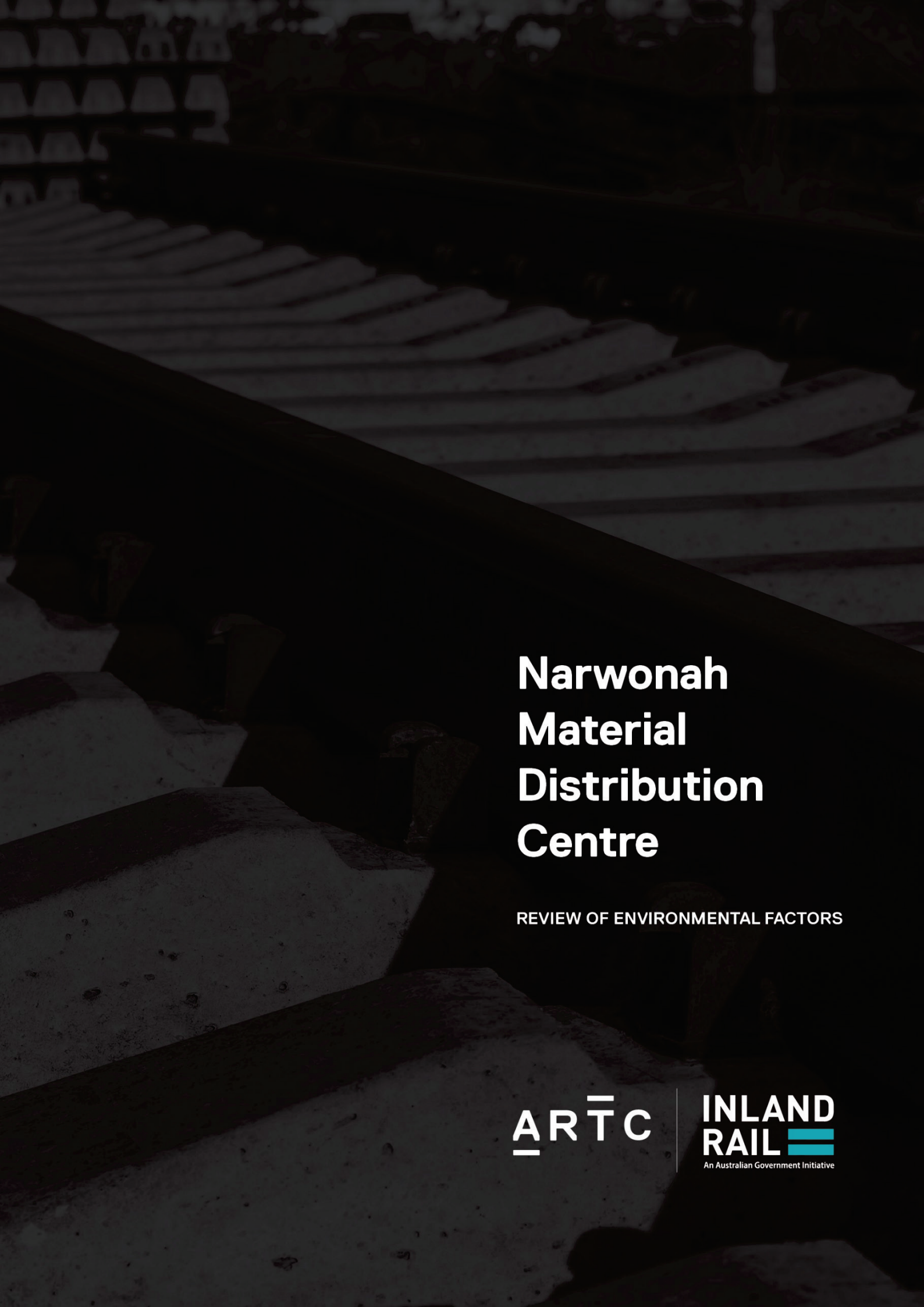

Narwonah Material Distribution Centre

REVIEW OF ENVIRONMENTAL FACTORS

ARTC | INLAND RAIL
An Australian Government Initiative

Contents

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Appendices

Abbreviations

AEP	Annual exceedance probability
ACHAR	Aboriginal Cultural Heritage Assessment Report
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ARTC	Australian Rail Track Corporation
ASR	Archaeological Survey Report
AUL	Auxiliary left turn lane
BAL	Basic left turn treatment
BAM	Biodiversity Assessment Method
BAR	Biodiversity Assessment Report
BC Act	Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
BFPL	Bush Fire Prone Land
BOS	Biodiversity Offsets Scheme
CEMP	Construction environmental management plan
CHR	Channelised right turn lane
CLM Act	Contaminated Land Management Act 1997
CNVMP	Construction Noise and Vibration Management Plan
CPESC	Certified Professional in Erosion and Sediment Control
CSEMP	Communication and Stakeholder Engagement Management Plan
CSSI	Critical State Significant Infrastructure
Cth	Commonwealth
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DEC	Department of Environment and Conservation
DECC	Department of Energy and Climate Change
DECCW	Department of Environment, Climate Change and Water
DNG	Derived native grassland
DPC	Department of Premier and Cabinet
DPE	NSW Department of Planning and Environment
EEC	Endangered ecological community
EIP	Engagement Implementation Plan
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environment Planning and Assessment Regulation 2021
EPA	NSW Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPL	Environment Protection Licence
ESD	Ecologically sustainable development
FM Act	Fisheries Management Act 1994
ha	Hectare
HIA	Heritage Impact Assessment
I2S	Illabo to Stockinbingal
IAP2	International Association for Public Participation
ICNG	Interim Construction Noise Guideline

ICOMOS	International Council on Monuments and Sites
ILUA	Indigenous Land Use Agreements
Inland Rail	Inland Rail
ISC	Infrastructure Sustainability Council
KFH	Key Fish Habitat
km	Kilometre
KTP	Key threatening process
kV	Kilovolt
kVa	Kilovolt-amps
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LLS	Local Land Services
LWR	Long Welded Rail
m	Metre
MDC	Material Distribution Centre
ML	Megalitres
MNES	Matters of national environmental significance
N2N	Narromine to Narrabri
NEPC	National Environment Protection Council
NML	Noise management levels
NNTT	National Native Title Tribunal
NOx	Nitrogen oxides
NPI	National Pollutant Inventory
NPW Act	*National Parks and Wildlife Act 1974*
NS2B	North Star to Border
OEH	NSW Office of Environment and Heritage
proponent	Australian Rail Track Corporation
proposal	The construction and operation of the MDC, and the subdivision of Lot 16 DP755131, Lot 17 DP755131, Lot 1 DP1198931, Lot 232 DP755131 and Lot 233 DP755131 to create two lots.
proposal site	The area to be used for the construction and operation of the MDC (Lot 16 DP755131, Lot 1 DP1198931, Lot 232 DP755131 and Lot 233 DP755131)
PCT	Plant Community Type
PMF	Probable Maximum Flood
PMST	Protected Matters Search Tool
POEO Act	Protection of the Environment Operations Act 1997 (NSW)
PS SEPP	State Environmental Planning Policy (Planning Systems) 2021
RAPs	Registered Aboriginal Parties
RBL	Rating Background Level
RCP	Rail Corridor Program
REF	Review of Environmental Factors
S2P	Stockinbingal to Parkes
SAP	Special Access Point
SEARs	Secretary's Environmental Assessment Requirements
SEPPs	State Environmental Planning Policies
SES	State Emergency Service
SHR	State Heritage Register
SIS	Species Impact Statement

SISD	Safe Intersection Sight Distance
SLR	SLR Consulting Australia Pty Ltd
SSD	State Significant Development
SSI	State Significant Infrastructure
SWMP	Site Waste Management Plan
T&I SEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021
TECs	Threatened ecological communities
TfNSW	Transport for NSW
TIA	Traffic Impacts Assessment
TLM	Track Laying Machine
TMP	Traffic Management Plan
UXO	Unexploded ordnance
WAL	Water access licence
WoNS	Weed of national significance
WM Act	Water Management Act 2000 (NSW)

Certification

Certification by preparing officer

This Review of Environmental Factors (REF) provides a true and fair review of the proposal in relation to its likely effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed activity and provides sufficient information to determine that the activity as described in this REF will not or is not likely to significantly affect the environment. Accordingly, no Environmental Impact Statement (EIS) and/or Species Impact Statement (SIS) are required.

Name	CP Soin, TA Environment and Approvals Lead		
Company	Inland Rail ARTC		
Signature		**Date**	10 June 2022

Certification by ARTC Delivery Director

The project is titled: Narwonah Material Distribution Centre Review of Environmental Factors

Subject to approval, proposal commencement is anticipated to be: Late Q2/Early Q3 2022

I confirm that I have reviewed and accept the REF, including the scope of works as detailed, and will:

- Construct and operate the project as described in the REF;
- Ensure all legislative requirements related to approvals, consultation and notification are fulfilled;
- Implement all listed environmental management measures;
- Seek advice from ARTC environment staff as required and report all non-conformances and incidents;
- Undertake audits and/or environmental site inspections; and
- Appropriately communicate REF requirements to project personnel.

Name & Position	Andrew Dean, Program Manger Rail		
Signature	 Andrew Dean (Jun 10, 2022 11:32 GMT+10)	**Date**	10 June 2022

Certification by ARTC Reviewing Environmental Advisor

I confirm that I have:

- I have reviewed the REF in accordance with legislative requirements and it meets the requirements of the REF Guidance Note (ENV-FM-021);
- The management measures listed in the REF are suitable to mitigate the impact of works; and
- The activity as described, is unlikely to significantly affect the environment.

Name & Position	Ben Lippett, Program Environment Lead - Approvals		
Signature	 Ben Lippett (Jun 10, 2022 11:28 GMT+10)	**Date**	10 June 2022

1. Introduction

1.1 About Inland Rail

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 will enhance Australia's existing national rail network and serve the interstate freight market.

The Inland Rail route, which is about 1,700 kilometres (km) long, involves:

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

The Inland Rail Program has been divided into 13 sections, 7 of which are in NSW.

The objectives of the Inland Rail Program are to:

- provide a rail link between Melbourne and Brisbane that is interoperable with train operations to Perth, Adelaide, and other locations on the standard-gauge rail network, to serve future rail freight demand, and stimulate growth for inter-capital and regional/bulk rail freight
- provide an increase in productivity that will benefit consumers through lower freight transport costs
- provide a step-change improvement in rail-service quality in the Melbourne to Brisbane corridor and deliver a freight rail service that is competitive with road
- improve road safety, ease congestion and reduce environmental impacts by moving freight from road to rail
- bypass bottlenecks within the existing metropolitan rail networks, and free up train paths for other services along the coastal route
- act as an enabler for regional economic development along the Inland Rail corridor.

Further information on Australian Rail Track Corporation (ARTC) and Inland Rail can be found at artc.com.au and inlandrail.com.au.

1.2 The proponent

ARTC is the proponent for the proposal and has a program to deliver Inland Rail. ARTC is an Australian Government-owned statutory corporation that manages more than 8,500 km of rail track in NSW, Queensland, South Australia, Victoria and Western Australia. ARTC is responsible for:

- selling access to the rail network to train operators
- capital investment in the network
- managing train operations across the network
- maintaining the network
- developing new business.

1.3 The proposal

The Narwonah Material Distribution Centre (MDC) forms a key component of the Inland Rail Program. It is in regional NSW, south of the township of Narromine (see Figure 1).

The proposed MDC will be used for temporary track material storage and management prior to their distribution to multiple Inland Rail projects and sections across NSW, including Narromine to Narrabri (N2N), North Star to Border (NS2B), Illabo to Stockinbingal (I2S), Stockinbingal to Parkes (S2P) and potentially other projects along the Inland Rail route.

ARTC is seeking to commence detailed design and construction from Q2 2022 so it can be receiving material by Q3 2022.

The proposal also involves the subdivision of Lot 16 DP755131, Lot 17 DP755131, Lot 1 DP1198931, Lot 232 DP755131 and Lot 233 DP755131 to create two lots (Lot A and Lot B). The MDC would be located on the section of Lot B to the east of the Parkes to Narromine (P2N) rail line, in the new subdivision (see Figure 2).

FIGURE 1: PROPOSAL LOCATION

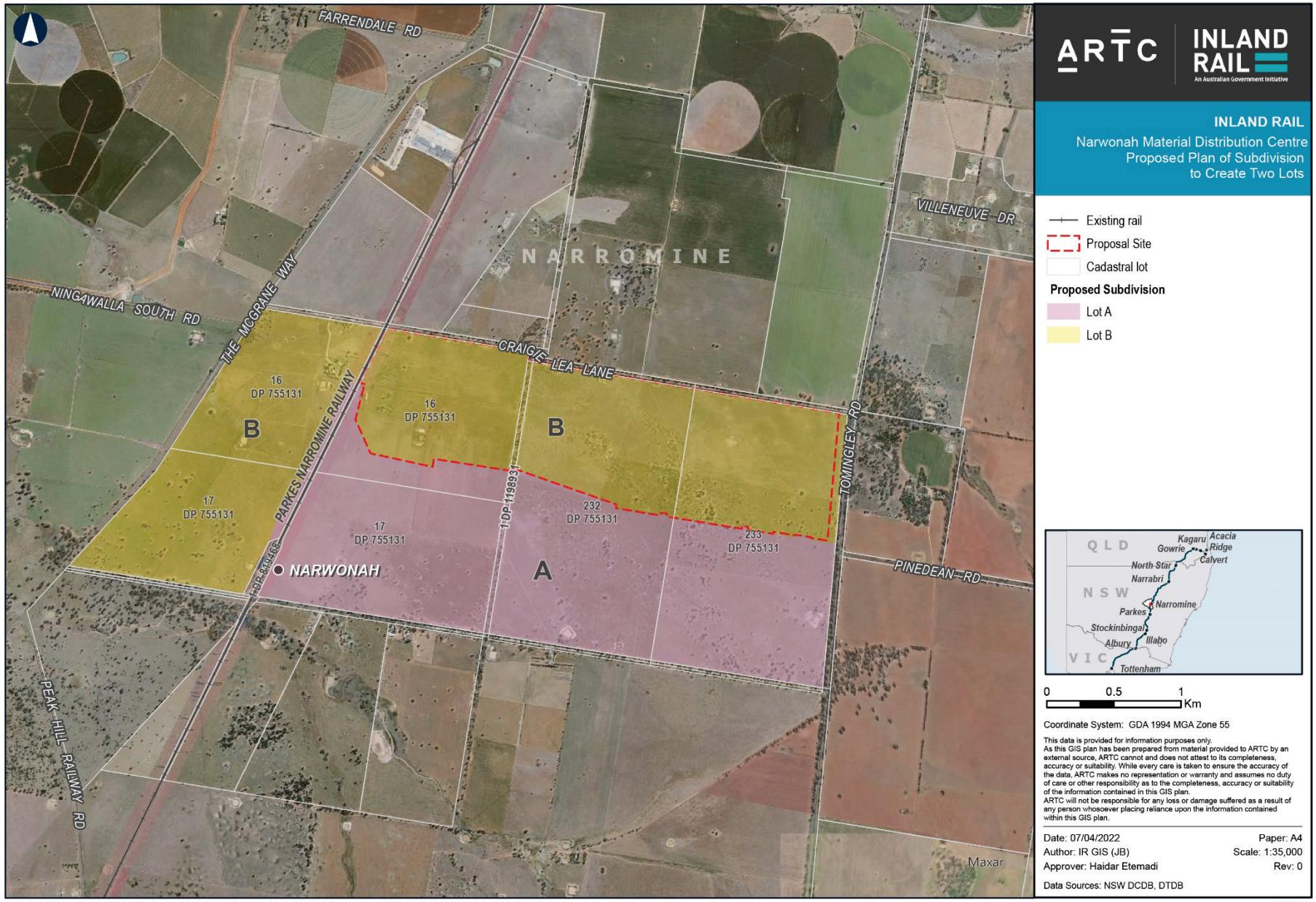

FIGURE 2: PROPOSED PLAN OF SUBDIVISION

1.4 Purpose of this report

ARTC has prepared this Review of Environmental Factors (REF) to consider the environmental factors listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation). The REF will allow ARTC to discharge its responsibilities under section 5.5 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) by allowing it to, '*examine to the fullest extent possible all matters affecting, or likely to affect the environment, by reason of the (proposal's) activities*'. The REF, therefore, helps ARTC determine if the proposal can be carried out while protecting and enhancing the environment as per objectives of the EP&A Act. ARTC is both the proponent and determining authority for the proposal.

The findings of this REF will be used to determine:

- whether the proposal is likely to have a significant environmental impact
- the significance of any impact on listed species and the requirement for a Species Impact Statement (SIS), Biodiversity Development Assessment Report (BDAR), or an Environmental Impact Statement (EIS)
- whether the proposal will impact a matter of national environmental significance (MNES) requiring a referral to be made to the Commonwealth Government under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- control measures to reduce and manage the likely impacts of the proposal.

This REF has been prepared in accordance with:

- Clause 171 of the EP&A Regulation
- ARTC's Code of Practice for Environmental Impact Assessment of Development Proposals in NSW, January 2016
- ARTC's Work Instruction for Review of Environment Factors (Version 2), February 2022.

2. Needs and options considered for the proposed MDC

2.1 Needs and objectives

The proposed MDC is required to allow for the timely delivery, stockpiling, handling and distribution of track construction materials (rail, ballast and sleepers) to support multiple Inland Rail projects and sections, including N2N, NS2B, I2S, S2P and potentially other Inland Rail projects.

The key objectives of the proposed MDC are to:

1. allow for the continued production of the materials at the suppliers' yards at a sustainable rate to meet the consumption demand once track construction commences
2. avoid significant volumes of road freight; therefore, enhancing road safety, reducing environmental impacts, network strain and simplifying the delivery process
3. allow for more controlled and safer material storage and handling operations to be undertaken, using a purpose-built and rail-accessible MDC; therefore, minimising potential quality issues and material damage
4. limit the number of times materials are required to be handled and transported prior to installation works
5. provide flexibility to the overall Inland Rail Program through the ability to reallocate materials to other Inland Rail projects and sections depending on demand
6. support the construction process through the storage of materials at a centralised location, which allows for the implementation of more efficient and environmentally responsible construction methodologies.

2.2 Alternatives and options

The track material supply for the Inland Rail projects can be provided in two ways:

- traditional procurements—where materials are delivered to numerous small stockpiles along the Inland Rail alignment, as required, to supply the track construction works
- pre-construction procurement—where materials are delivered to an MDC, allowing distribution to the worksites via rail and reducing the impact of multiple intermediate stockpiles along the Inland Rail alignment. This is the preferred option for the reasons outlined in the below subsection.

Alternative options for the MDC location were considered based on desktop analysis, site visitations and other factors, such as size availability, accessibility of site to existing rail corridors, ownership arrangements and conduciveness to overall delivery strategy. These options included the following:

- the proposal site (as described in this REF)
- locations at Curban and North Star. Both were determined to be unviable due to the size, access, and rail delivery restrictions they each imposed
- the area located immediately to the south of the proposal site. This was identified for potential use as part of the N2N Project, in the N2N Project EIS; however, it is planned to be used by the civil-works contractors constructing the N2N Project for their camp and laydown area.

2.3 Preferred option

The preferred option, that is the proposed MDC on the proposal site, is justified through achieving the key objectives as detailed in Table 1 below.

TABLE 1: JUSTIFICATION OF THE PREFERRED OPTION

Key objective	Justification
1. Allow for the continued production of the materials at the suppliers' yards at a sustainable rate to meet the consumption demand once track construction commences	Given the large amount of track materials required across the Inland Rail Program, and that consumption rates are set to significantly exceed production rates, the traditional procurement arrangement of delivering materials at the time of construction is non-viable, as this approach requires: ▸ sufficient storage at the production facilities ▸ the ability to meet and maintain production rates within a reduced production window ▸ adequate train paths to the rail corridor via the already congested rail network. There is a limited amount of available storage within the rail and sleeper suppliers' yards that will be rapidly exhausted once production commences; as such, alternative storage arrangements need to be implemented in line with this proposal.

Key objective	Justification
	While a traditional procurement approach may reduce the overall required storage time of rail and sleepers, the inherent lead times of this process may result in an absence of available materials to complete construction when required, resulting in construction timeframes extending significantly. This would result in prolonged impacts to amenity of nearby sensitive receivers resulting from typical construction activities. Early delivery of materials, where feasible, minimises this construction risk by building stockpiles of sufficient volumes for use, while continuing to replenish stores throughout construction. Further analysis of the implications of the production and demand requirements for each material type is provided below. **Concrete sleepers** There are approximately 1.3 million concrete sleepers still required to be produced for the Inland Rail Program, from precast facilities in Wagga and Rockhampton. Approximately 690,000 of which are required for the N2N, S2P, NS2B and S2P. Given this large quantity, and the suppliers other client-supply obligations, it is critical that the Inland Rail Program provides suppliers with a required production schedule that can be sustained over the course of the Inland Rail Program. Commencing supplier production early, and delivering materials to the MDC, will alleviate the large peaks and troughs in production requirements that would otherwise occur if materials were supplied on time along the alignment. Large demand fluctuations in a supplier production schedule may cause: ▸ supplier resourcing issues ▸ loss of trained personnel in periods of slower production ▸ quality issues that result when inexperienced personnel are used as the production demand increases, following periods of slower production ▸ inability to meet the required production requirements due to capacity or other client-supply obligations. **Rail** The preparation and welding of short rail into Long Welded Rail (LWR) strings is the longest path activity for the supply of rail for track construction. Once track construction commences, rail will be consumed in the order of approximately 3500 metres (m)/day, based on the preferred Track Laying Machine (TLM) methodology. Each 330-m LWR string comprises 12 x 7.5 m short rail strings that are required to be prepared, welded and ground, prior to being stockpiled as LWR, and ready for load out to the track construction work front. To meet the consumption demand, approximately half of the overall required quantity of LWR needs to have been fabricated and stockpiled prior to commencing track construction. As such, a purpose-built rail welding and storage facility is required. **Ballast** The volume of ballast (3.4 million tonnes (t)) that is required for the Inland Rail Program, necessitates careful procurement planning. It is critical that the rail construction contractors work collaboratively with the civil works contractors to ensure that sufficient rock material can be sourced to meet the Program's requirements. The MDC will allow for ballast material to be produced in parallel with the production of civil earthworks and pavement materials as it will be able to progressively be delivered and stored at the proposed MDC. This will allow: ▸ ballast materials to be economically sourced from farther afield due to the ability to deliver to the MDC via rail ▸ the prevention of over-crushing of rock source material, that will be suitable for ballast, to produce civil pavement products.
2. Avoid significant volumes of road freight; therefore, enhancing road safety, reducing environmental impacts and network strain, and simplifying the delivery process	A clear objective is to minimise, so far as is practicable, the potential social and environmental impacts resulting from the transportation of the track materials. The existing rail network accesses the proposal location, which was chosen to maximise the potential for the delivery of materials by rail, greatly reducing the number of material deliveries that will be required by road. Rail-based transport is only possible when delivering to an MDC or to brownfield areas of the alignment prior to the commencement of the civil works, and subsequent removal of the existing track. Rail-based delivery aims to minimise: ▸ heavy vehicle movements on the road network ▸ strain on the road haulage and logistics industry ▸ negative environmental impacts ▸ increased traffic through local communities ▸ negative community impacts and perception relating to increased road traffic ▸ damage to road network and resultant repair costs.

Key objective	Justification
	The below table provides a high-level comparison of the anticipated number of truck deliveries required for the supply of materials for N2N, NS2B, A2I, I2S and S2P, if train delivery cannot be achieved.

Product	Quantity	Deliveries (one-way movements)
Sleepers	690,000	8,600 truck deliveries OR 93 train movements
Short Rail	30,000 x 27.5 m lengths rail	2,515 truck deliveries OR 157 train movements
Ballast	1.4 million tonnes	32,900 truck deliveries OR 465 train movements

Notes:

- *Sleeper road transport by semi-trailer—80 sleepers/truck*
- *Short rail transport by semi-trailer—12 rails/truck*
- *Ballast transport by truck & dog—42.5t per truck*
- *Sleeper rail transport—7488 sleepers/train*
- *Short rail transport by train—192 rails/train*
- *Ballast transport by rail—3000t per train*

3. Allow for more controlled and safer material storage and handling operations to be undertaken, using a purpose-built and rail-accessible MDC; therefore, minimising potential quality issues and material damage	The construction and operation of the MDC of its size will have a more controlled materials handling processes, resulting in: ▸ a reduction in the level of damage caused to materials through their excessive handling, as they will be able to be delivered directly to the MDC from the supplier, and will not need relocating until they're used in track construction ▸ reduced plant and personnel costs associated with handling of materials ▸ controlled welding conditions ▸ more controlled, and safer, processes for storing and handling of materials, particularly sleepers and LWR, through using purpose-built unloading/loading gantry cranes and construction plant ▸ enhanced safety through the reduction in working and receiving deliveries within an operating rail corridor ▸ reduction in material waste and subsequent disposals through greater control over material quality, and more efficient and effective handling techniques.
4. Limit the number of times materials are required to be handled and transported prior to installation works	It is anticipated that the Inland Rail Program will likely be able to operate, on average, three supply trains per month, for both sleepers and rail, within the existing rail network. Given the quantum of materials and the number of train deliveries required (see above table), this will be insufficient to service the construction demand requirements if early production is not implemented; as such, the early production, delivery and stockpiling of materials is needed in order to meet construction consumption requirements. The construction and operation of an MDC allows for materials to be delivered and stockpiled once, until they are loaded onto work trains for incorporation into the new track. Without an operational MDC, materials will need to be stockpiled at numerous locations along the alignment. These locations will be located away from the alignment until such time as the civil works has been completed; as such, using stockpiles along the alignment will introduce several additional handling operations; from the supplier to intermediate stockpiles, then to adjacent the alignment (following the civil works), before then being distributed along the alignment for incorporation into the new track.
5. Provide flexibility to the overall Inland Rail Program through the ability to reallocate materials to other Inland Rail projects depending on demand	The current civil works schedules for the remaining projects of the Inland Rail Program will be subject to change as each of the individual work packages is designed and subsequently constructed; as such, the overall sequence in which each of the civil works packages will be completed will also change to allow for the commencement of track construction. Failure to construct a central MDC will require materials to be delivered, predominantly by road, to small stockpiles along the alignment. These deliveries will, therefore, be scheduled in line with the Inland Rail Program sequence, which has the potential to change. Delivering materials to an MDC prior to transporting them to a construction site will: ▸ alleviate demand stresses on supplier schedules, which may result if materials were delivered directly to construction sites in the incorrect sequence ▸ allow for a smooth and easily forecast supplier production schedule, enabling ongoing regular material deliveries without the effects of a changing construction sequence

Key objective	Justification
	▸ allow for materials to be reallocated to different projects in line with a fluid Inland Rail Program schedule, as required ▸ greatly reduce the requirement for using road transport for any material relocations resulting from sequence changes.
6. Support the construction process through the storage of materials at a centralised location, which allows for the implementation of more efficient and environmentally responsible construction methodologies.	Failure to construct a central MDC will require altering the rail construction method for several Inland Rail projects and sections, from a significant automated TLM to a predominantly manual methodology requiring more plant, longer construction timeframes, increased material handling, increased manual handling and safety risks. While this may still occur in small, localised instances, this was deemed to be non-viable as the preferred method due to: ▸ the large amount of material road deliveries this would require ▸ supply and demand constraints ▸ the increased amount of land disturbance to construct smaller material laydowns along the alignment ▸ design and construction of the civil works for the Inland Rail projects not yet having been undertaken—areas would not yet be available along the alignment to receive the materials that are required to be delivered from the suppliers.

3. Description of the proposal

The proposal includes the construction and temporary operation of a MDC. The proposed MDC will primarily be used for track material (concrete sleepers, rail and ballast) storage and management, prior to their distribution to multiple Inland Rail projects and sections. The following activities will take place at the MDC:

- rail logistics and welding, including short rail delivery and stockpiles, flash-butt welding and grinding stations, and LWR stockpiles
- sleeper logistics, including sleeper stockpiling and handling
- ballast logistics, including stockpile and handling
- TLM and work train provisioning
- storage of turnouts and catchpoints, and other pre-cast materials, as required (e.g., culverts, level crossing panels)
- installation of mainline turnouts and catchpoints from exiting ARTC corridors
- stabling roads for work trains, ballast trains, track plant and locomotives
- office and amenities for MDC operation and maintenance personnel
- heavy vehicle access to material stockpiles
- construction plant laydown
- civil and rail plant maintenance facilities.

The proposed MDC is not considered to be an ancillary development as it is essentially a separate Inland Rail project that will be servicing multiple critical State Significant Infrastructure (CSSI) and non-CSSI Inland Rail projects (see section 4.4.2 of this REF for further details).

The proposal also involves the subdivision of Lot 16 DP755131, Lot 17 DP755131, Lot 1 DP1198931, Lot 232 DP755131 and Lot 233 DP755131 to create two lots: Lot A (476.15 hectares (ha)) and Lot B (558.05 ha) (see Figure 2). The MDC would be located on the section of Lot B to the east of the P2N line, in the new subdivision.

The subdivision is a development that forms part of the proposal. It will separate the land to allow Lot A to be specifically used to build the N2N Project under its own contract, while part of Lot B will be used to specifically build the MDC under a different contract. These proposals form distinct elements of the Inland Rail Program; they will have different construction and operational timeframes.

This means the subdivision is needed for the purpose of a railway, which is a form of development where ARTC does not need to obtain consent. Sections 4.2.1 and 4.4.1 describe why ARTC can develop railways and related infrastructure without consent.

In addition to facilitating the use of the proposal site for the MDC, the subdivision will allow for flexibility in dealing with the MDC after any Inland Rail-based requirements have been fulfilled.

Any use of the proposal site following completion of ARTC's use in connection with Inland Rail construction works does not form part of the proposal, and would need to be considered and assessed separately.

There is no current proposal for the land use of Lot A and Lot B.

3.1 Proposal location

The proposal will be situated to the north of the future N2N alignment within the Narromine Shire Council local government area (LGA). The proposal location is approximately 38 km west of the city of Dubbo, NSW and approximately 7 km south of the Narromine township (NSW) (see Figure 1).

The location of the proposed MDC has been determined based on the avoidance of conflict with infrastructure and topographic features of the area. It avoids any recorded significant environmental and cultural heritage values or resources. It is also a favourable location for to support multiple Inland Rail projects and sections.

3.2 Proposal site

The proposal site is the area to be used for the construction and operation of the MDC (see Figure 3). The proposal site is located on four properties, including Lot 16 DP755131, Lot 1 DP1198931, Lot 232 DP755131 and Lot 233 DP755131, all of which are currently owned by ARTC. The total area of the proposal site is approximately 328.61 ha.

The various aspects of the existing environment of the proposal site are detailed in section 6 of this report.

The indicative outline of the subdivided proposal site is set out in Figure 2.

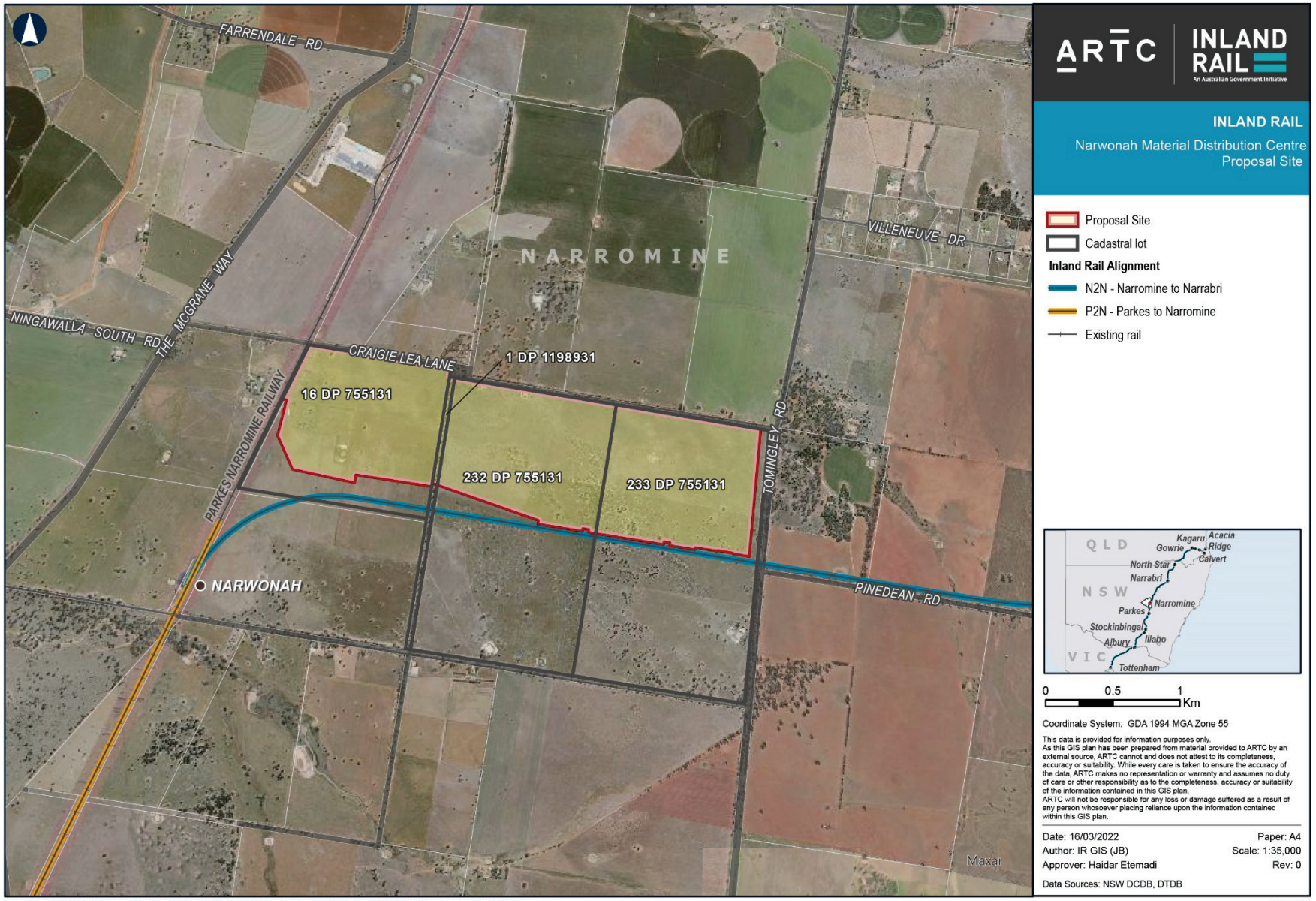

FIGURE 3: PROPOSAL SITE

3.3 Key design features

The proposed MDC is currently at conceptual design and will be further refined at detailed design, with the consideration of the outcomes identified throughout the assessment and approval process.

