



Tonkin Gap Project and Associated Works: Project Annual Sustainability Report 2022/2023

Prepared by Tonkin Gap Alliance

This annual report covers the period from 1/07/2022 to 30/06/2023. This is the third annual report to be prepared for the project. Previous annual sustainability reports include [2020-21; 2021-22]

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Disclaimer

All information was true and accurate at date of publication. Data is subject to change pending audits, verifications, and reviews.

Abbreviations and Acronyms Table

Abbreviation	Full Form
ASC NEMP	Australian Site Contamination National Environment Protection Measures
ASSMP	Acid Sulphate Soils Management Plan
CCF	Civil Contractors Federation
CCMP	Construction Contamination Management Plan
CCNH	Climate Change and Natural Hazard
CEMP	Construction Environment Management Plan
CNVMP	Construction Noise and Vibration Management Plan
CRC	Crushed recycled concrete
CSEP	Community and Stakeholder Engagement Plan
DBCA	Department of Biodiversity, Conservation and Attractions
DWER	Department of Water and Environmental Regulation
EMP	Environmental Management Plan
EPA	Environmental Protection Authority of Western Australia
FTE	Full-time employee
GHG	Green House Gas
GRI	Global Reporting Initiative
ha	Hectare(s)
IAP2	International Association for Public Participation
IS	Infrastructure Sustainability
ISC	Infrastructure Sustainability Council
ITS	Intelligent Transport Systems
km	Kilometre(s)
KPI	Key Performance Indicator
KRA	Key Result Area
LGA	Local government area
MEL	Morley-Ellenbrook Line
Main Roads	Main Roads Western Australia
NMP	Noise Management Plan
OGA	Open Graded Asphalt
PSP	Principle Shared Path
PTA	Public Transport Authority
RAP	Reclaimed Asphalt Pavement
RCP	Representative Concentration Pathway
RES	Resource Efficiency Strategy
SDG	United Nations Sustainable Development Goal
SP	Sustainable procurement
SuMP	Sustainability Management Plan
tCO ₂ e	Tonnes of carbon dioxide equivalent
TEC	Threatened Ecological Community
TOAG	Traditional Owner Advisory Group

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1 About this Report

1.0 Purpose

This report has been prepared for the Tonkin Gap Project and Associated Works (the Project). This report was compiled by the Tonkin Gap Alliance on behalf of Main Roads Western Australia (Main Roads). This report will accompany the Main Roads Annual Sustainability Report and will ultimately be integrated into the Main Roads Annual Report. The report content is prepared in accordance with Global Reporting Initiatives (GRI) principles and summarises the sustainability initiatives and potential environmental, social, and economic impacts of the Project. It is intended to meet the annual reporting requirements of Main Roads and provide greater transparency to community and stakeholders on the sustainability objectives and progress of the Project. Material topics reported in this report have been determined through a materiality process that aligns with the United Nations Sustainable Development Goals (SDGs) and adheres to requirements under the Infrastructure Sustainability Council (ISC) rating framework.

1.1 Sustainability Statement

The Project is considered a key component of the ongoing transformation of Tonkin Highway, delivering a high-standard north-south transport link from Muchea to Mundijong. It is expected to provide improved connectivity and access for communities throughout the Perth metropolitan region, with improvements for road users and cycling/pedestrian users. Sustainability is a top priority for the Project's Key Result Areas (KRAs), representing a sustainability wheel of success where each aspect contributes to our integrated sustainability model and our IS rating.



Figure 1 Sustainability Wheel of Success – Project Key Result Areas

The Project has developed and applied an integrated management system to deliver on the material issues identified in this report, driving the identification and implementation of key sustainability opportunities throughout the design and construction phases.

"The Alliance has demonstrated a commitment to integrating sustainability through our design and construction processes, with a focus on delivering infrastructure that meets the expectations of the clients, community and stakeholders. The team's approach has contributed to a number of industry-leading outcomes, and we are proud to have seen this reflected in a 'Gold' Infrastructure Sustainability rating for the design phase." – Peter Hopfmueller, Alliance Director

1.2 Highlights



Gold Design Rating

The Project demonstrated its commitment to achieving sustainable outcomes across the triple bottom line when it was verified with a Gold Infrastructure Sustainability rating for the Design phase.



Energy Reduction

The Project is committed to a 5% reduction in energy use across the life cycle of the asset, which considers fuel amongst other sources. The updated energy model prepared by TGA demonstrates a 5% reduction, equating to a saving of 1,462t CO₂-e.



Resource Efficiency

The Project has imported approximately 70,000 tonnes of crushed recycled concrete from a local supplier, which replaces virgin crushed limestone as pavement subbase. A total of 205,473 tonnes of recycled materials have been imported to the Project site to date.



Cofferdam Removal Success

The removal of the cofferdams in 2023 was successful, with minimal environmental impact to the Derbarl Yerrigan and surrounding environment. Removal involved consultation with DBCA, onsite Whadjuk heritage monitors and Marine Mammal Observers.



Aboriginal Business Spend

TGA had an initial target of \$10M spend on Aboriginal businesses. Through integrated efforts by the whole team, the Project's committed spend is tracking above \$25M, with a new stretch target of \$30M established.



Innovation

The Project has been verified by the ISC for four Australian First innovations. This includes trials with using various recycled materials in retaining blocks, in partnership with various suppliers.



Community Engagement

Innovative and proactive engagement methods adopted with our 6,000 community members include social media, four open house community events and more than 23 site tours (15 in this financial year).

2 Project Overview

The Tonkin Gap Project and Associated Works is part of an infrastructure package announced in 2019 and is located approximately eight kilometres east of Perth, along Tonkin Highway. Connecting Gateway WA and NorthLink WA, this section of Tonkin Highway forms part of a vital freight and commuter access route known as the Perth to Darwin National Highway. It is considered a key component of the ongoing transformation of Tonkin Highway, delivering a high-standard north-south transport link from Muchea to Mundijong. It is expected to provide improved connectivity and access for communities throughout the Perth metropolitan region, with improvements for road users and cycling/pedestrian users. Insufficient capacity to meet current demand at this location has created a 'bottleneck' that constrains the full realisation of the benefits from recent investments in Tonkin Highway and planned future investments to upgrade intersections and extend Tonkin Highway to the south. Congestion issues, combined with the inadequacy of current cycling and pedestrian connections, are having a negative impact on local amenity. Furthermore, the high proportion of merge, diverge and weave movements exacerbated by congestion are safety concerns and may lead to an increase in vehicle crashes.

The Project was fast tracked by Main Roads to help the WA Government drive economic recovery from the effects of COVID-19. The Project commenced detailed design in June 2020, with construction activities starting in November 2020. Majority of the detailed design was completed in the first half of 2021, with construction expected to be complete in late 2023.

Further information is available on the [Project website](#).

2.0 Locality and Scope

The Tonkin Gap section of the Project runs, along Tonkin Highway between Collier Road, Bayswater and Dunreath Drive, Redcliffe (2). The Project aims to improve traffic flow, safety, and enhance facilities for cyclists and pedestrians. The scope of the Tonkin Gap Project includes: new bridges at Dunstone Road, Guildford Road, Railway Parade and over the Derbarl Yerrigan (Swan River); increasing the number of lanes on Tonkin Hwy; the provision of noise walls and a new Principal Shared Path (PSP).

The Associated Works portion delivers rail-enabling works for the METRONET Morley-Ellenbrook Line (MEL) along Tonkin Highway, which also commenced construction works in 2021. Associated Works include underpasses and dive structures, to enable trains to enter and travel along the median of Tonkin Highway then exit in Malaga. Traffic and bus bridges will be built at Broun Avenue to provide access to the future Morley Station.

The Project intersects with three local government areas (LGAs); the City of Bayswater, the City of Swan and the City of Belmont.



2.1 Value and Funding

The Tonkin Gap Project is jointly funded by the Australian (\$232 million) and Western Australia (WA) Government (\$58 million).

2.2 Delivery Partners

The Project design and construction is being delivered by the Tonkin Gap Alliance (TGA) which is made up of five non-owner partners (NOPs); Georgiou, BMD, WA Limestone, GHD and BG&E. The owner participants include both Main Roads Western Australia (Main Roads) and the Public Transport Authority (PTA), due to the enabling works being completed for the MEL Project. The Project's supply chain involves numerous sub-contractors delivering packages of work, with a focus on local spend and supply, Aboriginal owned businesses and small and medium-sized enterprises (SMEs).

2.3 Project Timeline

The Alliance was formed prior to the Project contract being awarded in June 2020. Design work started immediately with various sustainability focused workshops held through the second half of 2020 and in the early months of 2021. Completion of design packages was achieved over many months, concluding around August 2021, with exception of the landscaping package. This is generally reliant on other aspects reaching completion before final landscaping adaptations can be made. Traffic modelling data used in the tender phase required substantial update as it was reflective of COVID-19 impacts, and therefore not representative of actual traffic numbers. This, along with changes proposed by the PTA in certain aspects of the MEL section of the Project, contributed to reasonable design delays for the Project.

Figure 3 shows a timeline of the significant sustainability milestones to date.

The IS Design Rating submission was subsequently delayed as a result of changes to the design through the later stages, however, was submitted to the ISC late in 2022. After one round of feedback from the verifiers, Tonkin Gap was awarded a 'Gold' Design Rating, achieving the highest score for a V2.0 Design project to date. At the time of writing this report, the team is working on compiling the As Built submission, with construction expected to reach practical completion at the end of 2023.

