WATER REUSE STRATEGY

A2I | Albury to Illabo

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GLOSSARY

TERM	DEFINITION
A2I	Albury to Illabo
A2P	Albury to Parkes
ARTC	Australian Rail Track Corporation
CoA	Conditions of Approval
CEMP	Construction Environmental Management Plan
CIZ	Construction Impact Zone
CSSI	Critical State Significant Infrastructure
CSWMP	Construction Soil and Water Management Plan
DPE	NSW Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure
EAD	Environmental Assessment Documentation
EIS	Environmental Impact Statement
I2S	Illabo to Stockinbingal
IS	Infrastructure Sustainability
ISC	Infrastructure Sustainability Council
IRPL	Inland Rail Pty Ltd
KM	Kilometre
LGA	Local Government Area's
NSW	New South Wales
SSI	State Significant Infrastructure
UMM	Updated Mitigation Measure
WTP	Water Treatment Plant

1 INTRODUCTION

1.1 Project overview

Inland Rail is an approximate 1,600 kilometres (km) freight rail network that will connect Melbourne and Brisbane via regional Victoria, New South Wales (NSW) and Queensland. The Inland Rail route would involve using approximately 1,000 km of existing track (with enhancements and upgrades where necessary) and 600 km of new track, passing through 30 local government areas (LGAs). Inland Rail will accommodate double-stacked freight trains up to 1,800 metres (m) long and 6.5 m high.

The Australian Government has confirmed that Inland Rail is an important project to meet Australia's growing freight task, improve road safety and help decarbonise the economy. Inland Rail will enhance our national freight and supply chain capabilities, connecting existing freight routes through rail, roads and ports, and supporting Australian's growth. Inland Rail is being delivered by Australian Rail Track Corporation (ARTC) and Inland Rail Pty Ltd (IRPL).

Comprising 12 sections, a staged approach is being undertaken to deliver Inland Rail. Each of these projects can be delivered and operated independently with tie-in points to the existing railway. Work south of Parkes has been prioritised, which will enable Inland Rail to initially connect to existing rail networks between Melbourne, Sydney, Perth and Adelaide via Parkes and Narromine. The Parkes to Narromine and Narrabri to North Star Phase 1 sections are complete.

The Albury to Illabo project (the project) delivered by Martinus Rail (MR) will enable enhancement works to structures and sections of track along 185 km of the existing operational standard-gauge railway in this section of the Inland Rail program. Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains. Works would include track realignment, lowering and/or modification within the existing rail corridor, modification, removal or replacement of bridge structures (rail, road and/or pedestrian bridges), raising or replacing signal gantries, level-crossing modifications and other associated works.

A detailed project description is provided in the Construction Environmental Management Plan (CEMP).

2 PURPOSE AND OBJECTIVES

2.1 Purpose

The purpose of this Water Reuse Strategy (this Strategy) is to identify and evaluate options for water reuse. This will address Condition of Approval (CoA) E132 and Updated Mitigation Measure (UMM) HFWQ2. The Strategy will be applied during construction of the project.

A copy of this Strategy will be made publicly available on the project's website.

2.2 Water Use and Reuse Approval requirements

The Inland Rail – Albury to Illabo project (the project) is declared State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). The project is permissible without development consent and is subject to assessment and approval by the NSW Minister for Planning and Public Spaces.

This Water Reuse Strategy has been prepared to meet the Ministers Conditions of Approval E132 and E169which is detailed in the table below.

