

# TECHNICAL PAPER

# 13

## Contamination

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT



ARTC INLAND RAIL

JUNE 2022

# ALBURY TO ILLABO (A2I) PROJECT

2-0008-210-EAP-00-RP-0012

## TECHNICAL PAPER 13 – CONTAMINATION





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# GLOSSARY AND ABBREVIATIONS

|                        |                                                                                                                                                                                                                                                                                 |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A2I                    | Albury to Illabo section of Inland Rail                                                                                                                                                                                                                                         |
| ACM                    | Asbestos containing material                                                                                                                                                                                                                                                    |
| AEC                    | Areas of Environmental Concern                                                                                                                                                                                                                                                  |
| ANZECC                 | Australian and New Zealand Environment and Conservation Council                                                                                                                                                                                                                 |
| ARTC                   | Australian Rail Track Corporation Ltd                                                                                                                                                                                                                                           |
| ARMCANZ                | Agriculture, and Resource Management Council of Australia and New Zealand                                                                                                                                                                                                       |
| ASRIS                  | Australian Soil Resource Information System                                                                                                                                                                                                                                     |
| ASS                    | Acid Sulfate Soils                                                                                                                                                                                                                                                              |
| ASSMAC                 | Acid Sulfate Soil Management Advisory Committee                                                                                                                                                                                                                                 |
| AST                    | Above ground storage tanks                                                                                                                                                                                                                                                      |
| BTEX                   | Benzene, toluene, ethylbenzene and xylene                                                                                                                                                                                                                                       |
| BTEXN                  | Benzene, toluene, ethylbenzene, xylene and naphthalene                                                                                                                                                                                                                          |
| CEMP                   | Construction Environment Management Plan                                                                                                                                                                                                                                        |
| CLM Act                | <i>Contaminated Land Management Act 1997</i>                                                                                                                                                                                                                                    |
| Construction compound  | An area used as the base for construction activities, usually for the storage of plant, equipment and materials and/or construction site offices and worker facilities.                                                                                                         |
| Construction footprint | The area that will be used for the construction of the proposal.                                                                                                                                                                                                                |
| COPC                   | Contaminants of potential concern                                                                                                                                                                                                                                               |
| CSM                    | Conceptual site model                                                                                                                                                                                                                                                           |
| CSSI                   | Critical State Significant Infrastructure                                                                                                                                                                                                                                       |
| Culvert                | A structure that allows water to flow under a road, railway, track, or similar obstruction.                                                                                                                                                                                     |
| Cumulative impacts     | Impacts that, when considered together, have different and/or more substantial impacts                                                                                                                                                                                          |
| DAWR                   | Australian Government Department of Agriculture and Water Resources                                                                                                                                                                                                             |
| DPE                    | Department of Planning and Environment                                                                                                                                                                                                                                          |
| DPIE                   | (former) Department of Planning, Industry and Environment                                                                                                                                                                                                                       |
| DSI                    | Detailed site investigation                                                                                                                                                                                                                                                     |
| Enhancement site       | Discrete sites within the A2I proposal site that are proposed for infrastructure enhancement.. Enhancement works at each of these discrete work sites may include raising, widening or replacing bridges, raising or replacing signal gantries, and lowering sections of track. |
| EIS                    | Environmental impact statement                                                                                                                                                                                                                                                  |
| EPA                    | NSW Environment Protection Authority                                                                                                                                                                                                                                            |

|                       |                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP&A Act              | NSW <i>Environmental Planning and Assessment Act 1979</i>                                                                                                                                                                                                                                                                                       |
| EPBC Act              | Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>                                                                                                                                                                                                                                                               |
| EPL                   | Environment protection licence                                                                                                                                                                                                                                                                                                                  |
| Gantry                | An overhead metal structure with a frame supporting equipment such as a signals, lighting or cameras.                                                                                                                                                                                                                                           |
| Inland Rail program   | The Inland Rail program comprises the design and construction of a new Inland Rail connection between Melbourne and Brisbane, via Wagga, Parkes, Moree, and Toowoomba. The route for Inland Rail is about 1,700 kilometres in length. Inland Rail will involve a combination of upgrades of existing rail track and the provision of new track. |
| LEP                   | Local environmental plan                                                                                                                                                                                                                                                                                                                        |
| LGA                   | Local government area                                                                                                                                                                                                                                                                                                                           |
| LOR                   | Limits of reporting                                                                                                                                                                                                                                                                                                                             |
| mAHD                  | Metres in Australian Height Datum                                                                                                                                                                                                                                                                                                               |
| mBGL                  | Metres Below Ground Level                                                                                                                                                                                                                                                                                                                       |
| MBO                   | Monosulfidic black ooze                                                                                                                                                                                                                                                                                                                         |
| NEPM                  | National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)                                                                                                                                                                                                                                               |
| NSW EPA               | NSW Environment Protection Authority                                                                                                                                                                                                                                                                                                            |
| OCPs                  | Organochlorine pesticides                                                                                                                                                                                                                                                                                                                       |
| Operational footprint | Area occupied by permanent infrastructure and required for the operation of the proposal                                                                                                                                                                                                                                                        |
| OPPs                  | Organophosphate pesticides                                                                                                                                                                                                                                                                                                                      |
| Overbridge            | A bridge over a railway or road. For the proposal, overbridges refer to those structures which allow a road to pass over the railway.                                                                                                                                                                                                           |
| PAHs                  | Polycyclic aromatic hydrocarbons                                                                                                                                                                                                                                                                                                                |
| PCBs                  | Polychlorinated biphenyl                                                                                                                                                                                                                                                                                                                        |
| Pedestrian bridge     | A bridge designed solely for pedestrians to cross a watercourse, rail corridor or road.                                                                                                                                                                                                                                                         |
| PFAS                  | Per- and Poly-fluoroalkyl Substances                                                                                                                                                                                                                                                                                                            |
| POEO Act              | Protection of the Environment Operations Act 1997                                                                                                                                                                                                                                                                                               |
| Precinct              | Groupings of enhancement sites in line with the LGAs including Albury, Greater Hume – Lockhart, Wagga Wagga and Junee.                                                                                                                                                                                                                          |
| PSH                   | Phase separated hydrocarbon                                                                                                                                                                                                                                                                                                                     |
| PSI                   | Preliminary Site Investigation (also referred to as a phase 1 investigation)                                                                                                                                                                                                                                                                    |
| QHRA                  | Qualitative health risk assessment                                                                                                                                                                                                                                                                                                              |
| Rail corridor         | The corridor within which the rail tracks and associated infrastructure are located                                                                                                                                                                                                                                                             |

|                   |                                                                                                                                                                                                                                                                                                                              |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RAP               | Remedial action plan                                                                                                                                                                                                                                                                                                         |
| SEARs             | Secretary's Environmental Assessment Requirements                                                                                                                                                                                                                                                                            |
| Shared user       | Descriptor of infrastructure or path designed to accommodate pedestrians and cyclists to cross a watercourse, rail corridor or road.                                                                                                                                                                                         |
| SRA               | State Rail Authority                                                                                                                                                                                                                                                                                                         |
| SSI               | State Significant Infrastructure                                                                                                                                                                                                                                                                                             |
| The proposal      | Proposed enhancement works to structures and sections of track along 185 kilometres of the existing operational standard gauge railway between Albury and Illabo for the purpose of meeting Inland Rail specifications.                                                                                                      |
| The proposal site | The areas that enhancement works are required to operate the Albury to Illabo section of Inland Rail. It includes the location of construction worksites, operational rail infrastructure, new bridge structures (road and shared user) and other ancillary work. It is otherwise referred to as the construction footprint. |
| SAS               | Site audit statement                                                                                                                                                                                                                                                                                                         |
| SEPP              | State Environmental Planning Policy                                                                                                                                                                                                                                                                                          |
| Study area        | The study area is defined as the twenty four discrete enhancement sites where work will be carried out and the immediate surrounds of the proposal site.                                                                                                                                                                     |
| TRH               | Total recoverable hydrocarbon                                                                                                                                                                                                                                                                                                |
| UFP               | Unexpected finds protocol                                                                                                                                                                                                                                                                                                    |
| UST               | Underground storage tanks                                                                                                                                                                                                                                                                                                    |
| UXO               | Unexploded ordnance                                                                                                                                                                                                                                                                                                          |
| VENM              | Virgin excavated natural material                                                                                                                                                                                                                                                                                            |
| VOCs              | Volatile organic compounds                                                                                                                                                                                                                                                                                                   |

# EXECUTIVE SUMMARY

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail is a major national program that would enhance Australia's existing national rail network and serve the interstate freight market.

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Albury to Illabo section of Inland Rail ('the proposal').

The proposal involves enhancement works to structures and sections of track along 185 kilometres of the existing operational standard gauge railway between Albury and Illabo. Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains.

The proposal is Critical State Significant Infrastructure (CSSI) and is subject to approval by the NSW Minister for Planning under Division 5.2, Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This report has been prepared as part of the Environmental Impact Statement (EIS) for the proposal. The EIS has been prepared to support the application for approval of the proposal, and address the environmental assessment requirements of the Secretary of the then NSW Department of Planning, Industry and Environment (the SEARs) (now the Department of Planning and Environment), dated 14 October 2020.

The contamination assessment is based on review of desktop sources, and site walkover at the 24 enhancement sites, where works are proposed.

Soils in the vicinity of Murray River bridge are identified as containing potential acid sulfate soil (such as sediments below the water table at Murray River bridge). The potential for sulfidic rock may also occur within the proposal site. In addition, the majority of regional soils are associated with some localised potential salinity hazard.

The contamination assessment identified a number of areas of environmental concern (AEC) and potential contamination sources including:

- use of the railway line, and in particular areas where historical maintenance may have occurred, predominantly around sidings and stations
- unknown fill and stockpiling of waste across sections of the proposal site likely associated with construction of existing nearby roads and rail infrastructure
- weed suppressing activities around sidings and stations
- hazardous building material in structures, and in some locations, residues on the site surface
- ballast stockpiles within the rail corridor and yards
- service stations and fuel storage and rural fire service (RFS) buildings located in the vicinity of the proposal site
- former fuel depots located adjacent to, or partially within, the study area
- agricultural use of land adjacent to the proposal site, presenting a low risk of diffuse agricultural chemical residues and moderate potential for isolated hotspots where machinery maintenance or chemical storage and transfer activities occurred
- waste dumping, particularly in locations near existing roads, road crossings, or potentially in infilled gullies or dams that may be discovered during the works.

Potential contaminants of concern relating to the above contamination sources include (but are not limited to) heavy metals (copper, lead, zinc, cadmium, chromium, nickel, arsenic and mercury), total recoverable hydrocarbon (TRH), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), per- and poly-fluoroalkyl substances (PFAS) and potential asbestos containing material (ACM).

In the context of the construction and operation of the proposal, these identified areas of environmental concern (AEC) and potential contamination sources are considered to have a low to moderate risk of contamination. If contamination is encountered, the contamination is likely to be localised and manageable through the implementation of mitigation during the construction.

Asbestos (in the form of suspected surface-lying ACM and asbestos containing buildings and structures) has been identified. Lead paint is known to be present at Murray River bridge.

Mitigation for the proposal will include measures for further investigation and management of acid sulfate soils, sulfidic rock and salinity. This will include a salinity management plan, prepared in order to manage and reduce the effect of salinity on the development, and reduce the risk of the development exacerbating salinity hazard in the surrounds.

Site investigations at more developed precincts (Albury and Wagga Wagga) and enhancement sites requiring significant excavation (Riverina Highway bridge, Billy Hughes bridge, Pearson Street bridge and Kemp Street bridge) will be undertaken by a suitably qualified and experienced consultant, as defined in Schedule B9 of the NEPM (2013) to inform the detailed design and the subsequent management and classification of waste soil. Excavated soils are required to be classified in accordance with the *NSW Waste Classification Guidelines* (NSW EPA, 2014) and the ARTC Earthworks Materials Management Framework. A Construction Environment Management Plan (CEMP) will be prepared and this document will include an unexpected finds protocol (UFP) so that if contamination is discovered during the works it can be appropriately managed. The CEMP will include triggers for the completion of additional investigation.

Where asbestos has been identified, further inspection by an occupational hygienist will occur. This will inform the level of remediation or management necessary prior to construction, which will be outlined in an asbestos management plan (AMP) to be prepared prior to works commencing. Any asbestos removal or management works must be conducted by appropriately licenced personnel, in accordance with relevant Safe Work codes of practice and with appropriate notification to SafeWork NSW.

If potential lead paint is to be disturbed during enhancement works its condition will be inspected prior to enhancement works commencing. Where lead paint is identified this will either be maintained in good condition or sealed in place or removed if poor condition is noted, in accordance with the lead risk work outlined in *Work Health and Safety Regulation* (2017).

# 1 INTRODUCTION

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## 1.1 OVERVIEW

The Australian Government has committed to delivering a significant piece of national transport infrastructure by constructing a high performance and direct interstate freight rail corridor between Melbourne and Brisbane, via central-west New South Wales (NSW) and Toowoomba in Queensland. Inland Rail is a major national program that would enhance Australia's existing national rail network and serve the interstate freight market.

The Inland Rail route, which is about 1,700 kilometres long, would involve:

- using the existing interstate rail line through Victoria and southern NSW
- upgrading about 400 kilometres of existing track, mainly in western NSW
- providing about 600 kilometres of new track in northern NSW and south-east Queensland.

Inland Rail has been divided into 13 projects, seven of which are located in NSW. Each of these projects can be delivered and operated independently with tie-in points on the existing railway.

Australian Rail Track Corporation Ltd (ARTC) ('the proponent') is seeking approval to construct and operate the Albury to Illabo section of Inland Rail ('the proposal').

The proposal is Critical State Significant Infrastructure (CSSI) and is subject to approval by the NSW Minister for Planning under Division 5.2, Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This report has been prepared as part of the Environmental Impact Statement (EIS) for the proposal. The EIS has been prepared to support the application for approval of the proposal, and address the environmental assessment requirements of the Secretary of the then NSW Department of Planning, Industry and Environment (the SEARs) (now the Department of Planning and Environment), dated 14 October 2020.

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## 1.2 THE PROPOSAL

The proposal involves enhancement works to structures and sections of track along 185 kilometres of the existing operational standard gauge railway between Albury and Illabo. Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains.

### 1.2.1 LOCATION

The proposal is generally within the existing active rail corridor between the town of Albury on the Victorian-NSW border and around three kilometres to the north-east of Illabo. The alignment passes through two major regional towns, Albury and Wagga Wagga, NSW, and several smaller regional towns. Works are proposed at 24 locations along the 'Main South Line' corridor, described as 'enhancement sites'.

The enhancement sites have been broken down into four precincts which align with the local government areas (LGAs) of Albury, Greater Hume – Lockhart, Wagga Wagga and Junee, as identified in Table 1.1 and shown in Figure 1.1.

Table 1.1 Enhancement sites

| PRECINCT                       | ENHANCEMENT SITES                     |
|--------------------------------|---------------------------------------|
| <b>Albury</b>                  | Murray River bridge                   |
|                                | Albury Station pedestrian bridge      |
|                                | Albury Yard clearances                |
|                                | Riverina Highway bridge               |
|                                | Billy Hughes bridge                   |
|                                | Table Top Yard clearances             |
| <b>Greater Hume – Lockhart</b> | Culcairn pedestrian bridge            |
|                                | Culcairn Yard clearances              |
|                                | Henty Yard clearances                 |
|                                | Yerong Creek Yard clearances          |
|                                | The Rock Yard clearances              |
| <b>Wagga Wagga</b>             | Uranquinty Yard clearances            |
|                                | Pearson Street bridge                 |
|                                | Cassidy Parade pedestrian bridge      |
|                                | Edmondson Street bridge               |
|                                | Wagga Wagga Station pedestrian bridge |
|                                | Wagga Wagga Yard clearances           |
|                                | Bomen Yard clearances                 |
| <b>Junee</b>                   | Harefield Yard clearances             |
|                                | Kemp Street bridge                    |
|                                | Junee Station pedestrian bridge       |
|                                | Junee Yard clearances                 |
|                                | Olympic Highway underbridge           |
|                                | Junee to Illabo clearances            |

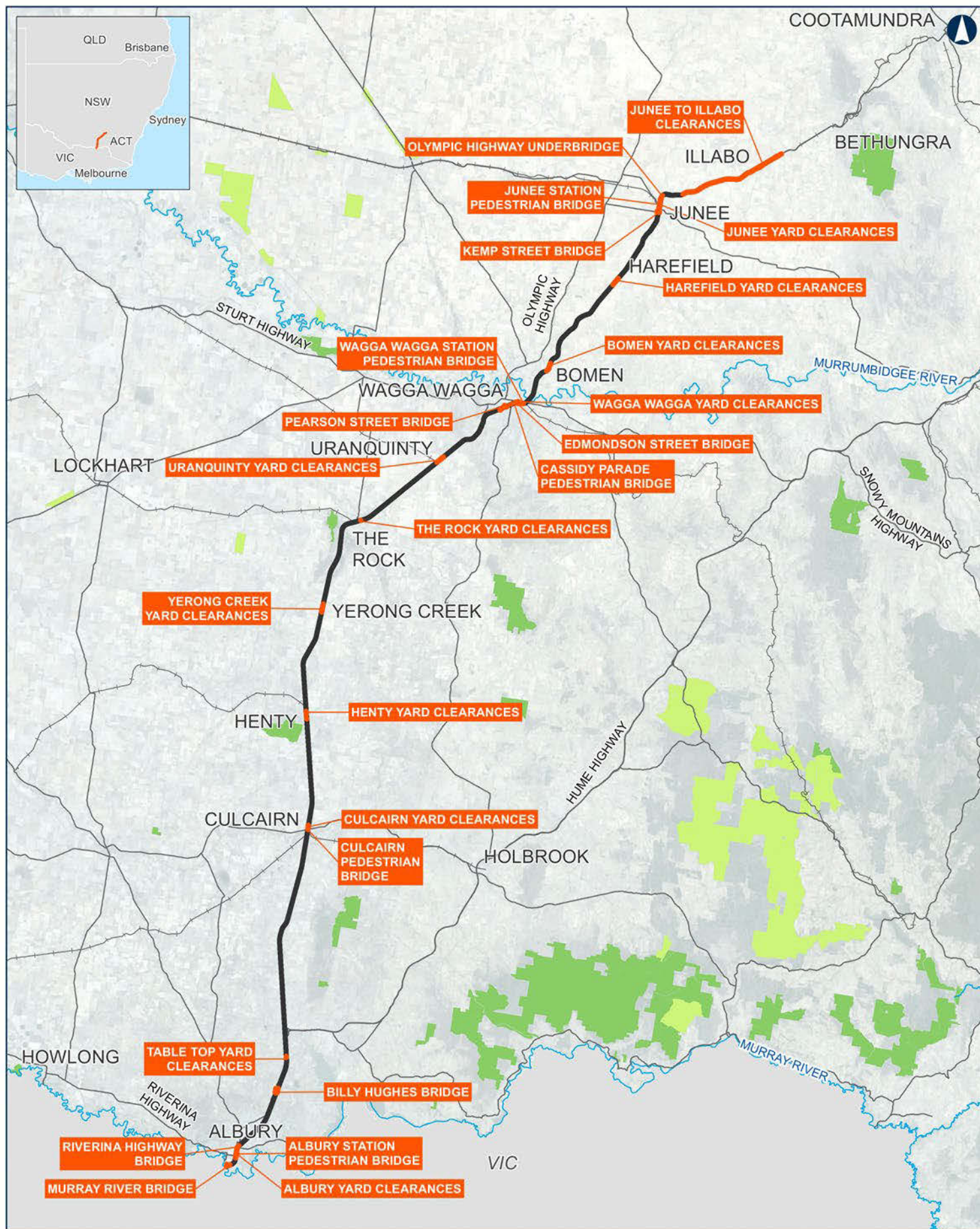
### 1.2.2 KEY FEATURES

The key features of the proposal include:

- adjustments to approximately 44 kilometres of track across 14 enhancement sites to accommodate the vertical and horizontal clearances according to Inland Rail clearance specifications, comprising:
  - realignment of track within the rail corridor
  - lowering of track up to 1.6 metres at three enhancement sites
- changes to bridges and culverts at enhancement sites to accommodate vertical clearances and track realignment as follows:
  - replacement of two road bridges and adjustments to adjoining intersections
  - replacement of three pedestrian bridges
  - demolition of two redundant pedestrian bridges
  - modifications to four rail bridges
- ancillary works, including adjustments to nine level crossings, modifications to drainage and road infrastructure, signalling infrastructure, fencing, signage, and services and utilities.

No additional works would be required outside the enhancement sites identified in Figure 1.1 as they meet the clearance requirement for the Inland Rail Program.





## Albury to Illabo

Figure 1.1 Enhancement sites of the proposal

0 10 20 km

Coordinate System: GDA 1994 MGA Zone 55

ARTC makes no representation or warranty and assumes no duty of care or other responsibility to any party as to the completeness, accuracy or suitability of the information contained in this GIS map. The GIS map has been prepared from material provided to ARTC by an external source and ARTC has not taken any steps to verify the completeness, accuracy or suitability of that material. ARTC will not be responsible for any loss or damage suffered as a result of any person whatsoever placing reliance upon the information contained within this GIS map.

Date: 4/11/2021  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3

Scale: 1:500,000

- Proposal site
- Track alignment
- Existing railway
- Main road
- River
- National Park
- State Forest

**INLAND RAIL** **ARTC**

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

### 1.2.3 TIMING

Subject to approval, further design and procurement, construction of the proposal is planned to start in early 2024 and is expected to take about 16 months. The proposal would be fully operational in 2025 with enhancement sites progressively commissioned on completion of construction. Inland Rail as a whole would be operational once all 13 sections are complete, which is estimated to be in 2027.

### 1.2.4 CONSTRUCTION

An indicative construction methodology has been developed based on the current design to be used as a basis for the environmental assessment process. Overall, the construction strategy is based on an approach of dividing the proposal into four construction packages which align with the precincts: Albury, Greater Hume – Lockhart, Wagga Wagga and Junee.

Construction of the proposal would require:

- construction compounds, laydown areas and other areas needed to facilitate construction works
- temporary changes to the road network, including roads closures to undertake works on road bridges and level crossings
- other ancillary works.

Construction within each precinct would generally involve the site establishment and enabling works, main construction works as relevant to the enhancement site and finishing works as outlined in Table 1.2.

Further information on the construction of the proposal is provided in Chapter 8 of the EIS.

Table 1.2 Indicative construction activities

| CONSTRUCTION STAGES                   | INDICATIVE ACTIVITIES                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site establishment and enabling works | <ul style="list-style-type: none"><li>— Establishment of key construction infrastructure, work areas, access points and other construction facilities</li><li>— Installation of environmental controls, fencing and site services</li><li>— Preliminary activities including clearing/trimming of vegetation</li></ul>                |
| Main construction works               | <ul style="list-style-type: none"><li>— Track works</li><li>— Rail bridge works</li><li>— Road bridge replacement</li><li>— Pedestrian bridge works</li><li>— Associated infrastructure works on level crossings, culverts and signalling</li></ul>                                                                                   |
| Finishing works                       | <ul style="list-style-type: none"><li>— Testing and commissioning of the new and modified infrastructure</li><li>— Demobilisation and removal of construction compounds and other construction infrastructure</li><li>— Restoration of disturbed areas, as required, including revegetation and landscaping, where required</li></ul> |

### 1.2.5 OPERATION

The proposal would form part of the rail network managed and maintained by ARTC. Train services would be provided by a variety of operators.

The proposal would enable the use of double stacked trains along its entire length. Inland Rail will operate 24 hours per day and would initially accommodate double-stacked freight trains up to 6.5 metres high and up to 1,800 metres in length. The possible future use of the railway between Albury and Illabo by freight trains up to 3,600 metres long would be subject to separate assessment. Freight train speeds would range from 60 to 115 kilometres per hour, which is consistent with current train speeds.



The average number of freight trains movements between Albury and Illabo would increase from a current average of up to 12 per day in 2021 to 18 per day in 2025, further increasing to about 20 per day in 2040.

ARTC would continue to maintain the Main South Line. This would typically involve minor maintenance works, such as bridge and culvert inspections, rail grinding and track tamping, through to major maintenance, such as reconditioning of track and topping up of ballast as required. Maintenance works and schedule are not proposed to change as a result of the proposal.

Further information on the operation of the proposal is in Chapter 7 of the EIS.

## 1.3 PURPOSE AND SCOPE OF THIS REPORT

The purpose of this report is to provide an assessment of potential contamination of land that will be directly affected by construction and operation of the proposal. The assessment is a Preliminary Site Investigation (PSI), as defined in the *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended in 2013 (NEPM 2013) (refer to section 2.1.2).

A number of areas of potential concern within the proposal site have been identified as requiring construction and these have been targeted for assessment in this report.

The report has been prepared to address the SEARs which were issued by the then Department of Planning, Industry and Environment (DPIE) (now the Department of Planning and Environment) for the proposal on 14 October 2020. The SEARs relevant to contamination, and references to sections where they have been addressed in the report, are outlined in Table 1.3.

Table 1.3 SEARs and where addressed in the report

| KEY ISSUE | REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                 | WHERE ADDRESSED IN THE REPORT                                                                                                                 |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 11. Soils | 1 Verify the risk of acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Risk Map) in the area likely to be impacted by the project and the impact of the project on acid sulfate soils (including impacts of acidic runoff offsite) in accordance with the current guidelines.                                                                                                                 | Chapter 4 and 6                                                                                                                               |
|           | 2 The likelihood of land contamination and identify if remediation of the land is required, having regard to the ecological and human health risks posed by the contamination in the context of past, existing and future land uses. Where assessment and/or remediation is required, the EIS must document how the assessment and/or remediation will be undertaken in accordance with current guidelines. | Chapter 4 and 6 – for assessment of likely contamination<br>Chapter 7 – mitigation and management measures to address potential contamination |
|           | 3 Identify whether soil salinity is likely to be an issue and if so, determine the presence, extent and severity of soil salinity within the project area, and assess the impacts of the project on soil salinity and how it may affect groundwater resources and hydrology.                                                                                                                                | Chapter 4 and 6                                                                                                                               |
|           | 4 The impacts on soil and land resources (including erosion risk or hazard). Particular attention must be given to soil erosion and sediment transport consistent with the practices and principles in the current guidelines.                                                                                                                                                                              | Impacts to soil and land resources are addressed in Chapter 20 of the EIS.                                                                    |

## 2 LEGISLATION AND POLICY CONTEXT

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### 2.1 COMMONWEALTH LEGISLATION

#### 2.1.1 *ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999*

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), proposed ‘actions’ that have the potential to significantly impact on matters of national environmental significance, the environment of Commonwealth land, or that are being carried out by an Australian Government agency, must be referred to the Commonwealth Minister for the Environment for assessment.

Preliminary environmental investigations identified threatened species under the EPBC Act which have the potential to be impacted by the proposal. As a result of the potential for impacts on protected matters, the proposal was referred to the (then) Commonwealth Minister for the Environment on 2 June 2020 (EPBC Referral No 2020/8670). On 29 June 2020, the Australian Government Department of Agriculture, Water and Environment (DAWE) notified that the proposal is a not controlled action, and hence approval under the EPBC Act is not required.

With respect to contamination, no significant impacts to matters of national environmental significance have been identified from the proposal.

#### 2.1.2 *NATIONAL ENVIRONMENT PROTECTION (ASSESSMENT OF SITE CONTAMINATION) MEASURE 1999 AS AMENDED IN 2013*

*The National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended in 2013 (NEPM 2013) is made under the *National Environment Protection Council Act 1994* and is given effect by individual legislation and guidelines in each state and territory. The NEPM 2013 is approved by the NSW Environment Protection Authority (NSW EPA) under Section 105 of the *Contaminated Land Management Act 1997* (CLM Act). The purpose of the measure is to establish a nationally consistent approach to the assessment of site contamination to ensure sound environmental management practices by the community, which includes regulators, site assessors, environmental auditors, landowners, developers and industry.

The objective for this measure is to provide adequate protection of human health and the environment, where site contamination has occurred, through the development of an efficient and effective national approach to the assessment of site contamination.

Under the NEPM 2013, site contamination assessment is generally carried out in stages involving progressively more detailed levels of data collection and analysis, such as preliminary site investigations, detailed site investigations and site-specific risk assessment. This contamination assessment is a preliminary site investigation (PSI), which assesses the potential for contamination to exist based on a desktop study, site walkover and review of previous reports/assessments undertaken within the proposal study area (where available).

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## 2.2 NSW LEGISLATION

### 2.2.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) and Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) establish a framework for the assessment and approval of developments in NSW.

The proposal has been declared as Critical State Significant Infrastructure (CSSI) and is subject to approval by the Minister for Planning under Division 5.2, Part 5 of the EP&A Act. An EIS has been prepared for the proposal to assess the impacts of the proposal in accordance with the SEARs. This technical paper supports the EIS.

### 2.2.2 PROTECTION OF THE ENVIRONMENT OPERATION ACT 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) provides the legislative framework for the protection and enhancement of the environment in NSW. Its primary objectives are to reduce risks to harmless levels through pollution prevention, cleaner production, application of waste management hierarchy, continual environmental improvement and environmental monitoring.

Environment protection licences (EPL) are required to undertake a scheduled activities or scheduled development work. The proposal meets the definitions of scheduled activities provided in Schedule 1: railway activities—railway infrastructure construction (clause 33) and railway activities—railway infrastructure operations (clause 33A). The proposal therefore will require an environment protection licence.

ARTC currently holds a licence to carry out railway systems activities (licence number EPL3142) within the A2I rail corridor. This EPL will be amended to include the operation of the proposal. A separate EPL will be obtained by the contractor for the construction of the proposal. Licensing requirements for the proposal will be considered in consultation with the EPA.

Rollingstock operators on ARTC's network in NSW are regulated by the NSW EPA and require a separate EPL.

### 2.2.3 CONTAMINATED LAND MANAGEMENT ACT 1997

The CLM Act is part of the management framework for contaminated land in NSW. The Act enables the NSW EPA to respond to and manage site contamination when it considers that contamination is significant enough to require regulation. Site contamination requires regulation under the CLM Act when a site is declared “significantly contaminated land” (defined as land described in a notice having effect under Section 11 of the CLM Act) or when land is subject to a management order or an approved voluntary management proposal. Lands within the proposal site have not been declared “significantly contaminated” and are not subject to a management order (outlined in section 4.3–4.6).

Section 105 of the CLM Act allows the EPA to make or approve guidelines for the purposes connected with the objectives of the CLM Act.

Contaminated sites not regulated by the EPA can be managed through the planning process by the relevant planning consent authority.

### 2.2.4 STATE ENVIRONMENTAL PLANNING POLICY (RESILIENCE AND HAZARDS) 2021

In 2022, *State Environmental Planning Policy No 55 — Remediation of Land* (SEPP 55) was repealed, and the provisions incorporated into *State Environmental Planning Policy (Resilience and Hazards) 2021*. Chapter 4 of the SEPP pertains to, and aims to, promote the remediation of contaminated land. Through the development application process, planning authorities (local councils, in particular) are required to assess the contamination status of land prior to granting development consent. The SEPP lists remediation work that may be undertaken without the consent of the consent authority.

In accordance with Clause 4.7(1) of the SEPP, a consent authority must not consent to carrying out development on land unless it has considered whether the land is contaminated. Based on the potential for contamination from the existing land uses, the development approval needs to be able to consider if the existing information is sufficient to make planning decisions. While the SEPP does not apply to CSSI, this report has been undertaken to determine the potential for contamination and provide a recommendation on next steps in relation to contamination (if any).

## 2.3 RELEVANT POLICY AND GUIDELINES

Key policy and guidelines relevant to the assessment of contamination are outlined in Table 2.1.

Table 2.1 Summary of relevant NSW and other national guidelines

| GUIDELINE                                                                                                                                              | RELEVANCE TO THE PROPOSAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Acid Sulfate Soils Assessment Guidelines – Acid Sulfate Soil Manual</i> (Acid Sulfate Soil Management Advisory Committee, 1998)                     | <p>The Acid Sulfate Soil Management Advisory Committee (ASSMAC) prepared the first NSW guidance on management of acid sulfate soils in 1998 (Acid Sulfate Soil Manual) and has been widely relied on for the past 20 years.</p> <p>The guidelines set out a stepwise process to decide whether Acid Sulfate Soils (ASS) are present on site, how to mitigate potential impacts and how to prepare documentation to gain approval for works disturbing ASS.</p> <p>In 2018, a suite of national ASS guidelines were prepared by the Australian Government Department of Agriculture and Water Resources (DAWR) and represent current best practice advice for the assessment and management of ASS these include:</p> <ul style="list-style-type: none"> <li>— National ASS sampling and identification methods manual</li> <li>— National ASS identification and laboratory methods manual</li> <li>— guidance for the dewatering of ASS in shallow groundwater environments</li> <li>— overview and management of monosulfidic black ooze (MBO) accumulations in waterways and wetlands.</li> </ul> |
| <i>Guidelines for the Assessment, Remediation and Management of Asbestos – Contaminated Sites in Western Australia</i> (WA Department of Health, 2009) | <p>The guidelines, though not specifically approved by the NSW EPA under Section 105 of the CLM Act, provide a framework and best practice advice for the assessment, remediation and management of asbestos-contaminated sites.</p> <p>The guidelines are referred to in NEPM 2013 and will be considered if the preparation of an asbestos management plan for soil is identified as being required as a result of an unexpected find during construction works.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <i>Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997</i> (EPA, 2015)                                      | <p>The guidelines detail circumstances in which contamination at a site triggers the requirement to notify the NSW EPA. The guidelines are made under Section 105 of the CLM Act. The duty to report lies with landowners and those responsible for the contamination. The triggers will need to be considered if contamination is encountered within the proposal study area.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <i>Guidelines for the NSW Site Auditor Scheme (3rd edition)</i> (EPA, 2017)                                                                            | <p>The guidelines describe the obligations of accredited site auditors undertaking site audits in NSW. The guidelines are made under Section 105 of the CLM Act. These guidelines will need to be considered if reports are required to be prepared that may be reviewed by a site auditor (e.g. investigation report or remediation action plan). This will only occur as a result of certain unexpected find incidents and the need be determined at that time.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| GUIDELINE        | RELEVANCE TO THE PROPOSAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Other guidelines | <p>EPA Guidelines developed under the CLM Act:</p> <ul style="list-style-type: none"> <li>— <i>Contaminated Land Guidelines: Consultants Reporting on Contaminated Land</i> (NSW EPA, 2020).</li> <li>— <i>EPA Guidelines developed under the POEO Act, including Waste Classification Guidelines</i> (NSW EPA, 2014).</li> <li>— <i>PFAS National Environmental Management Plan version 2.0</i> (HEPA, January 2020)</li> <li>— <i>Work Health and Safety Regulation</i> (2017).</li> </ul> <p>Urban and regional salinity – guidance given in the Local Government Salinity Initiative booklets (<a href="http://www.environment.nsw.gov.au/salinity/solutions/urban.htm">http://www.environment.nsw.gov.au/salinity/solutions/urban.htm</a>) which includes Site Investigations for Urban Salinity (DLWC, 2002).</p> <p>Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Volume 2 (A. Installation of Services; B. Waste Landfills; C. Unsealed Roads; D. Main Roads; E. Mines and Quarries) (DECC, 2008).</p> <p>ARTC Earthworks Materials Management Framework, Appendix B of ETC-08-03 which includes a preliminary step of assessing whether material has originated from a site which has potentially been subject to a contaminating activity.</p> <p><i>Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land</i> (DUAP and EPA, 1998). In 2022, SEPP 55 was repealed, and the provisions incorporated into Chapter 4 of <i>State Environmental Planning Policy (Resilience and Hazards) 2021</i>. However, as noted in section 2.2.4, the SEPP does not apply to CSSI and, therefore, this guideline is not applicable to the proposal.</p> |

## 3 METHODOLOGY

The assessment methodology follows the framework for the assessment of site contamination outlined in the NEPM 2013 and the initial assessment steps of *ARTC Earthworks Materials Management Framework*, Appendix B of ETC-08-03. The NEPM 2013 states that the preliminary investigation and initial assessment of site contamination will consider the possibility of all forms of potential contamination based on past use. Depending on the proposed use and the results of initial site history investigations, the assessment of a site may involve both preliminary and detailed investigations. Many site investigations proceed in multiple stages due to the complexity of the site and the discovery of unexpected contamination.

This report comprises a preliminary (also referred to as Phase 1) site investigation which assesses the potential for contamination to exist based on a site history review, desktop study and review of previous detailed site investigation (also referred to as Phase 2) reports/assessments. The preliminary site investigation has been prepared with reference to the following relevant guidelines:

- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*. (NSW Office of Environment and Heritage (OEH), 2011)
- NEPM, 2013
- *ARTC Earthworks Materials Management Framework*, Appendix B of ETC-08-03.

The following section provides an overview of the methodology.

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### 3.1 OBJECTIVES

Objectives of the contamination assessment were to:

- assess likely past and present on-site activities for potential to have caused contamination
- review of previous reports prepared for the proposal site
- document the likely associated potential chemicals of concern
- develop a conceptual site model (CSM)
- provide a preliminary assessment for potential contamination and provide recommendations for more detailed investigation and additional works (if required)
- identify need for remediation and contamination management
- conduct a desktop review of information on the likelihood of salinity, erosion and ASS hazards being encountered and provide recommendations for further work if deemed necessary.

The assessment is a PSI as defined in the NEPM 2013 (refer to section 2.1.2).

The purpose of the contamination assessment is to assess the risk of existing contamination to the proposal during construction and operation, including the risk of encountering contamination and exposure to receptors. Risk of contamination directly occurring from activities associated with construction and operation of the proposal is considered in Chapter 20 of the EIS.

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### 3.2 STUDY AREA

The contamination assessment focused on the 24 discrete enhancement sites where work will be carried out (the proposal site as discussed in section 1.2) and the immediate surrounds of the proposal site (the desktop study area).

The findings of the desktop review were used to inform the scope of enhancement sites walkover. Sites considered as having a potential risk for contamination were targeted for site inspection to verify the findings of the desktop assessment, in addition to general inspections of accessible areas, such as those adjoining public roadways.



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## 3.3 METHODOLOGY

The methodology for the preliminary site investigation is presented in the following sections.

### 3.3.1 DESKTOP ASSESSMENT

In preparing this contamination assessment, the following desktop sources of information were reviewed:

- databases to identify areas of known and potential contamination, including:
  - Department of Defence database for unexploded ordnance
  - NSW EPA register of contaminated sites and list of notified sites, under Sections 58 and 60 of the CLM Act, for sites located within two kilometres of the proposal study area
  - NSW EPA’s environment protection license records under Section 308 of the POEO Act
  - NSW Government database of former gasworks sites
- publicly available data and web-based information searches, background information relevant to the study area, survey data, and topography including:
  - Bureau of Meteorology, Australian Groundwater Explorer
  - historical aerial photographs from the NSW Government Land and Property Information website
  - geology of the proposal study area using the Department of Regional NSW DiGS database (<https://search.geoscience.nsw.gov.au/>)
  - NSW Soil and Land Information System
  - NSW Government ASS risk mapping (<https://www.asris.csiro.au/>)
  - NSW Government’s Heads of Asbestos Coordination Authorities naturally occurring asbestos risk mapping
  - maps published by the Geological Survey of NSW, former Department of Conservation and Land Management, and Australian Soils Resource Information System
  - mapping published by the former DPIE (now DPE), showing salinity risk and electrical conductivity (as a measure of salinity) of those soils.
- ARTC contaminated land records
- historical contamination reports were also reviewed to confirm where contamination may exist within the rail corridor to determine risk during construction and operation of the proposal, these included:
  - historical contamination reports prepared for the A2I project, including Coffey (2018a) Albury to Illabo (A2I) Inland Rail, environmental investigation reports (Coffey 2018a and 2018b) which presented the results of soil and groundwater sampling and analysis undertaken along the whole A2I proposal site
  - historical reports held by ARTC which were prepared for specific sites based on areas identified as containing a risk of contamination in the ARTC contamination register.

A summary of the contamination reports is provided in Chapter 4, when the relevant site is within the study site and when the ARTC contaminated land record states there is a “possible” level of risk present requiring consideration. Reports for sites outside of the study area have not been considered further.

### 3.3.2 SITE WALKOVER

A site walkover of the proposal site was completed to identify any areas of concern and verify the findings from the desktop investigation. The study area inspection comprised visual appraisal of accessible public roadways and land and accessible private properties. The walkover was completed on 22 to 25 February 2021 by an experienced environmental scientist.

It is noted that due to restrictions in access, and changes in the site investigation areas following completion of the site walkover, some limited areas were not accessed directly for the site survey. This includes the part of the proposal site for Docker Street Gantry (Wagga Wagga Yard clearances).

### 3.3.3 RISK ASSESSMENT

The findings are discussed in terms of risk through development of a CSM. The CSM seeks to present the potential chemicals of concern, likely receptors that could potentially be affected by these chemicals, and plausible pathways for exposure to occur (source, pathway, receptor linkages). A risk matrix is also used to qualitatively classify the identified risks in terms of the likelihood and consequence. The risk assessment matrix is outlined in the following section.

#### 3.3.3.1 CONTAMINATION RISK ASSESSMENT MATRIX

The risk matrix outlined in Table 3.1 was used to consider the significance of the risks associated with source pathway receptor scenarios identified through development of the CSM.

Table 3.1 Risk assessment matrix

| CONSEQUENCE | LIKELIHOOD  |          |          |        |
|-------------|-------------|----------|----------|--------|
|             |             | Unlikely | Possible | Likely |
|             | Minor       | Low      | Low      | Medium |
|             | Moderate    | Low      | Medium   | High   |
|             | Significant | Medium   | High     | High   |

Likelihood has been classified as likely; very common or occurs upon occasions, possible; could occur and unlikely; not likely to occur.

The consequence has been classified as minor; minor localised levels of environmental impact or low levels of human exposure below the occupational exposure scenarios/zero impact, moderate; significant localised environmental impact or exposure to humans above occupational exposure scenarios and significant; off-site environmental impact or an immediate and/or long term harm to human health or the environment.

Risks are defined as follows:

- Low Risk – based on review of the source, pathway receptor linkages, the AEC is not anticipated to pose unacceptable risk to human health or the environment.
- Medium risk – based on review of the source, pathway receptor linkages, the AEC has the potential to pose unacceptable risk to human health or the environment.
- High risk – based on review of the source, pathway receptor linkages, the AEC is considered likely to pose unacceptable risk to human health or the environment.

The application of this risk matrix with regards to identified AECs and potential source, pathway, receptor linkages is discussed further in Chapter 6 and presented in detail in Table 6.1.

# 4 EXISTING ENVIRONMENT

The following section provides a summary of the existing environment and historical review of the proposal site. The proposal areas are shown on Figure 5 in Appendix A-5.

## 4.1 SITE LOCATIONS AND DESCRIPTIONS

The proposal includes four precincts which are summarised in section 1.2.1, a summary of the enhancement sites relevant to each precinct is provided in Table 4.1. The enhancement site locations are presented on Figure 5 in Appendix A-5.

Table 4.1 Site locations and descriptions

| ENHANCEMENT SITE                                                                      | DESCRIPTION OF THE ENHANCEMENT SITE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | SURROUNDING LAND USE                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Albury Precinct</b>                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                    |
| Murray River bridge                                                                   | A 660 metre stretch of existing rail corridor, ending at the southern edge of the Murray River bridge (on the southern side of the Murray River), and Olive Street in the north. The enhancement site also includes a 340 metres section of unpaved road (Townsend Street) adjacent to the Murray River, extending from the rail corridor in the south towards the north to Abercorn Street.                                                                                                                                                                                                                             | Vacant land and residential buildings extend to the north of the enhancement site. The Hume Highway runs parallel to the southern boundary. The Murray River extends in an east-west direction, on the western boundary of the enhancement site.                                                                                                                   |
| Albury Station pedestrian bridge<br>Albury Yard clearances<br>Riverina Highway bridge | A 1,900 metre stretch of existing rail corridor including part of Albury Station ending on the northern side of Borella Road. There is also a commuter car park located adjacent to Albury Station.<br><br>The Riverina Highway bridge is located directly north west to the Scots School Albury.<br><br>The enhancement site also includes a 110 metres section outside the existing rail corridor. This includes pedestrian path, part of Kenilworth Street and landscaped area on the eastern side of Hume Highway. Sections outside the railway corridor for Riverina Highway bridge is a vacant council owned land. | The enhancement site is surrounded by residential properties, particularly to the east. There is a number of commercial properties including car dealerships, childcare centres, retail centres, grocery stores and a petrol station along the western boundary. There is also a petrol station located on Young Street, just to the west of the enhancement site. |
| Billy Hughes bridge                                                                   | A 800 metre stretch of existing railway corridor which crosses Wagga Road Bridge. The enhancement site also extends out and includes cleared agricultural land on both eastern and western side of the railway corridor. This out of corridor section extends up to 310 metres from the railway corridor.                                                                                                                                                                                                                                                                                                                | The enhancement site is surrounded by cleared agricultural land. A steel distributor is located 100 metres to the west and a paper mill is located 270 metres to the north of the enhancement site.                                                                                                                                                                |

| ENHANCEMENT SITE                                       | DESCRIPTION OF THE ENHANCEMENT SITE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SURROUNDING LAND USE                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Table Top Yard clearances                              | A 185 metre stretch of the existing railway corridor including 45 metres of the section which also extends into an over track structure on the existing corridor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | This enhancement site sits between three roadways running parallel (north-south), Perryman Lane to the west and two carriageways of the Hume Highway to the east. Outside of these roadways there are large (40–70 metres long) dams.                                                                                                                                                                                                                           |
| <b>Greater Hume – Lockhart Precinct</b>                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Culcairn pedestrian bridge<br>Culcairn Yard clearances | <p>A stretch of 635 metres existing railway corridor, with northern end just to the south of Melrose Street, and southern end at Balfour Street.</p> <p>The Culcairn pedestrian bridge is located on Balfour Street at the southern end.</p> <p>The Culcairn Station is located just outside the enhancement site boundary.</p>                                                                                                                                                                                                                                                                                                                                        | The enhancement site is surrounded by residential properties, predominantly to the east, with a mix of residential and commercial properties to the west. The grain terminal adjacent to the rail corridor used to load and unload grain from trains.                                                                                                                                                                                                           |
| Henty Yard clearances                                  | <p>A 700 metres stretch of the existing railway corridor, with northern end to the north of Sladen Street and southern end just to the south of Rosler Parade. Some part of the section also extends beyond the railway corridor: 35 metres to the west onto Sladen Street and 30 metres to the east onto Railway Parade.</p> <p>There is also around 16 metres section on the southern end that are located on the cleared land just outside the railway corridor.</p> <p>This enhancement is located just adjacent to the Henty Bicentennial Park including the Headie Taylor Header Museum. Henty Station is located in the immediate east of enhancement site.</p> | <p>The enhancement site is surrounded by residential properties, particularly to the west, with a mix of residential and commercial properties to the east, including two service stations.</p> <p>The Henty Rural Fire Service (RFS) Station is located across the Olympic Highway, on the intersection with Fox Street, at the northern end of the enhancement site.</p> <p>There is a grain storage facility adjacent to the Henty Yard clearances site.</p> |
| Yerong Creek Yard clearances                           | A stretch of 1,243 metres of existing railway corridor with its southern boundary ending just to the north of Queens Street and northern end ending before intersecting with Yerong Creek. There is a small section (20 metres) of the enhancement site that locates outside the existing railway corridor.                                                                                                                                                                                                                                                                                                                                                            | <p>The southern half of the enhancement site is flanked by residential properties. The northern portion is surrounded by cleared agricultural land. There is also a large warehouse parallel to the corridor to the north.</p> <p>Yerong Creek Fire Station is located to the west of the enhancement site on Finlayson Lane.</p>                                                                                                                               |
| The Rock Yard clearances                               | A stretch of 35 metres of the existing railway corridor crossing Urana Street.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>Both side of the corridor are residential properties and sections of cleared land.</p> <p>The Rock RFS is located on Urana Street to the north of the enhancement site.</p>                                                                                                                                                                                                                                                                                  |

| ENHANCEMENT SITE                                                                                                                    | DESCRIPTION OF THE ENHANCEMENT SITE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | SURROUNDING LAND USE                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Wagga Wagga Precinct</b>                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                             |
| Uranquinty Yard clearances                                                                                                          | A 1,900 metres stretch of railway corridor, with a level crossing of Yarragundry Street and a dirt roadway orientated north-west to south-east extending towards the north-west from the rail corridor. A park is located in the south that has a series of sculptures and a public bathroom.                                                                                                                                                                                                                                                                                                                                                                                                  | The enhancement site is surrounded by residential properties and agricultural land.<br><br>Uranquinty Rural Fire Service Brigade is located at the northern end of Ryan Street, immediately to the south of the enhancement site.                                                           |
| Pearson Street bridge                                                                                                               | A 955 metre stretch of the existing railway corridor which crosses Pearson Street bridge and ends just to the west of Bourke Street. The eastern end of the enhancement site is outside the railway corridor and extends 450 metres beyond the railway corridor to the south into Fernleigh Road. There are also multiple sections that extend beyond corridor including a 260 metres extension into Cheshire Street onto some cleared land adjacent to the east of Pearson Street. Some sections of the enhancement site also extend into the Wagga Show Campground.                                                                                                                          | To the north of the enhancement site are a number of commercial warehouses including automotive repairs, wardrobe fitting shops and a spraying equipment warehouse. The Wagga Wagga Racecourse is to the east of the enhancement site. Residential properties extend to the south.          |
| Cassidy Parade pedestrian bridge<br>Edmondson Street bridge<br>Wagga Wagga Station pedestrian bridge<br>Wagga Wagga Yard clearances | A 1,145 metre stretch of the existing railway corridor with western end ending just to the east of Noman Street and western end just pass Beauty Point Avenue. Section of the enhancement site at Edmondson Street extends 160 metres to north and 170 metres to the south outside of the existing railway corridor.<br><br>Section of the western portion of the enhancement site also locates outside of the existing railway corridor with sections extending 100 metres to the north on a pedestrian path into Brookong Avenue, and 25 metres to the south to Cassidy Parade.<br><br>The Wagga Wagga Station is located just to the immediate north outside the enhancement site boundary. | The south of the enhancement site is predominantly residential properties, and to the north are several commercial properties, including childcare centres, liquor stores, furniture shops and restaurants. Robertson Oval and Bolton Park are located further north                        |
| Bomen Yard clearances                                                                                                               | A stretch of 1,295 metres of the existing railway corridor with northern end to the north of Hereford Street and southern end to the north of Bavin Street. There is also a small portion (30 metres) of the enhancement site located outside the existing railway corridor.                                                                                                                                                                                                                                                                                                                                                                                                                   | There are cleared agricultural land to the east of the enhancement site. There are commercial warehouses located the south east and the west. These commercial properties include steel supplies, truck repairs, livestock processing and equipment, a waste oil refinery and a fuel depot. |

| ENHANCEMENT SITE                             | DESCRIPTION OF THE ENHANCEMENT SITE                                                                                                                                                                                                                                                                                                                                                                                                            | SURROUNDING LAND USE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Junee Precinct</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Harefield Yard clearances                    | A stretch of 1,210 metres of the existing railway corridor with its northern portion crossing Reedy Creek and Bucks Creek.                                                                                                                                                                                                                                                                                                                     | The enhancement site is surrounded by cleared agricultural land. There are some farming properties located south east of the enhancement site.                                                                                                                                                                                                                                                                                                                                                                                        |
| Kemp Street bridge and Junee Yard clearances | A stretch of 250 metres of the existing railway corridor for the enhancement site at Kemp Street bridge with southern end on George Street. This portion of the enhancement site extends beyond railway corridor with up to 160 metres extension on the east to Ducker Street and 220 metres on the west on the Olympic Highway.                                                                                                               | The enhancement site is surrounded by residential properties. There is Endeavour Park located to the west of the enhancement site, and an aquatic centre located to the east of the enhancement site.                                                                                                                                                                                                                                                                                                                                 |
| Junee Station pedestrian bridge              | A stretch of 220 metres of the existing railway corridor for the Junee Yard clearances enhancement site. The southern end is on just adjacent to Belmore Street with the northern end finishing to the south of the Olympic Highway.                                                                                                                                                                                                           | The enhancement site is surrounded by both residential and commercial properties. These commercial properties include an antique store, a motel, and a service station located on the corner of Gaba Tepe Avenue and Seigneur Street.                                                                                                                                                                                                                                                                                                 |
| Olympic Highway underbridge                  | A stretch of 1,580 metres of the existing railway corridor with southern end to the south of Cox Street and northern end to the north of Queens Street. Small portion of the sections also extend beyond the railway corridor including some sections with up to 60 metres of the to the west onto Regent Street and Olympic Highway. The portion of the enhancement site extending to Regent Street also encompasses part of Ben Martin Park. | <p>The enhancement site is generally surrounded by residential properties. The northern portion of the enhancement site (north of Queen Street) is surrounded by cleared land.</p> <p>There is a service station to the north-west of the enhancement site. A Shell service station is located to the west of the enhancement site on Illabo Road.</p>                                                                                                                                                                                |
| Junee to Illabo clearances                   | A stretch of 16,000 metres of the existing railway corridor including Marinna Station. The enhancement also includes Marinna Station and passes Illabo. Majority of the enhancement site is within the railway corridor. There are multiple small portions extending beyond the railway corridor with the longest extension in Junee, 130 metres south on Junee Street outside of the railway corridor.                                        | The surrounding land for this enhancement site is all cleared agricultural land. The enhancement site runs parallel to the Olympic Highway, it is crossed by Wornes Gate Lane, Brabins Road and Warrens Lane. Jeralgambeth Creek crosses the enhancement site. The enhancement site runs through the town of Illabo, this section has a number of residential properties and a school. A rural fire brigade station is present north of Turland Street. There are also four large grain silos next to a large warehouse in this area. |

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## 4.2 ENVIRONMENTAL SETTING

Whilst there is some variation between each precinct, there are similarities in the environmental setting for all precincts.

