digging using specialised hydraulic excavations, and ground penetrating radar techniques were also mobilised to the paddock sites to help determine if ACM irrigation pipes were buried across the alignment.

Results of the analytical testing indicate the majority of soil samples are below the applied Health Screening Levels (HSL) criteria for commercial/industrial sites (HSL D) usage. The exception is a few localised, minor exceedances for zinc and hydrocarbons. These locations include the proposed drainage sites, a location within the machine shop, and a location within the residence site.

PFAS compounds have been detected above the limits of laboratory detection within the soil samples collected at the Council property. The levels detected, however, are below the site assessment criteria applied to the assessment of contamination. This means they do not pose a potentially unacceptable risk for commercial/industrial land use, human health and/or the environment. In addition, PFAS compounds are not likely to be intercepted due to their depth below the soil.

No buried asbestos irrigation pipes (with the exception of previously identified piping) were found anywhere else along the alignment.

6.5.3 Potential impacts

Construction

Potential contamination impacts from construction of the modified project would generally be consistent with impacts identified in the project REF.

As identified through detailed site investigations, the area proposed for ancillary facility 2 (including construction site access), may contain PFAS material. However, this material is unlikely to be encountered as establishment of the ancillary facility would include laying

down material to create a hard stand. As a result, there would be no exposure pathway of materials to workers. Should any ground disturbance be required, this will be managed in accordance with the CEMP to minimise any potential risk.

Potential impacts associated with ACM are not expected, as additional asbestos irrigation pipes are unlikely to be encountered during construction. Appropriate management measures would include the development and implementation of an Unexpected Finds Protocol.

Operation

The operation of the proposed modification would be managed under similar practices that are used at present to prevent any spillage or contaminant risk. As such, there is expected to be no additional operational impacts from the modified project during operation of the New Dubbo Bridge project.

6.5.4 Safeguards and management measures

The proposed additional and/or modified environmental safeguards and management measures to those for the approved project (i.e. those presented in the submissions report) are provided in Table 6-15. Any additional wording has been underlined, and deleted measures, or parts of measures, have been struck out. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

Table 6-15 Environmental safeguards and mitigation measures – contamination

No.	Impact	Environmental safeguard	Responsibility	Timing	Reference
TC10	Ground disturbance	During the establishment of ancillary facility 2, material will be laid down to create hard standing. Should any ground disturbance be required within this land parcel, it will be managed in accordance with the CEMP to minimise any potential risk.	Contractor	Construction	Additional safeguard

6.6 Noise and vibration

An *Addendum Construction Noise and Vibration Assessment* (Jacobs, 2021) and an *Operational Traffic Noise Assessment* (Renzo Tonin, 2021) were completed to identify potential noise and vibration impacts to nearby sensitive receivers for the construction and operation for the modified project to determine noise and vibration impacts to nearby sensitive receivers. The assessments are provided in Appendix G and H, respectively, and are summarised below.

6.6.1 Methodology

The assessment of noise and vibration impacts involved:

- Review of construction scenarios in the previous noise and vibration assessment and update to the construction noise model as appropriate for the modified project
- Update of the operational noise model to reflect the modified project design
- Prediction of construction and operational noise levels
- Assessment of predicted noise and vibration levels against the relevant criteria to identify potential impacts
- Identification of any additional or revised environmental safeguards and management measures compared to the approved project.

No additional noise monitoring was carried out to inform this assessment.

6.6.2 Existing environment

The existing environment of the modified project is generally consistent with the project REF. This is summarised below.

Land uses to the east and north-west of the modified project are predominately semi-rural residential while the area west of the modified project in west Dubbo is populated primarily with low-density residential development. The area impacted by the modified project also accommodates commercial, community, industrial and recreational land uses.

As per the project REF, 3,244 receivers have been identified for the assessment and have been grouped into four Noise Catchment Areas (NCAs) based on key acoustic features. The NCAs are shown in Appendix G and Appendix H.

6.6.3 Potential impacts

Construction noise

Works associated with the modified project would primarily be carried out within the same boundary of work generally at, or near to, locations identified in the project REF. The location of ancillary facilities, however, have been updated. The modified project boundary and the locations of work is shown in Figure **1-1** and Figure 1-2.

Noise management levels

Noise management levels and sleep disturbance criterion for the modified project are consistent with that detailed in Table 6-18 of the project REF and have been included in Appendix G. These have been derived from background noise levels monitored during the development of the original noise and vibration impact assessment (Roads and Maritime, 2019).

The work has been divided into standard hours, out of Hours(OOH)1 and OOH2. The work would be carried out outside of standard hours (i.e. during evening, night or weekend periods) in order to ensure that safe work practices are upheld or to minimise disruption to traffic and/or surrounding businesses. *The Construction Noise and Vibration Guidelines* (CNVG) (Transport for NSW, 2019) segregates OOHW into the following two bands, according to the sensitivity of receivers to noise impacts:

- Out of Hours Works 1 (OOHW1):

Monday – Friday 6:00pm – 10:00pm

Saturday 7:00am – 8:00am and 1:00pm – 10:00pm

Sunday 8:00am – 6:00pm

- Out of Hours Works 2 (OOHW2):

Monday – Friday 10:00pm – 7:00am

Saturday 10:00pm – Sunday 8:00am

Sunday 6:00pm – Monday 7:00am.

Noise criteria for non-residential receivers have also been established in Table 6-19 of the project REF.

Construction scenarios

There have been some key changes from the construction scenarios in the project REF . These mainly include changes to equipment usage in construction scenarios SC03, SC06 and SC07. Four new scenarios were also adopted for the modified project assessment which include a scenario for the operation of ancillary facilities during work (Add-SC10), the construction of drainage lines to the Macquarie River (Add-SC11), piling around the rail bridge at Whylandra Street (Add-SC12) and the demolition of old pavements and concrete (Add-SC13). The scenarios are summarised below in Table **6-16**.

Table 6-16 Proposed construction scenarios, timings and equipment for the modified project

Works ID	Scenario	Equipment	Work periods		
			Standard hours	OOH1	OOH2
SC01	Early work	• Front end loader 23t • Backhoe (upper limit) • Excavator (tracked) 35t (lower limit) • Compressor • Concrete truck • Road truck x 4 • Truck (medium rigid) x 4 • Power generator • Hand tools (Electric) • Front end loader (small) • Light vehicles	✓	✓	✓
SC02	Utilities	• Concrete saw • Backhoe (upper limit) • Dump truck (Upper limit)	✓	✓	✓

Works ID	Scenario	Equipment	Work periods		
			Standard hours	OOH1	OOH2
		• Excavator (tracked) 35t (lower limit) • Concrete truck • Power generator • Hand tools (Electric) • Franna crane 20t • Light vehicles			
SC03	Piling	• Piling rig – driven steel tube piles • Backhoe (upper limit) • Compressor • Concrete pump (upper limit) • Concrete truck x 4 • Power generator • Franna crane 20t • Light vehicles • Vibratory hammer	✓		
SC04	Bridge work	• Concrete saw • Backhoe (upper limit) • Compressor • Concrete pump (upper limit) • Concrete truck x 4 • Power generator • Hand tools (Electric) • Franna crane 20t • Scissor Lift • Light vehicles • Vibrating screed	✓	✓	✓
SC05	Bulk/final earthworks	• Bulldozer D9 • Grader • Excavator (tracked) 35t (upper limit) • Front end loader 23t • Dump truck (Upper limit) • Excavator (tracked) 35t (lower limit) • Scraper 623 • Roller (large pad foot) • Smooth drum roller • Compactor • Light vehicles	✓		
SC06	Intersections work	• Concrete saw • Pavement laying machine	✓	✓	✓

Works ID	Scenario	Equipment	Work periods		
			Standard hours	OOH1	OOH2
		• Grader • Excavator (tracked) 35t (upper limit) • Backhoe (upper limit) • Dump truck (Upper limit) • Excavator (tracked) 35t (lower limit) • Concrete truck • Smooth drum roller • Asphalt truck & sprayer (upper) • Hand tools (Electric) • Light vehicles • Milling machine			
SC07	Pavements	• Pavement laying machine • Grader • Dump truck (Upper limit) • Concrete truck • Asphalt truck & sprayer (upper) • Asphalt truck & sprayer (lower) • Light vehicles • Milling machine • Shuttle buggy	✓		
SC08	Finishing work	• Grader • Road truck • Line marking truck • Franna crane 20t • Scissor Lift • Light vehicles	✓		
SC09	Ancillary facilities – Establishment	• Grader • Front end loader 23t x 2 • Backhoe (upper limit) • Excavator (tracked) 35t (lower limit) • Concrete truck • Smooth drum roller • Power generator x 2 • Hand tools (Electric) • Franna crane 20t • Front end loader (small) • Light vehicles	✓		

Works ID	Scenario	Equipment	Work periods		
			Standard hours	OOH1	OOH2
SC10	Ancillary facilities – operation	• Front end loader 23t • Power generator x 2 • Hand tools (Electric) • Franna crane 20t • Front end loader (small) • Light vehicles	✓	✓	✓
SC11	Drainage lines to Macquarie River	• Piling rig – bored • Excavator (tracked) 35t (upper limit) • Backhoe (upper limit) • Excavator (tracked) 35t (lower limit) • Concrete pump (upper limit) • Concrete truck x 2 • Power generator • Hand tools (Electric) • Franna crane 20t • Scissor Lift • Light vehicles • Dump truck (Upper limit)	✓		
SC12	Whylandra Street Rail Bridge Piling	• Concrete saw • Mobile crane • Piling rig – bored • Dump truck (Upper limit) • Excavator (tracked) 35t (lower limit) • Power generator • Franna crane 20t • Light vehicles	✓		
SC13	Demolition of Existing Pavement and Concrete	• Excavator (tracked) 35t + hydraulic hammer • Front end loader 23t • Dump truck (Upper limit) • Excavator (tracked) 35t (lower limit)	✓	✓	

It should be noted that Scenario 10 was not assessed individually as it is assumed that this stage would be present during all other work stages.

The noise model has assumed 2.4 metre high site hoarding to the full perimeter (including gates) for each of the ancillary facilities. If hoarding is not to be included for the ancillary sites, the noise level predictions for SC10 (outlined in Appendix G) would increase by 5dB. Mitigation would need to be provided accordingly.

Predicted construction noise levels

Predicted noise levels for each NCA and individual receiver location is provided in Appendix G. These predictions represent the predicted worst-case noise impact at the most affected receiver in the NCA when work would be nearest the receiver.

The worst case construction noise levels presented in Appendix G indicate that the highest noise exceedances at receivers are predicted to result from:

- Early work, utility work, intersection work, and pavement work with noise exceedances up to more than 95 dB(A) at receivers within NCA1 and NCA2
- Piling work with noise exceedances up to 91 dB(A) at receivers within NCA3.

Generally, noise levels at receivers predicted in the addendum REF work has been predicted to be higher than those of the project REF. This is primarily the result in noise levels of the works increasing due to the adoption of additional, loud equipment, such as concrete saws and impact piles. Additionally, especially in regard to NCA 1, the modified project area has expanded to come in closer proximity to the receivers along Thompson Street, in some instances within five metres.

Table 6-17 provides an overview of the number of receivers predicted to be impacted each construction scenario. The count totals include all receiver types (e.g. residences, commercial and school buildings) and are incremented in accordance with the noise impact bands defined in the CNVG (e.g. 0-10 dB exceedance above the NML; 11-20 dB above the NML and so on).

SC06 has been predicted to result in the highest number of exceedances during OOHW. The number of receivers requiring mitigation has increased from the project REF to the addendum REF, especially regarding nightworks. As previously mentioned, this is predominately the result of work encroaching closer to the nearest receivers, construction sound power levels increasing due the additional equipment adopted for each stage, and additional work locations.

It is noted that noise levels exceeding NMLs were also predicted at receivers beyond the study area adopted from the REF. Verification noise monitoring is also recommended to determine if additional noise management measures are required for potentially affected receivers located beyond the NCA's.

Table 6-17 Count of receivers (all receiver types) at which construction noise is predicted to exceed NML

Works		Highly Noise Affected (Day or Night)[1]	Count of Receivers (all receiver types within all NCAs)													
ID	Scenario		Standard Hours[1]			Out of Hours										
						OOHW1[1]				OOHW2[1]				Sleep Disturbance[1]		
			1-10 dB	11-20 dB	> 20 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	1-5 dB	6-15 dB	16-25 dB	>25 dB	1-10 dB	11-20 dB	> 20 dB
SC01	Early work	40	694	173	69	631	1041	238	62	224	1112	789	128	908	974	206
SC02	Utilities	40	694	173	69	631	1041	238	62	224	1112	789	128	908	974	206
SC03	Piling	4	839	87	36											
SC04	Bridge work	2	109	32	5	77	548	12	3	476	416	193	6	328	455	7
SCO5	Bulk/final earthworks	53	940	215	90											
SC06	Intersection work	61	1043	252	107	618	1104	457	91	53	946	1044	234	598	1107	395
SC07	Pavements	40	693	174	69											
SC08	Finishing work	22	320	103	39											
SC09	Ancillary establishment	1	170	43	5											
Add-SC11	Drainage lines	2	85	5	5											
Add-SC12	Whylandra Street Piling	0	134	27	3											
Add-SC13	Demolition of Existing Pavement	64	1043	253	107	619	1103	458	91							

Notes: 1. Standard hours: Monday to Friday: 7:00 am to 6:00 pm, Saturday: 8:00 am to 1:00 pm, Sundays and public holidays: no work.
Out of Hours Works 1 (OOHW1): Monday - Friday 6:00pm - 10:00pm, Saturday 7:00am - 8:00am and 1:00pm - 10:00pm, and Sunday 8:00am - 6:00pm
Out of Hours Works 2 (OOHW2): Monday - Friday 10:00pm – 7:00am, Saturday 10:00pm - Sunday 8:00am, and Sunday 6:00pm – Monday 7:00am. Highly noise affected: >75 dB(A).