TABLE 1: CONDITIONS OF APPROVAL RELEVANT TO WATER REUSE

No.	Requirement	Where addressed	How addressed
E132	A Water Reuse Strategy must be prepared, which sets out options for the reuse of collected stormwater and groundwater during construction. The Water Reuse Strategy must include, but not be limited to:	Section 5	This Strategy has been prepared in accordance with this condition and describes the options for reuse of collected stormwater and ground water during construction of the Project.
	a) evaluation of reuse options;	Section 5	This Strategy evaluates each reuse option. The evaluation is summarised primarily in Section 5
	b) details of the preferred reuse option(s), including volumes of water to be reused, proposed reuse locations and/or activities, proposed treatment (if required), and any additional licences or approvals that may be required;	Section 0	This Strategy has been prepared to address the details listed in this condition, where required.
	c) measures to avoid misuse of recycled water as potable water;	Section 4.1.3	Maintaining separation of recycled water systems from sources of drinking water has been identified.
	d) consideration of the public health risks from water recycling; and	Section 4.1.2	The potential health risks have been considered and appropriate strategies have been identified to mitigate these risks.
	e) time frame for the implementation of the preferred reuse option(s).	Section 0	Details regarding the timeframe in which MR propose to implement the preferred reuse option is provided in this Strategy.
	The Water Reuse Strategy must be prepared based on best practice and advice sought from relevant agencies, as required.	Section 4.1.3	This Strategy has considered water use practices and advice from similar infrastructure projects in NSW

No.	Requirement	Where addressed	How addressed
	The Strategy must be applied during construction.	Section 2	This Strategy has been developed for use during construction.
	Justification must be provided to the Planning Secretary if it is concluded that no reuse options prevail	Not applicable	Preferred reuse options have been selected as described in this plan.
	A copy of the Water Reuse Strategy must be made publicly available.	Section 2	This Strategy has been prepared and submitted in accordance with this condition and will be made publicly available.
E169	The CSSI must aim to reduce the need for water during construction including exploring, options to use additives, alternative construction techniques and reduce dust suppression regime where there is minimal potential for impacts.	Section 0	This Strategy has been prepared to address the details listed in this condition, where required.

There is one identified primary requirement of the UMMs related to the preparation of this Strategy. Table 2 lists this requirement and where it has been addressed in this Strategy.

TABLE 2: UMMS RELEVANT TO THIS STRATEGY

ID	Requirement	Where addressed
HFWQ2	Opportunities to reduce the need for water would be further explored during detailed design and construction planning. Such options include: ▪ Use of additives ▪ Alternative construction techniques ▪ Reduced dust suppression regime where there is minimal potential for impacts.	Section 0

2.3 Objectives and Targets

The following water management objective and target have been established by the project inline with the Inland Rail Policy Objectives, from the Sustainability Management Plan (SuMP, 5-0052-210-PMA-00-PL-0001).

Thme	Inland Rail Policy Objective	Martinus Target
Resource Use	Construction water demand reduced by 15% across the program	MR will achieve at least a 15% reduction in water use compared to the agreed Base Case.

2.4 Sustainability Rating Systems

The Project is targeting the Water Category credits as part of achieving an 'Excellent' Design and As-Built IS Rating. The following sustainability targets in IS Ratings Version 1.2, provided by ISC, are relevant to water management. The relevant water credits being targets, as per the SuMP (5-0052-210-PMA-00-PL-0001) and Construction Soil and Water Management Plan (CSWMP, 6-0052-210-EAP-00-RP-0006) are as follows:

ISC Credit	Credit Name	Description
Wat-1	Water use monitoring and reduction	A detailed water balance study will be prepared of the Base Case and actual case including opportunities to reduce water consumption. The project is targeting water reductions of 15% when compared to the base case.
Wat-2	Replace potable water	Non-potable water options will be assessed and managed. The project is targeting a 20% replacement of potable water with non-potable water.

3 CONSTRUCTION WATER SOURCES

During construction a number of water sources will be available. The Project will adopt the Water Use Hierarchy shown in the Figure below during construction.