The following sections provide a summary of the existing environment of the proposal site, with consideration of how this varies between each precinct.

### 4.2.1 TOPOGRAPHY AND VEGETATION

#### 4.2.1.1 ALBURY PRECINCT

The southern portion of the enhancement site at Murray River bridge is 150 metres Australian Height Datum (mAHD). The enhancement site is part of the Murray River Basin Catchment. The enhancement site crosses Murray River and its tributary Oddies Creek. There is dense vegetation to the south-west of the proposal site associated with the riparian zone of the Murray River (refer to Technical Paper 9 – Aquatic Biodiversity Impact Assessment).

The elevation of the enhancement sites Albury Station pedestrian bridge, Albury Yard clearances and Riverina Highway bridge site is 160 mAHD. These enhancement sites are part of the Albury sub catchment of the Murray River Basin. A tributary of Murray River formerly ran through the Albury enhancement site in the south; it may now be culverted beneath the rail line. Browns Lagoon is located 450 metres to the south west. The enhancement site is located within the town of Albury therefore there is not much vegetation other than a few trees around the railway station.

Elevation increases to Table Top Yard clearances and Billy Hughes bridge to approximately 230mAHD. These enhancement sites are part of the Albury sub catchment of the Murray River Basin. Table Top Yard clearances are surrounded by a number of dams and tributaries of Sandy Creek, Nine Mile Creek and Bowna Creek. Lake Hume is located three kilometres to the east of the enhancement site. There are some trees near to the enhancement site and along the highway, however most land surrounding the enhancement site has been cleared for agricultural use. Billy Hughes bridge crosses a tributary of Eight Mile Creek and has a number of dams surrounding it. There is vegetation around the enhancement site, in particular along the creek. Areas of land without vegetation has been cleared for agricultural use.

#### 4.2.1.2 GREATER HUME – LOCKHART PRECINCT

Culcairn pedestrian bridge and Culcairn Yard clearances are part of the Middle Billabong sub catchment of the Murray River Basin. Billabong creek is located 350 metres to the south and a tributary of it is 80 metres to the north of the railway corridor. The elevation of the enhancement site is 210mAHD. Trees line the boundary of the enhancement site, however the surrounding land is the town of Culcairn, where vegetation has been cleared for housing and agricultural land.

Henty Yard clearances, Yerong Creek Yard clearances and the Rock Yard clearances are part of the Burkes/Bullenbung sub catchment of the Murrumbidgee River Basin. The elevation of the enhancement site is 210mAHD. At Henty Yard, Buckaringah Creek is located 30 metres to the north of the enhancement site. The enhancement site is within the town of Henty with extensive residential development surrounding the enhancement site. Vegetation in the surrounding area is dense around the creek and Henty Bicentennial Park located to the east of the enhancement site. The Yerong Creek Yard clearances are also part of the Burkes/Bullenbung sub catchment of the Murrumbidgee River Basin. The Yerong Creek Yard enhancement site crosses Sandy Creek and Yerong Creek 400 metres to the north. There are several dams around the enhancement site and vegetation is limited to trees within residential property boundaries. At the Rock Yard clearances site there are two large dams north of the enhancement site and Burkes Creek is located 380 metres north of the enhancement site. There is some vegetation around the enhancement site and along the creek, however there is a lot of cleared land and several properties surrounding the enhancement site.



#### 4.2.1.3 WAGGA WAGGA PRECINCT

Uranquinty Yard clearances, Pearson Street bridge, Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances are at an elevation of 200mAHD. The enhancement sites are part of the Murrumbidgee River Basin catchment. The Uranquinty Yard clearances enhancement site crosses Sandy Creek and has three dams to the north. There is vegetation along the creek bed, however most of the surrounding land has been cleared for agriculture. At Pearson Street bridge a tributary of Flowerdale Lagoon is crossed by the enhancement site. The enhancement site encompasses two areas of grassed mounds on the side of the railway line, and there are some trees and other vegetation. This site is within the town of Wagga Wagga and it is surrounded by buildings rather than agricultural land. At Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances the Murrumbidgee River is located approximately 800 metres to the north of the enhancement site. As this part of the enhancement site is within the town of Wagga Wagga, it is surrounded by buildings and there is little vegetation, other than some trees along the edge of the railway line.

Bomen Yard clearances are at an elevation of 230mAHD. The enhancement site is within an industrial area and with little vegetation, other than some trees to the west of the railway line. There are a few small dams around the enhancement site. The enhancement site is part of the Murrumbidgee River Basin catchment.

#### 4.2.1.4 JUNEE PRECINCT

Harefield Yard clearances are at an elevation of 250mAHD. There are about four small dams surrounding the enhancement site, and Reedy creek is crossed twice by the enhancement site. Most of the vegetation around the enhancement site has been cleared for agricultural land. The enhancement site is part of the Houaghans sub catchment of the Murrumbidgee River Basin.

Below the Kemp Street bridge the elevation is 299mAHD and at the top of the bridge the elevation is 304mAHD. There is a small amount of vegetation along the boundary of the enhancement site, some trees run parallel along the railway line. The enhancement site is part of the Houaghans sub catchment of the Murrumbidgee River Basin.

Land surrounding the Junee Station pedestrian bridge is at an elevation of approximately 303mAHD. The enhancement site is mainly railway sidings and has very little vegetation. The enhancement site is part of the Houaghans sub catchment of the Murrumbidgee River Basin.

Junee Yard clearances and Olympic Highway underbridge are at an elevation of 310 to 320mAHD. A small tributary of Rock Creek is crossed at the south of the enhancement site. This section of the enhancement site traverses a town with more buildings than vegetation surrounding it. A small park is included within the enhancement site on the western boundary. The enhancement site is part of the Houaghans sub catchment of the Murrumbidgee River Basin.

The elevation of the Junee to Illabo clearances varies from 250mAHD in the east to 360mAHD in the west. Jeralgambeth creek and some other unnamed tributaries are crossed with this section of corridor. There are several dams surrounding the enhancement site, the largest of which is adjacent to Illabo station. There are trees lining the enhancement site, however the majority of the surrounding land has been cleared. The enhancement site is part of the Billabung sub catchment of the Murrumbidgee River Basin.

## 4.2.2 GEOLOGY

The underlying geology varies across the enhancement sites. A summary relevant to each enhancement site within each precinct is outlined below, and each geological unit is further described in Table 4.2:

- Albury precinct:
  - Underlying geology for enhancement sites from Murray River bridge to Riverina Highway bridge comprises the Abercrombie formation of the Lachlan Orogen overlain by Cenozoic sedimentary alluvial channel and floodplain deposits.
  - Underlying geology for enhancement sites from Billy Hughes bridge to Table Top Yard clearances comprises ungrouped Devonian Volcanics of the Lachlan Orogen overlain by Cenozoic sedimentary residual deposits.
  - No naturally occurring asbestos was noted in the vicinity of this precinct.
- Greater Hume – Lockhart precinct:
  - Underlying geology for Culcairn pedestrian bridge and Culcairn Yard clearances comprises Budginigi Ignimbrite of the Lachlan Orogen overlain by Cenozoic sedimentary alluvial floodplain deposits.
  - Underlying geology for Henty Yard clearances comprises Wallandoon Ignimbrite of the Lachlan overlain by Cenozoic sedimentary aeolian sand plain.
  - Underlying geology for Yerong Creek Yard clearances comprises Buchargindah Granite of the Lachlan Orogen overlain by Cenozoic sedimentary aeolian sand plains.
  - Underlying geology for the Rock Yard clearances comprises Cocoparra Group of the Lachlan Orogen overlain by Cenozoic sedimentary Colluvium.
  - No naturally occurring asbestos was noted in the vicinity of this precinct.
- Wagga Wagga precinct:
  - Underlying geology for Uranquinty Yard clearances comprises Collingullie Granite of the Lachlan Orogen overlain by Cenozoic sedimentary aeolian sand plain.
  - Underlying geology for Pearson Street bridge, Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances comprises Abercrombie Formation of the Lachlan Orogen overlain by Cenozoic sedimentary colluvium.
  - Underlying geology for Bomen Yard clearances comprises Wantabadgery Granite of the Lachlan Orogen overlain by Cenozoic sedimentary colluvium. No naturally occurring asbestos was noted in the vicinity of this precinct.
- Junee precinct:
  - Underlying geology for Harefield Yard clearances, Kemp Street bridge, Junee Station pedestrian bridge, Junee Yard clearances and Olympic Highway underbridge comprises Wantabadgery Granite of the Lachlan Orogen overlain by Cenozoic sedimentary colluvium.
  - No naturally occurring asbestos was noted in the vicinity of this precinct.
  - Illabo to Junee clearances are underlain by multiple geology types: including:
    - Chainage: 464900–467100 – Combaning formation of the Lachlan Orogen overlain by Cenozoic sedimentary alluvium.
    - Chainage 466700–469400 – Junawarra Volcanics of the Lachlan overlain by sedimentary alluvium.
    - Chainage 469500–476900 – Combaning Formation Lachlan Orogen overlain by Cenozoic sedimentary alluvium. Between chainage 471500–471900 – colluvial and residual deposits, described as undifferentiated colluvial and residual deposits.
    - 476900–477100 – Abercrombie Formation of the Lachlan Orogen overlain by Cenozoic sedimentary colluvial and residual deposits.
    - 477100–480800 – Wantabadgery Granite of the Lachlan Orogen overlain by Cenozoic sedimentary colluvial and residual deposits.

Table 4.2 Summary of geological units relevant to the proposal

| GEOLOGY UNIT                                                  | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Abercrombie formation of the Lachlan Orogen                   | Middle Paleozoic from 450 to 340 million years ago, described as brown and buff to grey, thinly to thickly bedded, fine- to coarse-grained mica-quartz sandstone, interbedded with laminated siltstone and mudstone.                                                                                                                                                          |
| Cenozoic sedimentary alluvial channel and floodplain deposits | 66 million years old. Fluvially deposited, very fine- to medium-grained lithic to quartz-rich sand, gravel, silt, clay.                                                                                                                                                                                                                                                       |
| Devonian Volanics of the Lachlan Orogen                       | Middle Paleozoic from 450 to 340 million years ago, as volcanic and volcanoclastic rock.                                                                                                                                                                                                                                                                                      |
| Cenozoic sedimentary residual deposits                        | 66 million years old. Weakly-consolidated regolithic residuum such as soil or saprolite mostly developed in-situ as a result of advanced weathering and/or pedogenesis.                                                                                                                                                                                                       |
| Budginigi Ignimbrite of the Lachlan Orogen                    | Middle Paleozoic from 450 to 340 million years ago. Garnet-bearing, welded crystal pumice volcanoclastic sandstone (ignimbrite); hyaloclastite breccia; K-feldspar-porphyritic rhyolite.                                                                                                                                                                                      |
| Wallandoon Ignimbrite of the Lachlan Orogen                   | Middle Paleozoic from 450 to 340 million years ago. Amphibole-bearing welded crystal-pumice breccia (ignimbrite).                                                                                                                                                                                                                                                             |
| Cenozoic sedimentary aeolian sand plain                       | 66 million years old. Flat to low undulating or hummocky fossil sand plain, red-brown to brown and humic, clayey, silty to fine-grained sand, silty clay at depth; abundant regolithic & pedogenic carbonate, extensively modified by pedogenesis. As well as alluvial floodplain deposits, described as silt, very fine- to medium-grained lithic to quartz-rich sand, clay. |
| Buchargindah Granite of the Lachlan Orogen                    | Middle Paleozoic from 450 to 340 million years ago. Granite coarse- to medium-grained muscovite granite.                                                                                                                                                                                                                                                                      |
| Cocoparra Group of the Lachlan Orogen                         | Middle Paleozoic from 450 to 340 million years ago. Quartz-rich and lesser lithic sandstone, pebbly sandstone, conglomerate, siltstone, grit; mainly fluvial sequence.                                                                                                                                                                                                        |
| Cenozoic sedimentary Colluvium                                | 66 million years old. Poorly sorted, weakly cemented to unconsolidated colluvial lenses of polymictic conglomerate with medium- to very coarse-grained sand matrix; interspersed with unconsolidated clayey and silty red-brown (aeolian) sand layers, modified by pedogenesis.                                                                                               |
| Collingullie Granite of the Lachlan Orogen                    | Middle Paleozoic from 450 to 340 million years ago. Feldspar-porphyritic, medium- to coarse grained biotite granite, highly xenolithic.                                                                                                                                                                                                                                       |
| Wantabadgery Granite of the Lachlan                           | Middle Paleozoic from 450 to 340 million years ago. Medium-grained, grey, massive to foliated (at the margins), equigranular to porphyritic granite; sporadically varies to a muscovite-biotite granodiorite; metasedimentary xenoliths are common; porphyritic phases are usually biotite-rich.                                                                              |
| Combaning formation of the Lachlan Orogen                     | Middle Paleozoic from 450 to 340 million years ago. Siltstone, sandstone, shale, conglomerate, minor felsic volcanic rocks.                                                                                                                                                                                                                                                   |
| Junawarra Volcanics of the Lachlan Orogen                     | Middle Paleozoic from 450 to 340 million years ago. Andesite, andesitic agglomerate, latite, sedimentary rocks, minor dacite.                                                                                                                                                                                                                                                 |

### 4.2.3 SOIL TYPE

The soil landscapes encountered along the proposal site, as described in eSPADE, are presented in Table 4.3.

Table 4.3 Soil landscapes

| LOCATION                                                                             | DETAILS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Murray River bridge                                                                  | <p>The enhancement site is underlain by alluvium belonging to the Wakool River landscape<sup>1</sup>. and comprise grey and black Vertosols (deep cracking clays), brown and red chromosols (soils with a clay subsoil overlain by a lighter topsoil).</p> <p>The soils are prone to water logging.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Albury Station pedestrian bridge, Albury Yard clearances and Riverina Highway bridge | <p>Being on the boundary of the alluvium belonging to the Wait A While landscape and the erosional Livingston landscape. The soils are described as comprising red Kurosols, (soils with a clay subsoil that is acidic) in the south of the enhancement site and Red Chromosols (soils that have a clay subsoil that are not acidic) in the north of the enhancement site.</p> <p>Soil limitations include localised wind erosion and localised waterlogging and flooding and localised salinity.</p>                                                                                                                                                                                                                                                                         |
| Table Top Yard clearances                                                            | <p>Belonging to the Ettamogah landscape, which is a residual landscape in which the soil has developed from weathering of the underlying granite. The soils are typically deep to moderately deep red to yellow Chromosols and Kurosols (soils with a distinct friable topsoil overlying clay subsoils – otherwise known as a podzolic soil), with Sodosols (podzolic profile but with elevated sodium in the clay) in low lying areas.</p> <p>The soils, particularly where sodic, have a high erosion hazard. Localised gully erosion has been observed along with widespread wind and sheet erosion.</p>                                                                                                                                                                   |
| Billy Hughes bridge                                                                  | <p>Belonging to the Ettamogah landscape, which is a residual landscape in which the soil has developed from weathering of the underlying granite. The soils are typically deep to moderately deep red to yellow Chromosols and Kurosols (soils with a distinct friable topsoil overlying clay subsoils – otherwise known as a podzolic soil), with Sodosols (podzolic profile but with elevated sodium in the clay) in low lying areas.</p> <p>The soils, particularly where sodic, have a high erosion hazard. Localised gully erosion has been observed along with widespread wind and sheet erosion.</p>                                                                                                                                                                   |
| Culcairn pedestrian bridge and Culcairn Yard clearances                              | <p>Belonging to the alluvial Culcairn Soil Landscape and comprise very deep (&gt;1.5 metres), moderately well-drained Red and Brown Chromosols and Kurosols (soils with a friable topsoil overlying a clay subsoil (i.e. podzolic soils) that are respectively either non acidic or acidic). Yellow and Grey Sodosols (podzolic soils with a high sodium content in the subsoil) on the higher, older terraces, with deep (1.0–1.5 metres), moderately well-drained Grey and Brown Dermosols (clay dominated soils with a gradational profile) occurring on lower younger terraces.</p> <p>The soils are prone to localised high gully erosion hazard, localised acidity, localised waterlogging and poor drainage, localised sodicity and foundation hazard where sodic.</p> |

<sup>1</sup> A “soil landscape” is a geographic classification of soils that are related, within a local area. The soil types within a soil landscape will be the result of local soil forming processes. These processes principally include the parent material (e.g. underlying rock or origin of the alluvium), the local topography and position in the landscape, and the age of the soil. Soils within a soil landscape have similar general properties and descriptions or are related to one another (e.g. certain soil types will be present on crests of hills and will grade to other soil types at lower points in the landscape)

| LOCATION                                                                                                                         | DETAILS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Henty Yard clearances                                                                                                            | <p>Belonging to the Aeolian Henty Soil Landscape and comprise very deep (&gt;1.5 metres), moderately well-drained Brown and Yellow Sodosols (soils with a subsoil having elevated sodium) on the higher, older terraces with deep (1.0–1.5 metres), moderately well-drained Brown Dermosols (clay dominated soils with gradational profile) and Yellow Chromosols (soils with a friable topsoil overlying a clay subsoil that is not acidic) occurring on lower younger terraces.</p> <p>The soils are prone to moderate wind and gully erosion hazard, localised acidity, localised waterlogging and poor drainage, localised sodicity, foundation hazard where sodic, burial by wind-blown sand, complex terrain.</p> |
| Yerong Creek Yard clearances                                                                                                     | <p>Belonging to the Alluvial Mangoplah Soil Landscape and comprise moderately deep (80–150 centimetre) red Sodosols (soils with a subsoil having elevated sodium). The far south, in the vicinity of the Sandy Creek, is described as belonging to the O'briens Creek Soil Landscape with moderately deep Red and brown Sodosols.</p> <p>The soils are prone to streambank erosion, acidity and localised water logging.</p>                                                                                                                                                                                                                                                                                            |
| The Rock Yard clearances                                                                                                         | <p>Belonging to the Vincent Road Soil Landscape in the west and Mangoplah Soil Landscape in the west. Both these soils are described as being moderately deep (80–150 centimetre) Sodosols (soils with a subsoil having elevated sodium). Those in the west are formed from colluvium from the local sandstones while in the east the soils are of alluvial origin.</p> <p>Local soils are also prone to high erosion hazard, localised foundation hazard and strong acidity. Low lying areas are also prone to localised waterlogging.</p>                                                                                                                                                                             |
| Uranquinty Yard clearances                                                                                                       | <p>Belonging to three soil landscapes including:</p> <ul style="list-style-type: none"> <li>— Pearson Soil Landscape in the south west with moderately deep red Sodosols (clay subsoils with elevated sodium content)</li> <li>— O'briens Creek Soil Landscape in the centre, with moderately deep Red and brown sodosols; and</li> <li>— Belfrayden Soil Landscape in the north east with red chromosols (non-sodic, non-acidic clay subsoils) and red dermosols (clay dominated but gradational profiles).</li> </ul> <p>The local soils have limitations that include strong acidity, local water logging and stream bank erosion. The erosion hazard is higher on the sodosols.</p>                                 |
| Pearson Street bridge                                                                                                            | <p>Belonging to the Becks Lane Soil Landscape, with moderately deep red and brown Chromosols (with a friable topsoil overlying clay subsoil) and Dermosols (clay dominated soils but with a gradational textural profile).</p> <p>The local soils have limitations that include high erosion hazard, acidity and localised foundation hazards.</p>                                                                                                                                                                                                                                                                                                                                                                      |
| Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances | <p>Belonging to the Becks Lane Soil Landscape, with moderately deep red and brown Chromosols (with a friable topsoil overlying clay subsoil – otherwise known as a podzolic soil) and Dermosols (clay dominated soils but with a gradational textural profile). The eastern end of the enhancement site belongs to the Lloyd Soil Landscape which in the vicinity of the enhancement site likely comprises red Chromosols and brown Sodosols (podzolic soils but with elevated sodium in the subsoil).</p> <p>The local soils have limitations that include high erosion hazard, steep slopes, localised foundation hazards and mass movement, stoney and strongly acid soils on ridges and upper slopes.</p>           |

| LOCATION                        | DETAILS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bomen Yard clearances           | <p>Belonging to the East Bomen Soil Landscape, with shallow to moderately deep red and brown Dermosols (clay dominated soils with a gradational textural profile). The south western end of the enhancement site belongs to the Currawarna Soil Landscape described as moderately deep Tenosols (relatively young or poorly developed soils) formed from Aeolian (wind-blown) material.</p> <p>The local soils have limitations that include moderate erosion hazard, moderate acidity and locally shallow soil and localised foundation hazard.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Harefield Yard clearances       | <p>Belonging to two soil landscapes including Currajong Soil Landscape in the south west and Houlaghans Creek Soil Landscape in the north east. Whilst the former is formed from weathering of colluvium from surrounding granites and the latter are formed from local alluvium the general descriptions of the soils are similar. The local soils likely comprise deep (&gt;100 centimetre) mottled red and brown Chromosols (with friable topsoil overlying non-acidic clay subsoils – also known as podzolic soils) on upper, mid and lower slopes. Moderately deep to deep (&gt;50 centimetre), Brown and Red Dermosols (clay dominated soils but with a textural gradation, becoming more clayey at depth) on mid to lower slopes and deep (&gt;100 centimetre), imperfect to moderately well-drained mottled red, brown and yellow Chromosols on lower slopes. Deep (&gt;100 centimetre), imperfectly drained brown and red Sodosols (podzolic soils with elevated sodium in the subsoil) on some lower slopes, in drainage depressions and along creek flats.</p> <p>The local soils have various limitations that include localised seasonal waterlogging, flood hazard, sheet and gully erosion hazard, poor drainage, strong acidity of topsoils, sodicity/dispersibility and low wet bearing strength of subsoil, and salinity.</p> |
| Kemp Street bridge              | <p>Belonging to the Currajong Soil Landscape which is formed from weathering of colluvium from surrounding granites. The local soils likely comprise deep (&gt;100 centimetre) mottled red and brown Chromosols (with friable topsoil overlying non-acidic clay subsoils – also known as podzolic soils) on upper, mid and lower slopes. Moderately deep to deep (&gt;50 centimetre), Brown and Red Dermosols (clay dominated soils but with a textural gradation, becoming more clayey at depth) on mid to lower slopes and deep (&gt;100 centimetre), imperfect to moderately well-drained mottled red, brown and yellow Chromosols on lower slopes. Deep (&gt;100 centimetre), imperfectly drained brown and red Sodosols (podzolic soils with elevated sodium in the subsoil) on some lower slopes, in drainage depressions and along creek flats.</p> <p>The local soils have various limitations that include localised salinity, poor drainage, high run-on, sheet and gully erosion hazard, high erodibility of subsoils, acidity of topsoils, and sodicity/dispersibility of subsoil.</p>                                                                                                                                                                                                                                              |
| Junee Station pedestrian bridge | <p>Belonging to the Currajong Soil Landscape which is formed from weathering of colluvium from surrounding granites. The local soils likely comprise deep (&gt;100 centimetre) mottled red and brown Chromosols (with friable topsoil overlying non-acidic clay subsoils – also known as podzolic soils) on upper, mid and lower slopes. Moderately deep to deep (&gt;50 centimetre), Brown and Red Dermosols (clay dominated soils but with a textural gradation, becoming more clayey at depth) on mid to lower slopes and deep (&gt;100 centimetre), imperfect to moderately well-drained mottled red, brown and yellow Chromosols on lower slopes. Deep (&gt;100 centimetre), imperfectly drained brown and red Sodosols (podzolic soils with elevated sodium in the subsoil) on some lower slopes, in drainage depressions and along creek flats.</p> <p>The local soils have various limitations that include localised salinity, poor drainage, high run-on, sheet and gully erosion hazard, high erodibility of subsoils, acidity of topsoils, and sodicity/dispersibility of subsoil.</p>                                                                                                                                                                                                                                              |



| LOCATION                                              | DETAILS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Junee Yard clearances and Olympic Highway underbridge | <p>Belonging to the Currajong Soil Landscape which is formed from weathering of colluvium from surrounding granites. The local soils likely comprise deep (&gt;100 centimetre) mottled red and brown Chromosols (with friable topsoil overlying non-acidic clay subsoils – also known as podzolic soils) on upper, mid and lower slopes. Moderately deep to deep (&gt;50 centimetre), Brown and Red Dermosols (clay dominated soils but with a textural gradation, becoming more clayey at depth) on mid to lower slopes and deep (&gt;100 centimetre), imperfect to moderately well-drained mottled red, brown and yellow Chromosols on lower slopes. Deep (&gt;100 centimetre), imperfectly drained brown and red Sodosols (podzolic soils with elevated sodium in the subsoil) on some lower slopes, in drainage depressions and along creek flats.</p> <p>The local soils have various limitations that include localised salinity poor drainage, high run-on, sheet and gully erosion hazard, high erodibility of subsoils, acidity of topsoils, and sodicity/dispersibility of subsoil.</p>                                                                                                                                                                                                                                                                      |
| Junee to Illabo clearances                            | <p>Belonging to a number of soil landscapes including:</p> <ul style="list-style-type: none"> <li>— Currajong Soil Landscape in the south, near Junee and beyond</li> <li>— Malebo Soil Landscape in the south, near Junee</li> <li>— Mimosa Soil Landscape centrally between Junee and Illabo; and</li> <li>— Eurongilly Soil Landscape in the north and beneath Illabo.</li> </ul> <p>These soil landscapes generally comprise red and brown Chromosols (with friable topsoil overlying non-acidic clay subsoils – also known as podzolic soils) and occasionally red Kurosols (similar podzolic soils but with acidic subsoil) on upper, mid and lower slopes. Brown and Red Dermosols (clay dominated soils but with a textural gradation, becoming more clayey at depth) on mid to lower slopes and mottled red, brown and yellow Chromosols on lower slopes. Imperfectly drained brown and red Sodosols (podzolic soils with elevated sodium in the subsoil) are often present in lower slopes, in drainage depressions and along creek flats.</p> <p>These various soils have a range of limitations including localised salinity, poor drainage, high run-on, sheet, wind and gully erosion hazard, high erodibility of subsoils, acidity of topsoils, and sodicity/dispersibility of subsoil, engineering hazard, low bearing strength and mass movement.</p> |

#### 4.2.4 SALINITY

The desktop review of soil types and electrical conductivity of those soils using the eSPADE portal (DPIE, 2020) across the proposal site indicates that a number of local soil types have potential salinity hazard associated with them (as discussed in section 4.2.3). These appear most prevalent in the northern half of the proposal site, particularly from Wagga Wagga north, but localised salinity hazards cannot be discounted from soils in the south of the proposal site.

Local salinity hazard risk depends on many factors including the underlying soils, the local topographical features and drainage, and the construction design. Typically salinity impacts in soil increase with soil depth, as salts have been leached deeper in the soil over time. However, construction activities have the potential to bring these salts back to the surface where they may then cause environmental impact (e.g. by reducing plant growth and enhancing erosion, or by causing increased salinity in runoff water) or may represent aggressive conditions to construction materials (leading to increased corrosion of steel and deterioration of concrete).



Pathways for salt mobilisation to the surface (or near surface) may include direct excavation of deeper soils, with the resulting spoil being left at the surface, or through in situ changes to the natural hydrology so that subsurface zones that will have freely drained prior to construction are disrupted (e.g. construction of retaining walls, or compaction of soils). This may lead to increases in groundwater levels bringing dissolved salts nearer the surface and can result in seepage zones developing where salts may accumulate through evaporation of water.

The salinity mapping presenting electrical conductivity data for each enhancement site is presented as Figures 1 and 2 in Appendix A-1 and Appendix A-2 respectively. Further discussion on salinity impacts is provided in section 6.2, with discussion on mitigation measures provided in Chapter 8. More detailed summaries of salinity at each enhancement site are provided in Appendix B.

#### 4.2.5 ACIDITY

Acidity of the soil and rock may be generated by ASS, be present as naturally acidic soils, or develop from exposed from sulfidic rock. These aspects are discussed in more detail below. Further discussion on acidity impacts is provided in section 6.1, with discussion on mitigation measures provided in Chapter 8.

##### 4.2.5.1 ACID SULFATE SOILS

ASS are those that have elevated levels of Reduced Inorganic Sulfur (RIS). Typically, ASS exists as either:

- Actual Acid Sulfate Soils (AASS): Where the oxidation of the RIS has led to significant acidification of the soils (pH 4 or less); or
- Potential Acid Sulfate Soils (PASS): Where the soils have not yet been oxidised, but have the potential to become acidic if allowed to oxidise.

ASS are a feature of low lying soils or depressions that have been saturated with sulfate rich water, in which microbial reduction of the sulfate has led to significant build-up of sulfides in the sediments (such as iron sulfide – pyrite). These become a concern when disturbed allowing the sediments to oxidise, and the sulfides then chemically react with oxygen releasing sulfuric acid.

Some ASS have sufficient presence and availability of naturally occurring carbonates that the acid generated by the oxidation of the RIS does not affect the soil pH. These are essentially self-buffering soils.

A review of the Australian Soil Resource Information System (ASRIS) Acid Sulfate Risk map identified that the proposal site is located within areas described as low probability of ASS, with the exception of the Murray River bridge enhancement site, where sediments which have a “high probability” of occurrence of inland ASS. It is possible that some other areas of localised inland ASS may be present in dams or other inundated areas where sulfides may be laid down in sediments over time.

The ASS mapping for each enhancement site is presented on Figure 3 in Appendix A-3. Summaries of ASS at each enhancement site are and provided in Appendix B.

##### 4.2.5.2 NATURALLY ACIDIC SOILS

Naturally acidic soils should not be confused with ASS. These soils are acidic, but not due to RIS oxidation. They may be acidic as a result of natural acidity inherent in the parent rock, due to organic acids being present in the soil or through agricultural practices (e.g. long term fertiliser use).

A review of modelled pH ranges from soil presented in the eSPADE Portal (DPIE, 2020) indicates that the upper 0.3 metres of soils relevant to the proposal site generally has a pH of between 5 and 6, which is considered strongly to moderately acidic (Hazelton and Murphy, 2007) in the context of soil chemistry. This is particularly so in the valleys. Where the proposal is located within, or near, more elevated terrain, such as near Ettamogah and Table Top, The Rock and northeast of Junee to Illabo the acidity of this upper 0.3 metres ranges from 4.5 to 5.5 and are stated to be very strongly acidic to strongly acidic (Hazelton and Murphy, 2007).

The modelled subsoil pH (0.3 metres to 1.0 metres) was indicated by eSPADE to be generally less acidic typically ranging from 5.5 to 6.5 (moderately acidic to slightly acidic) though again, the zones where the alignment passes through or near more rugged terrain have pHs that are lower, ranging between 4.5 to 6.0 (very strongly acidic to moderately acidic).

Naturally acid soils, where present, are unlikely to worsen significantly with time.

#### 4.2.5.3 SULFIDIC ROCK

Similar to ASS, minerals within sulfidic rock have a high concentration of RIS (e.g. pyrite). When exposed to the air these rocks may become acidic affecting surrounding soils and local waterways and built structures in contact with the rock.

Sulfidic rock can occur across a wide range of geologies, both igneous and sedimentary, and they are not necessarily acidic in their undisturbed state. Sulfidic rock is not mapped for the study area and so the areas of risk cannot be identified.

## 4.3 CONTAMINATION – ALBURY PRECINCT

### 4.3.1 REGULATORY DATABASE SEARCHES AND SUMMARY OF SITE HISTORY

A search of applicable regulatory databases and review of historical aerial photographs was undertaken for enhancements sites within the Albury precinct and is presented in Table 4.4 to Table 4.7 below.

Table 4.4 Results of regulatory database and summary of review site history – Murray River bridge

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that ARTC has EPL 3142 to operate the rail corridor however no other properties within two kilometres of the enhancement site held registered EPLs.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.<br><br>A number of sites have been notified to the NSW EPA under Section 60 of the CLM Act but none within two kilometres of the enhancement site are being regulated.                                                                                                                                                                                                                                                                                          |
| Unexploded ordinances                 | For an area with a two kilometres radius around this enhancement site, no unexploded ordinance information was found.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Summary of aerial imagery             | The rail corridor and bridge were visible in their current locations in the 1961 aerial photograph. The enhancement site was surrounded by agricultural land and low density residential properties. A quarry was located approximately 800 metres to the north-west of the enhancement site. The enhancement site and surrounding area remained largely unchanged in the 1975 and 1996 aerial photographs with the exception of further residential development to the north of the enhancement site. The Hume Highway and Spirit of Progress bridge were visible to the south of the railway bridge in the 2018 aerial photographs. |

Table 4.5 Results of regulatory database and summary of review site history – Albury Station pedestrian bridge, Albury station yard and Riverina Bridge

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that ARTC has EPL 3142 to operate the rail corridor. A Cleanaway site located 1,300 metres north east of the Riverina Highway bridge enhancement site has a license for non-thermal treatment of hazardous and other waste, as well as waste storage for hazardous, restricted soil, liquid, clinical and related waste and asbestos waste.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| EPA contaminated sites registers      | <p>Online searches of the NSW EPA POEO Act public register indicated that no notices were on record for the enhancement sites, however there were three properties within two kilometres of the enhancement sites that were listed.</p> <p>The Xpress Service Station, 616–624 Young Street, is located 60 metres to the west of the Riverina Highway bridge enhancement site. The site has 6 former notices. The site was declared to be a remediation site in 2008, Caltex Australia Petroleum Pty Ltd was then issued two Approved Voluntary Management Proposals in 2009 and 2011, and then two Amendment or Repeal of Order or Notices in 2012 and 2015. In 2015 Caltex Australia Petroleum Pty Ltd was issued a Notice of Completion or Withdrawal of Approved VMP.</p> <p>A former gas works and its surrounding commercial land, 441 Kiewa Street, is located 870 metres to the west of the Albury Station pedestrian bridge and Albury Yard clearances enhancement sites. The site has three current and four former notices. Albury City Council was issued with a Section 35 EHC Order in 1990, and an EHC Act Revocation Notice in 2006. The Albury Gas Company Ltd was issued with Approved Voluntary Management Proposal in 2012 and a Notice of Completion or Withdrawal of Approved VMP in 2018. The site was declared to be a remediation site in 2005 (current). The Albury City Council was issued with an Amendment or Repeal of Order or Notice in 2015 (current) and Australian Gas Networks (Albury) Pty Ltd was issued with an Approved Voluntary Management Proposal in 2018 (current).</p> <p>A former Thales Australia site, 161 Fallon Street, is located 1.5 kilometres north of the Riverina Highway bridge enhancement site. The site has two former notices. The site was declared significantly contaminated in 2013 and a Notice to End Investigation Declaration was issued in 2019.</p> <p>A number of sites have been notified to the NSW EPA under Section 60 of the CLM Act but none within two kilometres of the enhancement site are being regulated.</p> |
| Unexploded ordinances                 | No unexploded ordinance information was found for the area within a two kilometres radius of the enhancement site(s).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Summary of aerial imagery             | The rail corridor was visible in its current location in the 1961 aerial photograph. The surrounding area to the east of the corridor had been developed with predominantly low density residential use and mixed residential and commercial use to the west. Large warehouses were visible to the west of the rail corridor. The enhancement sites and surrounding land remained largely unchanged in the 1975 and 1990 aerial photographs with the exception of increased commercial development to the west of the corridor. The enhancement sites and surrounding land use remained consistent in the 2018 aerial photograph with the exception that several of the large warehouses to the west of the corridor had been demolished and replaced with smaller buildings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

Table 4.6 Results of regulatory database and summary of review site history – Billy Hughes bridge

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that ARTC has EPL 3142 to operate the rail corridor. A Visy Albury site is located 300 metres from the enhancement site, is registered for dangerous goods production and paper or pulp production.                                                                                                                  |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.<br><br>A number of sites have been notified to the NSW EPA under Section 60 of the CLM Act but none within two kilometres of the enhancement site are being regulated.                                           |
| Unexploded ordinances                 | 1.5 kilometres south west of the enhancement site is '172 Ettamogah'. This site has a unexploded ordnance (UXO) category of substantial potential. The site was part of an ammunition depot from WWII to 1982.                                                                                                                                                                         |
| Summary of aerial imagery             | The railway line was visible in the 1969 aerial photograph. The enhancement site was undeveloped and surrounded by agricultural land. The paper mill to the north-west of the enhancement site was first visible in the 1987 aerial photographs and the steel distributor's building first visible in 1998. The enhancement site and surrounds have been largely unchanged since 1998. |

Table 4.7 Results of regulatory database and summary of review site history – Table Top

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that ARTC has EPL 3142 to operate the rail corridor and no other properties within two kilometres of the enhancement site were found to have EPLs.                                                                                                                                                 |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres of the enhancement site.<br><br>A number of sites have been notified to the NSW EPA under Section 60 of the CLM Act but none within two kilometres of the enhancement site are being regulated. |
| Unexploded ordinances                 | 580 metres to the east of the enhancement site is '117 Tabletop'. This site has a UXO category of slight potential. The site was used as an artillery range during WWII.                                                                                                                                                                                             |
| Summary of aerial imagery             | The railway line was visible in the 1961 aerial photograph. The enhancement site was undeveloped and surrounded by agricultural land. The enhancement site and surrounds have been largely unchanged since 1961.                                                                                                                                                     |

### 4.3.2 RESULTS OF THE ENHANCEMENT SITE WALKOVER

Observations made during the walkover for each enhancement site are presented in Table 4.8 below. Any AECs identified during the walkover are presented in Figure 5 in Appendix A-5. A photographic log is included in Appendix C.

Table 4.8 Key observations of the walkover – Albury precinct

| ENHANCEMENT SITE                                                                      | DESCRIPTION OF THE LAYOUT AND USE OF ENHANCEMENT SITE AND SURROUNDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IDENTIFIED RISKS OR POTENTIAL FOR CONTAMINATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Murray River bridge                                                                   | The enhancement site was inspected on 23 February, 2021. This site consists of a single corridor approaching the Murray River bridge. Along the sides are several piles of sleepers and rails. There are two small derelict sheds along the corridor, inside are old electrical boards. The area below the bridge was not accessed.                                                                                                                                                                                                                                                                                                                                                                            | Some dilapidated sheds (possible old signal boxes) were observed alongside the corridor, at both chainages 648120 and 648240 these were labelled as containing asbestos. Asbestos sheeting was observed to have fallen away from the walls. Along the boundary fence with Townsend Street to the north of the corridor, some piles of dumped rubbish were observed (e.g. piles of AstroTurf and tyres).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Albury Station pedestrian bridge<br>Albury Yard clearances<br>Riverina Highway bridge | <p>These enhancement sites were inspected on 22 February, 2021. Adjacent to the Albury station is the Albury rail yard. From chainage 645400 to 64600 the enhancement site is wide with several rail lines, including abandoned lines that connect with old platforms. The sidings are covered in a ballast layer, scattered around the enhancement site are extra rails and sleepers as well as piles of metals joiners. There is an old turn table and several small buildings along the rail corridor that are likely old signal boxes.</p> <p>The Riverina Highway bridge enhancement site is located to the north of the yards and ballast and gravel sidings were observed running under the bridge.</p> | <p>Several material stockpiles were observed in the southern portion of the enhancement site near to chainage 646500, next to a former platform at chainage 646200 and in the northern portion of the enhancement site at chainage 645900, chainage 645600, chainage 645500. The majority of these stockpiles were made up of uniform rail ballast. One stockpile near to the western boundary at chainage 645500 comprised significant demolition rubble, including concrete, metal, wood, sand and ballast. A stockpile on the eastern boundary at chainage 645600 consisted of large boulders of sandstone.</p> <p>There were a number of old rusted drums scattered around the enhancement site. In particular there were about twelve near to the tree at chainage 645700. Some were open and contained general rubbish and others were closed with unknown contents.</p> <p>At chainage 645800 there is a rusted abandoned tanker carriage. Opposite the station itself at chainage 646100, there are a number of disused building structures alongside the rails. They were in poor condition with many holes in walls and windows. One of the buildings has a tank of unknown use attached to it.</p> |

| ENHANCEMENT SITE          | DESCRIPTION OF THE LAYOUT AND USE OF ENHANCEMENT SITE AND SURROUNDS                                                                                                                                                                                                                                                                                                                                                           | IDENTIFIED RISKS OR POTENTIAL FOR CONTAMINATION                                                                                                          |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Billy Hughes bridge       | The enhancement site was inspected on 22 February, 2021. At the time of the inspection this area of Wagga Road was closed to vehicles due to construction in the area. There was also maintenance being carried out on the rail line at chainage 634800. The area surrounding the corridor was paddocks with occasional tree. Machinery noise from a factory to the west of the enhancement site was audible from the bridge. | One stockpile of ballast was observed in the area east of the rail at chainage 635000. No other observable potential contaminating sources were present. |
| Table Top Yard clearances | The enhancement site was inspected on 22 February, 2021. This site was a small section of rail corridor that had an over track signal structure in its southern portion.                                                                                                                                                                                                                                                      | No observable potential contaminating sources were present.                                                                                              |

#### 4.3.3 RESULTS OF CONTAMINATION INVESTIGATIONS COMPLETED FOR THE PROPOSAL

The results of soil and groundwater investigations completed for the proposal (Coffey, 2018a and Coffey, 2018b) is summarised below:

- One soil bore was drilled at the Albury Station pedestrian bridge enhancement site, two bores were drilled at the Riverina Highway bridge enhancement site, two bores were drilled at Billy Hughes bridge enhancement site and one bore was drilled at the Albury Yard clearances enhancement site.
- ASS field tests and analysis for TPH, BTEX, PAH, and asbestos was undertaken in all bores with ASS chromium suite and a larger VOC suite analysis also undertaken in soil samples collected from the Riverina Highway overbridge and OCP and OPPs analysed at Billy Hughes bridge.
- The analytical results were not compared to any screening criteria by Coffey.
- Concentrations of TRH, BTEX, PAHs, OCP and OPPs were reported below the laboratory limits of reporting (LOR). Concentrations of metals were above LORs but below NEPM 2013 guidelines for protection of human health for commercial/industrial use.
- No asbestos was detected.
- Chromium suite results were below LORs
- The monitoring well was installed to a depth of 5.75 metres below ground level (mBGL) and was dry.

#### 4.3.4 *ARTC CONTAMINATED LAND RECORDS AND PREVIOUS REPORTS UNDERTAKEN WITHIN THE ALBURY PRECINCT*

##### 4.3.4.1 *ARTC CONTAMINATED LAND RECORDS*

The ARTC contaminated land records cover the following sites located immediately to the west of the enhancement site and within the ARTC leased area:

- Albury – Mobil Oil Fuel Depot; Priority rating: 2; unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations.
- Albury – SMs Residence (P5), Priority rating: 1: suitable for use in a commercial/industrial land use setting.
- Albury – Residential (P6) Priority rating: 2: unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations.
- Albury – Residential (P1) Priority rating: 2: unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations.
- Albury – Residential (P2) Priority rating: 2: unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations.
- Albury – Open Space (P4) Priority rating: 1: suitable for use in a commercial/industrial land use setting.

The following sites in the ARTC contaminated land records are located within the enhancement site and immediately to the west of the enhancement site in the northern portion of the Albury Precinct.

- Albury – Railway Yards & Refuelling Facility Priority rating: 2; unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations.
- Albury – Bunge Mills or Allied Mills Priority rating: 1: suitable for use in a commercial/industrial land use setting.

The areas covered by the ARTC contaminated land record are shown on Figure 4 in Appendix A-4.

Multiple historical reports summarising works undertaken in the vicinity of Albury Station pedestrian bridge and Albury Yard clearances were provided for review.

##### 4.3.4.2 *ALBURY YARD CLEARANCES*

The following sites are located within the area identified as Albury Yard clearances on the ARTC contaminated land database.

###### *FORMER MOBIL DEPOT*

The former Mobil depot is located to the west of the enhancement site and within the ARTC leased area, at the corner of Atkins Street and Railway Place (AEC 8 on Figure 5).

###### *CMPS&F (1996A) PHASE 1 ENVIRONMENTAL CONTAMINATION ASSESSMENT SR01, ALBURY*

A site inspection was undertaken on the fuel depot site. Petrol and diesel fuel were noted to be stored at the site in 13 above ground storage tanks (ASTs). Minor oil spots were observed on the ground surface. Underground storage tanks (USTs) were also noted on the site. The report recommended further assessment at the site.



## ***EGIS CONSULTING (2000) ALBURY MOBIL DEPOT CONTAMINATION ASSESSMENT – SUMMARY AND RECOMMENDATIONS***

Egis Consulting (2000) summarises historical assessments undertaken at the Mobil depot site. A site assessment from 1994 reported hydrocarbon concentrations in shallow soil above adopted assessment criteria at three locations on site. The land use used for assessment was not specified. Egis Consulting (2000) undertook drilling of 33 boreholes to a maximum depth of 7 metres and installation of four monitoring wells. Egis Consulting (2000) concluded that the potential for significant soil contamination from OCP, hydrocarbons or heavy metals exceeding commercial/industrial criteria was low. Groundwater was assessed to have the potential to present a risk to indirect health and/or ecological receptors due to concentrations of hydrocarbons. Egis Consulting (2000) recommended additional work be undertaken to assess the source and extent of contamination at the site.

### ***EGIS (2002), PHASE 2 CONTAMINATION ASSESSMENT, ALBURY GROUNDWATER REPORT***

This report was prepared for the adjacent site comprising Properties One to Six, however, it notes that during works monitoring wells on the Mobil site were gauged and phase separated hydrocarbon (PSH) was noted in two wells.

The above ground fuel related infrastructure is no longer present at the former Mobil depot. No reports documenting the remediation of this site were provided for review. It is not known if the sub surface infrastructure remains at the site. The site currently comprises a vacant lot. This site is located outside of the proposal area and the ARTC contaminated land record provides a Priority rating: 2. Unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations. No ground penetration is proposed at this location.

### ***PROPERTIES 1 TO 6, CORNER OF SMOLLET STREET AND RAILWAY PLACE, ALBURY***

Site assessments were undertaken on six State Rail Authority (SRA) properties located at the corner of Smollet and Railway Place. Properties One and Two were formerly residential properties, Property Three was an SRA barracks building, Property Four was a park, Property Five was the former station masters residence and later used as a Mobil administrative building and Property Six was a vacant lot.

#### ***LOT 3***

### ***ENVIRON (2003), SUMMARY SITE AUDIT REPORT (SAR)***

The summary SAR reviewed ten reports relating to the site. The historical assessments identified low concentrations of metals at the site surface and subsurface but below the adopted assessment criteria.

Concentrations of contaminants of potential concern (COPC) in groundwater were below the adopted assessment criteria. The auditor noted that insufficient assessment had been undertaken to assess the suitability of groundwater for a specific use but it was sufficiently characterised to indicate it was not contaminated by past activities.

The Environ (2003) concluded that the site was suitable for commercial/industrial use.

#### ***LOT 4***

### ***EGIS CONSULTING (2000) PHASE 1 CONTAMINATION ASSESSMENT, PROPERTY 4 (P4), RAILWAY PLACE ALBURY***

A desktop assessment and intrusive site assessment, comprising drilling of five boreholes, were undertaken at the site. Laboratory analysis for metals and limited analysis for OCPs was undertaken. Concentrations of lead and arsenic were detected in soil samples and Egis Consulting (2000) concluded they may have been associated with lead based paint on buildings. The concentrations of lead were considered to be a potential risk to human health. Egis Consulting (2000) recommended a phase 2 site assessment be undertaken and analysis for a broader suite of contaminants of concern.