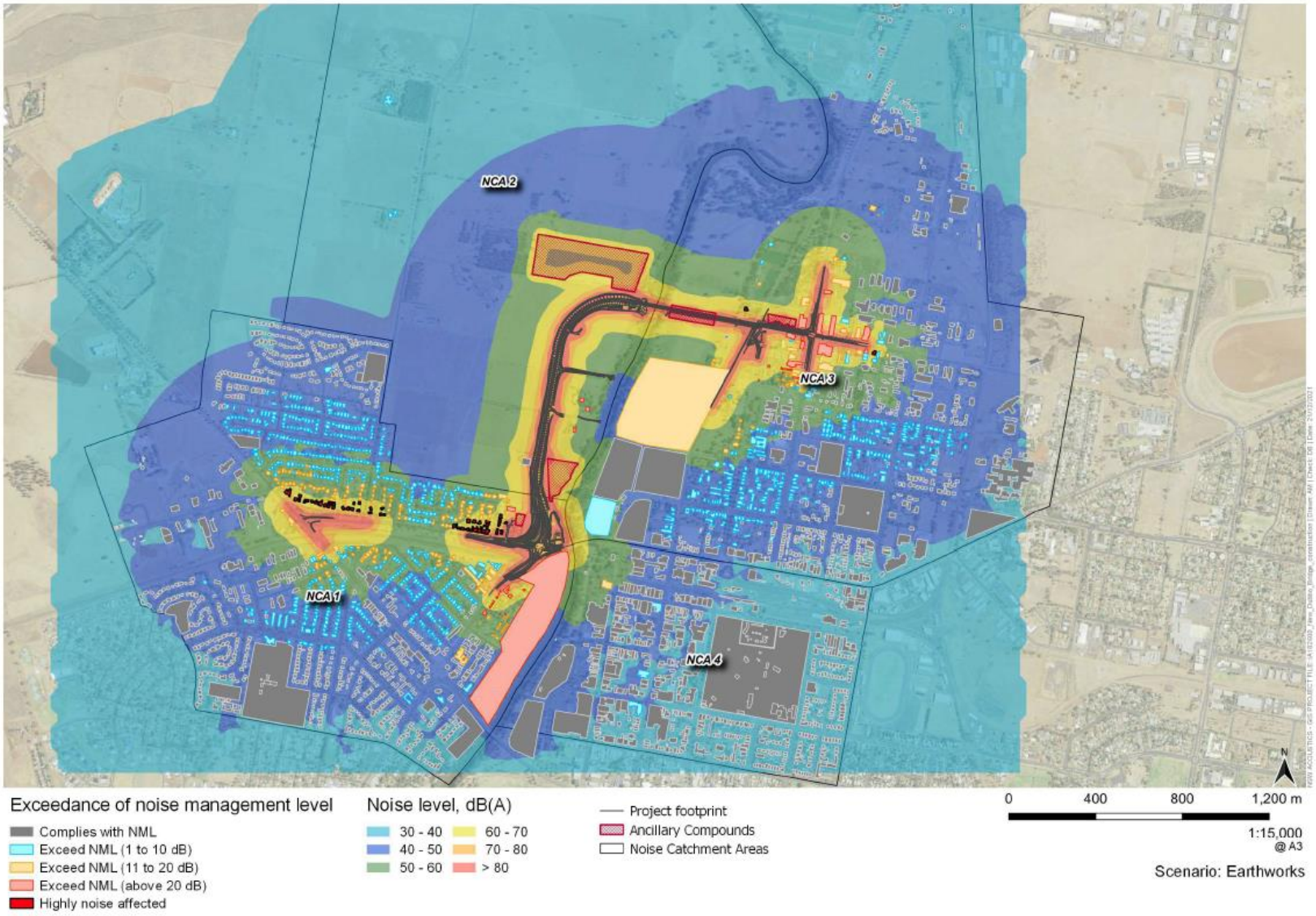


Figure 6-7 NML exceedance standard hours (Earthworks)

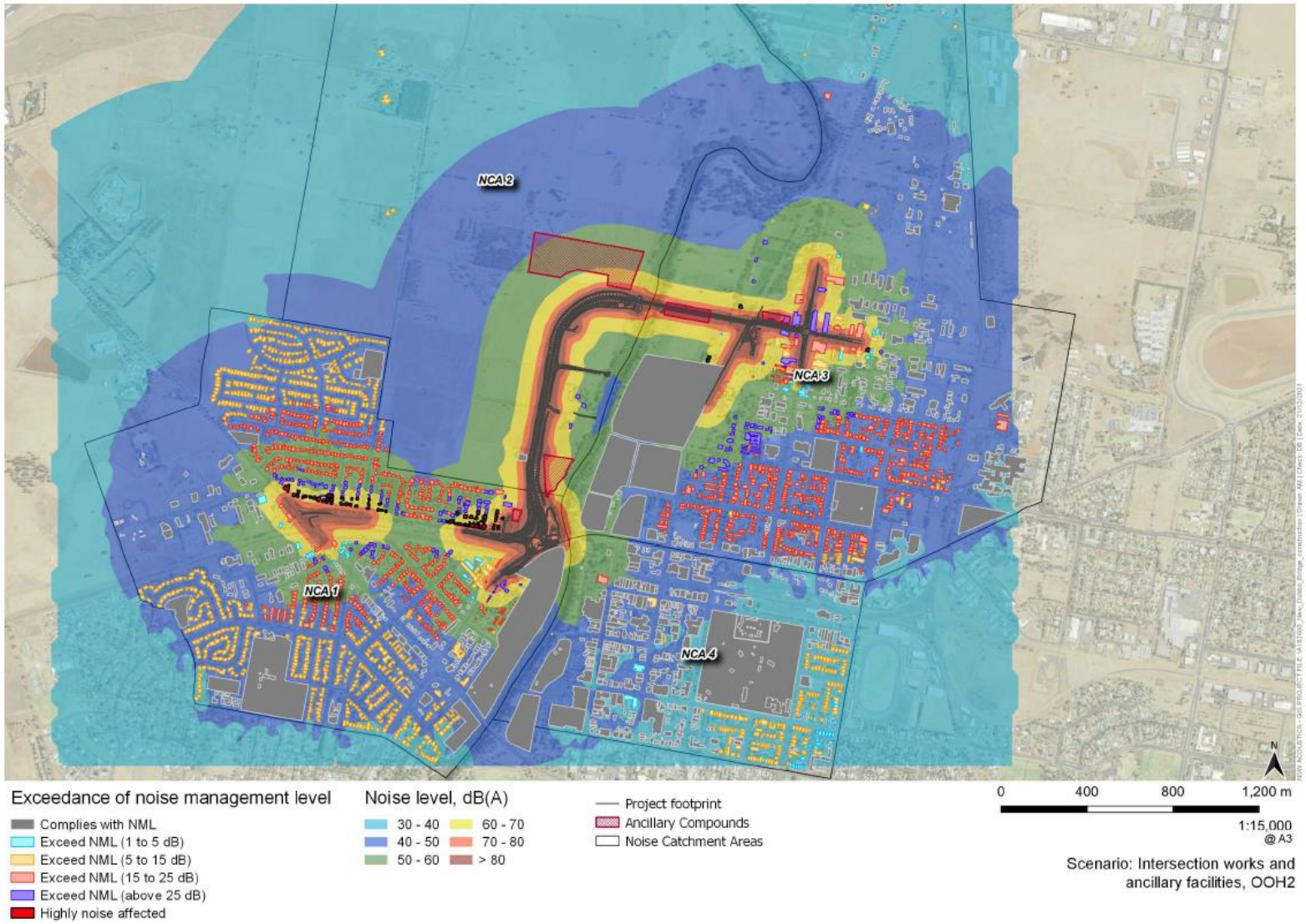


Figure 6-8 NML exceedance out of hours (intersections work and ancillary facilities)

Construction traffic noise

The construction traffic noise assessment has been extended from the project REF assessment to include Bunglegumbie Road and Brisbane Street. Details of the assessment can be found in Appendix G.

The assessment found that, due to the generally low existing traffic on Bunglegumbie Road and Brisbane Street, the additional construction traffic from the modified project would increase existing traffic noise levels by more than 2 dB along these roads. It is predicted that daytime construction traffic may increase existing traffic noise levels by up to 3.0 dB(A) during the day and 9.1 dB(A) during the night at Bunglegumbie Road, and up to 2 dB(A) during the day and 4.9 dB(A) during the night on the western side of Brisbane Street.

Additional safeguards and mitigation measures have been detailed in Section 6.6.4 to address construction noise impacts from the proposed modification.

Mitigation of construction noise

The standard and project specific mitigation measures for provided in Section 6.2.5 of the project REF have been deemed appropriate for the proposed modification. As with the project REF results, residual noise impacts are expected from the modified project even after it has applied the above standard noise mitigation measures. As such, the additional noise mitigation measures specified in Appendix C of the CNVG would be applied where feasible and reasonable. These measures have been detailed in the project REF. The count of receivers where this additional mitigation is applicable has increased from the project REF, and is provided in Table **6-18**.

Table 6-18 Counts of receivers identified as eligible for additional mitigation

NCA	Number of receivers eligible							
	Standard Hours	Out of Hours (OOHW1)			Out of Hours (OOHW2)			
	N, V	N, R1, DR	V, N, R1, DR	V, IB, N, R1, DR, PC, SN	N	V, N, R2, NR	V, IB, N, PC, S, N, R2, DR	AA, V, IB, N, P, C, SN, R2, DR
1	211	675	203	47	0	693	498	145
2	7	4	0	4	0	4	0	4
3	68	377	186	11	0	41	477	57
4	0	6	0	0	13	168	0	0

Notes:
AA = Alternative Accommodation
V = Verification
IB = Individual Briefing
N= Notification
RO = Respite offers
R1 = Respite Period 1
R2 = Respite Period 2
DR = Duration Respite
PC = Phone Calls
SN = Specific Notifications

Construction vibration

Vibration intensive plant proposed to be operated during construction include:

- Vibratory Rollers
- Hydraulic Hammers
- Bored Piling Rigs
- Impact Piling Rigs

- Vibratory Hammers.

The derivation of vibration criteria remains identical to that detailed in Table 6-29 of the project REF. The vibration setback distances applied in the project REF (100 metres for human response, 50 metres for heritage items and 25 metres for cosmetic damage) is appropriate for the main project alignment, as well as the ancillary facilities. Regarding drainage work, a five metre setback for heritage items and a two metre setback for cosmetic damage have been adopted.

Predicted construction vibration impacts

The overall construction vibration impact for the modified project is predicted to be similar to that outlined in the project REF. A further twenty receivers are expected to be impacted by construction vibration from the proposed modification. The count of vibration impacted receivers have been detailed in Table **6-19**.

Table 6-19 Indicative count of buildings within safe working distances of vibration-intensive work

Noise Catchment Area	Number of buildings within Safe Working Distance for…								
	Preservation of structural integrity of buildings (25m buffer zone)				Protection of human comfort (100m buffer zone)				Protection of heritage items (50 m buffer zone)
	Res	POW	Hotel	Com/Ind	Res	POW	Hotel	Com/Ind	
NCA 1	11	1	3	5	81	2	12	36	2[1]
NCA 2	2	0	0	0	3	0	0	0	1
NCA 3	0	0	0	17	5	0	23	51	1
NCA 4	0	0	0	0	0	0	0	0	0
Total	11	0	3	22	87	1	35	87	4

Notes: 1. This count includes the Terramungamine grinding grooves assessed in the project REF

There would be additional residential receivers affected in NCA1 as result of the extended modified project boundary.

Similar to the project REF, Dubbo Rail Bridge and Mount Olive are heritage items that would have construction work occur within the vibratory safe working distances. However, the additional construction work resulting from the modified project (such as piling and drainage work respectively) may be more vibration intensive and impacts to these heritage items may be greater. These impacts are further assessed in Section 6.2.

Operational noise

Operational noise criteria

The predicted operational noise levels at receivers within the study area are detailed in Appendix C of the assessment (Appendix H) and summarised below.

Traffic noise levels to each noise receiver were modelled for the Build and No Build (without mitigation) scenarios and compared against the operational noise criteria detailed in Section 6.2.3 of the project REF.

Affected receivers

A summary of the receivers that would potentially qualify for consideration of operational noise mitigation from the modified project is provided in Table 6-20. This is for noise levels in the worst scenario, ten years after opening of the modified project. The table indicates the noise trigger(s) by which these receivers would potentially qualify for consideration of mitigation.

Table 6-20 Number of buildings that qualify for consideration of operational noise mitigation from the modified project

Noise Catchment Area	Number of receivers assessed	Number of receivers qualifying for consideration of mitigation	Receiver qualifies for consideration of mitigation due to:			
			Cumulative limit	Acute noise exposure	>2dB(A) increase	Combination of criteria
NCA 1	1095	6[1]	0	0	4	2[1]
NCA 2	8	1	0	0	1	0
NCA 3	402	3	0	0	3	0
NCA 4	6	0	0	0	0	0
Total	**1511**	**10[1]**	0	0	8	2[1]

Note: 1. One passive recreation receiver (external recreation space, not a building) is above the relevant road traffic noise criteria and is included in this total, however, is not eligible for at-property treatment.

The submissions report acoustic report had identified a total of 11 buildings that would potentially qualify for consideration of operational noise mitigation as a result of the approved project (not including the open space passive recreation receiver). The assessment of the modified project identified nine buildings (see Table 6-20) that would potentially qualify for consideration of operational noise mitigation as a result of the modified project (not including the open space passive recreation receiver). A comparison of the buildings nominated for mitigation is provided in Table 6-21 and the locations of these properties are mapped in Appendix H. Although two buildings no longer meet the threshold for at-property treatment, these measures would still be implemented, as described in the submissions report.

Table 6-21 Comparison of buildings nominated for at-property treatment

This table has been redacted for confidentiality purposes.

Biddybungie Reserve, Dubbo is the open space passive recreation receiver that was considered for operational noise mitigation by both noise assessments. However, since it is an open space and no at-property treatment can be applied, it has not been considered further in this assessment.

Consistent with the project REF, low noise pavements and noise barriers were not considered to be reasonable mitigation options for buildings affected by operational noise of the modified project. At-property treatments options for buildings affected by the modified project are consistent with options outlined in Section 6.2.4 of the project REF. Further assessment of individual dwellings and consultation with landowners would be required to identify the specific acoustic treatments to be applied to each of these buildings.

Maximum noise level assessment

The maximum noise level events at the at the most-affected receivers were considered in the Submissions Report. These events are sufficient for indicating if the modified project will result in additional maximum noise level events during the night.

No changes to the maximum noise level events are expected from modified project. As stated in the Submissions Report operational noise assessment, there are 28 projected maximum noise level events on Thompson Street and 32 projected maximum noise level

events on Bourke Street. As previously noted in the project REF and Submissions Report, the introduction of a signalised intersection at Thompson Street/Whylandra Street would likely increase the number of maximum noise level events at receivers in the vicinity of the intersection. Overall, it remains likely that the total number of maximum noise level events experienced at receivers across the study area would increase with the construction of the proposed new road.

6.6.4 Safeguards and management measures

The proposed additional and/or modified environmental safeguards and management measures to those for the approved project (i.e. those presented in the submissions report) are provided in Table 6-22. Any additional wording has been underlined, and deleted measures, or parts of measures, have been struck out. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

Table 6-22 Environmental safeguards and mitigation measures – noise and vibration

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV5	Construction vibration	Specific measures to manage the potential for vibration impacts would be determined as part of the CNVMP developed during detailed design once the specific equipment schedule and localised geotechnical conditions are known. At that time, the CNVMP will consider the feasibility of implementing at least the following measures to minimise potential construction vibration impacts: • Use of lower vibration-generating plant and equipment, such as smaller capacity hydraulic hammers or concrete crushers/pulverisers in place of hammers • Suitably programming the hours of operation of major vibration generating plant and equipment • Minimising consecutive work in the same locality • Using dampened hammers • Carry out attended vibration monitoring where vibration-intensive work are to be undertaken within the safe working distances, with engineering advice being sought for monitoring historical structures • Where vibration reaches levels that may result in damage to historical structures within safe working distances, works should be ceased and revised to minimise impacts • Completing building condition surveys before and after vibration-intensive work to identify existing damage and any damage due to the work Repairing any visual impacts resulting from the works to historical structures within safe working distances.	Contractor	Detailed design/Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV7	Construction traffic noise	Construction vehicles should adhere to the following protocols: • Schedule the timing of vehicle movements. • Reducing construction traffic speed. • Avoiding the use of compression brakes. • Ensuring vehicles are adequately silenced before allowing site access.	Contractor	Construction	Additional safeguard

6.7 Socio-economic

This section outlines the potential socio-economic impacts from the construction and operation of the proposed modification.