The present conceptual design of the proposed MDC is planned to cater for various functional requirements, which are outlined in Table 2 and illustrated in the Conceptual Layout Plan (Figure 4).

TABLE 2: FUNCTIONAL REQUIREMENTS OF THE MDC

Functional requirements	Details
Access	▸ Standard-gauge track access from the existing Hunter Valley line through a mainline turnout ▸ Standard-gauge track access throughout the proposal site for the receipt/delivery and unloading/loading of material ▸ Heavy vehicle truck access to and throughout proposal site, including separate plant access to stockpiles.
Rail welding	▸ Flash-butt welding station ▸ Rail preparation and grinding (underfoot, web, profile) stations ▸ Rail conveyor system to move rail shorts progressively along LWR production line, allowing simultaneous prep/welding/grinding at progressive workstations ▸ Transfer LWR via gantry to stockpile and subsequent loading of material supply trains to service a progressive rail construction front.
Delivery and storage	▸ Mobile gantry crane unloading, and storage from sleeper and rail delivery wagons and/or heavy vehicles as required ▸ Delivery and stockpiling of ballast by train and heavy vehicles ▸ Potential under train wagon ballast discharge and conveyor system ▸ Additional sleeper 'spill-over' storage, as required, with vehicle access to be loaded from gantry crane and relocated to 'spill over' storage location.
Semi-permanent/demountable buildings and storage	▸ Road plant and on-track maintenance bays (including bunding) ▸ Offices ▸ General materials storage (e.g. shipping containers/covered areas) ▸ Crib and ablution facilities ▸ Fuel storage (including bunding) ▸ Generators/power (including three-phase power for welding) ▸ Lighting to allow for 24/7 operation ▸ Water storage (potable/dust suppression) ▸ Plant storage areas ▸ Adequate signage and fencing to manage site access.

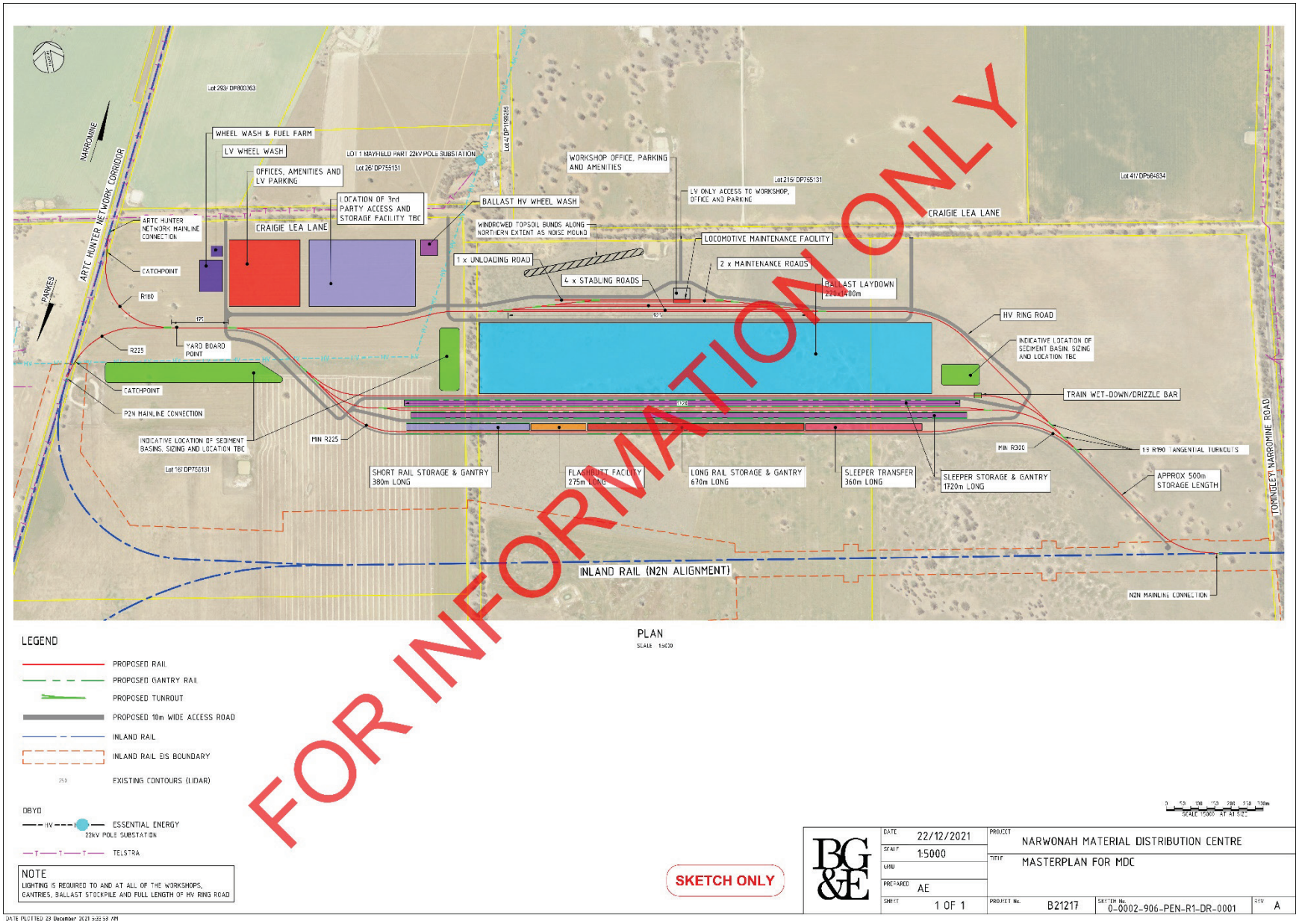

FIGURE 4: MDC CONCEPT LAYOUT

3.4 Construction activities

A complete and detailed construction methodology for the MDC will be prepared by the nominated construction contractor. It will be based on the detailed design of the proposed MDC and consider the appropriate environmental mitigation measures.

A high-level set of activities expected to be involved in the construction of the MDC is listed below:

- structural and engineering fill placement—material will be collected onsite to be used as general and structural fill, with these borrow locations being in areas of cut that will then be used as a hardstand area for site offices and laydown
- strengthening of some internal roads and rail track structure—pavement material and ballast will be sourced from local quarries
- track construction including placement of ballast, sleepers and rail—the track will be constructed using specialist excavator attachments, loaders, trucks and track-mounted resurfacing machines, and will connect to the existing rail corridor
- installation of steel structures (gantries, portal frames)—the portal frame installation involves concrete foundations being installed, with cranes placing the steel structures for fixing
- installation of insitu concrete elements for the flash-butt welding stations, rail handling rollers, and for the drop pits to be used for rollingstock maintenance
- vegetation clearing and grubbing
- stripping of topsoil
- bulk earthworks and subgrade treatment
- installation of diversion drains and erosion control
- installation of electrical connection and site distribution infrastructure
- installation of fuel storage infrastructure
- set up of offices and amenities.

3.5 Operation activities

When an Inland Rail project or work component requires material for use in construction it will be loaded onto work trains at the MDC and placed directly into their final design location via a material train (containing rail and sleepers to feed directly into the automated TLM) and ballast trains (to distribute ballast through bottom-dumping directly into track).

Table 3, below, outlines the anticipated delivery, management and distribution of the materials at the proposal site.

TABLE 3: DELIVERY, MANAGEMENT AND DISTRIBUTION OF MATERIAL

Material	Delivery and management of material
Concrete sleepers	▸ Concrete sleepers will be delivered by rail, from Rockhampton and Wagga, and unloaded from the delivery rake using a track-mounted mobile gantry crane. Sleepers will be stored on hardwood dunnage within the nominated cleared areas of the proposal site. ▸ Additional sleeper spill-over storage will be accessed via truck as required, with sleepers unloaded from the delivery rake, using the gantry crane, and transferred to the spill-over storage location via truck and forklift. ▸ Concrete rail sleepers will be loaded onto supply trains to service a progressive rail construction front.
Rail	▸ Rail shorts (27.5 m) are delivered by rail, from Whyalla, South Australia, and unloaded from the delivery rake using a track-mounted mobile gantry crane. ▸ Rail shorts are then transferred via gantry to atop an automated feeding table system, which feeds them onto a hydraulic roller conveyor system. ▸ The rail short ends are prepared for welding, through 'sand' blasting/grinding and then fed along the roller conveyor system to flash-butt welder unit. ▸ The rail conveyor system propels rail shorts progressively along LWR production line, allowing simultaneous prep/welding/grinding at progressive workstations. ▸ 330-m-long LWRs will be fed along conveyor system and then transferred to storage with linked stationary gantry cranes. They will then be loaded onto the supply consist for transport to TLM.

Material	Delivery and management of material
Ballast	▸ Ballast will be delivered to the proposal site by rail, and stockpiled prior to later loading and ▸ potential under train wagon ballast discharge and conveyor system ▸ ballast haul roads, including for high-volume delivery of ballast ▸ front-end loader and dump truck handing, and transportation around site ▸ ballast wagon loading (potentially inclusion of conveyor loading system).

3.6 Plant, equipment and material

Plant and equipment anticipated to be used for the construction of the MDC include:

- all-terrain forklifts/Franna cranes
- articulated dumper trucks
- ballast regulator and tamper
- bulldozers (bush rake)
- compactors and rollers
- concrete agitators
- concrete pumps
- crawler cranes
- excavators
- front-end loaders
- fuel pods
- generators
- graders
- Hi-Rail dump trucks
- light vehicles
- mobile flash-butt welder
- portable office/amenities
- road stabiliser
- road trains
- scrapers
- side-tippers
- skid-steers
- sleeper laying excavator with octopus attachment
- track geometry trolley
- truck & dogs
- tub grinder/mulcher graders
- water trucks (body, semis, road trains & articulated).

The following materials would be imported to the proposal site for the construction of the MDC:

- concrete and reinforcement
- concrete sleepers, rail, turnouts, catchpoints, including associated signaling
- geosynthetics
- drainage materials (concrete box culverts/pipes and corrugated steel pipes)
- plastic conduits and associated materials
- imported quarry materials (general fill, structural fill, road base, ballast, rip-rap, drainage stone)
- construction and potable water.

Plant and equipment anticipated to be used during the operation and maintenance of the MDC include:

- all-terrain forklifts/Franna cranes
- articulated dumper trucks
- compactors and rollers.
- excavators
- flash-butt welder
- front-end loaders
- fuel pods
- generators
- graders
- light vehicles
- loading/unloading ballast conveyors
- locomotives.
- rail-mounted gantry cranes
- road trains
- shunt tractor
- side-tippers
- skid-steers
- truck and dogs
- water cart, for dust suppression
- wheel
- work trains

3.7 Haulage and traffic

3.7.1 Train movements during operation

Train deliveries to and from the operational MDC, from both the material suppliers and to the Inland Rail construction fronts, are anticipated to occur on the basis outlined in Table 4.

TABLE 4: TRAIN MOVEMENTS DURING OPERATION

Materials	Train movement	Occurrence
Deliveries from suppliers		
Sleepers	1 inbound & outbound train (2 movements)	Weekly (ongoing)
Rail	1 inbound & outbound train (2 movements)	Weekly (ongoing)
Ballast	1 inbound & outbound train (2 movements)	Daily (ongoing)
Deliveries to construction fronts		
Rail and sleepers	1 inbound & outbound work train (2 movements)	Daily (during rostered workdays)
Ballast	4 inbound & outbound ballast trains (8 movements)	Daily (during rostered workdays)

3.7.2 Road vehicle movements during construction and operation

In addition to the train movements outlined above, road vehicle movements during operation and construction of the MDC are expected to consist of the following:

Construction phase:

- up to 10 light vehicles and one or two minibuses—daily (24 movements)
- up to 20 heavy vehicles inbound for delivery of materials or disposal of waste—daily (40 movements).

Operation phase:

- up to 10 light vehicles and six minibuses—daily (32 movements)
- up to 10 heavy vehicles inbound per week for materials deliveries (points machines, sleepers, turnouts, etc.)—weekly (20 movements)
- up to four front-end loaders and two forklifts constantly working.

3.8 Water usage

The proposed MDC would require approximately 75 megalitres (ML) of water for construction use (moisture conditioning) and for dust suppression. Water may be sourced from several locations from privately owned, commercially licensed bores in Narromine. These sources have been reviewed and are considered satisfactory, pending commercial agreements with the bore owners.

3.9 Utilities

No utility adjustments would be required as part of the proposal; however, utilities may be brought in, particularly main power, where this is more efficient than generators.

Office and lighting would be connected and powered by nearby 22 kilovolt (kV) distribution via a property pole with pole-mounted transformer and substation. Larger machinery and plant (such as gantries) would be generator powered.

3.10 Workforce

Approximately 100 personnel are anticipated onsite at any one time during construction the operation of the MDC. This will include a mix of people working the yard (welding and material handling), and office-based logistics staff managing, coordinating and administrating various operational aspects.

3.11 Working hours

Construction hours

Construction activities, including site establishment and unloading activities, would be sought to be undertaken during the recommended standard hours for construction work as per the *NSW Interim Construction Noise Guideline* (ICNG) (Department of Environment and Climate Change (DECC), 2009), which will be:

- 7:00 am to 6:00 pm Monday to Friday
- 8:00 am to 1:0 0pm Saturday

Works may be undertaken outside the recommended standard hours, however, which include, but are not limited to, the following:

- works where the proponent has negotiated agreements with directly affected residents and sensitive land uses
- low-impact noise activities can occur, including:
  - construction that causes LAeq (15 minutes) noise levels:
    - no more than 5 dB(A) above the rating background level at any residence in accordance with the ICNG
    - no more than the 'noise affected' noise management levels (NMLs) specified in Table 3 of the ICNG at other sensitive land uses
  - construction that causes:
    - continuous or impulsive vibration values, measured at the most affected residence, are no more than the preferred values for human exposure to vibration specified in Table 2.2 of Assessing Vibration: a technical guideline (Department of Environment and Conservation (DEC), 2006)
    - intermittent vibration values, measured at the most affected residence, are no more than the preferred values for human exposure to vibration, specified in Table 2.4 of *Assessing Vibration: a technical guideline*
- the delivery of oversized plant or materials that are subject to excess mass or dimension restrictions to transport along public roads
- emergency work to avoid the loss of life or damage to property, or to prevent environmental harm
- maintenance and repair of public infrastructure where disruption to essential services and/or considerations of worker safety do not allow work within standard hours
- public infrastructure works that shorten the length of the project and are supported by the affected community
- works where a proponent demonstrates and justifies a need to operate outside the recommended standard hours.

Operation hours

Operational activities, including welding, loading and distribution, will be undertaken 24 hours a day, 7 days a week.

3.12 Duration of works

The MDC is expected to be built from June 2022 and to be operational from September 2022 until approximately 2027.

3.13 Decommissioning

Upon completion of the Inland Rail corridor works, ARTC will consider the most effective ongoing use of the proposal site or Lot B and decommission the MDC according to what its proposed future use would be.

3.14 Operational rail line

Trains delivering materials for the operational MDC would enter the proposal site via a mainline turnout from the Hunter Valley line. The delivery and storage of the rail materials within the MDC would not change existing operational arrangements of the Hunter Valley line, other than temporary impacts on rail traffic during delivery. The low frequency of use of the existing line would allow delivery sequencing to occur without impact on existing services.

4. Statutory requirements

This section details the planning and environmental legislation applicable to the proposal and any associated legislative requirements.

4.1 Commonwealth Legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The purpose of the EPBC Act is to, among other things, provide for the protection of the environment, especially MNES and to conserve Australian biodiversity values.

The EPBC Act is primarily concerned with 'actions'. Under the EPBC Act, an action includes a proposal, a development, an undertaking, an activity or a series of activities, or an alteration of any of these things, and it would include the proposal. An action that the Commonwealth Minister for the Environment determines 'has, will have or is likely to have a significant impact' on MNES or an action taken on Commonwealth land that 'has, will have or is likely to have a significant impact on the environment' more broadly is a 'controlled action' and may not be conducted without prior approval from the Minister for the Environment.

Potential MNES of relevance to this assessment include:

- threatened species and ecological communities
- migratory species.

Threatened biota and migratory species recorded or likely to occur in the study area have been identified and assessments of significance in accordance with the EPBC Act *Significant Impact Guidelines 1.1* (Department of the Environment and Energy (DEE, 2013)) have been prepared for threatened biota listed under the EPBC Act that would be impacted, or are likely to be impacted, by the proposal. A discussion of the findings is presented in section 6.1The significant impact assessments concluded that the impacts of the proposal are not considered significant. Despite these results, a referral to the Department of Agriculture, Water and the Environment (DAWE) was undertaken by precaution on the 28th of April 2022.

4.1.2 Native Title Act 1993

The *Native Title Act 1993* (Cth) (Native Title Act) recognises that First Nations people have rights and interests to land and water that derive from their traditional laws and customs. Native title may be recognised in places where First Nations people continue to follow their traditional laws and customs, and have maintained a link with their traditional Country.

Native title is managed though native title claims, Indigenous Land Use Agreements (ILUA) or future act agreements. An ILUA (once registered on the Register of Indigenous Land Use Agreements) is a formal, binding agreement, negotiated between native title groups and other parties who use or manage the land and water resources.

The National Native Title Register, Register of Native Title Claims, Unregistered Claimant Applications Register, and Register of Indigenous Land Use Agreements were searched in November 2021 for reported native title claimants in the Narromine Shire Council LGA. There are currently no native title applications, claims, determinations or ILUA present in the proposal site as at that date.

4.2 New South Wales Legislation

4.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act aims to promote the orderly and economic use and development of land, and facilitate ecologically sustainable development through the integration of relevant economic, environmental and social consideration during the environmental planning and assessment process.

The EP&A Act regulates the carrying out of 'development', which is defined in Section 1.5 of the EP&A Act to include (among other things) the erection of a building, the carrying out of a work, the subdivision of land, and any other act, matter or thing that may be controlled by an environmental planning instrument that is made under the EP&A Act.

The EP&A Act provides several pathways for the assessment and (if required) the approval of development. It also allows planning instruments to be formed, such as State environmental planning policies (SEPPs) and local environmental plans (LEPs). The instruments also control development in NSW, while providing additional forms of environmental protection; they helped determine which pathway applies to the proposal.

Specifically, clause 2.91 of State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) (discussed further below) states that development for the purpose of a 'railway' or 'rail infrastructure facilities', which would include the proposal, can be undertaken by, or on behalf of, a public authority without development consent.

Schedule 1 of the EP&A Regulation prescribes ARTC as a 'public authority' with the rights to develop a 'railway' or 'rail infrastructure facilities' without consent. This means they are the 'determining authority' for such proposals, providing the proposal does not trigger any alternative pathway.

Section 5.5 of the EP&A Act requires that a determining authority 'examines and takes into account to the fullest extent possible all matters affecting or likely to affect the environment', in relation to any activity, before approving or carrying that activity out.

If an activity is 'likely to significantly affect the environment', the proponent would need to prepare an EIS. This would make the activity SSI by means of section 2.13 and Schedule 3 clause 1 of State Environmental Planning Policy (Planning Systems) 2021 (PS SEPP), which would mean it needs approval from the Minister for Planning and Homes, under Division 5.2 of the EP&A Act.

This REF has been prepared to fulfil the relevant requirements of Part 5 of the EP&A Act. Furthermore, clause 171 of the EP&A Regulation details the 'factors to be considered concerning the impact of an activity on the environment'. All relevant factors for consideration are addressed in sections 6 and 7 of this REF, and a checklist is provided in section 8.2. The assessment in this REF concludes that the proposal would not have a significant impact on the environment or threatened species, populations or ecological communities or their habitats and, therefore, should be assessed under Division 5.1 of the EP&A Act.

4.2.2 Protection of the Environment Operations Act 1997

The underlying objectives of the *Protection of the Environment Operations Act 1997* (NSW) (POEO Act) is to reduce pollution and regulate the storage, treatment and disposal of waste in NSW. The POEO Act establishes the procedures for issuing licences for environment protection; imposes controls on various environmental aspects such as waste, air, water, and noise pollution control; and requires notifications of incidents and other matters.

The POEO Act provides that an Environment Protection Licence (EPL) is required where any scheduled activity (as described in Schedule 1) is to be undertaken.

The proposal does not involve any of the scheduled activities listed in Schedule 1, clause 33 of the POEO Act; this means, a specific EPL is not needed to either construct or operate the MDC. Further, the MDC would also not need to operate under the wider EPL provisions ARTC holds for its 'railway infrastructure operations' (i.e. EPL 3142).

Though the proposal can be carried out without the need for an EPL, various construction and operational management measures (see section 7) would be used to prevent and minimise pollution and waste generation, consistent with the objectives of this Act and its supporting regulations.

4.3 Other key legislation

4.3.1 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (NSW) (BC Act) provides protection for certain biota of conservation significance in NSW. The BC Act: provides for the listing of threatened species and communities; conservation of Areas of Outstanding Biodiversity Value; promotes ecological sustainable development; establishes a framework to avoid, minimise and offset the impacts of proposed development (i.e. the Biodiversity Offsets Scheme (BOS)); and establishes a scientific method for assessing the likely impacts on biodiversity values and calculating measures to offset those impacts (i.e. the Biodiversity Assessment Method (BAM)).

Section 7.3 of the BC Act requires that the significance of the impact on threatened species, populations and endangered ecological communities listed under the BC Act, are assessed using a five-part test. Where a proposal is 'likely to significantly affect' the environment, or threatened species or ecological communities, the proponent must prepare a SIS in accordance with the Secretary's Environmental Assessment Requirements (SEARs), or, if the proponent so elects, a BDAR (which must be prepared in accordance with the BOS and BAM). The proponent must also prepare an EIS.

A Biodiversity Assessment Report (BAR) was prepared for the proposal and is provided in Appendix A. The findings of the BAR are discussed in section 6.1.

The assessments concluded that the proposal is not likely to have a significant impact on Areas of Outstanding Biodiversity Value, threatened ecological communities (TECs) or threatened species listed under the BC Act, or on MNES under the EPBC Act, as discussed in section 6.1. Neither a SIS nor a BDAR is required for the proposal.

4.3.2 Biosecurity Act 2015

The *Biosecurity Act 2015* (Cth) (Biosecurity Act) seeks to prevent, eliminate and manage biosecurity risks in NSW. The Biosecurity Act shares biosecurity responsibilities between government, industry and communities.

For the proposed activities, the key responsibilities that arise under the Biosecurity Act are the avoidance of weed and pathogen dispersal occurring because of vehicle movement through the corridor and surrounding properties, and import of soil/material. It is also to control attracting pest species onsite.

Priority weeds are regulated under the Biosecurity Act, with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Some priority weeds have additional management obligations that may apply generally, or under specific circumstances.

Any identified weed species within the proposal site are the subject of a general biosecurity duty that requires any person who deals with the plant to ensure the biosecurity risk of the weed is prevented, eliminated or minimised, so far as is reasonably practicable. Regional measures for many species include the requirement that land managers should mitigate the risk of new weeds being introduced to their land.

The provisions of the Biosecurity Act have been considered as part of the BAR (Appendix A) for the proposal, which is summarised in section 6.1.

4.3.3 Contaminated Land Management Act 1997

The *Contaminated Land Management Act 1997* (NSW) (CLM Act) creates processes for investigating, managing and remediating contaminated land that poses a risk to human health and the environment.

Consideration of the provisions and requirements of the CLM Act are provided in the assessment of soil and contamination in section 6.1.

4.3.4 Fisheries Management Act 1994

The objectives of the *Fisheries Management Act 1994* (NSW) (FM Act) are to conserve, develop and share the fishery resources of the state for the benefit of present and future generations. It provides for the listing of threatened species, populations and ecological communities, key threatening processes, and otherwise sets out requirements for the preparation of a SIS.

The proposal site does not contain any watercourses that provide suitable habitat for threatened fish listed under the FM Act. The species predicted to occur in the locality are associated large river systems and, as a result, can be reliably excluded from occurring within the proposal site.

The proposal is not expected to impact on key fish habitat, marine vegetation or present any obstruction to fish passage.

4.3.5 Heritage Act 1977

The *Heritage Act 1977* (NSW) (Heritage Act) provides for the identification, registration and conservation of the state's heritage, and the protection of 'relics'.

Section 22 of the Heritage Act establishes the State Heritage Register (SHR). There were no items found within the proposal site, or within 3 km of the proposal site, that are listed on the SHR; therefore, a permit to carry out activities within the curtilage of an item listed on the SHR under Section 60 of the Heritage Act is not required.

Section 170 of the Heritage Act requires all government agencies to maintain a Heritage and Conservation Register that lists all heritage assets and an assessment of the significance of each asset. There were no items found within the proposal site or within 3 km of the proposal site that are listed on Section 170 Registers, including State Heritage Inventory, the ARTC and Transport for NSW (TfNSW) inventories.

The Heritage Act also provides protection for relics. The Heritage Impact Assessment (HIA) assessed that any archaeological remains within the proposal site would not reach the threshold of local significance; therefore, neither an excavation (under Section 140 of the Heritage Act) or exemption (under Section s139(4) of the Heritage Act) is required for the proposed MDC works to proceed under the Heritage Act.

Considerations of the provisions and requirements of the Heritage Act is provided in the HIA report (Appendix B) and summarised in section 6.3.

4.3.6 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NSW) (NPW Act) provides for the control and management of all national parks, historic sites, nature reserves, wetlands and other stage reserves. It also provides for the protection of 'Aboriginal objects' and 'Aboriginal places'.

Section 86 of the Act lists offences relating to the harming or desecrating of Aboriginal objects. If any identified Aboriginal object or Aboriginal place may be harmed during the proposed MDC, an approval under Sections 87(1) and 90(2) of the NPW Act will be required.

No Aboriginal sites or places were listed in the proposal site.

Consideration of the provisions and requirements of the NPW Act is provided in the Aboriginal Archaeological Survey Report (ASR) (see Appendix C) and summarised in section 6.3.

4.3.7 Roads Act 1993

The *Roads Act 1993* (NSW) (Roads Act) regulates the carrying out of various activities that impact the function of roads, and sets out the rights of those who pass along and access public roads.

Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. Clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads. ARTC is not a public authority for the purposes of the Roads Act.

The proposed MDC is unlikely to result in temporary road closures or diversions during its construction and operation phases.

4.3.8 Waste Avoidance and Resource Recovery Act 2001

The *Waste Avoidance and Resource Recovery Act 2001* (NSW) (WARR Act) is aimed at minimising the consumption of waste resources and controlling the management and disposal of any waste materials onsite.

It promotes the waste hierarchy to avoid resource consumption and implement resource recovery in the form of material reuse and recycling in preference to waste disposal. The WARR Act acknowledges that certain material present either human or environmental risk, requiring classification, treatment and disposal, in accordance with specific waste-management provisions.

The MDC generates waste mainly during the construction phase. The principles of the waste management hierarchy and other relevant waste management requirements would be implemented onsite.

Further assessment of waste generation is in section 6.11.

4.3.9 Water Management Act 2000

The *Water Management Act 2000* (NSW) (WM Act) addresses the sustainable management of surface waters in NSW and the integration of water management with other environmental management practices.

It is currently proposed that construction water will be sourced from existing bores. Under the WM Act, a water access licence (WAL) is typically required to take water from a very broad range of sources, including bores, aquifers and natural waterways. In some cases, and depending on the proposed construction methodology and water requirements, ARTC or its construction contractor may be able to source water from third parties' entitlements, relying on those parties' WALs. In other cases, ARTC or the construction contractor may need to obtain their own WAL to source construction water.

The following water management work approvals under the WM Act may be required by the construction contractor based on the final construction method and resourcing water:

- Water supply works approval (s.91B of the WM Act). This authorises the holder to construct and use a specified water supply work at a specified location (from a river, lake or aquifer). Water supply works include, but are not limited to, water pumps, bores and dams.
- Drainage work approval (s.91C of the WM Act). This authorises the holder to construct and use a drainage work.
- Flood work approval (s.91D of the WM Act). This authorises the holder to construct and use a work located near a river, estuary, or within a floodplain, which is likely to affect the flow of water to or from a river, estuary or lake, or distribution or flow of floodwater in times of flood.

Temporary dewatering and construction activities that interfere with aquifers may need one or more of the above approvals and a WAL under the WM Act. While the WM Act also separately provides for aquifer interference approvals, the provisions of the WM Act addressing those approvals have not yet commenced operation.

4.4 Environmental planning instruments

4.4.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

The T&I SEPP aims to assist in the effective delivery of public infrastructure across NSW. The aim is achieved by improving regulatory certainty and efficiency through a consistent planning pathway and more flexibility in location for infrastructure and services. It also identifies the applicable environmental assessment and approval process for infrastructure and services.

Clause 2.91(1) permits development for the purpose of railway or rail infrastructure facilities to be carried out by, or on behalf of, a public authority without development consent, on any land. The proposal comprises development for the purposes of a railway or rail infrastructure facilities, within the meaning of clause 2.91.

In addition, the subdivision is development for the purpose of railway or rail infrastructure facilities as it facilitates the use of the proposal site for the MDC, by allowing the creation of a specific lot for the MDC. This, in turn, will facilitate the use of the MDC to support Inland Rail, as well as providing flexibility to facilitate any further ongoing use.

The proposed activities are not located on land reserved under the *National Parks and Wildlife Act 1974* (NSW) and its operation is not inconsistent with the operation of State Environmental Planning Policy (Resilience and Hazards) 2021 or State Environmental Planning Policy (Planning Systems) 2021. Therefore, the proposal can progress as development without consent as there are no other legal provisions that would affect the planning pathway.

4.4.2 State Environmental Planning Policy (Planning Systems) 2021

The PS SEPP provides details of projects that will be considered State Significant Development (SSD), SSI and critical CSSI.

The PS SEPP provides that, for this proposal to be considered SSI, it must have a capital investment value of more than $50 million or be likely to significantly affect the environment.

The proposal has a capital investment value below $50 million and is not likely to have a significant impact on the environment; therefore, it does not classify as SSI. The proposal has been assessed under Division 5.1 of the EP&A Act.

Schedule 5, Clause 7, declares various Inland Rail projects to be CSSI, and includes ancillary development. Clause 7 defines 'ancillary development' to be development that is ancillary to any other CSSI development under Clause 7. The proposal is not considered to meet this definition as it is a separate Inland Rail project which will be servicing multiple other Inland Rail projects and sections, some of which are CSSI and some of which are not. Furthermore, the proposal will be built under a different contract to the Inland Rail projects and have different construction and operational timeframes.

4.4.3 Narromine Local Environmental Plan 2011

The proposal is located within the Narromine Shire Council LGA. The proposal site is located within the Primary Production (RU1) zone under the Narromine Local Environmental Plan 2011 (LEP). Works described as 'freight transport facilities' are permitted, with consent, within zone RU1. Freight transport facility is defined under the Narromine LEP as a facility used principally for the bulk handling of goods for transport by road, rail, air or sea, including any facility for the loading and unloading of vehicles, aircraft, vessels or containers used to transport those goods and for the parking, holding, servicing or repair of those vehicles, aircraft or vessels or for the engines or carriages involved.

Clause 1.9(1) of the LEP states '*the plan is subject to the provisions of any State environmental planning policy that prevails over this Plan as provided by section 3.28 of the EP&A Act*'. As the proposal is permitted without consent under the T&I SEPP (see section 4.4.1), the prohibition of development within a specific zone under the LEP does not apply; however, zoning remains to be considered to evaluate land use consistency.

The two proposed lots that the subdivision would create on the proposal site would meet the principal development standards under clause 4.1 of the Narromine LEP, by remaining within the minimum lot size (400 ha) for zone RU1.

4.5 Statutory position of the proposal

In accordance with the provisions of the T&I SEPP, the proposal does not require development consent and is assessable under Division 5.1 of the EP&A Act. ARTC is the proponent and the determining authority for the proposal.

An EPL is not required for the proposal site as the proposed MDC does not involves a scheduled activity, as per clause 33 'Railway activities—railway infrastructure construction' or any other clause under Schedule 1 of the POEO Act. Additionally, for similar reasons, and because its scope and provisions do not apply to a separate project essentially at a separate location (i.e. the proposed MDC), ARTC's existing operational rail licence (EPL 3142) does not apply to the proposal.

This REF helps fulfils ARTC's obligation under Division 5.1 of the EP&A Act to examine and consider, to the fullest extent possible, all matters affecting, or likely to affect, the environment by reason of the activity.

The proposal is not likely to have a significant impact on MNES, nor is it likely to significantly affect any Commonwealth or NSW-listed threatened species, populations or ecological communities, or their habitats; however, the proposal was referred to DAWE for assessment to confirm the proposal is not a 'controlled action'.