### ***EGIS CONSULTING (2002) PHASE 2 CONTAMINATION ASSESSMENT, RAILWAY PLACE (PROPERTY 4), ALBURY***

The assessment comprised soil sample collection from four test pits, one borehole and 25 surface sample locations. Concentrations of lead and benzo(a)pyrene exceeded the adopted assessment criteria for residential land use however Egis (2002) concluded the site was suitable for continued open space (park land) use.

**COFFEY ENVIRONMENTS (2006) MOBIL ALBURY DEPOT (ADMINISTRATION OFFICE) (VA01) LOT 4 RAILWAY PLACE, ALBURY, NSW 26, QUALITATIVE HEALTH RISK ASSESSMENT**

Coffey Environments (2006) summarised the results of two historical site assessments (IT (2006a) *Phase 1 Environmental site assessment (ESA)* and IT (2006b) *Phase 2 ESA*). Three monitoring wells were installed on site and indicated that groundwater flows towards the west to the Murray River. Concentrations of hydrocarbons and metals exceeded the adopted assessment criteria for potable and recreational use. No concentrations of contaminants of potential concern (COPC) were noted above the adopted assessment criteria in the soil samples collected by IT (2006b). Coffey Environments (2006) note that the site was historically used for hydrocarbon storage. The qualitative health risk assessment (QHRA) assessed the exposure of COPC to potential residential and intrusive maintenance workers. Coffey Environments (2006) concluded that the contamination identified at the site was unlikely to present a risk to future residential and intrusive maintenance workers. If groundwater were to be extracted for beneficial purposes further assessment will be required.

WSP note that no remedial action plan (RAP) or site audit statement (SAS) was provided for this lot.

**LOT 5**

**ENVIRON (2003), SUMMARY SITE AUDIT REPORT (SAR)**

The summary SAR reviewed nine reports relating to the site. The historical assessments identified low concentrations of OCPs at the site surface and metals in the subsurface but below the adopted assessment criteria for commercial use. A concentration of benzo(a)pyrene was reported above the adopted assessment criteria for commercial use at one surface and one deeper location but statistical analysis showed that these concentrations were not considered to pose a risk to commercial site users.

A concentration of lead was reported above the adopted assessment criteria. The auditor noted that insufficient assessment had been undertaken to assess the suitability of groundwater for a specific use but it was sufficiently characterised to indicate it was not contaminated by past activities, with the exception of lead.

The Environ (2003) concluded that the site was suitable for commercial/industrial use but further assessment of groundwater was required if usage was proposed.

**LOTS 1, 2 AND 6**

**GHD (2003), YOUNG STREET ALBURY, PROPERTIES 1, 2 AND 6, REMEDIAL ACTION PLAN**

A RAP was prepared for three (Properties One, Two and Six) of the six properties located at the corner of Smollet Street and Railway Parade. The other three properties were not considered to require remediation.

Historical assessments at the site had identified concentrations of metals, OCPs and benzo(a)pyrene above the adopted assessment criteria for commercial use in soil.

Asbestos Containing Material (ACM) was noted on the site surface at one location, considered likely to be from the house, garage and buildings on the site which were confirmed to contain asbestos.

Concentrations of COPC in groundwater were reported below the adopted assessment criteria and Egis (2002) considered the groundwater to be suitable for irrigation and drinking water.

The RAP proposed excavation of impacted soil, off-site disposal and validation of the excavations before backfilling with clean fill.

**ENVIRON (2006), SITE AUDIT REPORT, REMEDIAL ACTION PLAN, PROPERTIES 1, 2 AND 6, YOUNG STREET, ALBURY**

The SAS was prepared to assess the suitability of the GHD (2003) RAP. The SAS noted that the RAP was, in general valid, and noted that the validation should be assessed by an auditor and the RAP should be updated as it was prepared in 2003.

#### *GHD (2010), REVISED REMEDIAL ACTION PLAN*

The RAP was updated to reflect the current legislation, guidelines and site condition for the remediation of properties 1, 2 and 6. The RAP proposed excavation of impacted soil, off-site disposal and validation of the excavations before backfilling with clean fill.

This site is located outside of the proposal area and the ARTC contaminated land record provides a Priority rating: 2. Unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations. No ground penetration is proposed at this location.

#### **4.3.4.3 514–526 YOUNG STREET, ALBURY**

514–526 Young Street is located immediately to the south-west of the Albury Yard clearances ARTC contaminated land site. It is located to the west of the railway corridor and wholly located with the Albury Station Precinct but outside of the construction impact zone.

#### *ENVIRON (2007) SITE AUDIT REPORT, 514-526 YOUNG STREET, ALBURY*

The audit comprised review of five site assessment reports for the site and a remediation options letter which was prepared by Environ.

The eastern portion of the site was used as a rail siding and the western portion of the site was used as a Shell fuel storage depot in with USTs and metal buildings. Environ (2007) reported the USTs were removed prior to the 1980s and all buildings removed by 2005.

A RAP was prepared for the site by URS in 2004 and remediation of two areas of elevated TRH concentrations was undertaken in accordance with the RAP in 2005. Environ (2007) noted that the remediation was appropriate, however, soil contamination remained in the western portion of the site, ongoing groundwater monitoring was required (including off site) and the backfill had not been demonstrated to be virgin excavated natural material (VENM). Groundwater samples collected from monitoring wells on site in 2006 identified concentrations of metals above adopted assessment criteria and elevated hydrocarbon concentrations. Phase separated hydrocarbons (PSH) was measured in one monitoring well and laboratory analysis indicated it was severely degraded leaded petrol and highly degraded diesel, likely released in the late 1970s or early 1980s.

Environ (2007) concluded that the western portion of the site was significantly contaminated with TRH, BTEX and PAHs. No contamination was identified in the eastern portion of the site. Enviro (2007) noted that SRA may have had a duty to notify of significant risk of harm due to a risk of groundwater contamination migrating from the site. The following works were recommended to establish site suitability for commercial/industrial use:

- additional shallow soil sampling in the eastern portion of the site
- a site specific risk assessment for the western portion of the site assuming a worst case scenario unless a vapour assessment is undertaken across the western portion of the site and additional shallow soil sampling was undertaken across the mid-western portion of the site
- a risk assessment of down gradient conditions, including additional off site monitoring well installation.

#### *COFFEY ENVIRONMENTS (2010), 514-526 YOUNG STREET, ALBURY, NSW ON SITE HEALTH RISK ASSESSMENT*

An HRA was conducted for the western portion of the site to assess risks to commercial occupants of a slab on ground building and sub surface maintenance workers within a 1 metre deep trench. No unacceptable chronic risk to human health was identified for these proposed land uses.

#### *COFFEY GEOTECHNICS (2010), ENVIRONMENTAL WORKS AT 514-526 YOUNG STREET, ALBURY*

A site assessment was undertaken on the eastern portion of the site to assess the suitability for commercial/industrial use. Soil samples were collected from six boreholes and analysed for PAHs, TRH, BTEX, phenols and asbestos. Concentrations were below the adopted assessment criteria for commercial use. It was recommended that an environmental management plan be developed to handle unexpected finds.

#### *COFFEY ENVIRONMENTS (2011), REVIEW OF DOCUMENTATION AND RECOMMENDATIONS FOR FURTHER WORKS*

Coffey Environments (2011) undertook a review of all historical reports for the site (including those summarised above). In addition to the above conclusions and recommendations Coffey Environments (2011) also concluded that:

- Coffey Environments (2010) did not assess the risk to basement structures so additional assessment maybe required
- no asbestos sampling was undertaken following building demolition so asbestos may exist in the soil post demolition works
- additional assessment
- soil and groundwater impacts were not delineated off site to the south-west
- not all sub surface fuel infrastructure such as pipes was removed from the site
- a subsurface conduit for water or sewage was located in the western portion of the site was not assessed for contamination migrating off site
- elevated concentrations of hydrocarbons in soil could have indicated that PSH was present in the soil
- no assessment of dense non aqueous phase liquid (DNAPL) had been undertaken.

#### *GHD (2016), ALBURY PORTFOLIO CONTAMINATION ASSESSMENT – STRATEGY FOR SITES 4 AND 5*

A site assessment and options assessment were undertaken for Site 5 (previously referred to as 514–526 Young Street, Albury) and Site 4 located immediately to the north of Site 5. GHD 2016 summarised a letter provided by the NSW EPA dated 2009 stating that they did not consider the soil contamination presented a significant risk of harm and that there was insufficient information to assess the risk of harm in relation to groundwater. The NSW EPA had requested Shell undertake additional off site assessment. Shell responded that there were several different lease holders on the site and that they will not undertake until it was shown Shell were responsible for the contamination. GHS (2016) notes that the eastern portion of Site 5 and Site 4 were not identified to have significant contamination through historic site assessments. Concentrations of hydrocarbons in one on site well exceeded the adopted assessment criteria for human health from vapour intrusion for commercial/industrial use. Neither of the two off site wells (installed by GHD in 2016) had exceedances of commercial/industrial criteria so it was not considered that the down gradient commercial receptors were at risk. The report recommended reparation of a RAP, further groundwater assessment, remediation of PSH on the western site boundary, consideration of removal of remaining infrastructure, preparation of a groundwater management plan and site audit.

Site 4 and the eastern portion of Site 5 were considered suitable for commercial/industrial use. The western portion of Site 5 was not suitable for commercial/industrial use but was not considered to pose a risk to of site receptors. It was noted remediation of the PSH was required by NSW EPA policy.

PSH was reported at 514–526 Young Street, Albury in 2016. Recommendations were provided for further assessment and remediation, however, no reports prepared for works undertaken after this date were provided for review. This site is not located within the proposal area and the ARTC contaminated land record provides a Priority rating: 2. Unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations. No ground penetration is proposed at this location.

#### 4.3.5 SUMMARY OF CONTAMINATION RISKS IDENTIFIED WITHIN ALBURY PRECINCT

Contamination risks identified relevant to the Albury precinct comprise:

- High probability of occurrence of inland ASS within Murray River sediment (AEC 3).
- Lead paint on the Murray River bridge is considered to be low risk as no excavation is taking place in this area (AEC 3).
- Moderate land salinity hazard at Table Top Yard clearances enhancement site. Additionally, the soils, particularly where sodic, have a high erosion hazard, however, limited excavation is proposed to take place at this enhancement site so the risk is considered to be low.
- Searches of regulatory databases identified the Xpress Service Station, 616–624 Young Street (AEC 4), is located 60 metres to the west of the enhancement site. This is considered to present a low risk to the enhancement site based on the distance from the enhancement site. The former gasworks at Kiewa Street and Thales at Fallon Street are considered to present a low risk due to the large distance from the enhancement site.
- Hazardous building materials comprising lead paint associated with Murray River bridge enhancement site, asbestos within a shed and some dumping of domestic waste and tires adjacent to the track near the Murray River crossing (AEC 1) may present a risk to construction workers when working in the vicinity of the hazardous material.
- One stockpile of demolition waste within the Albury Yard clearances enhancement site (AEC 2) which has the potential to also include ACM may present a risk to construction workers when working in the vicinity of the hazardous material. Stockpiles of ballast were also noted at AEC 7 and AEC 11 which may present a risk to construction workers when working in the vicinity of the stockpile.
- Metals drums with unknown contents were observed around the precinct (AEC 5 and AEC 6) may present a risk to construction workers when working in the vicinity of the hazardous material.
- Geotechnical and contamination reports prepared for the proposal have not identified contamination potentially requiring management relevant to the precinct.
- Based on review of other historical contamination reports, the risk presented by the contaminated sites historically assessed at Albury Precinct (AEC 8 and AEC 9) is considered to be low as no excavation is proposed within the construction footprint of sites identified, and risk of contamination in adjacent areas is considered to be low. There is a potential risk from migration of PSH in groundwater from 514-526 Young Street, Albury (AEC 10) to the enhancement site if remediation has not been undertaken. However, the ARTC contaminated land records state that this site is unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations, and no work is proposed at this location.

## 4.4 CONTAMINATION – GREATER HUME - LOCKHART PRECINCT

### 4.4.1 REGULATORY DATABASE SEARCHES AND SUMMARY OF SITE HISTORY

A search of applicable regulatory databases and review of historical aerial photographs was undertaken and is presented in Table 4.9 to Table 4.12 below.

Table 4.9 Results of regulatory database and summary of review site history – Culcairn pedestrian bridge and Culcairn Yard clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that ARTC has EPL 3142 to operate the rail corridor. Greater Hume Shire Council holds a licence for sewage treatment at the Culcairn sewage treatment works and effluent reuse area located approximately 1.4 kilometres to the east of the enhancement site.                                                                                                                                                                                                                                                                                                                                                         |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.<br><br>Two sites have been notified to the NSW EPA under Section 60 of the CLM Act but none within two kilometres of the enhancement site are being regulated.                                                                                                                                                                                                                                                                                                                                                    |
| Unexploded ordinances                 | For an area with a two kilometres radius around this enhancement site, no unexploded ordinance information was found.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Summary of aerial imagery             | The 1959 aerial photograph shows the rail corridor has been developed in its current location and some low density residential properties have been developed in the surrounding areas. Buildings are visible in the area to the north of Balfour Street but their use was not discernible. The enhancement site and surrounding area are largely unchanged in the 1966 aerial photograph with the exception of further development of low density residential properties in the surrounding area and the silos adjacent to the northern portion of the enhancement site are now visible. The enhancement site remains largely unchanged in the 1980, 1990 and 2019 aerial photographs. |

Table 4.10 Results of regulatory database and summary of review site history – Henty Yard clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that ARTC holds an EPL 3142 to operate the rail corridor. The Henty sewerage treatment works is located 500 metres to the west of the enhancement site. It is registered for Sewage treatment processing by small plants.                                                                                                                                                                                                                                                                           |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.<br><br>No sites have been notified to the NSW EPA under Section 60 of the CLM Act within two kilometres of the enhancement site.                                                                                                                                                                                                                                                                |
| Unexploded ordinances                 | No unexploded ordinance information found within a two kilometres radius of the enhancement site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Summary of aerial imagery             | The rail corridor is visible on the 1959 aerial photograph consistent with its current layout. Bicentennial Park was visible and the silos located to the north-west of the enhancement site were consistent with their current location. The enhancement site was surrounded by some low density residential land use and commercial buildings are visible to the east of Bicentennial Park. The enhancement site is largely unchanged between the 1966 aerial photograph and the 2016 photograph with the exception of further low density residential development. |

Table 4.11 Results of regulatory database and summary of review site history – Yerong Creek Yard clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that ARTC holds an EPL 3142 to operate the rail corridor.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres of the enhancement site.<br><br>No sites have been notified to the NSW EPA under Section 60 of the CLM Act within two kilometres of the enhancement site.                                                                                                                                                                                                                                                      |
| Unexploded ordinances                 | No unexploded ordinance information found within a two kilometres radius of the enhancement site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Summary of aerial imagery             | The rail corridor location was consistent with the current site layout in the 1969 aerial photograph. The silos and large warehouse building in the northern portion of the enhancement site were visible. The surrounding area comprised some low density residential properties. The enhancement site and surrounding areas were largely unchanged in the 1980 and 1999 aerial photographs. The enhancement site and surrounding areas were largely unchanged in the 2014 aerial photograph with the exception of the construction of a small shed to the east of Waratah Street. |



Table 4.12 Results of regulatory database and summary of review site history – The Rock Yard clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that ARTC holds an EPL 3142 to operate the rail corridor. The Rock sewage treatment works is located 1,400 metres to the north west of the enhancement site, it is registered for Sewage treatment processing by small plants.                                                                                                                                                                                                    |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.<br><br>No sites have been notified to the NSW EPA under Section 60 of the CLM Act within two kilometres of the enhancement site.                                                                                                                                                                                              |
| Unexploded ordinances                 | No unexploded ordinance information found within a two kilometres radius of the enhancement site.                                                                                                                                                                                                                                                                                                                                                                                                   |
| Summary of aerial imagery             | The rail corridor location was consistent with the current site layout in the 1969 aerial photograph. The silos and site buildings are largely consistent with the current site layout. The enhancement site is surrounded by low density residential properties and agricultural land. The enhancement site and surrounding areas were largely unchanged in the 1980 and 1999 aerial photographs. The enhancement site and surrounding areas were largely unchanged in the 2014 aerial photograph. |

#### 4.4.2 RESULTS OF THE ENHANCEMENT SITE WALKOVER

Observations made during the walkover for each enhancement site are presented in Table 4.13 below. AECs are presented on Figure 5 in Appendix A-5. A photographic log is included in Appendix C.

Table 4.13 Key observations of the walkover – Greater Hume – Lockhart Precinct

| ENHANCEMENT SITE                                        | DESCRIPTION OF THE LAYOUT AND USE OF ENHANCEMENT SITE AND SURROUNDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | IDENTIFIED RISKS OR POTENTIAL FOR CONTAMINATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Culcairn pedestrian bridge and Culcairn Yard clearances | The enhancement sites were inspected on 23 February, 2021. At the southern end of the enhancement site there is a level crossing at Balfour street, chainage 597000. Adjacent to this level crossing is a two storey cottage 'Station House'. A rough asphalted roadway connects the railway carpark to Balfour Street. Behind the cottage area are three large corrugated sheds, followed by a park and the Culcairn walking track. Within this park is a playground. On the other side of the park is dense bushland that was inaccessible. Within this area of bushland was a large wetland area. | Within the park adjacent to the station there is a RV grey and black water disposal dump point. Culcairn station itself was in good condition with no observable ACM. A small stockpile of ballast was observed opposite the station at chainage 596800. Larger stockpiles were observed in the northern portion of the enhancement site, past chainage 596700. North of the grain silos at chainage 596500 there is the remnants of an old platform, significant dumping surrounds this structure, including Besser blocks, metal drums, spray cans and other debris. |

| ENHANCEMENT SITE             | DESCRIPTION OF THE LAYOUT AND USE OF ENHANCEMENT SITE AND SURROUNDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | IDENTIFIED RISKS OR POTENTIAL FOR CONTAMINATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Henty Yard clearances        | <p>The enhancement site was inspected on 23 February, 2021. There is a level crossing at chainage 580200 at Sladen Street.</p> <p>Opposite the current train platform there is an old wooden platform with a metal shed on top, these structures are not in good condition with much of the wooden platform rotted away. Behind the station on the eastern side of the enhancement site there is Henty Bicentennial Park. This park contains a small playground, a BBQ area with seating and the Headie Taylor Header Museum. The park is irrigated with reclaimed sewage.</p> <p>There is a small toilet block in the park near to chainage 580600. Within the station itself there is a book shop and a craft shop run out of what was previously a waiting room for the railway. The store attendant explained to WSP that her and her colleagues tend to the cleaning of the station.</p> | <p>A number of rusted emptied metal drums are strewn around the old platform structure. At the northern end of the enhancement site adjacent to the silos at chainage 580200 there are a number of stockpiles of soil and ballast. On the western boundary at chainage 580100 a trench has been dug, near to the silos. As a result, there are a number of small soil stockpiles along this trench. Extra rails and sleepers are also strewn around this site. Six containers of Penetrol, a wetting agent, were observed amongst the additional rails.</p>       |
| Yerong Creek Yard clearances | <p>The enhancement site was inspected on 23 February, 2021. There is a level cross at chainage 56300 at Plunkett Street. Between chainages 565500 and 565800 there was nothing but cleared land adjacent to the rail. At the very south of the enhancement site, at chainage 56580 a large amount of Paddy Melon plants were observed, therefore it is possible that this area is treated with herbicide.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Several small ballast stockpiles were observed around the chainage 565400 point as well as piles of old rails. At chainage 565200 there was a large fenced off area inside which was a significant amount of dumped materials, in particular switchboards and other electronics from signal boxes as well as other metal objects such as ladders and pipes. At chainage 564900 there are Grain Corp silos, around these silos and the adjacent warehouse at chainage 564600 there was more dumped material including, metal drums, tires and other debris.</p> |

| ENHANCEMENT SITE         | DESCRIPTION OF THE LAYOUT AND USE OF ENHANCEMENT SITE AND SURROUNDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IDENTIFIED RISKS OR POTENTIAL FOR CONTAMINATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Rock Yard clearances | The enhancement site was inspected on 23 February, 2021. There is a level crossing at chainage 550200 and the station is just south of that at 550300. Around the station there is a large amount of cleared land with a gravel road that connects Urana Street to the grain silos at chainage 550600. West of chainage 550800 there was a large cement platform. There is a large dam to the west of chainage 551000, the sides of which have been built up with what looks to be natural soils. There are four over-track signal structures. | Opposite The Rock station a significant amount of potential ACM fragments were observed on the enhancement site surface, within this area there was ballast, glass and pieces of metal also strewn about. To the west of the grain silos at chainage 550600 there is a roofed walkway structure that runs parallel to the corridor, there is a pile of rusted metal drums (approximately 50). Surrounding these drums at chainage 550700, there are piles of broken wooden sleepers, concrete blocks and old tires as well as rusted pieces of rail. A small cylindrical structure with a domed roof was observed at chainage 551000, this structure was constructed from suspected ACM and has a few holes in the side where fibres were exposed. |

#### 4.4.3 RESULTS OF CONTAMINATION INVESTIGATIONS COMPLETED FOR THE PROPOSAL WITHIN THE GREATER HUME – LOCKHART PRECINCT

The results of soil and groundwater investigations completed for the proposal (Coffey, 2018a and Coffey, 2018b) is summarised below:

- One soil bore was drilled in Culcairn (outside of the enhancement site) and one bore was at drilled at The Rock (outside of the enhancement site).
- ASS field tests and analysis for TRH, BTEX, PAH, OCP, OPP and asbestos was undertaken in both bores.
- The analytical results were not compared to any screening criteria.
- Concentrations of TRH, BTEX, PAHs, OCP and OPPs were reported below the LOR. Concentrations of metals were above LORs but below NEPM 2013 guidelines for protection of human health for commercial/industrial use.
- No asbestos was detected.
- Chromium suite results were below LORs.

#### 4.4.4 ARTC CONTAMINATED LAND RECORDS AND PREVIOUS REPORTS

The ARTC contaminated land records cover the following sites located to the south of the enhancement site:

- Culcairn – Former Gang Shed (SES Headquarters) Priority rating: 3: active exposure risk or legislative issue that should be investigated and potentially requires management.
- Culcairn – Service Station Fertiliser Storage Priority rating: 1: suitable for use in a commercial/industrial land use setting.

The locations of the areas covered by the ARTC contaminated land records is presented on Figure 4 in Appendix A-4.

#### 4.4.4.1 CULCAIRN – FORMER GANG SHED (SES HEADQUARTERS)

WSP were provided with three reports relating to the former gang shed which is now used as the Culcairn Men's shed which is located approximately 300 metres south of the enhancement site at Culcairn. Although this site is noted located within the enhancement site the reports were reviewed as the site has a Priority rating 3:

- CMPS&F (1996), *Preliminary environmental review, SR38A Culcairn*;
- ESP (2014), *ARTC NSW asbestos register*; and
- McMahon Services (2019), *Asbestos register/management plan*.

CMPS&F (1996) stated that the site was formerly used as a rail gang shed and the SES storage building and base. Rail activities may have included storage of fuel, oil, chemicals or herbicides. It was recommended an intrusive assessment be undertaken.

ESP (2014) identified an asbestos backing board and some internal asbestos at the site. It was noted that the site was used as a men's shed. McMahon Services (2019) additionally identified interior walls, ceilings and shower partitions to comprise asbestos material.

#### 4.4.5 SUMMARY OF CONTAMINATION RISKS IDENTIFIED WITHIN GREATER HUME – LOCKHART PRECINCT

Risks identified in the Greater Hume Precinct comprise:

- The probability of occurrence of inland ASS is considered to be low.
- Culcairn pedestrian bridge and Culcairn Yard clearances have a “Low” land salinity hazard but the groundwater and streams have a high salinity load making the overall salinity hazard “Very High” (AEC 12). Excavation associated with realignment of the track and new signals at Culcairn pedestrian bridge and excavation associated with the bridge removal at Culcairn Yard will need to avoid causing groundwater flows to be impeded at these sites as that could cause salts to be brought nearer the surface.
- Searches of regulatory databases did not identify any sites requiring further consideration.
- Dumped waste materials and ballast stockpiles at AEC 13, AEC 14, AEC 17, AEC21, AEC 22, AEC 24, AEC 26, AEC 27 and AEC 28 may present a risk to construction workers when working in the vicinity of the hazardous material.
- Metal drums observed to have been discarded in the enhancement site near an old platform structure (AEC 18) and containers of chemicals (Penetrol) observed to have been discarded at (AEC 16) may present a risk to construction workers when working in the vicinity of the drums if they still contain chemicals. There is a low potential risk of groundwater contamination from these drums as no staining or leaking was observed.
- Henty RFS is located to the east of the enhancement site (AEC 19), Yerong Creek RFS (AEC 24) is located to the west of the enhancement site and The Rock RFS (AEC 25) is located to the west of the enhancement site. Information provided by RFS on 19 and 21 October 2021 states that a number of years ago audits were undertaken on all RFS stations regarding the use of firefighting foams that contain PFAS. They advised that, to the best of their knowledge, no firefighting foams that contained PFAS were used at any of the RFS stations.
- The service station (AEC 20).
- Potential ACM in a structure observed at The Rock (AEC 28) may present a risk to construction workers when working in the vicinity of the hazardous material.
- Geotechnical and contamination reports prepared for the proposal have not identified contamination potentially requiring management relevant to the precinct.

- Historical contamination reports were reviewed for one site. The likelihood of asbestos, hydrocarbons, metals and pesticides being present at the Culcairn men's shed (AEC 15) is considered to be low as the site is no longer used as a gang shed. The information provided by RFS on 19 October 2021 also advised that, to the best of their knowledge, no firefighting foams that contained PFAS were used at the former Gang Shed (SES Headquarters and now the Culcairn men's shed).

## 4.5 CONTAMINATION – WAGGA WAGGA PRECINCT

### 4.5.1 REGULATORY DATABASE SEARCHES AND SUMMARY OF SITE HISTORY

A search of applicable regulatory databases and review of historical aerial photographs was undertaken and is presented in Table 4.14 to Table 4.17 below.

Table 4.14 Results of regulatory database and summary of review site history – Uranquinty Yard clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that the enhancement site was not on record or other properties within two kilometres of the enhancement site.                                                                                                                       |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.<br><br>No sites have been notified to the NSW EPA under Section 60 of the CLM Act within two kilometres of the enhancement site. |
| Unexploded ordinances                 | For an area with a two kilometres radius around this enhancement site, no unexploded ordinance information was found.                                                                                                                                                                                  |
| Summary of aerial imagery             | The rail corridor was visible orientated north-east to south-west with low density buildings surrounding the corridor in the 1960 aerial photograph. The adjoining section of site orientated north-west to south-east was visible as a roadway and surrounded by agricultural land.                   |

Table 4.15 Results of regulatory database and summary of review site history – Pearson Street bridge

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that the enhancement site was not on record. Kurrajong Recyclers is located approximately 800 metres north-east of the enhancement site, it is registered for recovery of general waste.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| EPA contaminated sites registers      | Online searches of the NSW EPA POEO Act public register indicated that no notices were on record for the enhancement site, however there was one property within two kilometres of the enhancement site that were listed:<br><br>A former gasworks, 54 Chaston Street, is located 140 metres north of the enhancement site. The gasworks has one current and two former notices. Wagga Wagga City Council was issued with an Agreed Voluntary Remediation Proposal in 2003 and a Notice for Maintaining Remediation in 2007. Kurrajong Waratah was issued with a Notice for Maintaining Remediation in 2008 (current).<br><br>No additional sites have been notified to the NSW EPA under Section 60 of the CLM Act within two kilometres of the enhancement site. |

| DATABASE SEARCH           | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unexploded ordinances     | Three kilometres west of the enhancement site is '30 Kapooka'. The site has a UXO category of other. This site was used for engineer demolition training during WWII.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Summary of aerial imagery | <p>Pearson Street bridge was visible in the 1971 aerial photograph. The eastern portion of Pearson Street was undeveloped. The council depot has been developed but the clarity was too poor to see any detail; there appears to be an oval immediately adjacent to the enhancement site. The Wagga show camp ground site has been developed and was visually consistent with the current site use. The enhancement site remained largely unchanged in the 1980 aerial photograph.</p> <p>The 1997 aerial photograph showed construction of commercial properties had taken place to the east of Pearson Street. The enhancement site to the south-east of Pearson Street bridge remained undeveloped. Further development had taken place on the Council Depot site and a warehouse building and possible storage were visible on site.</p> |

Table 4.16 Results of regulatory database and summary of review site history – Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that the ARTC holds an EPL 3142 to operate the rail corridor. A council water filtration plant is located 1 kilometres to the east of the Wagga Wagga Yard clearances enhancement site. It is registered to undertake miscellaneous licensed discharge to waters (at any time). Discharged waters comprise treated effluent, stormwater and groundwater seepage. Riverina Fresh Pty Ltd is located 370 metres to the east of the Wagga Wagga Yard clearances enhancement site, it is registered for dairy processing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| EPA contaminated sites registers      | <p>Online searches of the NSW EPA POEO Act public register indicated that no licenses or notices were on record for the enhancement sites, however there were three properties within two kilometres of the enhancement sites that were listed:</p> <p>A former dry-cleaning facility, 183 Fitzmaurice Street, is located 1,800 metres north of Edmondson Street bridge enhancement site. This facility has two current notices. The site was declared significantly contaminated in 2018 (current) and Knights Meats were issued with a Management Order in 2019.</p> <p>The former gasworks described in Table 4.15 is located 1.8 kilometres west of Edmondson Street bridge.</p> <p>A former gasworks, corner of Tarcutta Street and Cross Street, is located 1,300 metres north north-east of Edmondson Street bridge. The site has two current and one former notice. The Council of the City of Wagga Wagga was issued with a Site Audit Statement in 2015 and the site was declared as a Remediation Site in 2007 (current) and the City of Wagga Wagga was issued with an Approved Voluntary Management Proposal in 2013 (current).</p> <p>No additional sites have been notified to the NSW EPA under Section 60 of the CLM Act within two kilometres of the enhancement site.</p> |
| Unexploded ordinances                 | No unexploded ordinance information found within a two kilometres radius of the enhancement site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| DATABASE SEARCH           | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Summary of aerial imagery | Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances were visible in the 1966 aerial photograph. Buildings had been constructed to the north of the rail corridor in Wagga Wagga precinct. The portion of the enhancement site to the east was not visible on the aerial photograph. The 1971 aerial photograph showed the Wagga Wagga precinct was largely unchanged. Low density residential properties were located at Cassidy Parade and the lot on the opposite side of the rail corridors was undeveloped. The enhancement site remained largely unchanged in the 1980 aerial photograph with the exception that the lot on the opposite side of the rail corridor to Cassidy Parade had been developed in a configuration consistent with the current layout. The enhancement site remained largely unchanged in the 1990 aerial photograph and to the most recent 2020 aerial photograph. |

Table 4.17 Results of regulatory database and summary of review site history – Bomen Yard clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that the enhancement site was not on record. H.J. Heiz company is located 700 metres to the west of the enhancement site. It is registered for livestock processing. Teys Australia Wagga Wagga is located 150 metres to the west of the enhancement site. It is registered for general animal products production, rendering or fat extraction, slaughtering or processing animals. BOC Limited is located 60 metres from the enhancement site, it is registered for dangerous goods production, general chemical storage and waste storage of hazardous, restricted solid, liquid, clinical and related waste and asbestos waste. A sewage treatment facility owned by Wagga Wagga City Council is located 1200 metres to the west of the enhancement site. The facility is registered for Sewage treatment processing by small plants. |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.<br><br>The Enirgi Power Storage Recycling facility located approximately 1.6 kilometres north-east of the enhancement site is under assessment by the NSW EPA under Section 60 of the CLM Act.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Unexploded ordinances                 | For an area with a two kilometres radius around this enhancement site, no unexploded ordinance information was found.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Summary of aerial imagery             | The rail corridor was visible in the 1966 aerial photograph. The commercial area on Bomen Road to the west of the enhancement site had been constructed. The surrounding land comprised agricultural land. The enhancement site remained largely unchanged in the 1971 aerial photograph. The 1990 aerial photograph showed the commercial/industrial area to the north-west of Bomen station had started to become developed and the Prixcar services warehouse was located to the south-east of the enhancement site. The enhancement site and surrounding area were largely unchanged in the 1995 and 1998 aerial photographs. The 2018 aerial photograph showed the commercial/industrial area was visibly consistent with the current layout.                                                                                                                                                          |



## 4.5.2 RESULTS OF THE ENHANCEMENT SITE WALKOVER

A walkover of key areas of the enhancement site was undertaken and the observations are presented below. AECs are presented in Figure 5 in Appendix A-5. Site photographs are presented in Appendix C.

Table 4.18 Key observations of the walkover – Wagga Wagga precinct

| ENHANCEMENT SITE                                                                                                                    | DESCRIPTION OF THE LAYOUT AND USE OF ENHANCEMENT SITE AND SURROUNDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | IDENTIFIED RISKS OR POTENTIAL FOR CONTAMINATION                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Uranquinty Yard clearances                                                                                                          | The enhancement site was inspected on 23 February, 2021. There is a level crossing at Yarragundry Street, at chainage 535600. Further south at chainage 535700 is the station, grain silos are located at chainage 535900. Behind the station on the eastern boundary is a park. This park has a playground, seating and BBQ areas and a public bathroom.                                                                                                                                                                                                                                                                                                                                                                                                            | Around the silos there was dumped material including rusted metal drums. Several large stockpiles were observed at chainage 535600, and 535200. Inside the park there is a recreational vehicle grey and black water disposal dump point. Opposite the silos on the eastern boundary is the Uranquinty RFS station and across the road is a Caltex service station.         |
| Pearson Street bridge                                                                                                               | The enhancement site was inspected on 23 February, 2021. Between chainage 52300 and 523400 the enhancement site is a narrow corridor with a single line of track, along the western boundary of the enhancement site are a number of warehouses and yards that store various machinery. On the day of the inspection there were workers repairing the walls of the corridor, the walls had recently collapsed. Near to their work were several stockpiles of soil. Inside the stockpiles were a number of anthropogenic material including tires and bricks. On the southern end of the bridge between 523600 and 523900 the corridor widened out. On the eastern boundary at chainage 523600 there is a concrete culvert on the other side there is a wetland area. | Along the corridor between 523400 and 523200 there is scrap metal and other material along the fence. A fragment of potential ACM was observed beneath the bridge. Evidence of anthropogenic material within freshly unearthed material indicates a larger amount of fill surrounding the corridor. Inside the culvert there is evidence of a fire place and other rubbish. |
| Cassidy Parade pedestrian bridge<br>Edmondson Street bridge<br>Wagga Wagga Station pedestrian bridge<br>Wagga Wagga Yard clearances | The enhancement site was inspected on 23 February, 2021. The station and a pedestrian bridge are located at chainage 521200. ARTC offices and storage yards are located north east of the station at chainage 521000. There are several rail lines that feed into the station precinct. The sidings become narrow south of 521500. Opposite the station there is a laydown area where excess rail track and rail ballast stockpiles are stored. To the east of the station the rail corridor widens to allow for a number of rail tracks and sidings. To the east the track narrows to a single track. This area has been cut away and has high walls of soil on either side of the corridor.                                                                        | One fragment of potential ACM was observed on the enhancement site surface near to a skip bin to the north of the station. No other observable potential contaminating sources were present.                                                                                                                                                                                |

| ENHANCEMENT SITE      | DESCRIPTION OF THE LAYOUT AND USE OF ENHANCEMENT SITE AND SURROUNDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | IDENTIFIED RISKS OR POTENTIAL FOR CONTAMINATION                                                                                                                                                                                                                                        |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bomen Yard clearances | <p>The enhancement site was inspected on 24 February, 2021. At the time of the inspection there was a cargo train being loaded at chainage 513900, the level crossing at chainage 513600 was closed as a result of this. The station building at chainage 513800 was in moderate condition, however there was a lot of grass growing in the concrete. A number stockpiles of ballast were observed near to the station, and at chainage 513900. Where the train was being loaded between chainage 514200 and 513900 there were a number of large shipping containers and cranes.</p> <p>Adjacent to chainage 514200 and 514600 is a meatworks. The main carpark of which borders the western boundary of the enhancement site. Next to chainage 514500 there is a small paddock that houses the cattle before they are processed.</p> | On the eastern boundary at chainage 514000 there are some piles of abandoned drums and other rail equipment. At the time of inspection, workers arrived to conduct herbicide spraying around the station, they also mentioned they were heading to Harefield station later in the day. |

#### 4.5.3 RESULTS OF CONTAMINATION INVESTIGATIONS COMPLETED FOR THE PROPOSAL

The results of soil and groundwater investigations completed for the proposal (Coffey, 2018a and Coffey, 2018b) is summarised below:

- Two soil bores were drilled at Pearson Street bridge, one soil bore was drilled at Brookong Avenue pedestrian bridge, two bores were drilled at Edmondson Street bridge, one bore was drilled at Wagga Wagga Station pedestrian bridge and three bores were drilled at Kemp Street bridge.
- ASS field tests were undertaken at Pearson Street bridge and Edmondson Street bridge sites. Analysis for TRH, BTEX, PAH, OCP, OPP and asbestos was undertaken in all bores. An extended suite of VOC analysis was undertaken in samples collected from Wagga Wagga Station pedestrian bridge and Kemp Street bridge.
- The analytical results were not compared to any screening criteria.
- Concentrations of BTEX, OCP and OPPs were reported below the LOR. Concentrations of TRH, PAHs and metals were above LORs but below NEPM 2013 guidelines for protection of human health for commercial/industrial use.
- No asbestos was detected.
- Chromium suite results were below LORs.
- Concentrations of lead at Edmondson Street and Kemp Street over bridges and benzo(a)pyrene at Edmondson Street were reported above the CT1 threshold for general solid waste but undertaking toxicity characteristic leaching procedure (TCLP) analysis may refine this classification.
- The monitoring well was installed to a depth of 5.98mBGL and groundwater was gauged at a depth of 1.41mBGL. Samples were analysed for inorganic nutrients and metals.

#### 4.5.4 ARTC RECORDS AND PREVIOUS REPORTS UNDERTAKEN WITH IN THE WAGGA WAGGA PRECINCT

The ARTC contaminated land records cover one site located within and immediately to the north of the Wagga Precinct enhancement site in the vicinity of the Edmondson Street bridge: Wagga Wagga – Railway Precinct, Priority rating: 3. Active exposure risk or legislative issue that should be investigated and potentially requires management.

The areas covered by the ARTC contaminated land records is presented on Figure 4 in Appendix A-4.

##### 4.5.4.1 EDMONDSON STREET BRIDGE

WSP were provided with five historical reports relating to the area between Edmondson Street bridge and the Wagga Wagga Station pedestrian bridge.

*SKM, 1999A, PRELIMINARY CONTAMINATION ASSESSMENT; AND SKM, 1999B, OPTIONS REPORT.*

SKM undertook the options report (1999b) following a preliminary contamination summary (1999a) for an area of rail sidings identified as S1 (identified as AEC 36). WSP note that the majority of this lot does not form part of the current enhancement site. The works document in SKM (1999a) comprised submission of 35 soil samples laboratory analysis of TRH, BTEX, PAHs, OCPs, herbicides, heavy metals and polychlorinated biphenyls (PCBs). Three wells installed to a depth of 8–10mBGL were dry and one groundwater sample was collected from a well installed to a depth of 4.5mBGL. This sample was analysed but the analytes were not provided. All contaminants of concern were reported below the adopted assessment criteria for commercial/industrial use with the exception of arsenic at one surface location. SKM (1999b) report stated that the arsenic hotspot required delineation and further assessment before the site is suitable for commercial/industrial use.

*RAIL INFRASTRUCTURE CORPORATION, 2002, INITIAL ENVIRONMENTAL ASSESSMENT, WAGGA WAGGA (LOT S2).*

The assessment was undertaken at lot S2 (identified as AEC 37) to identify any previous or currently contaminating activities at the site and address the need for further assessment to make the site suitable for sale or lease. The lot was located at the corner of Edmondson Street and Railway Street. The lot was noted to house numerous iron sheds, brick offices and garages. The 1893 historical plans noted that four dwellings were located on the lot. Rubbish comprising gas cylinders, grease and drums, transformers, rail components and battery acid containers were noted at the site. The report concluded that no significant environmental risks were identified but the waste on site should be removed prior to sale or lease.

*RAIL INFRASTRUCTURE CORPORATION, 2002, INITIAL ENVIRONMENTAL ASSESSMENT, WAGGA WAGGA (LOT 3).*

The assessment was undertaken at the former Station Masters residence to identify any previous or currently contaminating activities at the site and address the need for further assessment to make the site suitable for sale or lease. No evidence of contamination was noted during the assessment. The report concluded that no significant environmental risks were identified but the site possessed heritage significance.

*CAVVANBA, 2019, CONTAMINATION SUMMARY REPORT.*

The report presented the site history review of two parcels of land being S1; the former District Engineers Office, workshop and branch depot (which does not form part of the site) and S2: the north portion of Main South Railway and a former gang shed (which does comprise a portion of the site). The site summary documented a UST and one further potential UST, and firefighting storage tanks at site S1 which was formerly used as a fuel store. Area S2 was also used for a mechanics workshop and herbicide storage. Site S2 comprised a former gang shed, welders shed, laundry, toilet, communications depot and store. The area was used for storage at the time of assessment. Cavanba reported that this portion of the site formerly had residential dwellings that were demolished between 1984 and 1997. Cavanba (2019) summarised the findings of SKM (1999a) and noted that the building structures were likely to contain asbestos but the report did not note the locations of these buildings.

The report notes no assessment has been undertaken to assess the presence of PFAS and no intrusive assessment has been undertaken on area S2. The report notes that USTs may be present in area S1 but this does not comprise part of the site.

#### 4.5.4.2 URANQUINTY YARD CLEARANCES

WSP were provided with one historical report for the Uranquinty Yard clearances area. This area is noted as AEC 31 and the report is summarised below.

*EGIS (2002), PRELIMINARY SITE INVESTIGATION, OLYMPIC HIGHWAY URANQUINTY NSW.*

A desktop assessment and soil sampling of six boreholes was undertaken at the site which was owned by SRA and also housed an RFS building. No hydrocarbon, pesticide or metals concentrations were reported above the adopted assessment criteria for human health receptors and Egis (2002) concluded the site was suitable for continued commercial use. WSP note that no PFAS analysis was undertaken at the site.

#### 4.5.5 PREVIOUS REPORTS OUTSIDE OF THE PROPOSAL SITE

The Department of Defence has undertaken assessments at the Blamey Barracks (Kapooka) as part of the PFAS Investigation Management Program. Jacobs (2021) *PFAS management area plan (PMAP)* indicates that there were several sources of PFAS contamination on the base. PFAS at the base was transported by surface water run off which has impacted Kapooka Creek to the west of the rail alignment. Surface water transport is controlled by a north south ridge line that runs through the centre of the base and water flow sheds to the east and west of this ridge line. Some transport of PFAS contamination has also been transported by groundwater although Jacobs (2021) state this is not a major transport pathway. The Base's PMAP outlines potential management options to address risks presented in a human health and ecological risk assessment. The extent of PFAS impact has not been delineated, and Jacobs (2021) identified potential off site pathways and receptors.

#### 4.5.6 SUMMARY OF CONTAMINATION RISKS IDENTIFIED WITHIN WAGGA PRECINCT

Risks identified at the Wagga Wagga precinct comprise:

- The probability of occurrence of inland ASS is considered to be low.
- Moderate land salinity hazard at Uranquinty Yard clearances, Pearson Street bridge and Bomen Yard clearances. Excavation associated with track realignment is proposed at Uranquinty Yard clearances and Bomen Yard clearances and more extensive excavation associated with track lowering is proposed at Pearson Street bridge so there is a potential risk of encountering saline soil.
- Searches of regulatory databases did not identify any sites requiring further consideration. The Enirgi Power Storage Recycling facility under consideration by the NSW EPA is considered to be a low risk due to the distance from the enhancement site.
- The Uranquinty RFS building was noted at AEC 30 within the ARTC leased area. A historical site assessment has been undertaken at this property but no PFAS analysis was undertaken. Information provided by RFS on 19 October 2021 states that a number of years ago audits were undertaken on all RFS stations regarding the use of firefighting foams that contain PFAS. They advised that, to the best of their knowledge, no firefighting foams that contained PFAS were used at Uranquinty RFS.
- The service station (AEC 31) is considered to present a low risk as it is located outside of the enhancement site.
- Potential ACM was observed on the enhancement site surface under Pearson Street bridge (AEC 33). Where the fill in this location had been excavated for trenching works, it was also observed to contain anthropogenic material. ACM should not present a risk to human health receptors during the track lowering works at this enhancement site if the ACM is removed prior to works and correct construction practices are followed. ACM was also identified at proposed laydown area within Wagga Wagga Station site (AEC35). This is not likely to present a risk to human health receptors if it is removed prior to works commencing.

- Neither Wagga Wagga show ground (AEC 32) nor the Council Depot (AEC 34) were accessible to inspect and may contain chemical storage for maintenance of the grounds and machinery or fuel stores. Both of these areas are proposed laydown areas and so there is low risk to human health receptors. Groundwater is a potential receptor if bulk fuel and chemical storage is present.
- Herbicides were observed to be in use around the Bomen station building (AEC 38) where excavation for track realignment and drainage will take place. Use of herbicides is not likely to present a risk to human health receptors if correct construction practices are used. The risk to groundwater from use of herbicides is considered to be low.
- Ballast stockpiles were observed at AEC 39 which may present a risk to construction workers when working in the vicinity of the stockpiles.
- Geotechnical and contamination reports prepared for the proposal have not identified contamination potentially requiring management relevant to the precinct.
- Historical contamination reports for the Edmondson Street bridge and Wagga Wagga Station pedestrian bridge enhancement sites identified potential USTs which were reported by SKM (1999a) outside and to the north of the enhancement site (AEC 36) and gas cylinders, grease and drums, transformers, rail components, battery acid and ACM in buildings was reported by SKM (1999b) within the proposal area at AEC 37. Cavvanba (2019) undertook a review of these reports and also noted the potential for historical use of PFAS at AEC 36. No sampling or other work has been undertaken to confirm the presence or absence of PFAS use at this site. There is a potential risk to groundwater receptors if PFAS was historically used at this site.
- There is the potential for PFAS contamination to have migrated from Blaney Barracks towards the east to the enhancement site, however, the closest enhancement site (Uranquinty Yard clearances) are located approximately five kilometres to the south of Blaney Barracks so the risk is considered to be low.

## 4.6 CONTAMINATION – JUNE Precinct

### 4.6.1 REGULATORY DATABASE SEARCHES AND SUMMARY OF SITE HISTORY

A search of applicable regulatory databases and review of historical aerial photographs was undertaken and is presented in Table 4.19 to Table 4.23 below.

Table 4.19 Results of regulatory database and summary of review site history – Harefield Yard clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that the enhancement site was not on record or other properties within two kilometres of the enhancement site.                                                                                                                                                     |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.<br><br>No sites have been notified to the NSW EPA under Section 60 of the CLM Act within two kilometres of the enhancement site.                               |
| Unexploded ordnances                  | For an area with a two kilometres radius around this enhancement site, no unexploded ordnance information was found.                                                                                                                                                                                                                 |
| Summary of aerial imagery             | The rail corridor was visible in its current location in 1961 aerial photograph. Some development had taken place to the south of the enhancement site and a dam was visible. The enhancement site was surrounded by agricultural land. The enhancement site and surrounds remained largely unchanged in the 1979 aerial photograph. |

Table 4.20 Results of regulatory database and summary of review site history – Kemp Street bridge and Junee Yard clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that the enhancement site was not on record or other properties within two kilometres of the enhancement site.                                                                                                                                                                                                        |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres. The Junee – Former Roundhouse Rail Depot facility located approximately 980 metres south of the enhancement site is under assessment by the NSW EPA under Section 60 of the CLM Act.                              |
| Unexploded ordinances                 | No unexploded ordinance information found within a two kilometres radius of the enhancement site.                                                                                                                                                                                                                                                                                       |
| Summary of aerial imagery             | The rail corridor and Kemp Street bridge were visible in their current location in 1961 aerial photograph. The area surrounding the enhancement site was developed with low density residential properties visually consistent with the current surrounding land use. The enhancement site and surrounding area remain largely unchanged in the 1987, 1994 and 2015 aerial photographs. |

Table 4.21 Results of regulatory database and summary of review site history – Junee Station pedestrian bridge

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that the enhancement site was not on record or other properties within two kilometres of the enhancement site.                                                                                                                                                                              |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.                                                                                                                                                                                         |
| Unexploded ordinances                 | No unexploded ordinance information found within a two kilometres radius of the enhancement site.                                                                                                                                                                                                                                                             |
| Summary of aerial imagery             | The rail corridor was visible in its current location in 1961 aerial photograph. The area surrounding the enhancement site was developed with low density residential properties visually consistent with the current surrounding land use. The enhancement site and surrounding area remain largely unchanged in the 1987, 1994 and 2015 aerial photographs. |

Table 4.22 Results of regulatory database and summary of review site history – Olympic Highway underbridge

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that the enhancement site was not on record or other properties within two kilometres of the enhancement site.                                                                                                                                                                              |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres.                                                                                                                                                                                         |
| Unexploded ordinances                 | No unexploded ordinance information found within a two kilometres radius of the enhancement site.                                                                                                                                                                                                                                                             |
| Summary of aerial imagery             | The rail corridor was visible in its current location in 1961 aerial photograph. The area surrounding the enhancement site was developed with low density residential properties visually consistent with the current surrounding land use. The enhancement site and surrounding area remain largely unchanged in the 1987, 1994 and 2015 aerial photographs. |



Table 4.23 Results of regulatory database and summary of review site history – Junee to Illabo clearances

| DATABASE SEARCH                       | RESULTS                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPA environmental protection licenses | Online searches of the NSW EPA POEO Act public register indicated that the enhancement site was not on record or other properties within two kilometres of the enhancement site.                                                                                                                                                                              |
| EPA contaminated sites registers      | Online searches of the NSW EPA contaminated land record database indicated that no notices were on record for the enhancement site or any site within two kilometres. No sites have been notified to the NSW EPA under Section 60 of the CLM Act within two kilometres of the enhancement site.                                                               |
| Unexploded ordinances                 | No unexploded ordinance information found within a two kilometres radius of the enhancement site.                                                                                                                                                                                                                                                             |
| Summary of aerial imagery             | The rail corridor was visible in its current location in 1961 aerial photograph. The area surrounding the enhancement site was developed with low density residential properties visually consistent with the current surrounding land use. The enhancement site and surrounding area remain largely unchanged in the 1987, 1994 and 2015 aerial photographs. |

#### 4.6.2 RESULTS OF THE ENHANCEMENT SITE WALKOVER

A walkover of key areas of the enhancement site was undertaken and the observations are presented in Table 4.24 below. AECs are presented on Figure 5 in Appendix A-5. Site photographs are presented in Appendix C.