6.7.1 Methodology

The methodology for the socio-economic assessment involved:

- Reviewing the previous assessment documented in the project REF
- Scoping of the potential socio-economic issues for the proposed modification and identification of communities likely to be affected by the modified project
- Assessing potential impacts of the proposed modification's construction and operation on the socio-economic environment of the study area (depicted in Figure 1-2)
- Identifying safeguards and management measures to avoid, minimise or mitigate potential socio-economic impacts identified in the assessment.

6.7.2 Existing environment

The existing environment of the proposed modification is generally consistent with that outlined in Section 6.6.2 of the project REF. In summary, features of the existing socio-economic environment of the study area include:

- **Regional overview:** The Dubbo LGA is located within the Central West and Orana region of central NSW. Dubbo is one of the largest inland regional cities in NSW. As a key regional centre, Dubbo serves an estimated catchment of about 120,000 people from across the Central and Orana region.
- **Land use:** Land use surrounding the proposed modification is mostly rural-residential. Other uses include agriculture, environmental management, recreational, business and infrastructure. Areas in Dubbo's north-west is marked for future residential development.
- **Demography:** The demography of the study area comprises younger communities, with the study area recording lower median ages, higher proportions of children and a lower proportion of people aged 65 year or over at the 2016 Census. The study area had a relatively high level of dependency on private vehicle of travel to work. Median weekly personal and household incomes were above the NSW regional average.
- **Business and industry:** The main industries near the proposed modification are retail, government services, tourism, manufacturing, construction, agriculture, businesses services and transport. Businesses near the proposed modification area comprise hotels, and retail uses including petrol stations and car dealerships.
- **Social infrastructure:** Dubbo urban area accommodates a range of community services and facilities that cater for the needs of local and regional communities. These include education facilities, health, medical and emergency services, sport, recreation and leisure facilities, and community and cultural facilities.
- **Community values**: Amenity in the study area is influenced by a mix of uses, including residential uses, rural uses, community uses such as open space areas, and commercial uses in the city centre. The Macquarie River contributes to the liveability of Dubbo for residents and visitors with a range of open space and recreational opportunities supported by the river.

- **Access and connectivity:** Dubbo is located at the intersection of major routes for road, rail and air transport. The study area includes several major transport corridors, including roads, rail and bus corridors and pedestrian and cycle networks.

6.7.3 Potential impacts

Construction

Property acquisition and land use

As discussed in Section 3.6, the proposed modification would result in some changes to the temporary lease area of properties described in the project REF. The changes to the temporary lease areas would generally be required to provide construction access and additional land for construction. Changes to the temporary lease areas are not expected to impact on the overall use of properties and potential property impacts would be consistent with impacts described in Section 6.6.3 of the project REF.

The proposed modification would require the temporary lease of an additional private property located directly west of Macquarie River. This would be required for the construction on an underground drainage pipe and outlet to Macquarie River. A house is located away from the affected area and access to the house would be maintained during construction. The land would be reinstated to its pre-construction use once construction is completed.

Temporary lease areas would be managed with safeguards described in Section 6.6.4 of the project REF.

Local business and industry

Potential impacts on businesses from the construction of the proposed modification would be similar to those described in Section 6.6.3 of the project REF, although the proposed modification would have potential amenity impacts on additional businesses at Victoria Street, immediately south of the railway line, as well as north of Thompson Street. These businesses comprise retail and services related businesses, including a car/truck rental, disability equipment sales and service, swimming pool supplies and a service station. Potential impacts to these businesses are expected to be managed with safeguards described in Section 6.6.4 of the project REF.

Access and connectivity

As per the project REF, access to local properties would be maintained throughout construction, minimising potential impacts.

The proposed modification would include construction access along Bunglegumbie Road, which connects Thompson Street and Troy Bridge Road. Bunglegumbie Road currently provides access for residential properties along and west of Bunglegumbie Road, community facilities such as schools and open space areas, and rural uses. Access would be maintained for users of this road, however, minor delays and disruptions may occur from additional construction traffic on the road.

As this road is one of the main connecters between Thompson Street and Troy Bridge Road, traffic delays on this road may cause a minor inconvenience for motorists travelling along this route.

Community values

Impacts to community values would be consistent with impacts described in Section 6.6.3 of the project REF.

The extensions of the modified project area as a result of the proposed changes has the potential to result in additional temporary amenity impacts for residents of homes at

Thompson Street, west of Cooinda Crescent and north of Young Street. The use of Bunglegumbie Road for construction access may also temporarily impact amenity for residents and users of the open space along this road. Any additional impacts on local amenity from the proposed modification would be managed with safeguards described in Section 6.6.4 of the project REF.

Operation

Property acquisition and land use

As discussed in Section 3.6, the proposed modified project would have an overall increase in property acquisitions compared to the project REF.

Permanent partial strip acquisition would be required of an additional private property located directly south of River Street and west of Brisbane Street. The property is used for rural/rural residential activities and the affected land comprises areas of grass and trees along the River Street frontage. A house is located away from the affected area with access from Brisbane Street. Partial acquisition of the land for the modified project is not expected to impact on the overall use of the property. As indicated in Section 6.6.3 of the REF, where partial acquisition occurs, infrastructure such as fencing and driveways that is impacted by the project would be rebuilt and relocated as part of construction activities in consultation with the property owner.

Overall, the significance of impacts on property from the proposed modification would be low, consistent with that described in Section 6.6.3 of the project REF.

Access and connectivity

The proposed modification would provide an additional footpath along the western side of Brisbane Street, and an extension of the footpath from Emile Serisier Bridge to the Newell Highway. The length of the shared path along Newell Highway through Wiradjuri Park would be reduced from the project REF, however, the proposed modification would include provision for future extension of this shared path.

A new driveway connecting to the Riverside Church would be provided as part of the proposed modification. Similar to the current driveway, this would connect from Thompson Street. The change is not expected to affect access to users of the Church.

The proposed modification would also result in a loss of informal on-street parking on River Street, located from Brisbane Street to just east of Bourke Street. There is on street parking available on nearby surrounding streets and, additionally, many businesses provide parking capacity for customers. Therefore, the loss of this parking is not expected to impact to have any significant impact on local parking.

Overall, the operation of the modified project would support improved access and connectivity throughout the study area, particularly for active transport users, providing a positive impact to access and connectivity.

Local business and industry

The proposed modification would upgrade the intersection of Bourke Street and River Street as discussed in Section 3.2.3, allowing dedicated right turn lanes into businesses along River Street. This direct access from River Street compared to the approved project is expected to have positive impacts for these businesses.

Social infrastructure

The proposed modification would include a vehicle access point to Wiradjuri Park and an additional car parking area for users of the park. This would have a positive impact for visitors of the park.

6.7.4 Safeguards and management measures

The proposed additional and/or modified environmental safeguards and management measures to those for the approved project (i.e. those presented in the submissions report) are provided in Table 6-23. Any additional wording has been underlined, and deleted measures, or parts of measures, have been struck out. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

Table 6-23 Safeguards and management measures - socioeconomic

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
SC5	Consultation – property owners	Consultation will be carried out with all affected property owners prior to and during construction to develop and implement measures to mitigate impacts on their property. This includes (but is not limited to): • Businesses at Whylandra Street, River Street and Victoria Street • Riverside Church Dubbo Kingdom Hall Jehovah's Witness • Dubbo Regional Council (as managers of open space and recreation areas near the modified project) • Private properties affected by property acquisition/leases.	TfNSW/ Contractor	Pre-construction/ Construction	Additional safeguard

6.8 Landscape character and visual impacts

This section outlines potential landscape character and visual impacts from the construction and operation of the proposed modification.

6.8.1 Methodology

The proposed changes to the project have been reviewed with regards to the previous landscape character and visual impact assessment (LCVIA) to identify any potential changes to impacts on landscape character and visual amenity.

Where proposed changes have the potential to change the impacts identified in the project REF and submissions report, this assessment adopted the matrix defined in the project REF to assess the combination of sensitivity of the existing environment to change and magnitude of the proposed change to identify a level of impact for the modified project.

6.8.2 Existing environment

The existing environment of the modified project is generally consistent with that outlined in Section 6.7.2 of the project REF. This is summarised below.

Locality and landform

The modified project area and surrounds include a mix of residential, agricultural, recreational, industrial and transport related land uses with the main features including:

- Kingdom Hall of Jehovah's Witness
- Dubbo Rail Bridge, a heritage item of local and State significance
- Wiradjuri Park, located on the western side of the Macquarie River, immediately north of the Emile Serisier Bridge
- Mount Olive, a local heritage item on the western bank of the Macquarie River
- Aboriginal heritage items
- Riverside Church Dubbo
- Businesses on the River Street/Newell Highway intersection
- Businesses along River Street
- Residential properties along Thompson Street.

Landscape character

The five landscape character zones (LCZ) and their sensitivity as identified for the modified project area remain as described in the project REF. These five LCZ are summarised in Table 6-24.

Table 6-24 Summary of landscape character zones for the modified project area

LCZ	Sensitivity
LCZ1 – Agricultural landscape	Low
LCZ2 – Industrial landscape	Low
LCZ3 – Residential landscape	High
LCZ4 – Open space/recreation landscape	Moderate

LCZ	Sensitivity
LCZ5 – Commercial landscape	Low

General visibility

The main viewers of the proposed modification would be users of the highway and residents, workers and visitors of nearby properties. The visual catchment of the proposed modification remains as per the project REF. It is well defined due to the topography of the site and clear barriers to sightlines, including vegetation, built form and the like.

Thirteen representative viewpoints were identified in Section 6.7.3 the project REF, as outlined in Table 6-26.

Table 6-25 Assessed representative viewpoints

Viewpoint	Sensitivity
VP1 – Bunglegumbie Road	Low
VP2 – Chifley Drive	Moderate
VP3 – Newell Highway looking north-east	Low
VP4 – Thompson Street	Moderate
VP5 – Riverside Church grounds	Moderate
VP6 - Wiradjari Park picnic shelters top of river bank	High
VP7 - Intersection of Thompson Street and Newell Highway	Low
VP8 - North Dubbo weir on the Macquarie River	High
VP9 – Brisbane Street	Moderate
VP10 – River Street	Moderate
VP11 – Brisbane Street	Moderate
VP12 - River Street towards Brisbane Street intersection	Low
VP13 - River Street and Bourke Street intersection	Low

6.8.3 Potential impacts

Construction

Potential impacts to landscape character and visual amenity are generally consistent with the project REF. During construction, there would be temporary impacts on visual amenity from the clearing of vegetation, generation of wastes and construction activities, including operation of ancillary facilities. Temporary lighting would be required at some of the ancillary facilities and in the modified project area when night work is required. Particular attention would be given to design and location of temporary lighting, to avoid light spill into residential areas and any other identified sensitive receivers. These impacts would occur throughout construction, but construction staging would result in the impact not being spread across the entire modified project area at the one time.

Operation

Landscape character

The landscape character assessment reviewed the impact on areas of common character traits, which is summarised in Table 6-26. There would be no change to the potential landscape character impacts identified for the approved project as a result of the proposed modification.

Table 6-26 Potential impacts on landscape character zones

LCZ	Summary of potential impact	Magnitude	Comment
LCZ1	The proposed changes include localised widening of the horizontal highway alignment, reduction in the western embankment of the highway and extension of the bridge. The scale of these changes would not affect the magnitude of change.	Moderate	As per the project REF
LCZ2	The scale of the proposed changes to intersection layouts at River Street and Brisbane Street, including relocation of shared paths would not affect the magnitude of change.	Moderate	As per submissions report
LCZ3	The proposed changes do not change the extent of impact on the residential precinct to the west of the modified project.	Negligible	As per submissions report
LCZ4	The open space west of the Macquarie River remains impacted by the modified project. The refinements to shared paths and access would not alter the magnitude of impact identified for the approved project.	High	As per submissions report
LCZ5	The nature and scale of the proposed changes would not change the extent of impact on the commercial areas next to the alignment.	Low	As per project REF

Visual impacts

The 13 viewpoints assessed in the project REF have been reviewed for potential likelihood to change as a result of the proposed modification. The proposed changes to the project would be most visible at viewpoints 8, 11, 12 and 13. However, no overall impact ratings would change as a result of the proposed modification., The assessment is summarised in Table 6-27.

Table 6-27 Visual impact assessment

VP	Summary of potential impact	Overall rating	Comment
VP1	The proposed changes include reduction in height of the proposed Newell Highway alignment that would be visible from this view.	Low	As per project REF
VP2	Although the proposed changes include reduction in height of the proposed Newell	Low	As per project REF

VP	Summary of potential impact	Overall rating	Comment
	Highway alignment, project elements would still be visible from this VP.		
VP3	The scale of proposed changes would not change the overall extent of impact at this VP.	Low	As per project REF
VP4	The scale of proposed changes would not change the overall extent of impact at this VP. The infrastructure of the modified project would remain the dominant element of the VP.	Moderate to High	As per submissions report
VP5	Changes to the access and carpark of the church would be minor. The scale of proposed changes would not change the extent of overall impact at this VP.	Moderate	As per submissions report
VP6	The scale of proposed changes would not change the overall extent of impact at this VP. The infrastructure of the modified project would remain the dominant element of the VP.	High	As per submissions report
VP7	The scale of proposed changes to the highway alignment would not change the overall extent of impact at this VP.	Moderate	As per project REF
VP8	An additional instream pier, a significant structure, would be visible in the foreground of the VP, and would restrict views downstream. The changes to the bridge structure does not alter the previous assessment outcome as ratings are already the highest in terms of impact.	High	As per submissions report
VP9	The scale of proposed changes to the New Dubbo Bridge would not change the overall extent of overall impact at this VP, given the distance and proposed screening.	Moderate	As per project REF
VP10	Whilst the modified vertical alignment of the New Dubbo Bridge provides additional height clearance at this VP, the bridge would still dominate the foreground and a sense of openness would still be removed.	High	As per submissions report
VP11	The retaining wall at the eastern bridge abutment would be further east and therefore slightly less visible compared to the approved project. However, the bridge would still be visible in the distance, at a slightly higher elevation. The scale of proposed changes to the New Dubbo Bridge would not change the overall extent of overall impact at this VP.	Moderate	As per submissions report

VP	Summary of potential impact	Overall rating	Comment
VP12	Although the relocation of the retaining wall would mean it would be slightly further from the VP, there would still be a significant change in character and sense of enclosure. Given the dominance of the bridge in this view, the proposed changes would not change the extent of overall impact at this VP.	Moderate	As per submissions report
VP13	The change in intersection layout including removal of dedicated turning and merging lanes along River Street would slightly reduce the dominance of the road in the view. However, the proposed changes would not change the overall extent of impact at this VP.	Moderate	As per project REF

6.8.4 Safeguards and management measures

No changes are proposed to the landscape and visual amenity environmental safeguards and management measures presented in the submissions report as a result of the proposed modification. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

6.9 Traffic and transport

This section outlines the potential traffic and transport impacts from the construction and operation of the modified project.