SUSTAINABILITY

PROJECT TIMELINE



Base Case

MARCH 2021

Base case for energy, water and materials verified by ISC

Annual Report

JULY 2022

TGA publishes Annual Sustainability Report FY2021/22

Design Rating

MARCH 2023

TGA gets verified for a 'Gold' IS Design Rating from ISC

As Built Submission

Late 2023

As Built rating will be submitted to ISC and final achievement report prepared for Main Roads

Project Award

JULY 2020

Design commences and sustainability kick-off workshop held

Materiality Assessment

FEBRUARY 2021

Materiality assessment, informed by internal and external stakeholders, verified by ISC

MR Knowledge Share

JUNE 2021

Sustainability Lead presents at knowledge sharing forum for Main Roads projects

PTA Knowledge Share

NOVEMBER 2022

Sustainability Lead presents at knowledge sharing forum for PTA projects

ISC WA Symposium

APRIL 2023

TGA presents at the WA ISC conference on IBAA innovative trial

Construction End

Late 2023

Works for TGA program will reach practical completion

Figure 3 - Project Sustainability Timeline Infographic

2.3.1 Construction Milestones

Since construction kicked off in early 2021, significant milestones have been achieved by the Project in each of the construction zones, namely the Tonkin Highway corridor and MEL enabling works. Some of these milestones within the last financial year are shared below.



All footbridges for the Project have been completed and are now open to the public. Malaga footbridge has recently been added the scope of works and will be completed in early-2024.



In May 2023, the new Redcliffe Bridge over the Derbarl Yerrigan was successfully opened to public traffic, with the incremental launch having been completed the year prior (Figure 5).



The reconstructed Broun Avenue bridge was completed and opened to public traffic in March 2023, with the Minister for Transport and state government representatives visting for a press conference to announce the opening.



Noise walls on the new Redcliffe Bridge, over the Derbarl Yerrigan were completed in early 2023 and work has commenced to install noise walls on the existing Redcliffe Bridge.



Across the Project, we are installing noise walls across various locations, identified through extensive noise modelling. At the time of this report, we are 98% complete with the construction.



Both the northern and southern dive structures have been completed and handed over to PTA for construction of the Morley-Ellenbrook Line.



TGA have constructed approximately 94% of the over 20,000 LM of slipform traffic barriers across the entire alignment.



Tonkin Highway northbound and southbound has been opened to traffic, travelling over the newly constructed southern and northern dive structures (Figure 6).

Figure 4 Significant Construction Milestones in FY



Figure 5 Redcliffe Bridge open to public traffic – May 2023



Figure 6 Tonkin Highway northbound traffic over the southern dive structure

3 Governance

3.0 Approach to Sustainability

3.0.1 Sustainability Policy

TGA has developed a Sustainability Policy to guide the governance of the Project during design and construction. The [Sustainability Policy](#) has been endorsed by the Alliance Director and is available on the Project website.

3.0.2 Sustainability Management

Sustainability on the Project is managed in accordance with the TGA's Sustainability Management Plan (SuMP) and is championed by TGA's environment and sustainability team. The TGA Sustainability Lead works to ensure sustainability is discussed at the senior management team level, including the TGA board, while helping to drive sustainable outcomes with a whole of team approach. The SuMP sets the framework for sustainability integration during the design and construction phases to achieve sustainable outcomes.

To ensure ongoing integration and consideration of sustainability aspects through the construction phase, the sustainability team engages regularly with construction leads, commercial team and stakeholder engagement team. The sustainability 'wins' achieved to date are documented throughout this report, with key highlights described in Section 1.2.

3.0.3 Infrastructure Sustainability





TGA is committed to achieving positive sustainability outcomes across the Project through application of the ISC IS Rating Tool. The framework addresses a broad range of sustainability aspects on infrastructure projects across a range of credits, each with several requirements for which points are awarded. The Project is using V2.0 of the IS framework, also adapting credit requirements from the more recently released V2.1 tool. At the time of this report, TGA has successfully had the Design rating verified by ISC independent verifiers, achieving a 'Gold' Design score. The final submission will be submitted to ISC as the Project reaches practical completion, namely the end of construction, which is anticipated to be in late 2023. The Project is on track to achieve at least the minimum required score of 40 in the As Built (as-constructed) submission, which would translate to a 'Silver' rating.






Various tools and frameworks have been developed to support the submission of the IS rating in achieving improved outcomes, including those used for modelling water and energy across the life cycle of the Project.




3.1 Material Sustainability Issues






TGA has used the United Nations (UN) Sustainable Development Goals (SDG) to guide identification of the material sustainability issues related to significant economic, social and environmental impacts. In early workshops with an internal multidisciplinary team, priority themes were identified based on the Project context, stakeholder expectations and various environmental and social aspects, which are directly linked to the Project KRA's (outlined in Section 1.2). Highly material issues were named 'Focus Areas', which were then fleshed into various project objectives, with targets eventually set for each objective. These were later presented to stakeholders for feedback in various forums including community open days, distributed surveys and targeted stakeholder meeting and working groups. Table 1 provides an overview of the material sustainability issues – referred to as focus areas and objectives, mapped against the relevant SDGs. The positive and negative impacts the Project may also have against each SDG is presented in Appendix 1.

Table 1 Project Focus Areas and Objectives

Focus Area	Objectives	Relevant SDG	Relevant IS Credit
Enhanced Urban Design and Place-making	Enhance the Swan River crossing and surrounding area The Swan River is an iconic feature in the Perth landscape and is a significant aspect of Indigenous and Perth heritage. The Swan River and its surrounds provides beneficial use to a variety of users. There are many stakeholders that will need to be consulted as part of the design and construction of the Redcliffe Bridge.		Con-2 Urban and Landscape Design Context
	Maximise connectivity for multi-mode transport The design of Tonkin Gap and Associated Works must meet the needs of different transport users including road (passenger and freight), rail, cycling and pedestrians. It is essential for the upgraded bridge and alignment to consider and address all these needs in the final design.	 	Con-2 Urban and Landscape Design Context Ecn-1 Options Assessment
	Preserve and enhance ecological values Preserving and enhancing ecological value is an important aspect of the Project. This is significantly associated with the ecological value that the Swan River has for terrestrial and aquatic fauna and flora.		Con-2 Urban and Landscape Design Context Eco-1 Ecological Assessment and Risk Management

Focus Area	Objectives	Relevant SDG	Relevant IS Credit
	Preserve and enhance heritage values Preserving and enhancing the Indigenous, natural and European heritage values is an important aspect of the Project. This is mainly attributed to the Swan River and surrounding precinct.		<i>Con-2</i> Urban and Landscape Design Context <i>Her-1</i> Heritage
Management and Mitigation of Impacts to Water	Optimise the design and groundwater interface The design and groundwater interface represents a significant challenge for the Project due to existing contamination, presence of acid sulfate soils, the quantity of water required to be dewatered during construction, and the ongoing impact of groundwater on buried assets.	 	<i>Env-1</i> Receiving Water Quality
	Reduce impacts relating to groundwater contamination and acid sulfate soils Groundwater contamination and acid sulfate represent challenge in various locations along the alignment.		<i>Rso-2</i> Contamination and Remediation <i>Rso-3</i> Management of Acid Sulfate Soils <i>Wat-2</i> Utilising Appropriate Water Sources
	Minimise impacts and improve discharge quality to surface water The Swan River has the potential to be significantly impacted by the Project. As such minimising impacts and improving long term water discharge into the Swan River through sensitive urban water design is a key sub-focus area.		<i>Env-1</i> Receiving Water Quality
Efficient resource use and sourcing	Optimised material selection and quantity Infrastructure projects require significant quantities of materials to be constructed. Appropriate selection and design optimisation can markedly contribute to minimise impacts to the environment and society.		<i>Rso-1</i> Resource Efficiency Strategy and Management <i>Rso-4</i> Resource Recovery
	Reduce energy requirements and emissions Infrastructure projects contribute a significant portion to Australia's and the world greenhouse gas emissions. Designing and delivering an energy efficient project is essential to minimising global warming and reducing depletion of finite resources.		<i>Ene-1</i> Energy Efficiency

Focus Area	Objectives	Relevant SDG	Relevant IS Credit
	Reduce water requirements While a road project during operations does not consume significant quantities of water compared to other types of infrastructure, water consumption during construction is considerable. Minimisation through construction methodology is important to reducing the use of this precious resource in our drying climate.		<i>Wat-1</i> Avoiding Water use
	Reduce waste and maximise onsite reuse and recycling Responsible stewardship of waste generated onsite is essential to improving environment and community outcomes.		<i>Rso-4</i> Resource Recovery
	Integration of offsite recycled products and materials The project has opportunity to reduce use of virgin material through enhancing the integration of recycled material.		<i>Rso-1</i> Resource Efficiency Strategy and Management
Industry Prosperity	Improved workforce diversity and wellbeing Enhancing workforce diversity has significant benefits to the wellbeing of the Project workforce and of our community.		<i>Wfs-2</i> Workforce Culture and Wellbeing <i>Wfs-3</i> Diversity and Inclusion
	Develop capability and capacity in subcontractors An opportunity to diversify and enhance businesses, particularly for large projects such as Tonkin Gap and Associated Works, is beneficial to improving resilience in the industry.		<i>Wfs-1</i> Jobs, Skills and Workforce Planning

Focus Area	Objectives	Relevant SDG	Relevant IS Credit
	<p>Increased Aboriginal Participation</p> <p>Aboriginal participation in the workforce is low compared to other community groups, and due to the size and nature of the project, there is opportunity to enhance outcomes in this area.</p>	  	<p><i>Wfs-1</i> Jobs, Skills and Workforce Planning</p> <p><i>Wfs-3</i> Diversity and Inclusion</p>
Consultation and Partnership	<p>Effective community engagement</p> <p>Working with the community and meeting reasonable expectations during construction and operation are an important part of delivery of the Tonkin Gap Project and Associated Works.</p> <p>Improved outcomes for the Swan River and other key precincts through consultation</p> <p>Working with stakeholders and the community through targeted information and consultation events is a key priority for the Tonkin Gap Project and Associated Works.</p> <p>Effective decision making through collaboration with METRONET</p> <p>The linkage between the Associated Works Project and the MEL Project makes consultation with METRONET during design and construction an important aspect of the project.</p>	 	<p><i>Sta-1</i> Stakeholder Engagement Strategy</p> <p><i>Sta-2</i> Stakeholder Engagement Strategy Implementation</p>

3.2 Sustainability Targets

Using the sustainability framework developed in the early stages of the Alliance forming, Sustainability Targets were formed for design, construction and operation to drive sustainability outcomes through the duration of the Project. Targets for the construction phase are detailed in Table 2 with a comment on the status of performance. A number of these will remain open until the project reaches practical completion, however the full target list is provided in Appendix 2, providing more detailed updates on the status of achieving these targets. Progress against each target is reported to the senior management team on a monthly basis. As described above, the targets have been linked within the Sustainability Framework to Focus Areas and Project objectives for sustainability.