Table 4.24 Key observations of the walkover – Junee precinct

| SITE ID                                      | DESCRIPTION OF THE ENHANCEMENT SITE LAYOUT AND USE                                                                                                                                                                                                                                                                                                                                                                                                                              | IDENTIFIED RISKS OR POTENTIAL FOR CONTAMINATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Harefield Yard clearances                    | The enhancement site was inspected on 24 February, 2021. Between chainage 497600 and 498200 there is a grain process facility that was inaccessible. A silo is located at chainage 497800. Outside of this grain processing area the track is in good condition and is flanked by cleared areas.                                                                                                                                                                                | At the north of the enhancement site several stockpiles of ballast were observed along the corridor. At chainage 497900 on the western boundary one fragment of potential ACM was observed on the enhancement site surface, in this area glass, ceramic, ballast and plastic were also observed on the surface.                                                                                                                                                                                                                                                                                                              |
| Kemp Street bridge and Junee Yard clearances | The enhancement site was inspected on 24 February, 2021. At the southern end of the enhancement site up to the bridge at 486200 there is nothing but three lines of rail. Between chainage 586200 and 486000 the enhancement site widens up and there are large trees, railway cottages and cleared areas for storage of vehicles and equipment. A well maintained park is located to the west of chainage 486200 and there are a number of residential properties to the east. | Within the cleared area at chainage 486100 there is significant dumped material. This includes drums, rails, sleepers and scrap metal. The railway cottages are in poor condition with walls and windows damaged. There were significant ACM fragments around these buildings. One pile has been attempted to be cordoned off, but the warning tape had torn and the ACM fragments are not covered. Inside these buildings equipment has been abandoned, including old fridges, heaters and water tanks. Closer to the bridge on the eastern side there are stockpiles of ballast and a large amount of dumped wooden beams. |



| SITE ID                        | DESCRIPTION OF THE ENHANCEMENT SITE LAYOUT AND USE                                                                                                                                                                                                                                                                                                                                                           | IDENTIFIED RISKS OR POTENTIAL FOR CONTAMINATION                                                                                                                                                                                                                                                    |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| June Station pedestrian bridge | The enhancement site was inspected on 24 February, 2021. Opposite the station, located at 485700, there is a large cleared area beside the corridor. This area has a few stockpiles of ballast and pieces of rail.                                                                                                                                                                                           | Around a tree on the western side of chainage 485600 there are very large piles of broken wooden sleepers, rusted metal rails, concrete blocks, and metal drums (off site). Across the road from the enhancement site on the western boundary at chainage 485700 there is a Mobil service station. |
| Olympic Highway underbridge    | The enhancement site was inspected on 24 February, 2021. Between chainage 485200 and 484600 the corridor is bordered by residential properties on the western boundary. Further north, between chainage 484600 and 484300 there is a park, with cleared grass land and some trees. Between 484000 and 483400 the corridor is bordered by bush and agricultural land, separating it from the Olympic Highway. | At chainage 484200 on the western boundary there is a service station, which had metal drums stored at its rear (track side) labelled as cooking oil. Some dumped rail material was observed near to chainage 483800 and 484500.                                                                   |
| June to Illabo clearances      | The enhancement site was inspected on 24 February, 2021. Illabo station is located at chainage 468700 and Marinna Station is located at chainage 478000. At each station there were silos. Apart from these stations, the majority of the enhancement site was limited to rail corridor with no significant infrastructure identified.                                                                       | Around Illabo station there were several stockpiles of ballast. Across the road on the western boundary there is a public school, a rest area, a pub and an RFS building. Stockpiles of ballast were observed near to chainage 472700 as well as around Marinna station.                           |

#### 4.6.3 RESULTS OF CONTAMINATION INVESTIGATIONS COMPLETED FOR THE PROPOSAL

The results of soil and groundwater investigations completed for the proposal (Coffey, 2018a and Coffey, 2018b) is summarised below:

- Five soil bores were drilled at Kemp Street bridge (within the enhancement site).
- ASS field tests and analysis for TRH, BTEX, PAH, OCP, OPP and asbestos was undertaken in all bores.
- The analytical results were not compared to any screening criteria.
- Concentrations of TRH, BTEX, PAHs, OCP and OPPs were reported below the LOR. Concentrations of metals were above LORs but below NEPM 2013 guidelines for protection of human health for commercial/industrial use.
- No asbestos was detected in samples collected.
- Chromium suite results were below LORs.

#### 4.6.4 ARTC RECORDS AND PREVIOUS REPORTS UNDERTAKEN WITHIN JUNEE PRECINCT

The areas covered by ARTC contaminated land records are presented in Figure 4 in Appendix A-4.

##### 4.6.4.1 JUNEE STATION PRECINCT

The ARTC contaminated land records cover one site located to the south of the enhancement site; Junee – Former Roundhouse Rail Depot, Priority rating: 3. Active exposure risk or legislative issue that should be investigated and potentially requires management.

WSP were provided with multiple reports for the former Roundhouse Rail Depot/Junee Railyards. However, this site is located within the rail corridor but not in the vicinity of any of the enhancement sites or proposal site. The closest enhancement site is Kemp Street bridge located approximately 980 metres north of the Roundhouse Rail depot and so this site is not considered likely to have an impact on the enhancement sites.

The ARTC contaminated land records cover one site located immediately to the south of the Junee Yard clearances enhancement site; Name: Junee – Tennis Courts Priority rating: 1: suitable for use in a commercial/industrial land use setting.

One historical memo was provided for Junee tennis courts. The memo indicated the site has historically been used as a tennis court and no further works to assess contamination are required.

The ARTC contaminated land records cover one site located to the north-west of the Olympic Highway underbridge enhancement; Name: Junee – Junction Street, Priority rating: 1: suitable for use in a commercial/industrial land use setting.

A desktop assessment and intrusive site assessment report were provided for Junee Junction Street. The most recent intrusive site assessment undertaken ERM (2006) *Phase II suite investigation report* indicated that concentrations of PAHs and metals were detected at concentrations above the adopted assessment criteria for residential and commercial/industrial use and asbestos was present in portions of the fill. No groundwater assessment was undertaken at the site. As this site is not located in close proximity to the enhancement site it is not considered likely to affect the proposed works.

#### 4.6.5 SUMMARY OF CONTAMINATION RISKS IDENTIFIED WITHIN JUNEE PRECINCT

Risks identified in the Junee Precinct comprise:

- The probability of occurrence of inland ASS is considered to be low.
- Moderate land salinity hazard at all enhancement sites. Excavation is proposed at all enhancement sites for either track realignment and/or bridge replacement with deeper excavation proposed for pier excavation at Kemp Street bridge which has a higher potential risk of encountering saline soil.
- Searches of regulatory databases did not identify any sites requiring further consideration. The Junee – Former Roundhouse Rail Depot under consideration by the NSW EPA is considered to be a low risk due to the distance from the enhancement site.
- Potential ACM observed on the enhancement site surface at Harefield yard clearances enhancement site (AEC 41), and within buildings in poor condition at Kemp Street bridge enhancement site (AEC 42). ACM should not present a risk to human health receptors during the track realignment works at this enhancement site if the ACM is removed prior to works and correct construction practices are followed.
- Stockpiles of ballast and metals drums and other waste were noted at AEC 43, AEC 44 and AEC 48 which may present a risk to construction workers when working in the vicinity of the stockpile.

- Herbicide use was known to have recently taken place at Harefield Yard clearances enhancement site (AEC 40). Use of herbicides is not likely to present a risk to human health receptors if correct construction practices are used. The risk to groundwater from use of herbicides is considered to be low.
- The Shell service station (AEC 46). This site presents a low risk to the enhancement site as it is not in the immediate vicinity of the enhancement site and contaminants unlikely to be present in significant quantities in soil or groundwater within the site.
- The Illabo RFS is located to the west of the enhancement site (AEC 47). The site presented a low risk to the enhancement site as concentrations at the enhancement site unlikely to exceed industrial health based levels but may have impacts on suitability for material reuse and disposal. Information provided by RFS on 19 October 2021 states that a number of years ago audits were undertaken on all RFS stations regarding the use of firefighting foams that contain PFAS. They advised that, to the best of their knowledge, no firefighting foams that contained PFAS were used at Illabo RFS.
- Geotechnical and contamination reports prepared for the proposal, and other historical contamination reports have not identified contamination potentially requiring management relevant to the precinct.

## 5 PRELIMINARY CONTAMINATION CONCEPTUAL SITE MODEL

Based on the enhancement site walkover and desktop review of the proposal and enhancement site setting and historical land use information, a preliminary contamination CSM has been prepared for the proposal site to provide a summary of how and where potential contaminants across the proposal site are expected to move and what impacts such movement may have.

This CSM has been developed without intrusive soil or groundwater chemical investigative data being collected from each of the enhancement sites to support assertions made from desktop searches and site inspections. Previous soil and groundwater data was reviewed but this data is generally not specific to the enhancement sites or the proposed enhancement work.

The CSM elements are summarised in the following sections, with a qualitative risk assessment presented in section 6.3.

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### 5.1 GENERAL CONTAMINATION RISK

The proposal is located within an industrial context, being an existing rail corridor, which will be considered to contain a general level of risk associated with contamination from historical development and activities associated with its operation. A range of sites can also be included within or adjacent to the rail corridor which will be considered to have associated contaminated risk, including agricultural land. Whilst these have been identified in discrete locations in some instances (refer to areas of potential environmental concern discussed in the following section), they will also be considered to have the potential to occur in other areas and thus a level of general contamination risk is present. These sources include:

- fill used in construction of the existing rail line, possible historical waste disposal along the proposal site
- weed suppression activities
- buildings potentially containing hazardous materials
- rail line ballast
- contamination from maintenance activities undertaken at sidings and near silos or other areas
- use of chemicals on agricultural land
- machinery storage and maintenance, refuelling and spray rig filling, agricultural sheds and silos.

These are assessed as a general contamination risk and whilst may be limited in area, are not assigned to discrete locations.

## 5.2 AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

A number of potential AECs were identified through completion of the assessment. These are summarised in Table 5.1 below and their location is presented on Figure 5 in Appendix A-5.

Table 5.1 Summary of Identified Potential AECs

| AEC NUMBER | MAP REFERENCE | DESCRIPTION                                                                                                         | ENHANCEMENT SITE(S)                                                                   |
|------------|---------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| AEC 1      | Map 1 of 16   | Structure with ACM sheeting. Murray River bridge also known to contain lead paint                                   | Murray River bridge                                                                   |
| AEC 2      | Map 1 of 16   | Dumped rubbish                                                                                                      | Murray River bridge                                                                   |
| AEC 3      | Map 1 of 16   | High probability of occurrence of inland ASS within Murray River sediment and lead paint on the Murray River bridge | Murray River bridge                                                                   |
| AEC 4      | Map 2 of 16   | Xpress Service Station, 616-624 Young Street, Albury                                                                | Albury Station pedestrian bridge<br>Albury Yard clearances<br>Riverina Highway bridge |
| AEC 5      | Map 2 of 16   | Drum storage                                                                                                        | Albury Station pedestrian bridge                                                      |
| AEC 6      | Map 2 of 16   | Old tanker carriage                                                                                                 | Albury Station pedestrian bridge<br>Albury Yard clearances                            |
| AEC 7      | Map 2 of 16   | Stockpiles of ballast along the corridor and one stockpile comprising demolition waste                              | Albury Yard clearances<br>Riverina Highway bridge                                     |
| AEC 8      | Map 2 of 16   | Former Mobil depot                                                                                                  | Albury Station pedestrian bridge<br>Albury Yard clearances                            |
| AEC 9      | Map 2 of 16   | Properties 1 to 6. Former properties with asbestos building materials, unknown storage, historical pesticide use    | Albury Station pedestrian bridge<br>Albury Yard clearances                            |
| AEC 10     | Map 2 of 16   | 514-526 Young Street/Site 5 and Site 4. Former Shell fuel depot                                                     | Albury Station pedestrian bridge<br>Albury Yard clearances<br>Riverina Highway bridge |
| AEC 11     | Map 3 of 16   | Ballast stockpiles                                                                                                  | Billy Hughes bridge                                                                   |
| AEC 12     | Map 4 of 16   | “Very High” salinity mapped as occurring in this area                                                               | Culcairn Yard clearances                                                              |
| AEC 13     | Map 4 of 16   | Dumping of materials including buildings waste, metals drums and spray cans                                         | Culcairn Yard clearances                                                              |
| AEC 14     | Map 4 of 16   | Ballast stockpiles                                                                                                  | Culcairn Yard clearances                                                              |
| AEC 15     | Map 4 of 16   | Former Gang Shed (SES Headquarters), now Culcairn men’s shed                                                        | Culcairn Yard clearances                                                              |

| AEC NUMBER | MAP REFERENCE | DESCRIPTION                                                                                                                                                                           | ENHANCEMENT SITE(S)                                                                             |
|------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| AEC 16     | Map 5 of 16   | Soil stockpiles, Chemical (Penetrol) storage and sleepers                                                                                                                             | Henty Yard clearances                                                                           |
| AEC 17     | Map 5 of 16   | Stockpiles of soil and ballast                                                                                                                                                        | Henty Yard clearances                                                                           |
| AEC 18     | Map 5 of 16   | Dumped metal drums                                                                                                                                                                    | Henty Yard clearances                                                                           |
| AEC 19     | Map 5 of 16   | Henty RFS                                                                                                                                                                             |                                                                                                 |
| AEC 20     | Map 5 of 16   | Shell Service station                                                                                                                                                                 |                                                                                                 |
| AEC 21     | Map 6 of 16   | Metals drums, tires and other debris stored (outside of site areas)                                                                                                                   | Yerong Creek Yard clearances                                                                    |
| AEC 22     | Map 6 of 16   | Storage of old electronic equipment including signal boxes, metal, pipes and ladders                                                                                                  |                                                                                                 |
| AEC 23     | Map 6 of 16   | Stockpiles of ballast and old rails                                                                                                                                                   |                                                                                                 |
| AEC 24     | Map 6 of 16   | Yerong Creek fire station                                                                                                                                                             |                                                                                                 |
| AEC 25     | Map 7 of 16   | The Rock RFS                                                                                                                                                                          | The Rock Yard clearances                                                                        |
| AEC 26     | Map 7 of 16   | Rusted metal drums, wooden sleepers, concrete blocks, tired and old rail                                                                                                              |                                                                                                 |
| AEC 27     | Map 7 of 16   | Potential ACM, glass and metal on the enhancement site surface                                                                                                                        |                                                                                                 |
| AEC 28     | Map 7 of 16   | Potential ACM structure                                                                                                                                                               | The Rock Yard clearances                                                                        |
| AEC 29     | Map 8 of 16   | Dumped metal drums                                                                                                                                                                    | Uranquinty Yard clearances                                                                      |
| AEC 30     | Map 8 of 16   | Uranquinty RFS                                                                                                                                                                        |                                                                                                 |
| AEC 31     | Map 8 of 16   | Caltex Service Station                                                                                                                                                                |                                                                                                 |
| AEC 32     | Map 9 of 16   | Wagga show camp ground; storage of unknown minor chemicals                                                                                                                            | Pearson Street bridge                                                                           |
| AEC 33     | Map 9 of 16   | Potential ACM on the ground surface and fill containing anthropogenic material                                                                                                        |                                                                                                 |
| AEC 34     | Map 9 of 16   | Former Council depot, storage of unknown chemicals or fuel, machinery maintenance                                                                                                     |                                                                                                 |
| AEC 35     | Map 10 of 16  | Potential ACM on the ground surface                                                                                                                                                   | Wagga Wagga Yard clearances                                                                     |
| AEC 36     | Map 10 of 16  | Potential USTs, formerly storage of firefighting storage tanks and former fuel store (not part of the enhancement site) – Former District Engineers Office, workshop and branch depot | Edmondson Street bridge<br>Wagga Wagga Station pedestrian bridge<br>Wagga Wagga Yard clearances |
| AEC 37     | Map 10 of 16  | Historical storage of gas cylinders, grease and drums, transformers, rail components and battery acid containers and potential asbestos in buildings – former gang shed               | Edmondson Street bridge                                                                         |

| AEC NUMBER | MAP REFERENCE | DESCRIPTION                                                                           | ENHANCEMENT SITE(S)                          |
|------------|---------------|---------------------------------------------------------------------------------------|----------------------------------------------|
| AEC 38     | Map 11 of 16  | Herbicide spraying around the station building and ballast stockpiles                 | Bomen Yard clearances                        |
| AEC 39     | Map 11 of 16  | Abandoned drums and rail equipment                                                    |                                              |
| AEC 40     | Map 12 of 16  | Herbicide spraying around the station                                                 | Harefield Yard clearances                    |
| AEC 41     | Map 12 of 16  | Potential ACM and glass, ceramic, ballast and plastic on the enhancement site surface |                                              |
| AEC 42     | Map 13 of 16  | Potential ACM around and within building                                              | Kemp Street bridge and Junee Yard clearances |
| AEC 43     | Map 13 of 16  | Dumped metals drums, sleepers and scrap metal                                         |                                              |
| AEC 44     | Map 13 of 16  | Ballast stockpiles                                                                    |                                              |
| AEC 45     | Map 14 of 16  | Mobil service station                                                                 | Junee Station pedestrian bridge              |
| AEC 46     | Map 15 of 16  | Shell service station with drums labelled as cooking oil stored close to the tracks   | Olympic Highway underbridge                  |
| AEC 47     | Map 16 of 16  | Illabo RFS                                                                            | Junee to Illabo Track clearances             |
| AEC 48     | Map 16 of 16  | Ballast stockpiles                                                                    |                                              |

## 5.3 POTENTIAL SOURCES OF CONTAMINATION

A summary of potential sources of contamination and associated potential contaminations of concern identified within the proposal site is provided in Table 5.2.

Table 5.2 Summary of potential contamination sources/contaminants of concern

| ACTIVITY ALONG PROPOSAL SITE                                                                                                                                            | CONTAMINANT SOURCE                                                                                                                                               | POTENTIAL CONTAMINANTS OF CONCERN                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Excavation for track realignment, track lowering, signal replacement or bridge replacement, utility trench excavation and any other excavation required in urban areas. | Fill used in construction of the existing rail line, possible historical waste disposal along the proposal area                                                  | Diffuse presence or isolated hotspots of heavy metals, TRH, BTEXN, PAHs, asbestos along the existing rail |
|                                                                                                                                                                         | Weed suppression activities along the proposal area                                                                                                              | Diffuse presence or isolated hotspots of OCPs or OPPs along the existing rail                             |
|                                                                                                                                                                         | Buildings containing hazardous materials (observed at AEC 1, AEC 28, AEC 37, AEC 41 and AEC 42) but potentially located in the vicinity of all enhancement sites | Asbestos and lead dust and/or paint                                                                       |
|                                                                                                                                                                         | Rail line ballast                                                                                                                                                | Heavy metals, TRH, BTEXN, PAHs, asbestos, lead containing dust and/or paint                               |
|                                                                                                                                                                         | Possible maintenance activities in sidings and near silos                                                                                                        | Heavy metals, TRH, BTEXN, PAHs, asbestos, lead containing dust and/or paint                               |



| ACTIVITY ALONG PROPOSAL SITE                                                                              | CONTAMINANT SOURCE                                                                                                                                       | POTENTIAL CONTAMINANTS OF CONCERN                                                          |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|                                                                                                           | Service stations or former fuel depots located near the enhancement sites noted at AEC 4, AEC 8, AEC 20, AEC 31, AEC 45 and AEC 46                       | TRH, BTEXN, PAHs and/or lead                                                               |
|                                                                                                           | Historical storage of chemicals potentially noted at AEC 19, AEC 24, AEC 25 AEC 30, AEC 36 and AEC 47 but potentially elsewhere at the enhancement sites | TRH, BTEXN and PAHs                                                                        |
|                                                                                                           | PSH at Site 5 of 514-526 Young Street, Albury (AEC 10) located to the south of a proposed compound                                                       | TRH and BTEXN                                                                              |
|                                                                                                           | Council depot storing machinery, chemicals or fuel and/or undertaking machinery maintenance at the western proposed lay down area (AEC 34)               | TRH, BTEXN, PAHs, heavy metals and/or asbestos                                             |
|                                                                                                           | Former District Engineers Office (AEC 36)                                                                                                                | TRH, BTEXN, PAHs, PFAS and asbestos                                                        |
| Excavation for track realignment, track lowering, signal replacement or bridge replacement in rural areas | Use of agricultural chemicals on farm land                                                                                                               | Heavy metals, OCPs and OPPs                                                                |
|                                                                                                           | Machinery storage and maintenance, refuelling and spray rig filling, agricultural sheds and silos                                                        | Point sources of heavy metals, TRH, BTEXN, solvents, OCPs and OPPs, and asbestos fragments |

TRH – total recoverable hydrocarbon; BTEXN – benzene, toluene, ethylbenzene, xylene and naphthalene; PAHs – polycyclic aromatic hydrocarbons; OCPs – organochlorine pesticides; OPPs – organophosphate pesticides; PCBs – polychlorinated biphenyls; PFAS – per- and poly-fluoroalkyl substances

## 5.4 POTENTIAL AFFECTED MEDIA

Based on the potential sources of contamination outlined in Table 5.2, soil is the primary potentially affected media although there is the potential for groundwater to be affected at Riverina Highway bridge where track lowering will take place and the enhancement site is close to a service station. This is applicable to all identified potential sources and contaminants. Generally, soil and groundwater contamination risks are considered low across the proposal site, however discreet areas of moderate risk have been identified within the AECs in Table 5.1.

Contamination may have the potential to have migrated to the groundwater, including hydrocarbons, metals and PFAS. This will be particularly relevant if significant soil impacts are identified during construction, contamination is present in unsealed areas and areas which cross waterways. Potential affected media are presented in Table 6.1 to Table 6.3.

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## 5.5 POTENTIAL RECEPTORS

Human receptors identified within the proposal site include:

- current and future construction workers or maintenance workers
- current and future users of the railway
- current and future users of adjacent land, including rural and residential properties.

Ecological receptors identified within the proposal site include:

- Terrestrial and aquatic ecosystems (refer to Technical Paper 8 – Biodiversity Development Assessment Report and Technical Paper 9 – Aquatic Biodiversity Impact Assessment for identification of these receptors). The ecological value of the majority of the proposal site itself is low given the highly disturbed nature of railway easements and sidings. Ecological value of downgradient environments may be higher than the proposal site which is currently used for commercial/industrial rail activities.

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## 5.6 POTENTIAL EXPOSURE PATHWAYS

Based on the potential contaminants and receptors identified, the following potential exposure pathways exist:

- direct contact with or ingestion of impacted surface or near surface soils by construction workers during proposed project work or maintenance workers following project work
- inhalation of dust, vapour or fibres by construction workers during the proposed project work or maintenance workers following the project work
- inhalation of dust, vapour or fibres by users of the railway or of adjacent land
- ingestion of, or dermal contact with, impacted groundwater if extracted for beneficial use by nearby site users
- terrestrial and aquatic ecosystems (refer to Technical Paper 8 – Biodiversity Development Assessment Report and Technical Paper 9 – Aquatic Biodiversity Impact Assessment for identification of these receptors).

The risks presented by the sources of potential contamination to the identified receptors, via the above exposure pathways is discussed in Chapter 6.

# 6 IMPACT ASSESSMENT

The following section provides an assessment of potential risks associated with the physical environment around the proposal site (such as ASS and salinity) as well as potential contamination sources, pathways and receptors. The impact assessment considers potential risks during construction and operation of the proposal.

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## 6.1 ACID SOILS AND ROCK

As discussed in section 4.2.5.1, there is potential for acidity across the proposal site (including sulfate soils, acid soils and sulfidic rock).

Impacts from acidity will include direct impacts to infrastructure (corrosion of concrete and steel structures) in contact with these soils, excavation of these materials, and potential spreading to other currently unaffected areas, or acidification of surface water and runoff, potentially impacting watercourses or other sensitive receptors.

The proposal site is located within an area described as low probability of ASS with the exception of Murray River bridge. However, the potential impact to the enhancement site is low due to limited to the proposal works comprising structural bridge work and grading of an access track which are not expected to encounter the saturated sediments where the ASS is likely to be present.

The soils along the route are likely to generally be slightly acidic to strongly acidic (from an agronomic view). The aggressivity of soil will be considered in selection of materials to be used in construction.

Geotechnical investigations completed for the proposal have not identified the requirement for excavation into rock, except for sites requiring piling and piling methodology will not require significant excavation. The risk of encountering sulfidic rock is therefore low, but uncertain and will require further assessment in areas where cutting into the underlying bedrock is confirmed. If sulfidic rock is encountered then further environmental management will be required to ensure appropriate reuse or disposal of this material, and manage potential impacts.

Given the soil conditions are considered very strongly acidic to strongly acidic within, or near, more elevated terrain, such as near Ettamogah and Table Top, The Rock and northeast of Junee to Illabo the selection of construction materials will consider the aggressivity of the soil. Any subsurface construction will take this into consideration.

Mitigation for all types of acid soils and rock is further discussed in Chapter 7.

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## 6.2 SALINE SOILS

Salinity is a concern as it can lead to corrosion of structures and land degradation, including salinisation of land so that it no longer can be stabilised by vegetation – leading to increased erosion risk. Where not managed it can also result in increased salt loads in local creeks.

One area was identified with very high potential salinity hazard at Culcairn pedestrian bridge and Culcairn Yard clearances. Moderate salinity was mapped at several enhancement sites. The highest risk is associated with enhancement sites that have high or moderate potential for salinity and more significant excavation comprising:

- Riverina Highway bridge enhancement site where excavation for track lowering will take place
- Billy Hughes bridge enhancement site where excavation associated with track lowering and realignment will take place
- Pearson Street bridge enhancement site where excavation for track lowering will take place
- Kemp Street bridge where deeper excavation is proposed for pier excavation.

The most likely scenarios leading to an increase in salinity presence at the surface will be excavation of salt affected soil from deeper horizons and placing it at the surface, and disruption of existing aboveground and sub-surface drainage patterns allowing salts to be brought to the surface in seeps or to accumulate in zones of evaporation. Soil disruption associated with excavations or cuttings into the landscape for the proposed rail line, footings, construction compounds, bridges or levelling purposes are potential activities that could lead to increased salinity risk.

Management of salinity hazards will require a site specific understanding of the salt distribution in the soil profile, and interaction with the groundwater and surface water regime to identify where measures will be required. Excavation associated with the proposal is generally limited to discrete sites, within areas subject to extensive prior disturbance from historical development of the rail corridor. As such, the risks relating to impacts occurring from salinity to the proposal are considered to be manageable. However, mitigation and management measures will be implemented to identify and manage these soil types where they are encountered (refer to Chapter 7).

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## 6.3 CONTAMINATION

A number of potentially contaminating activities have been identified as containing potential contamination risks relevant to the proposal site.

The qualitative risk assessment protocol for assessing the source, pathway receptor linkages for the proposal is outlined in Table 3.1. This risk matrix allows for simple identification of the direct receptors of the contaminating activities and whether or not they will result in unacceptable risk to human health or the environment based on activities associated with construction or operation of the proposal.

As discussed in Chapter 4, contamination risks have been categorised as general contamination risk, and specific contamination risks relevant to each enhancement site. The potential impact from the proposal associated with these contamination risks is discussed further in section 6.4 and section 6.5 respectively.

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## 6.4 GENERAL CONTAMINATION RISK

As discussed in section 5.1, a general contamination risk is considered to be present for all of the enhancement sites based on their general setting within an existing rail corridor and landuses which occur within and adjacent to these areas. Where even limited ground penetration is to take place, there is considered to be some potential for source, pathway and receptor linkages to be present from contamination. A qualitative risk assessment of the source, pathway receptor linkages for general contamination risks is provided in Table 6.1.

It is noted that, based on the intensity of historical activities observed within the rail corridor, including the presence of operational facilities, and development in the surrounding area, enhancement sites within Albury Station and surrounds, and Wagga Wagga Station and surrounds, the likelihood of contamination being present would be higher. Equally, enhancement sites with more extensive (including area and depth) excavation proposed, including Riverina Highway bridge, Billy Hughes bridge, Pearson Street bridge and Kemp Street bridge, may also be considered to have a higher likelihood for the proposal to encounter contamination. The mitigation outlined in Chapter 8 includes further investigation of these enhancement sites.

Table 6.1 Source Pathway Receptor Risk Ratings – general contamination risk

| CONTAMINANT SOURCE                                                                                                                                            | RELEVANT AECS WHERE OBSERVED OR PREDICTED TO OCCUR                                                                                                                 | POTENTIAL CONTAMINANTS OF CONCERN                                                                        | PATHWAY                                                                                                                       | RECEPTORS                                                                                                                               | LIKELIHOOD AND CONSEQUENCE RATING (REFER TO SECTION 3.3.3) | ASSESSED RISK                                                                                                                                                                             | MITIGATION APPROACH (REFER TO CHAPTER 7)                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Areas of dumped rubbish, including potential ACM.                                                                                                             | Noted at AEC2, AEC 13, AEC 18, AEC 21, AEC 22, AEC 26, AEC 27, AEC 29, AEC 33, AEC 35, AEC 39, AEC 41, AEC 42, AEC 43 but also potential at all enhancement sites. | Heavy metals, TRH, BTEX, PAHs, asbestos, lead containing dust and/or paint                               | Direct contact through inadvertent ingestion, or dermal absorption of soils.<br><br>Inhalation of impacted soils/dust/fibres. | Future construction workers on all enhancement sites.<br><br>Surrounding ecological and residential receptors at all enhancement sites. | Likelihood – Possible<br><br>Consequence – Moderate        | Medium – significant unsolicited waste disposal along the proposal site is unlikely.                                                                                                      | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation where triggered by the UFP. Hazardous materials will be managed as per the mitigation outlined in Chapter 7, including implementation of the AMP and UFP.                      |
| Fill used in construction of the existing rail line, possible historical waste disposal along the proposal area.                                              | All enhancement sites.                                                                                                                                             | Diffuse presence or isolated hotspots of heavy metals, TRH, BTEX, PAHs, asbestos along the existing rail | Direct contact through inadvertent ingestion, or dermal absorption of soils.<br><br>Inhalation of impacted soils/dust/fibres. | Future construction workers on all enhancement sites.<br><br>Surrounding ecological and residential receptors at all enhancement sites. | Likelihood – Possible<br><br>Consequence – Moderate        | Medium – significant unsolicited waste disposal along the proposal site is unlikely.                                                                                                      | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP.<br><br>Hazardous materials will be managed as per the mitigation outlined in Chapter 7, including implementation of the AMP and UFP.              |
| Weed suppression activities along the proposal site.                                                                                                          | All enhancement sites.                                                                                                                                             | Diffuse presence or isolated hotspots of OCPs or OPPs along the existing rail.                           | Direct contact through inadvertent ingestion, or dermal absorption of soils.<br><br>Inhalation of impacted soils/dust.        | Future construction workers on all enhancement sites.<br><br>Surrounding ecological and residential receptors at all enhancement sites. | Likelihood – Possible<br><br>Consequence – Minor           | Low – significant impact from weed suppression is unlikely.                                                                                                                               | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.                                                                                                                                                                                                                     |
| Building, bridges and other structures containing hazardous materials (including lead paint) but potentially located in the vicinity of all enhancement sites | Noted at AEC 1, AEC 3, AEC 28, AEC 37, AEC 42 but also potential at all enhancement sites.                                                                         | Asbestos and lead dust and/or paint                                                                      | Inhalation of impacted soils/dust/fibres.                                                                                     | Future construction workers on all enhancement sites.<br><br>Surrounding ecological and residential receptors at all enhancement sites. | Likelihood – Possible<br><br>Consequence – Medium          | Medium – may present a risk to workers if not removed from the proposal site or made safe.                                                                                                | A hazardous materials survey will be completed on buildings or other structures identified which may be impacted by the proposal.<br><br>Hazardous materials will be managed as per the mitigation outlined in Chapter 7, including implementation of the AMP and UFP.                                                          |
| Rail line ballast, stockpiles of soil                                                                                                                         | Noted at AEC 7, AEC 11, AEC 14, AEC 16, AEC 17, AEC 23, AEC 38, AEC 44, AEC 48 but also potential at all enhancement sites.                                        | Heavy metals, TRH, BTEX, PAHs, asbestos, lead containing dust and/or paint                               | Direct contact through inadvertent ingestion, or dermal absorption of soils.<br><br>Inhalation of impacted soils/dust/fibres. | Future construction workers on all enhancement sites.<br><br>Surrounding ecological and residential receptors at all enhancement sites. | Likelihood – Possible<br><br>Consequence – Minor           | Low – potentially contain isolated spills or metals dust from trains. Ballast is typically an inert metamorphosed basalt or granite and not considered a contaminant source in of itself. | Inspect ballast for indications of contamination during construction.<br><br>Management of ballast and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Hazardous materials will be managed as per the mitigation outlined in Chapter 7, including implementation of the AMP and UFP. |

| CONTAMINANT SOURCE                                                                                 | RELEVANT AECS WHERE OBSERVED OR PREDICTED TO OCCUR                   | POTENTIAL CONTAMINANTS OF CONCERN                                                         | PATHWAY                                                                                                                                                                                 | RECEPTORS                                                                                                                                   | LIKELIHOOD AND CONSEQUENCE RATING (REFER TO SECTION 3.3.3) | ASSESSED RISK                                                                                                                                                                                                                 | MITIGATION APPROACH (REFER TO CHAPTER 7)                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Possible maintenance activities in sidings and near silos.                                         | All enhancements sites where these features occur.                   | Heavy metals, TRH, BTEX, PAHs, asbestos, lead containing dust and/or paint                | Direct contact through inadvertent ingestion, or dermal absorption of soils.<br><br>Inhalation of impacted soils/dust/fibres.<br><br>Migration through leaching into groundwater.       | Future construction workers on the all enhancement sites.<br><br>Surrounding ecological and residential receptors at all enhancement sites. | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – possible maintenance areas may present an isolated source of impact to soils.                                                                                                                                           | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation where triggered by the UFP.<br><br>Hazardous materials will be managed as per the mitigation outlined in Chapter 7, including implementation of the AMP and UFP. |
| Use of agricultural chemicals on farm land.                                                        | All enhancements sites where these features occur in adjacent areas. | Heavy metals, OCPs and OPPs                                                               | Direct contact through inadvertent ingestion, or dermal absorption of soils.<br><br>Inhalation of impacted soils/dust/vapour spray.                                                     | Future construction workers on all enhancement sites.<br><br>Surrounding ecological and residential receptors at all enhancement sites.     | Likelihood – Possible<br><br>Consequence – Minor           | Low – unlikely to be present in significant quantities in soil within the proposal site.                                                                                                                                      | Management of soils as per mitigation outlined in Chapter 7, including implementation of the unexpected finds protocol.                                                                                                                                                                                           |
| Machinery storage and maintenance, refuelling and spray rig filling, agricultural sheds and silos. | Noted at AEC 5, AEC 6 but also potential at all enhancement sites.   | Point sources of heavy metals, TRH, BTEX, solvents, OCPs and OPPs, and asbestos fragments | Direct contact through inadvertent ingestion, or dermal absorption of soils.<br><br>Inhalation of impacted soils/dust/vapour spray.<br><br>Migration through leaching into groundwater. | Future construction workers on all enhancement sites.<br><br>Surrounding ecological and residential receptors at all enhancement sites.     | Likelihood – Possible<br><br>Consequence – Minor           | Low – long term machinery storage or maintenance may be a continued source of impact to soils and groundwater if permeated through soil profile but these areas are generally located off site and not in proposed work area. | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation where triggered by the UFP.<br><br>Hazardous materials will be managed as per the mitigation outlined in Chapter 7, including implementation of the AMP and UFP. |

6.5 SUMMARY OF CONTAMINATION RISK AT ENHANCEMENT SITES

In addition to general contamination risk, specific contamination risks have been identified at certain enhancement sites, these are discussed through consideration of each precinct in the following sections.

6.5.1 ALBURY PRECINCT

Potential AECs identified in the vicinity of the Albury Precinct are summarised in Table 6.2 below.

Table 6.2 Source Pathway Receptor Risk Ratings – Albury precinct

| RELEVANT PROPOSED WORK                                                                                                             | CONTAMINANT SOURCE                                                                                                       | POTENTIAL CONTAMINANTS OF CONCERN       | PATHWAY                                                                                                                                                                             | RECEPTORS                                                                                                                                                                                                                                                                                               | LIKELIHOOD AND CONSEQUENCE RATING (REFER TO SECTION 3.3.3) | ASSESSED RISK                                                                                                                                                                                            | RECOMMENDED ACTIONS                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Adjacent to Albury Station and surrounds enhancement sites.                                                                        | Properties 1 to 6. Former properties with asbestos building materials, unknown storage, historical pesticide use (AEC 9) | TRH, BTEX, PAHs, pesticides and/or lead | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Unnamed drain/culvert located 20 metres east of AEC.<br><br>Groundwater present as the Upper Murray hydrostatic unit (HSU) at approximately 8mBGL.<br><br>Surrounding residential receivers, the nearest being 175 metres south south-west. | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – adjacent to the enhancement site.<br><br>Groundwater migration unlikely to impact Riverina Highway underbridge.                                                                                    | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>A hazardous materials survey will be completed on buildings or other structures identified which may be impacted by the proposal.<br><br>Hazardous materials will be managed as per the mitigation outlined in Chapter 7, including implementation of the AMP and UFP. |
| Adjacent to Albury Station and surrounds enhancement sites.                                                                        | Former Mobil depot (AEC 8)                                                                                               | TRH, BTEX, PAHs and/or lead             | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Unnamed drain/culvert located 20 metres east of AEC.<br><br>Groundwater present as the Upper Murray HSU at approximately 8mBGL.<br><br>Surrounding residential receivers, the nearest being 110 metres south south-west.                    | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – the former depot has been assessed as unlikely to present a risk to receptor and no excavation is planned in the former Mobil depot area.                                                          | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP.                                                                                                                                                                                                             |
| Excavation associated with lowering of track., drainage of surface water overflow during track lowering (Riverina Highway bridge). | Service station located to the south of the enhancement site (AEC 4)                                                     | TRH, BTEX, PAHs and/or lead             | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Unnamed drain/culvert located 20 metres east of AEC.<br><br>Groundwater present as the Upper Murray HSU at approximately 8mBGL.<br><br>Surrounding residential receivers, the nearest being 190 metres north north-west.                    | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – the service station is not in the immediate vicinity of the enhancement site and contaminants unlikely to be present in significant quantities in soil or groundwater within the enhancement site. | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP.                                                                                                                                                                                                             |



6.5.2 GREATER HUME – LOCKHART PRECINCT

Potential AECs identified in the vicinity of the Greater Hume - Lockhart Precinct are summarised in Table 6.3 below.

Table 6.3 Source Pathway Receptor Risk Ratings – Greater Hume – Lockhart Precinct

| RELEVANT PROPOSED WORK                                                                                            | CONTAMINANT SOURCE                                                         | POTENTIAL CONTAMINANTS OF CONCERN          | PATHWAY                                                                                                                                                                             | RECEPTORS                                                                                                                                                                                                                                                                                       | LIKELIHOOD AND CONSEQUENCE RATING (REFER TO SECTION 3.3.3) | ASSESSED RISK                                                                                                                                                                                            | RECOMMENDED ACTIONS                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation associated with realignment of track, new signals and other ancillary work (Culcairn Yard clearances). | The former gang shed which is now used as the Culcairn Men’s shed (AEC 15) | TRH, BTEX, PAHs, heavy metals and asbestos | Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater.                                                                         | Future construction workers on the enhancement site.<br><br>Billabong Creek, located 220 metres south of the AEC.<br><br>Groundwater present as the Billabong Creek HSU at approximately 13mBGL.<br><br>Surrounding residential receivers, the nearest being 50 metres west.                    | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – RFS have confirmed that PFAS was not historically used at the former gang shed.                                                                                                                    | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |
| Excavation associated with track realignment (Henty Yard clearances).                                             | Henty RFS (AEC19) – historical storage of chemicals potentially used       | TRH, BTEX and PAHs                         | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Buckaringah Creek, located 160 metres north of the AEC.<br><br>Groundwater present as the Lachlan fractured rock HSU at approximately 50mBGL.<br><br>Surrounding residential receivers, the nearest being immediately to the south. | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – RFS have confirmed that PFAS was not historically used at the RFS building. The RFS shed is approximately 50 metres north of the enhancement site.                                                 | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |
|                                                                                                                   | Shell service station (AEC 20)                                             | TRH, BTEX, PAHs and/or lead                | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Buckaringah Creek, located 470 metres north-east of the AEC.<br><br>Groundwater present as the Lachlan fractured rock HSU at approximately 50mBGL.<br><br>Surrounding residential receivers, the nearest being 20 metres east.      | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – the service station is not in the immediate vicinity of the enhancement site and contaminants unlikely to be present in significant quantities in soil or groundwater within the enhancement site. | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |

| RELEVANT PROPOSED WORK                                                          | CONTAMINANT SOURCE                                                           | POTENTIAL CONTAMINANTS OF CONCERN | PATHWAY                                                                                                                                                                                    | RECEPTORS                                                                                                                                                                                                                                                                                           | LIKELIHOOD AND CONSEQUENCE RATING (REFER TO SECTION 3.3.3) | ASSESSED RISK                                                                                                                                                                                                        | RECOMMENDED ACTIONS                                                                                                                                                                  |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation associated with realignment of track (Yerong Creek Yard clearances). | Yerong Creek RFS (AEC 24) – historical storage of chemicals potentially used | TRH, BTEX and PAHs                | <p>Direct contact through ingestion, or dermal absorption or soils.</p> <p>Migration from overland flow into surface water bodies.</p> <p>Migration through leaching into groundwater.</p> | <p>Future construction workers on the enhancement site.</p> <p>Sandy Creek, located 435 metres south of the AEC.</p> <p>Groundwater present as the Lachlan fractured rock HSU at approximately 50mBGL.</p> <p>Surrounding residential receivers, the nearest being 55 metres north.</p>             | <p>Likelihood – Possible</p> <p>Consequence – Minor</p>    | <p>Low – RFS have confirmed that PFAS was not historically used at the RFS building.</p> <p>The fire station is located approximately 25 metres west of the enhancement site.</p>                                    | <p>Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.</p> <p>Additional soil investigation, where triggered by the UFP.</p> |
| Gantry modification (The Rock Yard clearances).                                 | The Rock RFS (AEC 25) – historical storage of chemicals potentially used     | TRH, BTEX and PAHs                | <p>Direct contact through ingestion, or dermal absorption or soils.</p> <p>Migration from overland flow into surface water bodies.</p> <p>Migration through leaching into groundwater.</p> | <p>Future construction workers on the enhancement site.</p> <p>Burkes Creek, located 280 metres north of the AEC.</p> <p>Groundwater present as the Lachlan fractured rock HSU between approximately 30 and 50mBGL.</p> <p>Surrounding residential receivers, the nearest being 30 metres west.</p> | <p>Likelihood – Unlikely</p> <p>Consequence – Minor</p>    | <p>Low – RFS have confirmed that PFAS was not historically used at the RFS building.</p> <p>The fire station is located approximately 50 metres north of the enhancement site.</p> <p>No significant excavation.</p> | <p>Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.</p> <p>Additional soil investigation, where triggered by the UFP.</p> |

6.5.3 WAGGA WAGGA PRECINCT

Potential AECs identified in the vicinity of the Wagga Wagga precinct are summarised in Table 6.4 below.

Table 6.4 Source Pathway Receptor Risk Ratings – Wagga Wagga precinct

| RELEVANT PROPOSED WORK                                                                             | CONTAMINANT SOURCE                                                            | POTENTIAL CONTAMINANTS OF CONCERN | PATHWAY                                                                                                                                                                             | RECEPTORS                                                                                                                                                                                                                                                                                                                                                                                                       | LIKELIHOOD AND CONSEQUENCE RATING (REFER TO SECTION 3.3.3) | ASSESSED RISK                                                                                                                                                                                            | RECOMMENDED ACTIONS                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation associated with track realignment and bridge modification (Uranquinty Yard clearances). | Potential historical chemical storage at the Uranquinty RFS building (AEC 30) | TRH, BTEX and PAHs                | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Endangered ecological community, located 500 metres north-east of the AEC.<br><br>Sandy Creek, located 380 metres south-west of the AEC.<br><br>Groundwater present as the Lachlan fractured rock HSU, inferred to be a depths of greater than 8mBGL.<br><br>Surrounding residential receivers, the nearest being 105 metres south-east.            | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – RFS have confirmed that PFAS was not historically used at the RFS building.<br><br>The fire station is located approximately 50 metres north of the enhancement site.                              | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |
|                                                                                                    | Service station located to the south of the enhancement site (AEC 31)         | TRH, BTEX, PAHs and/or lead       | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Endangered ecological community, located 500 metres north-east of the AEC.<br><br>Sandy Creek, located 380 metres south-west of the AEC.<br><br>Groundwater present as the Lachlan fractured rock HSU, inferred to be a depths of greater than 8mBGL<br><br>Surrounding residential receivers, the nearest being immediately adjacent to the south. | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – the service station is not in the immediate vicinity of the enhancement site and contaminants unlikely to be present in significant quantities in soil or groundwater within the enhancement site. | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |

| RELEVANT PROPOSED WORK                                                                                                                                             | CONTAMINANT SOURCE                                                                                                                                                                                                 | POTENTIAL CONTAMINANTS OF CONCERN              | PATHWAY                                                                                                                                                                                                                              | RECEPTORS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LIKELIHOOD AND CONSEQUENCE RATING (REFER TO SECTION 3.3.3) | ASSESSED RISK                                                                                                                                                                                 | RECOMMENDED ACTIONS                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excavation associated with lowering of track.<br>(Pearson Street bridge)                                                                                           | Council depot (AEC 34) storing machinery, chemicals or fuel and/or undertaking machinery maintenance and Wagga Wagga Showground (AEC 32) storing minor volumes of chemicals at the western proposed lay down area. | TRH, BTEX, PAHs, heavy metals and/or asbestos. | Direct contact through inadvertent ingestion, or dermal absorption of soils.<br><br>Inhalation of impacted soils/dust/vapour/fibres.                                                                                                 | Future construction workers on the enhancement site.<br><br>Endangered ecological community, located in the Wagga Wagga LGA.<br><br>Unnamed artificial drainage line, located 615 metres north-west of AEC 34 and immediately adjacent to AEC 32.<br><br>Groundwater present as the Lachlan fractured rock HSU, inferred to be a depths of 4.5 to greater than 14.9mBGL.<br><br>Surrounding residential receivers, the nearest being 30 metres south of AEC 32 and 85 metres south of AEC 34. | Likelihood – Possible<br>Consequence – Minor               | Low – possible maintenance or storage areas may present an isolated source of impact to soils.                                                                                                | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |
| Limited excavation for new bridge, stairs ramps and utilities (Edmondson Street bridge).<br><br>Excavation associated with new drainage (Edmondson Street bridge). | Former District Engineers Office (AEC 36), workshop and branch depot and former gang shed (AEC 37).                                                                                                                | TRH, BTEX, PAHs, PFAS and asbestos             | Direct contact through ingestion, or dermal absorption or soils.<br><br>Inhalation of impacted soils/dust/fibres.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Groundwater present as the Lachlan fractured rock HSU, inferred to be at depths of 4.5 to greater than 14.9mBGL.<br><br>Surrounding residential receivers, the nearest being 45 metres south of AEC 37 and 65 metres north-west of AEC 36.                                                                                                                                                                                        | Likelihood – Possible<br>Consequence – Minor               | Low – primarily due to the small scale of proposed works. Chemicals may represent health or environmental concerns if present and not managed. Chemicals may also affect reuse opportunities. | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |

6.5.4 JUNE Precinct

Potential AECs identified in the vicinity of the June Precinct are summarised in Table 6.5 below.

Table 6.5 Source Pathway Receptor Risk Ratings – June Precinct

| RELEVANT PROPOSED WORK                                                                                     | CONTAMINANT SOURCE                                                          | POTENTIAL CONTAMINANTS OF CONCERN | PATHWAY                                                                                                                                                                             | RECEPTORS                                                                                                                                                                                                                                                                                                                                      | LIKELIHOOD AND CONSEQUENCE RATING (REFER TO SECTION 3.3.3) | ASSESSED RISK                                                                                                                                                                                            | RECOMMENDED ACTIONS                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Minor excavation associated with bridge removal and signal adjustment.<br>(June Station pedestrian bridge) | Mobil service station located to the south of the enhancement site (AEC 45) | TRH, BTEX, PAHs and/or lead       | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Unnamed tributary of Houlaghans Creek, 70 metres south-west of the AEC.<br><br>Groundwater present as the Lachlan fractured rock HSU, inferred to be at depths of 4.5 to greater than 14.9mBGL.<br><br>Surrounding residential receivers, the nearest being 250 metres south-east. | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – the service station is not in the immediate vicinity of the enhancement site and contaminants unlikely to be present in significant quantities in soil or groundwater within the enhancement site. | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |
| Excavation associated with track realignment.<br>(Olympic Highway underbridge)                             | Shell service station located to the west of the enhancement site (AEC 46)  | TRH, BTEX, PAHs and/or lead       | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>North arm of Jeralgambeth Creek located 800 metres south of the AEC.<br><br>Groundwater present as the Lachlan fractured rock HSU, inferred to be at a depth of approximately 10mBGL.<br><br>Surrounding residential receivers, the nearest being 50 metres south-west.            | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – the service station is not in the immediate vicinity of the enhancement site and contaminants unlikely to be present in significant quantities in soil or groundwater within the enhancement site. | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |
| Excavation associated with level crossing works in Illabo (June to Illabo Track clearances).               | Potential historical chemical storage at the Illabo RFS building (AEC 47)   | TRH, BTEX, PAHs and PFAS          | Direct contact through ingestion, or dermal absorption or soils.<br><br>Migration from overland flow into surface water bodies.<br><br>Migration through leaching into groundwater. | Future construction workers on the enhancement site.<br><br>Jeralgambeth Creek located 800 metres north-east of the AEC<br><br>Groundwater present as the Lachlan fractured rock HSU, inferred to be at a depth of approximately 19mBGL.<br><br>Surrounding residential receivers, the nearest being 80 metres south-west.                     | Likelihood – Unlikely<br><br>Consequence – Minor           | Low – RFS have confirmed that PFAS was not historically used at the RFS building.<br><br>The fire station is located approximately 50 metres north of the enhancement site.                              | Management of soils and waste as per mitigation outlined in Chapter 7, including implementation of the UFP.<br><br>Additional soil investigation, where triggered by the UFP. |

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## 6.6 FURTHER INVESTIGATION AND REMEDIATION

The risk of contamination across the proposal site is considered to be generally low within the context of the proposal site's railway land use. However, some discrete areas of medium risk have been identified, including:

- areas of dumped rubbish, including potential asbestos, including specific AECs as well as a general risk identified within the rail corridor
- fill used in construction of the existing rail line, including possible historical waste disposal within the proposal site
- building, bridges and other structures containing hazardous materials (including lead paint) but potentially located in the vicinity of all enhancement sites.