6.9.1 Methodology

The traffic and transport assessment of the proposed modified project comprised:

- Qualitative assessment of potential impacts relating to the additional construction access along Bunglegumbie Road
- SIDRA traffic modelling to identify and assess any potential impacts of the modified layouts at the Thompson Street/Whylandra Street and River Street/Bourke Street intersections
- An assessment of the impacts of the construction and operation of the modified project on property access, pedestrians, cycling and active transport infrastructure and road safety
- Review and identification of additional or revised project environmental safeguards and management measures compared to the approved project.

The approach to traffic modelling was consistent with that described in Section 6.1.1 of the project REF. Additional traffic monitoring was carried out in June 2021 for the purposes of validating the model only and is not presented in this assessment.

6.9.2 Existing environment

The existing environment of the modified project remains as described in Section 6.1.2 of the project REF and summarised below.

Dubbo serves as an important transport and freight hub, being located at the junction of the Newell Highway, Golden Highway and Mitchell Highways. The average daily traffic volumes across the Emile Serisier Bridge is in the order of 18,500 vehicles per day, with a large number of heavy vehicles using the Newell Highway.

All intersections within the study area during morning and evening peak periods operate with acceptable Level of Service (LoS) B or better, except the intersection of Thompson Street and Whylandra Street (Newell Highway), which operates at a LoS F during the evening peak hour.

6.9.3 Potential impacts

Construction

Generally, the potential construction traffic impacts of the modified project would be consistent with the project REF. There is no change to overall construction traffic vehicle number as a result of the proposed changes.

However, the additional site accesses to ancillary facilities 2 and 5 via Bunglegumbie Road would introduce additional light and heavy vehicles to this section of road. Up to 60 light vehicles and 20 heavy vehicles may use this site access during the day time, and up to 20 light vehicles and 4 heavy vehicles may use this site access during the night time. Typically, the peak for light vehicles would be associated with construction workers arriving on site, which would be before the peak traffic period and leaving before the peak evening traffic period.

Bunglegumbie Road is a local road connecting Thompson Street to Troy Bridge Road and providing access to the residential precinct to the west of the modified project. The introduction of construction traffic along the route would have the potential to generate minor delays and disruptions to existing traffic flows along Bunglegumbie Road and the private access tracks.

Appropriate measures would be implemented through a Traffic Management Plan (TMP). This would include measures ensure appropriate access is maintained to properties at all times during the construction period, in consultation with property owners. This would include the driveway. Measures would also be included to prevent construction vehicles queuing on public roads (including Bunglegubmie Road).

As per the project REF, pedestrian and cycle infrastructure would be impacted during construction, which would require diversions and the use of alternative existing and temporary paths to maintain safe pedestrian and cycling access at all times. Temporary paths are likely to be in place for the full duration of the construction period

Operation

Modelling of the proposed changes to intersection layouts identified that both the modified Thompson Street/Whylandra Street and River Street/Bourke Street intersections would operate with acceptable LoS (either B or C) during the morning and evening peak. The modified layout would provide improved traffic performance at the Thompson Street/Whylandra Street intersection compared to the existing priority intersection.

Potential impacts on property access would be limited. The proposed changes include improvements to accesses on Thompson Street, including the Riverside Church and the addition of a turning lane on River Street to allow access to properties.

The proposed revisions to shared paths would result in an improvement in access for users, with future provision also provided. Access to Wiradjuri Park would also be an improvement compared to the project REF. Consultation with Dubbo Regional Council and the Aboriginal community regarding Wiradjuri Park is ongoing to inform landscaping design and to ensure areas used only for construction are reinstated appropriately.

6.9.4 Safeguards and management measures

No changes are proposed to the traffic and transport environmental safeguards and management measures presented in the submissions report as a result of the proposed modification. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

6.10 Other impacts

The project REF also assessed the potential impacts for the following environmental factors:

- Topography, geology and soils
- Groundwater and surface water
- Air quality
- Climate change and greenhouse gas
- Waste and resource management.

6.10.1 Existing environment and potential impacts

The existing environment and potential impacts for other relevant environmental factors are outlined in Table 6-28.

Table 6-28 Potential impacts for the other environmental factors

Environmental factor	Existing environment	Potential impacts
Topography, geology and soils	The existing environment is consistent with that outlined in Section 6.9.2 of the project REF.	The proposed changes include a reduction in height of the western embankment of the proposed Newell Highway. As a result, there would be a minor change to topography of the modified project area. As per the project REF, this change would be would not be expected to be substantial. The proposed modification has altered the approach to earthworks described in the project REF. Overall, the modified project is expected to require slightly decreased volumes of earthworks from those calculated in the project REF. As per the project REF, once the modified project is operational, the surfaces disturbed during construction would have been resurfaced or revegetated prior to operation. Erosion and salinity risks and would therefore continue to be minimal. Potential impacts on soils and nearby waterways as a result of surface water run-off would be managed through stabilisation of disturbed areas, revegetation and scour protection along drainage lines and culvert inlets and outlets.
Groundwater	The existing environment is consistent with that outlined in Section 6.3.2 of the project REF.	The proposed modification would have additional deep footings and piles as a result of the new bridge structure described in Section 3.2.3. Consistent with the project REF, deep footings may intersect the groundwater level however no material impacts are expected, as mixing would be limited to water from alluvial layers. The piles are also unlikely to affect the local groundwater flow system or alter groundwater/surface water exchange with Macquarie River. No additional impacts are expected on local Groundwater Dependent Ecosystems (GDEs). Overall, the impacts to groundwater as a result of the proposed modification would be consistent with the project REF.
Surface water	The existing environment is consistent with that outlined in Section 6.3.2 of the project REF.	The modified project includes an additional instream pier. Potential impacts of construction of the instream piers were assessed in the project REF and would be consistent for the modified project. Appropriate measures as described in the project REF would be implemented to manage potential impacts on the Macquarie River and its floodplain.

Environmental factor	Existing environment	Potential impacts
		The proposed modification would include an additional operational spill basin at the western end of New Dubbo Bridge. This would be used to collect any low risk spills occurring on the bridge deck. The additional operational spill basin will help manage potential impacts on water quality. Operation drainage infrastructure has been rationalised including drainage lines on the eastern side of the Macquarie River. As per the project REF, trapping suspended solids is the primary focus of the water quality management strategy for the operational phase of the project. Therefore, detailed design has been developed to meet the operational phase water quality design criteria of 80 per cent total suspended solids (TSS) load reductions. As a result, impacts to water quality are not expected to be significant. Overall, impacts to water quality as a result of the proposed modification would generally be consistent with the project REF.
Air quality	The existing environment is consistent with that outlined in Section 6.10.2 of the project REF.	The proposed modification has altered the approach to earthworks described in the project REF. Overall, the modified project is expected to require slightly decreased volumes of earthworks from those calculated in the project REF. This would reduce the potential short-term dust emission impacts generated from earthworks, stockpiles and the use of imported fill. The additional ancillary facility associated with the proposed modification would include a plant and equipment parking area. The exhaust fumes from the use of the additional plant, equipment, and vehicles may have a minor impact to local air quality. This impact, however, would generally be consistent with the air quality impacts described in Section 6.10.3 of the project REF. There would be no change to the potential operational impacts.

6.10.2 Safeguards and management measures

No changes are proposed to the other environmental safeguards and management measures presented in the submissions report as a result of the proposed modification. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

6.11 Cumulative impacts

6.11.1 Other project and developments

A cumulative impact occurs when two or more projects are carried out concurrently and in proximity to one another. The impacts may be caused by both construction and operational activities and can result in a greater impact to the surrounding area than would be expected if each project was carried out in isolation.

A search of the Department of Planning, Industry and Environment's Major Projects Register and Dubbo Regional Council Development Application Register was carried out on 7 December 2021. In addition to the projects outlined in Section 6.12 of the project REF, the project outlined in Table 6-29 below can potentially result in cumulative impacts with the modified project.

Table 6-29 Other projects and developments within proximity of the modified project

Project	Construction impact	Operation impact
Dubbo Quarry Continuation Project *[Status: More information required]* Holcim (Australia) Pty Limited propose to develop and operate two new resource areas at Dubbo Quarry approximately 1.9 kilometres south-east of Dubbo on Sheraton Road. The project would extend the quarry life by 25 years.	• Noise Management Levels (NMLs) will be exceeded during construction at two of the closest noise sensitive receivers (for up to eight weeks during standard day-time construction hours). • The proposal would result in up to 5.82 ha of native vegetation removal. Most of the vegetation in the project area is highly degraded, low quality and has low importance for threatened flora and fauna species.	• During operations, NMLs will be exceeded at several assessment locations. Significant noise generation will occur during stripping work. • The project will require removal of one identified, an isolated artefact of low archaeological significance. • High to moderate visual impact to three existing residences. • Positive social benefits including access to employment, land use opportunities post-rehabilitation and contribution to local economic growth and development. • Negative social benefits include noise and dust emissions.

Project	Construction impact	Operation impact
Dubbo Gas Energy Storage Scheme *[Status: Prepare Environmental Impact Statement]* Energy Transition Solutions Pty Ltd proposes to develop a Gas Energy Storage System consisting of the construction and operation of a gas fired power station and hydrogen electrolysis plant in Dubbo. The proposed site is on Yarrandale Road, approximately 4 kilometres north of Dubbo town centre, and 3 kilometres north-east of the New Dubbo Bridge. The project would be operational in 2024/2025.	• Construction of the project would result in the following potential impacts: • Localised dust generation and nuisance construction noise potentially affecting surrounding residential, commercial and ecological receptors • Removal of native vegetation • Disturbance of a known Aboriginal heritage site • Increased traffic volumes on the road network.	• Emissions produced by gas combustion would be released during operation of the project, with potential air quality impacts. • Generation of operational noise. • The project would be hazardous development, with potential for impacts associated with failure of the plant, or uncontrolled discharges to the surrounding environment. • Employment opportunities generated from construction and operation would have positive socioeconomic benefits.
Local developments *[Status: Various]* Applications in the study area relate mainly to new residential developments, residential and retail modifications. There are also applications for light industrial developments and modifications including a new service station (to replace an existing service station). Many of the developments would have similar construction timeframes to the proposal.	The Statements of Environmental Effects do not identify significant impacts during construction, although noise and dust emissions are expected.	The Statements of Environmental Effects do not identify significant impacts during operation.

6.11.2 Potential impacts

Construction

The Dubbo Quarry Continuation Project and Dubbo Gas Energy Storage Scheme are not currently approved, but may potentially be constructed concurrently with the modified project. The modified project is located to the north-west and west of the Dubbo town centre, while the Dubbo Quarry Continuation Project is located to the south-east and the Dubbo Gas Energy Storage Scheme is located to the north-east. Due to the separation and level of

predicted impacts of the projects, cumulative effects associated with noise, air quality and traffic are not expected to occur.

As identified in Section 6.12.4 of the project REF, multiple construction activities in Dubbo would have a cumulative impact on vegetation clearing (including habitat clearing), fauna mortality, aquatic habitats and local Aboriginal heritage.

Operation

No operational cumulative impacts are expected.

6.11.3 Safeguards and management measures

No changes are proposed to the cumulative environmental safeguards and management measures presented in the submissions report as a result of the proposed modification. A complete list of proposed safeguards and management measures for the modified project is provided in Section 7.2.

7 Environmental management

7.1 Environmental management plans

A number of safeguards and management measures have been identified to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the modified project. Should the proposed modification proceed, these management measures would be addressed if required during detailed design and incorporated into the Project Environmental Management Plan (PEMP) and the Contractors Environmental Management Plan (CEMP) and applied during the construction and operation of the proposed modified project.

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures for the New Dubbo Bridge project are summarised in Table 7-1. Additional safeguards and management measures identified in this addendum REF are included in underlined font. The safeguards and management measures will be incorporated into the detailed design phase of the proposed modification, the CEMP and the PEMP and implemented during construction and operation of the proposed modification, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed work on the surrounding environment.

Table 7-1 Summary of safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
GEN1	General - minimise environmental impacts during construction	A CEMP will be prepared and submitted for review and endorsement by the TfNSW Environment Manager prior to commencement of the activity. As a minimum, the CEMP will address the following: • Any requirements associated with statutory approvals • Details of how the project will implement the identified safeguards outlined in the REF • Issue-specific environmental management plans • Roles and responsibilities • Communication requirements • Induction and training requirements • Procedures for monitoring and evaluating environmental performance, and for corrective action • Reporting requirements and record-keeping • Procedures for emergency and incident management • Procedures for audit and review. The endorsed CEMP will be implemented during the undertaking of the activity.	Contractor/ TfNSW project manager	Pre-construction/ detailed design	Core standard safeguard GEN1

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
GEN2	General - notification	All businesses, residential properties and other key stakeholders (eg schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity.	Contractor/ Transport for NSW project manager	Pre-construction	Core standard safeguard GEN2
GEN3	General – environmental awareness	All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings.	Contractor/ Transport for NSW project manager	Pre-construction/ detailed design	Core standard safeguard GEN3
GEN4	Utilities	Prior to the commencement of work: • The location of existing utilities and relocation details will be confirmed following consultation with the affected utility owners • If the scope or location of proposed utility relocation work falls outside of the assessed modified project ~~proposal~~ scope and footprint, further assessment will be undertaken.	Contractor	Pre-construction/ detailed design	Core standard safeguard U1
GEN5	Hazards and risk management	A Hazard and Risk Management Plan (HRMP) will be prepared and implemented as part of the CEMP. The HRMP will include, but not be limited to: • Details of hazards and risks associated with the activity • Measures to be implemented during construction to minimise these risks • Record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • A monitoring program to assess performance in managing the identified risks • Contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations.	Contractor	Pre-construction/ detailed design	Core standard safeguard HAZ1