The proposed MDC is not considered to be an ancillary development, as defined under Schedule 5 of the PS SEPP, as it is essentially a separate Inland Rail project, which will be servicing multiple CSSI and non-CSSI Inland Rail projects.

5. Stakeholder and community consultation

This section outlines the community and stakeholder consultation undertaken for the proposal.

5.1 Overall objectives

ARTC is committed to engaging with local communities in an open and collaborative manner, and in accordance with International Association for Public Participation (IAP2) core principles.

ARTC's goals for engagement are outline in Table 5.

TABLE 5: ARTC INLAND RAIL GOALS OF ENGAGEMENT

Goal	How this will be achieved for the proposal
Build trust	▸ Ongoing engagement with landowners regarding investigations, field studies and the acquisition process; and ensure the engagement team continues to value and remain engaged (where appropriate) in the landowner relationship ▸ Demonstrate to communities how their feedback has been considered in the REF and the feasibility design through an iterative consultation process—show them the changes we have made ▸ Regularly engage with stakeholders and ensure the conversation is advancing and action items are being closed out.
Build credibility	▸ Identify how Inland Rail can benefit the community ▸ Support the Social Performance team to enhance positive impacts ▸ Decide on specific design and alignment elements requested by the community and then communicate the reasoning to the community ▸ Engage stakeholders and communities on the issues that are important to them, seek their input to validate models, and have technical experts that can explain what the data means ▸ Deliver on the commitments we make to the community in a timely and appropriate way.
Build visibility	▸ Have a presence on the ground in communities by attending and sponsoring local events ▸ Go to the community—don't expect them to come to us. Attend community meetings and implement an outreach program ▸ Undertake a program of well-advertised consultation at times and venues that are suitable for the community.

5.2 Stakeholder identification

Key stakeholders that would be directly and indirectly impacted by the proposal have been identified using desktop analysis and site visitations. The key stakeholders for the MDC include:

- Federal, state and local elected representatives
- government agency technical officers
- council officers
- state government agencies, including:
  - State Emergency Service (SES)
  - Siding Spring Observatory
  - TfNSW
  - DPE Water
  - Heritage NSW
- Narromine Chamber of Commerce
- N2N Community Consultative Committee Narromine sub-committee
- Indigenous stakeholders
- emergency services
- community groups
- community action groups
- directly impacted and adjacent property owners
- general community
- media.

5.3 Consultation process and activities

5.3.1 Engagement approach

An Engagement Implementation Plan (EIP) has been developed for the proposal, with the objectives to ensure:

- external stakeholders are clearly identified, and their specific needs are understood and managed
- all stakeholders understand and are aware of the proposal, and work to increase acceptance of Inland Rail in the region
- the social licence to operate (reputation and trust) is built and maintained through the engagement of external stakeholders
- engagement and communication activities are transparent, equitable and accessible, with adequate opportunities for stakeholders to comment or provide input
- the delivery of engagement is targeted at mitigating identified stakeholder risks, so that the proposal can be delivered on budget and schedule
- effective dialogue with the Inland Rail team to build relationships with stakeholders
- all stakeholders, including relevant Indigenous parties and bodies, are aware of the statutory consultation process, timeframes and opportunities to provide feedback
- stakeholders are aware of the Inland Rail Program and understand the early field studies, environmental approvals and design development process
- involvement of the community in negotiable decision points to build trust and buy-in with Inland Rail about the design of the proposal
- the potentially affected landowners contact Inland Rail directly with concerns about the design, have trust in Inland Rail to assist them to resolve their concerns, and include their feedback into the design and approval process
- stakeholder and community cooperation
- understanding and acceptance of the design through meaningful interactions and appropriate engagement.

5.3.2 Government agency consultation

ARTC issued letters advising the following parties of the proposal on 7 December 2021:

- DPE (Water)
- TfNSW
- Heritage NSW.

A second letter was sent to the same parties on 7 April 2022 to provide notification of the expansion of the scope of the REF to include the subdivision of land. DPE (Water) advised a review of the REF will be undertaken during public exhibition. TfNSW provided written preliminary advice regarding traffic assessment to be considered in the REF.

The DPE and the Environment Protection Authority (EPA) were informed of the proposal on 23 and 24 February 2022, respectively. Sentiment towards the proposal was generally positive from the DPE and EPA. The EPA confirmed the proposal does not meet the threshold of needing an EPL for railway activities (see section 4.2.2).

The Narromine Shire Council-elected representatives and technical officers were engaged to ensure they have a clear understanding of the proposal. The engagement has included formal written correspondence, emails and meetings. Sentiment towards the proposal was generally positive.

5.3.3 Community and landowner consultation

The Inland Rail Stakeholder Engagement team have continued engagement with landowners adjoining the proposal site, and the local community, that commenced during the N2N feasibility stage.

Landowners within 2 km of the proposal site have been provided verbal and written advice of the intent to establish the facility, including details of the proposed features. Landowners were also offered a face-to-face meeting should they wish to discuss the proposal. The team held face-to-face or online meetings with five landowners.

Landowner sentiment overall was neutral. Issues raised included property management, potential for agistment and/or leasing, impact on local roads, and supply opportunities.

In addition, the Stakeholder Engagement team shared information about the proposal with the broader community via the media (see Appendix D), Inland Rail's established social media channels, an article in the N2N Project

electronic newsletter, a project fact sheet on the Inland Rail website (see Appendix D), a presentation to the Narromine sub-committee of the Narromine to Narrabri Community Consultative Committee, and a pop-up consultation stand outside Kierath's Shopping Square (see advertisement in Appendix D), attended by 24 people.

Broad community sentiment overall was neutral to positive. Issues raised included the N2N Project alignment, employment and supply opportunities.

5.3.4 First Nations consultation

Consultation with the Aboriginal community and the Registered Aboriginal Parties (RAPs) has been ongoing throughout the development of the proposal.

Representatives from the RAPs were present at all field surveys and will be present at test investigations.

ARTC representatives met with the Narromine Local Aboriginal Land Council (LALC) on 25 January 2022 and advised of the proposal. Key issues raised discussed included indigenous employment opportunities. Regular ongoing engagement with the LALC is planned.

5.3.5 T&I SEPP Notification

Part 2.2 of the T&I SEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. This is detailed in Table 6 below.

TABLE 6: T&I SEPP CONSULTATION REQUIREMENTS

Issue	T&I SEPP clause	Potential impact	Yes / No
Council related infrastructure or services			
Stormwater	T&I SEPP cl.2.10(1)(a)	Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	No
Traffic	T&I SEPP cl.2.10(1)(b)	Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	No
Sewerage system	T&I SEPP cl. 2.10(1)(c)	Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of any part of the system?	No
Water usage	T&I SEPP cl. 2.10(1)(d)	Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	No
Temporary structures	T&I SEPP cl. 2.10(1)(e)	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	No
Road and footpath excavation	T&I SEPP cl. 2.10(1)(f)	Will the works involve more than minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	No
Local heritage			
Local heritage	T&I SEPP cl.2.11	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	No
Flood liable land			
Flood liable land	T&I SEPP cl.2.12 and 2.13	Will the works have impacts on flood liable land?	Yes
Public authorities other than councils			
National parks and reserves	T&I SEPP cl.2.15(2)(a)	Is the proposal adjacent to land reserved under the National Parks and Wildlife Act 1974 or to land acquired under Part 11 of that Act?	No
National parks and reserves	T&I SEPP cl.2.15(2)(b)	Is the proposal on land in Zone E1 National Parks and Nature Reserves or in a land use zone that is equivalent to that zone, other than land reserved under the National Parks and Wildlife Act 1974?	No

Issue	T&I SEPP clause	Potential impact	Yes / No
Navigable waters	T&I SEPP cl.2.15(2)(c)	Does the proposal comprise a fixed or floating structure in or over navigable waters?	No
Artificial light	T&I SEPP cl.2.15(2)(d)	Would the proposal increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map?	Yes
Defence communications buffer land	T&I SEPP cl.2.15(2)(e)	Is the proposal on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument?	No
Mine subsidence land	T&I SEPP cl.2.15(2)(f)	Is the proposal on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	No

Based on the proposed activities, potential issues relevant to flood-liable land and artificial light have been identified, and the associated public authorities have been notified and provided with an opportunity to comment on the proposal.

Flood-liable land

The proposal site is subject to flood-liable land; however, the proposed activities are anticipated to include appropriate drainage provisions and not result in alteration to the flood patterns to more than a minor extent. A letter of notice was sent to Narromine Shire Council and the SES under Clauses 2.12 and 2.13 of the T&I SEPP, respectively, on 29 November 2021.

Artificial light

The proposal site is located on lands within the dark sky region, as identified on the dark sky region map, and works at night are proposed that will potentially increase the amount of artificial light in the night sky.

A letter of notice was sent to the Director of the Siding Spring Observatory under Clause 2.15(2)(d) of the T&I SEPP, on 29 November 2021. Any nightworks with artificial light pollution would only be commenced with consent from the Director or consideration of any response from the Director received within 21 days after the letter of notice is provided.

The Director of the Siding Spring Observatory provided a response letter on 8 December 2021, requesting the proposal to consider good lighting principles listed in Section 4.1 of the Dark Sky Planning Guidelines when the centre is operated at night. A lighting assessment has been undertaken for the proposed MDC (see Appendix E), which concluded that the light fittings and design of the MDC used in the modelling exercise meet the recommendations of the Dark Sky Planning Guideline.

5.3.6 Ongoing engagement

ARTC is committed to communicating with stakeholders throughout the life of the proposal.

This engagement will be aligned with ARTC's Program-wide engagement goals. Following project approval, a detailed Communication and Stakeholder Engagement Management Plan (CSEMP) will be prepared for the construction and operation of the MDC.

A range of communication tools and techniques will be used to establish and maintain stakeholder relationships, and continue meaningful engagement.

The engagement tools and activities used during the construction and operation phase would include:

- landowner meetings
- stakeholder meetings
- project update e-newsletters
- factsheets
- videos
- feedback channels: 1800 number, email address, web form, interactive mapping tool
- notifications
- local events
- site tours
- maps and visualisations.

6. Environmental assessment

Assessment of the existing environment has been undertaken for the following environment aspects to identify the baseline, potential impacts and the required control measures prior to and during construction, operation and (where appropriate) decommissioning of the proposal:

- noise and vibration
- Indigenous and non-Indigenous heritage
- biodiversity
- surface water (hydrology, flooding and water quality)
- air quality
- traffic and access
- land use and property
- socio-economic
- landscape character and visual amenity
- soil and contamination
- waste
- hazard and risk.

The assessment of each key environmental aspect has been completed with a consistent approach by:

1. undertaking a desktop review and or field assessment to define the baseline environment
2. carrying out assessment of the MDC's predicted impacts during construction, operation and (where appropriate) decommissioning
3. developing control measures to avoid, minimise, or otherwise manage impacts.

Information regarding regional context and the existing conditions of the rail corridor and surrounding environment have been referred from the N2N EIS where the existing rail corridor and surrounding land (including aspects of the proposal site) were considered as part of the assessment for the N2N Project. The N2N EIS can be accessed and viewed at **planningportal.nsw.gov.au/major-projects/project/41351**.

6.1 Biodiversity

The potential impacts of the proposal on biodiversity are assessed in the Narwonah Material Distribution Centre Biodiversity Assessment Report (BAR) (see Appendix A). The potential impacts and safeguards to avoid, mitigate or manage impacts are summarised in this section.

6.1.1 Assessment methodology

A detailed methodology for the biodiversity assessment is provided in the BAR in Appendix A. The following provides an overview of the methodology used:

- A desktop assessment was completed of the existing environment within a 10-km search radius area to identify threatened flora and fauna species, populations and ecological communities (threatened biota) listed under the BC Act and FM Act, and MNES listed under the EPBC Act, that could be expected to occur in the locality based on previous records, known distribution ranges, and habitats present.
- An assessment of likelihood of occurrence for threatened and migratory species and vegetation community profiles was prepared.
- Identification of plant community types was completed using existing mapping available from the SEED portal and the results of rapid ground-truthing surveys conducted in September 2018 as part of the BDAR prepared for the N2N Project.
- Seasonal field surveys were conducted in the locality as part of the BDAR assessments for the N2N Project between September 2018 and November 2020. Additional surveys were undertaken of the proposal site on 5–6 July 2021 and targeted surveys were completed for Sloane's Froglet in Gilgai, and koala and raptors in road reserves near the proposal site in August 2021.
- Threatened species surveys were completed for species with the potential to occur and methods included surveys within previously conducted plots, and surveys using random meander transects in areas of suitable potential habitat where possible.
- Habitat assessments were completed and include surveys for hollow bearing tree, rocks, caves, overhangs, dens and burrows, and evidence of foraging, animal tracks or animal remains.
- A detailed review was carried out of detailed fauna surveys, which were completed as part of the N2N BDAR. These surveys included diurnal surveys, active searches, opportunistic/incidental observations, spotlighting, call playback and targeted searches.

- Plot/transect surveys were also conducted onsite with reference to the BAM (Department of Planning, Industry and Environment (DPIE), 2020a). The results of these vegetation plots were used to determine plant community types and vegetation quality and condition.
- Native vegetation cover, extent and connectivity were assessed using aerial photography. Air photo interpretation was used to identify and record distinct vegetation patches, determine the broad condition state of vegetation types and the location and extent of vegetated habitat corridors.
- Weather observations during the survey period were taken from the Dubbo weather station about 35 km from the proposal site.

6.1.2 Existing environment

The proposal is located within the Macquarie River catchment that forms part of the larger Murray-Darling basin. The majority of the site is largely agricultural, and contains cleared lands from cropping and grazing. Small patches of semi-intact native vegetation is present along existing fence lines, as scattered trees, or along adjacent road reserves. Small dams occur throughout the proposal site.

The proposal does not cross any important listed wetlands or any Ramsar wetlands. The nearest Ramsar wetland is the Macquarie Marshes Nature Reserve but is a considerable distance to the west and is unlikely to be impacted by the proposal.

The climate of the proposal site is warm and temperate with an average rainfall of about 579 millimetres (mm). The lowest rainfall typically occurs in June and the highest rainfall occurs in January, although there is little difference between the months. January is the hottest month, with the overall average of 25.5 °C and average maximum of 32.8 °C. July is the coldest month, with an overall average of 9.5 °C and average minimum of 3.6 °C.

The proposal is located in the Bogan-Macquarie subregion, which is part of the Darling Riverine Plains IBRA Bioregion and crosses one NSW (Mitchell) landscape region, identified as the Boggy Cowal Alluvial Plains.

Plant community types

Regional vegetation mapping of the Macquarie catchment identified one native vegetation community in the proposal site identified as the Poplar Box/Bulloak woodland on grey-brown clay flats. One additional plant community type (PCT) was identified in areas next to the proposal site identified as Mugga Ironbark/Dwyer's Red Gum/Black Cypress Pine woodland on gravelly slopes. On-ground surveys conducted for the proposal identified four PCTs within and adjacent to the proposal site (see Figure 5) and include:

- PCT 27: Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South bioregion and listed under the BC Act as Weeping Myall Woodland
- PCT 49: Partly derived Windmill Grass–Copperburr alluvial plains shrubby grassland of the Darling Riverine Plains Bioregion and Brigalow Belt South bioregion
- PCT 88: Pilliga Box - White Cypress Pine–Buloke shrubby woodland in the Brigalow Belt South Bioregion
- PCT 244: Poplar Box grassy woodland on alluvial clay–loams soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).

There is also a large portion of exotic grassland present on the western portion of the proposal site and a portion on the eastern section is dominated by introduced groundcover species due to past disturbance from cropping. Weed species present in these areas include African Boxthorn (*Lycium ferocissimum*) and Saffron Thistle (*Carthamus lanatus*). The African Boxthorn is identified as a priority weed species and a weed of national significance (WONS). This species has a general biosecurity duty that requires any person who deals with the plant to ensure the biosecurity risk of the weed is prevented, eliminated or minimised, so far as is reasonably practicable. Regional measures for many species include the requirement that land managers should mitigate the risk of new weeds being introduced to their land.

Threatened flora

A total of 44 native flora species and 11 introduced species were recorded during surveys on the proposal site. Of these, 16 species are *Poaceae* (grasses). No threatened flora species were recorded in the proposal site, or in the locality during surveys for the N2N BDAR.

Threatened fauna

One threatened fauna species; the Grey-crowned Babbler, was recorded within the proposal site during surveys. Based on the results of the desktop assessment and habitat assessment during field surveys, a total of 29 threatened fauna species (identified in Table 7) are ‘possible’ or ‘likely’ to occur within the proposal site. The proposal site does not contain any watercourses that provide suitable habitat for fish listed under the FM Act. No migratory fauna species are likely to occur in the proposal site.

TABLE 7: THREATENED FAUNA SPECIES RECORDED OR AS POSSIBLE OR LIKELY TO OCCUR

Common name	Scientific name	BC Act status	EPBC Act stats	Likelihood of occurrence	Likelihood of impact
Birds					
Barking Owl	*Ninox connivens*	V	-	Possible	Low
Black Breasted Buzzard	*Hamirostra melanosternon*	V	-	Possible	Low
Black Falcon	*Falco subniger*	V	-	Possible	Low
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis*	V	-	Possible	Low
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	-	Possible	Moderate
Diamond Firetail	*Stagonopluera guttata*	V	-	Possible	Moderate
Dusky Woodswallow	*Artamus cyanopterus*	V	-	Possible	Moderate
Flame Robin	*Petroica phoenicea*	V	-	Possible	Moderate
Gilbert's Whistler	*Pachycephala inornata*	V	-	Possible	Moderate
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis*	V	-	Recorded	High
Grey Falcon	*Falco hypoleucos*	E	-	Possible	Low
Hooded Robin (south-eastern form)	*Melanodryas cucullata*	V	-	Possible	Moderate
Little Eagle	*Hieraaetus morphnoides*	V	-	Possible	Low
Little Lorikeet	*Glossopsitta pusilla*	V	-	Possible	Low
Masked Owl	*Tyto novaehollandiae*	V	-	Possible	Low
Painted Honeyeater	*Grantiella picta*	V	V	Possible	Low
Pied Honeyeater	*Certhionyx variegatus*	V	-	Possible	Low
Scarlet Robin	*Petroica boodang*	V	-	Possible	Moderate
Spotted Harrier	*Circus assimilis*	V	-	Possible	Low
Square-tailed Kite	*Lophoictinia isura*	V	-	Possible	Low
Superb Parrot	*Polytelis swainsonii*	V	V	Possible	Low
Turquoise Parrot	*Neophema pulchella*	V	-	Possible	Low
Varied Sittella	*Daphoenositta chrysoptera*	V	-	Possible	Moderate
Mammals					
Corben's Long-eared Bat	*Nyctophilus corbeni*	V	V	Possible	Moderate
Koala	*Phascolarctos cinereus*	V	E	Possible	Moderate
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	Possible	Low
Little Pied Bat	*Chalinolobus picatus*	V	-	Possible	Moderate
Northern Free-tailed Bat	*Ozimops lumsdenae*	V	-	Possible	Moderate
Yellow-bellied Sheathtail-Bat	*Saccolaimus flaviventris*	V	-	Likely	Moderate

Key: M – migratory, V – vulnerable, E – endangered

Threatened ecological communities

One PCT fulfils the requirements under the BC Act as a threatened ecological community (TEC) and includes a small woodland patch of Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South bioregion, which is classified as endangered.

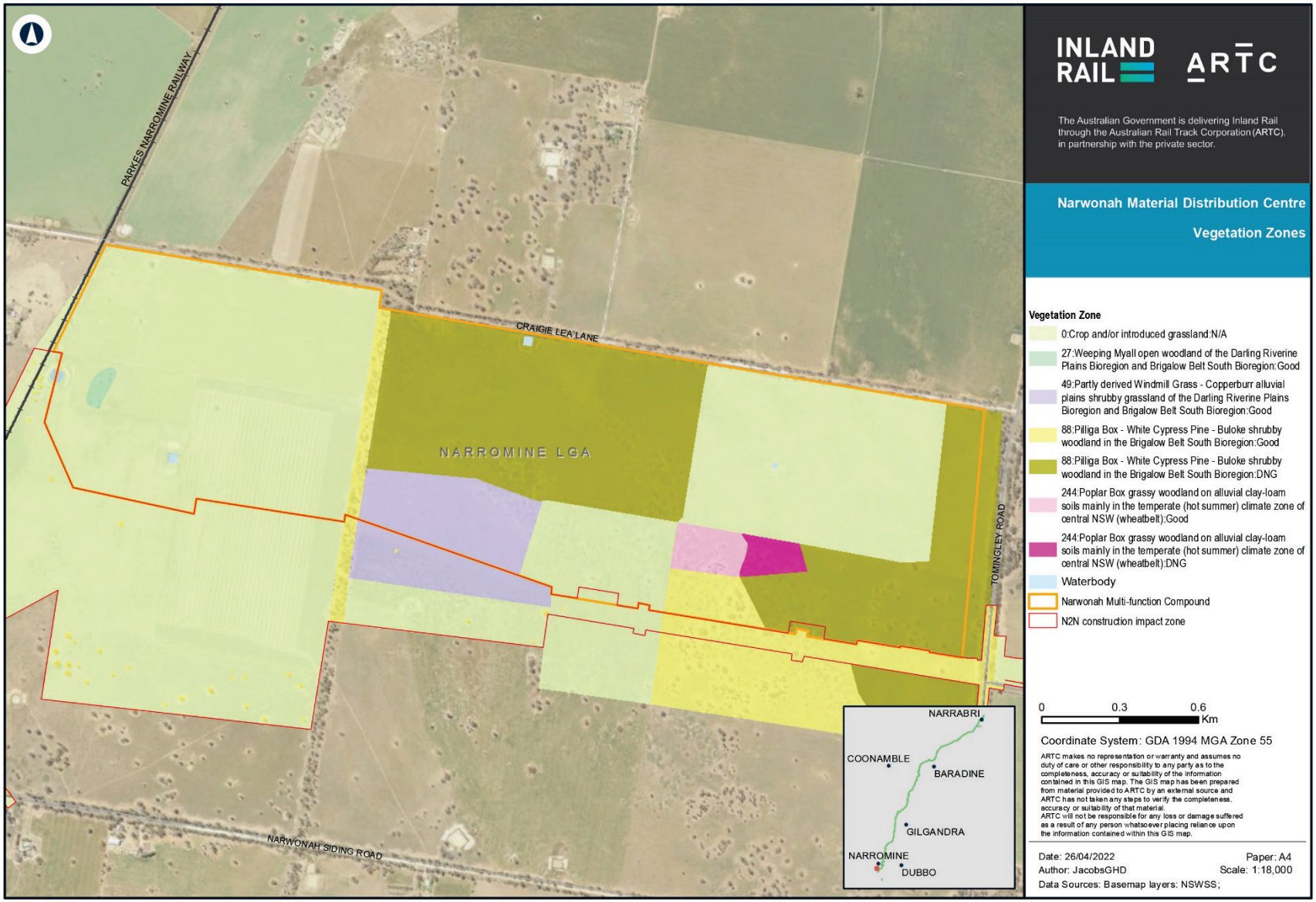

FIGURE 5: VEGETATION ZONES

6.1.3 Potential impact

Construction

Vegetation clearance

Construction of the proposal would remove about 328.19 ha of vegetation. Of this, about 181.89 ha of vegetation is comprised of cropland and introduced vegetation. The remaining 146.30 ha is comprised of native vegetation and includes four PCTs identified in the field survey. Table 8 summarises the impacts to vegetation from the proposal.

TABLE 8: IMPACTS TO VEGETATION COMMUNITIES

PCT ID	PCT name	BC Act Status	EPBC Act Status	Area of clearing (ha)
27	Weeping Myall open woodland of the Darling Riverine Plains bioregion and Brigalow Belt South Bioregion	Comprises a component of Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions endangered ecological community (EEC)	Does not conform to the EPBC Act listing for Weeping Myall TEC	1.07
49	Partly derived Windmill Grass–Copperburr alluvial plains shrubby grassland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion	-	-	17.86
88	Pilliga Box – White Cypress Pine – Buloke shrubby woodland in the Brigalow Belt South Bioregion (Woodland)	-	-	10.07
88	Pilliga Box – White Cypress Pine – Buloke shrubby woodland in the Brigalow Belt South Bioregion (DNG)	-	-	109.51
244	Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) (Woodland)	Does not conform to the BC Act listing for the Brigalow TEC	Does not conform to the EPBC Act listing for the Poplar Box TEC	4.71
244	Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) – Derived Native Grassland	Does not conform to the BC Act listing for the Brigalow TEC	Does not conform to the EPBC Act listing for the Poplar Box TEC	3.08
Total amount native vegetation				**146.30**
N/A	Introduced vegetation	-	-	181.89
Total vegetation clearance				**328.19**

Threatened ecological communities

The proposal would involve the removal of around 1.07 ha of the Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions EEC listed under the BC Act. The community does not conform to the EPBC Act listing for the community. An assessment of the likely significance of impacts of the proposal on Myall Woodland, pursuant to Section 7.3 of the BC Act (five-part test), has been prepared and found that the proposal would be unlikely to have a significant impact on this community.

Threatened flora

No threatened flora species listed under the BC Act or the EPBC Act have been recorded, or are assumed present within the proposal site, and, subsequently, none are likely to be impacted directly or indirectly by the proposal.

Fauna habitat and connectivity

The removal of native vegetation, as summarised in Table 8, would impact fauna habitats, due to the removal of foraging and breeding habitat of fauna species, including threatened species, listed under the BC Act and EPBC Act (see Table 7). Terrestrial habitat resources impacted would include mature trees that provide foraging resources, such as nectar and fruit, woody debris, leaf litter and hollows, as well as roosting and nesting habitat. Aquatic habitat impacted would include farm dams and gilgais located on the proposal site that contain habitat for commonly occurring frog species and common wetland bird species. While habitat would be removed for the proposal, alternate foraging (and/or breeding) habitat would remain in patches of woodland to the east of the proposal and in other nearby dams and aquatic habitat along the Macquarie River, about 8 km north of the proposal.

No areas of Key Fish Habitat (KFH) are mapped within the proposal site. The proposal would not alter natural flow regimes of rivers and streams, and their floodplains and wetlands.

The proposal is in a highly fragmented rural landscape with roads surrounding the proposal. Vegetation clearance required for the proposal would sever some fauna movement corridors, such as the corridor located along the fence line in the centre of the property; however, narrow roadside and fence line corridors are present elsewhere in the area, and connectivity would be retained in these areas.

Fauna injury or mortality

Fauna injury or death has the greatest potential to occur during construction when vegetation clearing would take place. The extent of this impact would be proportionate to the extent of vegetation that is cleared. Less mobile species (e.g. ground-dwelling reptiles), or those that are nocturnal and nest or roost in trees during the day (e.g. arboreal mammals and microbat species), may find it difficult to rapidly move away from the clearing activities when disturbed.

More mobile native fauna, such as adult birds, and larger terrestrial mammals and reptiles that may be sheltering in vegetation in the proposal site, are more likely to evade injury during construction activities. A range of fauna species are at risk of vehicle strike during construction. Fauna at risk of injury and mortality include terrestrial fauna, as well as birds, bats and gliders.

Threatened fauna

An assessment of the likelihood of occurrence of threatened fauna predicted to occur in the locality found that there are 16 threatened fauna species identified in Table 9 that have been recorded, or are assumed present, within the proposal site and, subsequently, are likely to be impacted directly or indirectly by the proposal.

TABLE 9: THREATENED FAUNA IMPACTED BY THE PROPOSAL

Species	BC Act status	EPBC Act status	Impact (ha)
Woodland birds			
Black-chinned Honeyeater (eastern subspecies)	V	-	15.85
Brown Treecreeper	V		15.85
Diamond Firetail	V		328.16
Dusky Woodswallow	V		15.85
Flame Robin	V		15.85
Gilbert's Whistler	V		15.85
Grey-crowned Babbler (eastern subspecies)	V		15.85
Hooded Robin (south-eastern form)	V		15.85
Painted Honeyeater	V	V	15.85
Scarlet Robin	V		15.85
Varied Sittella	V		15.85

Species	BC Act status	EPBC Act status	Impact (ha)
Microbats			
Corben's Long-eared Bat	V	V	15.85
Little Pied Bat	V		15.85
Northern Free-tailed Bat	V		15.85
Yellow-bellied Sheathtail-Bat	V		328.16
Arboreal mammals			
Koala	V	E	15.85

Assessments of significance pursuant to Section 7.3 of the BC Act (five-part test) have been prepared for these species and found that the proposal is unlikely to directly or indirectly impact on these species.

Assessments of significance were also prepared for threatened biota listed under the EPBC Act. The proposal is unlikely to have a significant impact on any biota listed under the EPBC Act, such as the Koala, Painted Honeyeater or Corben's Long-eared Bat.

Migratory species

No important habitat for any migratory species would be impacted by the proposal. Any migratory species that may occur would be transient individuals and would not rely on the limited wetland or woodland habitat present in the proposal site.

Indirect impacts

A summary of the potential indirect impacts associated with construction of the proposal is provided in Table 10.

TABLE 10: INDIRECT IMPACTS ON BIODIVERSITY VALUES

Impact	Description
Weed invasion and edge effects	'Edge effects' refers to increased noise and light or erosion and sedimentation at the interface of intact vegetation and cleared areas. Edge effects could result from vegetation clearance activities and may result in impacts such as changes to vegetation type and structure, increased growth of exotic plants, increased predation of native fauna or avoidance of habitat by native fauna. The proposal site and adjoining land have been extensively cleared for agriculture and weed invasion, and edge effects are already present. Impacts from the proposal would, therefore, be limited, given the existing modification of the proposal site.
Weeds, pests, diseases and pathogens	Construction activities, particularly the movement of construction vehicles, have the potential to introduce weed and pest species, and diseases and pathogens. Weed species are effective competitors for food and habitat resources, and have the potential to exclude native species and modify the composition and structure of vegetation communities. Weed species present in the proposal site include African Boxthorn (*Lycium ferocissimum*) and Saffron Thistle (*Carthamus lanatus*). The proposal has the potential to result in further spread of these weed species into native vegetation where they are not yet established or where they occur at low densities. Diseases and pathogens can be introduced or spread to site via dirt or organic material attached to machinery, vehicles, equipment and employees. Plant pathogens (such as Phytophthora (*Phytophthora cinnamomi*), and Myrtle Rust (*Uredo rangelii*) may result in the dieback or modification of native vegetation and damage to fauna habitats. The potential for significant or new impacts associated with these pathogens is relatively low, given the existing development presence and extent of human visitation across the proposal site and surrounding study area.
Light, noise and vibration	Light, noise and vibration can indirectly affect breeding, foraging and roosting activities where fauna are located close to construction activities, particularly in environments that are not already subject to these effects. Fauna are currently subject to varying levels of disturbance from light, noise and vibration. Individuals that nest or den in trees could abandon their nests and dens as a result of noise and vibration during construction. While there would be localised increases in light, noise and vibration during construction, these are unlikely to have a significant impact.
Sedimentation and erosion	Loose soil generated by construction activities may increase the risk of sedimentation and run-off on aquatic habitats in the study area in times of high rainfall. The risk of erosion and sedimentation is generally low due to the lack of ephemeral aquatic habitats in the study area.

Key threatening processes

A key threatening process (KTP) is a process that threatens, or may threaten, the survival, abundance or evolutionary development of a native species or ecological community. KTPs that may be exacerbated by the construction and operation of the proposal, and which would require the implementation of mitigation measures to limit impacts, include:

- clearing of native vegetation
- removal of hollows
- removal of dead wood and dead trees
- aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners (*Manorina melanocephala*)
- infection of frogs by amphibian chytrid causing the disease chytridiomycosis
- infection of native plants by Phytophthora cinnamomic
- introduction and establishment of Exotic Rust Fungi of the order *Pucciniales pathogenic* on plants of the family Myrtaceae
- invasion of native plant communities by exotic perennial grasses
- competition from various feral pests
- human-caused climate change.

Operation

The proposal would be operated and maintained by ARTC until it is decommissioned. Potential operational impacts of the MDC are discussed in Table 11.

TABLE 11: OPERATIONAL IMPACTS OF THE MDC

Impact	Description
Injury and mortality	Operation of the MDC will create a novel strike risk in the area via the movement of trains, truck and other machinery. This would include impacts on terrestrial fauna that may cross tracks and roads. Given the clearing of vegetation in the proposal site and adjacent N2N construction impact zone, noise and vibration of works, fauna is likely to move away from the proposal site, or use vegetated corridors along roads in the area.
Noise	Operation of the MDC would introduce regular noise and vibration into the proposal site, through the movement of trains, trucks and machinery, and through activities such as welding and loading of materials. As described above, noise has been shown to have a variety of impacts on fauna, including changing foraging behaviour, impacting breeding success and changing species occurrences. Species less tolerant to disturbance may be displaced from remaining vegetation in adjacent areas. Other more resilient fauna species typical of disturbed areas are likely to become accustomed to the noise.
Fire	Activities at the MDC will create a risk of fire from sparks. The risk of fires spreading to adjacent habitat areas would be expected to be minimal given the cleared N2N corridor and MDC, and surrounding agricultural land; however, a residual risk of fire does exist. The risk of fires spreading to adjacent areas would be minimised through a fire hazard management plan and other measures to contain and control the outbreak of fire.
Biosecurity	Operation of the MDC has the potential to spread weeds and pests. The surroundings of railways (e.g. verges and embankments) often host a high diversity of non-native species, in many cases due to their transportation as stowaways in or on trains. Introduction and spread of weeds can impact agricultural land and native vegetation. Mitigation measures to minimise the risk of weed introduction and spread are provided in section 6.1.4.

6.1.4 Mitigation and management measures

Table 12 lists the mitigation and management measures that will be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise impacts to biodiversity.