Contamination within the proposal site may include heavy metals, TRH, BTEX, PAHs, asbestos, PFAS, lead dust and/or paint, OCPs or OPPs. Whilst the assessment has not identified the presence of significant quantities of contamination, requiring management action or remediation, a level of uncertainty remains. The requirements for further investigation of contamination and hazardous materials are discussed in the following sections.

### 6.6.1 CONTAMINATION

A general risk of contaminants being present has been identified to the rail corridor as a whole, including all enhancement sites. However, this risk is considered to be low, and would not warrant detailed site investigations (DSI) to inform the EIS, as it can be effectively managed through construction management measures, including an unexpected finds protocol (UFP). Spoil or material being reused on site would need to be tested to inform waste classification and/or beneficial reuse of spoil. As the design of the proposal progresses, further investigation during this stage would assist in informing waste management (including management of contamination) during construction. Spoil or material being reused on site would need to be tested to inform waste classification and/or beneficial reuse of spoil (refer to section 6.7). Beyond this, contamination can also be effectively managed through construction management measures, including an UFP, without the completion of a DSI.

Notwithstanding, based on the intensity of historical activities observed within the rail corridor, including the presence of operational facilities, and development within the surrounding land, the enhancement sites within Albury Station and surrounds, and Wagga Wagga Station and surrounds are considered to have a higher likelihood for the presence of contamination.

In addition, enhancement sites with more extensive (including area and depth) excavation proposed, may also be considered to have a higher likelihood to encounter contamination, given the extent of disturbance that is required. These sites include Riverina Highway bridge, Billy Hughes bridge, Pearson Street bridge and Kemp Street bridge. Targeted investigation of these enhancement sites is recommended, which would confirm the requirement for further management actions.

A Sampling, Analysis, and Quality Plan (SAQP) would inform the scope of site investigations.

### 6.6.2 HAZARDOUS MATERIALS

Asbestos (in the form of suspected surface lying asbestos containing material and asbestos containing buildings and structures) has been identified. Where asbestos has been identified, it is recommended that further inspection by an occupational hygienist occurs. This will inform the level of remediation or management necessary, and inform clearance requirements prior to construction commencing. Remediation may comprise emu pick, excavation or capping of soils, depending upon the extent of the asbestos and the planned works. Where asbestos is identified within buildings it will either be removed or labelled and maintained in good condition.

Given the nature of the proposal site, ongoing asbestos finds are likely during the proposed works, and so it is recommended that an asbestos management plan (including an unexpected finds protocol) be prepared prior to works commencing.

Any asbestos removal or management works will need to be conducted by appropriately licenced personnel, in accordance with relevant Safe Work codes of practice and with appropriate notification to SafeWork NSW.

If potential lead paint is to be disturbed during enhancement works its condition will be inspected prior to enhancement works commencing. Where lead paint is identified this will either be maintained in good condition or sealed in place or removed if poor condition is noted.

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## 6.7 WASTE DISPOSAL AND MATERIAL REUSE

Any excess spoils requiring removal from the proposal site will need to be classified in accordance with Waste Classification Guidelines (NSW EPA, 2014) for waste disposal purposes or otherwise be assessed for its suitability for beneficial reuse in accordance with existing resource recovery orders and exemptions prepared by the NSW EPA (including potential application of the ARTC order and exemption (NSW EPA, 2020) as per the ARTC Earthworks Material Management Framework, Appendix B of ETC-08-03.

Where specific chemicals of concern have been identified in this report for the enhancement sites, these will be considered as part of any waste classification or beneficial reuse assessment for the enhancement site. The presence of asbestos will preclude beneficial reuse of assessed material – it must be disposed of or otherwise managed onsite (such as by placement in a purpose built cell).

For enhancement sites where there is a risk of encountering contaminated soil, and more significant excavation is required as part of the proposal, further investigation would be carried out by the contractor to inform the detailed design and the subsequent management and classification of the excavated material during construction. Testing would be undertaken by a suitably qualified and experienced consultant, as defined in Schedule B9 of the NEPM (2013) and assessed against the criteria contained in NEMP (2013) to assess all waste against the waste classification criteria in NSW EPA (2014).



# 7 CUMULATIVE IMPACT ASSESSMENT

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## 7.1 OVERVIEW

For an EIS, cumulative impacts can be defined as the successive, incremental, and combined effect of multiple impacts, which may in themselves be minor but could become significant when considered together. The methodology for the cumulative impact assessment is provided in detail in the EIS (Chapter 26).

Projects identified with sufficient information to undertake assessment of potential cumulative impacts from the proposal are shown on Figure 7.1, and include:

- adjacent sections of Inland Rail, including:
  - Tottenham to Albury (Victoria)
  - Illabo to Stockinbingal
- other projects, including:
  - Thurgoona Link Road
  - Nexus Industrial Precinct
  - Jindera Solar Farm
  - Glenellen Solar Farm
  - Walla Walla Solar Farm
  - Culcairn Solar Farm
  - Uranquinty Solar Farm
  - Sandy Creek Solar Farm
  - Gregadoo Solar Farm
  - Solar farm (five MW) – Uranquinty
  - Solar farm (five MW) – Bomen
  - Wagga Wagga Special Activation Precinct
  - Riverina Intermodal Freight and Logistics Hub
  - Olympic Highway intersection upgrades
  - Project EnergyConnect (NSW – Eastern Section)
  - HumeLink
  - Junee Station Upgrade
  - Junee to Griffith Line Upgrade
  - Illabo Solar Farm
  - I2S (NSW) Grade separating road interfaces.

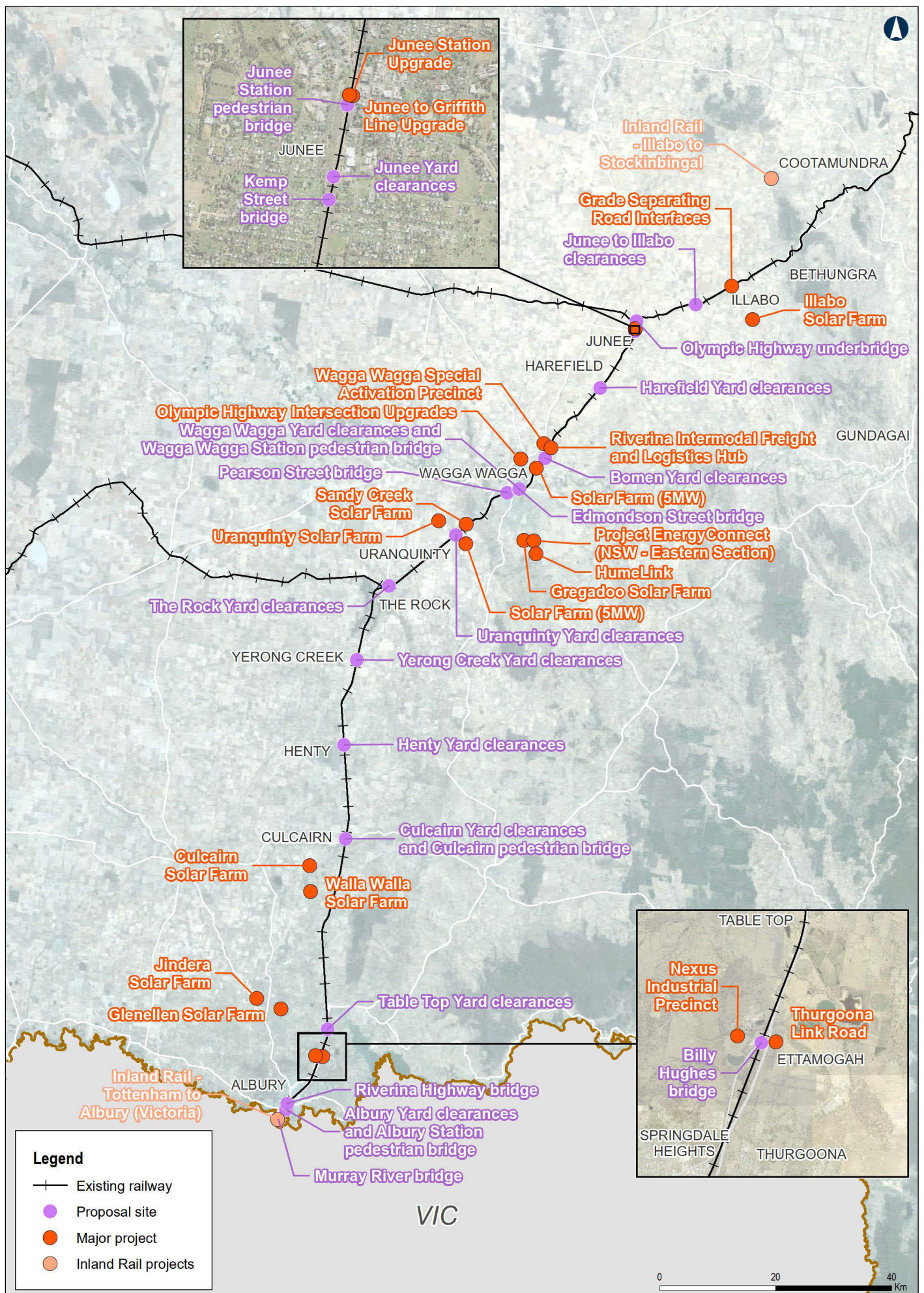


Figure 7-1 Major projects in the vicinity of the proposal

Data Sources: ARTC, NSWSS



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## 7.2 CUMULATIVE IMPACTS DURING CONSTRUCTION AND OPERATION

Cumulative impacts to contamination may occur when project(s) impact areas of contamination in addition to the proposal, which result in cumulative risk to human and ecological receptors.

Whilst the projects identified above may impact on contamination and require management, they have not been identified to include disturbance in areas impacted by the proposal site. Further, AECs identified in this assessment have not been identified to extend to adjacent areas which may be impacted by other projects. Migration of contamination has not been identified as a significant risk and implementation of mitigation measures will remove the risk of cumulative impacts.

Cumulative impacts from contamination are not anticipated for construction or operation of the proposal.

# 8 MITIGATION AND MANAGEMENT MEASURES

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## 8.1 APPROACH TO MITIGATION AND MANAGEMENT

Environmental management for the proposal will be carried out in accordance with the environmental management approach as detailed in Chapter 27 of the EIS (Approach to mitigation and management).

As part of the CEMP a contamination and hazardous materials sub plan will be prepared. The sub-plan will include measures, processes and responsibilities to minimise the potential for contamination impacts on the local community, workers and environment, and procedures for incident management and managing unexpected contamination finds. The unexpected finds protocol (UFP) is aimed at ensuring the health and safety of staff, contractors and visitors with regards to contaminated soil, asbestos or soil potentially containing contamination or asbestos outside identified impacted zones. The plan is to be implemented during the construction works on the proposal site.

The objective of the UFP is to describe procedures minimising exposure of all site occupants to possible contamination and asbestos materials potentially found within soil through the development and implementation of the management systems outlined herein.

Typical indicators of contamination include:

- unusual odours
- stained soil
- sheens on soil or water
- unusual colours
- crystalline or powdery substances
- presence of drums
- underground storage tanks.

In the interests of ensuring worker health and safety, and protection of the environment, any unexpected findings will be handled with care including segregation of the area from general site workers and the public, and obtaining specialist advice on the handling and disposal of the material.

As a precautionary measure to ensure the protection of the workforce and surrounding community, should additional asbestos or any other unexpected potentially hazardous substance be identified, the procedure summarised in the flow chart shown in Figure 8.1 is to be followed.

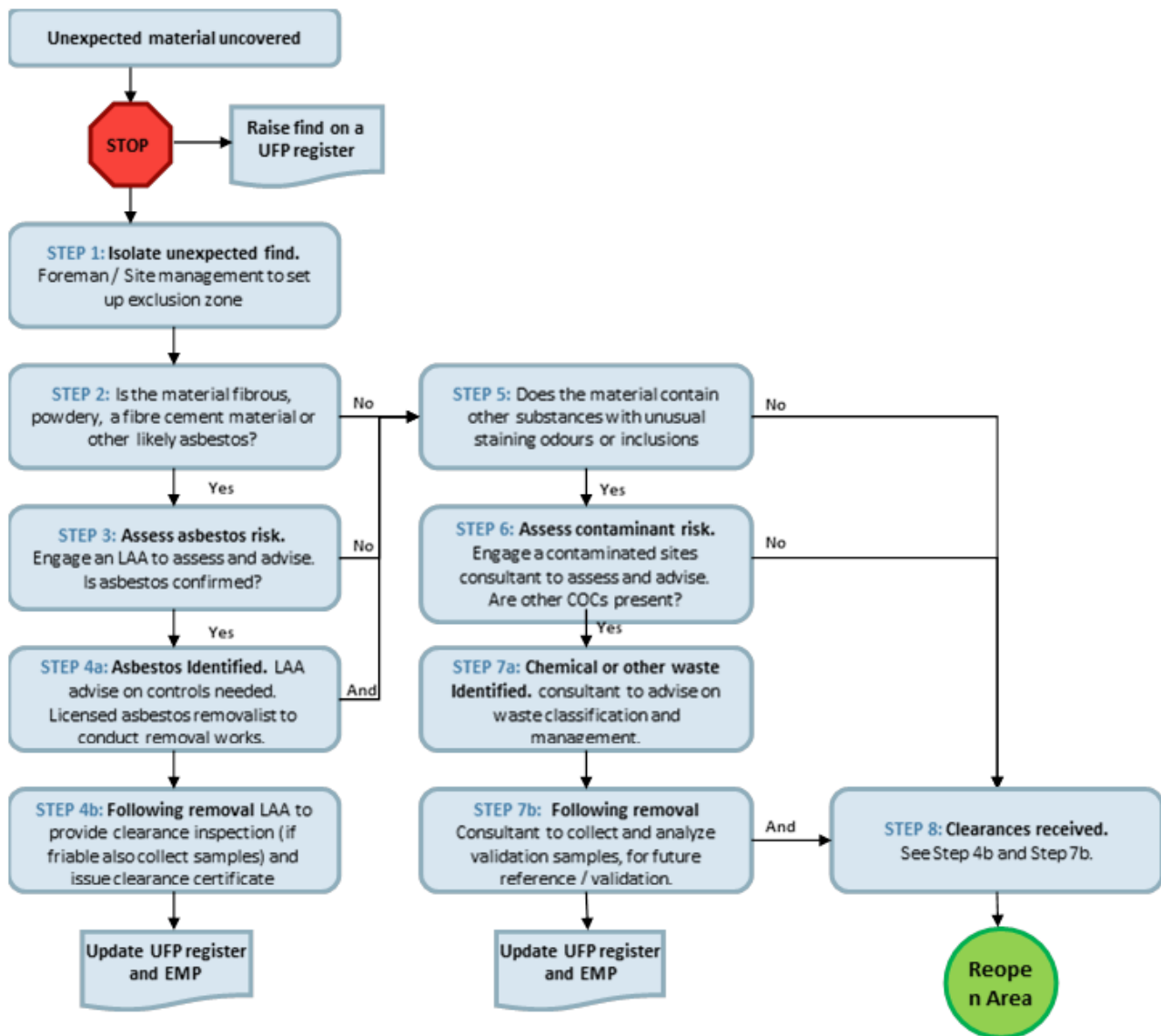


Figure 8.1 Unexpected finds protocol

A soil and water management sub-plan will also be prepared as part of the CEMP. The objectives for this plan will be to inform of the incidence, risks and mitigation strategies for salinity for the project. The plan will include at a minimum:

- general salinity management principles (water cycle management, groundwater management, soil management, vegetation management)
- relevant results obtained from site specific field investigation at the higher risk sites
- classification of the soils by the salinity hazard at various depth and the aggressivity of the soil conditions to building products
- consider surface or subsurface drainage and methods to mitigate risks of exacerbating local salinity
- include strategies to minimise environmental risk including minimising erosion hazard or leaching of salts to local waterways, and distribution of saline soils at the proposal site surface.

The risk of encountering contamination outside of the discrete areas of medium risk where asbestos and other hazardous materials have been identified is considered to be low, however as outlined in section 8.2, further intrusive assessment would be undertaken during detailed design and pre-construction at specific enhancement sites to inform the design and the subsequent management and classification of the excavated material during construction.

Management of potentially contaminated spoil and other waste will be completed in accordance with the mitigation and management measures outlined in Chapter 23 (Waste and resource management) of the EIS.

## 8.2 SUMMARY OF MITIGATION AND MANAGEMENT MEASURES

The mitigation measures to manage contaminated land impacts to during detailed design/pre-construction, construction and operation are outlined in Table 8.1.

Table 8.1 Summary of mitigation measures

| IMPACT TYPE         | MITIGATION MANAGEMENT MEASURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | PROJECT PHASE                    |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Acid soils and rock | In the event of any ground disturbance below the water table in areas mapped as containing potential ASS at the Murray River Bridge enhancement site, testing will be carried out to confirm the presence of actual and/or potential ASS and liming rates required to mitigate the risk. If ASS are encountered, they will be managed in accordance with the <i>Acid Sulfate Soils Manual</i> (ASSMAC, 1998b) and the <i>Waste Classification Guidelines – Part 4: Acid Sulfate Soils</i> (NSW EPA, 2014b).                                                                                                                                                                                          | Detailed design/pre-construction |
|                     | The aggressivity of the soil pH to construction materials will be assessed to confirm impacts from acidity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Detailed design/pre-construction |
|                     | Where excavation into sulfidic rock is confirmed during detailed design, a suitably qualified geologist or geotechnical engineer will advise on the risk and mitigation required to ensure the suitability of construction materials. If sulfidic rock is identified then environmental advice will be sought for waste management and environmental protection.                                                                                                                                                                                                                                                                                                                                     | Detailed design/pre-construction |
| Saline soils        | <p>Further assessment of salinity will be completed at enhancement sites where excavation is required, including:</p> <ul style="list-style-type: none"> <li>— Riverina Highway bridge</li> <li>— Billy Hughes bridge</li> <li>— Pearson Street bridge</li> <li>— Kemp Street bridge</li> </ul> <p>The assessment of salinity will include drilling of representative boreholes to test the depth profile of salts and consideration of how the works will affect surface and subsurface water flows.</p> <p>Where identified, salinity will be managed in accordance with the salinity management plan.</p> <p>Relevant aggressivity will be considered in the design of subsurface structures.</p> | Detailed design/pre-construction |

| IMPACT TYPE         | MITIGATION MANAGEMENT MEASURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PROJECT PHASE                        |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Contamination       | <p>Site investigations at more developed precincts (Albury and Wagga Wagga) and enhancement sites with more significant excavation (Riverina Highway bridge, Billy Hughes bridge, Pearson Street bridge and Kemp Street bridge) will be undertaken by a suitably qualified and experienced consultant, as defined in Schedule B9 of the NEPM (2013) to inform the detailed design and the subsequent management and classification of waste soil. The scope of site investigations will be informed by a Sampling, Analysis and Quality Plan.</p> <p>Any excavated material would be suitably managed in accordance with the Soil and Water Management sub-plan and the spoil management strategy (mitigation measure WM2).</p>                                                                                                         | Detailed design/<br>pre-construction |
| Contamination       | <p>In the event that unidentified contaminated material is discovered during construction, an unexpected contaminated finds protocol will be implemented.</p> <p>The protocol will detail requirements for ceasing work and isolating the potential contaminated material, requirements for site investigations and procedures for reporting and response.</p> <p>Site investigations, where required, will be undertaken by a suitably qualified and experienced consultant, as defined in Schedule B9 of the NEPM (2013) to assess exposure risks to site workers and other receptors.</p> <p>The results of the site investigations will be assessed against the criteria contained within the <i>National Environment Protection (Assessment of Site Contamination) Measure 1999</i> to determine the need for any remediation.</p> | Detailed design/<br>pre-construction |
| Hazardous materials | <p>An occupational hygienist will be engaged to complete survey of areas known or suspected to contain asbestos or lead-based paint potentially impacted by the proposal. This work will be carried out in accordance with asbestos and lead-based paint management controls contained in the contamination and hazardous materials sub-plan of the CEMP. This would include (but is not limited to) areas with known or suspected asbestos or lead based paint including Murray River bridge (AEC 1), The Rock Yard clearances (AEC 27), buildings at Wagga Wagga Yard clearances (AEC 35), Harefield Yard clearances (AEC 41) and buildings at Junee Yard clearances (AEC 42). Lead paint is known to be present at Murray River bridge (AEC 1).</p>                                                                                  | Detailed design/<br>pre-construction |
| Hazardous materials | <p>An appropriately licensed asbestos removal contractor will be engaged to remove all asbestos identified to be present. Removal will be undertaken in accordance with How to Safely Remove Asbestos Code of Practice (Safe Work Australia, 2020) and relevant regulatory requirements.</p> <p>This work will be carried out in accordance with asbestos management controls contained in the contamination and hazardous materials sub-plan of the CEMP.</p>                                                                                                                                                                                                                                                                                                                                                                          | Construction                         |
| Hazardous materials | <p>Lead-based paint at localised areas on structures to be modified will be appropriately removed and/or managed in accordance with the lead risk work outlined in <i>Work Health and Safety Regulation</i> (2017).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Construction                         |



| IMPACT TYPE | MITIGATION MANAGEMENT MEASURE                                                                                                                                                                                                                             | PROJECT PHASE |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|             | Lead-based paint removal will be performed in accordance with the procedure outlined in AS/NZS 4361.2:201 Guide to hazardous paint management, Part 1: Lead and other hazardous metallic pigments in industrial applications (Standards Australia, 2017). | Construction  |

## 8.3 PREDICTED EFFECTIVENESS OF THE MITIGATION AND MANAGEMENT MEASURES PROPOSED

The mitigation measures specified above are anticipated to reduce the likelihood and/or consequence of the identified risks. Where an identified issues/risk is reduced but not eliminated, for example asbestos identified in shallow fill material, it will need to be assessed further through all project stages to determine if further action is required and then managed using the UFP.

If any issues are unable to be mitigated through the design, construction or operational process, site-specific analysis will be undertaken during detailed design to inform how issues associated with constructing infrastructure in dispersive and saline or sodic soils will be managed, including appropriate treatment measures (as required). Design documents will specify construction procedures to identify and address ‘unsuitable’ subgrade soils.

Auditing and monitoring will be undertaken during construction to ensure that the CEMP and relevant included plans are being implemented.

## 9 CONCLUSIONS

WSP was commissioned by ARTC to complete a contamination assessment as part of the Albury to Illabo section of Inland Rail ('the proposal').

The majority of regional soils have some localised potential salinity hazard associated with them. The highest risk is associated with enhancement sites that have high or moderate potential for salinity and more significant excavation comprising Riverina Highway bridge enhancement site, Billy Hughes bridge enhancement site, Pearson Street bridge enhancement site and Kemp Street bridge enhancement site. The actual hazard will depend on site specific features including the soil properties, local topography and hydrology, and the proposed construction can also have an effect. The risks will be managed during the development through preparing and adopting a salinity management plan. Prior to the plan being prepared soil testing at the enhancement sites will be conducted.

Though ASS and acid soils are unlikely to be a significant concern on the project, the Murray River sediments have a "high probability" of occurrence of inland ASS. It is noted that proposed works include increasing the gantry height and as such sediments are unlikely to be encountered.

The potential for local geological layers to contain sulfidic material cannot be ruled out. Where the proposal will include cutting into bedrock it is recommended that a geologist or geotechnical engineer advise on the potential for the works to intercept sulfidic rock so that risks, if present, can be managed.

The assessment identified a number of AECs and potential contamination sources including:

- use of the railway line, and in particular areas where historical maintenance may have occurred, predominantly around sidings and stations
- unknown fill and stockpiling of waste across sections of the proposal site to construct existing nearby roads and rail infrastructure
- weed suppressing activities around sidings and stations
- hazardous building material in structures
- ballast stockpiles within the rail corridor and yards
- service stations and fuel storage and RFS buildings located in the vicinity of the proposal site
- former fuel depots located adjacent to, or partially within, the study area
- agricultural use of land adjacent to the proposal site, presenting a low risk of diffuse agricultural chemical residues and moderate potential for isolated hotspots where machinery maintenance or chemical storage and transfer activities occurred; and
- waste dumping, particularly in locations near existing roads, road crossings, or potentially in infilled gullies or dams that may be discovered during the works.

Potential contaminants of concern relating to the above contamination sources include (but are not limited to) TRH, BTEX, PAH, OCPs, OPPs, PCBs, PFAS and ACM.

The key risks to receptors (as identified in section 5.5) identified:

- the potential for direct contact exposure by construction workers or future maintenance workers is considered to be a low risk, with exception of the following medium risks, where workers may be exposed to soils associated with:
  - dumped materials and stockpiles along the proposal site
  - hazardous building materials dumped in enhancement sites or from poorly maintained buildings located in/adjacent to enhancement sites
  - machine storage and maintenance areas.

Contamination risks are likely to be localised and manageable through assessment prior to early and main works being undertaken and by the implementation of mitigation during construction. Based on the desktop assessment, site inspection and in the context of continuing railway land use, for the requirement for further detailed site investigations was identified at the enhancement sites where asbestos has been identified. Where asbestos has been identified further assessment will be required prior to construction and potentially remediation which may comprise emu pick, excavation or capping of soils, depending upon the extent of the asbestos and the planned works. Where asbestos is identified within buildings it will either be removed or labelled and maintained in good condition. Additional asbestos or contamination may be discovered during the works. These risks will be managed by implementation of an unexpected finds protocol.

Site investigations at more developed precincts (Albury and Wagga Wagga) and enhancement sites with more significant excavation (Riverina Highway bridge, Billy Hughes bridge, Pearson Street bridge and Kemp Street bridge) will be undertaken by a suitably qualified and experienced consultant, as defined in Schedule B9 of the NEPM (2013) to inform the detailed design and the subsequent management and classification of waste soil.

If potential lead paint is to be disturbed during enhancement works its condition will be inspected prior to enhancement works commencing. Where lead paint is identified this will either be maintained in good condition or sealed in place or removed if poor condition is noted.

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# 11 LIMITATIONS

This Report is provided by WSP Australia Pty Limited (*WSP*) for ARTC (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal and agreement with the Client (*Agreement*).

## *PERMITTED PURPOSE*

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (*Permitted Purpose*).

## *QUALIFICATIONS AND ASSUMPTIONS*

The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and / or recommendations in the Report (Conclusions) are based in whole or in part on information provided by the Client and other parties identified in the report (Information), those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

The Conclusions are reflective of the current Site conditions and cannot be regarded as absolute without further extensive intrusive investigations, outside the scope of the services set out in the Agreement and are indicative of the environmental condition of the Site at the time of preparing the Report. As a general principle, vertical and horizontal soil or groundwater conditions are not uniform. No monitoring, common or intrusive testing or sampling technique can eliminate the possibility that monitoring or testing results or samples taken, are not totally representative of soil and / or groundwater conditions encountered at the Site. It should also be recognised that Site conditions, including subsurface conditions can change with time due to the presence and concentration of contaminants, changing natural forces and man-made influences.

Within the limitations imposed by the scope of the services undertaken by WSP, the monitoring, testing (intrusive or otherwise), sampling for the preparation of this Report has been undertaken and performed in a professional manner in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

WSP has prepared the Report without regard to any special interest of any person other than the Client when undertaking the services described in the Agreement or in preparing the Report..

## *USE AND RELIANCE*

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# TECHNICAL PAPER 13

Contamination

## Appendix A Figures

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT



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**APPENDIX A-1**  
**FIGURE 1 – SALINITY – 0–30cm**



Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:3,000

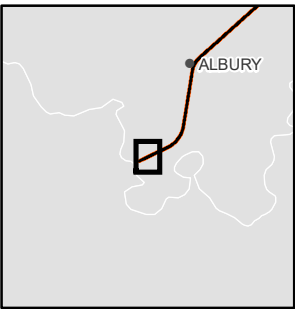
**Electrical conductivity (0-30cm)**

High : 3.77

Low : 0.01

**Legend:**

- Proposal Site
- Track alignment
- Main road
- Watercourse



The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.





Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:7,500

Proposal Site

Track alignment

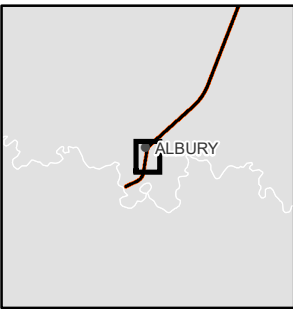
Main road

Watercourse

**Electrical conductivity (0-30cm)**

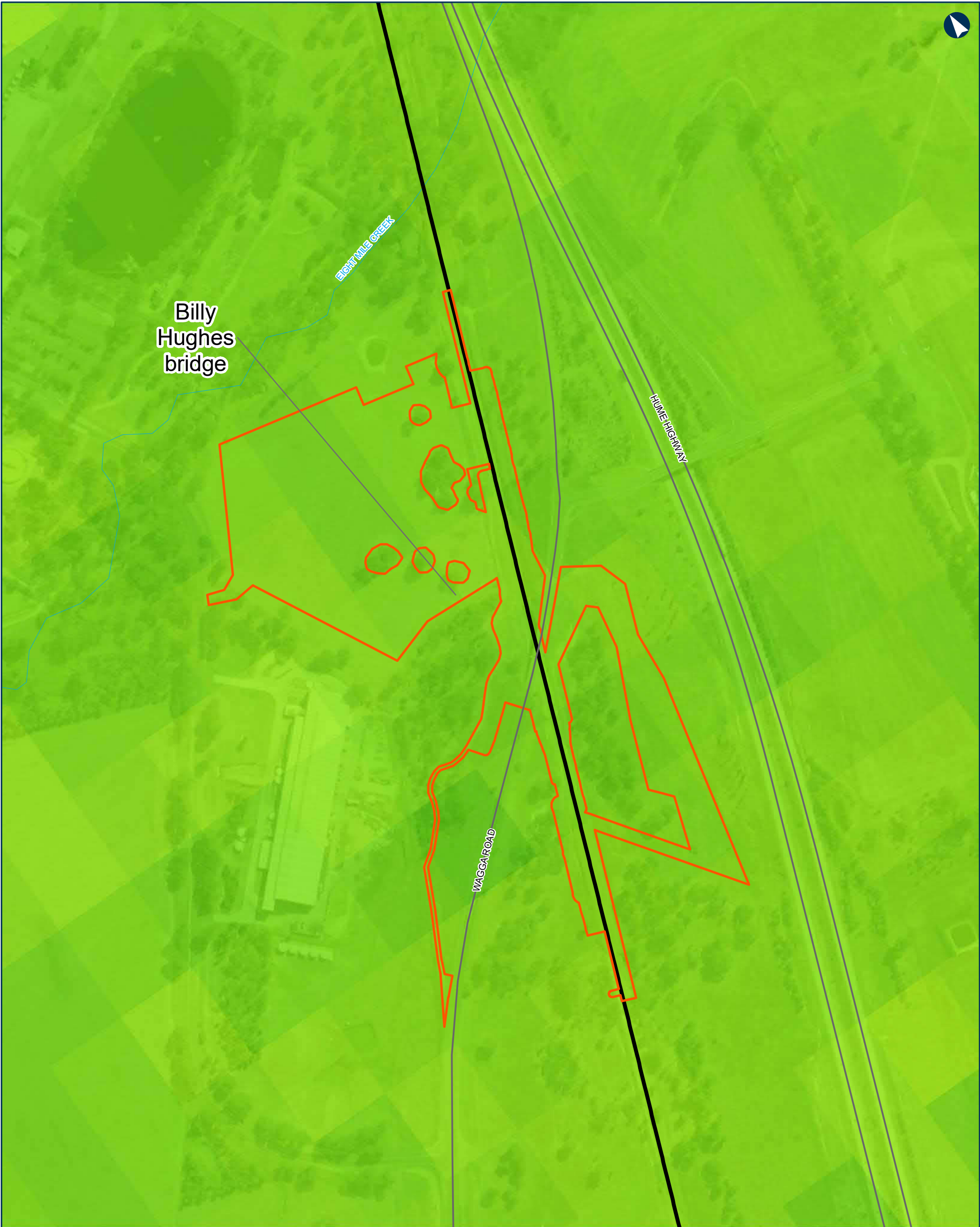
High : 3.77

Low : 0.01



The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.





Albury to Illabo

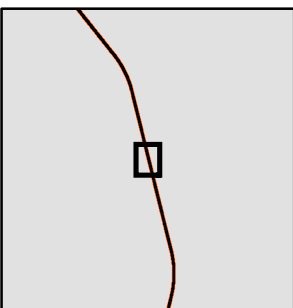
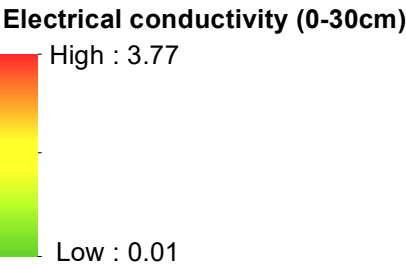
Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ  
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Author: WSP Scale: 1:4,500  
Data Sources: ARTC, NSWSS

- Proposal Site
- Track alignment
- Main road
- Watercourse



INLAND RAIL ARTC

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Albury to Illabo

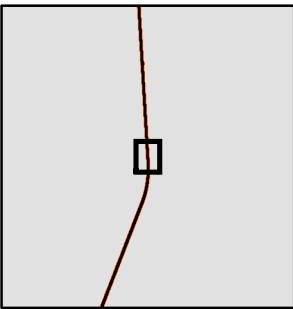
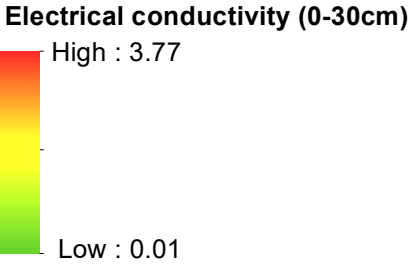
Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ  
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Date: 25/05/2022 Paper: A3  
Author: WSP Scale: 1:4,500  
Data Sources: ARTC, NSWSS

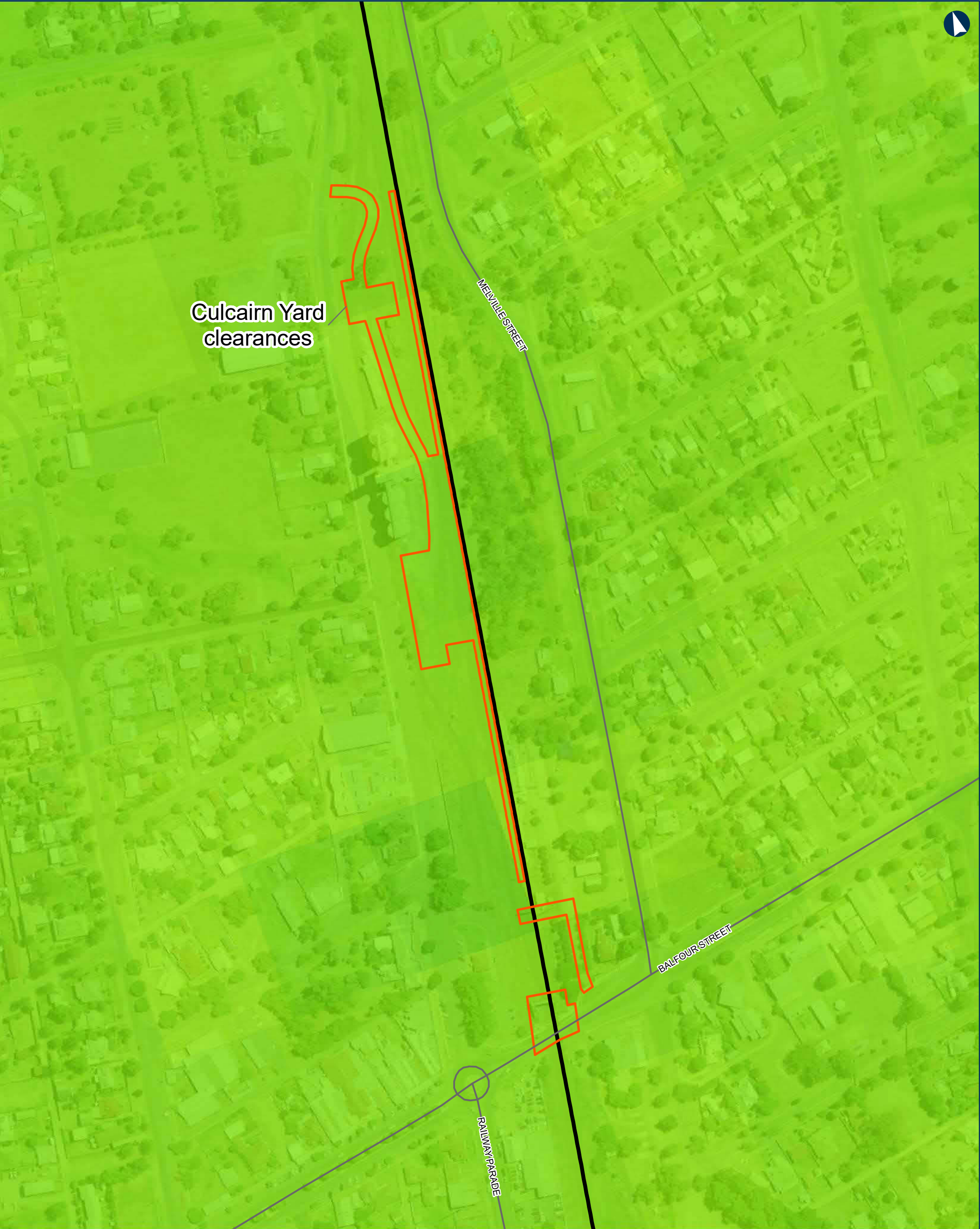
- Proposal Site
- Track alignment
- Main road



**INLAND RAIL** **ARTC**

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Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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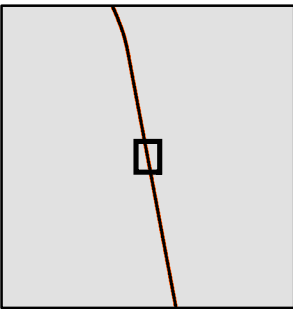
Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:3,000

□ Proposal Site  
— Track alignment  
— Main road

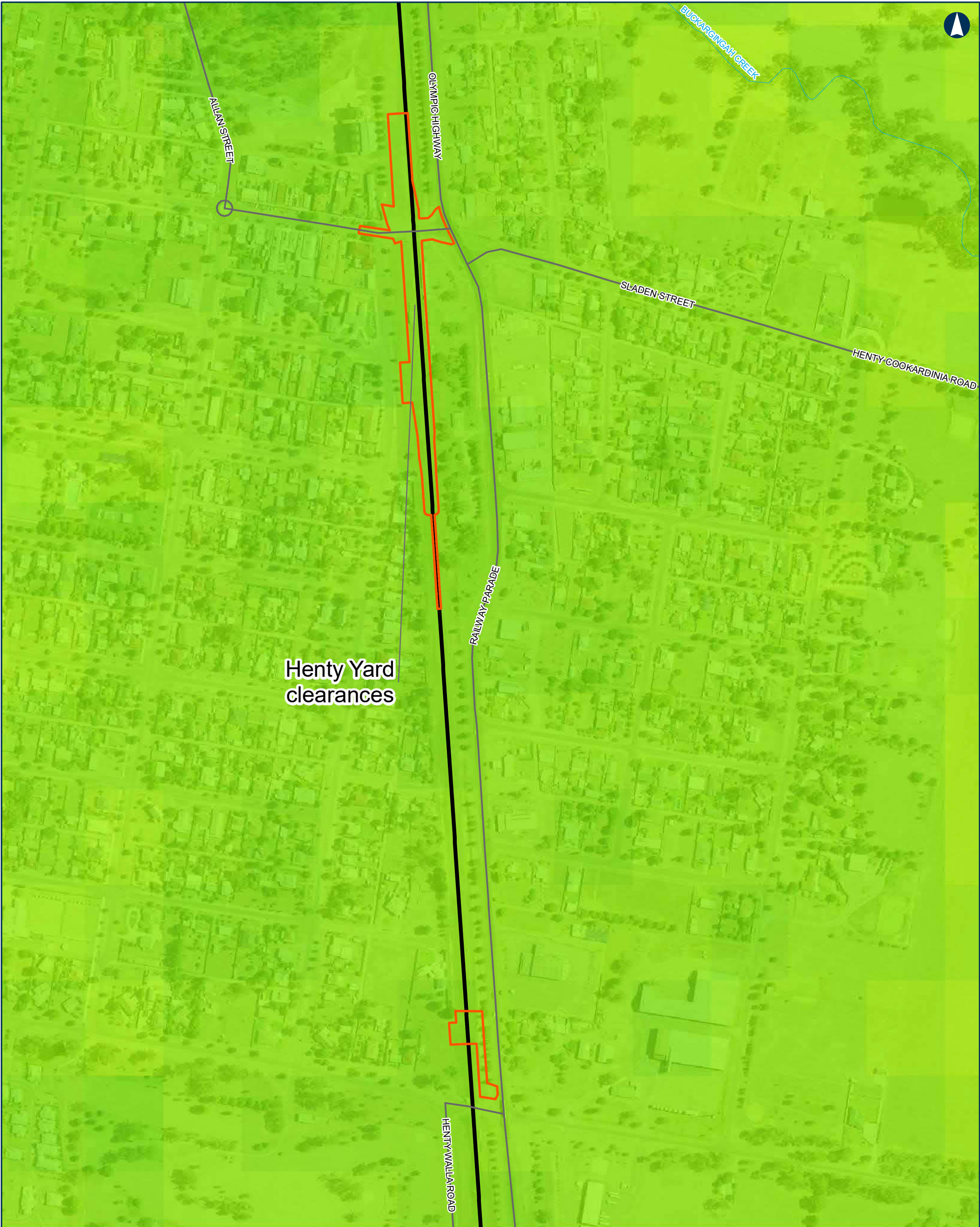
**Electrical conductivity (0-30cm)**

High : 3.77  
Low : 0.01



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Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

MAP 6 OF 20

0 50 100 m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022

Author: WSP

Data Sources: ARTC, NSWSS

Paper: A3

Scale: 1:5,000

□ Proposal Site

— Track alignment

— Main road

— Watercourse

Electrical conductivity (0-30cm)

High : 3.77

Low : 0.01

HENTY

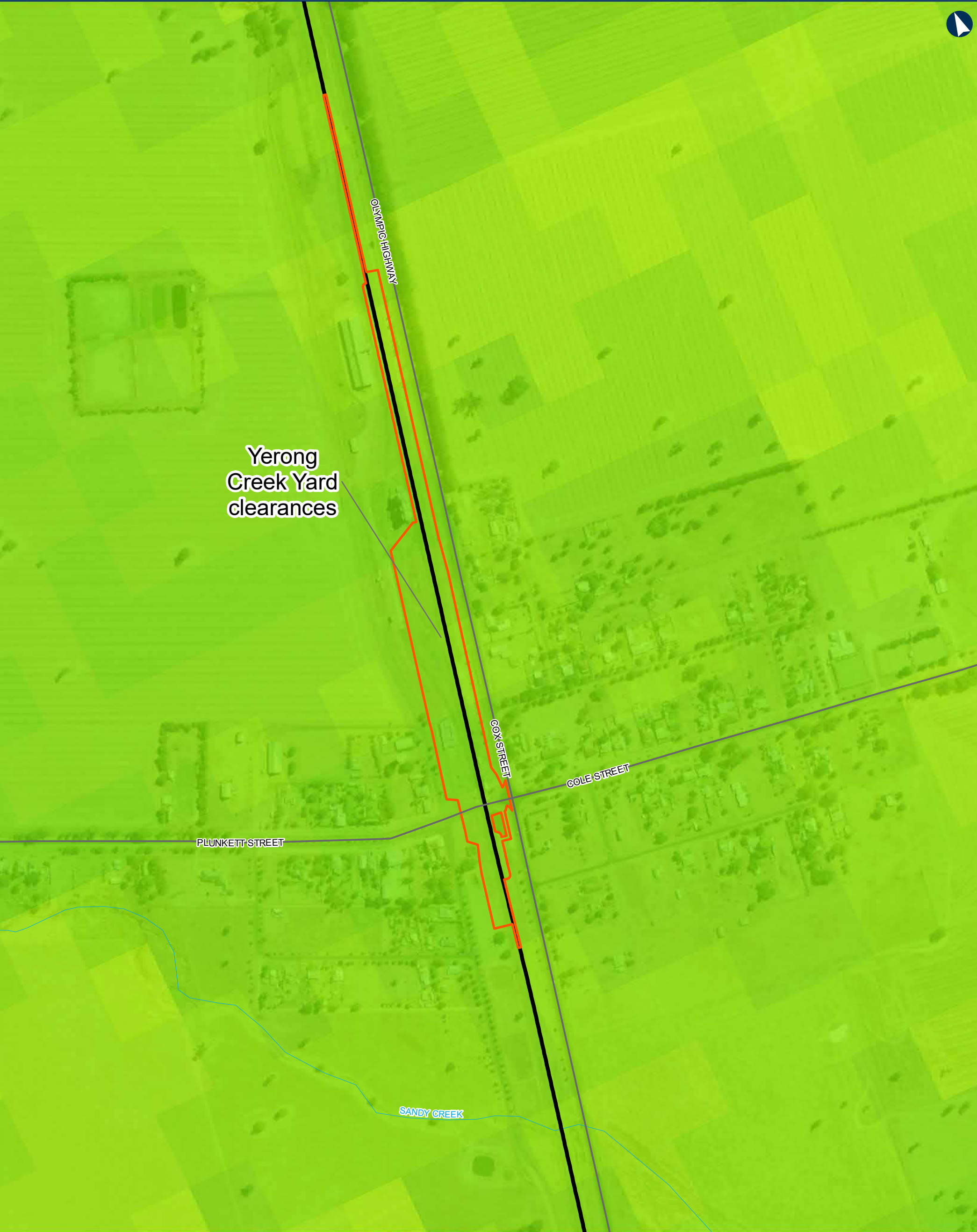
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C:\Users\Emily.Mitchell\WSP 0365\AU-WKG - Geospatial - AIS - Projects\PS122419\_Albury\_to\_Illabo\Tasks\210\_0010\_EAP\_EISReportFigures\Documents\Contaminated\_Land\210\_EAP\_F01\_SalinityMapping\_0-30\_r1v5.mxd





Albury to Illabo

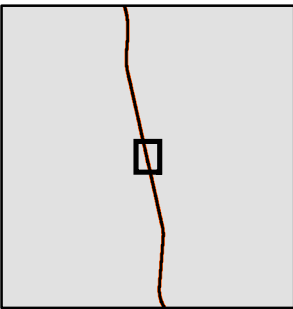
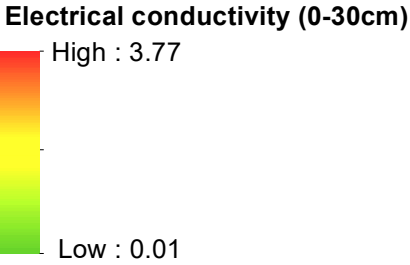
Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ  
ARTC makes no representation or warranty and assumes no duty of care or other responsibility to any party as to the completeness, accuracy or suitability of the information contained in this GIS map. The GIS map has been prepared from material provided to ARTC by an external source and ARTC has not taken any steps to verify the completeness, accuracy or suitability of that material.  
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Date: 25/05/2022 Paper: A3  
Author: WSP Scale: 1:6,000  
Data Sources: ARTC, NSWSS

- Proposal Site
- Track alignment
- Main road
- Watercourse



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Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

MAP 8 OF 20

0 50 100 m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022

Author: WSP

Data Sources: ARTC, NSWSS

Paper: A3

Scale: 1:5,000

■ Proposal Site

— Track alignment

— Main road

— Watercourse

**Electrical conductivity (0-30cm)**

High : 3.77

Low : 0.01

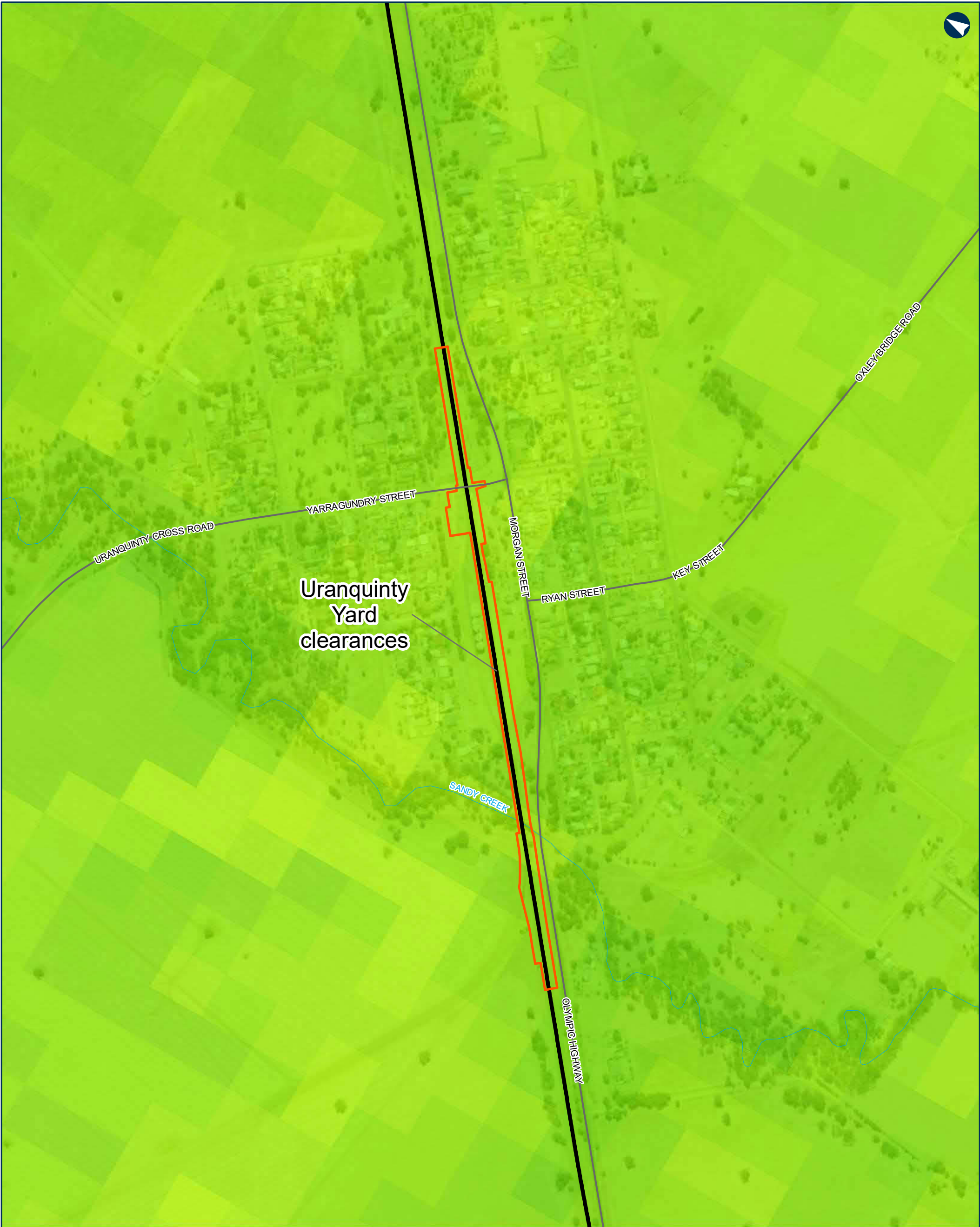
INLAND RAIL

ARTC

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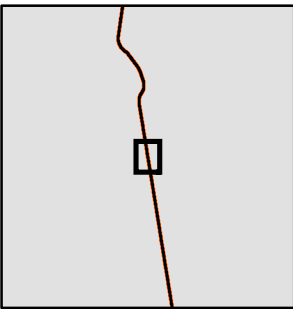
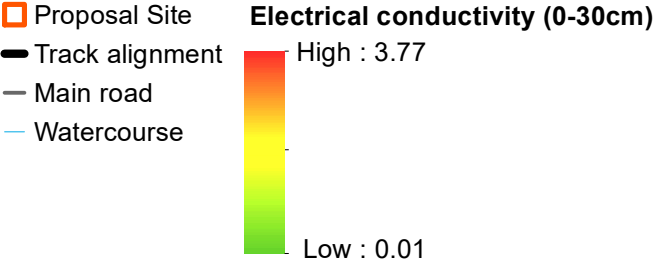
0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:8,000



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Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022      Paper: A3  
Author: WSP            Scale: 1:7,500  
Data Sources: ARTC, NSWSS

Proposal Site

Track alignment

Main road

**Electrical conductivity (0-30cm)**

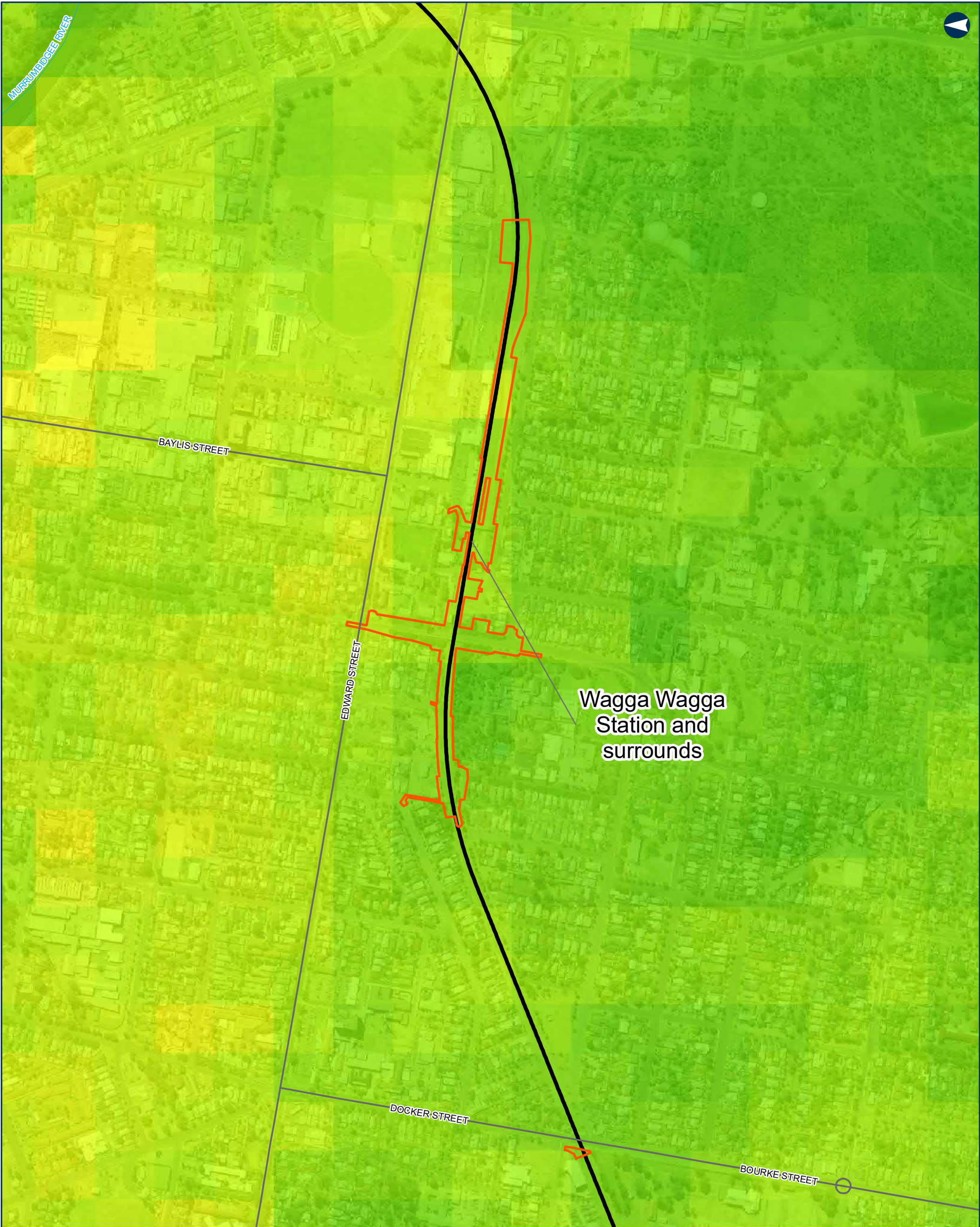
High : 3.77

Low : 0.01



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Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

MAP 11 OF 20

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:8,000

□ Proposal Site

— Track alignment

— Main road

— Watercourse

**Electrical conductivity (0-30cm)**

High : 3.77

Low : 0.01

WAGGA WAGGA

**INLAND RAIL**

**ARTC**

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050100m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022

Paper: A3

Author: WSP

Scale: 1:8,000

Data Sources: ARTC, NSWSS

□ Proposal Site

— Track alignment

— Main road

Electrical conductivity (0-30cm)

High : 3.77

Low : 0.01



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0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:7,000

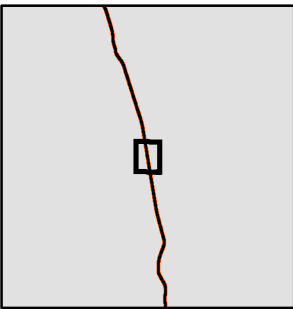
**Electrical conductivity (0-30cm)**

High : 3.77

Low : 0.01

**Legend:**

- Proposal Site
- Track alignment
- Main road
- Watercourse



The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.





Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:9,500

Proposal Site

Track alignment

Main road

Watercourse

**Electrical conductivity (0-30cm)**

High : 3.77

Low : 0.01



The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.





Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

050100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022

Paper: A3

Author: WSP

Scale: 1:8,000

Data Sources: ARTC, NSWSS

■ Proposal Site

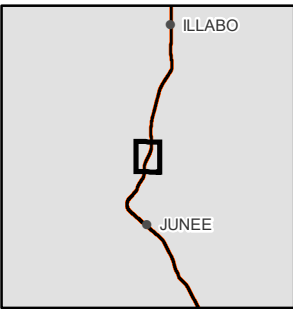
— Track alignment

— Main road

Electrical conductivity (0-30cm)

High : 3.77

Low : 0.01



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Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:8,000

Proposal Site

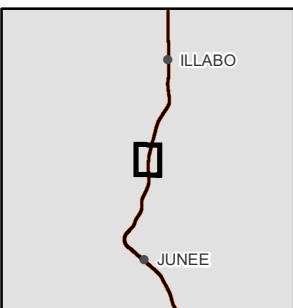
Track alignment

Main road

**Electrical conductivity (0-30cm)**

High : 3.77

Low : 0.01



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Albury to Illabo      Figure 1 - Salinity mapping – 0-30 cm      MAP 17 OF 20

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022      Paper: A3  
Author: WSP      Scale: 1:8,000  
Data Sources: ARTC, NSWSS

**Electrical conductivity (0-30cm)**

High : 3.77

Low : 0.01

Legend:  
[Red outline] Proposal Site  
[Black line] Track alignment  
[Grey line] Main road

**INLAND RAIL** **ARTC**

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Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

050100m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022

Paper: A3

Author: WSP

Scale: 1:8,000

Data Sources: ARTC, NSWSS

Proposal Site

Track alignment

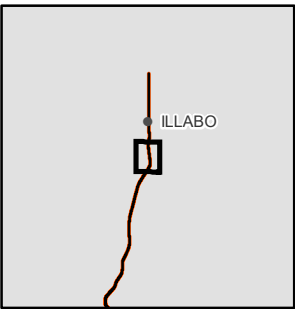
Main road

Watercourse

Electrical conductivity (0-30cm)

High : 3.77

Low : 0.01



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Albury to Illabo

0 50 100 m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022

Paper: A3

Author: WSP

Scale: 1:8,000

Data Sources: ARTC, NSWSS

□ Proposal Site

— Track alignment

— Main road

— Watercourse

Electrical conductivity (0-30cm)

High : 3.77

Low : 0.01

ILLABO

INLAND RAIL

ARTC

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Albury to Illabo

Figure 1 - Salinity mapping – 0-30 cm

0 50 100  
m

Coordinate System: Gunung Segara NEIEZ

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:9,000

■ Proposal Site

— Track alignment

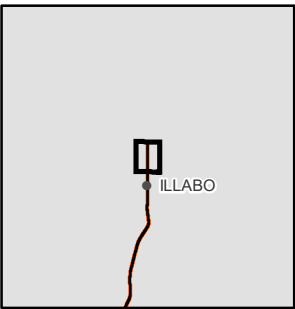
— Main road

— Watercourse

Electrical conductivity (0-30cm)

High : 3.77

Low : 0.01



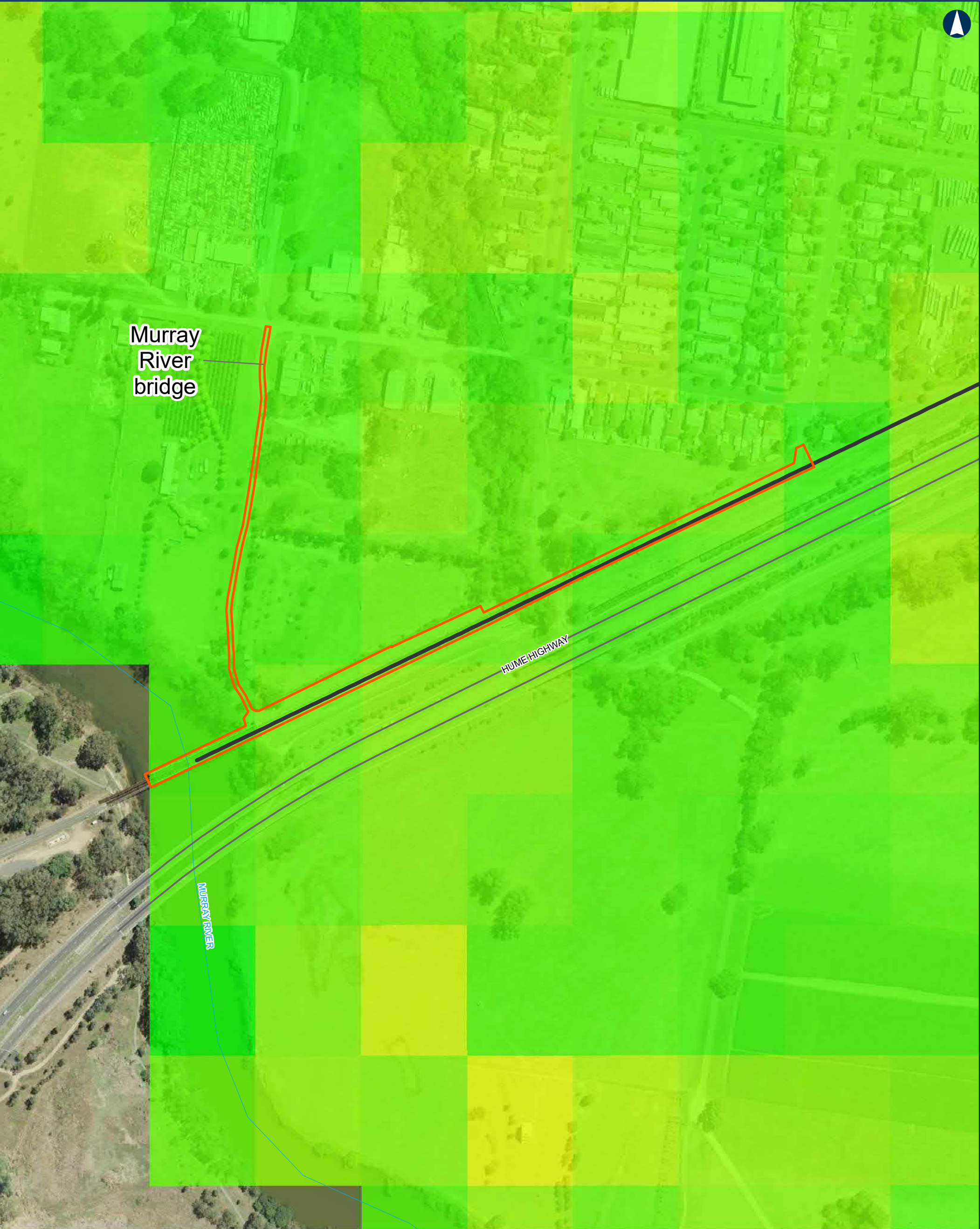
INLAND RAIL = ARTC

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**APPENDIX A-2**  
**FIGURE 2 – SALINITY – >30cm**



Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

MAP 1 OF 20

050100

m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25/05/2022

Paper: A3

Author: WSP

Scale: 1:3,000

Data Sources: ARTC, NSWSS

□ Proposal Site

— Track alignment

— Main road

— Watercourse

Electrical conductivity (>30cm)

89.87

0

ALBURY

□

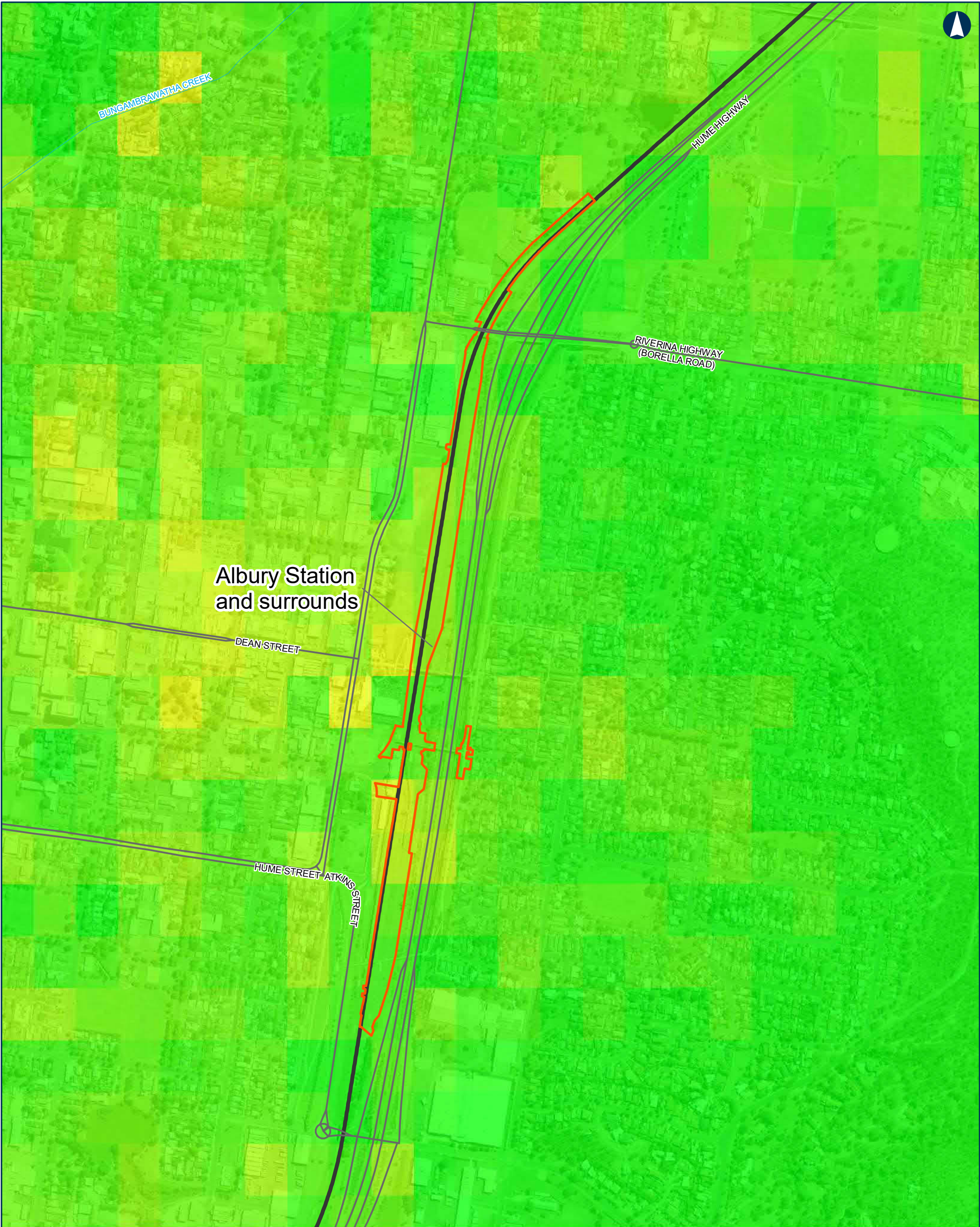
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C:\Users\Emily.Mitchell\WSP 0365\AU-WKG - Geospatial - AIS - Projects\PS122419\_Albury\_to\_Illabo\Tasks\210\_0010\_EAP\_EISReportFigures\Documents\Contaminated\_Land\210\_EAP\_F02\_SalinityMapping\_30\_r1v5.mxd





Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

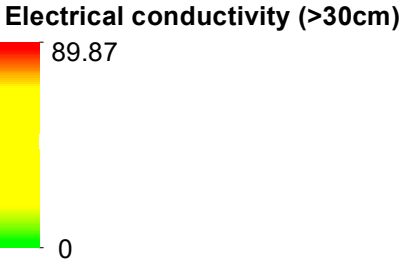
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Coordinate System: GDA 1994 MGA Zone 55  
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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:7,500

- Proposal Site
- Track alignment
- Main road
- Watercourse

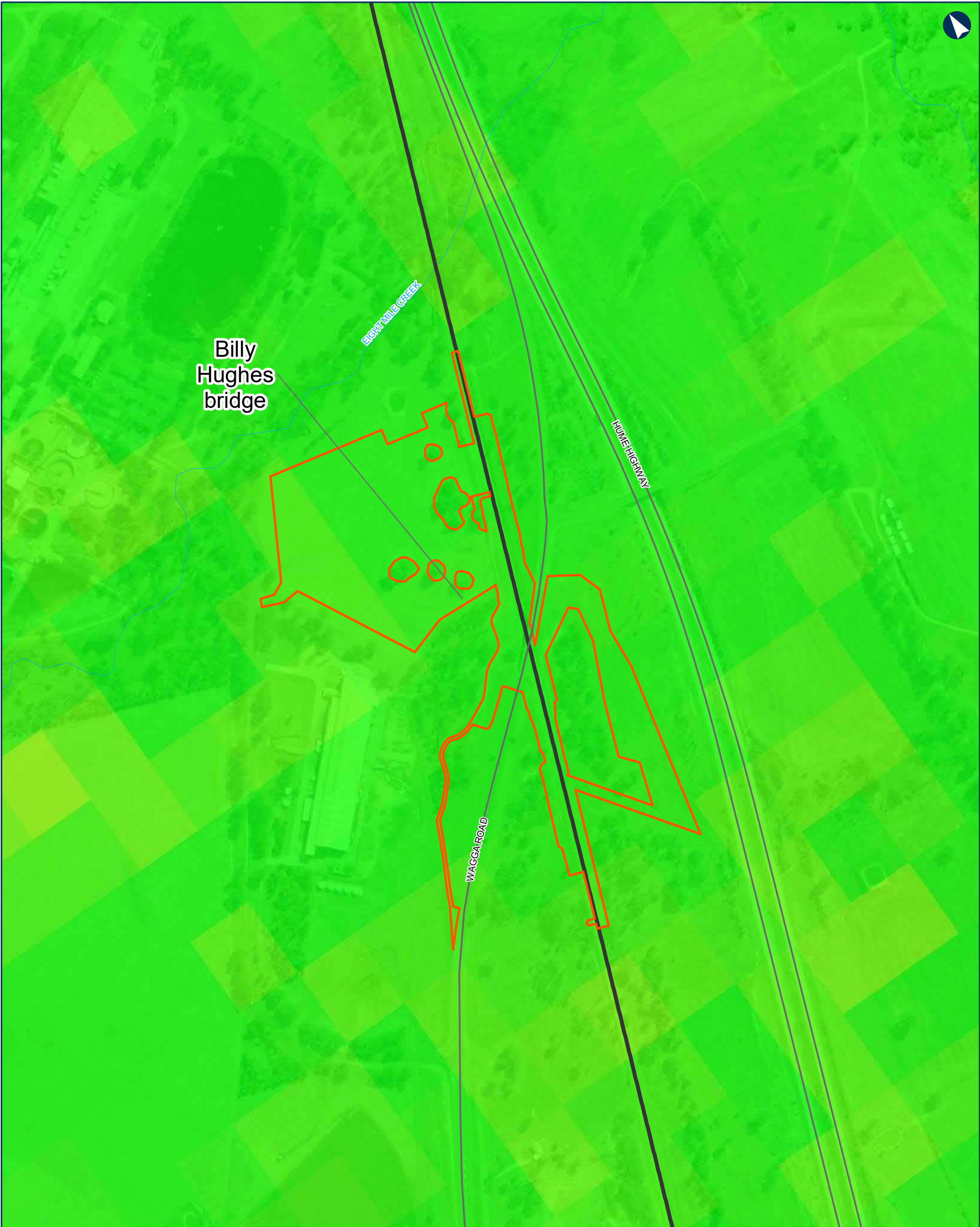


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Albury to Illabo Figure 2 - Salinity mapping – >30 cm MAP 3 OF 20

0 50 100 m

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

**Electrical conductivity (>30cm)**

89.87

0

**Legend**

- Proposal Site
- Track alignment
- Main road
- Watercourse

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Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

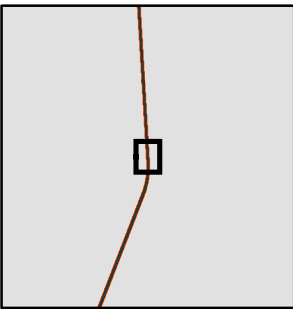
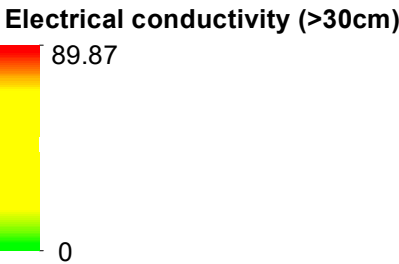
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Author: WSP Scale: 1:4,500  
Data Sources: ARTC, NSWSS

- Proposal Site
- Track alignment
- Main road



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0 50 100  
m

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Date: 25/05/2022

Paper: A3

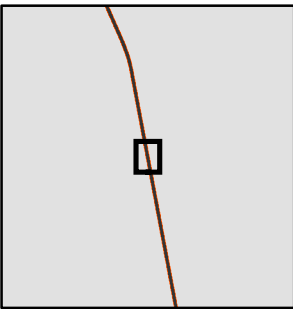
Author: WSP

Scale: 1:3,000

Data Sources: ARTC, NSWSS

Proposal Site  
Track alignment  
Main road

Electrical conductivity (>30cm)



INLAND  
RAIL

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Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

MAP 6 OF 20

050100

m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25/05/2022

Author: WSP

Data Sources: ARTC, NSWSS

Paper: A3

Scale: 1:5,000

Proposal Site

Track alignment

Main road

Watercourse

Electrical conductivity (>30cm)

89.87

0

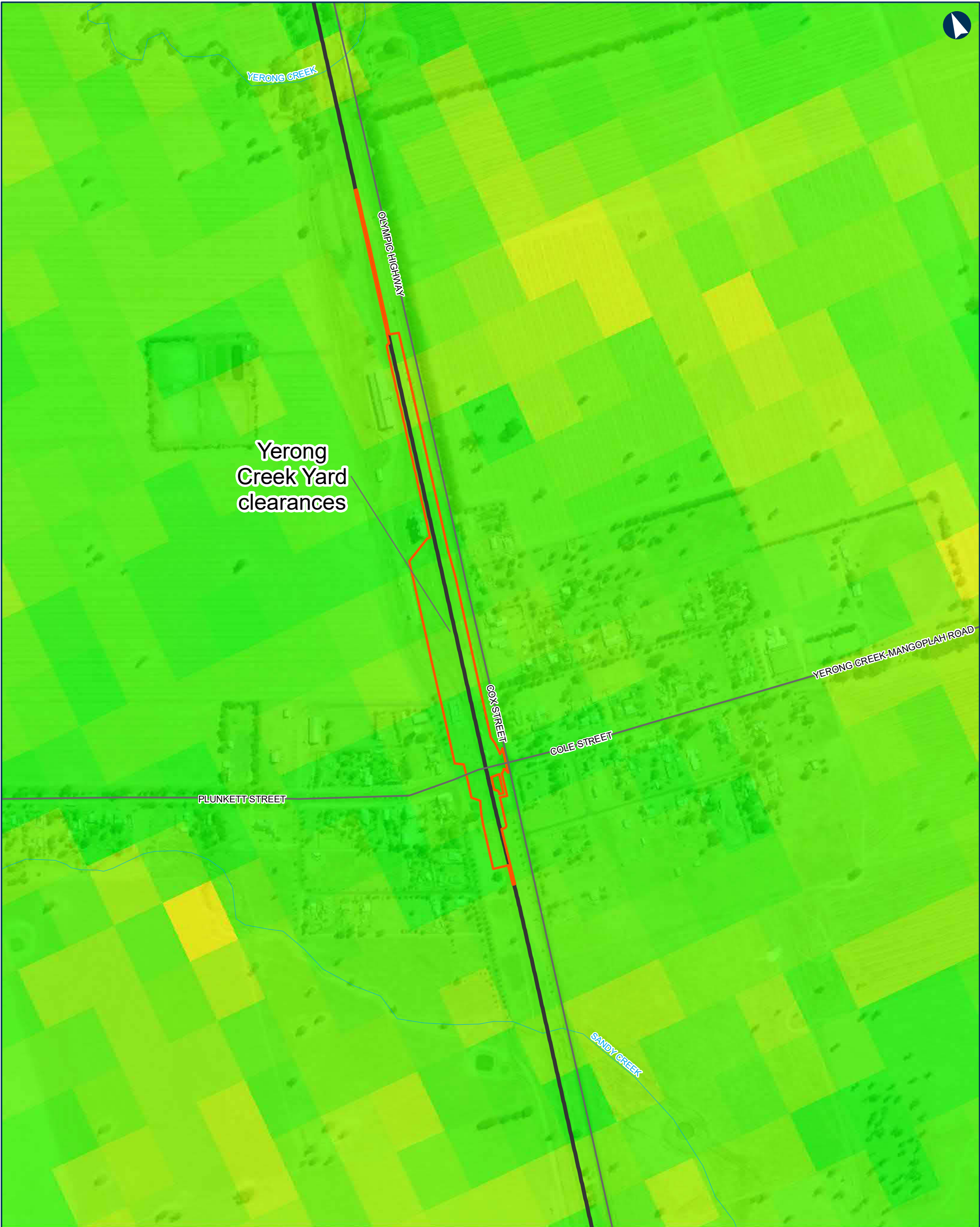
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0 50 100  
m

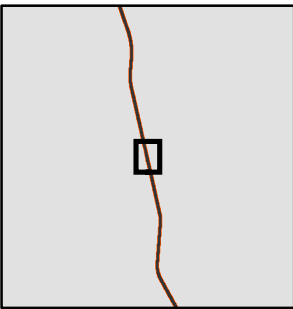
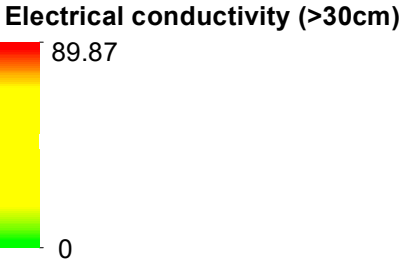
Coordinate System: GDA 1994 MGA Zone 55

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:6,000

- Proposal Site
- Track alignment
- Main road
- Watercourse

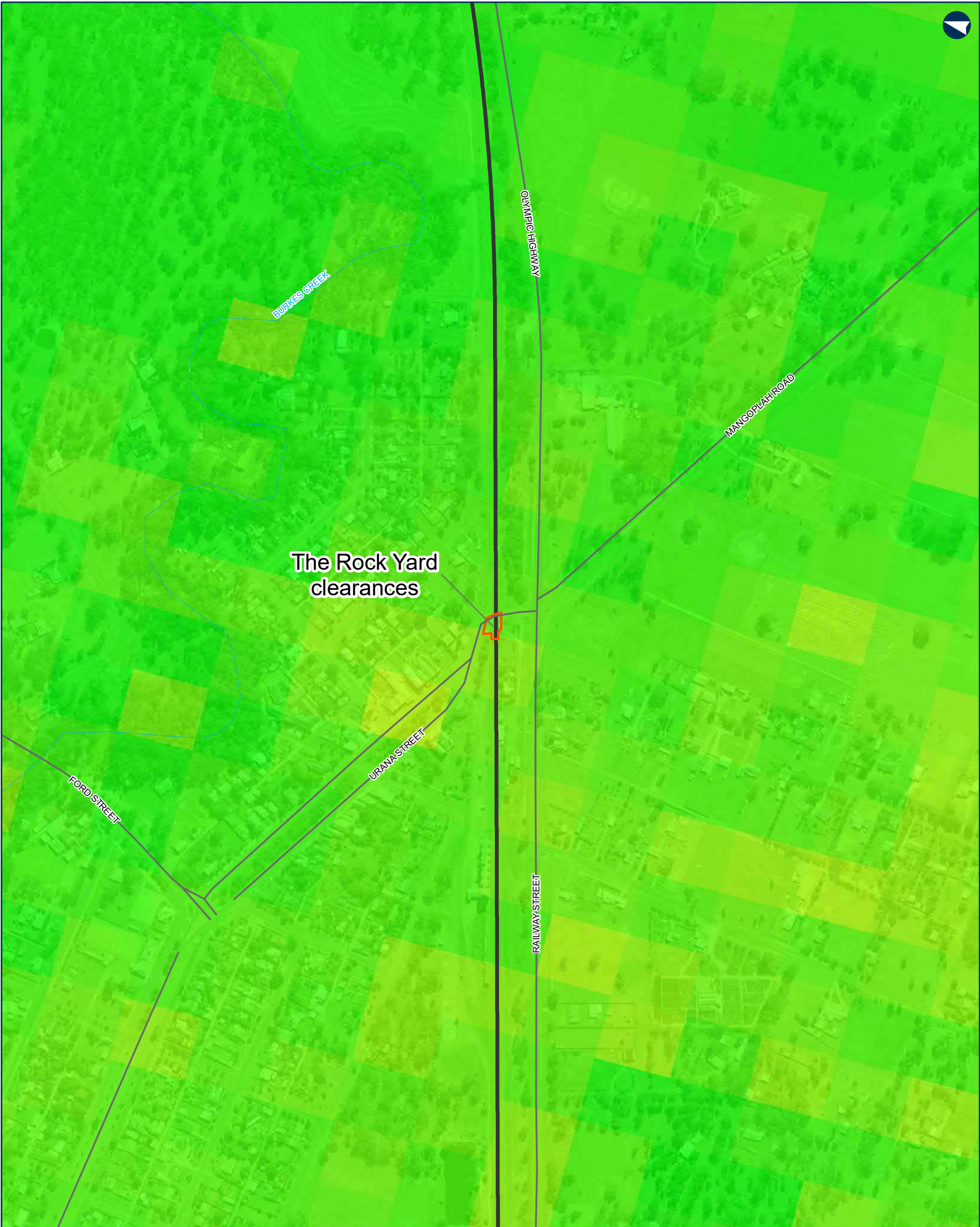


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Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

MAP 8 OF 20

050100m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

■ Proposal Site

— Track alignment

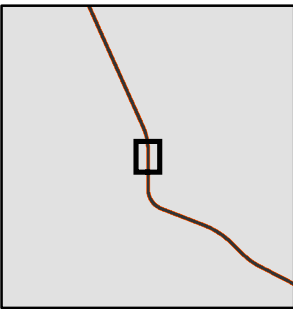
— Main road

— Watercourse

Electrical conductivity (>30cm)

89.87

0

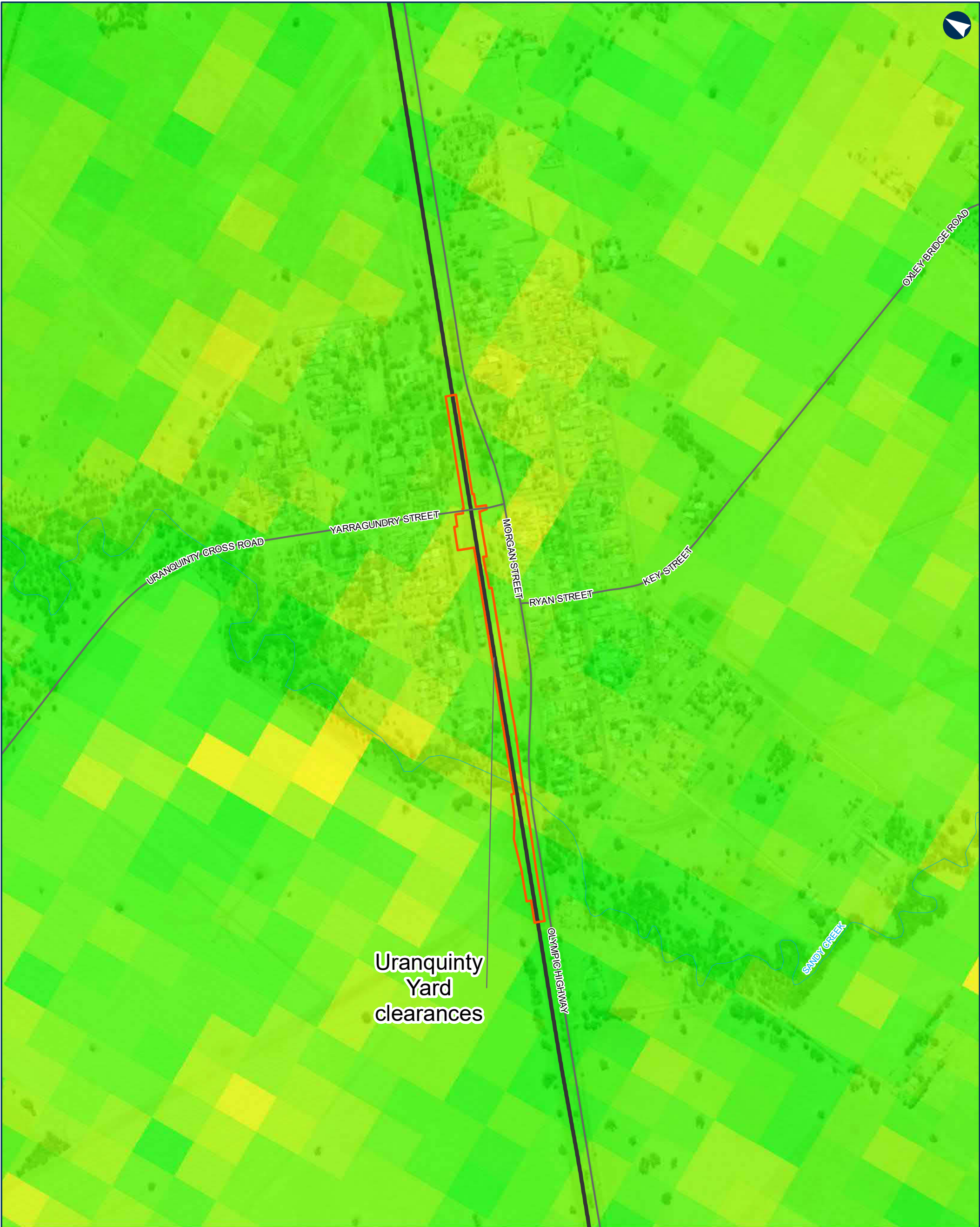


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Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

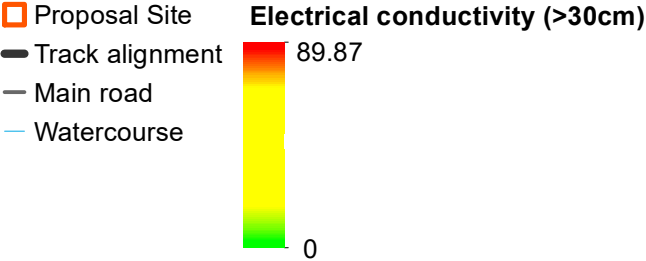
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m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:8,000

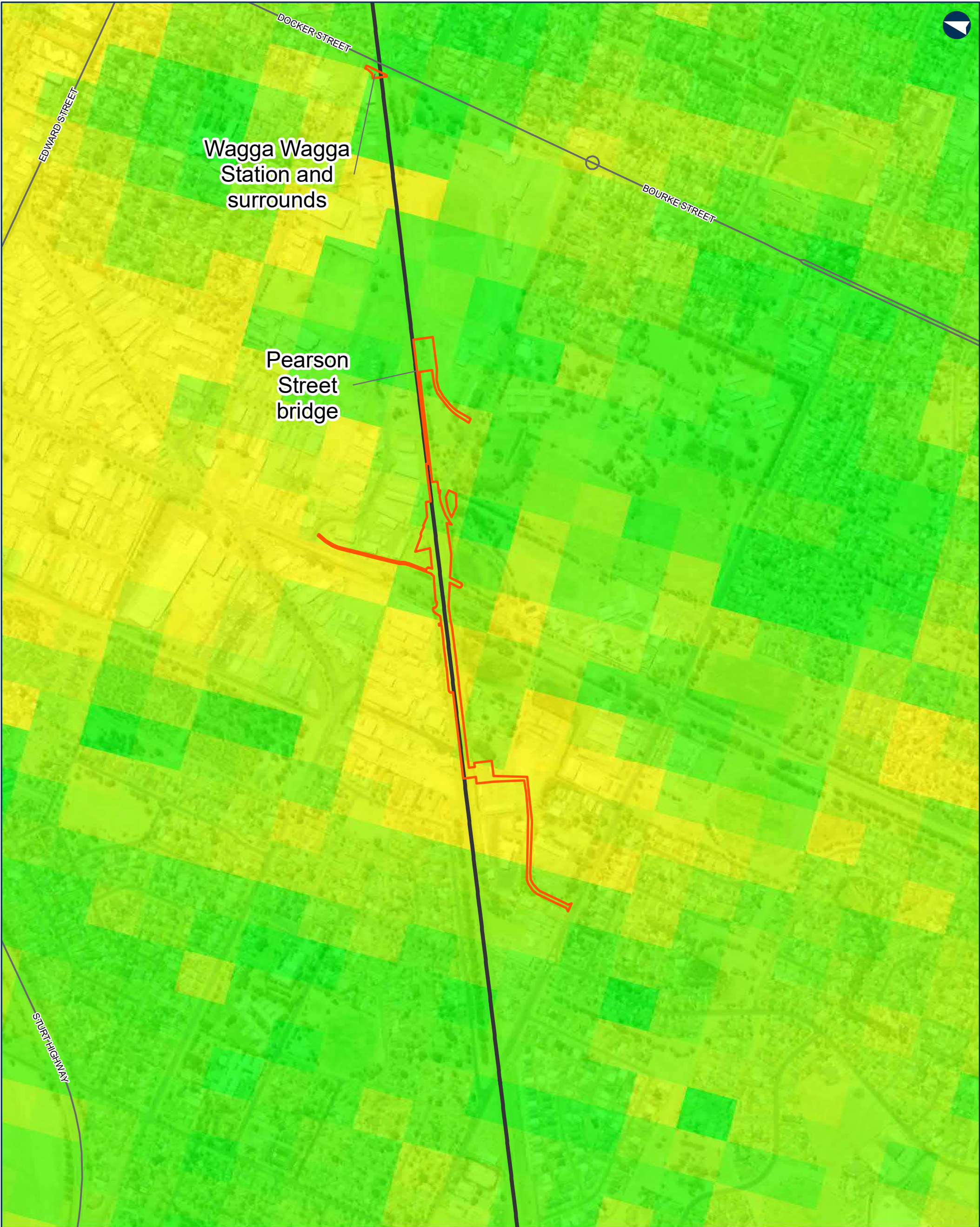


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0 50 100  
m

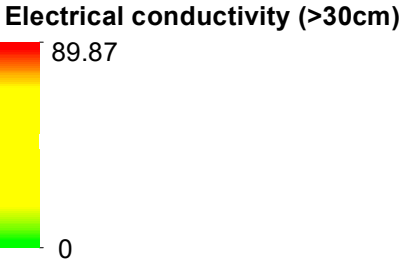
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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:7,500

- Proposal Site
- Track alignment
- Main road

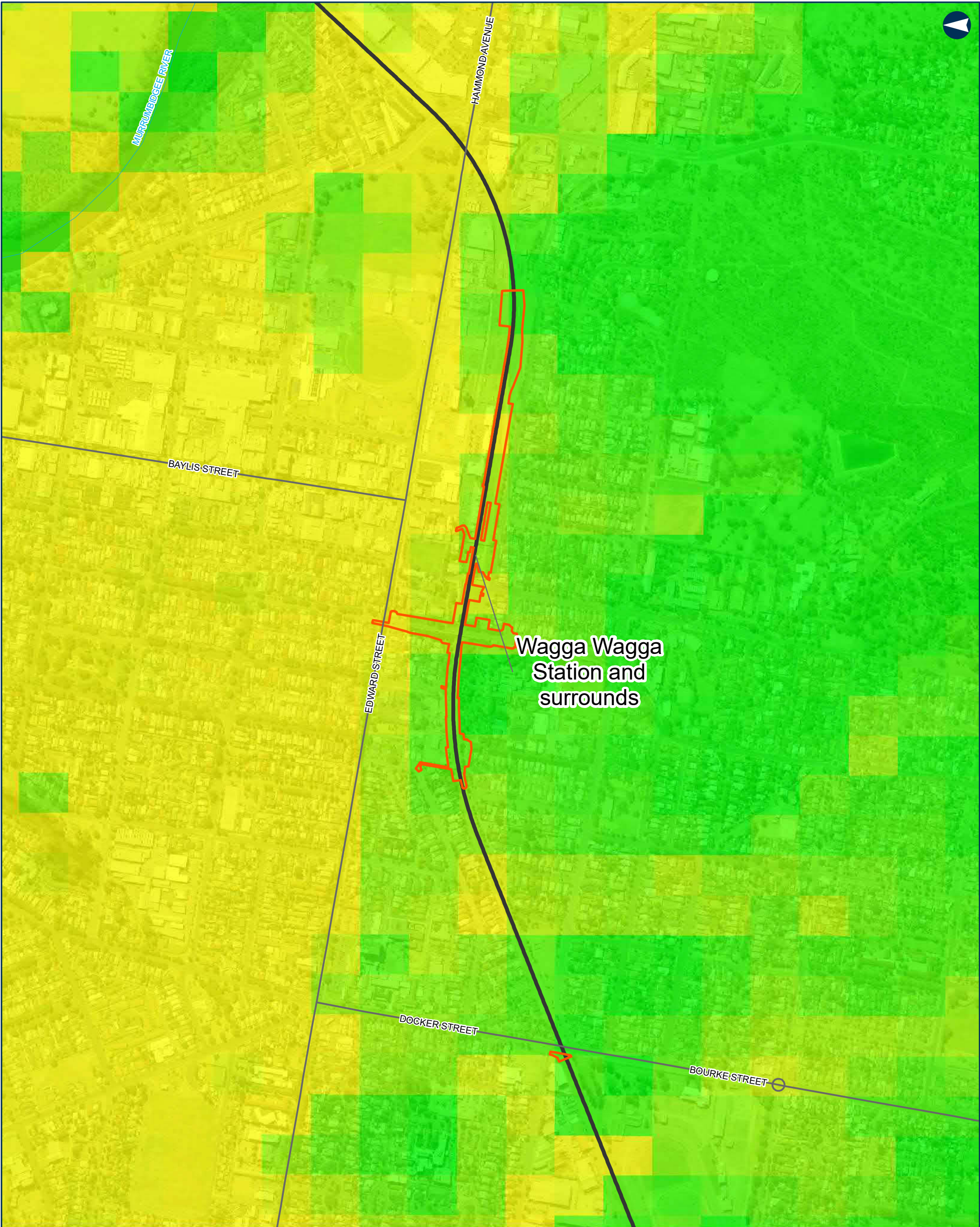


INLAND RAIL

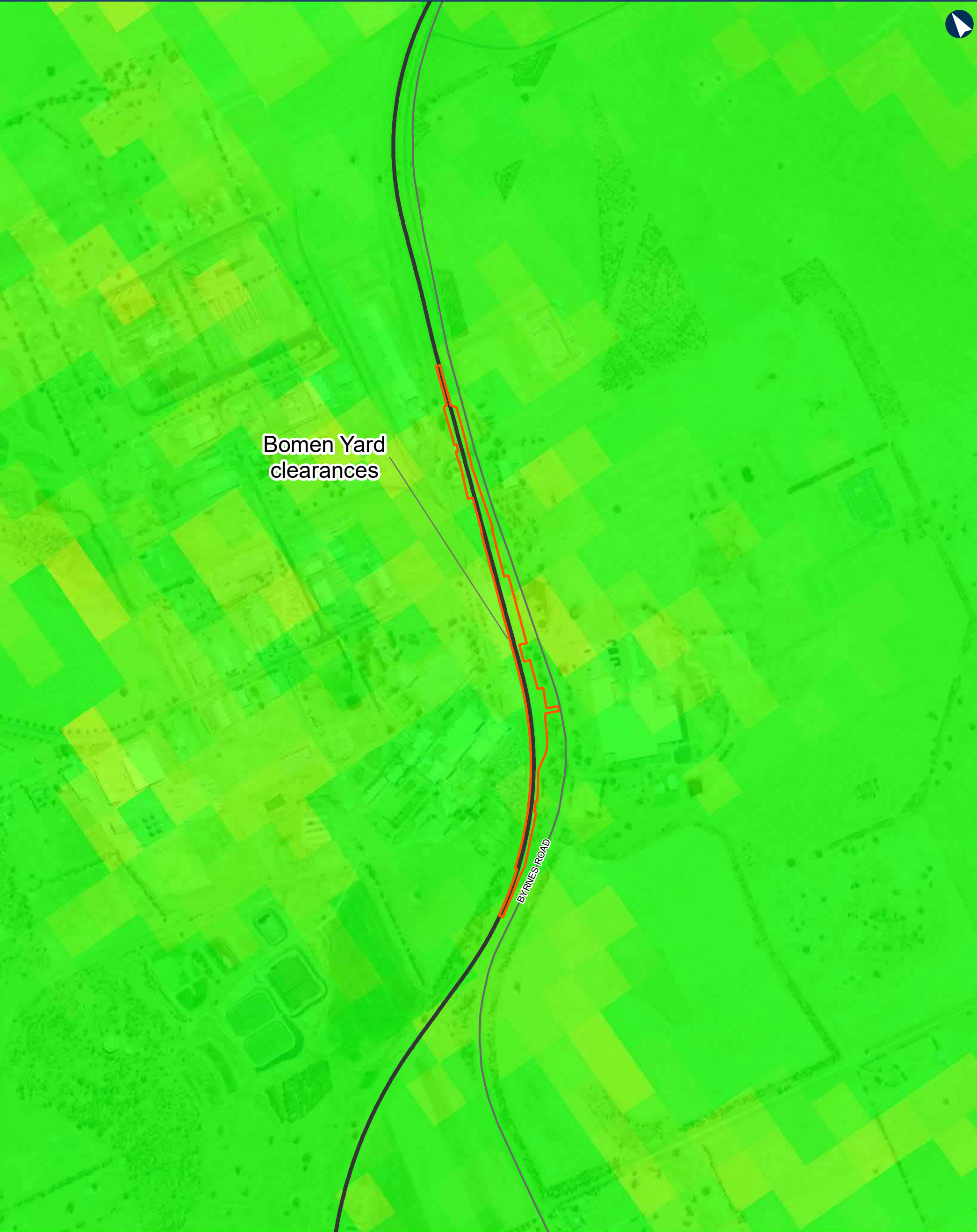
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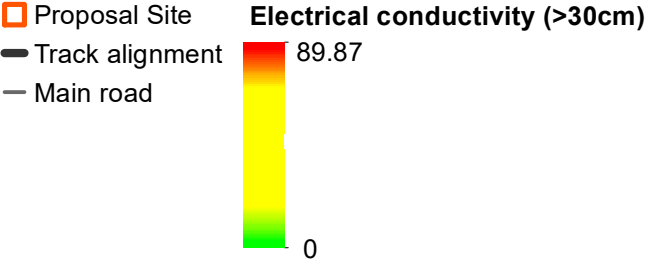
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Coordinate System: GDA 1994 MGA Zone 55