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		The HRMP will be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice, and EPA or Office of Environment and Heritage publications.			
GEN6	General – environmental awareness	Standard construction hours: • Monday to Friday 7am to 6pm • Saturdays 8am to 1pm • No construction on Sundays or Public Holidays. Works outside standard construction hours (including those detailed within this REF) will be undertaken in accordance with the management and mitigation measures detailed within the Noise and Vibration Management Plan.	Contractor	Construction	Core standard safeguard GEN4
GEN7	General – environmental awareness	The TfNSW Project Manager will notify the TfNSW Environment Manager at least five days prior to the commencement of the activity. The notification will include a copy of any local community notification undertaken (GEN2).	Contractor	Pre-construction/ detailed design	Additional safeguard
Traffic and Transport					
TT1	Traffic and transport	A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Roads and Maritime Traffic Control at Work Sites Manual (RTA, 2010) and QA Specification G10 Control of Traffic (Roads and Maritime, 2008). The TMP will include: • Confirmation of haulage routes • Measures to maintain access to local roads and properties • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access	Contractor	Detailed design/Pre-construction	Section 4.8 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • Monitoring, review and amendment mechanisms.			
TT2	Property access - pre-construction	Requirements for any changes to local access arrangements will be confirmed during detailed design in consultation with the local road authority and any affected landowners.	TfNSW	Pre-construction/ detailed design	Additional safeguard
TT3	Pedestrian and cycle facilities	TfNSW will investigate the incorporation of pedestrian and cycle facilities for the modified project ~~proposal~~ during detailed design.	TfNSW	Detailed design	Additional safeguard
TT4	Notifications to landowners	Disruptions to property access and traffic will be notified to landowners at least five days before starting the activity, in accordance with the relevant community consultation processes outlined in the TMP.	TfNSW and Contractor	Construction	Additional safeguard
TT5	Property access – during construction	Access to properties will be maintained during construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners and the relevant local road authority.	TfNSW and Contractor	Construction	Additional safeguard
TT6	Reduce speeds, traffic delays and	Road users, local communities and the freight industry will be provided with timely, accurate, relevant and accessible	TfNSW and Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
	disruptions during construction	information about changed traffic arrangements and delays owing to construction activities.			
TT7	Disruption to public transport, including school bus services	Access for public transport services, including school bus services, will be maintained. The requirements for any temporary changes will be confirmed following consultation with local bus operators and the community.	TfNSW and Contractor	Construction	Additional safeguard
TT8	Impacts of the regional road network	Where possible, the most disruptive work (such as work that requires lane closures) will be carried out at night to minimise potential impacts on the regional road network. This, combined with temporary effective traffic management, will assist in minimising impacts to traffic and transport using the local road network.	TfNSW and Contractor	Construction	Additional safeguard
TT9	Traffic impacts at Thompson Street and the Newell Highway	• Detailed construction traffic impacts of the modified project ~~proposal~~ will be further analysed during the detailed design phase following confirmation of construction staging • The construction staging plans will be modified, if required, to mitigate traffic impacts during construction.	TfNSW and Contractor	Pre-construction/ detailed design	Additional safeguard
Noise and Vibration					
NV1	Noise and vibration	A Construction Noise and Vibration Management Plan (CNVMP) will be prepared and implemented as part of the CEMP. The CNVMP will generally follow the approach in the Interim Construction Noise Guideline (ICNG) (DECC, 2009) and identify: • All potential significant noise and vibration generating activities associated with the activity	Contractor	Detailed design/Pre-construction	Core standard safeguard Section 4.6 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Feasible and reasonable mitigation measures to be implemented, taking into account Beyond the Pavement: urban design policy, process and principles (Roads and Maritime, 2014) • A monitoring program to assess performance against relevant noise and vibration criteria • Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.			
NV2	Noise and vibration	All sensitive receivers (e.g. schools, local residents) likely to be affected will be notified at least five days prior to commencement of any work associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of: • The project • The construction period and construction hours • Contact information for project management staff • Complaint and incident reporting • How to obtain further information.	Contractor	Detailed design/Pre-construction	Core standard safeguard
NV3	Construction noise	• Additional noise mitigation measures specified in Appendix C of the NVG are to be applied where feasible and reasonable to do so. • The number of receivers identified as eligible to receive additional mitigation is indicated in Table 5-11 of Appendix D.	Contractor	During construction	Additional safeguard
NV4	Construction noise	Based on the construction noise impact assessment above, the following project~~posal~~-specific noise mitigation measures will be	Contractor	During construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		implemented in addition to the standard mitigation measures where it is feasible and reasonable to do so: • Contain work predicted to generate noise impacts, to standard hours where feasible and reasonable • Notwithstanding the above, contain the use of any noise-intensive equipment (eg. rock breaking) to standard hours. The programming of these noise-intensive work should include periods of respite (as outlined in the ICNG) • Ensure vehicle engines are switched off when stationary or parked within ancillary facilities • Program noise-intensive work nearest to noise-sensitive receivers during their less sensitive times, e.g. work near schools should be scheduled for after-school hours, and piling and hammering for times when nearby residents are likely to be away from their home • Enclose or screen stationary noise sources such as pumps and compressors. This can reduce noise emissions by up to 15 dB(A) • Screen noise-intensive processes such as pneumatic hammering with mobile screens (e.g. acoustic screens mounted on trailers that can be moved to track the progress of work). Such screens can reduce noise levels from these activities by approximately 3-8 dB(A) where the line of sight to a receiver from the work is screened • Shield sensitive receivers from noisy construction processes by the judicious placement of structures (eg site sheds, fencing or signage) or use of site topography to screen plant Implementation of a noise monitoring program to ensure verification of predicted noise levels and ongoing noise monitoring for receivers identified as qualifying for the consideration of additional mitigation measures			

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Provision of respite periods, alternative accommodation and individual briefings for highly noise affected receivers and receivers exposed to out-of-hours work.			
NV5	Construction vibration	Specific measures to manage the potential for vibration impacts would be determined as part of the CNVMP developed during detailed design once the specific equipment schedule and localised geotechnical conditions are known. At that time, the CNVMP will consider the feasibility of implementing at least the following measures to minimise potential construction vibration impacts: • Use of lower vibration-generating plant and equipment, such as smaller capacity hydraulic hammers or concrete crushers/pulverisers in place of hammers • Suitably programming the hours of operation of major vibration generating plant and equipment • Minimising consecutive work in the same locality • Using dampened hammers • Carry out attended vibration monitoring where vibration-intensive work are to be undertaken within the safe working distances, with engineering advice being sought for monitoring historical structures • Where vibration reaches levels that may result in damage to historical structures within safe working distances, works should be ceased and revised to minimise impacts • Completing building condition surveys before and after vibration-intensive work to identify existing damage and any damage due to the work • Repairing any visual impacts resulting from the works to historical structures within safe working distances.	Contractor	Detailed design/Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NV6	Operational noise	Further assessment of individual dwellings and consultation with landowners will be required to identify the specific acoustic treatments to be applied to buildings identified as potentially requiring noise mitigation.	TfNSW	Detailed design/Pre-construction	Additional safeguard
Hydrology, surface water and flooding					
HSF1	Soil and water	A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The SWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction.	Contractor	Detailed design/Pre-construction	
HSF2	Contaminants entering receiving environments during construction	Control measures to minimise the risk of water pollution will be implemented including: • All fuels, chemicals, and liquids will be stored at least 40 metres away from the existing stormwater drainage system and stored in an impervious bunded area within the ancillary facilities • Plant and maintenance machinery will be refuelled in impervious bunded areas in the designated ancillary facilities • Vehicle wash downs and/or concrete truck washouts will be carried out within a designated bunded area of an impervious surface or carried out off-site • Regular visual water quality checks (for hydrocarbon spills/slicks and turbid plumes) will be carried out when working in or near the waterway.	Contractor	Construction	Additional safeguard
HSF3	Groundwater contamination	• Use of bores GW060611 and GW060613 and whether bores are in active use will be confirmed before construction • The water supply bores located close to the proposed bridge alignment (bores GW060611 and GW060613) will not be	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		pumped during periods of pile construction until pile concrete has set.			
HSF4	Dewatering	No dewatering of groundwater is anticipated. However, if the groundwater is intercepted during construction, confirmation of whether or not a licence is required under the Water Management Act 2000 as defined under the Aquifer Interference Policy will be required prior to any dewatering activity commencing.	TfNSW / Contractor	Pre-construction/ Construction /Operation	Additional safeguard
HSF5	Changes to stormwater and drainage flows	Hydraulic and hydrologic assessment will be carried out to confirm that structures will not impact existing drainage and to identify any additional management or mitigation measures that may be required and included in the design.	Transport for NSW	Detailed design	Additional safeguard
HSF6	Changes to water quality	Design and implementation of a water quality monitoring program during pre-construction, construction and operation in accordance with the Roads and Maritime Guideline for Construction Water Quality Monitoring (RMS 2003).	TfNSW / Contractor	Pre-construction/ Construction /Operation	Additional safeguard
HSF7	Increase in pollutant generation and flow velocities	Operational water quality treatment and quantity of flows will be identified during the detailed design phase to minimise the impact to sensitive receiving environments and downstream waterways. The water quality controls will include: • Swales • Scour protection and control to reduce erosion and water quality impacts from increased sediment loads • Bridge pier designs to minimise changes to flow and velocity.	Transport for NSW	Detailed design	Additional safeguard
HSF8	Accidental spills	Operational phase accidental spill containment will be provided at critical location(s) to ensure that spills can be captured before reaching sensitive receiving environments.	TfNSW	Detailed design	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
HSF9	Recharge of groundwater	Should bores GW060611 and GW060613 be found to be active and used for water supply purposes, stormwater infrastructure will be designed to ensure runoff from the bridge/road does not recharge the groundwater system near bores.	TfNSW	Detailed design	Additional safeguard
HSF10	Flood impacts	• The flood mitigation option will be further refined at detailed design stage to optimise the flood level reductions • Additional flood management measures to be considered at detailed design stage will include: • Additional culvert capacity under the road embankment at River Street • Scour protection at culvert outlets.	Transport for NSW	Detailed design	Additional safeguard
HSF11	Impacts to building	Any residual flood impacts to properties after implementing feasible mitigation work will be quantified. Floor level survey data will be collected to quantify impacts to above-floor flooding of properties located along the modified project ~~proposal~~ that may be impacted.	Transport for NSW	Detailed design	Additional safeguard
HSF12	Impacts to the operation of weir	Temporary work at the weir will be avoided and all channel construction activities for the New Dubbo Bridge will be outside of the operational area of the weir.	Construction contractor	Construction	Additional safeguard
HSF13	Ancillary facilities (Construction compounds)	• Appropriate management measures would be in place during construction to ensure minimal impact on the Macquarie River and its capacity to convey flows in the event of a flood, including minimising the extent of temporary in-channel work platforms • All ancillary facilities would include appropriate erosion and sediment control measures to minimise the sediment that could be transported into Macquarie River • Consideration will be given to reducing the size of the ancillary facility ~~2~~3	Contractor	Pre-construction/ Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Ancillary facility ~~facilities 1 and~~ 3 will be partly raised to achieve five per cent AEP flood immunity • The existing drainage flow path in ancillary facility 5 will be filled and appropriate site drainage provided.			
HSF14	Flooding	A flood management plan will be prepared to set out site management measures during the construction phase in order to minimise potential flood impacts.	Contractor	Detailed design	Additional safeguard
HSF15	Accidental spills	The risk of accidental spills would need to be determined at Detailed Design stage through a desktop risk assessment that identifies locations where the risk of a spill is higher, by taking into consideration the road geometry, the maximum road speed and any other potential hazards such as intersections.	Design contractor	Detailed design	Additional safeguard
HSF16	Scour impacts during construction	Appropriate bank and bed scour protection will be considered to minimise the scour risk and potential of the Macquarie River channel bed or banks as a result of the temporary in-river coffer dam and work platform.	Contractor	Construction	Additional safeguard
Aboriginal heritage					
AB1	Impacts to Aboriginal Heritage	An AHIP for harm to ~~DLGA-OS-11 (36-1-0553)~~ SP-OS-05 (36-1-0400), DLGA-ST-06 (36-1-0551), DLGA-OS-15 (36-1-0552), DLGA-IF-07 (36-1-0554), DLGA-IF-10 (36-1-0555), Bunglegumbie Road 01 (31-1-0751), TP-OS-03 (36-1-0301) (partial)~~the relocation of Terramungamine grinding grooves will be obtained prior to subsurface work commencing~~. The AHIP will be provided for the following: • Salvage of artefacts from recorded sites in the ~~proposal~~ modified project area and reburial in a in a location agreed by RAPs and recorded on AHIMS	TfNSW	Detailed design/Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Harm without salvage for all objects identified within the ~~proposal~~ modified project area • Retention of topsoils from an area of 100m^2 around the recorded Aboriginal sites to a designated conservation area near the modified project ~~proposal~~ as agreed with RAPs ~~Repatriation of the Terramungamine Grinding Grooves to a location agreed by RAPs.~~			
AB2	Aboriginal Heritage	Where impacts can be avoided (e.g. retention of ~~If the~~ Terramungamine Grinding Grooves ~~can be retained~~ within Wiradjuri Park or avoidance of majority of site TP-OS-03 (36-1-0301)) an exclusion zone/fencing will be installed to protect the site before construction. TfNSW will continue to consult with the RAPs. ~~Where the Terramungamine grinding grooves cannot be retained, an AHIP to relocate the Terramungamine grinding grooves will be required before subsurface work begins.~~	Contractor	Pre-construction	Additional safeguard
AB3	Aboriginal Heritage	An Aboriginal Heritage Management Plan (AHMP) will be prepared in accordance with the Procedure for Aboriginal cultural heritage consultation and investigation (Roads and Maritime, 2012) and Standard Management Procedure - Unexpected Heritage Items (Roads and Maritime, 2015) and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented for managing impacts on Aboriginal heritage. The AHMP will be prepared in consultation with all relevant Aboriginal groups.	Contractor	Detailed design/Pre-construction	Core standard safeguard AH1 Section 4.9 of QA G36 Environment Protection
AB4	Additional Aboriginal heritage impacts	Any further impacts proposed beyond those assessed in this addendum REF or beyond the ~~proposal~~ modified project area must be subject to further assessment and consultation with Aboriginal stakeholders, consistent with the process in this report.	TfNSW	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
AB5	Minimise risks to Aboriginal cultural heritage during construction	All personnel working on site will receive a cultural heritage induction to ensure awareness of requirements of the AHMP and relevant statutory responsibilities. The induction will provide details on the following: • Overview of the nature and extent of archaeological materials within the modified project ~~proposal~~ • Broader cultural context of the site and its significance to Aboriginal people • Relevant legislation • AHIP • Salvage procedure.	Contractor	Detailed design/Pre-construction	Additional safeguard
Non-Aboriginal heritage					
NAH1	Non-Aboriginal heritage	A non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to non-Aboriginal heritage.	Contactor	Detailed design/Pre-construction	Core standard safeguard H1 Section 4.10 of QA *G36 Environment Protection*
NAH2	Non-Aboriginal heritage	*The Standard Management Procedure - Unexpected Heritage Items* (Roads and Maritime, 2015) and *Unexpected Heritage Finds Guideline* (TfNSW, 2019) will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered Work will only re-commence once the requirements of that Procedure have been satisfied.	Contactor	Detailed design/Pre-construction	Core standard safeguard H2 Section 4.10 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NAH3	Conservation strategy or policy	A Conservation Strategy or Policy is required before construction to mitigate impacts to the Dubbo Railway Bridge and Mount Olive. This Policy will be consistent with Heritage Council Guidelines for Conservation Strategies and Policies.	Contractor	Detailed design/Pre-construction	Additional safeguard
NAH4	Lighting and signage	The impact of the lighting and signage on the Dubbo Railway Bridge and Mount Olive Cottage will be considered and specifically addressed in the design documents and referenced in the Conservation Strategy and Policy.	Contractor	Detailed design/Pre-construction	Additional safeguard
NAH5	Vibration	It is not considered that the modified project ~~proposal~~ will result in significant impacts from construction vibration during construction. However, as a precautionary measure it is recommenced that impacts from vibration to the Dubbo Lattice Railway Bridge, Mount Olive Cottage and “Tantallon” residence are managed as part of the CEMP for the modified project ~~proposal~~, including vibration monitoring and inspections by suitably qualified engineers as appropriate.	Contractor	Construction	Additional safeguard
NAH6	Notification of NSW Heritage Council	Having consideration for the requirement for approval under s57 of the Heritage Act 1997. The NSW Heritage Council will be advised of the proposed work and the SOHI for future reference. This notification would be in writing. Specifically, advice regarding standard exemptions (Exemption 9) will be formerly sought prior to finalisation of the project design or before final project approval.	Contractor	Detailed design/Pre-construction	Additional safeguard
NAH7	Non-Aboriginal heritage	Non-Aboriginal heritage awareness training will be provided for all contractors and personnel before construction to outline the identification of potential heritage items and associated procedures to be implemented in the event of the discovery of non-Aboriginal heritage materials, features or deposits (that is, unexpected finds), or the discovery of human remains.	Contractor	Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
NAH8	Non-Aboriginal heritage	The remnants of the house on 9 Brisbane Street would be located prior to construction commencing.	Contractor	Pre-construction	Additional safeguard
Socio-economic, property and land use					
SC1	Consultation	A Project Communications Plan (CP) will be prepared and implemented as part of the CEMP	Contractor	Detailed design/Pre-construction	Section 3.7 of QA G36 Environment Protection
SC2	Consultation	A CP will be prepared and implemented to help provide timely and accurate information to the community during consultation. The CP will include (as a minimum): • Mechanisms to provide details and timing of proposed activities to affected residents and businesses, including changed traffic and access conditions, including from work carried out at night • Contact name and number of complaints. The CEP will be prepared in accordance with the *Community Involvement and Communications Resource Manual (RTA, 2008)*.	TfNSW	Pre-construction and construction	Standard safeguard
SC3	Property acquisition	All property acquisition will be carried out in accordance with the *Land Acquisition Information Guide* (Roads and Maritime, 2012) and the *Land Acquisition (Just Terms Compensation) Act 1991*.	TfNSW project manager	Pre-construction and construction	Core standard safeguard PL1
SC4	Emergency vehicle access	Access for emergency vehicles will be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.	TfNSW and Contractor	Pre-construction/ Detailed design	Additional safeguard SE2