TABLE 12: BIODIVERSITY CONTROL MEASURES

Control measures	Proposed MDC phase
A flora and fauna management sub-plan will be prepared prior to construction, and implemented as part of the Construction Environmental Management Plan (CEMP). The plan will be prepared in accordance with the relevant guidelines, legislation and standards, and will include but not be limited to: ▸ establishing protocols for the staged clearing of vegetation and safe tree felling and log removal to reduce the risk of fauna mortality ▸ an unexpected finds protocol ▸ processes for notification of a wildlife rescue organisation (e.g. WIRES) in case any injured fauna are found. All animals encountered will be treated humanely, ethically, and in accordance with relevant codes under the *Prevention of Cruelty to Animals Act 1979* (NSW).	Design and Pre-construction
Measures to suppress dust, prevent erosion and sedimentation will be implemented during clearing and site work.	Construction / Operation
Temporary and permanent stockpiles are to be located within cleared areas (and not within areas of adjoining native vegetation) or within the dripline of trees.	Construction / Operation
All workers will be provided with an environmental induction prior to starting work onsite. This will include information on the ecological values of the site, protection measures to be implemented to protect biodiversity, and penalties for breaches.	Pre-clearing
A suitably qualified ecologist is to be present during clearing activities for habitat identified during pre-clearing surveys, in order to identify areas to be avoided, and manage the rescue or relocation of fauna as necessary. If a Koala is observed in the area during vegetation clearing, works are to cease and not recommence until the Koala has moved on of its own accord or with the assistance of an ecologist.	Pre-clearing
A weed and pest species management protocol will be prepared as part of the CEMP to manage weeds and pathogens during site activities. It will include, but not be limited to, the following: ▸ process to identify, control and remove all priority weeds in accordance with the requirements of the *Biosecurity Act 2015* ▸ process to minimise the introduction and spread of weeds, such as exclusion areas for native vegetation, driving instructions, etc. ▸ communication of responsibilities of all site personnel regarding the management of weeds and pathogens, through site inductions and toolbox talk meetings ▸ measures to ensure all trucks transporting weed waste from the site are covered to avoid the spread of weed-contaminated material. Disposal must be documented and evidence of appropriate disposal must be kept.	Pre-clearing
So far as is practicable, suitable bush rock habitat, hollow-bearing logs or limbs, and woody debris will be relocated to nearby adjacent areas outside of the proposal site footprint by the supervising ecologist or contractor.	Pre and during clearing
Disturbance of vegetation will be limited to the minimum necessary to undertake the proposal. Clearing boundaries and any features to be retained, e.g. hollow bearing trees, need to be clearly marked on-ground before clearing commences.	During clearing
All machinery entering the site must be appropriately washed down and disinfected, as far as is practicable, prior to mobilisation onsite to prevent the potential spread of weeds, Cinnamon Fungus (Phytophthora cinnamomi) and Myrtle Rust (Pucciniales fungi), in accordance with the national best practice guidelines for Phytophthora (O'Gara et al., 2005) and the Myrtle Rust factsheet (DPI, 2015b) for hygiene control. Weed inspections of vehicles should also be undertaken and documented as part of the CEMP.	Prior to any plant or machinery being brought onto the site, where practicable
Protocols to prevent introduction or spread of chytrid fungus will be implemented following hygiene guidelines for wildlife, protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants (DPIE, 2020b).	Pre-clearing, during construction and operation

Control measures	Proposed MDC phase
Sediment controls are to be established around the proposal site perimeter as a minimum, in accordance with the Blue Book and the contractor's environmental management plan. Measures will be implemented to minimise the risk of movement of materials in the event of a significant rainfall, such as covering stockpiles with impervious covers (tarps) or temporary trenching upslope of stockpiles to divert surface runoff around stockpiles. In the event of forecast heavy rainfall, additional measures will be implemented or works will be postponed to prevent the potential for sediment laden run-off into adjacent properties or waterways.	Pre-clearing, during construction and operation

6.2 Noise and vibration

A noise and vibration assessment has been undertaken and summarised in the below subsection. The full report is contained in Appendix F.

6.2.1 Assessment methodology

The noise and vibration assessment involved:

- reviewing the existing operational noise and vibration assessment previously completed relevant to the proposal site, including the N2N EIS Technical Report 8: Noise and Vibration Assessment (Construction and operations)
- identifying the noise and vibration assessment study area, which, for this assessment, is the area within a 2 km radius around the proposal site
- identifying noise and vibration-sensitive receivers
- identifying existing background noise levels near the proposed MDC, based on the previous noise monitoring conducted by ARTC as part of the N2N EIS
- establishing the noise and vibration assessment criteria and management levels to provide a basis for assessing the potential impacts throughout the construction and operation phases of the proposed MDC
- developing a noise and vibration model based on seven representative construction/operation scenarios to predict airborne noise generated during construction and operation
- completing noise modelling to predicted construction noise levels associated with the proposed MDC
- assessing the potential for noise and vibration to exceed the applicable criteria and impact to sensitive receivers during construction and operation of the proposed MDC
- identifying the main potential noise and vibration sources during construction and operation
- identifying and recommending noise and vibration management and mitigation measures to minimise impacts during construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.2.2 Existing environment

The proposal site is situated within a rural setting and surrounded by a total of 20 residential receivers and two industrial receivers, which have been identified as sensitive receivers, within a 2-km radius. The closest sensitive receiver is approximately 170 m to the north the proposal site. Other buildings within the 2-km radius that have not been considered as sensitive receivers include industrial buildings, garages, sheds, etc. It is noted that the residential dwellings on Craigie Lea Lane, to the immediate west of the P2N rail line, are proposed to be acquired by the Inland Rail Program and, therefore, are not included as a sensitive receiver for this assessment.

Existing background noise levels were based on noise monitoring results previously established as part of the N2N EIS. The EIS identifies two noise logger locations, M01 and M13, located within 2 km of the proposed MDC where noise levels were monitored in November 2018. These locations are north of Craigie Lea Lane along the P2N rail line and Tomingley Road, respectively.

The Rating Background Levels (RBLs) are presented in Table 13. These noise levels measured are representative of the acoustic environment in 2022 and have been applied to sensitive receivers within the study area. An RBL level of 35 decibels A (dBA) for day, and 30 dBA for evening and night has been adopted across the study area for the purposes of this assessment to avoid any potential under-prediction of construction noise impacts.

TABLE 13: EXISTING NOISE LEVELS

Noise monitoring ID (as per N2N EIS)	Noise monitoring location	Rating background noise level (L_{A90} dB(A))		
		Day[1]	Evening[1]	Night[1]
M1	North of Craigie Lea Lane along the P2N rail line	35[2]	37	34
M13	Near Tomingley Road, to the east of the	35[2]	30[2]	30[2]

6.2.3 Potential impact

The potential noise and vibration impacts discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

Sensitive receivers likely to be impacted, particularly throughout the operation of the MDC, are generally within 2 km of the proposal site and are mapped in the noise and vibration assessment report (refer Appendix D of the Noise and Vibration Assessment Report contained in Appendix F of this REF).

Construction impacts

Noise impact

The main sources of noise considered for the MDC during construction are vibratory rollers, dump trucks, chainsaws and bobcats.

The following potential noise impacts are anticipated during the construction of the MDC:

- Two sensitive receivers were identified where noise levels are predicted to exceed the standard hours NMLs of 45 dBA, with predicted noise level ranges of 45–50 dBA and 50–60 dBA during standard construction hours.
- On occasions where these works could occur outside standard working hours, seven sensitive receivers are predicted to exceed the out-of-hours NMLs of 35 dBA; however, it is acknowledged that works such as ground compaction and clearing are expected to occur only during standard hours. While the construction details of any unavoidable night works are currently unknown, it is expected that these works will be minimised and relatively short term.
- Up to two sensitive receivers are anticipated to be at the risk of sleep disturbance during night-time activities; however, works are generally anticipated to occur during standard hours where sleep disturbance effects are not typically considered.
- The construction road traffic noise analysis suggests that there may be a noticeable increase in road traffic noise on Tomingley Road; however, based on the predictions undertaken in the N2N EIS (Technical Report 8), the levels are expected to be compliant with the Road Noise Policy.

Vibration impact

Ground vibrations are likely to occur during construction and particularly during site preparation due to vibratory compaction; however, no adverse vibration impacts are predicted based on the offset distances between the proposal site and the closest sensitive receiver, which is located approximately 170 m north of the proposal site. The ground-borne noise levels are predicted to be compliant with the criteria (<35 dBA).

Operational impacts

Noise impact

Based on the noise modelling and assessment results, the main sources of noise at the proposal site during operation are anticipated to be generated during rail preparation, including grinding and sandblasting.

[1] Periods as defined by the EPA's Noise Policy for Industry (EPA, 2017)

[2] Levels defined as the minimum in accordance with EPA's Noise Policy for Industry (EPA, 2017) where measured levels are less than 30 dBA

The following potential noise impacts are anticipated during the operation (24 hours a day, 7 days a week) of the MDC:

- daytime NMLs expected to be exceeded by up to 7 dBA at two sensitive receivers during standard operational hours
- night-time NMLs expected to be exceeded by up to 17 dBA at 11 sensitive receivers during out-of-work hours
- up to four sensitive receivers are anticipated to be at the risk of sleep disturbance during night-time activities, with the dominant components anticipated to include:
  - rail grinding and sandblasting
  - rail movements over tight rail curves and points, along with potential use of train horns for safety purposes
  - rail and ballast loading and unloading activities due to the metal-on-metal and stone 'clanging' that could occur onsite.

Vibration impact

Rail movements within the site may induce vibrations but rail-induced vibrations of slow-moving locomotives and wagons are typically negligible at distances greater than 8 0m from surface ballasted tracks on ground. As such, no adverse vibration impacts are predicted to result from the operation of the proposed MDC. The ground-borne noise levels are predicted to be compliant with the criteria (<35 dBA).

Decommissioning impacts

Decommissioning activities may cause potential noise impacts of a similar magnitude to construction and operation.

6.2.4 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Table 14 lists the mitigation and management measures that will be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise noise and vibration impacts.

TABLE 14: NOISE AND VIBRATION CONTROL MEASURES

Control measures	Proposed MDC phase
Develop and implement a Construction Noise and Vibration Management Plan (CNVMP)	Design and Pre-construction Construction/ Operation
The construction noise impact assessment in this report should be refined following any changes in design refinement, to reflect the final locations of construction activities and scheduling to inform the development of the CVNMP.	Design and Pre-construction
Building condition surveys will be undertaken for sensitive receivers within 200 m of the proposed MDC to ensure there is sufficient information to respond to any potential complaints. Surveys are to take place prior to commencement and on completion of vibration-generating works.	Design and Pre-construction
Review construction staging method to identify opportunities to schedule noisy works during the day or, where relevant, evening time period.	Design and Pre-construction
Review construction staging method to identify opportunities where simultaneous operation of noisy equipment can be separated out to operate individually.	Design and Pre-construction
Selection of quieter construction equipment should be investigated where feasible and practicable. This is especially important for any out-of-hours works where predicted noise levels indicate high levels of noise impacts to nearby sensitive receivers.	Design and Pre-construction
Staff training is to be undertaken so that unnecessary sources of noise and vibration are avoided. Training must include the understanding and adoption of the CNVMP and best-practice behaviours onsite to minimise noise and vibration. The behaviours and implementation of CNVMP should be enforced through regular checks and reminders.	Construction/ Operation
Where feasible and practicable, plant and equipment used intermittently, or no longer in use, should be throttled or shut down.	Construction/ Operation
Equipment will be operated and maintained in a manner as detailed by the manufacturer. This includes the replacement of engine covers, repair of defective silencing equipment, tightening of rattling components and repair of leakages in compressed air lines.	Construction/ Operation

Control measures	Proposed MDC phase
All mechanical plant near sensitive receivers should be modified to reduce noise, where feasible and practicable, such as: ▸ internal combustion engines are fitted with a suitable muffler in good repair, operating as per the manufacturer's specifications ▸ pneumatic tools are fitted with an effective silencer on their air exhaust port ▸ aggregate bins, loaders and chutes are lined with a rubber material to dampen the vibration of the structure ▸ suitable rubber pads on wagons, loaders and ground are installed prior to unloading of rails, ballast and sleepers to minimise short-term noise impacts.	Construction/ Operation
Localised acoustic shielding in the form of acoustic semi-enclosures and blankets will be installed to shield noisy construction equipment from the nearest residences, where practicable: ▸ acoustic enclosures should be installed as close to the works area as possible ▸ acoustic blankets should be arranged to overlap such that no air gaps are present between blankets. Acoustic shielding is particularly effective for stationary plant that is scheduled to work for lengthy periods. Guidance for acoustic enclosures should be taken from AS 2436-2010 - *Guide to noise and vibration control on construction, demolition, and maintenance sites*.	Construction/ Operation
Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on the site and for any out-of-hours works, where practicable.	Construction/ Operation
Site access points and roads should be sited as far as practicable from sensitive receivers.	Construction/ Operation
Delivery vehicles shall be fitted with straps rather than chains where feasible.	Construction/ Operation
Sites are to be designed so that reversing of delivery vehicles is minimised so that they can drive through the site were possible.	Construction/ Operation
Where feasible and practicable: ▸ unsealed haul roads should be regularly graded. Sealed access roads and hardstand areas should have potholes filled in a timely fashion ▸ night-time construction traffic should be limited. If unavoidable, they should be redirected away from noise-sensitive receivers, in accordance with the Construction Traffic Management Plan ▸ appropriate construction traffic speed limits should be established and enforced near noise-sensitive receivers.	Construction/ Operation
Regular communications on the activities and progress of the proposal should be provided to the community (e.g. via newsletter, email and/or website).	Construction/Operation
The operational works staging method will be reviewed to identify opportunities to schedule noisy works during the day or, where relevant, evening.	Operation
The provision of at-property treatment could be considered for any noise impacts, given the 24-hour operational duration of the MDC. This may include: ▸ investigating potential for local at-property solid fencing ▸ offering alternative ventilation where the windows are to remain closed ▸ upgrading the acoustic performance of specific elements of the building envelope (e.g. windows and doors). Note that these at-property treatments would require prior detailed investigations and assessments of the existing conditions to assess the most effective acoustic treatment. If these treatments are considered effective, works would be executed only if specific agreements between the property owners and the proponent are reached.	Operation

6.3 Indigenous and non-Indigenous heritage

An Indigenous heritage assessment (as part of an ASR) and a HIA have been undertaken and summarised in the below. The ASR and the HIA reports are contained in Appendix C and Appendix B, respectively.

6.3.1 Assessment methodology

The HIA and the Indigenous heritage assessment undertaken as part of the ASR, both identified a study area that has been defined as per the boundary of the proposal site.

The heritage assessments involved desktop research, field-based research, significance of impact assessment, and identification of management and mitigation measures to minimise heritage impacts during construction and operation of the proposed MDC. Further details on the assessment methodologies are outlined below.

Indigenous Heritage

The ASR was prepared in accordance with the:

- *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (Department of Environment, Climate Change and Water (DECCW), 2010a)
- *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010b)
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010c)
- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (Office of Environment and Heritage (OEH), 2011).

The assessment involved:

- an overview of the Aboriginal history of the study area
- identifying Aboriginal sites and areas of archaeological potential within the study area
- identifying potential historical disturbance to ground within the study area
- undertaking desktop searches for heritage listings on the relevant registers
- undertaking a site inspection on 21 February 2022 with RAPs
- undertaking assessment of the significance of identified Aboriginal sites.

Non-Indigenous Heritage

The HIA has been prepared in accordance with the guidelines outlined by the NSW Heritage Office (now Heritage NSW), the Department of Premier and Cabinet (DPC), the DPE, and the Australian International Council on Monuments and Sites (ICOMOS).

The assessment involved:

- determining the significance of heritage items, or a potential archaeological resource is undertaken using a system of assessment centred on the Burra Charter of Australia ICOMOS
- identifying impacts on heritage significance using the document *Statement of Heritage Impact 2002*, contained in the *NSW Heritage Manual*, as a guideline. Type of impacts include direct (physical) impacts, indirect (visual) impacts and potential direct impacts
- an archaeological assessment using a specialised framework to consider the range of values of an archaeological site
- undertaking desktop searches for heritage listings on the relevant registers
- reviewing available literature to determine the historical context
- undertaking a site inspection on 21 February 2022.

6.3.2 Existing environment

Indigenous Heritage

Several sites were identified to the immediate south of the study area, on gilgai formations. Gilgais are generally described as small, ephemeral pond-like depressions, or small mounds, formed due to the presence of highly reactive soils that contract and expand in response to varying moisture conditions. These gilgais appear to continue into parts of the study area that could not be inspected during survey due to dense vegetation coverage and poor access. Detailed field survey was limited to only 36 per cent of the study area due to dense vegetation.

An Aboriginal site (Site MDC-AS01) was identified during the site visit in a localised area of heightened soil visibility, located on the north-western segment of the study area (i.e. proposal site). Site MDC-AS01 is a low-density artefact scatter located on an active bull-ant nest surrounding two peppercorn trees. It was determined that the identification was likely due to no previous farming activity in the affected location due to its proximity to mature trees.

There are no previously recorded Aboriginal sites identified within the study area and no other findings regarding Aboriginal Heritage were identified within the proposal site.

Based on local modelling, the study area is unlikely to be of greater than low–moderate archaeological potential.

Non-Indigenous Heritage

No listed items of built heritage are located within the study area or within 3 km of it. A search of archival text and plan records indicated that the study area has solely functioned as agricultural land since the late 19th century and has not been the location of significant built structures.

The significance of potential archaeological finds in the study area has been assessed as not reaching the level of local heritage threshold and the archaeological potential of the study area has been rated as low to nil.

One item of potential local heritage significance, the Craigie Lea homestead, is present approximately 200 m west of the study area.

6.3.3 Potential impact

The potential impacts to Indigenous and non-Indigenous heritage discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

Construction impacts

Indigenous Heritage

Based on the current design stage of the MDC, impacts to Site MDC-AS01 are not confirmed. Avoidance of impacts to Site MDC-AS01 is the preferred option; however, if it is not able to be achieved through design development then an Aboriginal Cultural Heritage Assessment Report (ACHAR) and Aboriginal Heritage Impact Permit (AHIP) will be required.

Areas where gilgais are evident have been assessed as being of moderate archaeological potential, and a program of archaeological sub-surface testing must be completed for these parts of the study area. Areas outside of site MDC-AS01, where no gilgais are present, have been assessed here as of low archaeological potential.

Non-Indigenous Heritage

No works are proposed within or near to any non-Indigenous heritage sites. As such, the proposed MDC is unlikely to impact on non-Indigenous heritage and no further formal archaeological or built heritage investigation is required for the study area.

Operational impacts

Indigenous Heritage

Given the nature of the operational phase of the proposed MDC and minimal ground disturbance likely to occur, impacts to Indigenous heritage are considered unlikely.

Non-Indigenous Heritage

No operational works are proposed within or near any non-Indigenous heritage sites. As such, the proposed MDC is unlikely to impact on non-Indigenous heritage and no further formal archaeological or built heritage investigation is required for the study area.

6.3.4 Mitigation and management measures

Table 15 lists the mitigation and management measures that will be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to avoid or minimise impacts to Indigenous heritage values.

TABLE 15: INDIGENOUS AND NON-INDIGENOUS HERITAGE CONTROL MEASURES

Control measures	Proposed MDC phase
The MDC design should be formulated to avoid impacts to Site MDC-AS01, in which case, the location of MDC-AS01: ▸ is protected with a 10-m fenced no-go zone through the period of ground-disturbing construction works ▸ is marked on site mapping ▸ restrictions regarding it must be discussed at site inductions and toolbox meetings for works in the site vicinity. If impacts to Site MDC-AS01 cannot be avoided: ▸ surface salvage of artefacts in Site MDC-AS01 must be carried out ▸ salvage of artefacts in Site MDC-AS01 must be carried out in consultation with RAPs	Design/ Pre-Construction

Control measures	Proposed MDC phase
▸ artefacts collected from Site MDC-AS01 must be subject to repatriation in accordance with consultation with RAPs ▸ an AHIP will be required to permit any impacts, including surface collection salvage, to Site MDC-AS01 ▸ an ACHAR will be required in support of the AHIP application.	
Mature trees in Lot 1 DP 1198931 are to be inspected for evidence of cultural modification.	Design/ Pre-Construction
A program of archaeological sub-surface testing must be completed for areas where gilgais are evident in the proposal site, in accordance with the *Code of Practice for archaeological investigation of Aboriginal objects in NSW*.	Design/ Pre-Construction
The following steps should be carried out to manage potential minor indirect (visual) impacts to Craigie Lea homestead: ▸ The homestead should be inspected by a heritage specialist to determine whether the homestead retains heritage significance, or whether it has been substantially altered. ▸ If the homestead is confirmed to be of local heritage significance, or a significance assessment is not completed, design of the MDC should minimise visual impacts through reduction of height adjacent to the item, or consideration of additional screening.	Design/ Pre-Construction
An Unexpected Heritage Finds procedure must be prepared and implemented for any ground-disturbance works.	Pre-Construction
Staff engaged in onsite works should receive a heritage induction that will make them aware of the nature of potential heritage finds and their obligations under the *National Parks & Wildlife Act 1974* and the *Heritage Act 1977.*	Pre-Construction

6.4 Surface water (hydrology, flooding and water quality)

6.4.1 Assessment methodology

The surface water impact assessment involved:

- reviewing existing technical assessments undertaken as part of the N2N EIS, including the Hydrology and Hydraulic Report and existing flood studies, to understand the existing surface water attributes
- undertaking desktop analysis to obtain further information on the existing surface water features within and surrounding the proposal site
- identifying sensitive receivers surrounding the proposal site
- undertaking a qualitative assessment, based on the general positioning of elements identified in the concept layout plan, to identify changes that might affect the existing waterways, drainage and flood impacts, and any associated impacts from the construction and operation of the proposed MDC
- recommending management and mitigation measures to minimise impacts on surface water during construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.4.2 Existing environment

The proposal site is characterised by relatively flat land (0.5% grade) sloping in a north-westerly direction. Ground elevation ranges from approximately 248 mAHD (Australian Height Datum) on the east to 238 mAHD on the west (see Figure 6). Several localised depressions and small farm dams are noted within the proposal site.

The proposal site is not located within the flood planning area and, therefore, is not subject to flood-related development controls. The proposal site is, however, liable to experience temporary overland flood flows during, and/or immediately after significant rainfall events (ephemeral flowpaths). Such events may likely take the form of convective thunderstorms that generate intense rainfall across the localised catchments within a matter of hours, typically generating shallow overland flows that discharge through the site. This would likely pass within a few hours, although some ponded run-off may remain in terrain depressions.

Details of existing surface water features associated with the proposal site are outlined in Table 16.

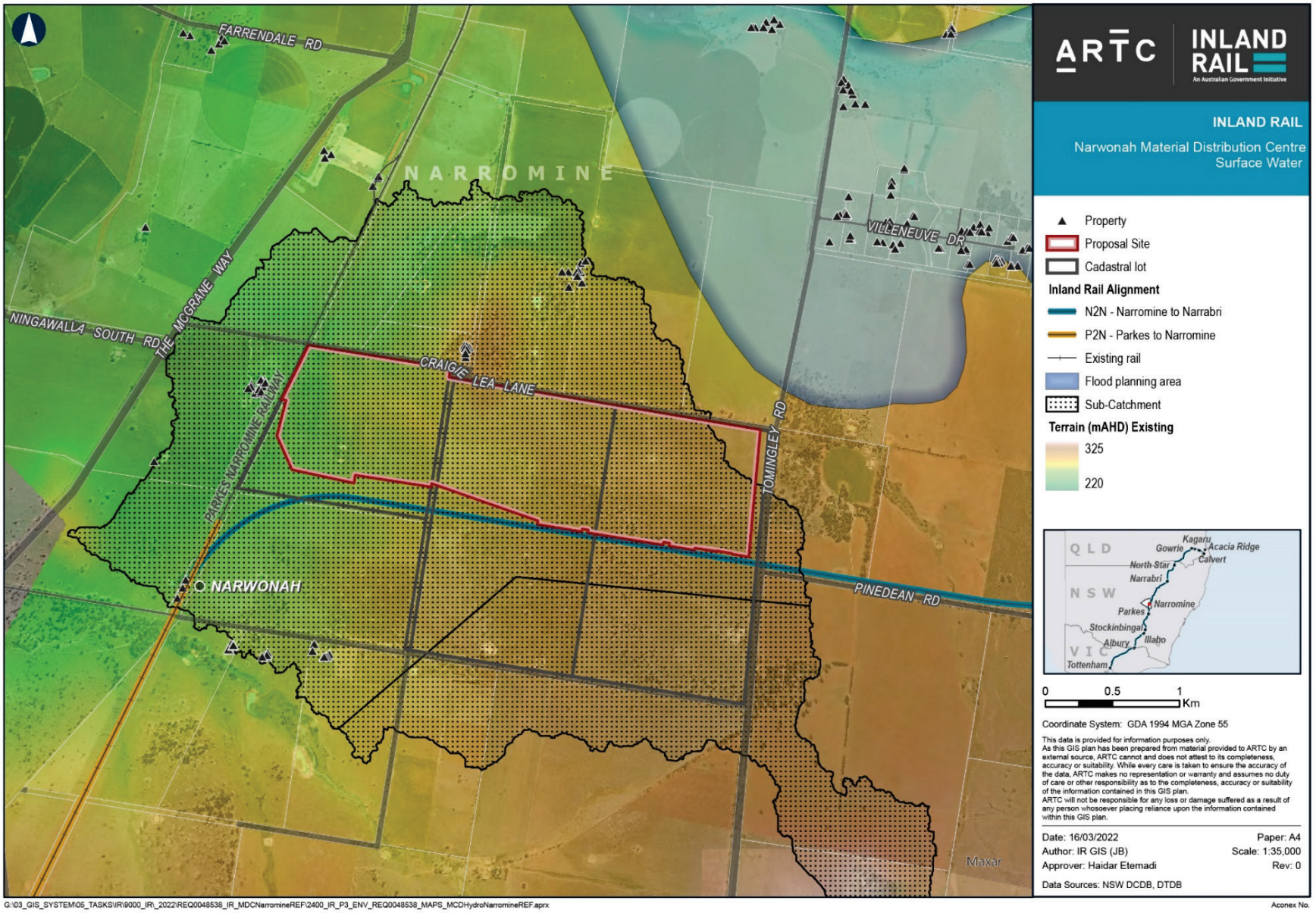

FIGURE 6: SURFACE WATER

TABLE 16: SURFACE WATER FEATURES

Aspect	Details

Catchments and watercourses	▸ Surface water flows within the proposal site are characterised by non-perennial watercourses (temporary, ephemeral or intermittent), which ultimately drain towards the Macquarie River.
	▸ The catchments to the proposal site are described as below and shown in Figure 6:
	  ▸ approximately 4.74 km^2 contributes to the watercourses discharging to the west
	  ▸ approximately 4.36 km^2 contributes to the watercourses discharging to the north
	  ▸ the nearest non-perennial named watercourses are Wallaby Creek, located approximately 1 km east, and Yellow Creek, located approximately 2 km south of the proposal site
	  ▸ the nearest perennial watercourse is Macquarie River, located approximately 9 km north of the proposal site.

Flood planning area	▸ The *NSW Floodplain Development Manual* (Department of Infrastructure, Planning and Natural Resources (DIPNR), 2005) defines the flood planning area as the area of land below the flood planning level and, therefore, subject to flood-related development controls. ▸ Flood-liable land is defined synonymously with flood-prone land (i.e. land susceptible to flooding up to the Probable Maximum Flood (PMF) event). The term *flood-liable land* covers the whole floodplain and does not exclude areas below the flood planning level. ▸ The proposal site is not located within the flood planning area (see Figure 6).
Overland flood risk	▸ While the proposal site is outside of flood planning area, it is subject to shallow surface flows caused by runoff from local catchments following relatively localised but intense rainfall events. ▸ The detailed flood assessment completed as part of the N2N Project includes overland flood information of the proposal site. Full details of the hydrology and flood modelling are provided in the *Narromine to Narrabri Project Flooding and Hydrology Assessment Technical Report* (2-0001-250-EAP-00-RP-0010).
Flood hazard	▸ In the 1% annual exceedance probability (AEP) event, flood hazard within the proposal site is typically characterised as low (i.e. less than 0.4 m^2/s), while around the access road located on the north-west, flood hazard is characterised as low to medium (i.e. less than 0.8m^2/s). ▸ Existing flood hazard for the 1% AEP and PMF are shown in Figure 7.
Extents and depths	▸ Flooding within most of the proposal site is characterised to be widespread, but relatively shallow, overland flows with depths up to approximately 0.5 m in the 1% AEP. ▸ Along the western boundary of the site, flows are impeded by the existing P2N line, causing flood depths of up to approximately 1 m in the 1% AEP. ▸ Existing flood extents for the 1% and PMF are shown in Figure 8.
Flow velocities	▸ In the 1% AEP event, flood velocity within the proposal site is typically less than 1 m/s. ▸ Existing flood velocity distribution for the 1% AEP is shown in Figure 9.
Inundation time	▸ For most of the proposal site, inundation time in the 1% AEP event is generally less than 10 hours, except at localised depressions and areas of ponding adjacent to the existing railway, where inundation time is greater.