Table 2 TGA Construction Targets for Sustainability

Focus Area	Target	Performance
Enhanced urban design and place making	Implement at least two opportunities to enhance the Swan River precinct identified during consultation with key external stakeholders.	Achieved – Extensive consultation undertaken for precinct and opportunities implemented in design.
	Implement at least one opportunity to improve user connectivity for each mode of transport identified for the project.	Achieved – Construction of PSP along extent of Project, connecting to existing paths and providing new pedestrian access.
	Implement at least one environmental enhancement opportunity, with a stretch target for two opportunities.	Achieved – Remediation of historical contamination at the southern dive
Management and mitigation of impacts to water	Implement the three (3) adopted mitigation strategies for minimising the risk and challenges of the design and groundwater interface identified during design	Achieved – Design considerations made to minimise the groundwater interface.
	Implement the prepared Acid Sulfate Soil Management Plan	On track – Measures continue to be implemented as required, however risk is low at this stage of construction
	Implement the prepared Site Contamination Management Plan	On track – Measures continue to be implemented as required, however risk is low at this stage of construction
	Implement the identified methods and management measures to minimise impacts on the Swan River water quality or use	Achieved – Construction works in the Swan River are completed and management measures were in place throughout construction.

Focus Area	Target	Performance
	Achieve no more than two (2) Class 2 incidents and zero (0) Class 1 incidents, as defined by the TGA Environmental Management Plan	On track – No Class 1 incidents recorded to date and only one Class 2 incident recorded.
	Implement monitoring of the Swan River and achieve the water quality criteria as specified in the management plan approved under the Swan and Canning Rivers Management Act 2006	On track – Monitoring continues throughout construction as per plan requirements.
Efficient resource use and sourcing	Achieve at least a 5% reduction in materials used on the project as measured by the IS Materials Calculator (i.e. based on environmental impacts)	On track – Modelled reduction in Design suggest TGA on track to achieve, with a review to be undertaken at PC when all data has been collated.
	Divert at least 85% of clean/inert excavation spoil from landfill and reuse at least 50% onsite	On track – Tracking at over 92% reuse onsite, with 100% diverted from landfill.
	Divert at least 60% of office resource outputs from landfill	At risk - Office waste diversion tracking at 58% diversion from landfill.
	Divert at least 70% of other inert resource outputs from landfill	On track – Tracking at 71% diversion from landfill.
	Re-use/retain at least 65% of contaminated soil on site (excluding asbestos), and dispose of no greater than 10% to landfill	On track – Cinders contamination treated and reuse, no other contamination (excluding asbestos) has been identified.
	Re-use/retain at least 50% of acid sulfate soils on site, and dispose of no greater than 15% to landfill	On track – Tracking at 100% diversion from landfill, with 87% reused onsite.
	Implement at least two (2) opportunities to replace use of virgin materials, with a stretch target for four (4) opportunities	Achieved – More than 4 opportunities to replace virgin materials have been implemented.
Industry prosperity	Achieve 75% satisfaction on the cultural and wellness survey of team cohesion	On track – The latest employee survey showed 91% satisfaction of team cohesion.
	Attract and retain at least 10% of new entrants into the workforce (new employees with less than 5 years' experience)	On track – Tracking at 21% employees with less than 5 years in the construction industry.

Focus Area	Target	Performance
	Achieve at least 10% of the workforce representing women	On track – TGA are tracking at 10.4% female participation.
	Fundraise for 1 event supporting people living with disabilities, such as City to Surf for Activ (host a team etc.)	In progress – Event for 2023 being considered by Project.
	Celebrate 1 event during Pride Month or throughout the year	On track – Pride month has been celebrated each year.
	Develop a Flexible Working Arrangements Policy	Achieved – Flexible Working Arrangements Policy implemented in early 2021.
	Investigate engagement through the Infrastructure Ready Program	Abandoned – Project has focused efforts on other employment programs.
	Celebrate 1 event for Harmony Week	Achieved – Harmony Week has been recognised each year with Toolboxes and knowledge sharing events.
	Prepare at least three discrete packages of work to enable to WA Limestone to achieve Main Roads prequalification level R2, and two other small subcontractors have intent to submit for B1/R1.	On track – WA Limestone have submitted R2 pre-qualification and one other subcontractor has achieved R1 pre-qualification
	Engage at least 30 Aboriginal FTEs for the entire project duration	At risk – Not expected to achieve the FTE target, however overall participation has been ~6%.
	Award at least \$10m of contracts to Aboriginal businesses	Achieved – TGA has significantly exceeded this target, with a new project stretch target of \$30M established.
	Provide at least 1 mentor to Aboriginal employees for project duration	On track – TGA has been partnered with Nudge since 2021, providing mentoring services to Aboriginal employees.
	Establish a Project Working Group and implement at least two (2) initiatives related to Aboriginal participation	On track – Traditional Owner Advisory Group was established early in design and have contributed to development of the heritage trail and participation progress.

Focus Area	Target	Performance
	An Aboriginal Coordinator was appointed for the project and was available for at least 20%-30% of the project	On track – An Aboriginal Coordinator has been involved on the Project since 2021.
Consultation and partnership	Maintain communication channels and maintain dust mitigation strategies and monitoring	On track – Construction updates and targeted communication channels include information about anticipated dust impacts to residents and businesses.
	Maintain communication channels and maintain noise mitigation strategies and monitoring	On track – Construction updates and targeted communication channels include information about anticipated noise impacts to residents and businesses.
	Maintain communication channels and maintain vibration mitigation strategies and monitoring	On track – Construction updates and targeted communication channels include information about anticipated vibration impacts to residents and businesses.
	Complete stakeholder satisfaction surveys every 6 months and achieve at least a 60% rate for stakeholder satisfaction	On track – Latest stakeholder satisfaction survey showed 85% satisfaction.
	Complete community perception surveys every 6 months and achieve at least a 50% rate for community sentiment	On track – Latest community perception survey showed 86% feel positively towards the Project.
	Stakeholder input influences more than one (1) priority project negotiable (as defined in the CSEP)	Achieved – 12 negotiable issues have been influenced by community and stakeholder inputs.
	Maintain consultation channels with key external stakeholders during implementation of opportunities for Swan River precinct	On track – Consultation regarding foreshore reactivation works will be ongoing through construction.
	Complete bi-monthly meetings with METRONET to establish progress and obtain feedback for integration with the project	On track – Regular meetings continue to manage the interface between the two Projects.

3.3 Climate Change Assessments

A Climate Change and Natural Hazard (CCNH) risk assessment was undertaken involving representatives from the TGA design, environment and community teams, as well as key stakeholders from Main Roads, PTA, the impacted LGAs and Perth Airport. The risk assessment used the Representative Concentration Pathway (RCP) 8.5 modelled scenario to quantify climate predictions for the years 2030, 2050 and 2090. RCP scenarios were adopted from the Intergovernmental Panel on Climate Change (IPCC) and simulate both future energy technologies and emissions. The pathways produce emissions scenarios that are then used by scientists to run complex climate models that simulate how the climate might change in the future. The Project adopted RCP 8.5 as it is the more conservative approach with the intention to protect the constructed project physically and its users throughout its 100-year design life.

3.3.1 Climate change projections

The following key projections are attributed to the Southern and South-Western Flatlands West sub-cluster, which represents the south-west area of WA (Climate Change in Australia, 2021):

- Average temperatures will continue to increase in all seasons (very high confidence).
- Decreasing winter rainfall (high confidence), spring rainfall also projected to decrease (high confidence).
- More hot days and warm spells (very high confidence).
- Increased intensity of extreme rainfall events (high confidence).
- A harsher fire-weather climate (high confidence).

3.3.2 Identified risks and adaptations

Two high priority risks facing the Project relating to increases in extreme weather, including increased frequency and intensity of bushfires and flooding, were identified. To minimise risk of aquaplaning from rainfall events, the geometry of the road was assessed and reviewed and this risk was eliminated from the Design. Risks associated with bushfire events were mitigated through review of landscaping species selection and mulching in fire prone areas. This includes maximising the use of groundcovers and trees in suitable areas, providing more fire-retardant plant in revegetation mixes and application of larger particle mulch. Mitigation actions have been incorporated into the relevant design reports and landscaping framework and implementation of the landscaping works are commencing at the time of this report being prepared. Implementation is being monitored as part of closing out the climate change risks in the risk register.

3.4 Technology and Innovation

The Project has endeavoured to pursue opportunities to include innovative construction methodologies and materials by incorporating new technologies, improving the outcomes of the Project. Ongoing engagement with industry and other Main Roads and PTA projects allows for the sharing of sustainability knowledge, lessons learnt and driving enhanced outcomes in innovative technologies. Innovative initiatives are captured as part of the Project's Opportunities Register, where implementation plans are identified and carried out.

Collaboration between subcontractors, suppliers and non-owner partners have facilitated the implementation of opportunities. This includes changes to design and construction methodologies to remove requirement for a temporary pier in the Derbarl Yerrigan, trialling use of recycled content in retaining wall blocks and use of lower carbon concrete. These innovations were identified through the opportunities assessment process and through ideas generated from suppliers or external parties. Further detail is provided in an example below.