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Data Sources: ARTC, NSWSS

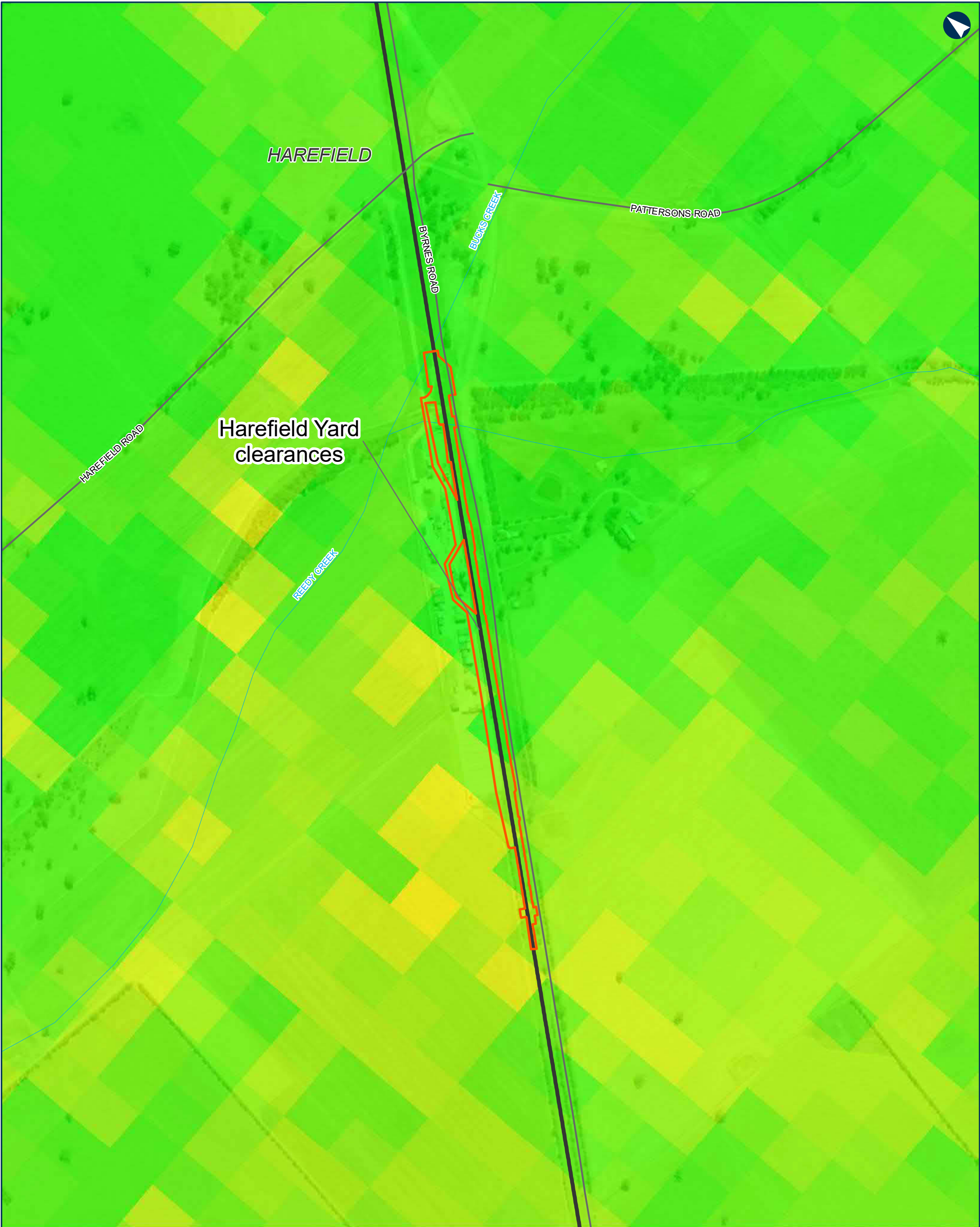
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Scale: 1:8,000



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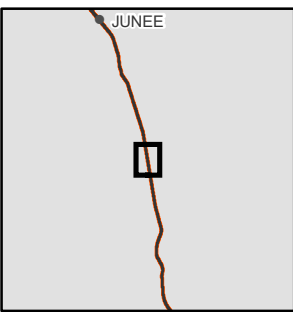
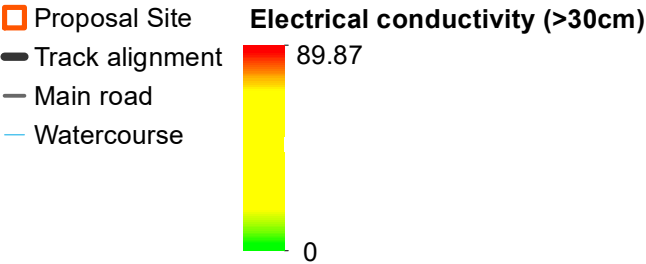
0 50 100  
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Coordinate System: GDA 1994 MGA Zone 55

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Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
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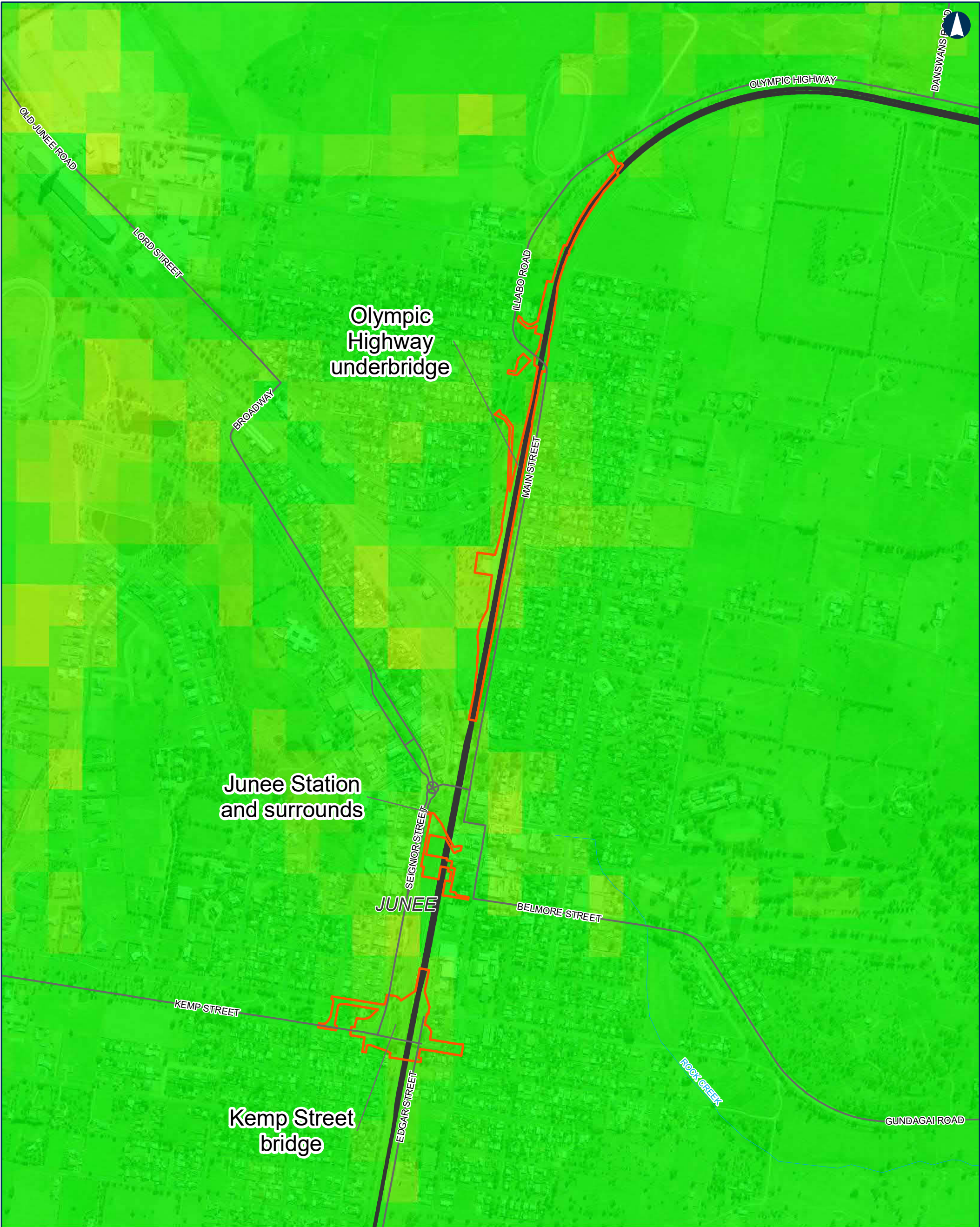


INLAND RAIL

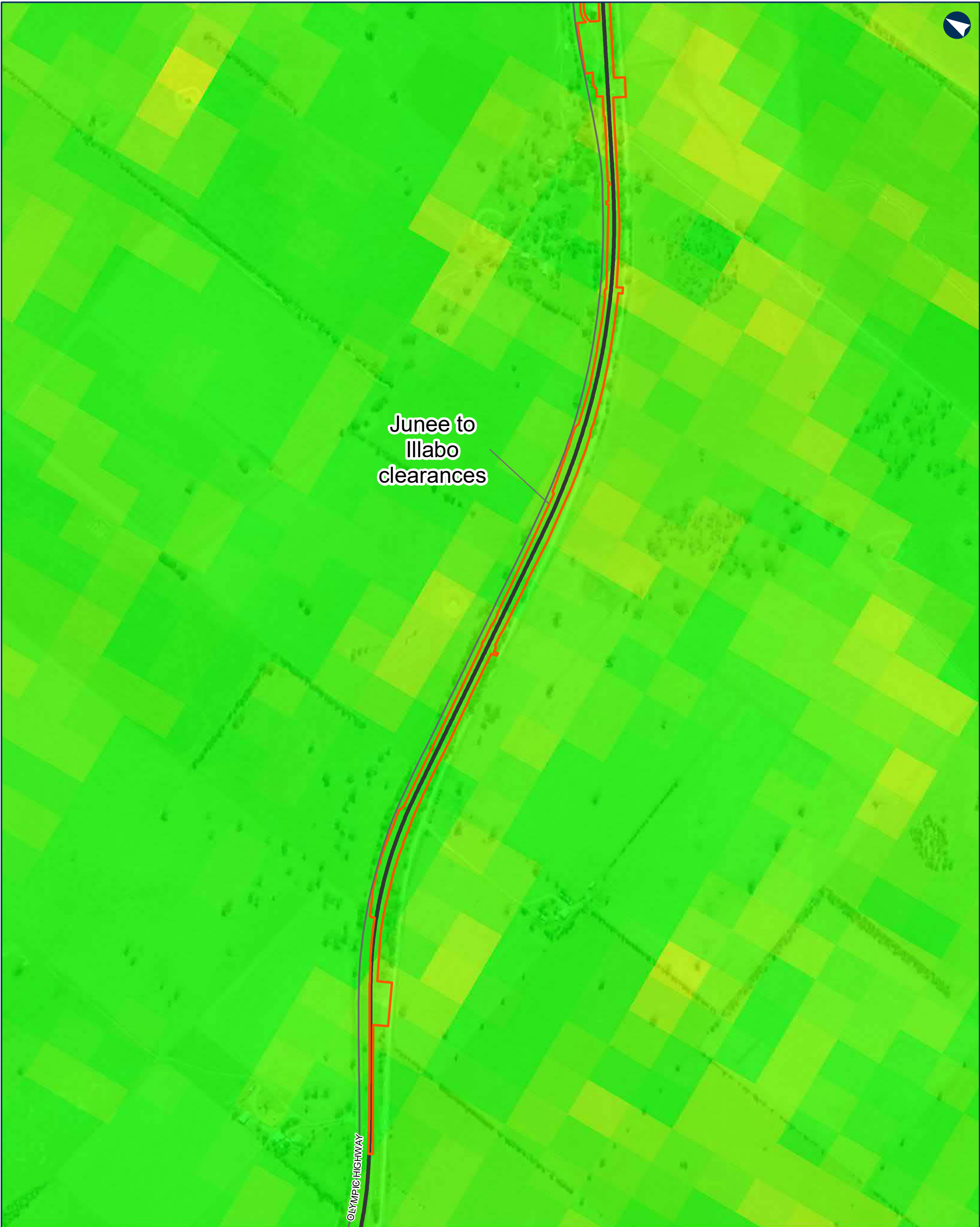
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Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

0 50 100  
m

Coordinate System: GDA 1994 MGA Zone 55

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Author: WSP  
Data Sources: ARTC, NSWSS

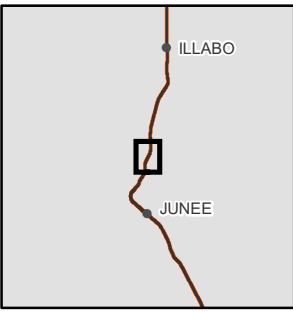
**Electrical conductivity (>30cm)**

89.87

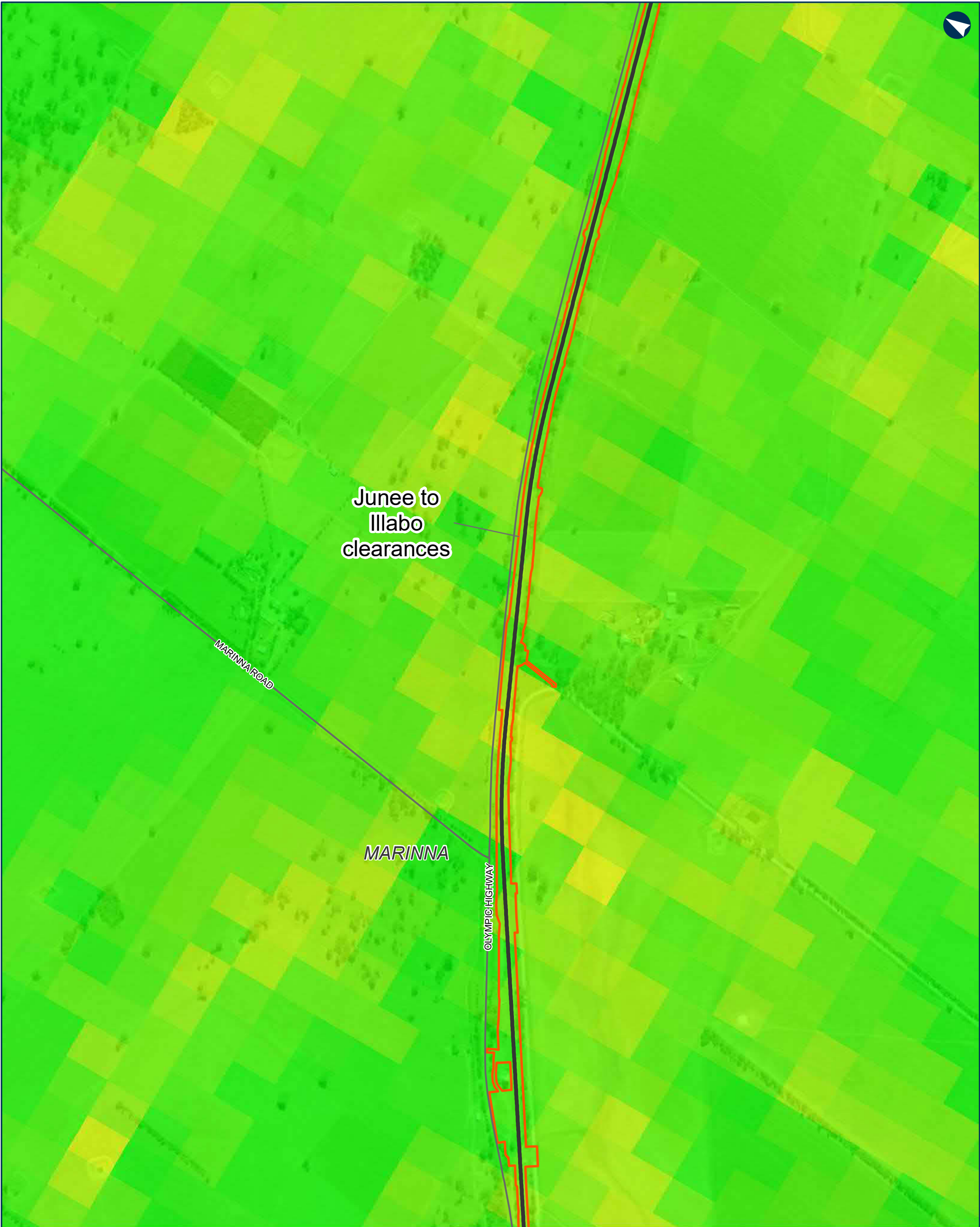
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**Legend**

- Proposal Site
- Track alignment
- Main road



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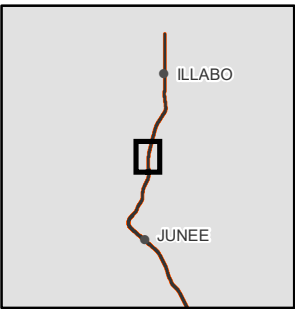
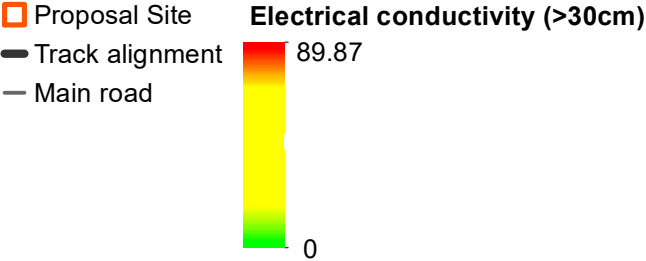
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Coordinate System: GDA 1994 MGA Zone 55

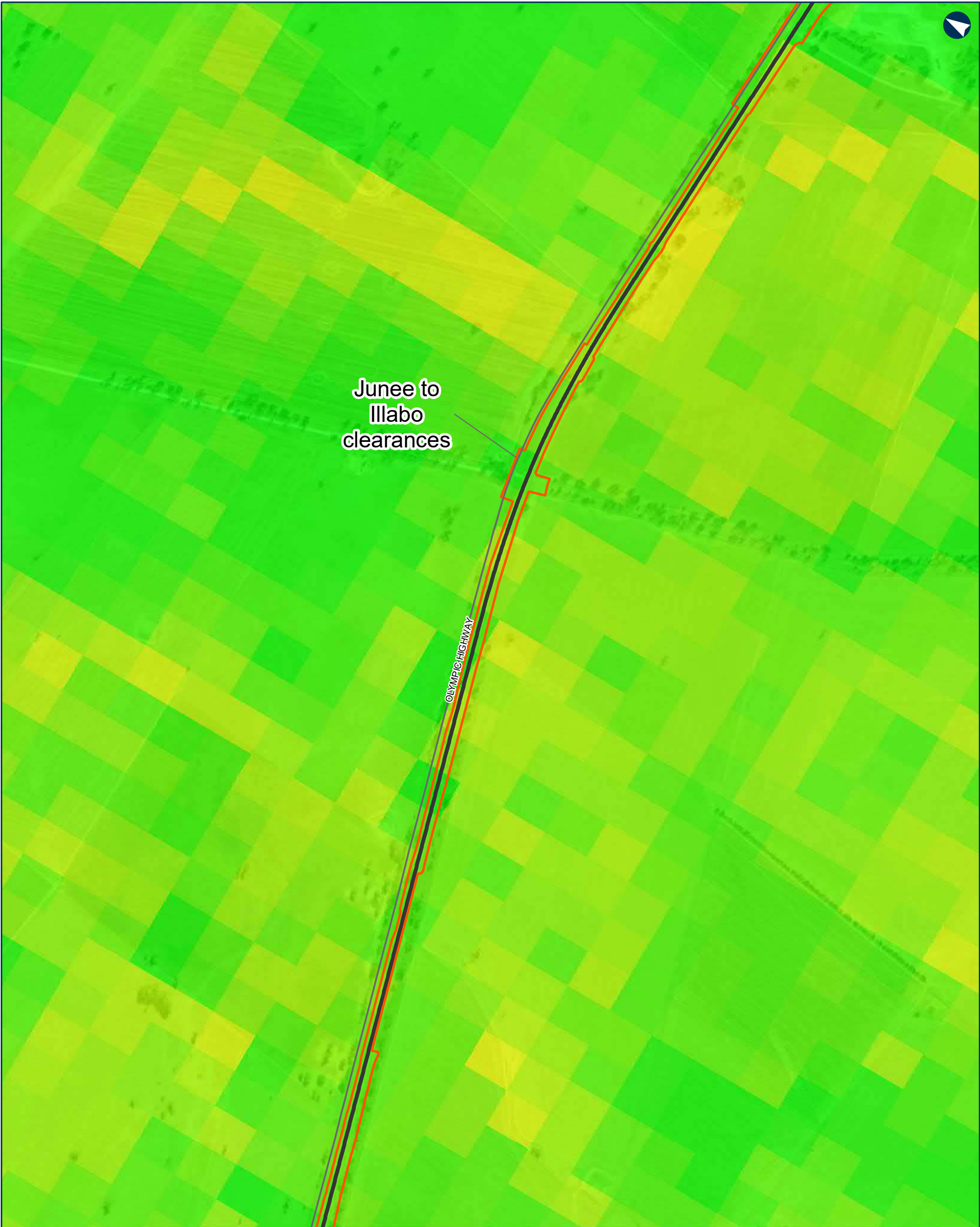
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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:8,000







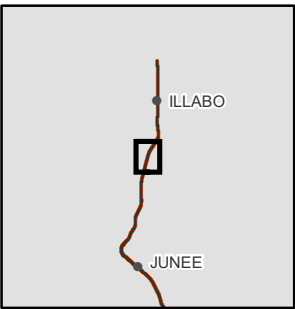
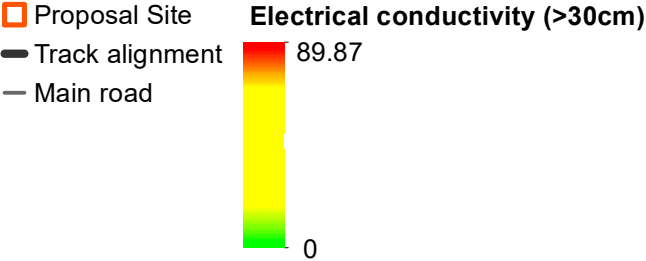
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m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

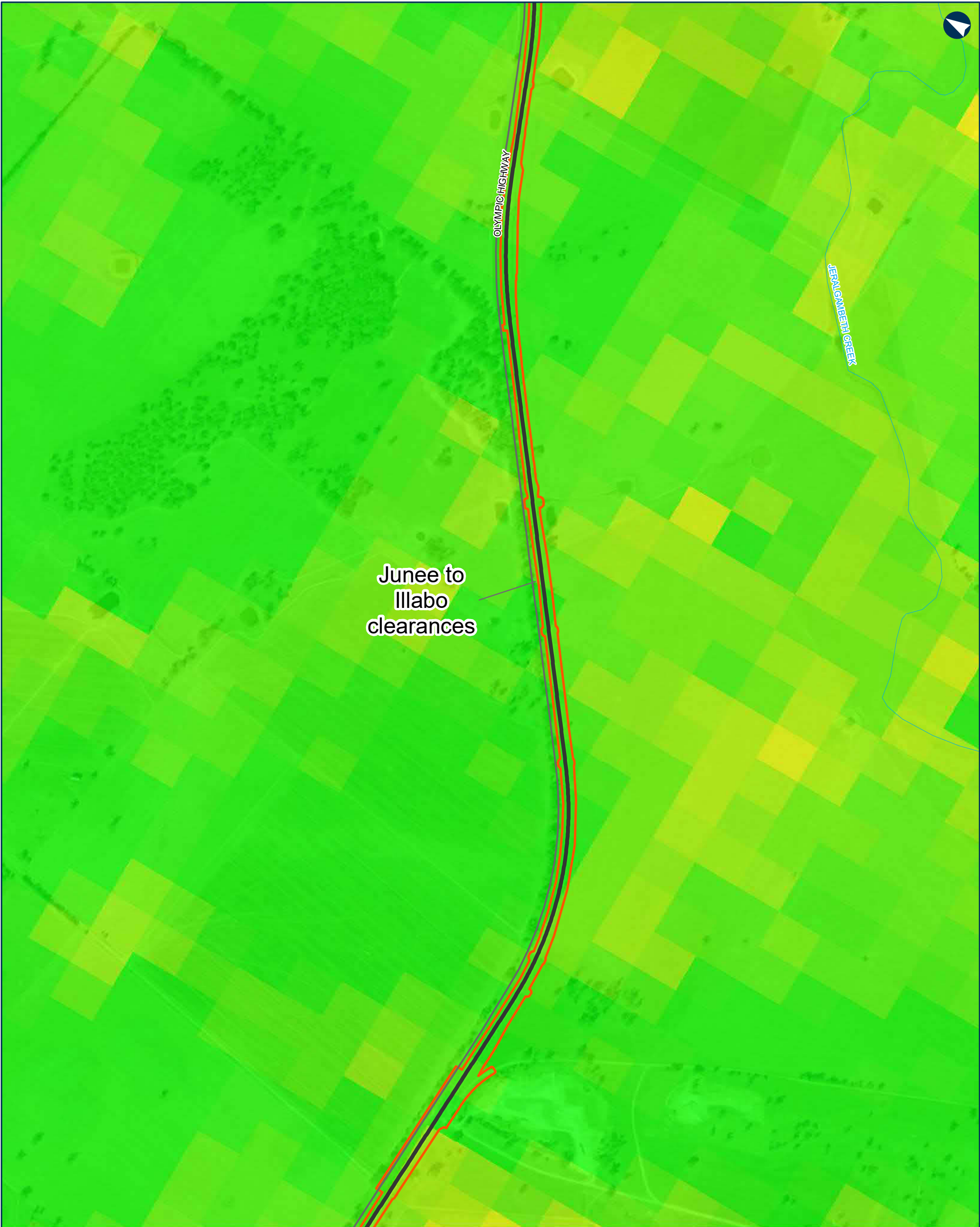
Paper: A3  
Scale: 1:8,000



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Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

0 50 100  
m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:8,000

Proposal Site

Track alignment

Main road

Watercourse

Electrical conductivity (>30cm)

89.87

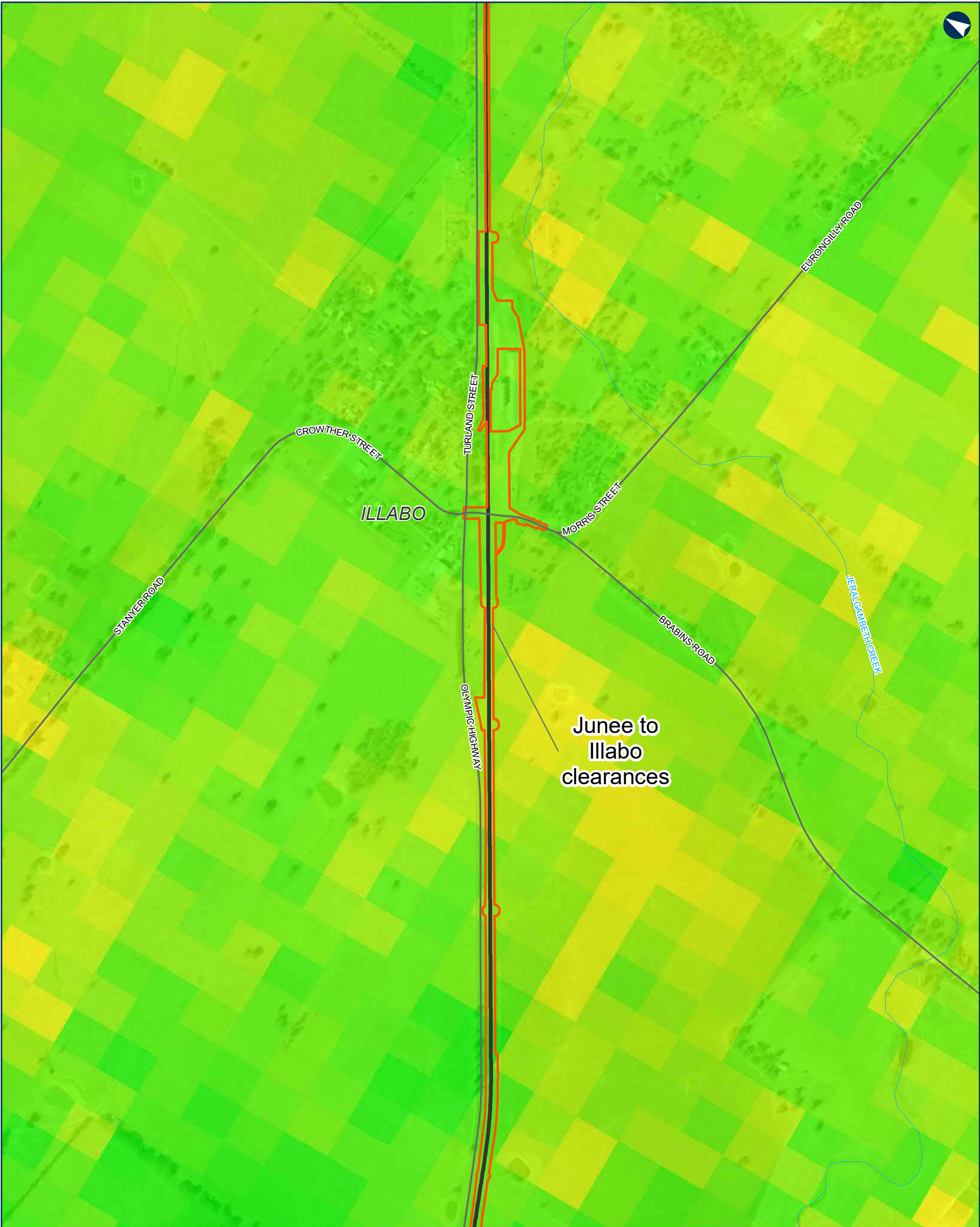
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Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

0 50 100  
m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:8,000

■ Proposal Site

— Track alignment

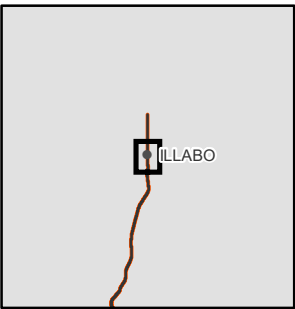
— Main road

— Watercourse

Electrical conductivity (>30cm)

89.87

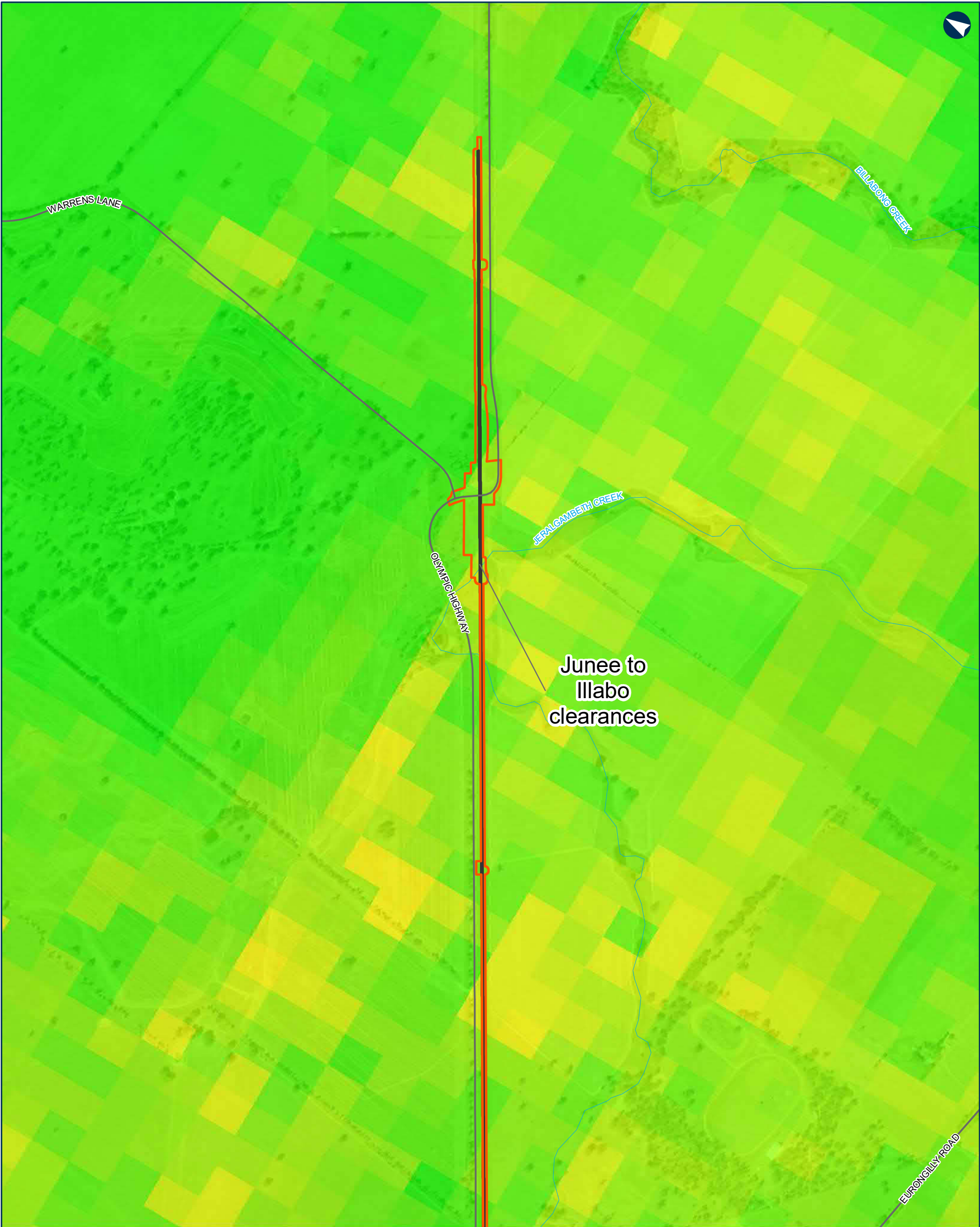
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Albury to Illabo

Figure 2 - Salinity mapping – >30 cm

0 50 100  
m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 25/05/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:9,000

■ Proposal Site

— Track alignment

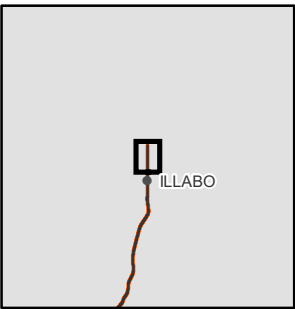
— Main road

— Watercourse

Electrical conductivity (>30cm)

89.87

0



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---

## **APPENDIX A-3**

### **FIGURE 3 – SALINITY RISK**



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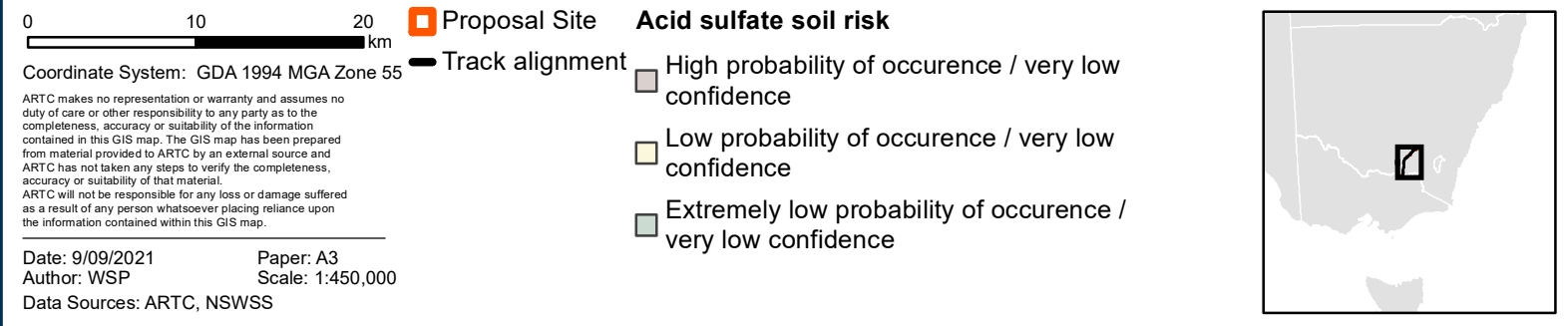
**APPENDIX A-4**  
**FIGURE 4 – ACID SULFATE**  
**SOIL MAPPING**





Albury to Illabo

Figure 4 - Acid sulfate soil mapping



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---

**APPENDIX A-5**  
**FIGURE 5 – ARTC CONTAMINATED**  
**LAND RECORDS**





Albury to Illabo

Figure 5 - ARTC contaminated land records at Murray River bridge

0100m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Paper: A3

Author: WSP

Scale: 1:5,000

Data Sources: ARTC, NSWSS

Proposed site

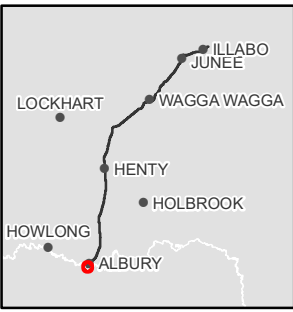
Existing railway

Main road

Watercourse

**Contaminated land priority rating**

2. Unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations



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Albury to Illabo

Figure 5 - ARTC contaminated land records at Albury Station sites

0100m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Paper: A3

Author: WSP

Scale: 1:5,500

Data Sources: ARTC, NSWSS

Proposed site

Existing railway

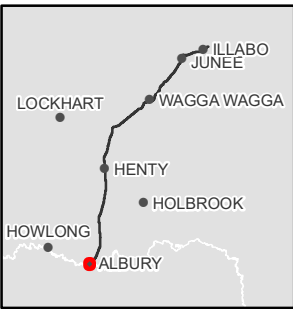
Main road

Watercourse

Contaminated land priority rating

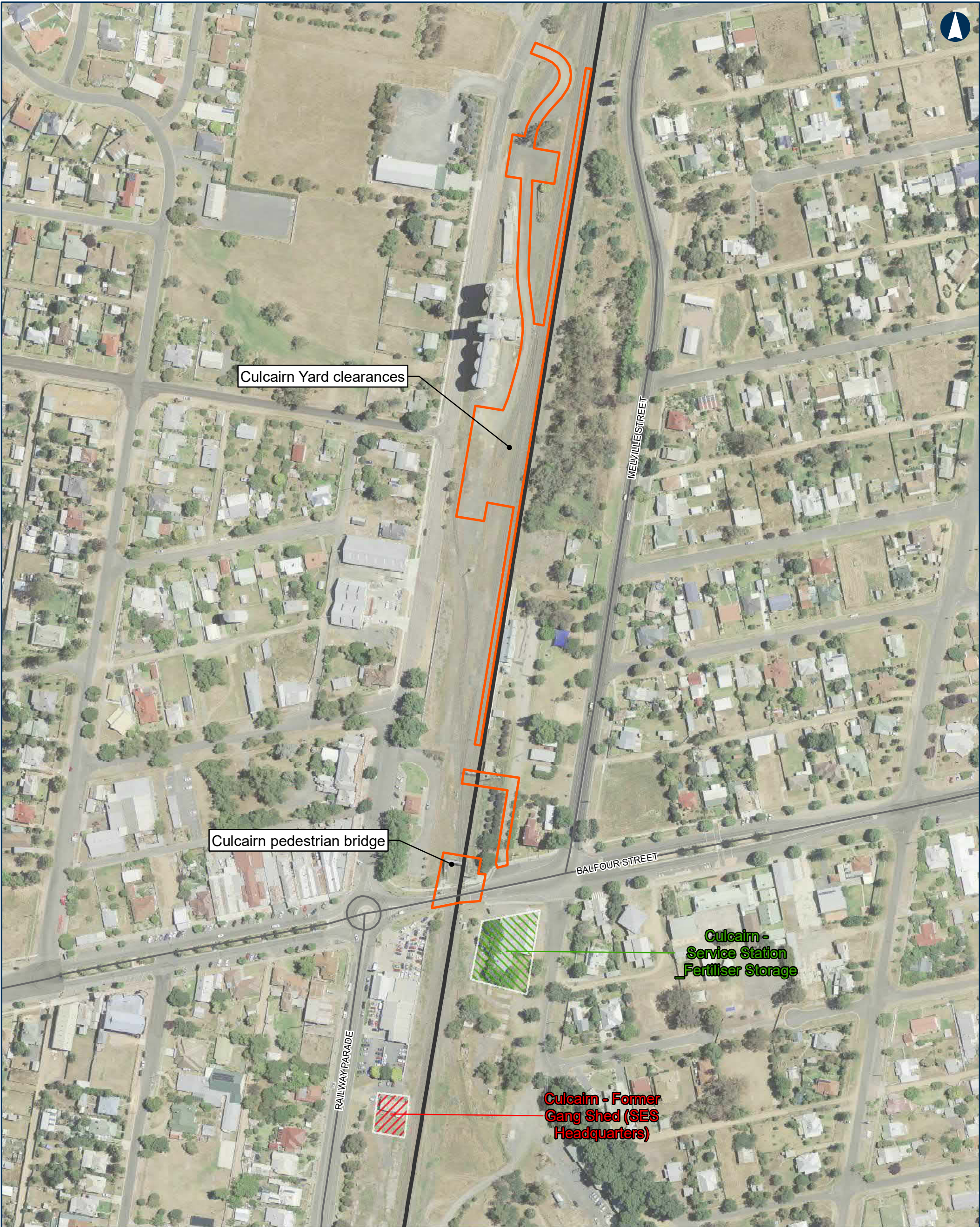
1. Suitable for use in a commercial / industrial land use setting

2. Unlikely to pose a risk of exposure to human health or ecological receptors, as long as not disturbed, or in accordance with management obligations



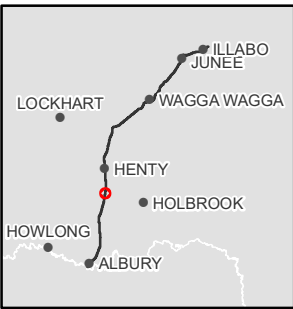
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0 100 m  
Coordinate System: GDA 1994 MGA Zone 55  
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Date: 18/02/2022 Paper: A3  
Author: WSP Scale: 1:2,500  
Data Sources: ARTC, NSWSS

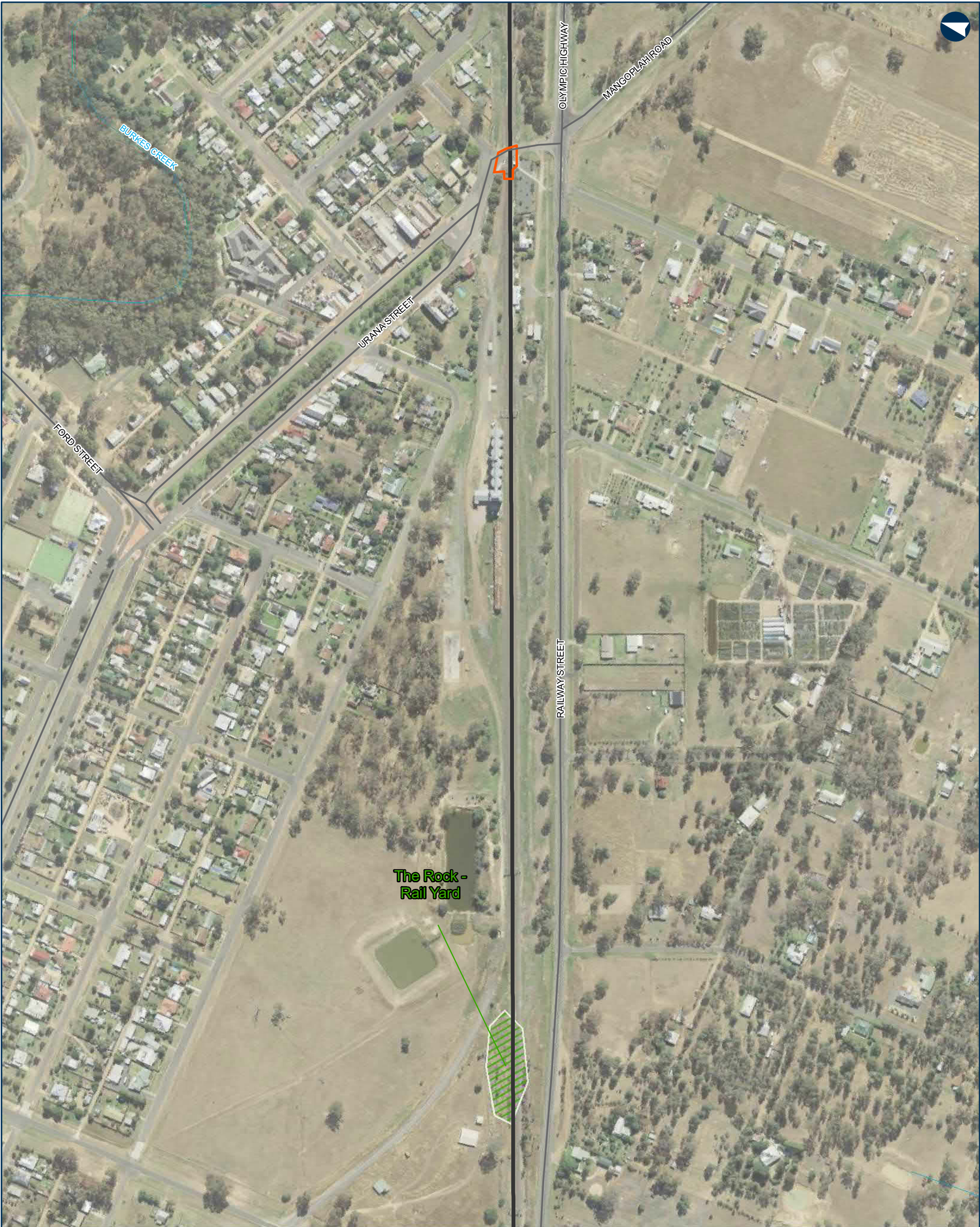
- Contaminated land priority rating**
- 1. Suitable for use in a commercial / industrial land use setting
  - 3. Active exposure risk or legislative issue that should be investigated and potentially requires management
- Legend:**
- Proposal site
  - Existing railway
  - Main road



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Albury to Illabo

Figure 5 - ARTC contaminated land records at The Rock Yard clearances

0100m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Author: WSP

Data Sources: ARTC, NSWSS

Paper: A3

Scale: 1:4,000

Orange outline

Proposal site

Black line

Existing railway

Grey line

Main road

Blue line

Watercourse

Green hatched

1. Suitable for use in a commercial / industrial land use setting

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D:\WSP O365\AU-WKG - Geospatial - AIS - Projects\PS122419\_Albury\_to\_Illabo\Tasks\210\_0010\_EAP\_EISReportFigures\Documents\Contaminated\_Land\210\_EAP\_F05\_ARTCContaminatedLandRecords\_r1v8.mxd





Albury to Illabo

Figure 5 - ARTC contaminated land records at Uranquinty Yard clearances

0100m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Paper: A3

Author: WSP

Scale: 1:5,000

Data Sources: ARTC, NSWSS

Proposal site

Existing railway

Main road

Watercourse

Contaminated land priority rating

1. Suitable for use in a commercial / industrial land use setting



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Albury to Illabo

Figure 5 - ARTC contaminated land records at Wagga Wagga Station and surrounds sites

0100m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Paper: A3

Author: WSP

Scale: 1:3,500

Data Sources: ARTC, NSWSS

Proposed site

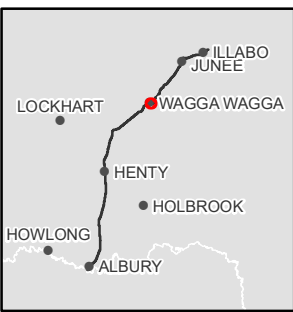
Existing railway

Main road

Watercourse

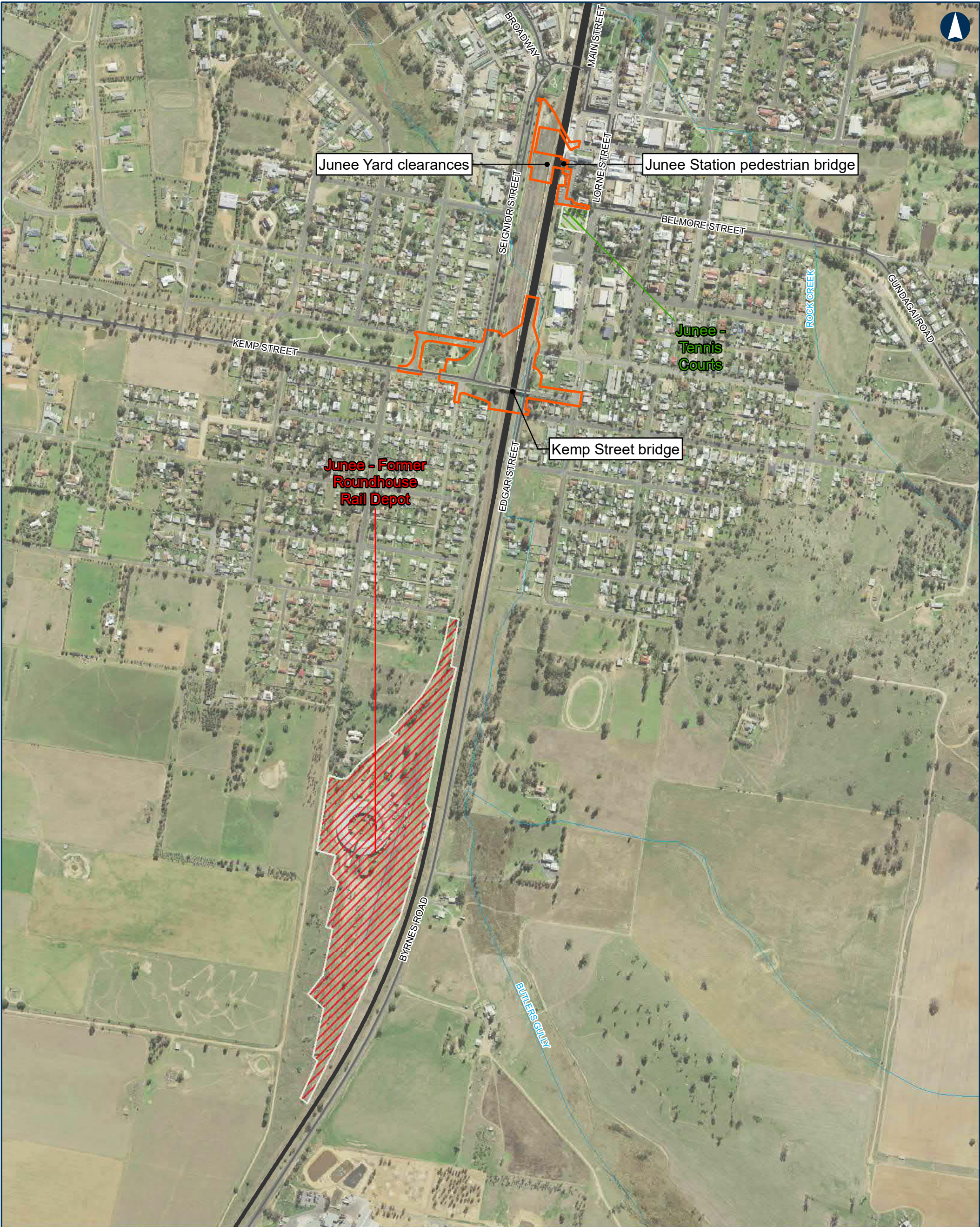
Contaminated land priority rating

3. Active exposure risk or legislative issue that should be investigated and potentially requires management



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0 100  
m

Coordinate System: GDA 1994 MGA Zone 55

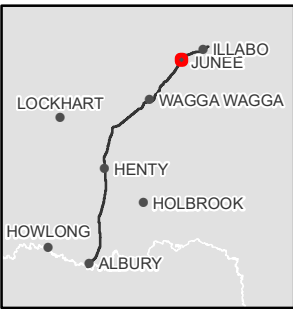
ARTC makes no representation or warranty and assumes no duty of care or other responsibility to any party as to the completeness, accuracy or suitability of the information contained in this GIS map. The GIS map has been prepared from material provided to ARTC by an external source and ARTC has not taken any steps to verify the completeness, accuracy or suitability of that material. ARTC will not be responsible for any loss or damage suffered as a result of any person whatsoever placing reliance upon the information contained within this GIS map.