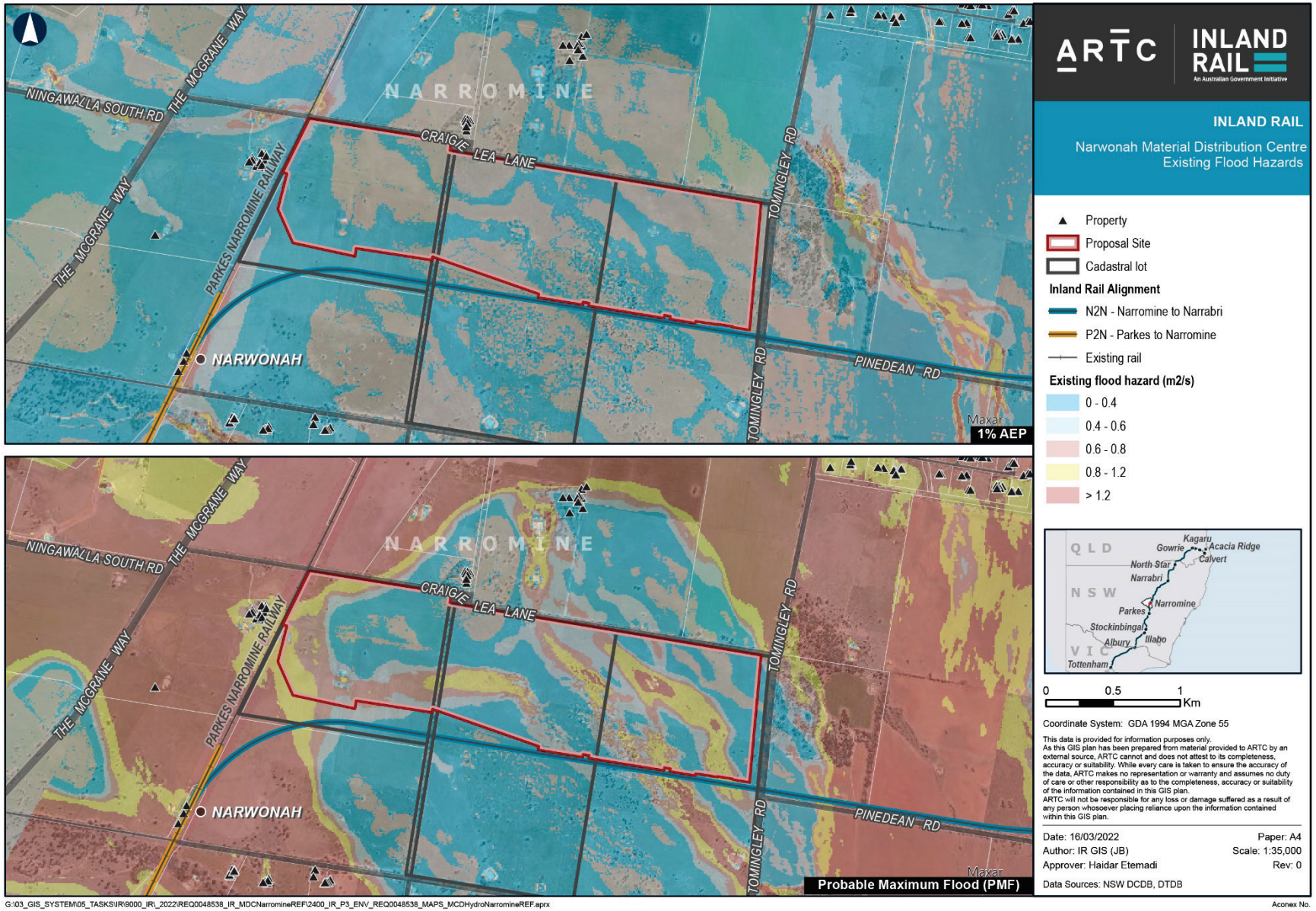

FIGURE 7: EXISTING FLOOD HAZARDS (1% AEP AND PMF)

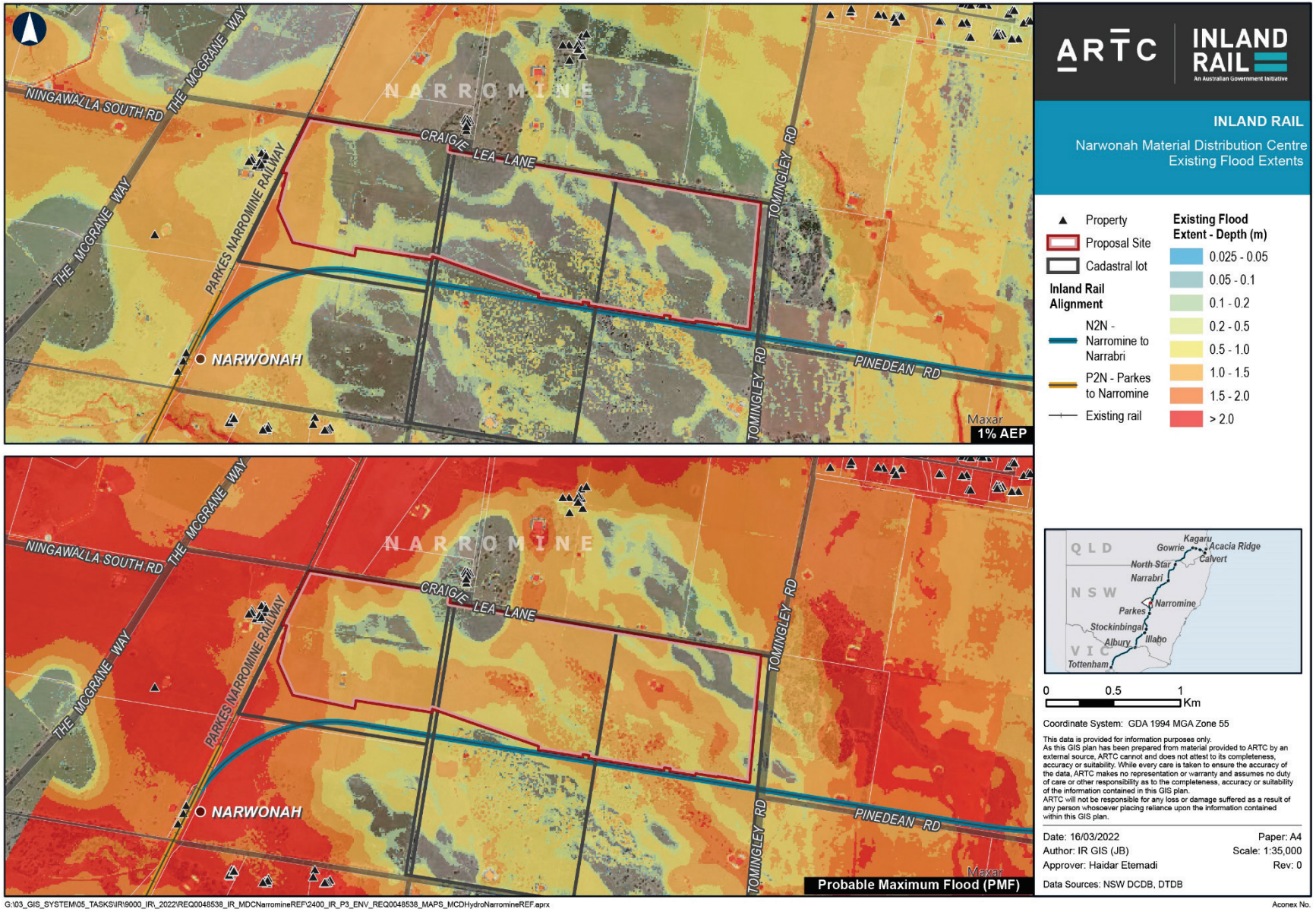

FIGURE 8: EXISTING FLOOD EXTENTS (1% AEP AND PMF)

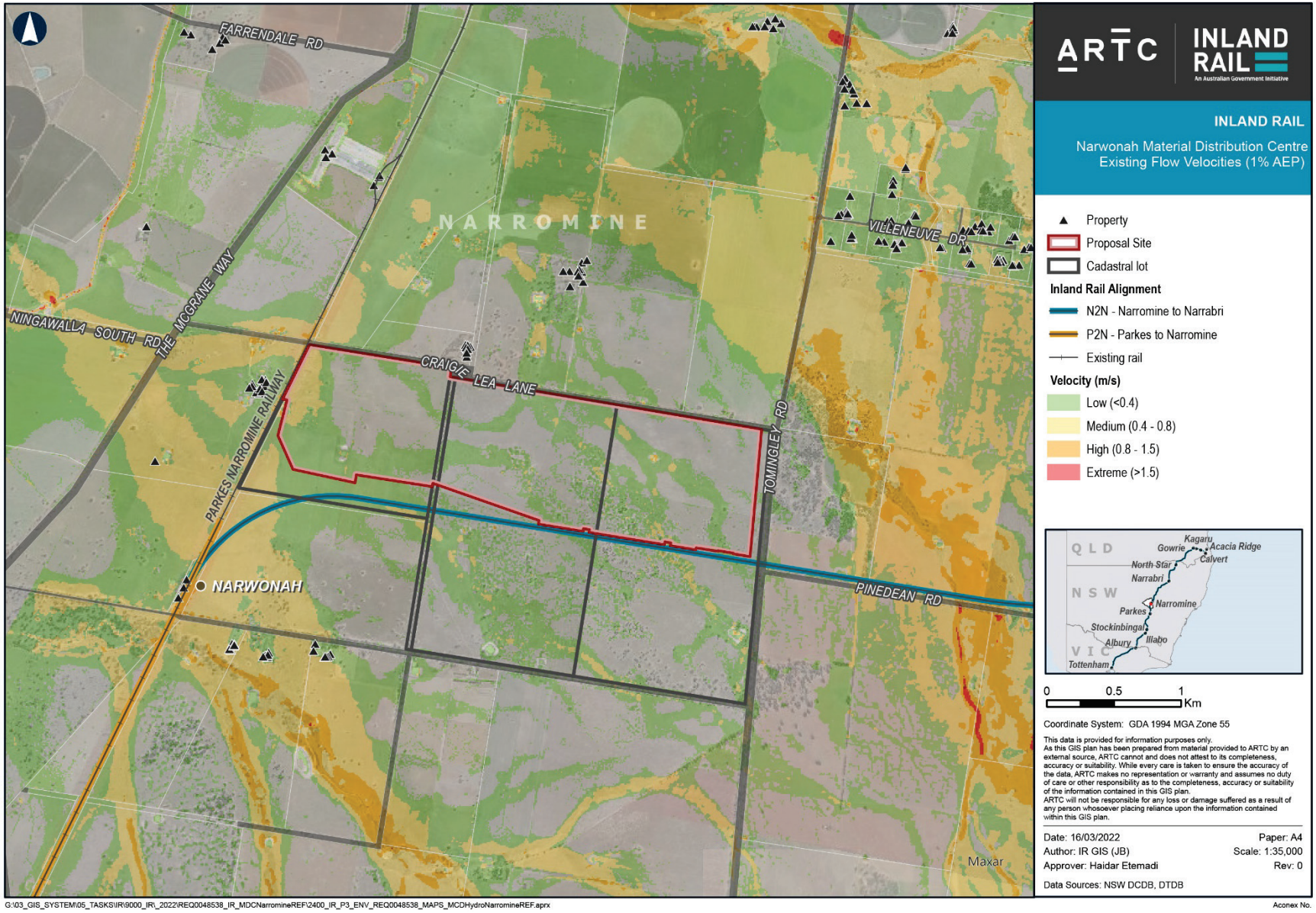

FIGURE 9: EXISTING FLOW VELOCITIES (1% AEP)

6.4.3 Potential impact

The potential impacts to surface water discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

The potential for the MDC to cause adverse surface water impact to surrounding sensitive receivers, or increased safety risks to surrounding road and rail infrastructure, can be managed through appropriate design and mitigation. The final design impacts would need to be confirmed in the detailed design phase.

Construction

The detailed construction layout and staging plans (including duration of the staging works) would be determined as part of the detailed design phase.

Potential impacts associated with construction works are likely to be similar to the operational phase (see section below), depending on the nature of the works and the staging plans. Accordingly, they would also need to be considered to an appropriate degree during the detailed design, including assessment and design calculations using existing hydraulic modelling for the MDC and surrounding area. Any unacceptable impacts arising from the proposed construction phase layout should be mitigated.

Operation

Based on the conceptual layout plan (see Figure 4), the proposed stockpile area is located downstream of the N2N alignment, within areas of overland flow paths (i.e. small, localised flow paths conveying rainfall runoff before entering creek or stream). Depending on the extent and amount of cut and fill or earthworks proposed for the stockpile area, there may be varying degrees of upstream afflux (i.e. increases in flood levels) or changes to flood extents; however, this is predicted to be localised to the proposal site extents and unlikely to extend to the N2N project area.

A sensitive receiver is located immediately downstream, north of the proposal site on Lot 26 DP755131 (see Figure 6). This property contains multiple farm dams, which intercept water from the watercourses traversing the site. Impacts to stream flow along these watercourses could occur both upstream and downstream from the re-grading of ground surface within the proposal site.

The precise magnitude and extents of flood impacts (i.e. afflux or changes to flow regime) during the operational stage of the MDC would be quantified during the detailed design phase. If any non-compliant impacts or changes to stream flow external to the proposal site were predicted, they could be addressed via modification to the site design, along with the provision of any necessary drainage infrastructure/mitigation strategies.

6.4.4 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Table 17 lists the mitigation and management measures that will be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC, to minimise impacts to surface water.

TABLE 17: SURFACE WATER CONTROL MEASURES

Control measures	Proposed MDC phase
Flood assessment will be undertaken based on design calculations, using existing hydraulic modelling for the MDC and surrounding area, to confirm requirements for design provisions and mitigation measures under the following scenarios: ▸ proposed MDC without N2N rail infrastructure in place ▸ proposed MDC with N2N rail infrastructure in place (i.e. cumulative impact assessment) if deemed required.	Design and Pre-construction
A risk assessment will be undertaken to identify opportunities for relaxation of flood immunity/protection requirements of various site elements on a case-by-case basis (in consideration of the impacts to adjacent landholdings and receptors, and extents of infrastructure required in achieving such requirements), and in consultation with relevant parties	Design and Pre-construction
Site elements will be strategically placed to minimise impacts to overland flow conveyance and storage, in so far as is possible.	Design and Pre-construction
Appropriate cross- and open-drain features will be provided to maintain designated flow regime and avoid flow redirection and/or flood impacts on external properties. If required, adequate design allowance should be included to accommodate changes in flow distribution resulting from the N2N Project. This would also include appropriate scour protection measures.	Design and Pre-construction
Appropriate flood protection will be provided to protect hazardous material storage facilities.	Design and Pre-construction

Control measures	Proposed MDC phase
Erosion and sediment control plans and a Site Waste Management Plan (SWMP) will be developed and be signed off by a Suitably Qualified Person (e.g. a Certified Professional in Erosion and Sediment Control (CPESC)) in accordance with regulatory requirements.	Construction
Requirements for construction water (volumes, quality, demand curves, approvals requirements and lead times) would be defined during detailed design.	Construction
Any discharge of construction water (e.g. from sediment basins and excavation dewatering, etc.) to the drainage systems or receiving waters would comply with the trigger values so that the proposed MDC does not have an adverse impact on water quality.	Construction
Inspection and maintenance of any erosion and sediment controls would be carried out throughout the works to ensure they are operating effectively.	Construction and Operation
The proposed MDC would be managed in accordance with the water quality management requirements specified in state policy, procedures and guidelines.	Operation

6.5 Air quality

6.5.1 Assessment methodology

The assessment of air quality impacts involved:

- reviewing the National Pollutant Inventory (NPI) to identify any local pollutant sources at the proposed location
- identifying:
  - surrounding sensitive receivers
  - neighbouring land uses
  - sources of air emissions during construction and operation
- recommending management and mitigation measures to minimise air quality impacts during construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.5.2 Existing environment

Air quality within the area of the proposal site is influenced by rural activities, vehicle and rail emissions, and limited industrial/processing activities.

No sources of significant emissions to air are listed on NPI within 25 km of the proposal site.

The proposal site is surrounded by a total of 44 residential properties in addition to several non-residential properties within a 5 km radius. The nearest residential property that is a sensitive receiver is located approximately 170 m to the north of the proposal site.

6.5.3 Potential impact

The potential impacts to air quality discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

Potential air quality impacts are expected to come from the following:

- dust generation
- combustion emission from motor vehicles and train travelling to and from the site
- use of diesel generators to provide power.

The potential impacts caused by these sources have been assessed in the below subsections.

Construction

Dust

Dust-generating activities associated with construction would occur within the proposal site, such as grading of areas of the proposal site, transport and delivery of materials/prefabricated offices, demarcation of the proposed site layout as well as the installation of hardstand in storage areas. Dust emissions are also likely to be generated from an increase in vehicles travelling along unsealed access roads.

The total amount of dust generated at any one time would depend on the soil characteristics, volume of construction activity being undertaken and the meteorological conditions.

Given the distance of sensitive receivers from potential dust-generating activities at the proposal site and unsealed access roads (nearest sensitive receiver approximately 170 m away) and the scale of activities that would generate quantum of dust, the risk of amenity/nuisance issues and human health impacts, without management measures in place, would be low and not significant.

The site preparation and construction would be undertaken in a relatively short period of time (approximately four months). Therefore, any associated dust emissions can be managed through typical mitigation measures, such as dust suppression techniques using water or chemical dust suppressants.

Exhaust emissions

Construction plant, machinery and generators onsite, as well as trucks and trains travelling to and from the proposal site, have the potential to impact local air quality. Expected numbers of train and truck movements during construction are outlined in section 3.7 of this REF. As there are no train movements, and only approximately 32 vehicles per day forecasted during the construction phase, this would not result in significant air quality impacts for nearby sensitive receivers. In addition, given the distance of sensitive receivers from the proposal site itself, the emissions from construction plant and machinery would disperse prior to any impact occurring at nearby sensitive receivers.

Under certain meteorological conditions, for example, where sensitive receivers are down-wind of generators, there is the potential for minor and temporary air quality impacts when these sources are in operation.

Operation

Dust

The potential impacts on air quality due to dust generation during operation would be lower than during the construction phase; however, dust generation will need to continue to be managed from activities such as stockpiling, ballast unloading pits, workshops where welding would be undertaken, and the transport and delivery of supplies. Mitigation measures implemented during construction to prevent dust generation and spread should also be implemented during onsite operations.

Exhaust emissions

Combustion emissions from vehicle, train and generator exhausts would continue from the construction phase to onsite operations.

- A total of up to 14 trains per day would travel in and out of the proposal site from construction fronts and suppliers (see section 3.7). Given the small frequency of movements and the limited number of sensitive receivers near the MDC, any air quality impacts would be temporary and minor. Trains may idle at the MDC while loading and unloading supplies; however, this would be minimised as much as practical. Based on the assessments undertaken for crossing loops proposed as part of Inland Rail projects, where trains idle waiting for other trains to pass on the main rail alignment, air quality impacts would likely only be significant within 25 m of an idling train. Therefore, any air quality impacts are anticipated to be restricted to within the proposal site and would not impact nearby sensitive receivers.
- Approximately 20 road vehicle movements per day are anticipated during onsite operations, split between staff travelling to and from the MDC and vehicles needed for deliveries that cannot be made via rail. It is highly unlikely that these vehicle movements would have any impact on air quality at nearby sensitive receivers, and vehicle movements and subsequent emissions are reduced from the construction phase.
- A 200 kilovolt-amps (KVa) generator is proposed to provide power onsite, particularly for the purposes of welding. Exhaust emissions, in particular oxides of nitrogen (NOx) and particulate matter (PM_{10} and $PM_{2.5}$), will be generated when in operation. Under certain meteorological conditions, e.g. where sensitive receivers are down-wind of the generator location, there is the potential for minor and temporary air quality impacts when the generator is in use.

6.5.4 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Table 18 lists the mitigation and management measures that would be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise air quality impacts.

TABLE 18: AIR QUALITY CONTROL MEASURES

Control measures	Proposed MDC phase
Where sensitive receivers are located within 200 m of proposed activities, or visible dust is generated from work areas or unsealed access roads, watering would be implemented where practicable.	Construction and operation
Dust will be visually monitored every day and, when excessive, controls such as watering, changed work practices or use of polymers will be used where practicable.	Construction and operation
Vehicle and machinery movements would be restricted to existing access roads where possible.	Construction and operation
Contractor plant and machinery, including generators, will be regularly checked and maintained in a proper and efficient condition.	Construction and operation
Plant and machinery would be switched off when not in use, and not left idling.	Construction and operation

6.6 Traffic and access

6.6.1 Assessment methodology

The traffic and access impact assessment involved:

- reviewing existing technical assessments undertaken as part of the N2N EIS, including traffic surveys, database reviews and background research
- undertaking desktop reviews of the surrounding road network and intersections, public transport services, access and other relevant features
- carrying out qualitative assessments of the impacts to traffic, intersections and pavement
- recommending management and mitigation measures to minimise impacts on traffic and access during construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.6.2 Existing environment

The road network within the proposal site consists mainly of local, private rural roads. Some arterial and sub-arterial roads are located surrounding the site. These roads are detailed in the below subsections and presented in Figure 10.

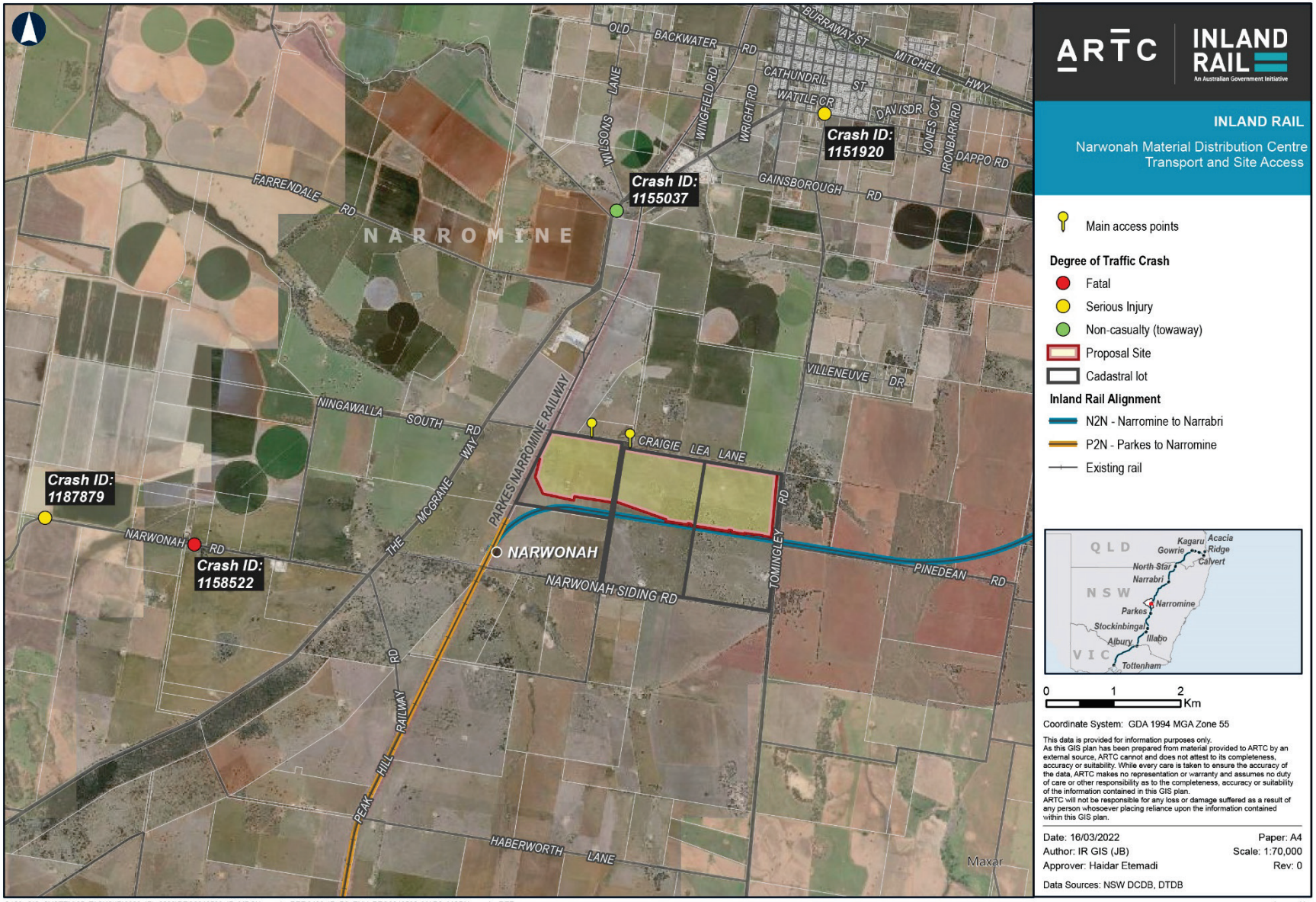

FIGURE 10: TRANSPORT AND SITE ACCESS

Main (regional) roads

The McGrane Way

The McGrane Way runs generally north to south and provides a link between Tullamore and Narromine. The proposal site connects with the P2N line to the east of The McGrane Way near Narwonah, about 10 km south of Narromine. At this location, The McGrane Way comprises a single lane in each direction on a single carriageway, with a posted speed limit of 100 km per hour.

Tomingley Road

Tomingley Road runs generally in a north–south direction, connecting the Newell and Mitchell highways and providing a direct link between Tomingley and Narromine. The proposal site crosses Tomingley Road immediately north of Pinedean Road, about 7.5 km south of Narromine. At this location, Tomingley Road comprises a single lane in each direction on a single carriageway, with a posted speed limit of 110 km per hour.

Local roads

The proposal site is adjacent to a local road on its northern boundary (Craigie Lea Lane) and nearby to another local road that is located beyond the southern boundary (Narwonah Siding Road).

Craigie Lea Lane

The Craigie Lea Lane is an unsealed single-lane (in both directions) local road connecting The McGrane Way and Tomingley Road on the northern side of the proposal site. It is about 4.5 km in total length and provides direct access to the proposal site.

Narwonah Siding Road

Narwonah Siding Road is an unsealed local road with a single lane of travel in each direction that lays to the south of the proposal site. It is approximately 5.5 km long connecting The McGrane Way and Tomingley Road and providing local access to eight lots, including two of which are subject to the proposal site.

Railway line

The P2N line is an operational single-track railway line that runs north–south, travelling north from the Broken Hill Line near Parkes. The line forms part of a larger route between Cootamundra on the Main South line and Werris Creek on the Main North line. The Narwonah Station is located south west of the proposal site, which is the immediate train stop after the Narromine Station.

Public transport

Passenger services on the P2N line were discontinued in the early 1970s. The existing rail line is operating for rail freight transport in both directions. No other public transport services are available to or from the proposal site.

Existing traffic volumes

Traffic surveys were undertaken between Tuesday 10th November 2020 to Monday 23rd November 2020, as part of the N2N EIS. Data for traffic volumes is available at the survey locations shown in Figure 11.

No turning volume data was available to undertake detailed intersection analysis.

There are no existing surveys undertaken for The McGrane Way near Craigie Lea Lane. The data at Tullamore Road is used to assess the traffic at The McGrane Way/Craigie Lea Lane intersection.

The peak volume for each road, each direction, in both the AM and PM, has been adopted for this traffic assessment. The approach was adopted so that a worst-case scenario could be studied. A summary of the AM and PM peak traffic volumes is discussed in section 6.6.3.

Crash history assessment

The available crash data was obtained from the TfNSW crash and casualty website (Crash and causality statistics - LGA view', 2021) (see Figure 10). The data incorporated was from the period 2016 to 2020.

The data shows that there were four crashes near the proposal site during this period. The crashes are summarised in Table 19 below.

TABLE 19: CRASHES NEAR THE PROPOSAL SITE

Location	Year	Degree of crash	Road user movement	No. killed	No. injured	Crash ID
Narwonah Road	2017	Fatal	Off road left—Object	1	1	1158522
Narwonah Road	2018	Serious Injury	Off road right—Object	0	1	1187879

Location	Year	Degree of crash	Road user movement	No. killed	No. injured	Crash ID
The McGrane Way	2017	Non-casualty (towaway)	Struck animal	0	0	1155037
Tomingley Rd	2017	Serious Injury	Cross traffic (x-intersection)	0	3	1151920

6.6.3 Potential impact

The potential traffic and access impacts discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

Any impacts to and from traffic and access during construction and operation would be insignificant based on the assessments outlined in the below section. This is because most of the deliveries will be via rail. Any amendments to delivery transportation methods and number of vehicles assumed should be reassessed.

Traffic impacts

Construction

It is anticipated that 10 daily light vehicle and 22 heavy vehicle (including two minibuses) movements will be generated during the peak phase of construction.

Based on the traffic surveys undertaken in November 2020 along Tullamore Road and Tomingley Road, 65 per cent of the total traffic access the location of the proposal site through the McGrane Way and 35 per cent of the total traffic use Tomingley Road. Using this data, the additional number of vehicles expected to be generated by the proposed MDC via Craigie Lea Lane and the two major roads during the AM peak, is calculated as follows:

- The McGrane Way—additional 21 vehicles (7 light vehicles and 14 heavy vehicles) daily
- Tomingley Road—additional 11 vehicles (3 light vehicles and 8 heavy vehicles) daily.

Operation

It is anticipated that up to 10 light vehicles and up to 8 heavy vehicles (including minibuses) will be generated daily during the peak phase of operation.

Using the same vehicle distribution ratio as for the construction period, i.e. traffic to the proposal site will be 65 per cent via The McGrane Way and 35 per cent though Tomingley Road, the additional number of vehicles expected to be generated by the proposed MDC during operation, turning in and out of Craigie Lea Lane during the AM peak to the two major roads, is outlined below:

- The McGrane Way—additional 14 vehicles (7 light vehicles and 7 heavy vehicles) daily
- Tomingley Road—additional 6 vehicles (3 light vehicles and 3 heavy vehicles) daily.

The increase in vehicle numbers calculated to be generated throughout construction and operation is not expected to have a significant impact on traffic operation; however, a revised traffic impact assessment must be undertaken if the number of vehicles accessing the site increases and or the origin/destination of the vehicles change.

Intersection impacts

A conservative growth rate for rural roads of 3 per cent (compound) has been adopted and applied to the base 2020 traffic volumes to estimate the traffic volumes along the McGrane Way and Tomingley Road during the construction, operation and decommissioning phases of the MDC. Figure 11 and Figure 12 illustrate the volumes based on this growth rate.

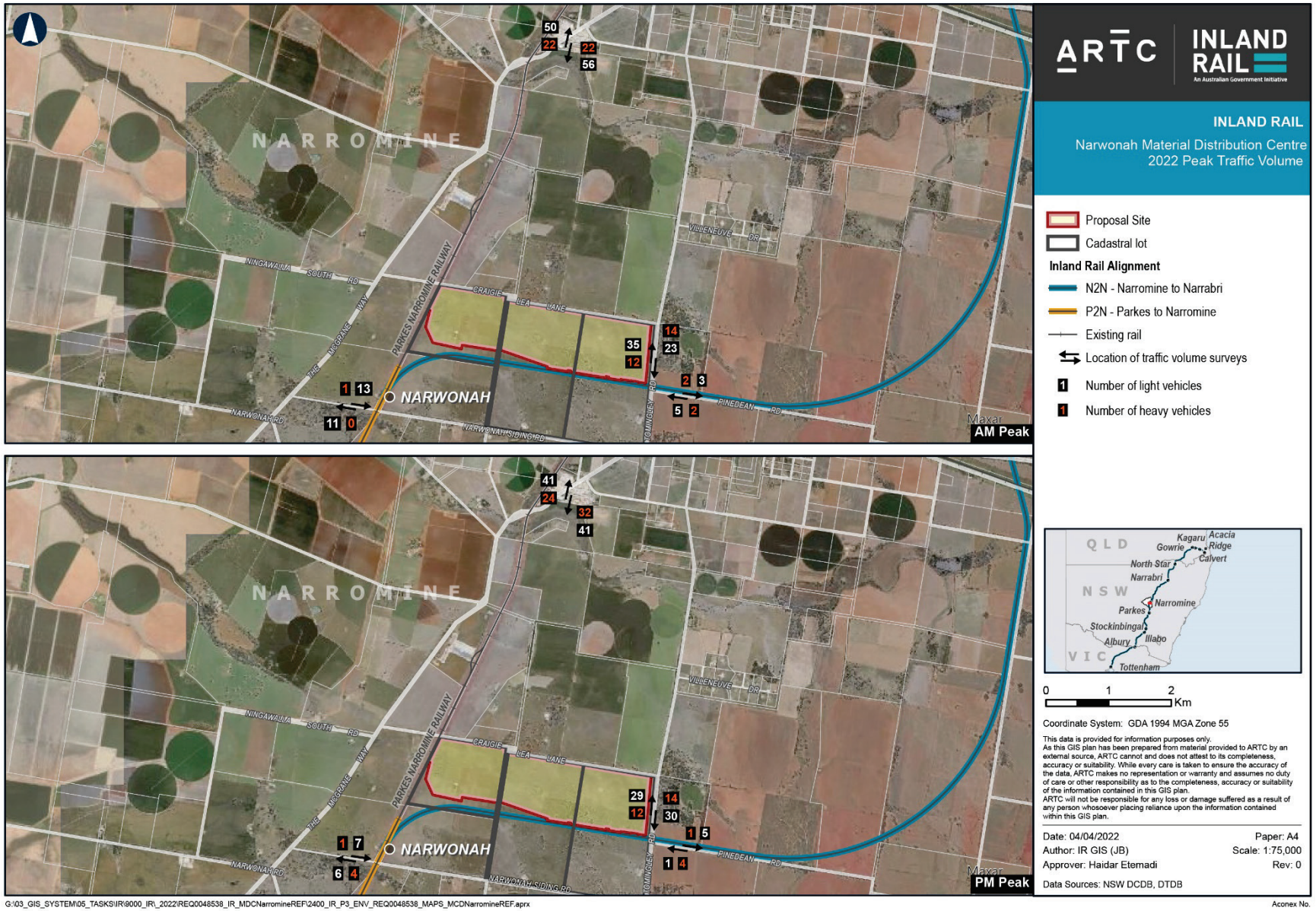

FIGURE 11: 2022 PEAK TRAFFIC VOLUME

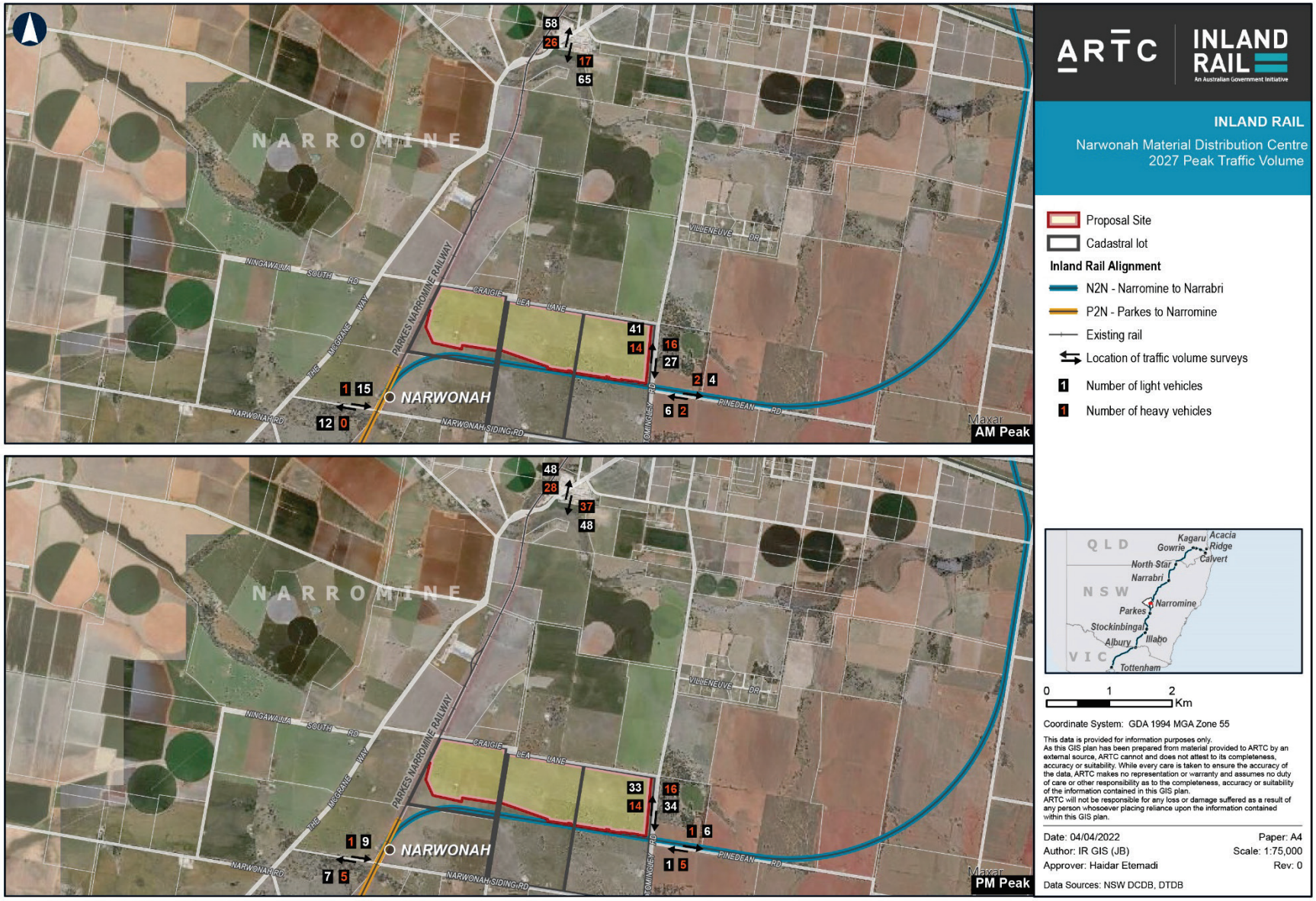

FIGURE 12: 2027 PEAK TRAFFIC VOLUME

Based on the traffic growth rates and the expected number of vehicles accessing the site during construction and operation, the following intersections would require rural basic right-turn (BAR) and basic left-turn (BAL) as per Part 6 of the *Austroads Guide to Traffic Management* (Austroads, 2020a) (see Figure 13 and Figure 14):

- McGrane Way/Craigie Lea Lane intersection
- Tomingley Road/Craigie Lea Lane intersection

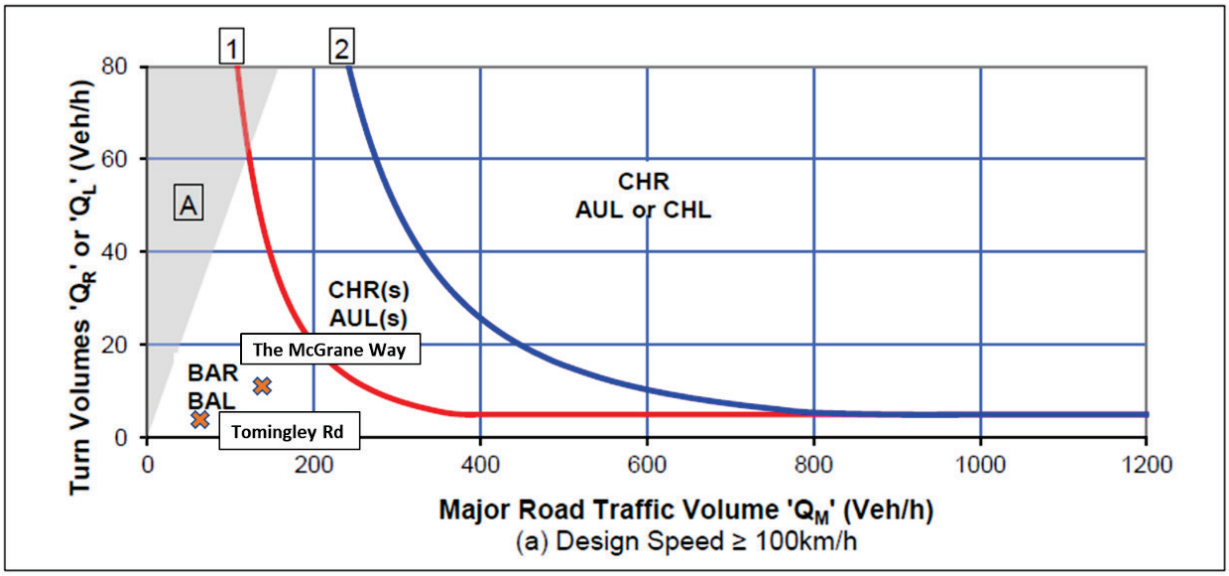

FIGURE 13: TURN TREATMENTS FOR THE CRAIGIE LEA LANE INTERSECTIONS DURING CONSTRUCTION (SOURCE: FIGURE 3.25, AUSTROADS GUIDE TO TRAFFIC MANAGEMENT)

If, during construction, the number of turning volumes is increased to 40 vehicles per hour, and or peak traffic volume along The McGrane Way is increased to approximately 225 vehicles per hour, The McGrane Way/Craigie Lea Lane intersection would require upgrades to a channelised right turn lane (CHR) and an auxiliary left turn lane (AUL).