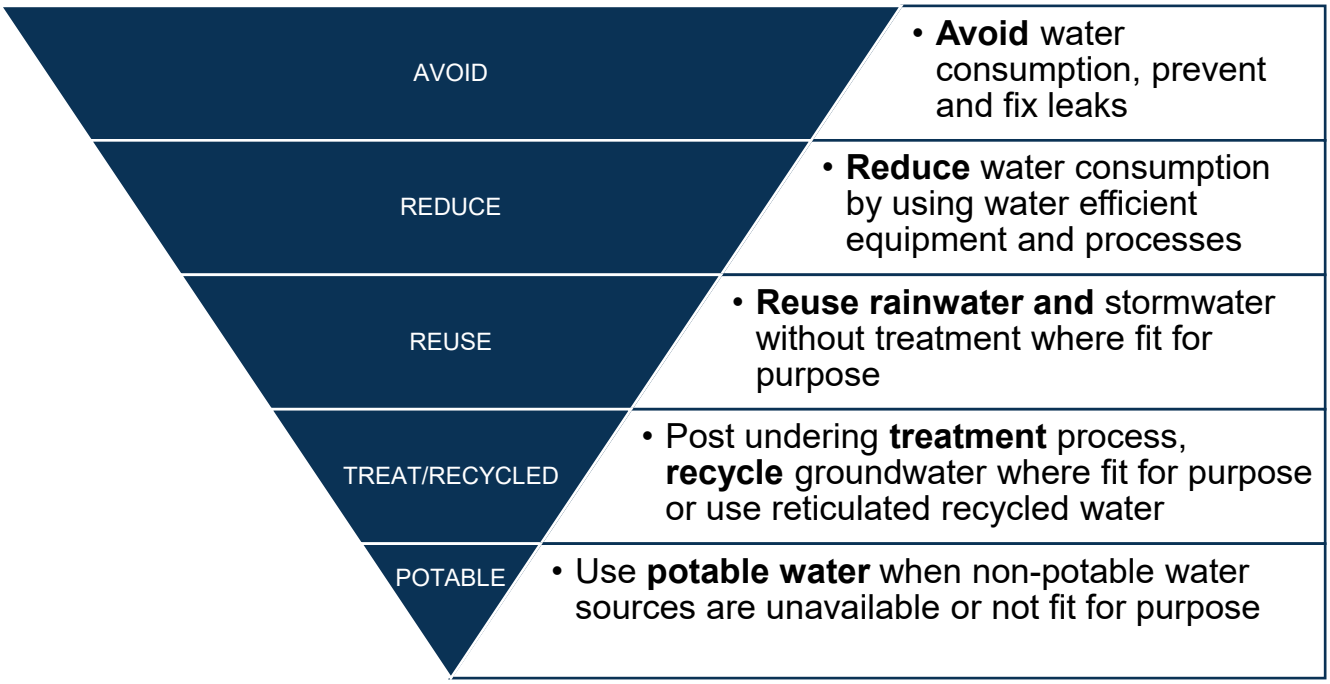

FIGURE 1: WATER USE HIERARCHY

Opportunities for the use of non-potable water in place of potable water have been assessed in accordance with the SuMP (5-0052-210-PMA-00-PL-0001). During delivery, the final use of the non-potable water will depend upon workplace health and safety considerations, economic feasibility, any relevant manufacturer's or design specifications and the availability and quality of non-potable water.

The following section describes the range of water source for Inland Rail – Albury to Illabo project (the project) construction works.

3.1 Potable water

All construction sites will have metred potable water connections to the relevant networks. Potable water will be supplied to site offices and will be utilised for kitchen facilities and can be used to supplement non-potable water supplies as needed. Where manufacturers or technical specification require, potable water will be used for construction activities.

3.2 Recycled water networks

There are recycled water networks located in the Albury LGA. Refer to Table 3: Recycled Water Networks for locations

TABLE 3: RECYCLED WATER NETWORKS

Enhancement site	Pindrop	Asset owner	Geo reference	Type	Notes
Billy Hughes Bridge	43 Sanctuary Lane, off Wagga Road	Ettamogah	-36.010373, 146.982200	Raw/Untreated bulk water	Suitable for all water tanker configurations. Ground level 80mm camlock male outlet connector. Flat sealed filling area. **The approved portable metered standpipes are permitted to be used in the hydrant locations nominated by Council only.**
Table Top Yard		Ettamogah	-36.010373, 146.982200	Raw/Untreated bulk water	

3.3 Groundwater

Groundwater is unlikely to be encountered through the construction activities due to the shallow depth of the excavations and the deep-water table of the Project area. Groundwater available for reuse is unlikely to be encountered during construction activities. Section 4.6 of the CSWMP (6-0052-210-EAP-00-RP-0006) details ground water systems that may be encountered or available for water use during construction across the enhancement sites, however this approach should be further investigated for feasibility during construction across the enhancement sites.