3.5 Innovation Case Study

TGA has prioritised resource efficiency and innovative opportunities in line with our objectives to *optimise material selection and quantity* and *integrate offsite recycled products and materials*. Through establishment of robust procurement processes and communication of our sustainability priorities, a partnership opportunity with WA Limestone was identified. WA Limestone had existing relationships with Avertas Energy and Covalent Lithium, from which a partnership was formed to deliver trials for two different retaining wall blocks containing recycled construction and demolition waste, with an incinerator bottom ash aggregate (IBAA) (with Avertas) and de-lithiated beta spodumene (DBS) (with Covalent).



Figure 7 Extruded recycled blocks at WA Limestone Yard

IBAA is a by-product from the waste-to-energy process, which enables the recovery of energy from residual waste. Typically, this product would be disposed of to landfill, and with the waste-to-energy plant operations commencing in Kwinana within the coming months, there's a significant opportunity to take the material and find another use for it, one of these being as a substitution for virgin limestone blocks. One block contains the total residual waste equivalent of 105 standard household landfill bins (240L).

DBS is the primary co-product in the lithium hydroxide refining process with approximately seven tonnes of DBS produced for every tonne of lithium hydroxide. Covalent Lithium are currently constructing multiple lithium refineries, which will be the first refineries in Australia and subsequently will be producing output materials, including DBS, that will require management.

The benefits of these trials include replacement of virgin materials, contribution to circular economy principles and the development of new product industries, supporting local economic development. Both of these applications were verified by the ISC as 'Australia Firsts'.



Figure 8 Recycled blocks at WA Limestone’s yard

4 Economic

4.0 Key Economic Context

Industry prosperity is a material issue for the Project due to its significant size and its capacity to impact local economies. Tonkin Highway is at the centre of several major road projects to improve connectivity and network operations in the region, with the road carrying more than 120,000 vehicles daily. Connecting the Gateway WA and NorthLink WA projects, this section of Tonkin Highway forms part of a vital freight and commuter access route for WA. Insufficient capacity to meet current demand at this location has created a 'bottleneck' that constrains the full realisation of the benefits from recent investments in Tonkin Highway and planned future investments to upgrade intersections and extend Tonkin Highway to the south.

The Project will transform Tonkin Highway to deliver a high standard, north-south transport link from Muchea to Mundijong. The upgrades are expected to save road users up to six minutes of travel time during morning peak and up to 11 minutes during afternoon peak. The Project has been fast-tracked as a part of the State Government's \$5.8 billion COVID-19 WA Recovery Plan. The Plan prioritises major road and rail projects across the state to connect suburbs, reduce congestion, support local jobs and bolster economic recovery.

The road safety improvements that will result from the construction of the Project include reducing the impacts of congestion that have contributed to the intersection of Tonkin Highway and Collier Road being rated as the worst in the state for vehicle crash frequency and cost between 2011-2015. This cost, totalling \$15.8 million for the period, will be significantly reduced with the road development. Additionally, the \$194.2 million cost of congestion and the \$19.6 million cost to the environment through air pollution and emissions are expected to be reduced when the Project is completed.

The surrounding land use is predominantly residential, however there are large areas of commercial/industrial land along Tonkin Highway north of Reid Highway, between Broun Avenue and Guildford Road. These commercial estates are characterised by auto services and associated businesses with a broad range of other businesses including construction, materials engineering and resource processing facilities. The Perth International Airport is also located close to the works along Great Eastern Highway and Tonkin Highway.

4.0.1 Economic parameters

Economic parameters are used to assess the progress of the Project through the construction phase. A summary of economic performance and aspects for the Project are detailed in Table 3.

Table 3 Summary of Economic Aspects

ECONOMIC ASPECT	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Funding Received	\$	202,950,100	542,999,418
Indigenous Enterprises	#	31	31
Disability Enterprises	#	1	1
Suppliers Engaged	#	666	666
Buy Local Spend	\$	292,514,825	462,514,823

4.1 Key Economic Outcomes

Extensive consultation continues to be undertaken with local businesses and industries to provide support during the construction phase and maximise benefits to these stakeholders during the operation of the asset. These stakeholders are noted among the full list in Appendix 3. Impacts to businesses along Great Eastern Highway and off Tonkin Highway have been felt during construction as a result of road closures and detours, as well as occasional noisy or night works. Targeted meetings are held with these businesses to discuss access and any other concerns the business owners may have.

The Project is expected to have created more than 3,000 jobs throughout the construction phase, which is anticipated to be completed over three and a half years. Projects like Tonkin Gap have been flagged as crucial by the State and Federal governments to support the WA economy. This job creation is also targeting young workers entering the workforce and maximising engagement and participation of local Aboriginal workers and businesses. This is further detailed in Section 6.5 and 6.9.

The key economic outcomes expected for the Project include:

- Improving travel times and the productivity of one of Perth's major freight routes.
- Reducing congestion and the high proportion of merge, diverge and weave movements that are leading to an increase in concern for the safety of asset users.
- Improving current cycling and pedestrian connections to increase local amenity.
- Providing infrastructure to support the delivery of METRONET's Morley-Ellenbrook Line.



Figure 9 Broun Ave Bridge reopening press conference with Minister for Transport Rita Saffioti, Member for Bassendean Dave Kelly, Member for Perth Patrick Gorman, with TGA and Main Roads representatives.

During the last financial year, milestones have been achieved, which align with progress against these objectives:

- Traffic permanently shifted onto completed Broun Avenue combined road and bus bridge over Tonkin Highway.
- Redcliffe Bridge western PSP opened under the bridge.
- Opening of Redcliffe Bridge to traffic.

Improvements to traffic times will be realised once practical completion is reached as closures and detours have ongoing impacts. Further details about the impacts to travel times during construction is discussed in Section 6.6.

4.2 Sustainable Procurement and Buy Local

TGA's procurement processes are mediated by the Project Sustainable Procurement Policy, the Commercial Management Plan and the Industry Sustainability Plan. Several of the Project sustainability targets are related to Industry Sustainability and Sustainable Procurement. Each plan and policy align with the State Government's industry sustainability and participation strategies. These include the WA Buy Local Policy, WA Industry Participation Strategy (WAIPS) and the Aboriginal Procurement Policy (APP). The Buy Local Policy in particular focusses on small and medium sized enterprises (SMEs), which make up at least 97% of WA businesses, and TGA aims to procure WA based goods and services as a first priority.

The targets for Industry Sustainability are included in the overall [Sustainability Targets](#) for the Project. The Project team is committed to ensuring all aspects of sustainability are considered in the procurement process and the [Sustainable Procurement Policy](#) is available on the Main Roads Project website. Progress against various economic parameters is presented in Table 3 above and further detail in Appendix 2.

In the initial stages of the Alliance forming, TGA partnered with the Civil Contractors Federation (CCF) to engage with the wider market in preparation for the procurement of packages on the Project. This was done over two separate sessions, one which was targeted at CCF signatories and one targeted at Aboriginal businesses. The sessions communicated the Project commitment to sustainable procurement, procurement and tender evaluation processes and types of packages.

Sustainable procurement processes dictate how we initially engage with and assess our suppliers, and ongoing supplier management (Figure 10). Criteria used in the assessment includes environmental impact, resource use and waste, stakeholder and community, safety, quality and industry experience and industry sustainability, and diversity (focussing on female and Aboriginal participation). This assessment is applied to all suppliers wanting to be engaged on the Project. This process has contributed to outcomes such as trialling Holcim's lower carbon ECOPact concrete mix, significant spend on Aboriginal businesses and increased female participation.

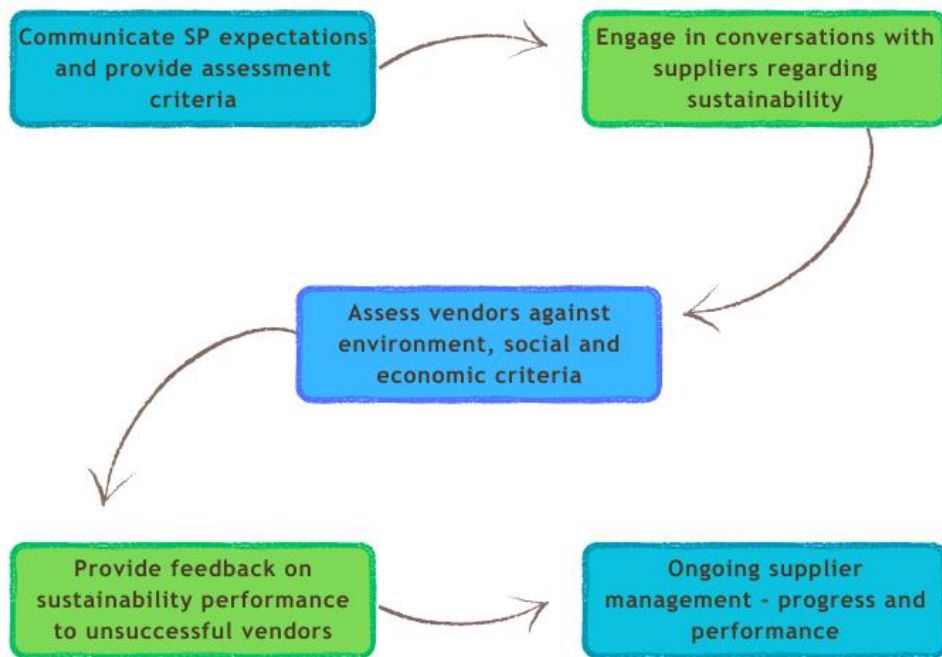


Figure 10 Simplified sustainable procurement process

4.3 Sustainable Transport

The widening of Tonkin Highway will significantly reduce the congestion and stop and start motions currently experienced along this portion of the road network. This is expected to reduce carbon emissions emitted from idling vehicles. The Project will also provide improved principal shared path (PSP) and cycling connections, encouraging the use of active transport modes.