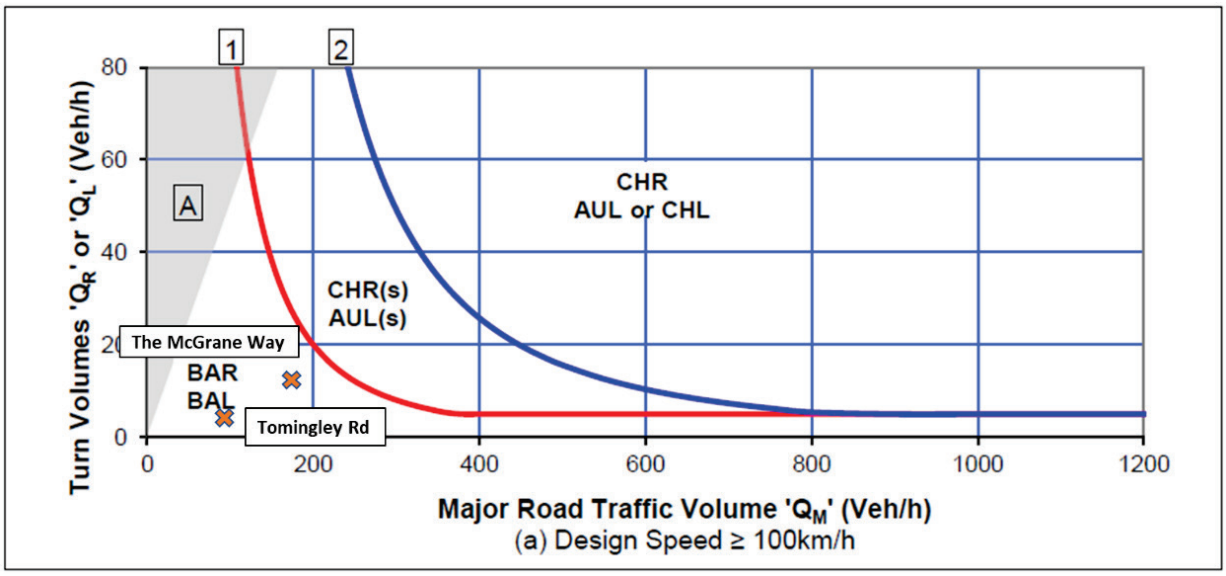

FIGURE 14: TREATMENTS FOR THE CRAIGIE LEA LANE INTERSECTIONS DURING OPERATION (SOURCE: FIGURE 3.25, AUSTROADS GUIDE TO TRAFFIC MANAGEMENT)

The McGrane Way/Craigie Lea Lane intersection would require upgrades to a CHR and an AUL once the MDC is operational if the number of turning volumes is increased to approximately 25 vehicles per hour and/or peak traffic volume along The McGrane Way is increased to approximately 210 per hour.

Similarly, the Tomingley Road/Craigie Lea Lane intersection would require an upgrade if there were an increase in the number of vehicles turning in and out of Craigie Lea Lane and or the number of vehicles along Tomingley Way.

An updated intersection analysis is recommended where there is a change to the number of vehicles generated during construction, the origin/destination of vehicles, and construction duration when compared with the numbers provided in this REF.

Pavement impacts

Minimal pavement impacts are expected during construction and operation based on the number of additional heavy vehicles that will be travelling along both roads and other major roads. Particularly for Craigie Lea Lane, which is currently an unsealed single-lane road and likely to be used as an access point to the proposal site.

6.6.4 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Table 20 lists the mitigation and management measures that will be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise impacts to and from traffic and access.

TABLE 20: TRAFFIC AND ACCESS CONTROL MEASURES

Control measures	Proposed MDC phase

A Traffic Impacts Assessment (TIA) will be undertaken during detailed design, which should address the following issues and all relevant matters in accordance with the Austroads *Guide to Traffic Management Part 12* (Austroads, 2020b) and *Guide to Traffic Generating Developments 2002* (Roads and Traffic Authority (RTA), 2002):
▸ traffic generation assessment with reference to *RTA Guide to Traffic Generating Developments* in order to determine traffic generation associated with the MDC
▸ reference *Guide to Traffic Management Part 6* (Austroads, 2020c) warrants for turning treatments. Swept path diagrams are to be provided to demonstrate the following:
  ▸ the proposed direction or directions of access and egress to and from the proposal site
  ▸ all vehicles can enter and exit the proposal site in a forward direction
  ▸ the design vehicle can access the proposal site and will not result in adverse impacts to The McGrane Way or Tomingley Road
  ▸ the width of the driveways are adequate to accommodate the swept path of the largest vehicle required to access the proposal site
▸ the software, AutoTurn Pro 10.2 is to be used to depict the vehicle swept paths. The parameters used to generate the swept path diagrams are to be noted on the plans
▸ an assessment of the type of intersection design required for access and egress points to and from classified roads, either directly or preferably via local roads. Safe Intersection Sight Distance (SISD) in accordance with the Austroads *Guide to Road Design* is to be provided at these access/egress points
▸ confirmation that the proposed design vehicle is legally able to access Craigie Lea Lane and Narwonah Siding Road
▸ any proposed signage may be subject to *State Environmental Planning Policy (Industry and Employment) 2021* and the *Transport Corridor Outdoor Advertising and Signage Guidelines* (Department of Planning and Environment (DPE), 2017). Referral to TfNSW may be required subject to clause 3.15 and 3.16 of the SEPP.
	Design and Pre-construction

The McGrane Way /Craigie Lea Lane and Tomingley Road/Craigie Lean Lane intersection treatment will be determined based on final detailed design.	Design and Pre-construction
Detailed design would consider the pavement impact assessment by carrying out a SIDRA Analysis of intersections subject to potential impacts.	Design and Pre-construction
A dilapidation survey should be undertaken of the made public roads within the proposed haulage routes, prior to and following completion of construction, and provided to the relevant road authority.	Design and Pre-construction
Detailed design would aim to minimise the potential for impacts to the surrounding road and transport network, and property access.	Design and Pre-construction
A Traffic Management Plan (TMP) will be prepared for the proposal as part of the CEMP, in consultation with council.	Design and Pre-construction
Temporary diversions and closures of existing rail and road traffic would be undertaken in consultation with relevant stakeholders, and alternative arrangements would be provided as required.	Construction and Operation

6.7 Land use and property

6.7.1 Assessment methodology

The assessment of land use and property impacts involved:

- reviewing existing technical assessments undertaken as part of the N2N EIS, including database reviews and background research
- reviewing relevant desktop information on land use within and surrounding the proposal site, including aerial imagery, zoning and land use maps, native title claims, Crown lands, mineral and petroleum exploration licences, travelling stock routes, road, etc.
- identifying properties surrounding the proposal site
- observing the proposal site and surrounding land during site visits
- recommending management and mitigation measures to minimise impacts on land use and property during construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.7.2 Existing environment

The proposal site is located on four properties, including Lot 16 DP755131, Lot 1 DP1198931, Lot 232 DP755131 and Lot 233 DP755131, all of which is wholly owned by ARTC and is currently unencumbered by any lease or licence to any third party. The proposed subdivision as part of this proposal is planned to combine and reconfigure these lots with the inclusion of Lot 17 DP755131 (i.e. five individual lots) to create two lots, as illustrated in Figure 2: Lot A (476.15 ha) and Lot B (558.05 ha).

The proposal site and the surrounding land the has been used for primary production purposes, predominately grazing and cropping, for an extended period of time (Figure 15). The proposal site is zoned RU1 (Primary production) and is adjacent to a railway line that is zoned SP2 (Infrastructure) in the Narromine LEP 2011. The road network within the proposal site consists mainly of local roads, and informal and unsealed roads.

The proposal site is surrounded by a total of 44 residential properties in addition to several non-residential properties within a 5 km radius. The nearest residential property that is a sensitive receiver is located approximately 170 m to the north of the proposal site.

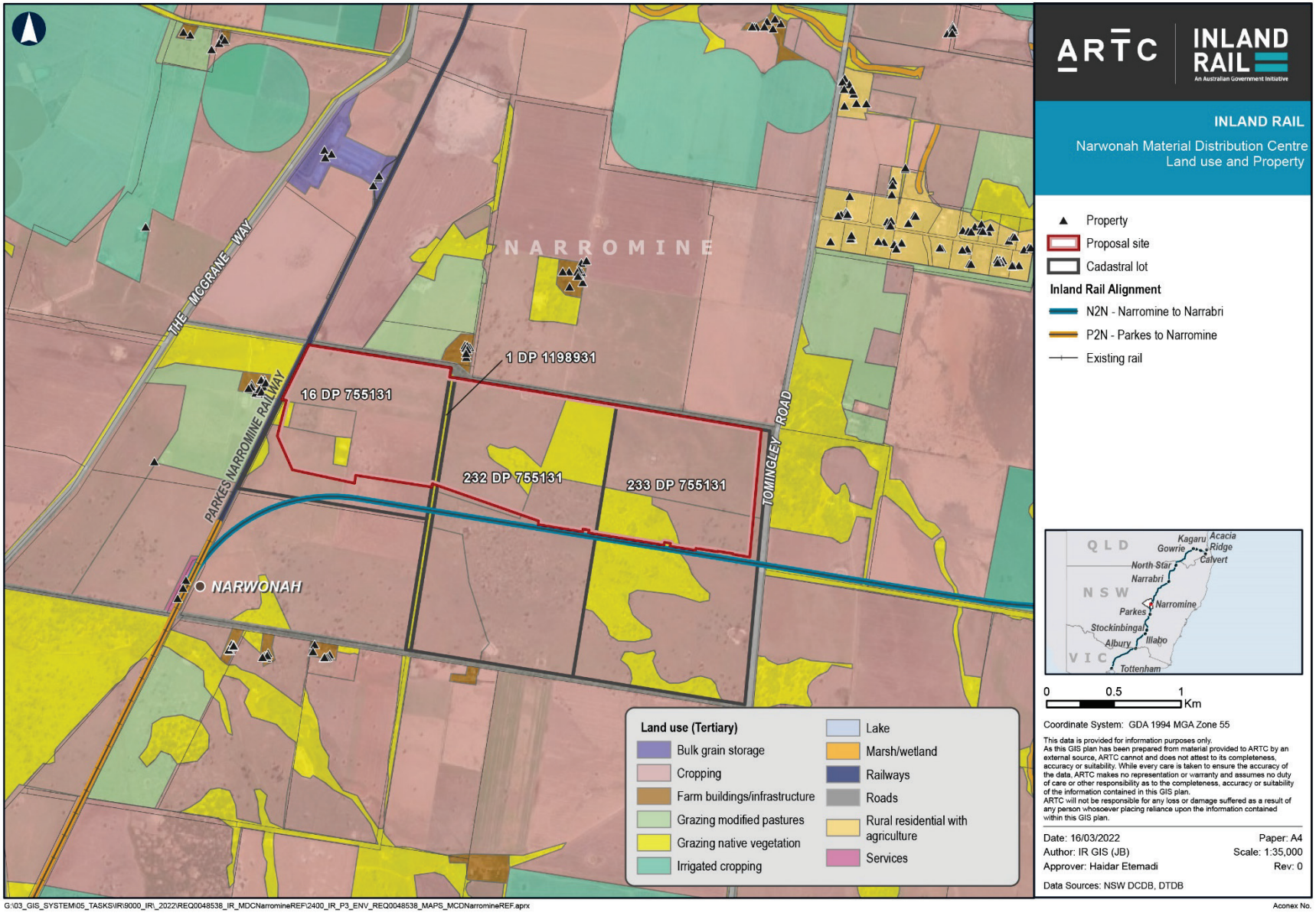

FIGURE 15: LAND USE AND PROPERTY

6.7.3 Potential impact

The potential land use and property impacts discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

Impacts to land use within the proposal site during the construction and operation of the MDC would be associated with a temporary change in land use from rural to rail operations, construction work site, material storage and laydown. Changes in land use would be managed with the mitigation measures outlined in this REF.

The subdivision does not alter the current land use; however, it supports the current use by allowing the MDC to be located primarily on a single lot. The subdivision may also facilitate the ongoing use of the proposal site post the decommissioning of the MDC or once its purpose for Inland Rail has been fulfilled, through providing flexibility in the future and ongoing use of the proposal site. The effects of the future land use of the proposed two lots has not been assessed as part of this REF and must be assessed by the future user.

As the proposed subdivision does not alter the current land use of the existing area during the lifespan of the MDC, impacts to the environment or the various environmental aspects are not expected and, therefore, have not been considered further as part of this REF or within supporting technical reports, except insofar as the subdivision facilitates the use of the proposal site for the MDC and allows unspecified future uses.

In accordance with the Narromine LEP, the proposed two lots will remain with the current minimum lot size for the land within the existing zone, which is 400 ha.

There are no private properties located within the proposal site. Potential impacts are expected to nearby residential properties throughout the construction and operation of the proposed MDC as result of increased noise (section 6.2), minor changes to air quality (section 6.5) and visual amenity (section 6.9). Potential impacts to nearby properties will be mitigated and managed as outlined in the relevant sections of this REF.

6.7.4 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Table 21 lists the mitigation and management measure that will be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise impacts to land use and property.

TABLE 21: LAND USE AND PROPERTY CONTROL MEASURES

Control measures	Proposed MDC phase
Access to the construction area for stock, as well as non-construction related vehicles and people would be restricted via fencing and other measures.	Design and Pre-Construction
Fencing will be provided in accordance with the Inland Rail fencing standards applicable to the adjacent land use and be constructed prior to the removal of existing fencing or any works being carried out on the subject land, unless otherwise agreed with the landowner.	Design and Pre-Construction
If required, land for the construction of the works would be acquired in accordance with the requirements of the relevant state land acquisition legislation, including the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW).	Design and Pre-Construction
Property owners, tenants and occupants would be consulted to ensure they are informed about the timing and scope of activities in their area and any potential property impacts/changes, particularly in relation to potential impacts to access, services, or farm operational arrangements.	Design and Pre-Construction

6.8 Socio-economic

6.8.1 Assessment methodology

The community and socio-economic assessment methodology involved:

- undertaking a desktop review of the Australian Bureau of Statistics' (ABS) Census Quick Stats (ABS, 2016) and publicly available information on local community structure and patterns
- reviewing the overarching stakeholder engagement tasks undertaken by ARTC to help identify key community concerns
- considering the potential socio-economic impacts and opportunities, including workforce, community, local supply and business during the operation and construction of the proposed MDC
- recommending management and mitigation measures to minimise impacts on the local community during construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.8.2 Existing environment

The proposal site is located within the Narromine LGA, located in the Central West and Orana region, and spans an area of about 5,200 km^2.

At the 2016 census, the LGA had a population of 6,444 people. Narromine is the main town in the LGA, with a population of 3,528 people (about 55 per cent of the LGA's residents). The town is located on the Mitchell Highway adjacent to the Macquarie River and about 10 km north of the proposal site. Other villages in the LGA include Trangie and Tomingley.

The median age of people in the LGA was 42 years. Children aged 0–14 years made up 21.4% of the population and people aged 65 years and over made up 21.1% of the population. Aboriginal and/or Torres Strait Islander people made up 19.9% of the population.

Of the employed people in the LGA, 7.5% worked in Other Grain Growing. Other major industries of employment included Grain-Sheep or Grain-Beef Cattle Farming 3.6%, Primary Education 3.6%, Hospitals (except Psychiatric Hospitals) 3.5% and Sheep Farming (Specialised) 3.3%.

Residents in the LGA value the strong sense of community, rural lifestyle, peaceful amenity, access to services and proximity to work and Dubbo. Aviation and sport play major roles in the culture of the Narromine community.

Community facilities within the LGA are mainly located in Narromine and include emergency services, a hospital and medical centre, several schools, and cultural facilities. Sport and recreation facilities include the Narromine Golf Club, Trangie and Narromine showgrounds, Narromine Aerodrome, Goobang National Park, the Bogan and Macquarie rivers, and state forests.

6.8.3 Potential impact

The potential socio-economic impacts or opportunities discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

Workforce

Approximately 100 personnel are anticipated onsite at any one time during the operation of the MDC and will be a mix of people working the yard (welding and material handling) and office-based logistics staff managing, coordinating and administrating various operational aspects.

The MDC would require a variety of roles and skills during construction, including labourers, tradespeople, machinery operators, engineers, surveyors and site supervisors. Assuming there is no material change in labour market conditions.

It is expected that the local labour market would have the capacity to supply some of the workforce requirements for the MDC, which may have temporary and short-term impacts associated with labour draw from the local area. As a result of this tight labour supply market, and the need for specialist or expert skills for various tasks, the MDC may need to source some workers from outside the region.

The requirement for the temporary relocation of some workers may result in an increase in pressure on the availability of short-term or temporary accommodation (which may be exacerbated during harvest seasons).

It is not expected that the temporary relocation of workers to the local region would put significant pressure on existing community facilities, given the workforce requirements, the short-term nature of the proposed MDC, and capacity in community facilities in Narromine being a regional centre in the LGA.

Local supply and business

The proposed MDC will be sited on ARTC-owned land and would not require the acquisition or severance of land for its construction and operation. As a result, there are unlikely to be any impacts on local business or industry due to changes in land use or the viability of surrounding rural land.

ARTC has developed the Inland Rail Sustainable Procurement Policy which would ensure that local, regional and Indigenous businesses would have opportunities to supply the proposed MDC.

A portion of the materials may be supplied by local businesses subject to availability, which may include the supply of a range of construction materials. Additionally, there are several services that would potentially be sourced from within local or regional communities, including plant hire (wet and dry hire), truck/tipper hire, electrical installations (excluding rail systems) and instrumentation, landscaping, waste disposal services, trade services, professional services (e.g. human resources and labour provision) and community adaption to the rail corridor (e.g. community and economic development services).

The MDC's local supply arrangements would be tailored to support local business and industry where practicable.

Community

Health and wellbeing

The construction and operation of the proposed MDC is not predicted to have a significant impact on the health and wellbeing of the community. There may be some temporary disruption and nuisance as a result of noise, dust and traffic impacts at the nearest receivers or for road users of the McGrane Way, Tomingley Road and Craigie Lea Lane; however, these impacts would be short-term and temporary in nature and would be managed to mitigate their impacts (see sections 6.2: Noise and vibration, 6.5: Air quality and 6.6: Traffic and access).

Amenity (noise, air quality and visual amenity)

The proposed MDC would result in nearby residents experiencing an increase in noise due to its construction and operation. The main sources of noise at the proposal site would be generated from general construction work, and operational activities, including grinding and sandblasting, as part of rail preparation. Residents surrounding the proposal site are likely to be impacted by construction and operation noise (see section 6.2).

The proposed MDC would generate dust and exhaust emissions through construction and operation. Given the distance of the nearest residential properties (nearest being approximately 170 m from the site), the unsealed road conditions, train and road vehicle movements, and the nature of the proposed activities, the risk of amenity and nuisance impacting human health is low and not significant (see section 6.5).

Visual amenity impacts are expected, particularly to the nearby properties surrounding the proposal site who would have visibility of the MDC. Landscape impacts are measured to be low to moderate as the character of the landscape would temporarily change from an agricultural open plain to a temporary construction facility (see section 6.9)

Accessibility

The construction and operation of the proposed MDC would not result in any impacts to the accessibility of nearby properties or to local public transport. Road users and local residents would experience an increase in traffic during construction and potentially during operation (see section 6.6).

6.8.4 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Table 22 lists the measures that would be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise impacts on the local community. Control measures listed under sections 6.2: Noise and vibration, 6.5: Air quality and 6.6: Traffic and access would also act as socio-economic control measures.

TABLE 22: SOCIO-ECONOMIC CONTROL MEASURES

Control measures	Proposed MDC phase
ARTC would continue to manage and deliver Program-wide community and stakeholder engagement for Inland Rail in accordance with the Inland Rail Communications and Engagement Strategy.	Design/Pre-construction
The CEMP would define the requirements for the complaints management system to be implemented during construction.	Design/Pre-construction
The project will include measures to ensure ongoing consultation with local emergency services providers to inform them about the locations of level crossings, and changes to access routes and road conditions.	Design/Pre-construction
To manage the implementation of the proposed socio-economic mitigation measures, contractual mechanisms will be put in place, and specific management action and targets will be developed, in response to these measures.	Design/Pre-construction
ARTC would continue to support local employment in accordance with the *Australian Jobs Act 2013* (Cth) and Australian Industry Participation National Framework, and through the Inland Rail Academy, to leverage training programs, upskill residents and young people, and connect businesses with Inland Rail opportunities and key regional industries.	Design/Pre-construction
Key stakeholders (including local councils, emergency service providers, public transport providers, the general community, and surrounding landowners/occupants) would continue to be consulted in accordance with the Engagement Implementation Plan.	Design and Pre-Construction/Construction

Control measures	Proposed MDC phase
A temporary workforce accommodation plan would be prepared to guide the design and provision of temporary accommodation. The plan would be developed in accordance with ARTC's Inland Rail Program Accommodation Principles, relevant council development codes and guidelines.	Design/Pre-construction
Residents, landholders, landowners, businesses, affected social and recreation facilities and other relevant stakeholders would be notified before work starts, in accordance with the communication management plan, and be regularly informed of construction activities.	Construction/operation
Complaints during construction would be managed in accordance with the complaints management system defined by the communication management plan.	Construction/operation

6.9 Landscape character and visual amenity

6.9.1 Assessment methodology

The landscape and visual amenity assessment methodology involved:

- undertaking a desktop review of the existing environment
- undertaking assessment as per the following guidance documents:
  - *Guidance Note for Landscape and Visual Assessment* (Australian Institute of Landscape Architects (AILA), 2018)
  - *Guideline for landscape character and visual impact assessment: Environmental impact assessment practice note EIA-N04* (TfNSW, 2020)
- identifying sensitive receivers and or sensitive locations surrounding the proposal site
- desktop landscape character and visual appraisal based on the themes of magnitude and sensitivity (see Table 23), to determine the level of impacts for landscape character and the representative viewpoints
- recommending management and mitigation measures to minimise impacts on the local community during construction, operation and (where appropriate) decommissioning of the proposed MDC.

TABLE 23: IMPACT LEVELS

SENSITIVITY	MAGNITUDE: High	Moderate	Low	Negligible
High	High Impact	High–Moderate	Moderate	Negligible
Moderate	High–Moderate	Moderate	Moderate–Low	Negligible
Low	Moderate	Moderate–Low	Low Impact	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Landscape character appraisal

Landscape character is defined as a distinct, recognisable or consistent pattern of elements in the landscape. It is the pattern of elements that can give an area a distinct sense of place, making one area unique or different from another.

Sensitivity

The sensitivity of a landscape refers to the inherent and intrinsic characteristics and values, and the degree to which it can accommodate change. See Table 24 for an indication on the attributes that inform the appraisal of landscape sensitivity.

TABLE 24: SENSITIVITY LEVELS FOR LANDSCAPE

Sensitivity	Description
High	Examples may include: ▸ likely to be protected by national designation (such as a national park) and/or widely acknowledged for its quality and value ▸ likely to contain features and elements that are rare and could not be replaced ▸ a landscape with low capacity to accommodate the type of change envisaged.
Moderate	Examples may include: ▸ perhaps a regionally or locally important landscape and/or protected by a regional designation ▸ likely to contain some features and elements that could not be replaced ▸ where its character, land use, pattern and scale may have some capacity to accommodate a degree of the type of change envisaged.
Low	Examples may include: ▸ likely to contain few, if any, features and elements that could not be replaced ▸ a landscape valued to a limited extent, perhaps at a local level ▸ where its character, land use, pattern and scale is likely to have the capacity to accommodate the type of change envisaged.
Negligible	Examples may include: ▸ a landscape that is not valued for its scenic quality ▸ comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place where its character, existing land use, pattern and scale are tolerant of the type of change envisaged, and the landscape has capacity to accommodate change.

Magnitude

Magnitude of change refers to the scale, nature and duration of change that is anticipated. Refer to Table 25 for typical examples that inform the appraisal of landscape magnitude of change.

TABLE 25: MAGNITUDE OF CHANGE FOR LANDSCAPE

Sensitivity	Description
High	Dominant, large-scale change to existing character or distinctive features and elements, and/or the addition of new features or elements, which is likely to fundamentally change the character of the landscape.
Moderate	Considerable or noticeable change to existing character or distinctive features or elements, and/or the addition of new features or elements that are uncharacteristic.
Low	Perceptible change that would not alter the overall balance of features and elements within the landscape.
Negligible	Barely perceptible change with no noticeable loss or improvement to the existing character.

Visual appraisal

The visual amenity of an area broadly refers to how potential viewers respond to or value a particular landscape.

Sensitivity

The sensitivity of a representative viewpoint is influenced by location, context and the importance of the viewer, together with the value placed on the locations by the community, or by legislation or policy. See Table 26 for typical examples that inform the appraisal of visual sensitivity.

TABLE 26: VISUAL SENSITIVITY LEVELS

Sensitivity	Description
High	Examples may include: ▸ large numbers of residential properties or viewers ▸ users of public footpaths or other recreational trails (e.g. national trails) ▸ users of recreational facilities where the purpose of that recreation is the enjoyment of the landscape (e.g. national parks and designated scenic lookouts).
Moderate	Examples may include: ▸ outdoor works ▸ users of scenic roads, railway corridors or waterways ▸ schools and other institutional buildings and their outdoor areas.
Low	Examples may include: ▸ indoor workers ▸ users of main roads or arterial roads ▸ users of recreational facilities where the purpose of that recreation is not related to the views ▸ low number of residential properties.
Negligible	Examples may include: ▸ limited numbers of viewers or infrequently accessed viewpoints ▸ limited interest in their surroundings ▸ users of minor roads and views from the air.

Magnitude

The magnitude of change considers the degree of change that the representative viewpoint will experience. It considers the nature, scale and duration of the change. See Table 27 for an indication on the attributes that inform the appraisal of visual magnitude of change.

TABLE 27: VISUAL MAGNITUDE OF CHANGE

Sensitivity	Description
High	The proposed MDC, or part of it, would become the dominant feature or focal point of the view.
Moderate	The proposed MDC, or part of it, would form a noticeable feature or element of the view that is readily apparent.
Low	The proposed MDC, or part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Negligible	Only a very small part of the proposed MDC would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view.

6.9.2 Existing environment

Landscape character

The landscape is characteristic of the flat expanse of undefined markers or points of interest. There are occasional trees that offer limited distinction, with occasional tree lines providing some demarcation of roads and other boundaries. The expanse of the area dominates to provide a strong sense of continuity over a large distance that is only interrupted by low hills in the distance. There is a regularity and uniformity in the landscape at scale, which is only punctuated by occasional trees and strands. Overall, the landscape offers limited character locally but, rather, it creates one uniform character zone representative of its agricultural use, with occasional isolated farm buildings offering another form of relief.

This means the landscape character is of ***low*** sensitivity.

Visual

Visual receptors broadly consist of users of local roads and farmsteads that intermittently line Craigie Lea Lane to the north and Narwonah Siding Road to the south. Views from the farmsteads are consistent of open, agricultural plains and scattered trees, with rising terrain marking the horizon in the distance. These views are occasionally filtered by property boundary vegetation.

The landscape and landform create a large zone of visual influence (e.g. the theoretical extent from where the MDC would be visible). Despite this, there are only a limited number of viewpoints in the area that would be potentially impacted by the proposal, which are represented below in the four viewpoints. All four of ***low*** sensitivity.

TABLE 28: VIEWPOINT IMAGE, DESCRIPTION AND PLAN LOCATION NUMBER

Plan location number (see Figure 16)	Viewpoint and image description
1	 *View east from Craigie Lea Lane access gate*
1	 *View south along existing tree line*
2	 *View looking north–west of paddock to east of rail corridor*
3	 *View south from Craigie Lea Lane centre of property*

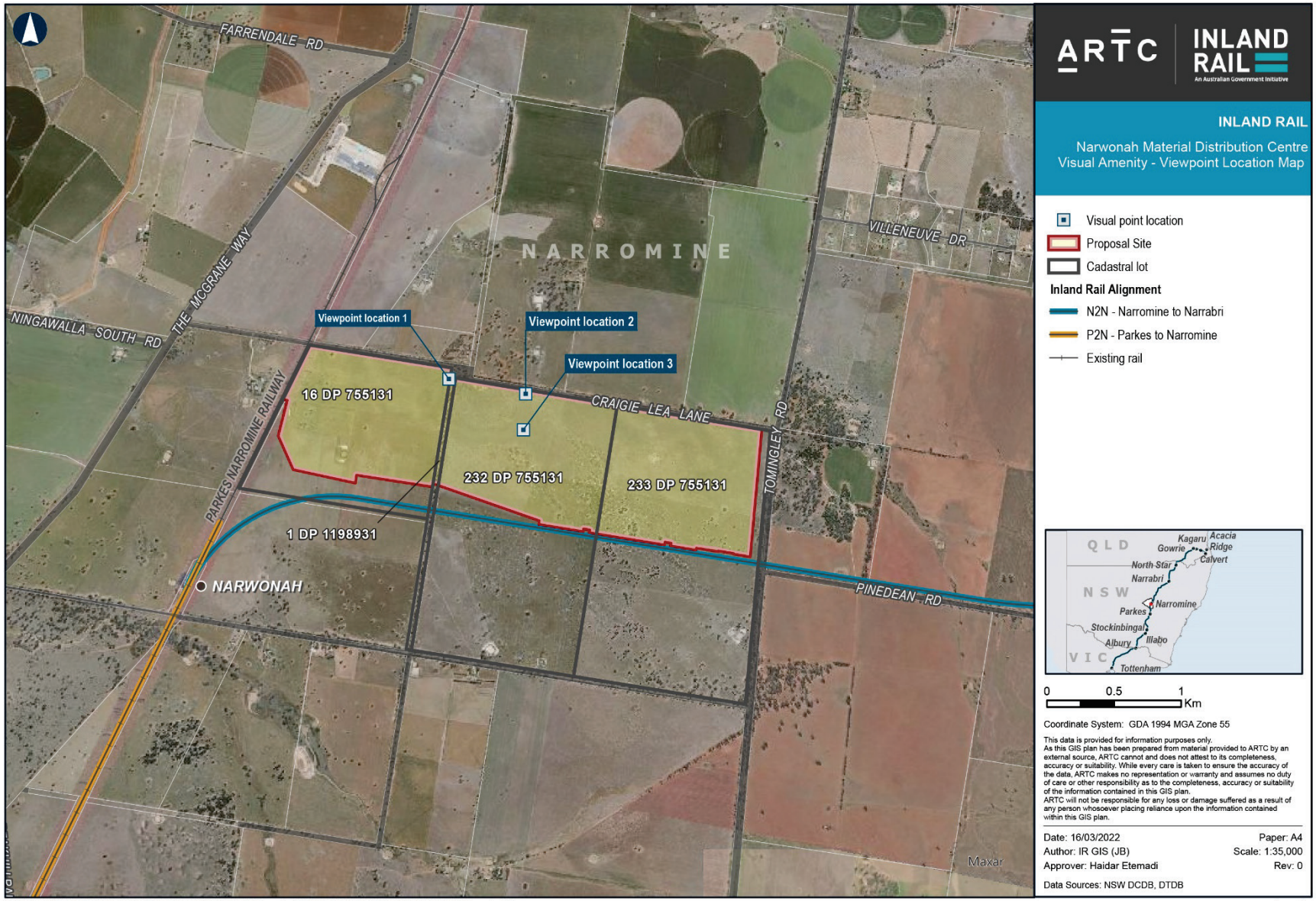

FIGURE 16: VIEWPOINT LOCATIONS

6.9.3 Potential impact

The potential impacts to landscape character and visually amenity discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

Landscape character

The proposed layout seeks to minimise impacts on existing landscape features; however, to facilitate the current concept layout, removal of vegetation would be required to facilitate the construction of the access road widening, and the laydown and storage areas.