3.4 Surface water

Surface water runoff may be collected through implementation of a pumped set up for diversion of surface water into temporary bunds or basins. This approach should be further investigated for implementation during construction across the enhancement sites.

Due to the nature of the enhancement sites and construction programme durations, the use of pump setups to divert surface water into temporary bunds, basins or tanks for water storage and reuse may be deemed as an impractical solution during construction. Additionally, additional space for basins or temporary bunds have not been considered for inclusion within the project CIZ extents across the enhancement sites due to the tight corridor proving impractical for sediment basins.

3.5 Rainwater

The average rainfall in the Project alignment is around 500-700mm per annum. There is opportunity to capture rainwater from the roofs of the site offices to supplement potable water supplies. This approach should be further investigated for implementation during construction across the enhancement sites.

3.6 Other water sources

Where there are other water reuse opportunities identified throughout the duration of construction, these will be considered for the A2I Project, where applicable, depending on water quality. However, other water sources such as greywater (wastewater from basins and sinks) and sewerage water (wastewater from toilet systems) are known to contain high microbial quality and their treatment would be expensive and are not considered feasible for reuse schemes within the project.

4 EVALUATION AND SELECTION OF PREFERRED WATER REUSE OPTIONS

Martinus are committed to managing water reuse on the Project in line with best practice and advice.

The use of reused water will be prioritised over the use of potable water on all sites where suitable quality and quantity is available. The supply of re-used water will be dependent on rainfall, groundwater inflow, construction activities, and availability of storage at each site. The following section provides an evaluation of the water sources for the A2I construction works.

Water is required during construction for a range of activities, including:

- Earthworks and formation preparation and material conditioning;
- Dust suppression;
- Concrete production;
- Vehicle and equipment wash down;
- Site services at compounds;
- Landscaping and rehabilitation.

4.1 Considerations for water reuse

The following water reuse considerations are based on best practice and advice and have been sought from relevant agencies, as required.

4.1.1 Water restrictions

Water reuse options should consider changes to local water restrictions that occur from time to time. Water restrictions may be imposed due to a reduced local water supply, drought conditions or due to other emergency circumstances that pose a risk to local water supplies. Specific water restriction details has been outlined below associated with the potential construction water sources detailed within Table 19 of the CSWMP (6-0052-210-EAP-00-RP-0006):

Albury City Council

- At the time of writing, Albury doesn't have any mandatory water restrictions in place.
- Ongoing water wise rules are in place.
- Water restriction details can be accessed from the Albury City website.

Junee Council

- At the time of writing, Junee doesn’t have any mandatory water restrictions in place.
- Water restriction details can be accessed from the Goldfields Water website.

Riverina Water

- At the time of writing, Stage 1 water restrictions are in place.
- Stage 1 water restrictions are in place during daylight savings each year.
- Water restriction details can be accessed from the Riverina Water website.

4.1.2 Public health risks

The potential health risks associated with recycling treated water on site have been considered and appropriate strategies have been identified to mitigate these risks. Following best practice and lessons learnt from prior projects, these risks are reduced through controls such as the separation of the recycled water system from the potable water system.

Further controls such as employee education via toolbox meetings and noticeboards in crib rooms along with clearly labelled pipes and outlets identifying non potable water supply will reduce the health risk. Where the water supply may be publicly accessible outside the controlled job site, controlled systems against unauthorised access by members of the public will need to be implemented to mitigate the public health risk.

4.1.3 Best practice and advice

This Strategy has considered water use practices and advice from similar infrastructure projects in NSW such other Inland Rail Projects including but not limited to N2NS SP1. Advice from relevant agencies and other projects will be sought as required during the implementation of this Strategy. Advise on reuse water supply availability has been sought from Wagga Wagga Council and Albury City Councils.