Date: 18/02/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:7,500

- Proposal site
- Existing railway
- Main road
- Watercourse

- Contaminated land priority rating**
- 1. Suitable for use in a commercial / industrial land use setting
  - 3. Active exposure risk or legislative issue that should be investigated and potentially requires management



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Albury to Illabo

Figure 5 - ARTC contaminated land records at Olympic Highway underbridge

0 100 m

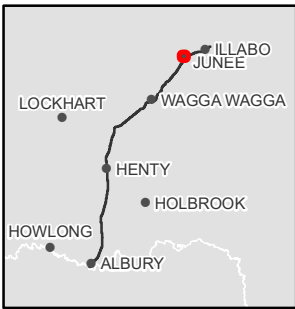
Coordinate System: GDA 1994 MGA Zone 55

ARTC makes no representation or warranty and assumes no duty of care or other responsibility to any party as to the completeness, accuracy or suitability of the information contained in this GIS map. The GIS map has been prepared from material provided to ARTC by an external source and ARTC has not taken any steps to verify the completeness, accuracy or suitability of that material. ARTC will not be responsible for any loss or damage suffered as a result of any person whatsoever placing reliance upon the information contained within this GIS map.

Date: 18/02/2022 Paper: A3  
Author: WSP Scale: 1:5,000  
Data Sources: ARTC, NSWSS

- Proposed site
- Existing railway
- Main road
- Watercourse

**Contaminated land priority rating**  
1. Suitable for use in a commercial / industrial land use setting



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---

**APPENDIX A-6**  
**FIGURE 6 – AREAS OF**  
**ENVIRONMENTAL CONCERN**





Albury to Illabo

Figure 6 - Areas of environmental concern at Murray River bridge

0 50  
m

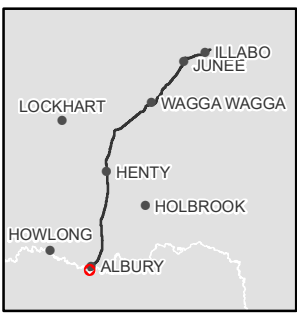
Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022      Paper: A3  
Author: WSP          Scale: 1:2,500  
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Watercourse
- ARTC Lease
- Chainage (100m)

AEC = Area of environmental concern



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Albury to Illabo

Figure 6 - Areas of environmental concern at Albury Station sites

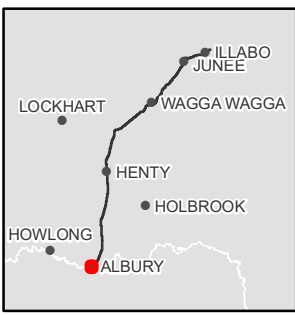
0 50  
m

Coordinate System: GDA 1994 MGA Zone 55

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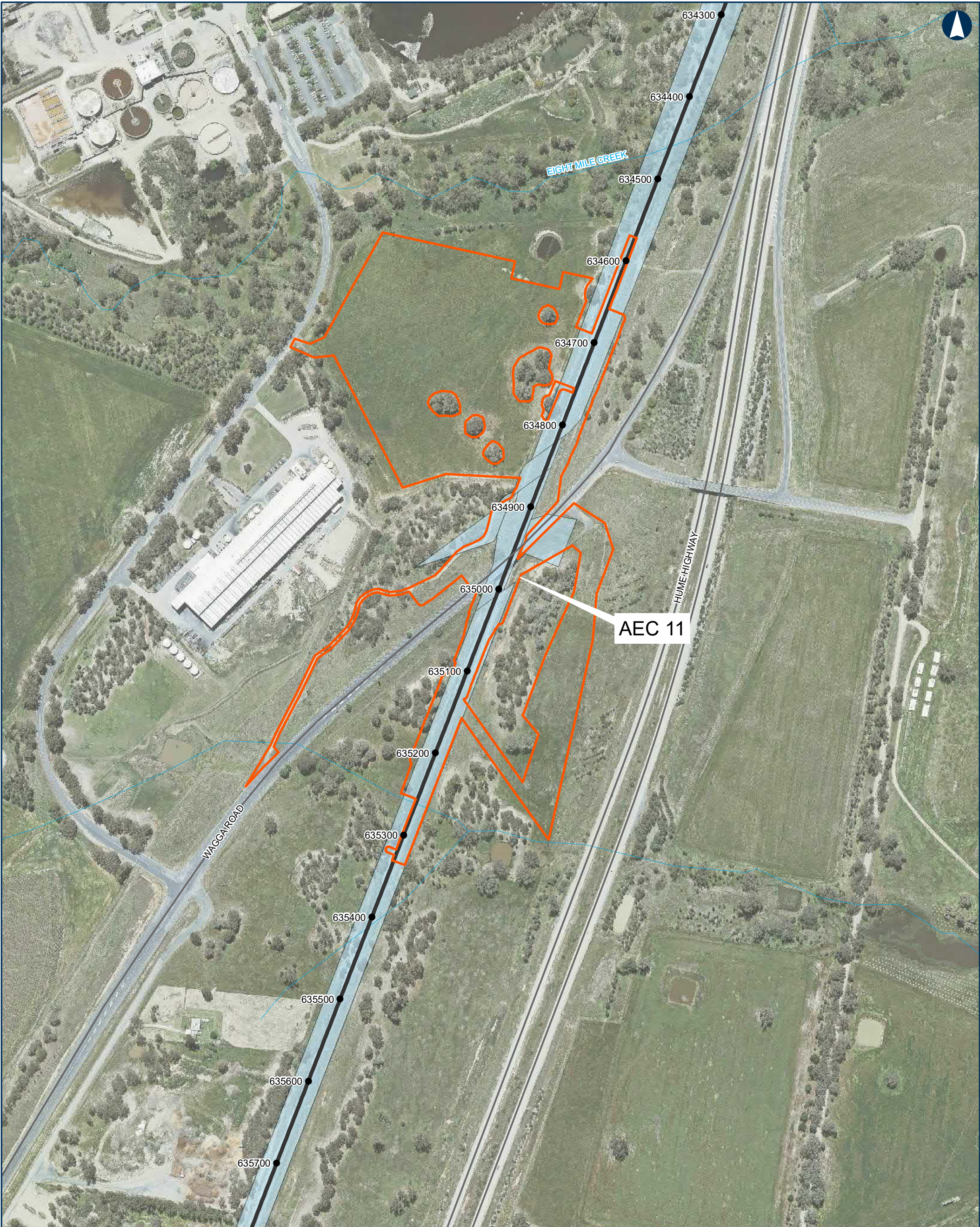
Date: 18/02/2022      Paper: A3  
Author: WSP              Scale: 1:7,500  
Data Sources: ARTC, NSWSS

- Proposal site
  - Existing railway
  - Main road
  - Watercourse
  - ARTC Lease
  - Location of historical site assessment
  - Chainage (100m)
- AEC = Area of environmental concern



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Albury to Illabo

Figure 6 - Areas of environmental concern at Billy Hughes bridge

0 50  
m

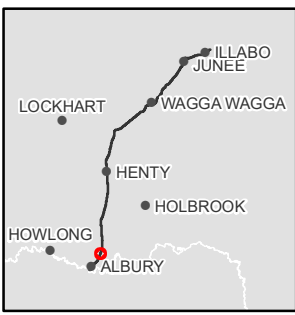
Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022      Paper: A3  
Author: WSP          Scale: 1:4,000  
Data Sources: ARTC, NSWSS

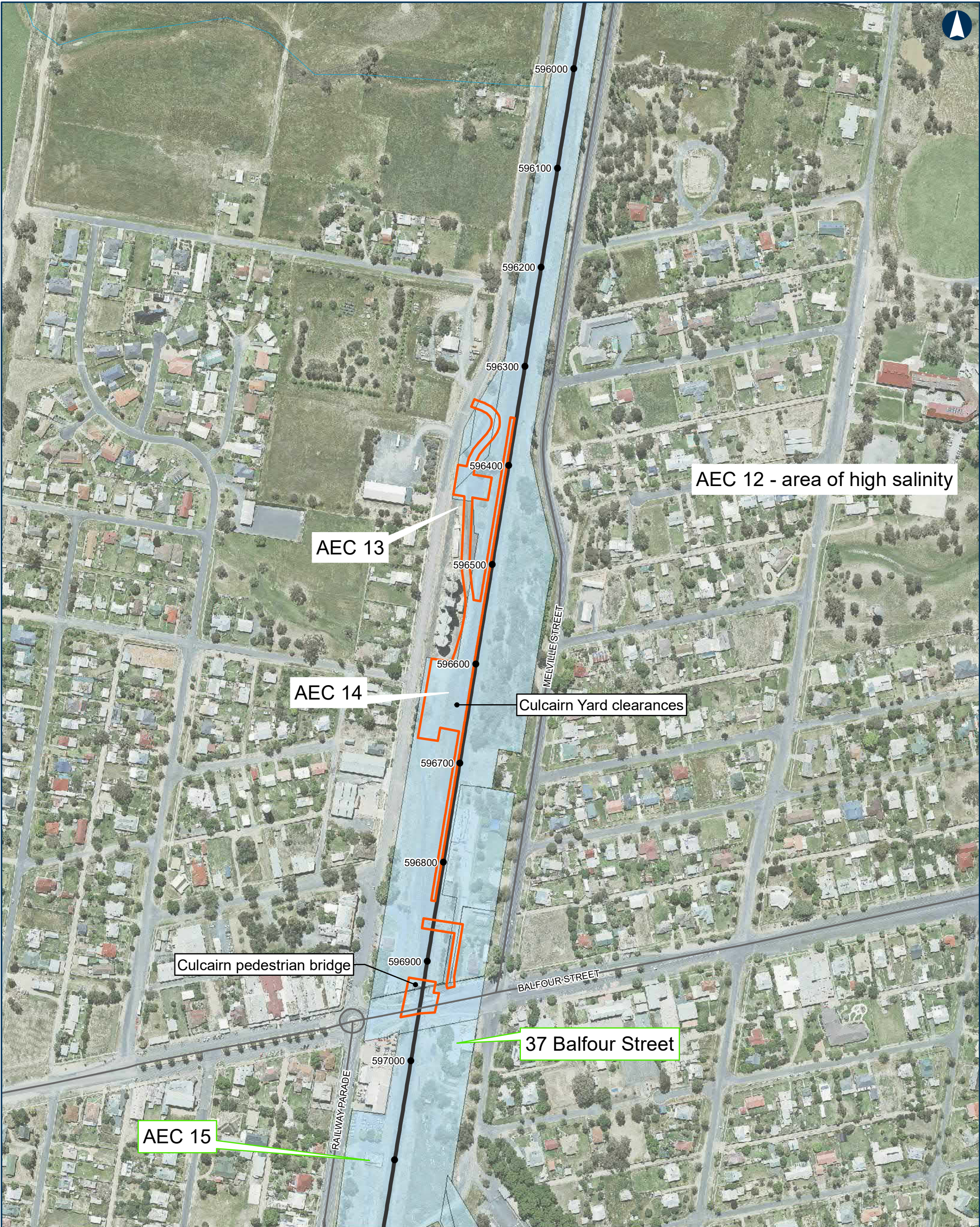
- Proposal site
- Existing railway
- Main road
- Watercourse
- ARTC Lease
- Chainage (100m)

AEC = Area of environmental concern



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Albury to Illabo

Figure 6 - Areas of environmental concern at Culcairn pedestrian bridge and Yard clearances

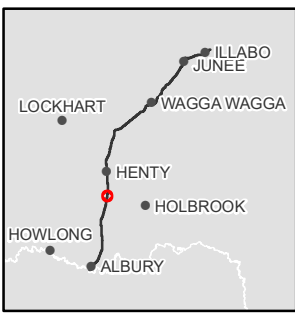
0 50  
m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022      Paper: A3  
Author: WSP      Scale: 1:3,500  
Data Sources: ARTC, NSWSS

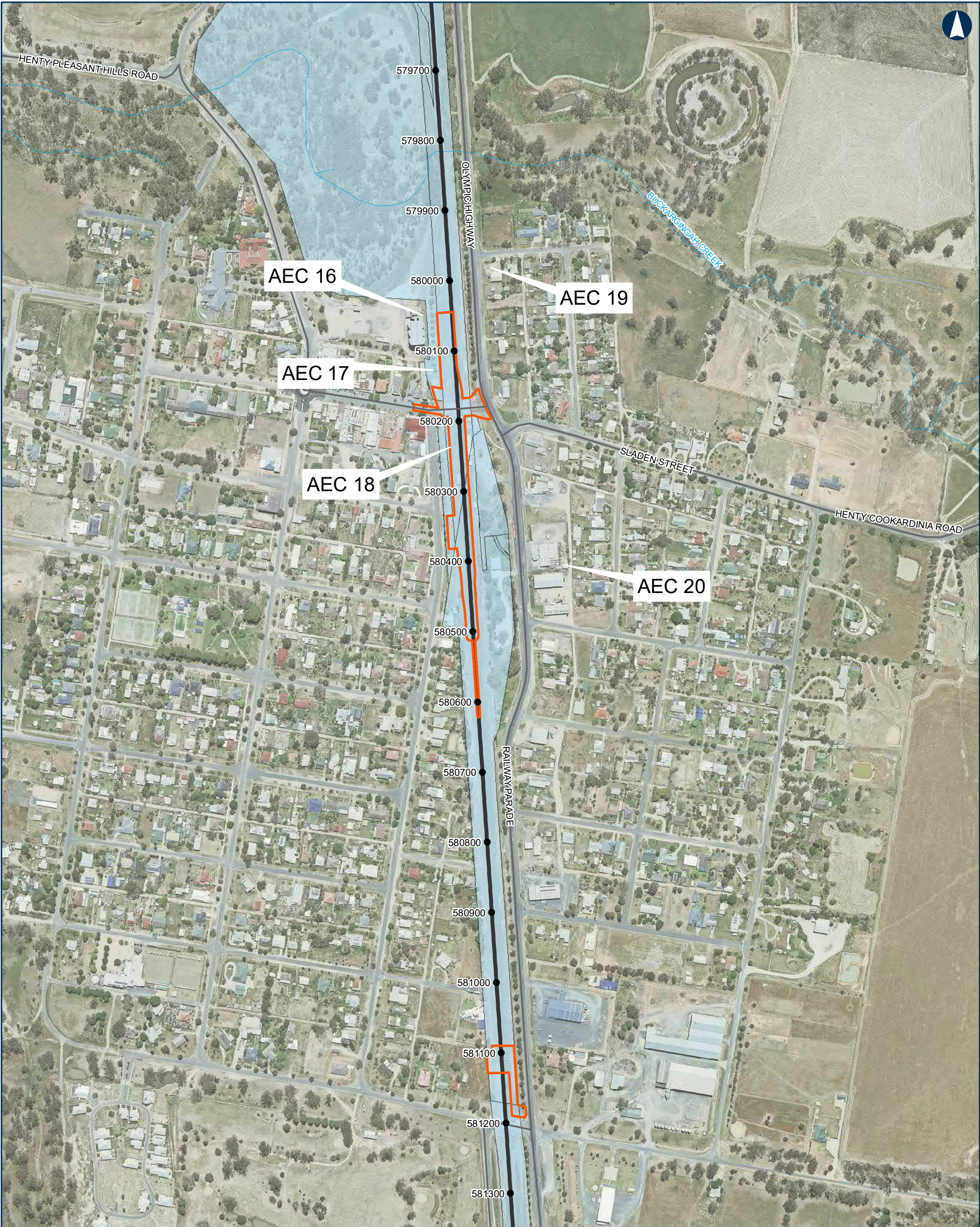
- Proposal site
  - Existing railway
  - Main road
  - Watercourse
  - ARTC Lease
  - Location of historical site assessment
  - Chainage (100m)
- AEC = Area of environmental concern



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Albury to Illabo

Figure 6 - Areas of environmental concern at Henty Yard clearances

- 050m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Paper: A3

Author: WSP

Scale: 1:5,000

Data Sources: ARTC, NSWSS
- Proposal site

— Existing railway

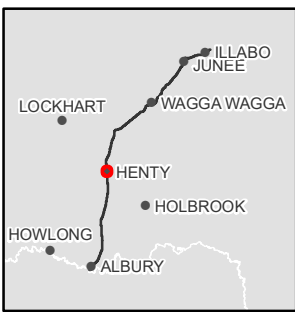
— Main road

— Watercourse

■ ARTC Lease

● Chainage (100m)

AEC = Area of environmental concern



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Albury to Illabo

Figure 6 - Areas of environmental concern at Yerong Creek Yard clearances

050m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Author: WSP

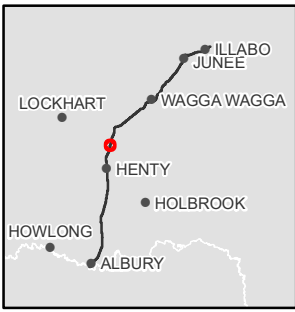
Data Sources: ARTC, NSWSS

Paper: A3

Scale: 1:5,000

- Proposal site
- Existing railway
- Main road
- Watercourse
- ARTC Lease
- Chainage (100m)

AEC = Area of environmental concern



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Albury to Illabo

Figure 6 - Areas of environmental concern at The Rock Yard clearances

0 50  
m

Coordinate System: GDA 1994 MGA Zone 55

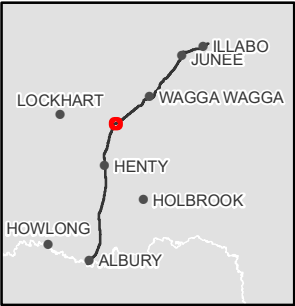
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Date: 18/02/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:5,000

- Proposal site
- Existing railway
- Main road
- Watercourse
- ARTC Lease
- Chainage (100m)

AEC = Area of environmental concern

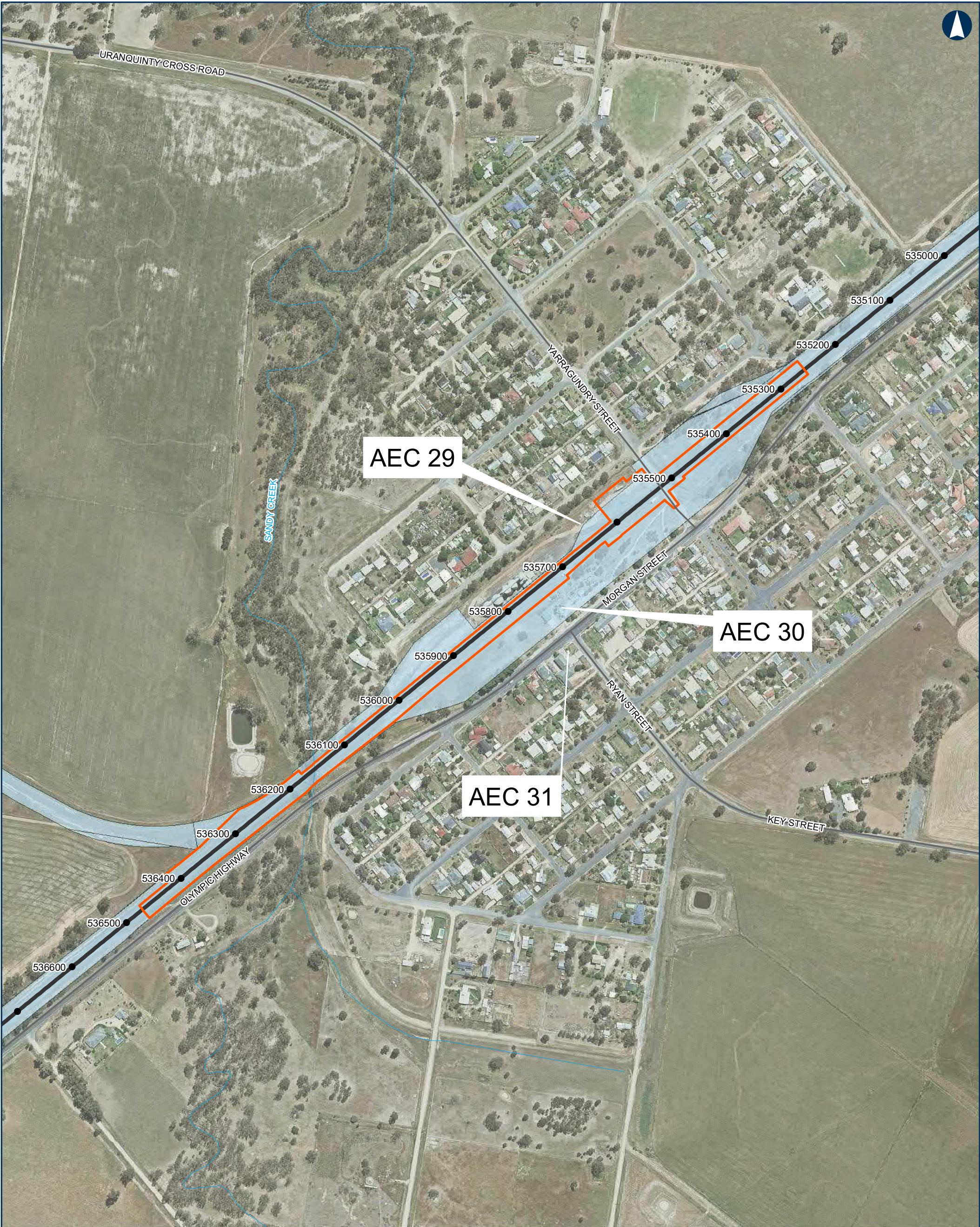


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Albury to Illabo

Figure 6 - Areas of environmental concern at Uranquinty Yard clearances

0 50  
m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:5,000

- Proposal site
- Existing railway
- Main road
- Watercourse
- ARTC Lease
- Chainage (100m)

AEC = Area of environmental concern



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Albury to Illabo

Figure 6 - Areas of environmental concern at Pearson Street bridge

MAP 9 OF 16

050m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Author: WSP

Data Sources: ARTC, NSWSS

Paper: A3

Scale: 1:5,000

■ Proposal site

— Existing railway

— Main road

— Watercourse

■ ARTC Lease

● Chainage (100m)

AEC = Area of environmental concern

LOCKHART

HOWLONG

ALBURY

HENTY

HOLBROOK

WAGGA WAGGA

ILLABO

JUNEE

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Albury to Illabo

Figure 6 - Areas of environmental concern at Wagga Wagga Station and surrounds sites

MAP 10 OF 16

0 50  
m

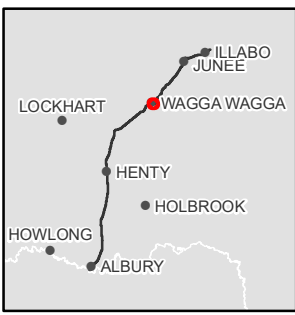
Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:5,000

- Proposal site
  - Existing railway
  - Main road
  - Watercourse
  - ARTC Lease
  - Location of historical site assessment
  - Chainage (100m)
- AEC = Area of environmental concern



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Albury to Illabo

Figure 6 - Areas of environmental concern at Bomen Yard clearances

- 050m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022  
Author: WSP  
Data Sources: ARTC, NSWSS
- Proposal site

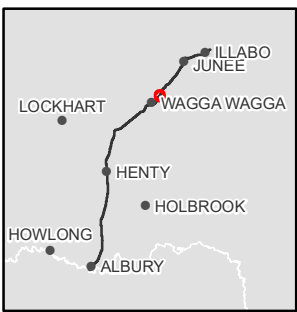
— Existing railway

— Main road

■ ARTC Lease

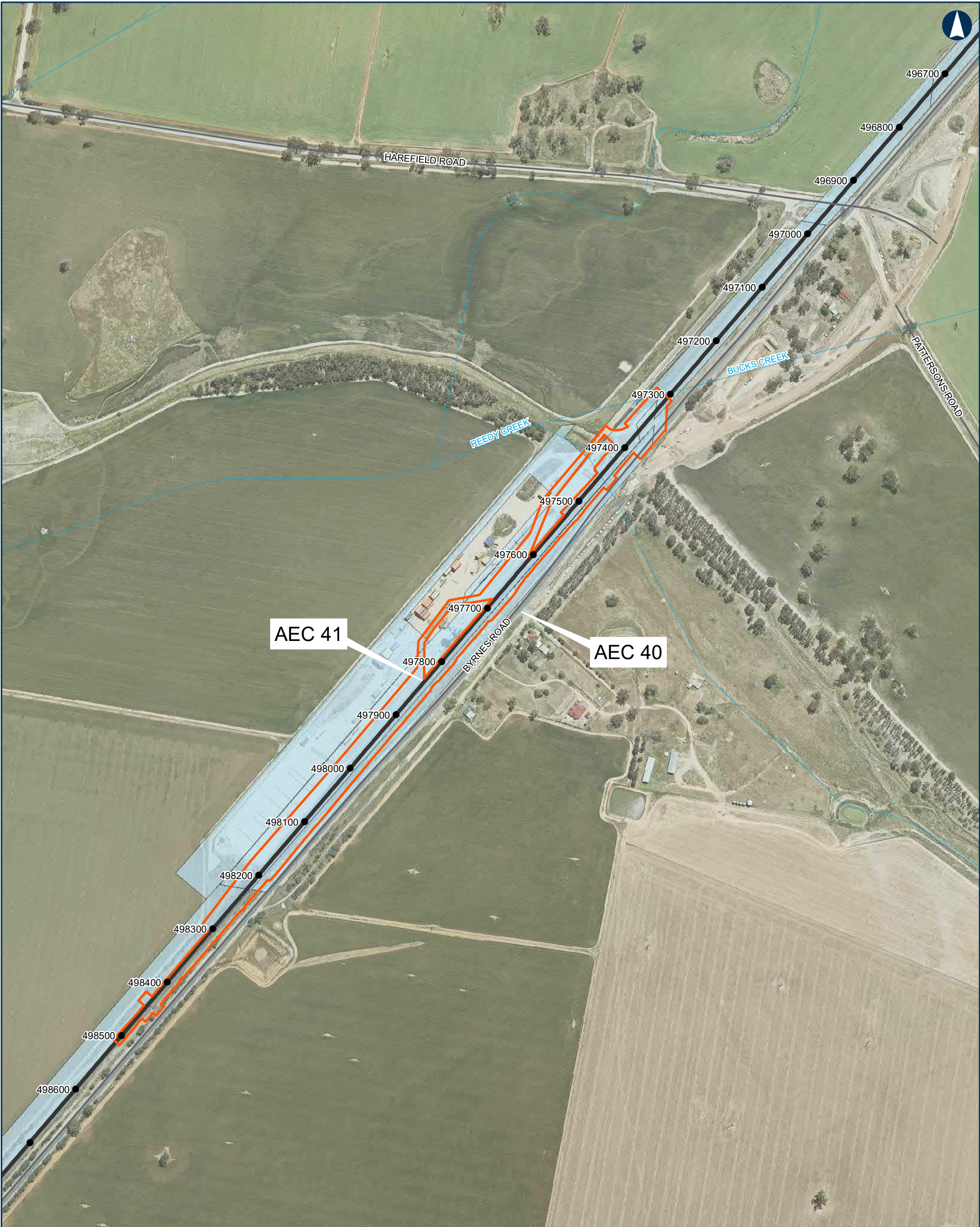
● Chainage (100m)

AEC = Area of environmental concern



The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.





Albury to Illabo

Figure 6 - Areas of environmental concern at Harefield Yard clearances

050m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Paper: A3

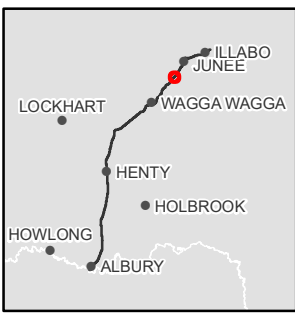
Author: WSP

Scale: 1:5,000

Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Watercourse
- ARTC Lease
- Chainage (100m)

AEC = Area of environmental concern



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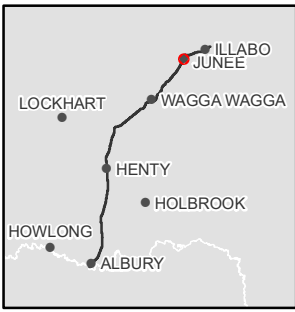
Albury to Illabo

Figure 6 - Areas of environmental concern at Kemp Street bridge

0 50 m  
Coordinate System: GDA 1994 MGA Zone 55  
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Date: 18/02/2022 Paper: A3  
Author: WSP Scale: 1:1,500  
Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Watercourse
- ARTC Lease
- Chainage (100m)

AEC = Area of environmental concern



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Albury to Illabo

Figure 6 - Areas of environmental concern at Junee pedestrian bridge and Yard clearances

MAP 14 OF 16

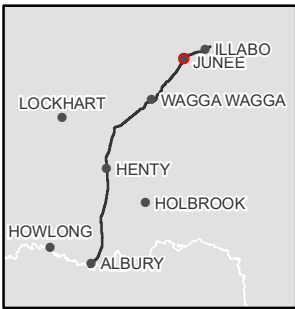
0 50 m  
Coordinate System: GDA 1994 MGA Zone 55  
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Date: 18/02/2022  
Author: WSP  
Data Sources: ARTC, NSWSS

Paper: A3  
Scale: 1:1,250

- Proposal site
- Existing railway
- Main road
- Watercourse
- ARTC Lease
- Chainage (100m)

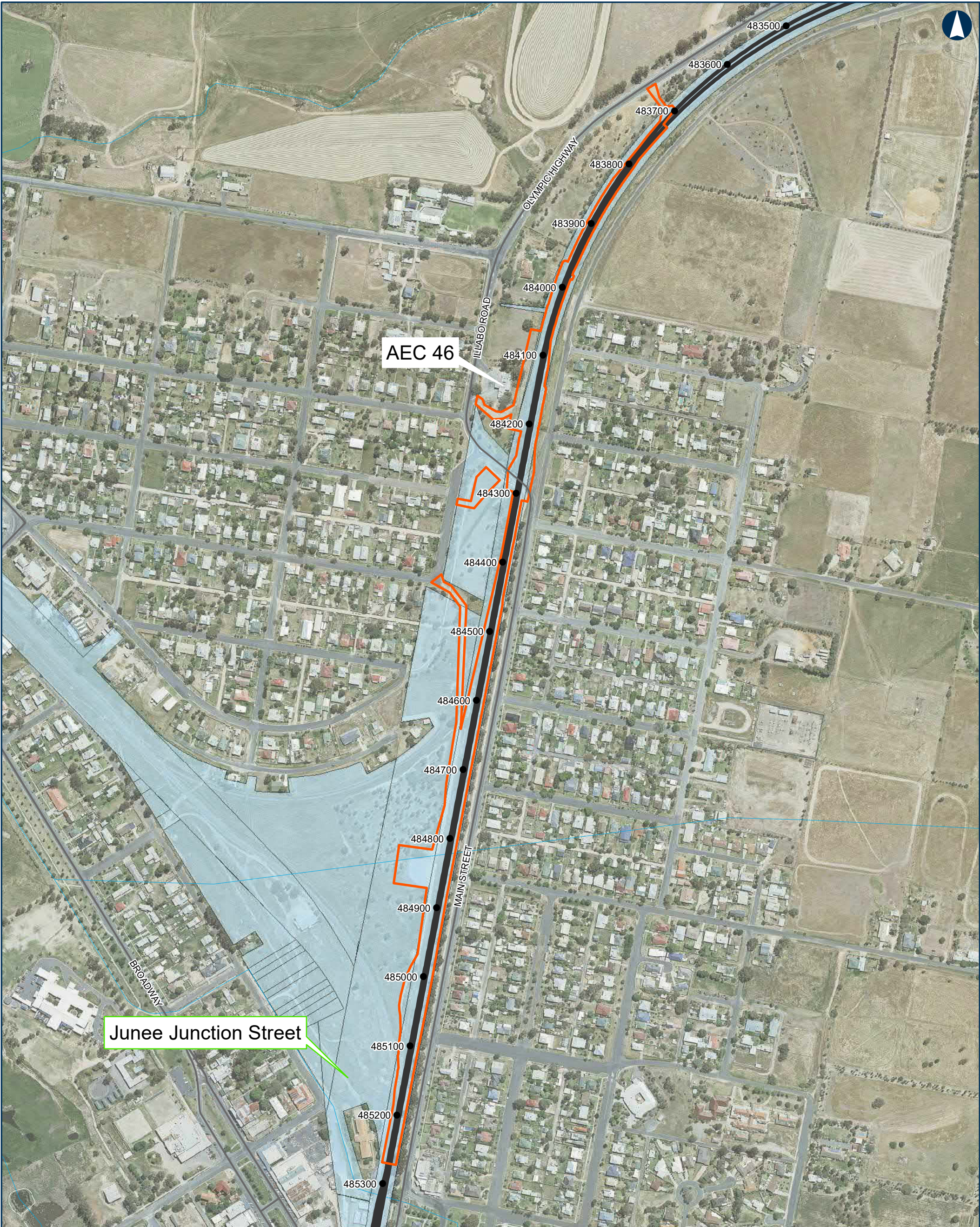
AEC = Area of environmental concern



INLAND RAIL = ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.





Albury to Illabo

Figure 6 - Areas of environmental concern at Olympic Highway underbridge

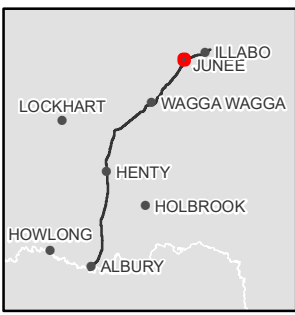
0 50  
m

Coordinate System: GDA 1994 MGA Zone 55

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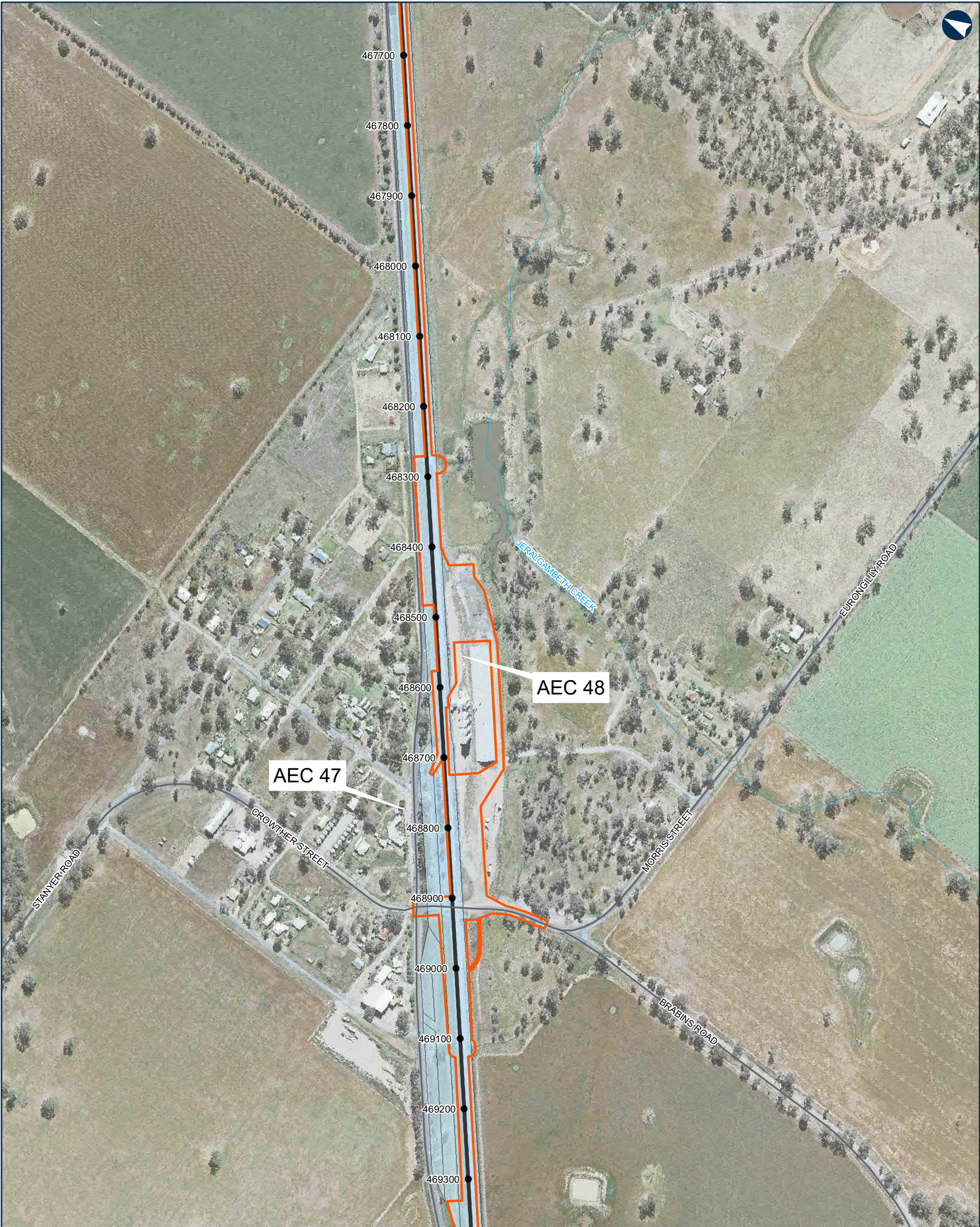
Date: 18/02/2022      Paper: A3  
Author: WSP          Scale: 1:5,000  
Data Sources: ARTC, NSWSS

- Proposal site
  - Existing railway
  - Main road
  - Watercourse
  - ARTC Lease
  - Location of historical site assessment
  - Chainage (100m)
- AEC = Area of environmental concern



The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.





Albury to Illabo

Figure 6 - Areas of environmental concern at June to Illabo clearances

050m

Coordinate System: GDA 1994 MGA Zone 55

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Date: 18/02/2022

Paper: A3

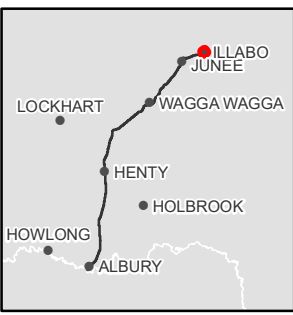
Author: WSP

Scale: 1:5,000

Data Sources: ARTC, NSWSS

- Proposal site
- Existing railway
- Main road
- Watercourse
- ARTC Lease
- Chainage (100m)

AEC = Area of environmental concern



The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.



# TECHNICAL PAPER

# 13

Contamination

## **Appendix B** Salinity and acid sulfate soils mapping data

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT





Table B.1 Murray River bridge

| ASPECT             | DETAILS                                                                                                                                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil salinity      | The salinity hazard of this landscape is mapped as “low risk”. The environment is also describes as being part of the Murray Alluvium hydrogeological landscape with an overall “low” land salinity hazard. |
| Acid sulfate soils | There is a “high probability” of occurrence of inland acids sulfate soils within Murray River sediment, however the soils either side have a “low probability”.                                             |

Table B.2 Albury Station pedestrian bridge, Albury Yard clearances and Riverina Highway bridge

| ASPECT             | DETAILS                                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil salinity      | The Wait A While landscape has localised salinity hazards identified and the land is also part of the Long Plain hydrogeological landscape which describes it as having “moderate” land salinity. |
| Acid sulfate soils | “Low probability” of occurrence of acid sulfate soils.                                                                                                                                            |

Table B.3 Table Top Yard clearances

| ASPECT             | DETAILS                                                                                                                                                                                                                                                       |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil salinity      | Whilst salinity is listed as “not observed” (not identified during assessment) for the Ettamogah landscape, the enhancement site is also shown on the Table Top hydrogeological landscape, in which is described as having a “moderate” land salinity hazard. |
| Acid sulfate soils | “Low probability” of occurrence of acid sulfate soils.                                                                                                                                                                                                        |

Table B.4 Billy Hughes bridge

| ASPECT             | DETAILS                                                                                                                                                                                                                                                       |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil salinity      | Whilst salinity is listed as “not observed” (not identified during assessment) for the Ettamogah landscape, the enhancement site is also shown on the Table Top hydrogeological landscape, in which is described as having a “moderate” land salinity hazard. |
| Acid sulfate soils | “Low probability” of occurrence of acid sulfate soils.                                                                                                                                                                                                        |

Table B.5 Culcairn pedestrian bridge and Culcairn Yard clearances

| ASPECT            | DETAILS                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Salinity          | The environment is described as being part of the Lower Billabong hydrogeological landscape. Though it has a “Low” land salinity hazard, the groundwater and stream have a high salinity load making the overall salinity hazard “Very High”. Care will need to be taken not to cause groundwater flows to be impeded at this site as that could cause salts to be brought nearer the surface. |
| Acid sulfate soil | There is a “low probability” of occurrence of acids sulfate soils.                                                                                                                                                                                                                                                                                                                             |

Table B.6 Henty Yard clearances

| ASPECT             | DETAILS                                                             |
|--------------------|---------------------------------------------------------------------|
| Salinity           | The local area is mapped as having “moderate” land salinity hazard. |
| Acid sulfate soils | There is a “low probability” of occurrence of acids sulfate soils.  |

Table B.7 Yerong Creek Yard clearances

| ASPECT             | DETAILS                                                             |
|--------------------|---------------------------------------------------------------------|
| Salinity           | The local area is mapped as having “moderate” land salinity hazard. |
| Acid sulfate soils | There is a “low probability” of occurrence of acids sulfate soils.  |

Table B.8 The Rock Yard clearances

| ASPECT             | DETAILS                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------|
| Salinity           | The local area is mapped as having “moderate” land salinity hazard.                                          |
| Acid sulfate soils | The enhancement site is described as having “extremely low” probability of occurrence of acid sulfate soils. |

Table B.9 Uranquinty Yard clearances

| ASPECT             | DETAILS                                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Salinity           | The local area is mapped as having “moderate” land salinity hazard in the south west and “low” salinity hazard beneath the township and extending to the north west. |
| Acid sulfate soils | The soils have “low” and “extremely low” probability of occurrence of acid sulfate soils.                                                                            |

Table B.10 Pearson Street bridge

| ASPECT             | DETAILS                                                                                                                                                                  |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Salinity           | The local area is mapped as having “low” land salinity hazard in the south west and central portions, and “moderate” salinity hazard beneath the far north west portion. |
| Acid sulfate soils | The soils have “low” probability of occurrence of acid sulfate soils.                                                                                                    |

Table B.11 Cassidy Parade pedestrian bridge, Edmondson Street bridge, Wagga Wagga Station pedestrian bridge and Wagga Wagga Yard clearances

| ASPECT             | DETAILS                                                               |
|--------------------|-----------------------------------------------------------------------|
| Salinity           | The local area is mapped as having “low” land salinity hazard.        |
| Acid sulfate soils | The soils have “low” probability of occurrence of acid sulfate soils. |

Table B.12 Bomen Yard clearances

| ASPECT             | DETAILS                                                                         |
|--------------------|---------------------------------------------------------------------------------|
| Salinity           | The local area is mapped as having “moderate” land salinity hazard.             |
| Acid sulfate soils | The soils have “extremely low” probability of occurrence of acid sulfate soils. |



# TECHNICAL PAPER 13

Contamination

## Appendix C Photographic log

ALBURY TO ILLABO ENVIRONMENTAL IMPACT STATEMENT





## PHOTOGRAPHIC LOG

**Client Name**  
ARTC Inland Rail

**Project**  
Albury to Illabo Project

**Photo No.**

1

**Date**

22/02/21

**Description**

Murray River Bridge – Building containing asbestos (AEC 1)



**Photo No.**

2

**Date**

22/02/21

**Description**

Murray River Bridge – Dumped waste (AEC 2)







## PHOTOGRAPHIC LOG

**Client Name**  
ARTC Inland Rail

**Project**  
Albury to Illabo Project

**Photo No.**

3

**Date**

22/02/21

**Description**

Albury Precinct - Piles of waste  
(AEC 7)



**Photo No.**

4

**Date**

22/02/21

**Description**

Albury Precinct - Piles of waste,  
including ballast (AEC 7)





|                                                                                   |                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------|
|  | <b>PHOTOGRAPHIC LOG</b>                    |
| <b>Client Name</b><br>ARTC Inland Rail                                            | <b>Project</b><br>Albury to Illabo Project |

|                                                           |             |                                                                                     |
|-----------------------------------------------------------|-------------|-------------------------------------------------------------------------------------|
| <b>Photo No.</b>                                          | <b>Date</b> |  |
| 5                                                         | 22/02/21    |                                                                                     |
| <b>Description</b>                                        |             |                                                                                     |
| Culcairn Year Clearances -<br>Ballast stockpiles (AEC 14) |             |                                                                                     |

|             |          |                                                                                      |
|-------------|----------|--------------------------------------------------------------------------------------|
| Photo No.   | Date     |  |
| 5           | 22/02/21 |                                                                                      |
| Description |          |                                                                                      |

Culcairn Yard Clearances -  
Dumping of materials including  
buildings waste, metals drums  
and spray cans (AEC 13)





## PHOTOGRAPHIC LOG

**Client Name**  
ARTC Inland Rail

**Project**  
Albury to Illabo Project

**Photo No.**

6

**Date**

23/02/21

**Description**

Henty Yard Clearances -  
Dumped metal drums (AEC 18)



**Photo No.**

7

**Date**

23/02/21

**Description**

Henty Yard Clearances -  
Stockpiles of soil and ballast  
(AEC 17)







## PHOTOGRAPHIC LOG

**Client Name**  
ARTC Inland Rail

**Project**  
Albury to Illabo Project

**Photo No.**

8

**Date**

23/02/21

**Description**

Henty Yard Clearances - Soil stockpiles, Chemical (Penetrol) storage and sleepers (AEC 16)



**Photo No.**

9

**Date**

23/02/21

**Description**

Yerrong Creek Yard Clearances - Storage of old electronic equipment including signal boxes, metal, pipes and ladders (AEC 22)





|                                                                                   |                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------|
|  | <b>PHOTOGRAPHIC LOG</b>                    |
| <b>Client Name</b><br>ARTC Inland Rail                                            | <b>Project</b><br>Albury to Illabo Project |

| Photo No.                                                                                                                     | Date     |                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------|
| 10                                                                                                                            | 23/02/21 |                                                                                     |
| <b>Description</b><br><br>Henty Yard Clearances - Metals drums, tires and other debris stored (outside of site areas) AEC 21) |          |  |

| Photo No.                                                                                                        | Date     |                                                                                      |
|------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------|
| 11                                                                                                               | 23/02/21 |                                                                                      |
| <b>Description</b><br><br>The Rock Yard Clearances - Potential ACM, glass and metal on the site surface (AEC 27) |          |  |



|                                                                                   |                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------|
|  | <b>PHOTOGRAPHIC LOG</b>                    |
| <b>Client Name</b><br>ARTC Inland Rail                                            | <b>Project</b><br>Albury to Illabo Project |

| Photo No.                                                 | Date     |                                                                                     |
|-----------------------------------------------------------|----------|-------------------------------------------------------------------------------------|
| 12                                                        | 23/02/21 |                                                                                     |
| Description                                               |          |  |
| The Rock Yard Clearances -<br>Dumped metal drums (AEC 26) |          |                                                                                     |

| Photo No.                                                         | Date     |  |
|-------------------------------------------------------------------|----------|--|
| 12                                                                | 23/02/21 |  |
| <b>Description</b>                                                |          |  |
| The Rock Yard Clearances –<br>Potential ACM structure (AEC<br>28) |          |  |

A photograph of a concrete structure, possibly a water tower or a large pipe, with a domed top. The structure is covered in graffiti, including the word 'POON' and 'WIX'. It is situated next to a railway track with gravel and some vegetation in the background.



|                                                                                   |                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------|
|  | <b>PHOTOGRAPHIC LOG</b>                    |
| <b>Client Name</b><br>ARTC Inland Rail                                            | <b>Project</b><br>Albury to Illabo Project |

| Photo No.                                                                            | Date     |  |
|--------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------|
| 12                                                                                   | 23/02/21 |                                                                                     |
| <b>Description</b><br><br>Uranquity Yard Clearances -<br>Dumped metal drums (AEC 29) |          |                                                                                     |

| Photo No.                                                                                                                                                  | Date     |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------|
| 13                                                                                                                                                         | 23/02/21 |                                                                                      |
| <b>Description</b><br><br>Pearson Street Track Lowering -<br>Potential ACM on the ground<br>surface and fill containing<br>anthropogenic material (AEC 33) |          |                                                                                      |



|                                                                                   |                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------|
|  | <b>PHOTOGRAPHIC LOG</b>                    |
| <b>Client Name</b><br>ARTC Inland Rail                                            | <b>Project</b><br>Albury to Illabo Project |

| Photo No.                                                                                                                                | Date     |  |                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------|----------|--|-------------------------------------------------------------------------------------|
| 14                                                                                                                                       | 23/02/21 |  |  |
| <b>Description</b><br><br>Harefield Yard Clearances - Potential ACM and glass, ceramic, ballast and plastic on the site surface (AEC 41) |          |  |                                                                                     |

| Photo No.                                                                                                                       | Date     |  |                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------|----------|--|--------------------------------------------------------------------------------------|
| 15                                                                                                                              | 23/02/21 |  |  |
| <b>Description</b><br><br>Kemp Street Bridge and Junee Yard clearances - Dumped metals drums, sleepers and scrap metal (AEC 43) |          |  |                                                                                      |



|                                                                                   |                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------|
|  | <b>PHOTOGRAPHIC LOG</b>                    |
| <b>Client Name</b><br>ARTC Inland Rail                                            | <b>Project</b><br>Albury to Illabo Project |

| Photo No.                                                                                                                                            | Date     |                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------|
| 16                                                                                                                                                   | 24/02/21 |                                                                                     |
| <b>Description</b><br><br>Olympic Highway Underbridge - Shell service station with drums labelled as cooking oil stored close to the tracks (AEC 33) |          |  |