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
SC5	Consultation – property owners	Consultation will be carried out with all affected property owners prior to and during construction to develop and implement measures to mitigate impacts on their property. This includes (but is not limited to): • Businesses at Whylandra Street, River Street and Victoria Street • Riverside Church Dubbo Kingdom Hall Jehovah's Witness • Dubbo Regional Council (as managers of open space and recreation areas near the modified project) Private properties affected by property acquisition/leases.	Transport for NSW/ Contractor	Pre-construction/ Construction	Additional safeguard
SC6	Consultation – business and industry	Consultation will be carried out with business, industry, freight transport providers and managers of tourism related businesses about the timing and duration of construction activities.	TfNSW and Construction Contractor	Pre-construction/ Detailed design	Additional safeguard
SC7	Business impacts	• A business impact risk register will be maintained to identify and manage the specific impacts associated with construction related work for individual businesses • Access to existing businesses will be provided on a continuous basis throughout the construction of the modified project ~~proposal~~ Appropriate road signage will be provided in accordance with the TfNSW guidelines to provide guidance to passing patrons on access to shops and services in Dubbo town centre.	Contractor	Construction	Additional safeguard
SC8	Complaints	A complaints handling procedure and register will be included in the CEMP.	Construction contractor	Construction	Additional safeguard
Landscape character and visual					

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
LC1	Design integration	During detailed design, TfNSW integrated project development will be followed and it will include urban designers (selected from the TfNSW's Registered Contractors Scheme) as part of the project team.	TfNSW	Detailed design	Additional safeguard
LC2	Design integration	Design development will reflect TfNSW Urban Design Policy and Guidelines.	TfNSW	Detailed design	Additional safeguard
LC3	Design integration	Urban design principles and objectives, as well as the concept design strategy presented in the LCVIA (Appendix M of the project REF) are to form basis of future design development.	TfNSW	Detailed design	Additional safeguard
LC4	Visibility of built elements	Further development of the bridge design is to ensure that a simple, refined, integrated structure which sits comfortably within the landscape is adopted and consistent with design guidelines, principles and concepts included in the LCVIA (Appendix M of the project REF).	TfNSW	Detailed design	Additional safeguard
LC5	Visibility of built elements	Minimise structural depth, construction footprint and disruption to the Macquarie River.	Contractor	Construction	Additional safeguard
LC6	Visibility of built elements	~~Proposal~~ Project work sites, including ancillary facilities will be managed to minimise visual impacts, including appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials.	Contractor	Construction	Core standard safeguard UD2
LC7	Landscape character and visual impact	An Urban Design and Landscape Strategy will be carried forward and further developed in the next phases of the project.	Design consultancy/ TfNSW	Detailed design	Additional safeguard
LC8	Vegetation and landscaping	A Landscape Management Plan to ensure cost effective and consistent management of landscape work will be developed in consultation with property owners, developers, and local council.	TfNSW	Operation	Core standard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		The plan will be prepared in accordance with the Roads and Maritime (2008) Landscape Guideline.			safeguard UD6
LC9	Retention of existing vegetation	• The ~~proposal~~ modified project design will avoid impact to prominent trees and vegetation communities where possible • Existing threatened flora species are to be retained and protected wherever possible • Minimise vegetation clearance extent where possible.	TfNSW	Detailed design/Pre-construction	Additional safeguard
LC10	Retention of existing vegetation	Clearly define clearance limits and exclusion zones to protect vegetation cover.	Construction contractor	Construction	Additional safeguard
LC11	Revegetation	• Vegetation communities to reflect existing communities and landscape character • Utilise local provenance material • Provide screen planting within road corridor to limit visibility of the modified project ~~proposal~~ from adjoining residential properties.	Design consultancy/ TfNSW	Detailed design	Additional safeguard
LC12	Revegetation	• Progressively implement revegetation work to limit erosion and to establish vegetation • Use cleared material as part of revegetation work.	Construction contractor	Construction	Additional safeguard
LC13	Visual impact of work sites	• Ancillary facilities will be decommissioned and the sites rehabilitated to their existing condition or as otherwise agreed with the landowner on completion of work • Provide minimum signage requirements and limit structural elements to provide and open and permeable setting.	Construction contractor	Construction	Additional safeguard
LC14	Light spill from work sites	Temporary lighting will be sited and designed to avoid light spill into residential properties and identified sensitive receptors. Night work will be limited to minimise light spill.	Construction contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
LC15	Visual impact	• The integration of the flood route into the overall parkland character will be investigated during detailed design. The flood route could provide the potential for access to Wiradjuri Park and off-street parking during non-flood event periods. The space between the Newell Highway and the flood route could be also developed to provide an active recreational facility west of the river. • Where feasible the Macquarie River will remain a passive open space and continue to be developed along the concepts presented in the Wiradjuri Park Masterplan (Moir Landscape Architecture, 2013).	TfNSW	Detailed design/Pre-construction	Additional safeguard
LC16	Visual impact	• Provide visual screening within the road corridor to limit the visual impact of the <u>modified project</u> ~~proposa~~l in areas identified as moderate or high impact • Provide a sense of space and openness associated with the agricultural landscape	Construction contractor	Construction	Additional safeguard
LC17	Light impact on the night sky	To reduce the amount of light contributing the glow that is visible from the Siding Springs Observatory the following principles listed in Part 4 of The Dark Sky Planning Guidelines (DPE, 2016) will be consider including: • Eliminate upward light spill. In other words, there are to be no direct emissions above the horizontal plane • Direct light downwards not upwards • Use shielded fittings • Avoid over lighting • Avoid directing light towards reflective surfaces • Use warm colours (3,500K or less).	Design consultancy	Detailed design	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
LC18	Vegetation screening	During detailed design the landscape plan would be reviewed to consider opportunities for additional vegetation screening between the Riverside Church and the new permanent slip road.	TfNSW	Detailed design	Additional safeguard
Biodiversity					
B1	Biodiversity	A Flora and Fauna Management Plan will be prepared in accordance with Roads and Maritime's Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects (RTA, 2011) and implemented as part of the CEMP. It will include, but not be limited to: • Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • Requirements set out in the Landscape Guideline (RTA, 2008) • Pre-clearing survey requirements • Procedures for unexpected threatened species finds and fauna handling • Procedures addressing relevant matters specified in the Policy and guidelines for fish habitat conservation and management (DPI Fisheries, 2013) • Protocols to manage weeds and pathogens.	Contractor	Detailed design/Pre-construction	Section 4.8 of QA *G36 Environment Protection*
B2	Biodiversity	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design and implemented where practicable and feasible.	Contractor	Detailed design/Pre-construction	Core standard safeguard
B3	Removal of native vegetation	• Pre-clearing surveys will be carried out in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines:	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		Protecting and managing biodiversity on RTA projects (RTA,2011) • Vegetation and habitat removal will be carried out in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • Native vegetation will be re-established in accordance with Guide 3: Re-establishment of native vegetation of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • Exclusion zones will be set up at the limit of clearing (that is the edge of the impact area) in accordance with Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • The hollow-bearing trees on the western boundary of ancillary facility 4 (shown on Figure 6-14 of the REF) will be retained and protected.			
B4	Removal of threatened species habitat and habitat features	• Habitat will be replaced or re-instated in accordance with Guide 5: Reuse of woody debris and bushrock and Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • The hollow-bearing trees on the western boundary of ancillary Facility 4 (shown on Figure 3-1 of Appendix N of the REF) will be retained and protected • The unexpected species find procedure is to be followed under Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) if threatened fauna, not assessed in the biodiversity assessment, are identified in the <u>project</u> ~~proposal~~ site. This is particularly relevant given the likely loss of hollow-bearing trees from riparian habitat near the bridge location.	Contractor	Detailed design/Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
B5	Aquatic impacts	Aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) and Section 3.3.2 Standard precautions and mitigation measures of the *Policy and guidelines for fish habitat conservation and management* Update 2013 (DPI (Fisheries NSW) 2013).	Contractor	Pre-construction/ Construction	Additional safeguard
B6	Injury and mortality of fauna	• Fauna will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • Activities and areas which present a higher risk of impacting on the receiving waters will be outlined in the Soil and Water Quality Management Plan (PS271) (SWQMP), along with specific controls to reduce the risk of these impacts occurring. The SWQMP will be prepared as part of the overall CEMP. These management plans will specify mitigation measures in accordance with Best Management Practices (BMPs) set out in 'Soils and Construction: Managing Urban Stormwater' (Landcom 2009).	Contractor	Construction and operation	Additional safeguard
B7	Invasion and spread of weeds	Weed species will be managed in accordance with: • Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011) • Central West Regional Strategic Weed Management Plan 2017-2022.	Contractor	Construction	Additional safeguard
B8	Invasion and spread of pests	Pest species will be managed within the ~~proposal~~ project site.	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
B9	Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011).	Contractor	Construction	Additional safeguard
B10	Noise, light and vibration	Shading and artificial light impacts will be minimised through detailed design.	Contractor	Detailed design	Additional safeguard
Topography, geology, soils and contamination					
TC1	Contaminated land	A Contaminated Land Management Plan will be prepared in accordance with the *Guideline for the Management of Contamination* (Roads and Maritime, 2013) and implemented as part of the CEMP. The plan will include, but not be limited to: • Capture and management of any surface runoff contaminated by exposure to the contaminated land • Further investigations required to determine the extent, concentration and type of contamination, as identified in the detailed site investigation (Phase 2) • Management of the remediation and subsequent validation of the contaminated land, including any certification required • Measures to ensure the safety of site personnel and local communities during construction.	Contractor	Detailed design/Pre-construction	Core standard safeguard C1 Section 4.2 of QA G36 *Environment Protection*
TC2	Contaminated land	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other work that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the TfNSW Environment Manager and/or EPA.	Contractor	Detailed design/Pre-construction	Core standard safeguard C2 Section 4.2 of QA G36 *Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
TC3	Contaminated land	The construction contractor would carry out a visual inspection of the house at 6R Bunglegumbie Road Dubbo prior to demolition to check for any hazardous material such as asbestos and lead paint.	Contractor	Pre-construction	Additional safeguard
TC4	Stockpile management	Stockpiles will be designed, established, operated and decommissioned in accordance with the Roads and Maritimes' *Stockpile Site Management Guideline 2015*.	Contractor	Construction	Additional standard safeguard SW9
TC5	Soil stabilisation and restoration	The rehabilitation of disturbed areas will be carried out progressively as construction stages are completed, and in accordance with: • Landcom's Managing Urban Stormwater: Soils and Construction series • Landscape Guideline (RTA, 2008) • Roads and Maritimes' Guideline for Batter Stabilisation Using Vegetation (2015).	Contractor	Construction	Additional standard safeguard SW15
TC6	Erosion and sedimentation	The SWMP will be implemented throughout the construction period. It will include the following safeguards: • Designated exclusion zones will be identified for the storage and use of construction plant and equipment. These zones will delineate traffic areas and restrict entry and exit points to construction sites • Areas of risk near the modified project ~~proposal~~, such as steep areas or highly erodible soils, will be identified and appropriate management controls implemented • Temporary or permanent diversion drains will be used to divert off-site runoff around or through the construction site to minimise the volume of flow that mixes with on-site runoff	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Physical controls will be developed in line with the erosion and sediment control plan (ESCP), including sediment fences, sediment filters, rock check dams, level spreaders, and on-site diversion drains installed before construction and maintained during construction • Exposed batters will be lined, if required • A schedule for the ongoing maintenance and inspection of temporary erosion and sediment controls will be developed.			
TC7	Pollution from runoff	The ancillary facilities will be managed within the ESCP. The following measures will be included to limit sediment and other contaminations entering receiving waterways: • Chemicals will be stored within a sealed or bunded area • Appropriate controls will be in place where plant is stored • Runoff from ancillary facilities will be controlled and treated before discharging into downstream waterways • Vehicle movements will be restricted to designated pathways where feasible • Areas that will be exposed for extended periods, such as car parks and main access roads, will be stabilised where feasible.	Contractor	Construction	Additional safeguard
TC8	Accidental spill	A site specific emergency spill plan will be developed, and include spill management measures in accordance with the TfNSW *Code of Practice for Water Management* (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including TfNSW and EPA officers). A fully equipped emergency spill kit will be kept on-site at all times.	Contractor	Detailed design/Pre-construction	Core standard safeguard C3 Section 4.3 of QA G36 *Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
TC9	Contaminated land	Intrusive contamination investigations should be carried out in the vicinity of the modified project ~~proposal~~ to quantify exposure risk to potential moderate risk AEIs.	Contractor	Detailed design/Pre-construction	Additional safeguard
TC10	Ground disturbance	During the establishment of ancillary facility 2, material will be laid down to create hard standing. Should any ground disturbance be required within this land parcel, it will be managed in accordance with the CEMP to minimise any potential risk.	Contractor	Construction	Additional safeguard
Air quality, climate change and greenhouse gas					
AQ1	Impacts on air quality during construction	An Air Quality Management Plan (AQMP) will be prepared and implemented as part of the CEMP. The AQMP will include, but not be limited to: • Potential sources of air pollution • Air quality management objectives consistent with any relevant published EPA and/or OEH guidelines • Mitigation and suppression measures to be implemented • Methods to manage work during strong winds or other adverse weather conditions • A progressive rehabilitation strategy for disturbed areas.	Contractor	Detailed design/Pre-construction	Section 4.4 of QA *G36 Environment Protection*
AQ2	Impacts on climate change during construction	During construction, the following measures will be considered and implemented where possible: • Plant and equipment will be switched off when not in use • Vehicles, plant and construction equipment will be appropriately sized for the task and properly maintained so as to achieve optimum fuel efficiency • Materials will be delivered with full loads and will come from local suppliers, where possible	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		• Energy efficiency and related carbon emissions will be considered when selecting vehicles and equipment • Vegetation clearing will be reduced as much as feasible, and re-established in suitable areas when construction is completed • Waste will be reduced and recycled as a preference before disposing to landfill.			
AQ3	Climate change risks to construction	Environmental safeguards and management measures in the CEMP will be designed to accommodate and respond to the increased frequency and severity of rainfall events.	Contractor	Pre-construction	Additional safeguard
Waste and resource management					
WR1	Generation of construction waste	A Waste Management Plan will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to: • Measures to avoid and minimise waste associated with the modified project ~~proposal~~ • Classification of wastes generated by the modified project ~~proposal~~ and management options (reuse, recycle, stockpile, disposal) • Classification of wastes received from off-site for use in the modified project ~~proposal~~ and management options • Identifying any statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions • Procedures for storage, transport and disposal • Monitoring, record keeping and reporting, including any documentation management obligations arising from resource recovery exemptions.	Contractor	Pre-construction/ Detailed design	Section 4.2 of QA *G36 Environment Protection*