Australian Guidelines for Water Recycling 2006 (AGWR 2006) has been considered.

As such, Appendix 3.4 of the AGWR 2006 details on-site controls to reduce both human exposure to hazards and the impact on receiving environments, including maintaining separation between recycled water schemes and drinking water systems or potential sources of drinking water.

Other factors such as economic feasibility, water quality specifications and plant manufacturer will require ongoing consideration.

4.1.4 Anticipated water reuse volumes

It is estimated that about 86.6 megalitres (ML) of water would be required for construction activities over the course of the project, as detailed in the CSWMP (6-0052-210-EAP-00-RP-0006).

The A2I project has been separated into two key stages, namely Stage A and Stage B, as detailed in the A2I Staging Report (6-0052-210-PES-00-RP-0001). The expected water demand for Stage A is approx. 10ML with the indicative timing occurring between January 2025 and July 2025. The indicative timing for Stage B to occur is from August 2025 to the completion of construction works. The project is targeting a 20% replacement of potable water with non-potable water. Based on the estimated water use volumes the Project has projected the non-potable water demand

TABLE 4: ANTICIPATED WATER REUSE VOLUMES

Stage	Estimated total water demand (ML)	Estimated non-potable water demand (ML)	Stage duration
A	10ML	0ML	January 2025 to July 2025
B	76.6ML	18ML	August 2025 to completion
TOTAL	86.6ML	18ML	

5 EVALUATION OF REUSE OPTIONS

The Project has evaluated the proposed water reuse options for the construction phase of the Project. The proposed water reuse options have been evaluated as Unsuitable, suitable and preferred are outlined in the Table below.

TABLE 5: EVALUATION OF REUSE OPTIONS

Non-potable water source	Evaluation of reuse option	Justification
Surface water Stormwater	**Unsuitable**	Due to construction boundary constraints, the construction of temporary bunds/basins or tanks to store and reuse for construction activities isn't a practical approach for surface water reuse across the project. it isn't feasible to procure a Water Treatment Plant (WTP) to treat the water for other construction uses.
Recycled Water Network	**Suitable**	Some recycled water networks existing within close proximity for the Project to utilise. The use of such network requires Council approval.
Treated Groundwater Groundwater	**Unsuitable**	Where the enhancement site includes track lowering excavation in the scope of work, there is the potential to encounter groundwater in the ARTC network however it is unlikely. Refer Section 4.6 of the CSWMP for utilising Groundwater systems for water use across the enhancement sites.
Rainwater Stormwater	**Suitable**	The collection of Rainwater via water tanks installed at each site compound strictly to be reused for toilet flushing. This appears to be the most likely option due to there being multiple enhancement sites where the water tanks can be relocated with site facilities to each site. See section below on volumes and further information.

5.1 Preferred water reuse options

Based on the evaluation detailed in the table above, the Project has determined the most feasible and reasonable options for water reuse on the Project. This is detailed in the section below.

Non potable water reuse	Available volume for reuse per annum	Reuse activities	Considerations/ Justifications	Implementation period
Rainwater Stormwater	270kL rainwater (based on average annual historic precipitation, duration in locations and size of roof)	End uses for water from rainwater tanks may include toilet flushing, and cleaning, irrigation, dust suppression, vehicle and equipment washdown, landscaping and rehabilitation, earthworks and formation preparation.	Water tanks will capture rainwater from the site offices during construction.	Rainwater collection and storage will commence following installation of the site facilities.
Recycled Water Network	Expected available volume to be determined in consultation with relevant LGA– Target	End uses for non-potable recycled water[1] may include irrigation, dust suppression, vehicle and equipment washdown, landscaping and	May be more suited to works requiring large volumes of water i.e. dust suppression.	Ongoing access during construction works. Dependent on agreement with relevant LGA.