The Project has undertaken a permeability self-assessment to define expected improvements in connectivity and placemaking. The assessment sought to define a baseline of the existing network and quantify improvements that would result from the construction of the Project. The assessment took into consideration walking and cycling connectivity, journey time reliability, access to cycleways, integration of culture and heritage and the provision and improvement of public spaces and stop and rest areas.

The Project is improving upon baseline permeability through:

- Reconnection of nature walks in Claughton Reserve and upgraded paths – works will be commencing soon alongside the foreshore reactivation works.
- Upgrading the shared paths from east and west sides of Great Eastern Highway, linking to the new upgraded Victoria Street footbridge to provide safe access across Tonkin Highway – Victoria Street footbridge and linkages completed in this financial year.
- Provision of a pedestrian underpass and shared path between Railway Parade and Stanton Road – expected to be completed by late 2023.
- Provision of rest stops on shared path networks – works will be completed as part of the foreshore reactivation and scar tree node.
- Optimising of connection points for walk and cycle crossings along Tonkin Highway.
- Reactivation of Derbarl Yerrigan foreshore – works are yet to commence however design has been finalised based on extensive community and stakeholder feedback.

- Interpretive heritage trail – works yet to commence with consultation and procurement ongoing.

Future proofing of the Project has been considered in the provision of these aspects of sustainable transport and additionally through the Associated Works package which is providing key infrastructure and services to METRONET's Morley-Ellenbrook Line. The Morley-Ellenbrook Line will provide an alternative travel option in Perth's highest car usage corridor, anticipating an increase in public transport use among Perth's population. Provision of alternative transport options are expected to contribute to a reduction in vehicle emissions.

4.4 Economic Case Study – Aboriginal Participation

When the Tonkin Gap Alliance was initially formed, a number of targets were agreed with Main Roads that are aligned to the Project priorities and Key Result Area's (KRA). One of these KRA's was Aboriginal Participation, which included the development of targets for employment and Aboriginal business spend.

An initial target of \$10 million spend on Aboriginal businesses was agreed and the team began focussing on opportunities through the procurement processes. This included identifying priority packages of work to target Aboriginal businesses for, as well as incorporation of 'Aboriginal Participation' criteria within the procurement multi-criteria analysis, encouraging the team to consider opportunities for Aboriginal employment and business spend for every package of works pursued. To date, the Project has a committed spend of over \$25 million on Aboriginal businesses and have subsequently adopted a stretch target of \$30 million.

The Traditional Owner Advisory Group (TOAG) was established in 2021, providing a platform for collaboration and review of design and legacy opportunities, working near the Derbarl Yerrigan and recruitment and business engagement, amongst other matters. TGA regularly reported progress against our business spend and employment targets to the TOAG, and the group provided valuable insights and advice for engagement methods. Additionally, the Main Roads Aboriginal Advisory Group advocates for positive change for Aboriginal people in WA, meeting quarterly to discuss initiatives that will help Aboriginal businesses and people develop and thrive. In March, TGA was invited to present for the group on our focus on Aboriginal participation and our progress to date (Figure 11).



Figure 11 Main Roads Aboriginal Advisory Group on a site tour with TGA representatives

5 Environmental

A summary of environmental performance and parameters for the Project is detailed in Table 4 to provide a snapshot of progress to date. Further detail is provided through the following sections. A summary of resource inputs and outputs (waste) is provided in Table 5, with further information in Section 5.5.

Table 4 Summary of Environmental Aspects

ENVIRONMENTAL ASPECTS	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Native Vegetation Cleared	ha	0	5.96
Native Vegetation Retained (due to design)	ha	0	3.1
Revegetation/rehabilitation Undertaken	ha	55	55
Number of Trees Cleared	#	~10	~256
Number of Trees Retained (due to design)	#	0	43
Total Water Consumption	kL	113,417	301,755
Total Non-Potable Water Consumption	kL	111,492	293,150
Total Potable Water Consumption	kL	1,925	8,605
Non-Potable Water Replacement	%	98	97
Total Green House Gas emissions [^]	t CO ₂ -e	5,936	11,310
Total Energy Consumption	GJ	82,887	156,875
Renewable Energy Mix	%	0	0

[^] Inclusive of Scope 1, 2 & 3 emissions

Note: Project Totals are based on the data available at time of report completion, the data is subject to change in subsequent reports.

Table 5 Resource and Waste Summary

RESOURCE INPUTS AND GENERATED WASTE	UNIT	TOTAL THIS PERIOD	TOTAL FOR THE PROJECT
Resource Inputs (Materials)			
Total Quantity of Virgin Materials Used	t	295,805	872,700
Total Quantity of Recycled Materials Used	t	68,095	205,473
Total Quantity of Reused Materials Used Onsite	t	874,921	1,355,673
Percentage of Recycled Material Used	%	18	19
Resource Outputs (Wastes)*			
Waste Sent to Landfill	t	1,112	3,425
Waste Diverted from Landfill	t	233,961	298,309
Total Waste Generated by Project	t	235,072	301,735
Waste Diversion Rate	%	99.5	98.9

*Totals do not include onsite reuse of resources.

Note: Project Totals are based on the data available at time of report completion, the data is subject to change in subsequent reports.

5.0 Environmental Context

The Project is located in a highly urbanised area of Perth, made up of both residential and industrial areas. Some undisturbed land with significant environmental features, such as the Threatened Ecological Community (Figure 12), is present to the north of the Project area (Appendix 3). The Project also crosses the Derbarl Yerrigan which, despite past bank modification, supports riverine flora and fauna.

In terms of green spaces, the Project area encompasses a range, from remnant native vegetation to areas of high disturbance. Small sections of native vegetation were present adjacent to the existing Tonkin Highway near Dunreath Drive, Belmont; around the Broun Avenue, Morley interchange; and on the shoreline of the Derbarl Yerrigan. The largest section of native vegetation, in the northern section of the Project area, is where TGA has constructed the northern dive structure for the rail line to run underneath the road and continue east of Tonkin Highway (Figure 12). These native vegetation areas have been approved for clearing under the *Environmental Protection Act 1986* and associated regulations, some with offset requirements. Other vegetation present within the Project includes weeds, non-native species and roadside revegetation species native to WA.

The Project area includes spaces of significant disturbance and some instances of ground contamination. This includes inert waste that has been illegally dumped and contamination from historical industrial use. Contaminated waste is managed in accordance with the various TGA contamination management plans, which were reviewed by an independent Contaminated Sites Auditor.



Figure 12 Aerial photo of the northern dive, showing the threatened ecological community to the north of the construction site, with Tonkin Highway to the west.

5.1 Environmental Management

Based on the Tonkin Gap Alliance values and commitment to Zero Harm, TGA is aiming to provide the best practice engineering solutions using sustainable environmental management principles and practices.

A Project specific Environmental Management Plan (EMP) provides a framework for the management of all environmental aspects of the Project. The primary purpose of the EMP is to describe the management systems and procedures, which will be adhered to in achieving Project environmental objectives and goals. The EMP is the overarching reference for environmental management throughout the construction phase and prescribes all applicable procedures, processes and practices to be undertaken by TGA and their subcontractors. The EMP outlines processes to manage environmental risks, minimise impacts on the surrounding environment and ensure compliance with regulatory requirements and other obligations throughout project delivery. The EMP undergoes 6-monthly external audits and is subsequently reviewed and updated as required. Within the last financial year, the only required changes were to the roles and responsibilities due to changes within the organisational structure of the environment team. Site Environmental Management Plan's are prepared for specific working areas to highlight the most material issues/risks for the environment at that site.

The Project EMP, its sub-plans and procedures are applicable to all project works, staff, and subcontractors. Sub-plans include the Flora Management Plan to ensure no risks to ecosystem health occur due to construction related effects on native flora. Mature trees, trees of significance and remnant vegetation as well as potential Black Cockatoo habitat trees have been retained as far as practicable within the approved Project Site boundary.

The key environmental legislation impacting the Project include:

Commonwealth Government

- *Aboriginal and Torres Strait Island Heritage Protection Act 1984*
- *Aboriginal and Torres Strait Island Heritage Protection Regulations 1984*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environment Protection and Biodiversity Conservation Regulations 2000*
- *National Environmental Protection Council Act 1994*
- *National Greenhouse and Energy Reporting Act 2007*

State Government

- *Aboriginal Cultural Heritage Act 2021*
- *Biodiversity Conservation Act 2016*
- *Biodiversity Conservation Regulations 2018*
- *Contaminated Sites Act 2003*
- *Environmental Protection Act 1986*
- *Environmental Protection Regulations 1987*
- *Environmental Protection (Noise Regulations) 1997*
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*
- *Environmental Protection (Controlled Waste) Regulations 2004*
- *Environmental Protection (Unauthorised Discharges) Regulations 2004*
- *Heritage Act 2018*

- *Rights in Water and Irrigation Act 1914*
- *Swan and Canning Rivers Management Act 2006*

Compliance with legislative requirements detailed in environmental approvals is monitored regularly and to date, there have been no non-conformances. The environmental approvals and allowance are summarised in Table 6.

Table 6 Environmental Allowances, Approvals and Permits

ENVIRONMENTAL ALLOWANCE TYPE	UNIT	PROJECT ALLOWANCE
Clearing Permit Allowance (CPS5242/5)	ha	14.9
Clearing Permit Allowance (CPS 8939/1)	ha	1.23
Clearing Permit Allowance (CPS 818/15)	ha	0.74
Water Abstraction Licence (5C for construction water)	kL	441,738
Water Abstraction Licence (5C for dewatering)	kL	1,659,401

5.2 Water Management

Water is a material aspect of the Project, due to the intersection with the Derbarl Yerrigan and groundwater sources, and as a significant requirement, for use during construction. Requirements for water during the construction phase include use for dust suppression, material compaction and optimisation, site office use, piling and other construction activities. Water use is monitored and reported on monthly through bore meter readings and invoices from suppliers. A model for construction and operational water use demonstrated a reduction of 6% compared to the determined baseline. This model considered the various end uses of water and any modelled reductions from implementation of initiatives. A water sourcing assessment was undertaken which identified several opportunities to reduce or improve the efficiency of water use.