No.	Impact	Environmental safeguards	Responsibility	Timing	Reference
		The Plan will be prepared taking into account the TfNSW *Environmental Procedure - Management of Wastes on Roads and Maritime TfNSW Services Land* and relevant TfNSW *Waste Fact Sheets*, as well as the adopting the Resources Management Hierarchy principles of the WARR Act.			
WR2	Existing condition of ancillary facilities	Prior to land being used for ancillary construction purposes (compounds, storage, parking, etc) a pre-construction land assessment will be carried out to identify the presence of any pre-existing wastes.	Contractor	Pre-construction/ Detailed design	Core standard safeguard W2
WR3	Final condition of ancillary facilities	A post-construction land assessment will be carried out of land that was used for ancillary construction purposes (compounds, storage, parking, etc.) to determine the suitability for hand-back to the landowner.	Contractor	Post construction/ Operation	Additional standard W12
Cumulative impacts					
C1	Cumulative impacts from construction of multiple projects	The CEMP will be updated as required to address cumulative impacts as other projects/activities begin. This will include a process to review and update mitigation measures as new work begins or if complaints are received.	Contractor	Pre-construction and Construction	Additional safeguard

7.3 Licensing and approvals

All relevant licenses, permits, notifications and approvals needed for the New Dubbo Bridge Project and when they need to be obtained are listed in Table 7-2.

Table 7-2 Summary of licensing and approval required

Instrument	Requirement	Timing
Roads Act 1993	Road Occupancy License will need to be obtained as necessary under section 138 of the Roads Act 1993.	Prior to start of the activity
National Parks and Wildlife Act 1974 (s90)	An AHIP for the entire modified project area will be obtained under section 90 of the National Parks and Wildlife Act 1974.	Prior to start of the activity
Permission from private landowners and residents	Permission from private landowners and residents must be obtained to access project work sites. This would likely be obtained through temporary lease.	Before accessing any private property
***Water Management Act 2000* (s304)**	Notice to the Minister for Primary Industries to exercise functions in special areas within the catchment area.	14 days prior to exercising functions
Crown Land Management Act 2016	Licence to occupy areas of Crown land. A Community Engagement Strategy which has been exhibited for at least 28 days and approved by the Minister (Lands and Forestry) is required for any action affecting Crown land use including licences and leases.	Prior to start of the activity
***Heritage Act 1977* (s57)**	Exemption notification for 'Standard Exemption 9: Change of Use' for work next to an item on the State Heritage Register from the Director OEH.	Prior to start of the activity
Fisheries Management Act 1994 (s199)	Written notification to the Minister for Department of Planning, Industry and Environment (former NSW Department of Primary Industries) prior to any dredging and reclamation work.	Prior to start of the activity
Fisheries Management Act 1994 (s220ZW)	A permit will be required to be obtained under section 220ZW of the Fisheries Management Act 1994 as the activity is likely to result in 'harm to a threatened species, population or ecological community.	Prior to start of the activity

8 Conclusion

8.1 Justification

The progression of the detailed design from the concept design (as assessed in the project REF) and ongoing stakeholder consultation has resulted in a number of design refinements across the New Dubbo Bridge project. These design refinements (described in Section 1.1) have been assessed as the proposed modification in this addendum REF. The proposed modification would provide an improvement in constructability and additional long-term operational benefits to the New Dubbo Bridge project. These long term benefits include:

- Improved flood resilience for the New Dubbo Bridge and the associated proposed Newell Highway
- Improved active transport facilities along the project alignment
- An improvement in flooding impacts to surrounding areas from the approved project.

The proposed modification would result in a minor increase in the number of receivers experiencing short-term impacts such as noise and amenity. These impacts are temporary and would be managed with the safeguards and mitigation measures outlined in this addendum REF.

Long term impacts resulting from the proposed modification include additional impacts to Aboriginal heritage. A further five Aboriginal sites would be impacted, with one site experiencing a partial impact and four sites experiencing a total impact. The proposed modification would also, however, result in long term positive impacts. These impacts include an improvement in flooding impacts from the approved project to surrounding areas, and an improvement in access and connectivity.

Overall, the proposed modification is considered to be justified. It has been developed to best meet the proposal objectives, whilst minimising the construction impacts. It provides additional, beneficial operational impacts to the project.

8.1.1 Social factors

As documented in Section 6.7, the proposed modification would have some minor short-term negative socio-economic impacts as a result of the disturbance and change that would occur during construction. The combined effect of construction noise, dust, local access changes, on-street parking loss and general disturbance caused by construction activity, construction traffic, lighting and machinery movements would result in a general loss of amenity for greater number of residents, motorists, workers and others who live near the modified project area and those who visit the modified project area on a regular basis. These impacts are generally consistent with the approved project.

Overall, the modified project would be considered to have positive social benefit in the long-term, through improvements to the transport network in and around the modified project area by removing heavy vehicles crossing the Emile Serisier Bridge and associated congestion. In addition to improving local traffic flow and safety, the modified project would improve freight efficiency and productivity for the Newell Highway for heavy vehicles including (B-Double road trains, B-Triples and AB triple vehicles) through Dubbo. The modified project would also improve flood immunity across the Macquarie River and provide an alternative route during flooding events.

8.1.2 Biophysical factors

The modified project involves the construction of a new bridge over the Macquarie River. The majority of the proposed modification is located within cleared agricultural landscape and within road reserve, consequently vegetation clearing has been minimised. Some clearing of native vegetation (about 3.16 hectares compared to 0.74 hectares for the project as determined) would be required,. However, as identified in Section 6.3, the vegetation clearing would not significantly impact threatened species, populations or ecological communities or their habitats.

The modified project would impact on a section of the Macquarie River which has been identified as having potential value as an aquatic ecosystem. Potential impacts include reduced water quality, impacts to fish passage and impacts to aquatic habitats. Any potential changes to ground water quality could also impact the health of the GDE and the quality of the groundwater discharge into the Macquarie River. These impacts are generally consistent with the approved project.

As discussed in Section 6.3, the proposed modification has been designed to accommodate stormwater volumes during a one per cent AEP flooding event, and would incorporate measures to protect in-stream water quality and prevent scour and erosion so as to protect aquatic ecosystems.

8.1.3 Economic factors

The proposed modification would require a higher area of partial property acquisition compared to the approved project. Partial acquisitions would require the development of property adjustment plans, which would be prepared in consultation with the property owner.

The modified project would deliver long-term economic benefits on its own and as part of a number of strategic plan for infrastructure investment in rural NSW including the NSW 12 Premier's Priorities and 18 State Priorities (Department of Premier and Cabinet, 2016), the State Infrastructure Strategy 2012–2038 (Infrastructure New South Wales, 2017) the Future Transport Strategy 2056 (Transport for NSW, 2018).

8.1.4 Public interest

The public interest is best served through the equitable distribution of resources, and investment in public infrastructure that fulfils the needs of the majority. The modified project represents a cost-efficient investment in public infrastructure that would maximise the long-term social and economic benefits, while minimising the long-term negative impacts on communities and the environment. By improving local and regional transport facilities, the modified project would better enable the movement of people, goods and services.

The proposed modification would result in some additional short-term impacts on amenity, access and noise during construction. Mitigation measures would be implemented to manage and reduce short term construction impacts.

8.2 Objects of the EP&A Act

The objects of the EP&A Act in relation to the proposed changes and/or the modified project are considered in Table 8-1 below.

Table 8-1 Consideration of the objects of the EP&A Act

Object	Comment
1.3(a) To promote the social and economic welfare of the community and	The modified project would improve the social and economic welfare of the

Object	Comment
a better environment by the proper management, development and conservation of the State's natural and other resources.	community by providing better access and road safety throughout the New Dubbo Bridge alignment. The modified project would also reduce the extent of flooding impacts on surrounding land resulting from the approved project.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	Ecologically sustainable development is considered in Section 8.3.
1.3(c) To promote the orderly and economic use and development of land.	The proposed modification may impact on minor additional areas of agricultural land surrounding the modified project. Impacts to land use and future development of land has been minimised where possible however changes to existing land uses would occur. The modified project would continue to improve the economic use of the road by improving freight efficiency for the freight industry during flood events.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the proposed modification.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	Impacts to native animals and plants, including threatened species, populations and ecological communities and their habitats are considered in Section 6.3. The modified project would result in clearing of about 3.16 hectares of native vegetation. However, the vegetation clearing would not significantly impact threatened species, populations or ecological communities or their habitats. Safeguards and management measures would be implemented to manage impacts to biodiversity and cleared areas would be appropriately revegetated at the completion of work.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	Impacts to Aboriginal heritage and non-Aboriginal heritage were considered in Section 6.1 and Section 6.2.

Object	Comment
	Construction work for the proposed modification would occur within the safe working distance for the Dubbo Railway Bridge, and may potentially impact the heritage item. Management measures described in Section 6.1.4 of the project REF to be implemented are sufficient to help mitigate any impacts to the heritage item. Construction work for the proposed modification would also occur along the edge of the Mount Olive heritage item curtilage. The proposed work is temporary, and impacts would be limited to negative visual amenity for views from the cottage. Any work within and around the curtilage would be reinstated to its pre-construction state once work is completed. The proposed modification would directly impact five Aboriginal sites. These include artefacts, isolated artefacts, artefact scatter and a scarred tree. The Terramungamine grinding grooves may continue to remain in place and be avoided during construction work, or may be relocated in consultation with the RAPs.
1.3(g) To promote good design and amenity of the built environment.	The proposal has been designed in accordance with the urban design objectives and principles as outlined in Section 2.3.2 of the project REF.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the proposed modification.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the proposed modification.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	The proposal development process has involved consultation with relevant stakeholders. Consultation carried out to date and proposed for the future is outlined in Chapter 5.

8.3 Ecologically sustainable development

8.3.1 The precautionary principle

Principle 15 of the United Nations Conference on Environment and Development 1992 (the Rio Summit) defined the precautionary principle: “where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation”. In 2000, a European Union communication further refined the definition to account for action where scientific evidence is “insufficient, inconclusive or uncertain”. Also realised was the responsibility placed on the developer to prove their actions as being safe and act in instances where there is uncertainty.

In all cases impact assessment is a subjective process. It relies on professional judgement and interpretation. Consequently, precaution has been built into the assessment carried out and reported in this addendum REF. This includes adopting a number of worst-case assumptions, such as all noise-generating equipment operating at its maximum output at the same time in the same location, or the assumption of the worst-case vegetation impact within the modified project area

This addendum REF has been prepared using the precautionary principle and appropriate mitigation measures are outlined to address all of the potential impact identified for the modified project.

Additional environmental assessment would be carried out where there is an identified inconsistency with this addendum REF as well as the project REF. This again would ensure that uncertainty is identified, addressed and resolved throughout the project’s design lifecycle by implementing precaution at all stages.

8.3.2 Intergenerational equity

Intergenerational equity refers to the principle that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

The modified project area would not impact on the health, diversity and productivity of the local environment or communities in a way that would disadvantage future generations.

8.3.3 Conservation of biological diversity and ecological integrity

Preserving biological diversity and ecological integrity requires that ecosystems, species, and biological diversity are maintained and improved to ensure their survival. It is accepted that this proposed modification would result in the loss of about 3.16 hectares of native vegetation. However the vegetation clearing would not significantly impact threatened species, populations or ecological communities or their habitats. The findings of the biodiversity assessment indicate that the potential impacts would be acceptable and minimised through the proposed safeguards (refer to Chapter 7).

8.3.4 Improved valuation, pricing and incentive mechanisms

The pricing of environmental resources involves placing a monetary value on natural assets and services. The principle suggests that Transport for NSW should:

- Bear reasonable costs to avoid pollution risks (the ‘polluter pays principle’) and implement controls to contain or reduce pollution should it occur
- Consider the lifecycle environmental, social and economic costs of building, operating and maintaining the proposal

- Implement the proposal's environmental goals by enabling specialists to identify the most cost-effective safeguards and management measures to respond to its predicted environmental impact.

As outlined in Section 8.2.4 of the project REF, Transport for NSW will continue adhere to this principle for the modified project.

8.4 Conclusion

This addendum REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration where relevant, of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the Federal EPBC Act.

A number of potential environmental impacts from the proposed modification have been avoided or reduced during the design development and options assessment. The proposed modification as described in the addendum REF best meets the project objectives, but would still result in some impacts on minor impacts on amenity for a larger number of receivers. Safeguards and management measures as detailed in this addendum REF would ameliorate or minimise these expected impacts. The modified project would also improve flood resilience of the project and provide better access and connectivity in the modified project area. On balance the proposed modification is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

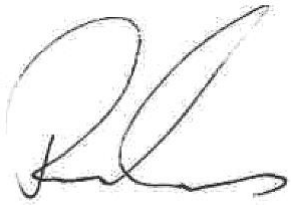
The proposed modification would not result in a change to the findings of the project REF and submissions report and would be unlikely to cause a significant impact on the environment. Therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The modified project as a result of the proposed changes is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

Significance of impact under Australian legislation

The proposed modification would not likely cause a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Government Department of Agriculture, Water and the Environment is not required.