[1] In accordance with the Martinus Procedure for Potable Water (MR-IRP-PR-006)

Non potable water reuse	Available volume for reuse per annum	Reuse activities	Considerations/ Justifications	Implementation period
	across the life of the Project 18ML	rehabilitation, earthworks and formation preparation.		Priority is for Stage B

During construction the Project will progress opportunities to further reduce water consumption and prioritise water reuse through initiatives. Some are listed below:

TABLE 6: WATER REDUCTION INITIATIVES

Initiative name	Initiative description
Lower site speed limits through non-sealed areas	By lowering the speed limits around the enhancement sites, less dust will be generated by plant and vehicles resulting in a reduction of water required for suppression.
Dust suppression at lower temperatures	Utilise watercarts for dust suppression at times of the day when the temperature is lower to reduce the likelihood of water evaporating.
Sealing where possible	By sealing dirt access tracks, plant and vehicles travelling along the route won't generate dust.
Chemical additives	Calcium, magnesium and sodium chloride control dust by absorbing moisture from the air causing the dust particles to bind together. These products are some of the mostly widely used dust suppressants. Another typical option on construction sites is the use of soil binder. Soil Binder is a method that works well for construction sites that need a temporary application that lasts for the length of a project. The project is investigating opportunities to utilise chemical additives as an alternative dust suppression method where there is a minimal potential for impacts. Some products produce 80% water savings on dust suppressing haul roads.
Construction boundary reduction	Minimising the construction boundary (also known as the Construction Impact Zone (CIZ)) at enhancement sites, where feasible, is another measure mitigating water usage across the enhancement sites. CIZ's will be monitored and evaluated by Martinus Rail on an ongoing basis as construction methodologies develop.
Lime stabilisation	Lime stabilisation will water by limiting layers in formation and hardstand construction. However, lime stabilisation is an expensive process reserved for areas that have been identified as high risk in preliminary geotechnical testing.
Efficient fixtures	Temporary site offices incorporating specific measures into design to minimise consumption, including WELS rated fixtures to reduce water use.
Construction program optimisation	Reduction in construction program will result in less maintenance water usage across the enhancement sites. 35.3ML is estimated to be used for maintenance during construction across all enhancement sites, a 15% construction programme optimisation result ins a 5.3ML saving.
Drought tolerant vegetation	Landscape CIZ areas with drought-tolerant and endemic species which will be selected for their longevity e.g. Acacia Brownii, Melaleuca Quinquenervia, Astelia Chathamica. This will eliminate ongoing irrigation requirements during operation.

Initiative name	Initiative description
Cover material stockpiles with Bidim or other textiles	By covering stockpiles with textiles will reduce the necessity of watering to maintain dust control.

6 MEASURING AND REPORTING

Water reuse data will be collected and reviewed throughout the construction of the project and reported at the frequency outlined in the Sustainability Management Plan.

Refer to Section 6.10 of the CSWMP for mitigation measures implemented for water use during construction phase of the project.

6.1 Reporting frequency

As per Section 4.9 of the Sustainability Management Plan, water reuse reporting will be captured in the reporting schedule as summarised by Table 7.

TABLE 7: REPORTING FREQUENCY

Report	Frequency/timing	Content
Monthly report	Monthly	The monthly sustainability report forms part of the monthly project report within Inland Rail's Sustainability Reporting System. The report will include updates on progress against project sustainability objectives and targets, activities undertaken in the month and sustainability metrics such as greenhouse gas emissions, embodied energy from materials used on the project, water use and risks and opportunities.
Quarterly report	Quarterly	Program sustainability reporting to the Inland Rail Leadership Team, the ARTC Board and the Martinus Rail's A2P Senior Management/Sustainability Champions on progress against IS credit targets, objectives and targets, risks and opportunities.
Annual report	Annually	Provision of supporting material to allow ARTC to complete Annual National Greenhouse and Energy Reporting. Relevant material will also be supplied to Inland Rail for inclusion in the Annual Sustainability Report.

6.2 Audit and review

Site water use, reuse, reduction during construction will be monitored as part of the Martinus Rail Environment and Sustainability Weekly Inspection Checklist (MR-EF-001) entries on Procore. The sustainability component of the inspection will focus on issues such as environmental and social impacts, energy management, waste management, etc. Where required, actions may be raised to address any issues identified. These actions will be recorded and closed out in Procore.

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