Key water saving and efficiency initiatives that have been implemented include:

- The use of dewatering effluent for construction purposes such as dust suppression and compaction works.
- Re-infiltration of dewatering effluent wherever possible to reduce the net loss to the aquifer system and limit the potential offsite impacts due to groundwater drawdown.
- The use of dewatering effluent as spray field, during summer periods or due to vegetation distress due to drawdown.
- Construction methodology change for piling at the southern dive to reduce water required for bentonite required for the construction of diaphragm walls.
- Use of alternative subbase materials, namely crushed recycled concrete, which has a lower optimal moisture content (OMC) %, meaning less water is required for compaction compared to crushed limestone (Figure 13).

To mitigate the impact on groundwater, a water quality monitoring program has been implemented. This program was created in accordance with the Swan River Construction EMP, Acid Sulfate Soils (ASS) and Dewatering Management Plans, and licence conditions for groundwater abstraction under the *Rights in Water Irrigation Act 1914*. Appendix 2 details TGA's progress towards targets related to minimising impacts on the Derbarl Yerrigan water quality and groundwater interface.

Initial modelling of water usage for the Project construction phase was done for the IS submission and this base line is used to monitor monthly usage against. Data is being recorded on a monthly basis which will be used to update the final model towards the end of the construction phase.



Figure 13 Crushed Recycled Concrete subbase placed onsite

Table 7 Water Parameters

WATER PARAMETER	TOTAL THIS PERIOD		TOTAL FOR PROJECT	
	kL	%	kL	%
Potable Water				
Standpipe / Scheme Water Purchased	1,925	2%	8,605	3%
Non-Potable Water				
Bore Water	111,492	98%	293,150	97%
Surface Water	0	0	0	0
Recycled / Wastewater	0	0	0	0
Total Water Used	113,417	100.0	301,755	100.0

Note: Project Totals are based on the data available at time of report completion, the data is subject to change in subsequent reports.

The Project has completed all works in the Derbarl Yerrigan with minimal impact, having adopted careful planning and environmental management procedures. Some of the actions the Project team has taken to achieve this include:

- Removed the need for a temporary pile within the river during the installation of the bridge.
- Use of 'coffer dams' which have sheet piled walls to stop sand and other material from the works area entering the river.

- Regular monitoring of water quality surrounding site works.
- Regular implementation and revision of the area Erosion and Sediment Control plan.

5.3 Vegetation

5.3.1 Clearing

Due to the highly urbanised location of the Project, the local community highly values the vegetation in or around the Project, particularly at the Derbarl Yerrigan foreshore and recreational areas. In response, the Project team aimed to minimise clearing. The Project team developed an internal clearing permit, in accordance with the EMP and relevant external approvals. The design, construction, and environment teams would do a walkthrough of areas to identify opportunities to retain vegetation, ensure clearing lines were easily identifiable to prevent confusion and, if required, organise fauna relocation prior to clearing. The clearing hierarchy has been implemented to minimise the clearing footprint and this is further described below.

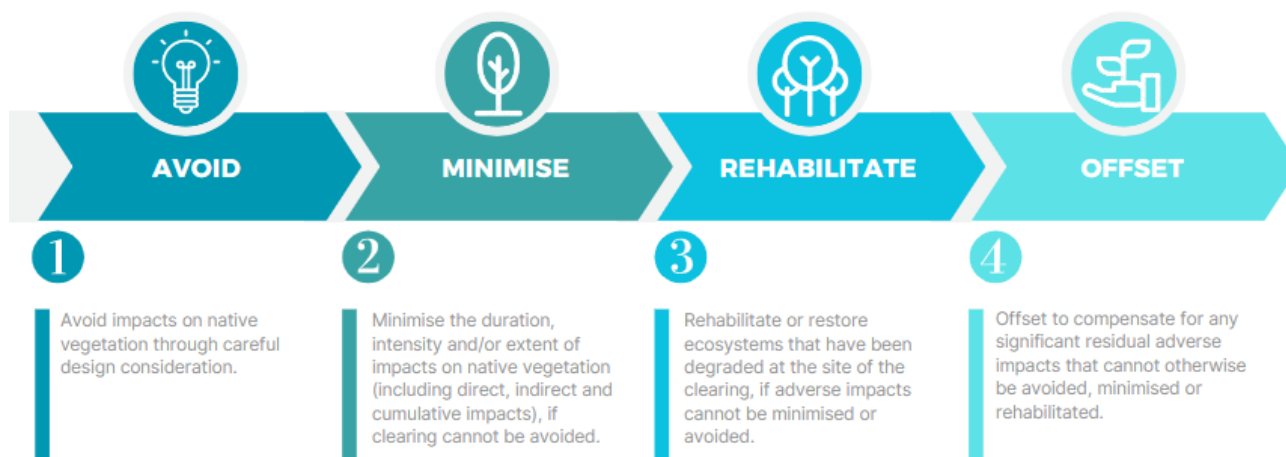


Figure 14 Clearing hierarchy priorities in order of importance

5.3.2 Revegetation/Rehabilitation

Across the Project, a total area of 29.1 ha will be revegetated. Landscaping has undertaken across the site over the last winter period, and continues now with areas that are reaching completion, with approximately 70% of landscaping complete. With construction works expected to be complete towards the end of 2023, this will ramp up over the next season. A mix of understory and canopy species have been selected for revegetation and landscaping works to meet the following criteria:

- Have provenance to the probable remnant vegetation complexes and existing Derbarl Yerrigan foreshore vegetation.
- Black cockatoo foraging and nesting habitat species.
- Additional species selected that have provenance to the Swan Coastal Plain.
- WA native landscape species selected for feature planting, with selection of species from Wildflower Capital Initiative.
- Select species, in consultation with Traditional Owner Working Group, that provide a connection to local Aboriginal use of the land surrounding the Project area.

5.3.3 Dieback

Dieback is a threatening process for biodiversity of south-west WA. The potential risks of transport of dieback through contaminated plants, equipment and materials and control measures have been implemented as per the EMP and managed by the Project through the Weed and Dieback Sub-plan.

There is known dieback to the north of the Project, in an area that is considered Brownfields and clearing has been undertaken for the construction of the northern dive structure. There have been no incidences of dieback being a concern during construction. As part of the EPA approval for the northern section, the Public Transport Authority conduct quarterly flora surveys which have also concluded low risk. Control measures are still in place and identified in the TGA Clearing Permits, including:

- Visual checks of all high-risk vehicles, plant and equipment entering site for evidence of loose soil, mud and pest flora seed, recorded on the Pre-Site Acceptance Checklist.
- Plant and equipment used in clearing and grubbing operations have been cleaned down prior to leaving site.
- Separation of weed infested vegetation and topsoil from 'clean' material. and been taken to an appropriate landfill facility for disposal.
- Movement of machines and vehicles restricted to designated tracks and clearing areas.
- Material used on site has come from cut-to-fill on site which has been assessed as dieback uninterpretable and imported fill has been sourced from reputable quarries obtained from depths greater than where dieback or weeds would be present.
- On-going record keeping of weed and dieback inspections.

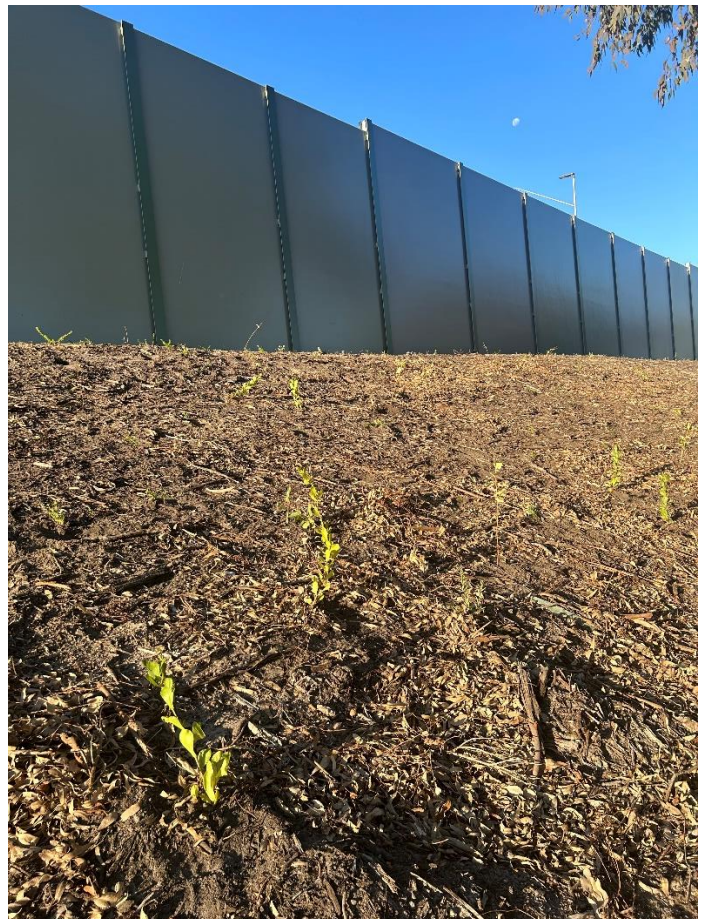


Figure 15 Landscaping undertaken near Wright Crescent

5.4 Carbon Emissions and Energy

The reduction of energy and carbon emissions is considered a priority objective for TGA, identified in Table 1 and is tied into the *"Efficient resource use and sourcing"* focus area. The Project will contribute significant carbon emissions during the full lifecycle of the asset, with the construction phase making up a portion of this. The sources of emissions during construction include:

- Emissions required to produce and deliver construction materials (embodied energy).
- Fuel use by construction plant, vehicles, and equipment (including travel to and from work by staff).
- Electricity consumption at offices and on-site temporary lighting.
- Waste transported from site to various facilities and emissions from waste to landfill (e.g., municipal solid waste from offices).
- Lost carbon sink from cleared vegetation.