Despite this, the MDC would be introduced into an area that is characterised by its scale and openness. This means the MDC would a component of the landscape but it would not come to dominate or distance it from its features. Therefore, the area would come to retain its agricultural character overall but, close to the MDC, this may be disrupted depending on the final design and form of the proposal. Therefore, there would be a perceptible change in the landscape from introducing the MDC but it would not affect the overall character of the landscape. For this reason, the change is assessed to result in a **low to moderate** adverse impact on landscape character.

Visual

Properties situated to the north of Craigie Lea Lane would experience south elevation views to large ballast laydown. Based on the current conceptual plan, topsoil bunds have been positioned to the north of the ballast laydown to reduce noise impacts and screen views towards machinery and construction movements during operation. Properties situated to the south of Craigie Lea Lane and to the west of the Parkes Narromine Railway would experience east elevation views towards the proposed office and amenities, with the laydown area evident in views further to the east.

Properties situated to the south of Narwonah Siding Road would experience views towards storage facilities backed by ballast laydown. Equipment machinery and movement are anticipated to be evident in these views for the duration of the works.

The visual impacts will vary throughout the operational phase of the MDC depending on the staging of the construction works; however, the presence of equipment machinery and material storage are likely to be evident through the duration. Aspects of the MDC will form a noticeable to dominant part of views from visual receptors with the potential to result in a moderate to high magnitude of change and a low to moderate visual impact.

6.9.4 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Table 29 lists the measures that would be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise impacts on the landscape character and visual amenity.

TABLE 29: LANDSCAPE CHARACTER AND VISUAL AMENITY CONTROL MEASURES

Control measures	Proposed MDC phase
A Landscape and Rehabilitation Strategy should be developed during the detailed design stage in line with the ARTC Landscape Strategy, Landscape Framework and the Landscape Specification.	Design/Pre-construction
Vegetation will be retained, where feasible, and supplemented with further planting to strengthen the existing screening value. This would be considered along Craigie Lea Lane, Narwonah Siding Road and to the east of Parkes Narromine Railway.	Design/Pre-construction
The detailed MDC layout would be refined so that, while not in use, construction machinery is stored in suitable locations to minimise views and disturbance.	Design/Pre-construction

6.10 Soil and contamination

6.10.1 Assessment methodology

The soil and contamination assessment methodology involved:

- reviewing existing technical assessments undertaken as part of the N2N EIS, including database reviews and background research
- reviewing the findings of existing geotechnical investigations carried out to support the MDC's engineering design (D&N Geotechnical Pty Ltd, 2022)

- reviewing relevant desktop information on land use within and surrounding the proposal site, including aerial imagery, zoning and land use maps, soils, geology and site investigations results such as geotechnical investigations
- undertaking searches of relevant databases, including:
  - NSW EPA's contaminated land record and record of notices
  - ARTC's contaminated site register
  - DPE's Acid Sulphate Soils (ASS) Risk Mapping
  - NSW DPI cattle dip site locators
  - Department of Defence's UXO Mapping Application
  - Per- and Polyfluoroalkyl substances (PFAS) investigation database
  - NSW governments' Naturally Occurring asbestos in NSW mapping
  - EPLs held under the POEO Act
- recommending management and mitigation measures to minimise impacts during construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.10.2 Existing environment

Landform, geology and soils

The site surface is typically flat, with a gentle reduction in surface elevation of approximately 15 m towards the west, over a distance of about 3 km between the eastern and western site extents. The site surface currently is occupied by long grasses and occasional mature trees, most recently used for livestock grazing. Several minor surface dams are evident at the site. Review of the aerial imagery and initial site observations indicate that gilgai features are evident at the site.

Site soils are identified to be generally stable and are broadly characterised as moist silts with clays at depth (see Figure 17).

A desktop review was undertaken in 2022, which indicated that geological conditions across the site locality are variable, comprising colluvium and alluvium soils, underlain by sedimentary bedrock, at variable depths. The solid geology is expected to comprise of predominantly siltstone bedrock, of the Early Silurian Aged Cotton Formation. The below soils above the geology comprise units that are expected to occur at the site, formed through more recent transportation/deposition activities:

- Quaternary aged (Holocene epoch), unconsolidated Colluvium (associated with weathering and transportation/disposition of the regional parent geology)
- Tertiary aged (Pliocene epoch), unconsolidated Alluvium (sandy clayey SILT, containing minor white carbonate nodules associated with floodplain deposition as a back plain).

The geotechnical assessment carried out to support the MDC's engineering design identified a high-dispersion hazard for the site soils. The soil material is medium-to-high plasticity and the pH of soils range between 6.8 and 8.6 units.

Acid sulphate soils

A search of the Australian Soil Resource Information System and ASS risk map (CSIRO, 2016) indicated that the probability of occurrence of ASS is extremely low. No deep earthwork cuttings are proposed; on this basis, the potential for encountering acid sulfate rock during the construction of the MDC is low and has not been considered further.

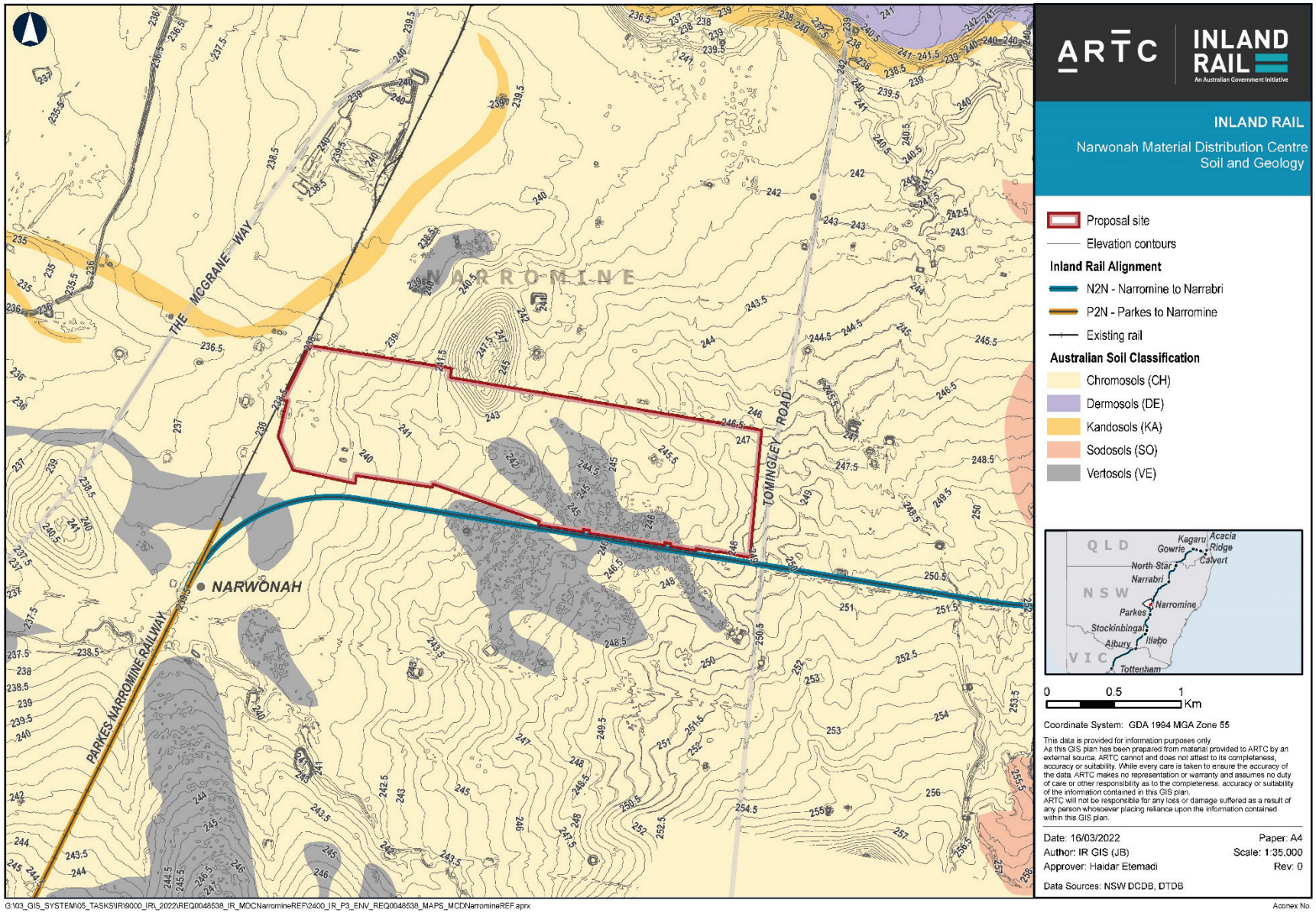

FIGURE 17: SOIL AND GEOLOGY

Contamination

The proposal site is not identified on the NSW EPA contaminated land records or listed in the following data bases:

- NSW EPA's contaminated land record (accessed 13 December 2021)
- NSW EPA's record of notices (accessed 13 December 2021)
- ARTC's contaminated site register (accessed 13 December 2021)
- DPE's Acid Sulphate Soils Risk mapping (accessed 13 December 2021)

The geotechnical assessment found on the proposal site that no areas of environmental concern have been identified and there has been no significant change to the livestock grazing land use from 1974 to 2022. Preliminary site investigation as part of this assessment found no evidence of soil contamination and assessed that there is a low potential risk from soil contamination to human health or environment on this site.

As part of the N2N EIS preliminary soil and contamination assessment, a total of three test pits and boreholes (TP2002, BH2001, BH-2-070) were identified near the proposal site. The analysis of soil samples found no visual or olfactory evidence of contamination in any of the test pits or boreholes.

Additionally, the proposal site does not contain the following:

- Sites that may be contaminated with PFAS based on the NSW Government PFAS Investigation Program (accessed 25 February 2022)
- Cattle dip structures are located based on site visits and a search of the NSW Department of Primary Industries cattle dip site locators (accessed 25 February 2022)
- Unexploded ordinance based on the Department of Defence's UXO Mapping Application (accessed 25 February 2022)
- Areas of naturally occurring asbestos based on NSW governments' *Naturally Occurring asbestos in NSW mapping* (accessed 25 February 2022)
- Current or previously held EPL.

Several existing land uses or areas within or near the proposal site have been identified as having a risk of contamination. These areas are listed in Table 30.

TABLE 30: PROPOSAL SITE AREAS WITH CONTAMINATION RISK

Land use and potential location	Potential contamination sources	Potential contaminations present
Degraded road surfaces potentially along the eastern side of the proposal site that is adjacent to Tomingley Road	Bitumen, asphalt or tar-based materials in degraded road surfaces that could impact adjacent surface soils and runoff. Contamination associated with degraded road surfaces is likely to be relatively isolated to surface soils and flow paths immediately underlying and surrounding existing roads.	Hydrocarbons (TRH, BTEX, PAH).
Agricultural activities throughout the proposal site	Contaminated soils and groundwater due to the use of agricultural chemicals, chemical storage (e.g. pesticides, fuels), disposal of farm wastes, livestock burial areas and livestock grazing; however, contamination is likely to be diffuse in nature (e.g. low-level pesticide use over large areas) or sporadic and localised.	Contaminants of concern could include heavy metals, hydrocarbons (TRH, BTEX), herbicides, pesticides and micro-biological organisms.
Existing railways and rail infrastructure traversing the western boundary of the proposal site	Contaminated surface soils and drainage paths adjacent to interchanges, intersections with existing roads and other stoppage points, due to leaks, brake pad use, etc. Contamination associated with existing railways and rail infrastructure is likely to be relatively isolated to the fill materials, ballast and surface soils immediately adjacent to existing infrastructure; however, the likelihood of encountering contamination at these locations is considered to be high.	Heavy metals, hydrocarbons (TRH, BTEX, PAH), herbicides, pesticides and asbestos.
Small farm dams throughout the proposal site	Contaminated sediments and water in dams due to use of agricultural chemicals and livestock grazing within the dam catchments. Contamination is likely to be isolated and it is unlikely that soils surrounding dams would be affected.	Heavy metals, hydrocarbons (TRH, BTEX), herbicides, pesticides and micro-biological organisms.

6.10.3 Potential impact

The potential soil and contamination impacts discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

Impact on soil

The proposed activities of thr MDC may result in increased risk from erosion and sedimentation due to vehicle movement over existing unsealed access roads and in the vicinity of the proposed activities. Suitable erosion and sediment controls are to be implemented, as per Table 31 and section 7.

Contamination impact

Construction

The proposal site is not located within known contaminated sites based on available information. Therefore, the construction works are unlikely to encounter any significant pre-existing contamination, including throughout site establishment activities where there will be ground disturbance; however, the risk on contamination migration exists throughout the construction phase.

Additionally, the geotechnical assessment found that proposal site is assessed to be suitable for its proposed future industrial use, subject to the implementation of the control measures outlined in the below subsection (see section 6.10.4).

Operation

Some of the proposed activities, such as fuel storage, refuelling activities, potential storage of excavated spoil, plant and machinery maintenance have the potential to cause contamination onsite as a result of spills or leaks, equipment breakdown and the rupture of hydraulic lines. The delivery and stockpiling processes do not involve further land-disturbing activities.

6.10.4 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Table 31 lists the mitigation and management measures that will be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise impacts to soils and from existing or potential contamination.

TABLE 31: CONTAMINATION AND SOIL CONTROL MEASURES

Control measures	Proposed MDC phase
A Contaminated Land and Hazardous Materials Management Plan would be prepared and implemented as part of the CEMP.	Design and Pre-Construction
An unexpected finds protocol should be included as part of the CEMP or as a stand-alone document if potentially contaminated fill material or buried unexpected finds are encountered during construction earthworks.	Design and Pre-Construction
Personnel involved in ground-disturbing works must be familiar with the unexpected finds protocol/procedure and be trained in the identification of potential contaminated soil/material and relevant controls.	Design and Pre-Construction
The reuse or retention of contaminated or potentially contaminated material onsite (i.e. soil, ballast and timbers) will be subject to a risk assessment and/or occur as per the relevant components of the CEMP.	Design and Pre-Construction
Hazardous materials surveys would be undertaken during detailed design for all proposed demolition activities.	Design and Pre-Construction
A hazardous substances and dangerous goods risk management strategy will be developed to manage the potential for risks.	Design and Pre-Construction
The proposed activities will adhere to the *Safe Work Australia Model Code of Practice—How to Manage and Control Asbestos in the Workplace 2016* (Safe Work Australia, 2020) and *Safe Work Australia Model Code of Practice – How to Safely Remove Asbestos 2018* (Safe Work Australia, 2018).	Design and Pre-Construction
If ASS are encountered, they would be managed in accordance with the *Acid Sulfate Soils Assessment Guidelines* (ASSMAC, 1998), and the *Waste Classification Guidelines - Part 4: Acid Sulfate Soils* (NSW EPA, 2014).	Design and Pre-Construction

Control measures	Proposed MDC phase
During construction works, surplus soil waste requiring offsite disposal must be assessed and classified prior to being transported to an appropriately licenced landfill, in accordance with the NSW EPA *Waste Classification Guidelines 2014*.	Construction
Topsoil would be stripped progressively in areas designated for construction and stockpiled separately onsite for use in rehabilitation/stabilisation works.	Construction
Drilling and excavation activities during construction will make use of drilling fluids and chemicals that are environmentally neutral and biodegradable, where practical.	Construction
Vehicle and plant maintenance activities will be undertaken in suitable areas, with hardstand to minimise risk of contaminants from incidental spills or leaks from entering aquifers via infiltration or surface runoff.	Construction and Operation
The freight transportation of dangerous goods of the proposed MDC will be in accordance with the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (National Transport Commission, 2020). Freight carts will be required to display appropriate Hazchem signage, including placards, and carry appropriate spill-containment equipment to be used by emergency services personnel in the event of an emergency.	Construction and Operation
A contamination assessment report (with sampling and analysis conducted) should be undertaken post the MDC and demobilisation to demonstrate the proposal site was not contaminated as a result of the MDC and the land is suitable for use or development.	Post decommissioning

6.11 Waste

6.11.1 Assessment methodology

The assessment of waste management and minimisation from the proposed MDC involved:

- identifying potential waste-generating activities and types of wastes from the proposed MDC
- classifying potential waste types identified and estimating quantities of each
- identifying risks associated with waste arising from the proposed MDC
- recommending management and waste-handling procedures to minimise impacts during construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.11.2 Potential impacts

The potential impacts from waste discussed in this subsection account for the impacts likely to be caused throughout construction, operation and (where appropriate) decommissioning of the proposed MDC.

Construction

The key waste-generating activity would be earthworks associated with construction of the MDC, which will generate spoil and would require appropriate measures to gauge potential impacts associated with handling and reuse/disposal. Other activities likely to generate waste during construction include:

- vegetation clearing and grubbing
- topsoil stripping
- fencing (temporary and or permanent)
- construction of roads, drainage structures, culverts, bridges and other ancillary infrastructure
- construction of rail infrastructure—rail formation, welding, ballasting and tamping
- general construction work
- washdown facilities

Key waste streams predicted to be generated during construction are outlined in Table 32, with the likely classifications based on Part 1 (Classifying waste) of the Waste Classification Guidelines. Waste volumes and classifications would be confirmed during detailed design and construction planning, and incorporated into the construction waste management plan.

TABLE 32: POTENTIAL WASTE GENERATION DURING CONSTRUCTION

Activity	Potential waste stream	Likely classification of waste streams
Clearing and grubbing of vegetation	Green waste including timber and leaves/grasses	General solid waste (non-putrescible)
Topsoil stripping	Topsoil	General solid waste (non-putrescible)
Cut and fill earthworks	Spoil—comprising virgin excavated natural material or excavated natural material and contaminated soils	General solid waste (non-putrescible)
Roads, drainage structures and culvert/bridge construction	Concrete, asphalt, aggregate, timber formwork, scrap metals, cable and packaging materials	General solid waste (non-putrescible)
Rail formation	Sleepers rail	General solid waste (non-putrescible)
Welding	Waste metal	General solid waste (non-putrescible)
Ballasting and tamping	Waster ballast	General solid waste (non-putrescible)
Fencing	Waste metal/timber posts	General solid waste (non-putrescible)
General construction wastes	Packaging waste, such as pallets, plastic film wrap, cable reels and metal straps/bands Oily rags and filters from use of plant and equipment	General solid waste (non-putrescible)
Construction workers	Typical domestic waste, including food waste, paper, cardboard and container	General solid waste (putrescible and non-putrescible)
Site amenities and washdown facilities	Wastewater, greywater, hydrocarbon and water mixtures or emulsions	Liquid waste

Operation

The main waste-generating activity during the operation of the MDC would be associated with maintaining the infrastructure onsite, including rail and road infrastructure. Small quantities of green waste may be generated because of vegetation control. Waste may also be generated by onsite staff, site amenities and washdown facilities, and maintenance of plants and vehicles (see Table 32 for potential waste streams of these activities and their likely classification). Other general debris and litter would also be collected.

Decommissioning

Waste-generating activities throughout decommissioning activities would generate waste such as general waste, concrete, bricks, wood, glass, metallic waste, cement, general construction waste and liquid waste.

6.11.3 Mitigation and management measures

Generally, all waste generated during construction and operation would be managed using the waste hierarchy approach of avoidance and reuse before consideration is given to disposal. If reuse or recycling are not viable options, waste would be disposed of at an appropriately licensed landfill in accordance with NSW Waste Classification Guidelines.

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Table 33 lists the measures that would be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise impacts of waste.

TABLE 33: WASTE MANAGEMENT CONTROL MEASURES

Control measures	Proposed MDC phase
A waste management plan would be prepared for the proposed MDC, including: ▸ waste targets for the MDC ▸ estimated waste generation (volumes and types of waste arisings) ▸ waste mitigation and management measures for the waste types and quantities, and contingencies for any unexpected waste volumes ▸ general protocols and performance objectives for keeping the worksite clean and tidy ▸ processes for monitoring, documenting and reporting waste types, volumes and how these arisings compare to waste targets (e.g. describe waste streams and estimated volumes, temporary waste storage areas and disposal locations on and offsite (including stockpiles and landfilling), as well as waste disposal NEPM criteria for disposal sites ▸ requirements for waste segregation (e.g. inert—including virgin excavated material, vegetation, building and demolition waste, concrete and asphalt; solid—such as food waste and litter, industrial/regulated—such as asbestos; hazardous—such as flammable liquids; liquid—such as sewage ▸ requirements for secure temporary storage, collection frequency and disposal/recycling requirements ▸ effluent management for construction staff amenities ▸ procedures and reporting/documentation requirements for ensuring waste transporters and receivers are appropriately licensed according to the type of waste ▸ requirements for training, inspections, audits, corrective actions, notification and classification of environmental incidents, record keeping, monitoring and performance objectives for handover on completion of construction ▸ any other requirements necessary to comply with conditions of approval, subsequent approvals or regulatory requirements.	Design/Pre-construction
During detailed design, a waste reduction review would be undertaken to identify opportunities to meaningfully achieve the waste reduction through design, construction and operation, including the consideration of the following: ▸ decommissioning of redundant track ▸ opportunities for designing out waste ▸ alternative approaches to materials used during construction, operation and maintenance to ensure resource efficiencies, in accordance with relevant design standards.	Design/Pre-construction
Detailed design would include measures to minimise excess spoil generation. This would include a focus on optimising the design to minimise spoil volumes, and the reuse of material onsite.	Design/Pre-construction
Consideration of alternative approaches to materials used, construction and operational techniques, and maintenance of a process to achieve a less resource-intensive and more efficient process, in accordance with relevant design standards.	Design/Pre-construction
All waste generated would be classified in accordance with the Waste Classification Guidelines and disposed of in accordance with the relevant requirements of the Protection of the Environment Operations (Waste) Regulation 2014.	Construction / Decommissioning
Arrangements would be made with landfill operators prior to the delivery of waste and recyclables to any rural facility to ensure that the waste types and quantities can be accepted.	Construction / Decommissioning
Any hazardous or dangerous waste (e.g. asbestos, chemicals, oils) would be correctly stored and managed onsite and, if necessary, disposed of by a licensed contractor or facility and in accordance with the relevant state occupational health and safety legislative and regulatory obligations. This includes wastes generated because of demolition.	Construction / Operation / Decommissioning
Waste management plans/procedures would be included in the Operators EMP.	Operation

6.12 Hazard and risk

6.12.1 Assessment methodology

The hazard and risk assessment involved:

- reviewing bushfire-prone maps within the proposed location
- reviewing the construction and operation activities, and identifying associated hazard and risks
- undertaking a qualitative assessment of the potential impacts to the public and staff during construction and operation
- recommending management and mitigation measures to minimise the potential for hazards and risks during the construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.12.2 Potential impact

Hazards and risks associated with the construction, operation and (where appropriate) decommissioning of the MDC are briefly discussed in this subsection.

The proposed MDC would contribute to additional movements of vehicles and plants per day during both the site preparation and operation phases, which may result in potential impacts to air quality, noise and vibration. Increased movements of vehicles to and from the proposal sites may also contribute to increased risk on road safety for road users and pedestrians during constriction; however, the proposal site is located within a rural setting with very limited surrounding development and there are no major impacts to roads or community facilities.

According to NSW Rural Fire Service's Bush Fire Prone Land mapping tool (accessed 25 January 2022), bushfire-prone areas are sparsely mapped within the proposal site; particularly, within areas of dense vegetation that are located along the eastern boundary of the proposal site. The construction and operation of the MDC have the potential to cause ignition through littering (cigarettes, glass bottles, etc.), generation of sparks thought hot works (welding or excavator bucket contacting rock or the rail track), mechanical failure of infrastructure components, fuel leaks and spills.

6.12.3 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Potential risks to onsite workers are regulated by workplace health and safety legislation (including the *Work Health and Safety Act 2011* (Cth)). The construction contractor would be responsible for managing the site in accordance with regulatory requirements.

Table 34 lists the measures that would be implemented during the construction, operation and (where appropriate) decommissioning of the proposed MDC to minimise hazards and risks.

TABLE 34: HAZARD AND RISK CONTROL MEASURES

Control measures	Proposed MDC phase
Local emergency services would be engaged with to discuss and coordinate emergency response procedures, including (but not limited to) temperature, high wind and container topple.	Design and Pre-Construction
A workforce safety plan that references the ARTC Safety Management System would be prepared and would outline any specific actions to ensure the safety of workers across the proposal site.	Construction
Maintenance program/operational policy would be developed to monitor bushfire risk.	Operation

6.13 Cumulative impacts

6.13.1 Assessment methodology

The cumulative impacts assessment determines the potential environmental effects of the proposed MDC with the consideration of other existing or likely future activities.

This assessment accounts for the spatial area of influence of the MDC determined by the proposal site and/or environmental values identified in impact assessments (see section 6).

The assessment of cumulative impacts for the proposed MDC has been based on identifying and considering the following:

- publicly listed major projects timed to occur during the construction, operation or decommissioning of the proposed MDC, including the project type, location, duration and intensity of impacts.
- significance of potential cumulative impacts
- management and mitigation measures to minimise the potential cumulative impacts during the construction, operation and (where appropriate) decommissioning of the proposed MDC.

6.13.2 Major projects nearing the proposal site

Projects with the potential for cumulative impacts with the proposed MDC are listed in Table 35 below.

The project that is most likely to contribute to cumulative impacts is the N2N Project, which is proposed by ARTC and expected to commence construction in 2023 to 2027, before being fully operational.

TABLE 35: PROJECT WITH THE POTENTIAL FOR CUMULATIVE IMPACTS

Project	Details	Status	Construction / Operation period	Likelihood of having cumulative impacts
Inland Rail—Narromine to Narrabri	ARTC seeks to construct and operate the N2N section of Inland Rail. The project consists of about 306 km of new single-track standard-gauge railway with crossing loops. The project also includes changes to some roads, to facilitate construction and operation of the new section of railway, and ancillary infrastructure to support the project. N2N would be located between the towns of Narromine and Narrabri in NSW. The proposal is located directly adjacent to the north of the proposed N2N track (see Figure 3). The construction of the N2N rail track is expected to progress during the operation period of the proposal. A turnout located to the south of the proposal site (see Figure 4) is planned for installation as the N2N track progresses construction. Early operation of the MDC will generally consist of the receipt, handling, rail welding and stockpiling of rail track materials (sleepers, rail, ballast). There may potentially be some deliveries of materials to the southern Inland Rail projects either by rail or road. Once the N2N track construction commences, early operation activities will continue; however, there will also be the load out of materials via the progressively constructed Inland Rail N2N main line heading north.	Response to submissions Prepare Amendment Report	Expected in early 2023 and to take about four years	Highly likely
Tomingley Gold Extension Project	Tomingley Gold Operations Pty Ltd propose to extend the existing Tomingley Gold Operations (TGO) gold mine, located immediately to the south of the Tomingley village in central western NSW, to incorporate mining of the San Antonio and Roswell deposits. The proposal is approximately 30 km north of the TGO extension project. An approved water pipeline, required for the TGO operations, travels from a licensed bore located approximately 7 km to the east of Narromine, along Pinedean Road and Tomingley Road, located at the south eastern corner of the proposal site.	Post public exhibition (Response to submissions)	Expected to be operation up to 2032	Unlikely
Inland Rail—Parkes to Narromine	The P2N section in NSW was commissioned in late September 2020 and is now operational. The project involved the upgrade of 98.4 km of existing rail track, including a full rebuild of the rail tracks, rail formation and supporting structures along the rail corridor. The 5.3-km stretch of new rail track near Parkes, known as the North West Connection, is also complete and has been transferred to ARTC Operations, with trains now using the line. The P2N project ends where the N2N Project begins. This point is located south west of the proposal site (see Figure 3).	Operational	-	Unlikely

6.13.3 Potential impacts

Construction

Cumulative impacts are unlikely during the construction phase of the MDC. The N2N Project is expected to commence construction once the MDC is operational.

Operation

Cumulative impacts may occur because of operational activities occurring simultaneously with the construction phase of the N2N Project. The N2N Project traverses along the southern boundary of the proposal site and is expected to commence construction in 2023. As the proposed MDC and the N2N Project will, in time, be concurrently active, potential cumulative impacts are expected; particularly, for the surrounding sensitive receivers that would be impacted by both the MDC and the N2N Project, as well as flooding implications and vegetation clearing impacts. Table 36 details the expected cumulative impacts during the operation of the proposed MDC and the construction phase of the N2N Project.

TABLE 36: POTENTIAL CUMULATIVE IMPACTS DURING THE CONSTRUCTION OF THE N2N PROJECT

Aspect	Potential cumulative impacts
Noise and vibration	Cumulative noise impacts would occur during the construction phase of the N2N rail track and MDC operations, which may affect the surrounding sensitive receivers. For receivers in proximity to the future N2N rail track, noise levels are predicted to be dominated by the N2N track construction. For the receivers that are more than approximately 300 m away from the future N2N track and the proposed MDC, the cumulative noise levels may increase by up to 2–3 dB, which is generally regarded as not significant. As such, no major cumulative noise impacts are predicted.
Biodiversity	The proposal would result in the clearing of up to 146.30 ha of native vegetation across the proposal site. The removal of 15.85 ha of woodland would remove potential habitat for a variety of threatened species, such as small woodland birds and microbats, as well as the Koala. As the proposal is located adjacent to the proposed N2N rail corridor and construction compound, it would contribute to additional clearing of native vegetation and threatened species habitat; however, it is unlikely to result in a cumulative impact that is significant.
Surface water	Offsite flood impacts that result from the MDC may change when assessed cumulatively with the N2N Project. This is expected to be largely due to flood regime changes resulting from the N2N Project works. The section of the proposed N2N rail alignment immediately south of the proposal site is currently designed to a 1% AEP formation flood immunity and includes new cross-drainage infrastructure (i.e. culverts). While the N2N Project aims to avoid adverse flood impacts/changes to the existing flow regime offsite, the N2N Project is expected to result in some changes to flow distribution across the various overland flow paths within the proposal site.
Air quality	Overlapping impacts of dust and exhaust emissions from the N2N Project construction activities and the operation of the MDC are likely to occur at some point. This would increase the risk of air quality impacts to nearby sensitive receivers. Given the low number of sensitive receivers near the proposal site, the risk of cumulative impacts during this period is considered to be low.
Traffic and access	The N2N Project would generate additional traffic during its construction phase; however, this will be throughout a temporary period during where the track segment located to the south of the proposal site would be under construction. The minimal road traffic expected for the proposed MDC and the temporary spike of additional traffic from the N2N Project during its construction phase of the rail track to the south of the proposal site would be temporary and, therefore, considered to impose minimal impacts.
Socio-economic	Cumulative socio-economic impacts would temporarily affect community amenity (noise, air quality and visual), particularly for the sensitive receivers in proximity of the proposal site. Impacts on these environmental factors, as assessed in this REF, may increase in intensity through the N2N track construction phase and cause further disturbance to the surrounding community.
Cultural heritage	Cultural heritage impacts for the proposed MDC are low, therefore it is anticipated that the cumulative impacts would also be low; however, the likelihood of potential impacts to cultural heritage would increase with ground disturbance to be undertaken to the south of the proposal site, which is expected to occur during the construction phase of the N2N Project.

6.13.4 Mitigation and management measures

Mitigation and management measures are based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

Given the short and temporary duration of most of the cumulative impacts, mitigation and management measures summarised in section 7 are considered sufficient to manage the impacts.

7. Summary of environmental management measures

Table 37 lists the control measures that have either been identified through the assessment undertaken in this REF or are standard best-practice environmental management controls.

These measures may be subject to refinement, as this REF report is based on the current design of the proposed MDC. Refinements based on the final design of the MDC, such as the final construction and operation locations within the proposal site, may be necessary.