9 Certification

This addendum review of environmental factors provides a true and fair review of the proposed modification in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed modification.



Paul Amos

Senior Environment Officer

Transport for NSW

Date: 25/2/2022

I have examined this addendum review of environmental factors and accept it on behalf of Transport for NSW.

Matthew Francisco

Project Manager

Transport for NSW Infrastructure and Place

Date: 25.2.2022.

10 References

Everick Heritage Consultants 2016. *Aboriginal Archaeological Survey: New Dubbo Bridge*. Report to NSW Roads and Maritime Services.

Everick Heritage Consultants 2019. *New Dubbo Bridge, NSW. Aboriginal Cultural Heritage Assessment Report.* Report to Roads and Maritime Services.

Jacobs 2019. *New Dubbo Bridge – Preliminary site investigation report*. Prepared for Transport for NSW.

Jacobs 2021. *Addendum Construction Noise and Vibration Assessment*. Prepared for Transport for NSW.

Jacobs 2021. *Addendum Statement of Heritage Impact - New Dubbo Bridge.* Prepared for Transport for NSW.

Jacobs 2021. *New Dubbo Bridge Addendum Hydrology and Hydraulics Assessment*. Prepared for Transport for NSW.

Jacobs 2021. *New Dubbo Bridge Detailed Site Investigations Summary Report*. Prepared for Transport for NSW.

Kelton, J. 2000. *An Archaeological Study of the Proposed Dubbo Sewerage Transfer Pipeline between Troy Sewerage Treatment Works and West Dubbo Collection Well.* Report to Public Works and Services.

Nolan, L. 2000. *Archaeological Monitoring of Sewerage Pipeline, West Dubbo NSW 2830*. Report to Dubbo Local Aboriginal Land Council.

OzArk Environment and Heritage 2007. *Aboriginal Heritage Study: Dubbo LGA. Stage Two: Field Study.* Report to Dubbo City Council.

OzArk Environment and Heritage 2021. *Aboriginal Cultural Heritage Assessment Report – New Dubbo Bridge.* Report to Jacobs.

Renzo Tonin 2021. *Operational Traffic Noise Assessment Report - New Dubbo Bridge*. Prepared for Transport for NSW.

Roads and Maritime Services (2013). *Standard Management Procedure: Unexpected Archaeological Items*. Sydney, NSW Roads and Maritime Services.

Transport for NSW (2019). *Unexpected Heritage Finds Guideline*. T. f. NSW. Sydney, Government of New South Wales.

Terms and acronyms used in this addendum REF

Term/Acronym	Description
AusLink	Mechanism to facilitate cooperative transport planning and funding by Commonwealth and state and territory jurisdictions
BC Act	*Biodiversity Conservation Act 2016* (NSW).
CEMP	Construction/Contractor's environmental management plan
EIA	Environmental impact assessment
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically sustainable development. Development which uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers.
NES	Matters of national environmental significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
Roads and Maritime	NSW Roads and Maritime was dissolved by the Transport Administration Amendment Bill in August 2019, all function are now managed by Transport for NSW
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SEPP 14	State Environmental Planning Policy No.14 – Coastal Wetlands
TSC Act	*Threatened Species Conservation Act 1995* (NSW)

Term/Acronym	Description
QA Specifications	Specifications developed by Roads and Maritime Services for use with road work and bridge work contracts let by Transport for NSW.

Appendix A

Consideration of clause 228(2) factors and matters of National Environmental Significance and Commonwealth land

Clause 228(2) Checklist

In addition to the requirements of the Is an EIS required? (1995/1996) guideline and the Roads and Related Facilities EIS Guideline (DUAP, 1996) as detailed in the addendum REF, the following factors, listed in clause 228(2) of the Environmental Planning and Assessment Regulation 2000, have also been considered to assess the likely impacts of the proposed modification on the natural and built environment.

Factor	Impact
Any environmental impact on a community? **The proposed modification would result in some short-term amenity-related impacts during construction to additional receivers in the community on Victoria Street, Thompson Street and Bunglebumbie Road.** **Operation of the proposed modification would provide better access and connectivity throughout the New Dubbo Bridge alignment and improve flooding impacts to surrounding land. Overall, the modified project would provide additional long term positive impacts on the community, by not only proving an alternative access route during a flood but also by providing better connectivity throughout the region.**	Short-term, minor, negative. Long-term positive.
Any transformation of a locality? **The proposed modification would temporarily impact the existing locality as the addition of a construction facility, adjacent to Macquarie River, may negatively impact the visual amenity of agricultural land.** **In the longer term, the proposed modification wouldn't provide significant, additional impacts to locality from the approved project. Overall, the modified project would continue to transform locality as it would introduce a new bridge to existing cleared agricultural lands.**	Short-term, minor, negative. Long-term, negative.
Any environmental impact on the ecosystems of the locality? **The modified project would impact on a section of the Macquarie River which has been identified as having potential value as an aquatic ecosystem, however this impact is not expected to be significant.**	Long-term, minor, negative.
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? **The proposed modification would continue to impact the overall aesthetic quality of the locality as a result of the temporary construction work. Impacts would be minimised as far as practicable through the implementation of safeguards outlined in Chapter 7.**	Short-term, minor, negative.

Factor	Impact
No recreational or scientific qualities of the locality are anticipated to be impacted during operation of the proposed modification.	
Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? **The proposed modification would include construction activities near Dubbo Railway Bridge, a State listed heritage item. Consistent with the apprived project, this work would have the potential to impact the heritage item. Management measures described in Section 6.1.4 of the project REF would help mitigate any impacts to this heritage item.** **Construction work for the proposed modification would also occur along the edge of the Mount Olive heritage item curtilage. The proposed work is temporary, and impacts would be limited to negative visual amenity for views from the cottage.**	Short-term, minor, negative.
Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? **The modified project would impact 3.16 hectares of native vegetation that provide potential habitat to threatened species. However, the primary work of the project are likely to avoid most of the known areas of high biodiversity values such as large trees and hollow bearing trees where possible.** **The modified project is not likely to significantly impact threatened species, populations or ecological communities or their habitats.**	Long term, minor, negative.
Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? **The proposed modification is not anticipated to endanger any species of animal, plant or other form of life. Biodiversity impacts associated with the proposed modification would be mitigated through the implementation of safeguards outlined in Section 6.5.4.**	Nil.
Any long-term effects on the environment? **The proposed modification would have an overall minor negative long term impact on the existing environment through permanent clearance of up to 3.16 hectares of native vegetation.** **The proposed modification would also directly impact five Aboriginal sites. These include artefacts, isolated artefacts, artefact scatter and a scarred tree. The Terramungamine grinding grooves may continue to remain in place and be avoided during construction work, or may be relocated in consultation with the RAPs.**	Long-term, minor, negative. Long-term, moderate, negative.

Factor	Impact
The proposed modification would have positive long-term effects on the community through improved flood impacts on the surrounding land from the approved project and better access and road safety throughout the New Dubbo Bridge alignment. Overall, the modified project would continue to increase flood immunity and route reliability, to reduce congestion and to improve access along the entire Newell highway.	Long-term, positive.
Any degradation of the quality of the environment? **The proposed modification would continue to require removal of vegetation for it's construction. The site would be rehabilitated far as practicable after construction, which would reduce the risk of long-term degradation to the environment. Safeguards would be implemented during construction including measures to prevent the spread of noxious weeds. This would have the potential to degrade the quality of the environment in the long-term.** **The proposed modification includes an additional operational sediment basin at the western end of New Dubbo Bridge to collect any low risk spills occurring on the bridge deck. This would reduce the risk of long-term degradation of the environment. Further impacts to water quality and soils would be minimised through the implementation of safeguards in Section 7.2.**	Short-term, minor, negative.
Any risk to the safety of the environment? **Construction of the proposed modification would continue to have the potential to temporarily decrease safety on the Newell Highway, River Street, Thompson Street and other local roads within the modified project area due to construction work.**	Short-term, minor, negative.
Any reduction in the range of beneficial uses of the environment? **The modified project is located across areas of public recreation, low density residential and environmental management zoned land. Although the modified project would permanently acquire some parts on these zoned lands, the overall operation of the modified project would support the beneficial uses of these lands.**	Short-term, minor, negative. Long-term, positive.
Any pollution of the environment? **Construction of the proposed modification may continue to have some minor water pollution risks from sediments, soil nutrients, waste, and spillage of fuels and chemicals. Management of water quality impacts would be carried out in accordance with the safeguards and management measures outlined in Section 7.2 and Chapter 7 of the project REF.**	Short-term, minor, negative.

Factor	Impact
Construction of the proposed modification may also continue to contribute to minor noise, lighting and air quality impacts (dust and exhaust emissions). Management of noise lighting and air quality impacts would be carried out in accordance with the safeguards and management measures summarised in Chapter 7 of the project REF.	
Any environmental problems associated with the disposal of waste? **Waste associated with the proposed modification would be managed in accordance with the *Waste Avoidance and Resource Recovery Act 2001* and recycled where possible. Issues associated with the disposal of waste are not expected.**	Nil.
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? **The modified project would require less imported fill in comparison to the approved project. There would be no increase in demands and therefore resources are not likely to become in short supply as a result of the proposed modification.**	Nil.
Any cumulative environmental effect with other existing or likely future activities? **Multiple construction activities in Dubbo would continue to have a cumulative impact on vegetation clearing (including habitat clearing), fauna mortality, aquatic habitats and local Aboriginal heritage with the modified project.** **Cumulative impact as a result of concurrent development would be managed according to safeguards outlined in Section 6.11.3.**	Short term, minor, negative.
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? **The proposal is not located within a coastal area and would not result in any impact on coastal processes and coastal hazards.**	Nil.

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposed modification should be referred to the Australian Government Department of Water, Agriculture and the Environment.

Under the EPBC Act strategic assessment approval a referral is not required for proposed road actions that may affect nationally listed threatened species, populations, endangered ecological communities and migratory species. Impacts on these matters are assessed in detail as part of this addendum REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
Any impact on a World Heritage property?	Nil
Any impact on a National Heritage place?	Nil
Any impact on a wetland of international importance?	Nil
Any impact on a listed threatened species or communities?	Nil
Any impacts on listed migratory species?	Nil
Any impact on a Commonwealth marine area?	Nil
Does the proposed modification involve a nuclear action (including uranium mining)?	Nil
Additionally, any impact (direct or indirect) on Commonwealth land?	Nil

Appendix B

Statutory consultation checklists

Infrastructure SEPP

Certain development types

Development type	Description	Yes/ No	If 'yes' consult with	ISEPP clause
Car Park	Does the project include a car park intended for the use by commuters using regular bus services?	No	-	ISEPP cl. 95A
Bus Depots	Does the project propose a bus depot?	No	-	ISEPP cl. 95A
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No	-	ISEPP cl. 95A

Development within the Coastal Zone

Issue	Description	Yes/ No/ NA	If 'yes' consult with	ISEPP clause
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No	-	ISEPP cl. 15A

Note: See interactive map here: https://www.planning.nsw.gov.au/policy-and-legislation/coastal-management. Note the coastal vulnerability area has not yet been mapped.

Note: a certified coastal zone management plan is taken to be a certified coastal management program

Council related infrastructure or services

Issue	Potential impact	Yes/ No	If 'yes' consult with the relevant local council(s).	ISEPP clause	Comment
Stormwater	Are the works likely to have a substantial impact on the stormwater management	No	-	ISEPP cl.13(1)(a)	

Issue	Potential impact	Yes/ No	If 'yes' consult with the relevant local council(s).	ISEPP clause	Comment
	services which are provided by council?				
Traffic	Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	Yes	-	ISEPP cl.13(1)(b)	Consultation carried out during project REF
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of any part of the system?	No	-	ISEPP cl.13(1)(c)	
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	No	-	ISEPP cl.13(1)(d)	
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	Yes	Dubbo Regional Council	ISEPP cl.13(1)(e)	Consultation has been ongoing regarding construction work in Wiradjuri Park
Road & footpath excavation	Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes	Dubbo Regional Council	ISEPP cl.13(1)(f)	Consultation carried out during project REF

Local heritage items

Issue	Potential impact	Yes/ No	If 'yes' consult with the relevant local council(s)	ISEPP clause	Comment
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	No	Dubbo Regional Council	ISEPP cl.14	Consultation carried out during project REF. The proposed modification is not predicted to have significant impacts to local heritage items.

Flood liable land

Issue	Potential impact	Yes/ No	If 'yes' consult with	ISEPP clause	Comment
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a minor extent?	No	Dubbo Regional Council	ISEPP cl.15	Consultation carried out during project REF. Flood patterns would not change by more than a minor extent as a result of the modified project.
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance?	Yes	State Emergency Services Email: erm@ses.nsw.gov.au	ISEPP cl.15AA	Consultation carried out during project REF. Flood patterns would not change by more than a minor extent as a result of the modified project.

Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled Floodplain Development Manual: the management of flood liable land published by the New South Wales Government.

Public authorities other than councils

Issue	Potential impact	Yes/ No	If 'yes' consult with	ISEPP clause
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	No	DPIE	ISEPP cl.16(2)(a)
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	DPIE	ISEPP cl. 16(2)(b)
Aquatic reserves and marine parks	Are the works adjacent to an aquatic reserve or a marine park declared under the *Marine Estate Management Act 2014*?	No	Department of Industry	ISEPP cl.16(2)(c)
Sydney Harbour foreshore	Are the works in the Sydney Harbour Foreshore Area as defined by the *Sydney Harbour Foreshore Authority Act 1998*?	No	Sydney Harbour Foreshore Authority	ISEPP cl.16(2)(d)
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service	ISEPP cl.16(2)(f)
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	ISEPP cl. 16(2)(g)
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhardt LEP	No	Secretary of the Commonwealth Department of Defence	ISEPP cl. 16(2)(h)

Issue	Potential impact	Yes/ No	If 'yes' consult with	ISEPP clause
	2012, Narrandera LEP 2013 and Urana LEP 2011).			
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	No	Mine Subsidence Board	ISEPP cl. 16(2)(i)

Growth Centres SEPP

Issue	Potential impact	Yes/ No	If 'yes' consult with	SEPP clause
Clearing native vegetation	Do the works involve clearing native vegetation (as defined in the Local Land Services Act 2013) on land that is not subject land (as defined in cl 17 of schedule 7 of the *Threatened Species Conservation Act 1995*)?	N/A	Department of Planning, Industry and Environment	SEPP 18A

Appendix C

Aboriginal Cultural Heritage Assessment Report

Appendix D

Addendum Statement of Heritage Impact

Appendix E

Addendum Hydrology and Hydraulics Assessment

Appendix F

Detailed Contamination and Waste Classification Assessment Summary Report

Appendix G

Addendum Construction Noise and Vibration Assessment

Appendix H

Operational Traffic Noise Assessment