For operations, the attributable modelled sources include lighting and traffic signals, pavement maintenance and asset user emissions (vehicles using the road). The energy model prepared for the Design submission considered Scope 1, 2 and 3 emissions and energy consumption across the construction and operation phases. This model demonstrated at least a 5% overall reduction in emissions as a result of changes that occurred through the value engineering process and implementation of other energy reduction opportunities.

Management is undertaken in accordance with the Carbon Emissions and Energy sub-plan within the Project's EMP. Monitoring during construction is ongoing for electricity and fuel use, involving the tracking of subcontractor fuel use and onsite refuelling.

The following initiatives have been implemented to reduce energy use during construction and operation:

- LED lighting on Redcliffe Bridge and on the PSP (4.7% reduction).
- Minimised clearing areas at the northern dive, several drainage basins and around the Derbarl Yerrigan (6.2% reduction).
- Changes in design and construction methodology, contributing to reduced fuel burn from plant and equipment, and the material required for construction (4.6% reduction). Examples include:
 - Removal of temporary pier in the river (Redcliffe Bridge), reducing fuel from plant and materials required for construction.
 - Mechanically Stabilised Earth walls at Broun Avenue, opting to use limestone blocks for a portion of the wall over precast concrete, reducing install hours and fuel burn (Figure 16)
 - Change from diaphragm walls to secant pile walls at the southern dive, reducing install hours and fuel burn. Alternative permanent pre-cast barrier system trialled on sections of the Project, reducing install hours and fuel burn.

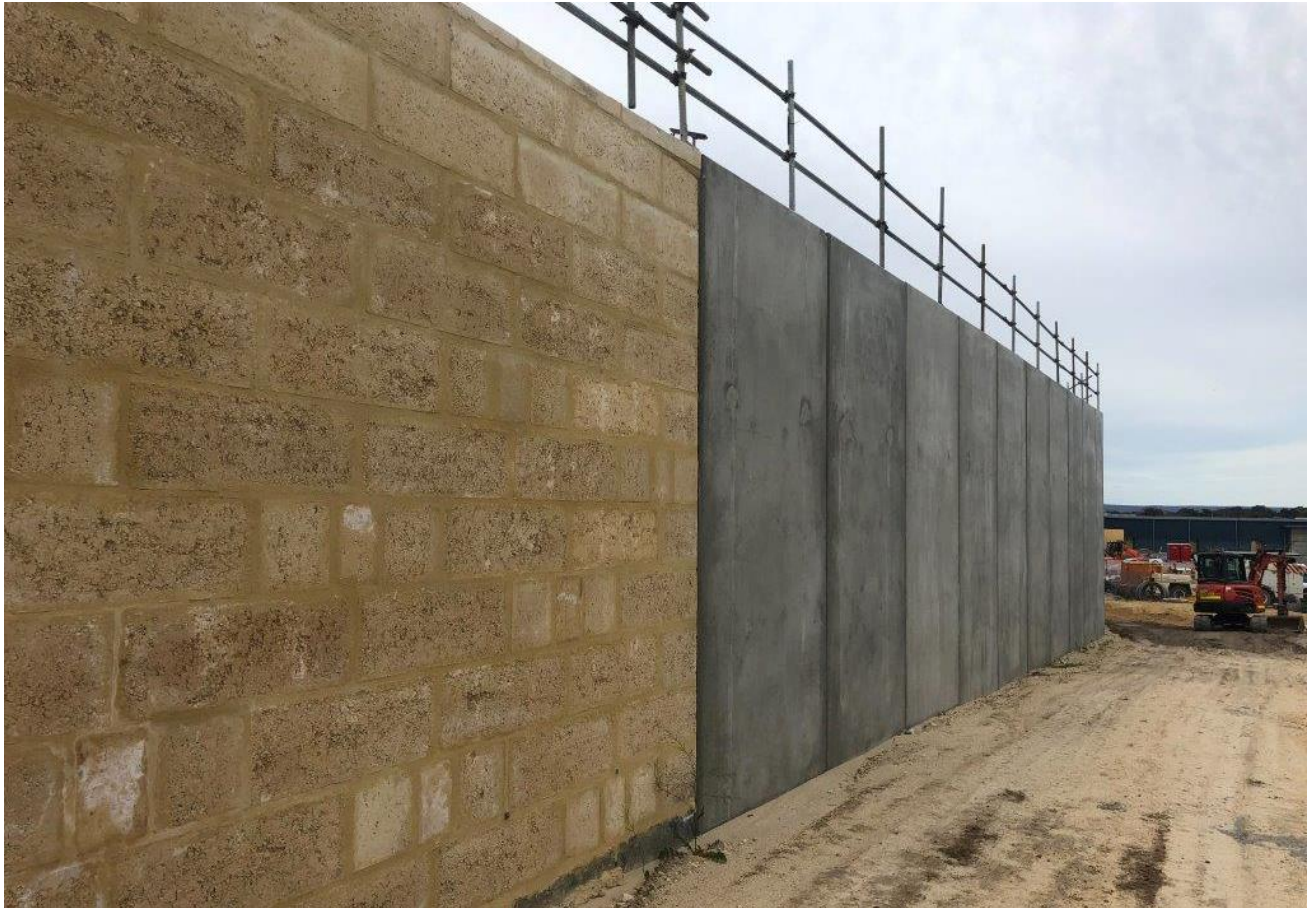


Figure 16 Limestone block transition for Broun Avenue MSE wall

The energy use of the Project to date, inclusive of the design and construction phase, is detailed in Table 8.

Table 8 Energy Parameters

ENERGY PARAMETERS	TOTAL THIS PERIOD			TOTAL FOR PROJECT		
	LITRES	KWH	% OF TOTAL USE	LITRES	KWH	% OF TOTAL USE
Unleaded (on and off road)	7,217	-	0.28%	14,969	-	0.33%
Diesel Used (on and off road)	2,115,271	-	98.51%	3,985,771	-	98.07%
Liquefied Petroleum Gas (LPG)	0	-	0	0	-	0
Biodiesel	0	0	0	0	0	0
Hydrogen	0	0	0	0	0	0
Oil	0	0	0	0	0	0
Other	0	0	0	0	0	0
Purchased Electricity from Grid	-	275,310	1.19%	-	698,464	1.6%
Green Power Mix	-	-	0	-	-	0
Generated from Renewable Energy Onsite and Used Onsite	-	0	0	-	0	0
Total Energy Used	-	275,310	100.0	-	698,464	100.0

Note: Energy in gigajoules (GJ) is calculated using the conversion values detailed in the [National Greenhouse Account Factors](#).

Note: Project Totals are based on the data available at time of report completion, the data is subject to change in subsequent reports.

5.5 Materials and Recycling

Material use and resource efficiency is an issue for the Project due to the high quantities of construction materials required. The Project Resource Efficiency Strategy (RES) objectives align with the wider regional strategy of the East Metropolitan Regional Council (EMRC, 2016) and the WA Waste Avoidance and Resource Recovery Strategy (Waste Authority, 2020). The RES includes resource specific targets (see Table 2) and management actions detailed within the action plan. The Project internally tracks resource inputs and outputs for monthly reporting to Main Roads and to measure modelled and actual impacts.

The Project has used significant volumes of materials including concrete, sand and fill material, steel, crushed limestone and aggregate. Major outputs for the Project include demolition waste, steel, contaminated soil, asphalt and general waste (refer to Table 9-Table 11 below for a detailed breakdown). The Project has adopted initiatives that reflect best practice applications to reduce the quantity of virgin materials used, remove outputs from waste streams and recycle materials where possible. These initiatives contain combinations of circular economy, industrial ecology, industrial symbiosis, cleaner production and resource recovery concepts.

The Project continues to maximise the use of recycled materials wherever possible, through reusing on-site resources or importing recycled materials from other projects or suppliers, such as those noted below. There are some restrictions with regards to using recycled materials, namely materials must meet certain specifications or receive exemption, and there may be locations where recycled materials are not suitable to be used, such as in wetland areas due to potential contaminant leaching. Recycled materials imported to date include road base, crushed concrete, asphalt and sand. The Project continues to import crushed recycled concrete from a local *Roads to Reuse* supplier, who is also contracted to remove various waste products from the site, including concrete, road base and other aggregates. While it is not guaranteed that TGA are importing their own waste concrete, there is alignment with circular procurement processes.

The following initiatives have been adopted onto the Project in the last FY:

- Repurposing of Victoria Street footbridge on another Project, rather than sending for recycling.
- Import of crushed recycled concrete from local supplier, approximately 30,000 tonnes this financial year.
- Reuse of 5,200 tonnes of pavement materials from demolition works on site.
- Use of blocks with recycled construction and demolition waste in place of virgin limestone, approximately 4,600 tonnes.
- Cut to fill optimisation with approximately 100% reuse of suitable excavated material on site.
- 100% onsite treatment and reuse of ASS material.