TABLE 37: SUMMARY OF CONTROL MEASURES

Aspect	Control measures	Proposed MDC phase
Biodiversity	A flora and fauna management sub-plan will be prepared prior to construction, and implemented as part of the construction environmental management plan (CEMP). The plan will be prepared in accordance with the relevant guidelines, legislation and standards, and will include but not be limited to: ▸ establishing protocols for the staged clearing of vegetation and safe tree felling and log removal to reduce the risk of fauna mortality ▸ an unexpected finds protocol. ▸ processes for notification of a wildlife rescue organisation (e.g. WIRES) in case any injured fauna are found. All animals encountered will be treated humanely, ethically, and in accordance with relevant codes under the Prevention of Cruelty to Animals Act 1979 (NSW).	Design and Pre-construction
Biodiversity	Measures to suppress dust, prevent erosion and sedimentation will be implemented during clearing and site work.	Construction / Operation
Biodiversity	Temporary and permanent stockpiles are to be located within cleared areas (and not within areas of adjoining native vegetation) or within the dripline of trees.	Construction / Operation
Biodiversity	All workers will be provided with an environmental induction prior to starting work onsite. This will include information on the ecological values of the site, protection measures to be implemented to protect biodiversity, and penalties for breaches.	Pre-clearing
Biodiversity	A suitably qualified ecologist is to be present during clearing activities for habitat identified during pre-clearing surveys, in order to identify areas to be avoided, and manage the rescue or relocation of fauna as necessary. If a Koala is observed in the area during vegetation clearing, works are to cease and not recommence until the Koala has moved on of its own accord or with the assistance of an ecologist.	Pre-clearing
Biodiversity	A weed and pest species management protocol will be prepared as part of the CEMP to manage weeds and pathogens during site activities. It will include, but not be limited to, the following: ▸ process to identify, control and remove all priority weeds in accordance with the requirements of the Biosecurity Act 2015 ▸ process to minimise the introduction and spread of weeds, such as exclusion areas for native vegetation, driving instructions, etc. ▸ communication of responsibilities of all site personnel regarding the management of weeds and pathogens, through site inductions and toolbox talk meetings ▸ measures to ensure all trucks transporting weed waste from the site are covered to avoid the spread of weed-contaminated material. Disposal must be documented and evidence of appropriate disposal must be kept.	Pre-clearing
Biodiversity	So far as is practicable, suitable bush rock habitat, hollow-bearing logs or limbs, and woody debris will be relocated to nearby adjacent areas outside of the proposal site footprint by the supervising ecologist or contractor.	Pre and during clearing

Aspect	Control measures	Proposed MDC phase
Biodiversity	Disturbance of vegetation will be limited to the minimum necessary to undertake the proposal. Clearing boundaries and any features to be retained, e.g. hollow bearing trees, need to be clearly marked on-ground before clearing commences.	During clearing
Biodiversity	All machinery entering the site must be appropriately washed down and disinfected, as far as practicable, prior to mobilisation onsite to prevent the potential spread of weeds, Cinnamon Fungus (Phytophthora cinnamomi) and Myrtle Rust (Pucciniales fungi), in accordance with the national best practice guidelines for Phytophthora (O'Gara et al., 2005) and the *Myrtle Rust factsheet* (DPI, 2015b) for hygiene control. Weed inspections of vehicles should also be undertaken and documented as part of the CEMP.	Prior to any plant or machinery being brought onsite, where practicable
Biodiversity	Protocols to prevent introduction or spread of chytrid fungus will be implemented following hygiene guidelines for wildlife, protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants (DPIE, 2020b).	Pre-clearing, during construction and operation
Biodiversity	Sediment controls are to be established around the proposal site perimeter as a minimum, in accordance with the Blue Book and the contractor's environmental management plan. Measures will be implemented to minimise the risk of movement of materials in the event of a significant rainfall, such as covering stockpiles with impervious covers (tarps) or temporary trenching upslope of stockpiles to divert surface runoff around stockpiles. In the event of forecast heavy rainfall, additional measures will be implemented, or works will be postponed, to prevent the potential for sediment laden run-off into adjacent properties or waterways.	Pre-clearing, during construction and operation
Noise and Vibration	Develop and implement a Construction Noise and Vibration Management Plan (CNVMP).	Design and Pre-construction Construction/ Operation
Noise and Vibration	The construction noise impact assessment in this report should be refined following any changes in design refinement, to reflect the final locations of construction activities and scheduling to inform the development of the CVNMP.	Design and Pre-construction
Noise and Vibration	Building condition surveys will be undertaken for sensitive receivers within 200 m of the proposed MDC to ensure there is sufficient information to respond to any potential complaints. Surveys are to take place prior to commencement and on completion of vibration-generating works.	Design and Pre-construction
Noise and Vibration	Review construction staging method to identify opportunities to schedule noisy works during the day or, where relevant, evening time period.	Design and Pre-construction
Noise and Vibration	Review construction staging method to identify opportunities where simultaneous operation of noisy equipment can be separated out to operate individually.	Design and Pre-construction
Noise and Vibration	Selection of quieter construction equipment should be investigated where feasible and practicable. This is especially important for any out-of-hours works where predicted noise levels indicate high levels of noise impacts to nearby sensitive receivers.	Design and Pre-construction
Noise and Vibration	Staff training is to be undertaken so that unnecessary sources of noise and vibration are avoided. Training must include the understanding and adoption of the CNVMP and best-practice behaviours onsite to minimise noise and vibration. The behaviours and implementation of CNVMP should be enforced through regular checks and reminders.	Construction/ Operation
Noise and Vibration	Where feasible and practicable, plant and equipment used intermittently, or no longer in use, will be throttled or shut down.	Construction/ Operation
Noise and Vibration	Equipment will be operated and maintained in a manner as detailed by the manufacturer. This includes the replacement of engine covers, repair of defective silencing equipment, tightening of rattling components and repair of leakages in compressed air lines.	Construction/ Operation

Aspect	Control measures	Proposed MDC phase
Noise and Vibration	All mechanical plant near sensitive receivers should be modified to reduce noise, where feasible and practicable, such as: ▸ internal combustion engines are fitted with a suitable muffler in good repair, operating as per the manufacturer's specifications ▸ pneumatic tools are fitted with an effective silencer on their air exhaust port ▸ aggregate bins, loaders and chutes are lined with a rubber material to dampen the vibration of the structure suitable rubber pads on wagons, loaders and ground are installed prior to unloading of rails, ballast and sleepers to minimise short-term noise impacts.	Construction/ Operation
Noise and Vibration	Localised acoustic shielding in the form of acoustic semi-enclosures and blankets will be installed to shield noisy construction equipment from the nearest residences, where practicable: ▸ acoustic enclosures should be installed as close to the works area as possible ▸ acoustic blankets should be arranged to overlap such that no air gaps are present between blankets. Acoustic shielding is particularly effective for stationary plant that is scheduled to work for lengthy periods. Guidance for acoustic enclosures should be taken from AS 2436-2010 -Guide to noise and vibration control on construction, demolition, and maintenance sites.	Construction/ Operation
Noise and Vibration	Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on the site and for any out-of-hours works, where practicable.	Construction/ Operation
Noise and Vibration	Site access points and roads should be sited as far as practicable from sensitive receivers.	Construction/ Operation
Noise and Vibration	Delivery vehicles shall be fitted with straps rather than chains where feasible.	Construction/ Operation
Noise and Vibration	Sites are to be designed so that reversing of delivery vehicles is minimised so that they can drive through the site were possible.	Construction/ Operation
Noise and Vibration	Where feasible and practicable: ▸ unsealed haul roads should be regularly graded. Sealed access roads and hardstand areas should have potholes filled in a timely fashion ▸ night-time construction traffic should be limited. If unavoidable, they should be redirected away from noise-sensitive receivers, in accordance with the Construction Traffic Management Plan ▸ appropriate construction traffic speed limits should be established and enforced near noise-sensitive receivers.	Construction/ Operation
Noise and Vibration	Regular communications on the activities and progress of the proposal should be provided to the community (e.g. via newsletter, email and/or website).	Construction/Operation
Noise and Vibration	The operational works staging method will be reviewed to identify opportunities to schedule noisy works during the day or, where relevant, evening.	Operation
Noise and Vibration	The provision of at-property treatment could be considered for any noise impacts, given the 24-hour operational duration of the MDC. This may include: ▸ investigating potential for local at-property solid fencing ▸ offering alternative ventilation where the windows are to remain closed ▸ upgrading the acoustic performance of specific elements of the building envelope (e.g. windows and doors). Note that these at-property treatments would require prior detailed investigations and assessments of the existing conditions to assess the most effective acoustic treatment. If these treatments are considered effective, works would be executed only if specific agreements between the property owners and the proponent are reached.	Operation

Aspect	Control measures	Proposed MDC phase
Indigenous and non-indigenous heritage	The MDC design should be formulated to avoid impacts to Site MDC-AS01, in which case, the location of MDC-AS01: ▸ is protected with a 10-m fenced no-go zone through the period of ground-disturbing construction works ▸ is marked on site mapping ▸ restrictions regarding it must be discussed at site inductions and toolbox meetings for works in the site vicinity. If impacts to Site MDC-AS01 cannot be avoided: ▸ surface salvage of artefacts in Site MDC-AS01 must be carried out ▸ salvage of artefacts in Site MDC-AS01 must be carried out in consultation with RAPs ▸ artefacts collected from Site MDC-AS01 must be subject to repatriation in accordance with consultation with RAPs ▸ an AHIP will be required to permit any impacts, including surface collection salvage, to Site MDC-AS01 ▸ an ACHAR will be required in support of the AHIP application.	Design/ Pre-Construction
Indigenous and non-indigenous heritage	Mature trees in Lot 1 DP 1198931 are to be inspected for evidence of cultural modification.	Design/ Pre-Construction
Indigenous and non-indigenous heritage	A program of archaeological sub-surface testing must be completed for areas where gilgais are evident in the proposal site, in accordance with the *Code of Practice for archaeological investigation of Aboriginal objects in NSW*.	Design/ Pre-Construction
Indigenous and non-indigenous heritage	The following steps should be carried out to manage potential minor indirect (visual) impacts to Craigie Lea homestead: ▸ The homestead should be inspected by a heritage specialist to determine whether the homestead retains heritage significance, or whether it has been substantially altered. ▸ If the homestead is confirmed to be of local heritage significance, or a significance assessment is not completed, design of the MDC should minimise visual impacts through reduction of height adjacent to the item, or consideration of additional screening.	Design/ Pre-Construction
Indigenous and non-indigenous heritage	An Unexpected Heritage Finds procedure must be prepared and implemented for any ground-disturbance works.	Pre-Construction
Indigenous and non-indigenous heritage	Staff engaged in onsite works should receive a heritage induction that will make them aware of the nature of potential heritage finds and their obligations under the *National Parks & Wildlife Act 1974* and the *Heritage Act 1977*.	Pre-Construction
Surface water	Flood assessment will be undertaken based on design calculations using existing hydraulic modelling for the MDC and surrounding area, to confirm requirements for design provisions and mitigation measures under the following scenarios: ▸ proposed MDC without N2N rail infrastructure in place ▸ proposed MDC with N2N rail infrastructure in place (i.e., cumulative impact assessment) if deemed required.	Design and Pre-construction
Surface water	A risk assessment will be undertaken to identify opportunities for relaxation of flood immunity/protection requirements of various site elements on a case-by-case basis (in consideration of the impacts to adjacent landholdings and receptors, and extents of infrastructure required in achieving such requirements) and in consultation with relevant parties.	Design and Pre-construction
Surface water	Site elements will be strategically placed to minimise impacts to overland flow conveyance and storage, in so far as is possible.	Design and Pre-construction
Surface water	Appropriate cross- and open-drain features will be provided to maintain designated flow regime, and avoid flow redirection and/or flood impacts on external properties. If required, adequate design allowance should be included to accommodate changes in flow distribution resulting from the N2N Project. This would also include appropriate scour protection measures.	Design and Pre-construction
Surface water	Appropriate flood protection will be provided to protect hazardous material storage facilities.	Design and Pre-construction

Aspect	Control measures	Proposed MDC phase
Surface water	Erosion and sediment control plans and SWMP will be developed and be signed off by a Suitably Qualified Person (e.g. CPESC) in accordance with regulatory requirements.	Construction
Surface water	Requirements for construction water (volumes, quality, demand curves, approvals requirements and lead times) would be defined during detailed design.	Construction
Surface water	Any discharge of construction water (e.g. from sediment basins and excavation dewatering etc.) to the drainage systems or receiving waters would comply with the trigger values so that the proposed MDC does not have an adverse impact on water quality.	Construction
Surface water	Inspection and maintenance of any erosion and sediment controls would be carried out throughout the works to ensure they are operating effectively.	Construction and Operation
Surface water	The proposed MDC would be managed in accordance with the water quality management requirements specified in state policy, procedures and guidelines.	Operation
Air quality	Where sensitive receivers are located within 200 m of proposed activities, or visible dust is generated from work areas or unsealed access roads, watering would be implemented where practicable.	Construction and operation
Air quality	Dust will be visually monitored every day and, when excessive, controls such as watering, changed work practices or use of polymers will be used where practicable.	Construction and operation
Air quality	Vehicle and machinery movements would be restricted to existing access roads where possible.	Construction and operation
Air quality	Contractor plant and machinery, including generators, will be regularly checked and maintained in a proper and efficient condition.	Construction and operation
Air quality	Plant and machinery would be switched off when not in use, and not left idling.	Construction and operation

Aspect	Control measures	Proposed MDC phase

Traffic and access	A Traffic Impacts Assessment (TIA) will be undertaken during detailed design, which should address the following issues and all relevant matters in accordance with the *Austroads Guide to Traffic Management Part 12* (Austroads, 2020b) and *Guide to Traffic Generating Developments 2002* (Roads and Traffic Authority (RTA), 2002):
	▸ traffic generation assessment with reference to RTA Guide to Traffic Generating Developments in order to determine traffic generation associated with the MDC
	▸ reference *Guide to Traffic Management Part 6* (Austroads, 2020c) warrants for turning treatments. Swept path diagrams are to be provided to demonstrate the following:
	  ▸ the proposed direction or directions of access and egress to and from the proposal site
	  ▸ all vehicles can enter and exit the proposal site in a forward direction
	  ▸ the design vehicle can access the proposal site and will not result in adverse impacts to The McGrane Way or Tomingley Road
	  ▸ the width of the driveways are adequate to accommodate the swept path of the largest vehicle required to access the proposal site
	▸ the software, AutoTurn Pro 10.2 is to be used to depict the vehicle swept paths. The parameters used to generate the swept path diagrams are to be noted on the plans
	▸ an assessment of the type of intersection design required for access and egress points to and from classified roads, either directly or preferably via local roads. Safe Intersection Sight Distance (SISD) in accordance with the *Austroads Guide to Road Design* is to be provided at these access/egress points
	▸ confirmation that the proposed design vehicle is legally able to access Craigie Lea Lane and Narwonah Siding Road
	▸ any proposed signage may be subject to State Environmental Planning Policy (Industry and Employment) 2021 and the Transport Corridor Outdoor Advertising and Signage Guidelines. Referral to TfNSW may be required subject to clause 3.15 and 3.16 of the SEPP.
		Design and Pre-construction

Traffic and access	The McGrane Way/Craigie Lea Lane and Tomingley Road/Craigie Lean Lane intersection treatment will be determined based on final detailed design.	Design and Pre-construction
Traffic and access	Detailed design would consider the pavement impact assessment by carrying out a SIDRA Analysis of intersections subject to potential impacts.	Design and Pre-construction
Traffic and access	A dilapidation survey should be undertaken of the made public roads within the proposed haulage routes, prior to and following completion of construction, and provided to the relevant road authority.	Design and Pre-construction
Traffic and access	Detailed design would aim to minimise the potential for impacts to the surrounding road and transport network, and property access.	Design and Pre-construction
Traffic and access	A Traffic Management Plan (TMP) will be prepared for the proposal as part of the CEMP, in consultation with council.	Design and Pre-construction
Traffic and access	Temporary diversions and closures of existing rail and road traffic would be undertaken in consultation with relevant stakeholders, and alternative arrangements would be provided as required.	Construction and Operation
Land use and property	Access to the construction area for stock, as well as non-construction related vehicles and people would be restricted via fencing and other measures.	Design and Pre-Construction
Land use and property	Fencing will be provided in accordance with the Inland Rail fencing standards applicable to the adjacent land use and be constructed prior to the removal of existing fencing or any works being carried out on the subject land, unless otherwise agreed with the landowner.	Design and Pre-Construction

Aspect	Control measures	Proposed MDC phase
Land use and property	If required, land for the construction of the works would be acquired in accordance with the requirements of the relevant state land acquisition legislation, including the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW).	Design and Pre-Construction
Land use and property	Property owners, tenants and occupants would be consulted to ensure they are informed about the timing and scope of activities in their area and any potential property impacts/changes, particularly in relation to potential impacts to access, services, or farm operational arrangements.	Design and Pre-Construction
Socio-economics	ARTC would continue to manage and deliver Program-wide community and stakeholder engagement for Inland Rail in accordance with the Inland Rail Communications and Engagement Strategy.	Design/Pre-construction
Socio-economics	The CEMP would define the requirements for the complaints management system to be implemented during construction.	Design/Pre-construction
Socio-economics	The project will include measures to ensure ongoing consultation with local emergency services providers to inform them about the locations of level crossings, and changes to access routes and road conditions.	Design/Pre-construction
Socio-economics	To manage the implementation of the proposed socio-economic mitigation measures, contractual mechanisms will be put in place and specific management action and targets will be developed in response to these measures.	Design/Pre-construction
Socio-economics	ARTC would continue to support local employment in accordance with the *Australian Jobs Act 2013* (Cth) and Australian Industry Participation National Framework, and through the Inland Rail Academy, to leverage training programs, upskill residents and young people, and connect businesses with Inland Rail opportunities and key regional industries.	Design/Pre-construction
Socio-economics	Key stakeholders (including local councils, emergency service providers, public transport providers, the general community, and surrounding landowners/occupants) would continue to be consulted in accordance with the Engagement Implementation Plan.	Design and Pre-Construction/Construction
Socio-economics	A temporary workforce accommodation plan would be prepared to guide the design and provision of temporary accommodation. The plan would be developed in accordance with ARTC's Inland Rail Program Accommodation Principles, relevant council development codes and guidelines.	Design/Pre-construction
Socio-economics	Residents, landholders, landowners, businesses, affected social and recreation facilities and other relevant stakeholders would be notified before work starts, in accordance with the communication management plan, and be regularly informed of construction activities.	Construction/operation
Socio-economics	Complaints during construction would be managed in accordance with the complaints management system defined by the communication management plan.	Construction/operation
Landscape character and visual amenity	A Landscape and Rehabilitation Strategy should be developed during the detailed design stage in line with the ARTC Landscape Strategy, Landscape Framework and the Landscape Specification.	Design/Pre-construction
Landscape character and visual amenity	Vegetation will be retained, where feasible, and supplemented with further planting to strengthen the existing screening value. This would be considered along Craigie Lea Lane, Narwonah Siding Road and to the east of Parkes Narromine Railway.	Design/Pre-construction
Landscape character and visual amenity	The detailed MDC layout would be refined so that, while not in use, construction machinery is stored in suitable locations to minimise views and disturbance.	Design/Pre-construction
Contamination and soil	A Contaminated Land and Hazardous Materials Management Plan would be prepared and implemented as part of the CEMP.	Design and Pre-Construction
Contamination and soil	An unexpected finds protocol should be included as part of the CEMP or as a stand-alone document if potentially contaminated fill material or buried unexpected finds are encountered during construction earthworks.	Design and Pre-Construction

Aspect	Control measures	Proposed MDC phase
Contamination and soil	Personnel involved in ground-disturbing works must be familiar with the unexpected finds protocol/procedure and be trained in the identification of potential contaminated soil/material and relevant controls.	Design and Pre-Construction
Contamination and soil	The reuse or retention of contaminated or potentially contaminated material onsite (i.e. soil, ballast and timbers) will be subject to a risk assessment and/or occur as per the relevant components of the CEMP.	Design and Pre-Construction
Contamination and soil	Hazardous materials surveys would be undertaken during detailed design for all proposed demolition activities.	Design and Pre-Construction
Contamination and soil	A hazardous substances and dangerous goods risk management strategy will be developed to manage the potential for risks.	Design and Pre-Construction
Contamination and soil	The proposed activities will adhere to the *Safe Work Australia Model Code of Practice—How to Manage and Control Asbestos in the Workplace 2016* (Safe Work Australia, 2020) and *Safe Work Australia Model Code of Practice – How to Safely Remove Asbestos 2018* (Safe Work Australia, 2018).	Design and Pre-Construction
Contamination and soil	If ASS are encountered, they would be managed in accordance with *the Acid Sulfate Soils Assessment Guidelines* (ASSMAC, 1998), and the *Waste Classification Guidelines - Part 4: Acid Sulfate Soils* (NSW EPA, 2014).	Design and Pre-Construction
Contamination and soil	During construction works, surplus soil waste requiring offsite disposal must be assessed and classified prior to being transported to an appropriately licenced landfill, in accordance with the NSW EPA *Waste Classification Guidelines 2014*.	Construction
Contamination and soil	Topsoil would be stripped progressively in areas designated for construction and stockpiled separately onsite for use in rehabilitation/stabilisation works.	Construction
Contamination and soil	Drilling and excavation activities during construction will make use of drilling fluids and chemicals that are environmentally neutral and biodegradable, where practical.	Construction
Contamination and soil	Vehicle and plant maintenance activities will be undertaken in suitable areas, with hardstand to minimise risk of contaminants from incidental spills or leaks from entering aquifers via infiltration or surface runoff.	Construction and Operation
Contamination and soil	The freight transportation of dangerous goods of the proposed MDC will be in accordance with the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (National Transport Commission, 2020). Freight carts will be required to display appropriate Hazchem signage, including placards, and carry appropriate spill-containment equipment to be used by emergency services personnel in the event of an emergency.	Construction and Operation
Contamination and soil	A contamination assessment report (with sampling and analysis conducted) should be undertaken post the MDC and demobilisation to demonstrate the proposal site was not contaminated as a result of the MDC and the land is suitable for use or development.	Post decommissioning

Aspect	Control measures	Proposed MDC phase
Waste	A waste management plan would be prepared for the proposed MDC, including: ▸ waste targets for the MDC ▸ estimated waste generation (volumes and types of waste arisings) ▸ waste mitigation and management measures for the waste types and quantities, and contingencies for any unexpected waste volumes ▸ general protocols and performance objectives for keeping the worksite clean and tidy ▸ processes for monitoring, documenting and reporting waste types, volumes and how these arisings compare to waste targets (e.g. describe waste streams and estimated volumes, temporary waste storage areas and disposal locations on and offsite (including stockpiles and landfilling), as well as waste disposal NEPM criteria for disposal sites ▸ requirements for waste segregation (e.g. inert—including virgin excavated material, vegetation, building and demolition waste, concrete and asphalt; solid—such as food waste and litter, industrial/regulated—such as asbestos; hazardous—such as flammable liquids; liquid—such as sewage ▸ requirements for secure temporary storage, collection frequency and disposal/recycling requirements ▸ effluent management for construction staff amenities ▸ procedures and reporting/documentation requirements for ensuring waste transporters and receivers are appropriately licensed according to the type of waste ▸ requirements for training, inspections, audits, corrective actions, notification and classification of environmental incidents, record keeping, monitoring and performance objectives for handover on completion of construction ▸ any other requirements necessary to comply with conditions of approval, subsequent approvals or regulatory requirements.	Design/Pre-construction
Waste	During detailed design, a waste reduction review would be undertaken to identify opportunities to meaningfully achieve the waste reduction through design, construction and operation, including the consideration of the following: ▸ decommissioning of redundant track ▸ opportunities for designing out waste ▸ alternative approaches to materials used during construction, operation and maintenance to ensure resource efficiencies, in accordance with relevant design standards.	Design/Pre-construction
Waste	Detailed design would include measures to minimise excess spoil generation. This would include a focus on optimising the design to minimise spoil volumes, and the reuse of material onsite.	Design/Pre-construction
Waste	Consideration of alternative approaches to materials used, construction and operational techniques, and maintenance of a process to achieve a less resource-intensive and more efficient process, in accordance with relevant design standards.	Construction / Decommissioning
Waste	All waste generated would be classified in accordance with the Waste Classification Guidelines and disposed of in accordance with the relevant requirements of the Protection of the Environment Operations (Waste) Regulation 2014.	Construction / Decommissioning
Waste	Arrangements would be made with landfill operators prior to the delivery of waste and recyclables to any rural facility to ensure that the waste types and quantities can be accepted.	Construction / Operation / Decommissioning
Waste	Any hazardous or dangerous waste (e.g. asbestos, chemicals, oils) would be correctly stored and managed onsite and, if necessary, disposed of by a licensed contractor or facility and in accordance with the relevant state occupational health and safety legislative and regulatory obligations. This includes wastes generated because of demolition.	Construction and Operation
Waste	Waste management plans/procedures would be included in the Operators EMP.	Operation

Aspect	Control measures	Proposed MDC phase
Hazard and risk	Local emergency services would be engaged with to discuss and coordinate emergency response procedures, including (but not limited to) temperature, high wind and container topple.	Design and Pre-Construction
Hazard and risk	A workforce safety plan that references the ARTC Safety Management System would be prepared and would outline any specific actions to ensure the safety of workers across the proposal site.	Construction
Hazard and risk	Maintenance program/operational policy would be developed to monitor bushfire risk.	Operation

8. Environmental matters and checklists

8.1 Ecologically sustainable development

As per Clause 6(2) of the *Protection of the Environment Administration Act 1991*, ecologically sustainable development (ESD) requires the effective integration of social, economic and environmental considerations in decision-making processes. ARTC is committed to the principles of ESD and understands that the social, economic and environmental matters are interdependent.

It is anticipated that the proposal site will receive delivery of bulk track construction materials and will be used for track material storage for multiple Inland Rail projects and sections. The proposed MDC allows for track construction via a progressive rail head from the proposal site; subsequently, significantly reducing the need for road transportation and waste production. Overall, the proposed MDC is a significant positive contribution to the Inland Rail projects' and sections' expected sustainability outcomes.

The Inland Rail program of works is seeking an Infrastructure Sustainability Council (ISC) sustainability rating, which provides independent verification of the sustainability performance of the works. The proposed MDC will form part of the Rail Corridor Program (RCP) ISC As Built rating.

The ESD principles set out in section 6(2) of the *Protection of the Environment Administration Act 1991* have been applied to the proposed MDC as follows:

a) ***Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations (the 'integration principle').***

   The selection of rail-based deliveries with the storage onsite has considered the complexity of the supply chain and determined that rail offered the best outcome, considering the cost of delivery options and the preference for limiting road transport to minimise environmental and social (traffic safety) effects.

b) ***If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (the 'precautionary principle').***

   The approach to site construction methodology would minimise environmental damage. The construction contractor will develop and implement appropriate measures and management plans to limit degradation.

c) ***The principle of inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (the 'intergenerational principle').***

   The approach to site construction methodology has minimised environmental damage through limitation of clearing and retention of waterway setbacks.

d) ***The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making (the 'biodiversity principle').***

   The approach to site construction methodology has minimised clearing of vulnerable ecological communities, with these sites protected from clearing.

e) ***Improved valuation, pricing and incentive mechanisms should be promoted and, more specifically, environmental factors should be included in the valuation of assets and services (the 'valuation principle').***

The proposal site and MDC's operation strategy allow efficiency in storage and delivery methods, representing the most cost-effective approach.

8.2 Clause 171(2) Checklist

The environmental factors listed in clause 171(2) of the EP&A Regulation have been considered in Table 38, below, to assess the likely impacts of the proposed MDC.

TABLE 38: CLAUSE 171(2) CHECKLIST

Factor	Impact
a) the environmental impact on a community	The proposal may result in some amenity-related impacts (visual, noise and dust) to nearby sensitive receivers during construction and operation. Potential impacts would be managed through the implementation of the safeguards and mitigation measures provided in section 7.

Factor	Impact
b) the transformation of a locality	The proposal would result in the clearance and grading of former agricultural land and native grasslands. In the context of the surrounding land uses, this is expected to be acceptable.
c) the environmental impact on the ecosystems of the locality	The proposal would result in the clearance and grading of former agricultural land and native grasslands. It is unlikely to have a significant impact on any ecosystems.
d) reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality	The proposal would result in the clearance and grading of former agricultural land and native grasslands. In the context of the surrounding land uses this is expected to be acceptable.
e) the effect on a locality, place or building that has— i) aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance, or ii) other special value for present or future generations	An Aboriginal site was identified within the proposal site and areas where gilgais are evident have been assessed as of moderate archaeological potential; however, excavation testing is required to establish the archaeological potential of the proposal site area.
f) the impact on the habitat of protected animals, within the meaning of the *Biodiversity Conservation Act 2016*	The proposal would result in the clearance of habitat for protected animals; however, the impact is not expected to be significant.
g) the endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	The proposal would not endanger any species of animal, plant or other form of life, whether living on land, in water or in the air, providing the implementation of the safeguards detailed in section7 are undertaken.
h) long-term effects on the environment	The proposal would clear and regrade a large area of former agricultural land and native grasslands.
i) degradation of the quality of the environment	There is the potential for negative noise, visual and dust impacts from the construction and operation of the proposal, as well as vegetation clearing. These impacts will be managed through the implementation of the control measures detailed in section 7.
j) risk to the safety of the environment	Contamination risks are present during the construction and operation of the MDC; however, any risks or potential impacts would be appropriately managed as necessary.
k) reduction in the range of beneficial uses of the environment	The proposal would not reduce the beneficial uses of the environment.
l) pollution of the environment	The proposal could potentially cause pollution of the environment; however, the potential impacts would be minimised through the implementation of the safeguards detailed in section 7.
m) environmental problems associated with the disposal of waste	All waste generated by the proposed MDC would be managed using the waste hierarchy approach of avoidance and reuse before consideration is given to disposal. If reuse or recycling are not viable options, waste would be disposed of at an appropriately licensed landfill in accordance with *NSW Waste Classification Guidelines*. Appropriate waste-management measures would also be adhered to.
n) increased demands on natural or otherwise resources that are, or are likely to become, in short supply	Materials required for the construction and operation of the MDC are readily available and would be sourced from local contractors where possible.
o) the cumulative environmental effect with other existing or likely future activities	The proposal would result in an increase in cumulative clearing of native vegetation when considered in conjunction with the N2N Project; however, additional clearing, and its impact on threatened fauna habitat, is not expected to be significant. Offsite flood impacts that result from the MDC may change when assessed cumulatively with the N2N Project.
p) the impact on coastal processes and coastal hazards, including those under projected climate change conditions?	The proposed MDC is not likely to have any impacts to coastal processes or coastal hazards.
q) applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1	The proposal is aligned with the relevant aims and objectives of the Narromine LEP 2011 and the Draft Central West and Orana Regional Plan 2041.
r) other relevant environmental factors.	Impacts of relevant environmental factors have been considered in this REF (see section 6).

8.3 Matters of national environmental significance

Under the environmental assessment provisions of the EPBC Act, MNES and impacts on Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to DAWE. Table 39, below, summarises the expected impacts on each MNES.

TABLE 39: MNES CHECKLIST

Will the proposal	If yes, describe the impacts (i.e., short term, long term, positive, negative, nil.)
Impact on listed threatened species and ecological communities?	No threatened ecological communities or flora species listed under the EPBC Act were identified as being present onsite. While there is the potential for Corben's Long-eared Bat and Koala, which are listed as vulnerable under the EPBC Act, to occur on the proposal site, none were recorded during surveys and are unlikely to be present. The assessments of significance found that the proposal is unlikely to significantly reduce the availability of foraging habitat for these species, given the wide availability of alternate foraging habitat in the study area, and is unlikely to have a significant impact on EPBC Act-listed threatened species and ecological communities.
Impact on listed migratory species?	No important habitat for any migratory species would be impacted by the proposal. Any migratory species that may occur would be transient individuals and would not rely on the limited wetland or woodland habitat present in the proposal site.
Impact on Wetlands of international importance?	The site is not proximate to any protected wetlands.
Impact on the Commonwealth marine environment?	The site is not proximate to the Commonwealth marine environment.
Impact on World Heritage properties?	The site is not proximate to World Heritage properties.
Impact on National Heritage places?	There are no National Heritage Register listed properties in the vicinity of the proposal site.
Involve nuclear actions?	No nuclear actions are proposed; no existing nuclear actions are proximate to the site.
Impact on the Great Barrier Reef Marine Park?	The site is not proximate to the Great Barrier Reef Marine Park.

9. Conclusion

The proposal is a key component of Inland Rail and is required to enable the construction of multiple Inland Rail projects.

The proposed MDC is required to allow for the timely delivery, stockpiling, handling and distribution of track construction materials. The MDC would achieve the following key objectives:

- continual production of materials to meet consumption demand of Inland Rail projects and sections
- avoidance of road freight to enhance safety, reduce environmental impacts and network constraints
- safer and better controlled material handling and storage process
- flexibility for the Inland Rail Program
- sustainability and efficiency in construction methods.

The current design of the proposed MDC will be developed in detailed design before construction commencement. ARTC is aiming to commence construction of the proposal from June 2022, be operational by September 2022 and decommission in 2027.

The proposal also includes a subdivision of five lots into two new lots, which will facilitate the use of the proposal site for the MDC and will also enable flexibility in the future and ongoing use of the proposal site.

This REF has been prepared by ARTC in accordance with Part 5, Division 5.1 pf the EP&A Act and considers all matters affecting or likely to affect the environment as a result of the proposal. The potential impacts of the proposal have been assessed in accordance with clause 171(2) of the EP&A Regulation and the requirements of the EPBC Act.

The following key impacts have been identified should the proposal proceed:

- loss of 146.30 ha of native vegetation (including 15.85 ha of woodland, which would remove potential habitat for a variety of threatened species)
- minimal increase of impacts to amenity (visual, noise and air quality)
- minimal increase in flood impacts within the ARTC boundary
- low risk of potential impacts to cultural heritage.

Mitigation and management measures have been recommended to address the above impacts and other potential impacts. They are based on the impacts of the current design of the MDC and, through the application of these recommended mitigations, the proposal can appropriately manage its impacts.

Based on the assessment, it is considered that the proposal will not result in a significant impact on the environment or any MNES under the EPBC Act. As such, an EIS or SIS is not required. This assessment concludes that it would be appropriate for the proposal to proceed.

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