Table 9 Imported Raw/Traditional Materials for the Project

IMPORTED RAW/TRADITIONAL MATERIALS			
MATERIAL	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Aggregate	t	8,312	12,347
Aluminium	t	12.7	12.7
Asphalt	t	62,095	88,146
Ballast	t	0	0

IMPORTED RAW/TRADITIONAL MATERIALS			
MATERIAL	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Bedding Aggregate	t	60	178.4
Bitumen	t	173.5	243.7
Bitumen Cutter (kerosene)	t	6	15.4
Bitumen Cutter (diesel)	t	12.5	13.7
Cement	t	528.2	1,288.3
Cement Additives	t	0	0
Cement Stabilised Backfill	t	660.9	858.9
Clay	t	0	0
Concrete	t	40,035	111,429
Crushed Dust (including Cracker Dust)	t	0	45
Crushed Limestone	t	72,350	331,129
Crushed Rock	t	51,352	113,145
Emulsion Based Prime (e.g. Ecoprime)	t	397.4	534.2
Ferricrete	t	0	0
Geofabric Polymers	t	0	0
Glass (including Glass Beads)	t	0	0
Gravel	t	0	0
Laterite	t	20,023.7	20,368.7
Lime	t	0	0
Lime Additives	t	0	0
Mechanically Stabilised Earth Backfill	t	0	0
Mulch	t	0	0
Paint (Waterborne, Thermoplastic, Cold Applied Plastics)	t	13.8	19.4
Perspex	t	0	0
Plastic	t	60.6	60.6
Precast Concrete	t	4,733.7	27,968.7
Sand	t	20,461	128,322
Steel	t	10,819	27,652
Synthetic Binders	t	0	0

IMPORTED RAW/TRADITIONAL MATERIALS			
MATERIAL	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Topsoil	t	145	145
Other – Limestone blocks	t	380	2,566

Note: Project Totals are based on the data available at time of report completion, the data is subject to change in subsequent reports.

Table 10 Imported Recycled Materials for the Project

IMPORTED RECYCLED MATERIALS			
MATERIALS	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Crumb Rubber	t	0	0
Crushed Recycled Concrete	t	30,699	70,911
Crushed Recycled Glass	t	0	0
Eco-blocks	t		
Geopolymer Concrete	t	0	0
Low Carbon Concrete	t	0	136.8
Mulch and Soil Conditioner (not including Food Organic and Garden Organics (FOGO))	t	0	0
Mulch (FOGO)	t	0	0
Soil Conditioner (FOGO)	t	0	0
Reclaimed Asphalt Pavement	t	32,599.7	33,801.6
Recycled Aggregate	t	0	0
Recycled Aluminium	t	0	0
Recycled Clay	t	0	0
Recycled Granular Material	t	0	0
Recycled HDPE Plastic Pipes	t	0	0
Recycled Mineral Sand	t	0	0
Recycled Sand (as per the definition in the Contractor Monthly Reporting form)	t	0	87,586
Supplementary Cementitious Materials – slag	t	0	0
Supplementary Cementitious – fly ash	t	0	0
Supplementary Cementitious – silica fume	t	0	0
Supplementary Cementitious – other	t	0	0
Topsoil	t	0	2,149.9

IMPORTED RECYCLED MATERIALS			
MATERIALS	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Warm Mix Asphalt	t	0	0
Other - Plastic	t	155.8	155.8

Note: Project Totals are based on the data available at time of report completion, the data is subject to change in subsequent reports.

Table 11 Materials Reused on the Project

MATERIALS REUSED WITHIN THE PROJECT SITE			
MATERIAL	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Aggregate	t	0	0
Asphalt (RAP)	t	0	0
Clay	t	0	0
General Fill	t	0	0
Granular Material	t	0	0
Limestone	t	0	0
Mulch	t	0	0
Overburden	t	0	525
Road Base	t	5,200	5,420
Sand	t	749,360	1,122,713
Spoil (treated ASS)	t	29,803	136,888
Topsoil	t	90,559	90,559
Other	t	0	0

Note: Project Totals are based on the data available at time of report completion, the data is subject to change in subsequent reports.

5.6 Noise and Vibration

As construction noise is considered a nuisance for nearby residents, it is considered a material topic for the Project and managed in accordance with the Construction Noise, Vibration and Dust Management Plan (CNVMP). The plan includes mitigation measures in place for construction, project specific targets and the monitoring management.

CNVMPs are developed for each of the relevant LGAs to cover the construction activities which are scheduled to occur outside normal construction hours (7am to 7pm Monday to Saturday), predominantly for safety reasons and minimising disruptions to the road network. Separate Noise Management Plan (NMP) approval is developed as required, such as where construction works using noisy equipment is scheduled to occur close to residences during out of hours periods or at the specific request of the approving authority.

The environmental and stakeholder engagement teams work together to mitigate impacts to residents and the environment when noise and vibration occurs. Residents are provided with

notification of upcoming construction works that may cause noise and vibratory disturbances via letter drops to impacted areas, email, social media pages and the Main Roads website. TGA has a community complaints process to ensure complaints regarding environmental noise and vibrations emission are recorded and investigated. The team responds to complaints by confirming noise level limits, using monitoring equipment, and then continuing to monitor activities to ensure noise and vibrations emitted are within accepted levels. Anticipated noise and vibrations expected during operation of the asset is mitigated through inclusion of noise walls in locations where noise would have exceeded acceptable levels for human comfort, determined through modelling.



Figure 17 Installation of noise walls on Redcliffe Bridge

5.7 Air Quality

Measures to mitigate impacts from other emission sources, including dust, are managed through the Project EMP. Air quality, including dust, is considered a material issue for the Project given the proximity to sensitive receptors including residents.

During construction, the key management measures for minimising and controlling dust across the project site include:

- Existing vegetation to be retained wherever possible and cleared only when necessary.
- Cleared areas, topsoil and spoil stockpiles areas not being worked for extended periods of time will be temporarily covered or stabilised with a more permanent suppressant, such as chemical, hydromulch or landscape treatments, particularly during the Christmas/New Year break. Stockpiles within the vicinity of sensitive receptors, such as residents, are also chemically stabilised to minimise dust lift.
- Dust control with water carts as required including minimal overspray.
- All vehicles hauling materials within the site will be adequately covered or wetted down, other than dump trucks.

- A speed limit will be clearly signposted and erected close to the access point advising of a 10 km/h speed limit within the site.
- Incorporating mulch and chemical sealant compounds to assist with dust suppression.
- Street sweeping if required.

All of these measures have been implemented at various times and intervals during construction. Avoiding the creation of dust in the first instance, either through minimising large cleared areas or using chemical suppressants, is the most effective method for reducing impacts, however where dust is generated from construction activities, the use of water carts spraying down areas is adopted as the dominant measure.



Figure 18 Directional Dust Deposition Gauge in use near Broun Avenue

Dust monitoring occurs on site through a number of directional dust deposition gauges (Figure 18) as well as two DustTraks either side of the southern dive structure construction area. The DustTraks provide live dust data and deposition gauges provide observations of dust coming off the site. The DustTrak monitors were moved around in early 2023, including being positioned at Lot 2 and Wright Crescent, before being retired in April 2023. During the winter months, the rainfall provided adequate dust suppression so it was deemed unnecessary to maintain these on site. Ongoing checks are carried out to ensure no work activities are causing environmental nuisance or harm through excessive dust.

Dust/emission levels are assessed visually, and mitigation measures are assessed as being necessary whenever dust generation has been visually identified (e.g. dust evident on nearby vegetation or properties). These measures may include additional water carts being sent to the area or in extreme cases, works being stopped temporarily to manage the dust.

5.8 Light Spill

Temporary lighting is used during nightworks for safety reasons, and light spill is controlled as much as possible through lighting tower positioning and construction methodology. Temporary lighting is to be directed towards construction works, away from private properties and vegetation/fauna habitat where possible to prevent excessive light spill. These lighting towers are moved around depending on where the work is being undertaken. Regular visual checks along with horizontal light spill measurements are carried out to ensure no light spill is causing environmental nuisance. Some longer term temporary solar lighting has been used to minimise noise impacts and emissions from the typical diesel generator lighting towers, at Broun Avenue and along shared paths across the Project.

5.9 Contamination

The Project includes a contaminated site which was historically used for the manufacturing and storage of superphosphate fertilizer and small volumes of associated chemicals from 1920 to 1933. By-products and residue produced at the site (including pyritic cinders) were disposed of and buried across the former site area. Following the cessation of manufacturing operations, contaminated site investigations identified elevated heavy metal concentrations in the soil, particularly along the western boundary and north of the former superphosphate bins (current eastern boundary of the Tonkin Highway).

The site, located north of Railway Parade, is where the first dive structure (southern dive structure) is being constructed to enable the new rail line to travel under the existing road and into the median to continue its journey north.

Remediation works have been undertaken for the land adjacent to the road to help clean up this historical issue. Contamination investigations to date, including those done by TGA, have further shown the extent of this pre-existing contamination, with some pockets of this cinders material within the Project footprint. As a result, as these pockets of cinders materials have been found during the excavation works, they have been quarantined and assessed for treatment and reuse. This material was stockpiled separately to acid sulfate soils, treated with lime and encapsulated as fill material in the Guildford Road abutment.

5.10 Acid Sulfate Soils

The Project site includes areas where Acid Sulfate Soils (ASS) naturally exist in the substrate under the surface. When exposed to air, this can increase the acidity of the soils and any water present. Across the Project area, the ASS risk profile ranges from 'moderate to low', with pockets of 'high to moderate'. TGA has an ASS Management Plan developed in consultation with relevant Australian Site Contamination National Environment Protection Measures (ASC NEPM) and Department of Water and Environmental Regulation to mitigate this risk during the numerous excavations across the Project site, the most significant of these being the northern and southern dive structures.

Separate complementary Construction Contamination Management Plan (CCMP) and Acid Sulfate Soil and Dewatering Management Plans (ASSDMP) were prepared to inform and guide the Project team during excavation/disturbance of natural ground for the dive structures. The northern dive is located north of Marshall Road in Malaga and the southern dive is north of Railway Parade in Bayswater.

5.11 Environmental Case Study – Rainbow Plastic

Significant volumes of construction and demolition waste are generated during the construction phase of a Project. Typically, this is managed in accordance with the waste hierarchy, with a majority of construction waste sent for recycling. While typical construction outputs such as concrete, asphalt and aggregates can be reasonably straight forward to recycle or re-sell commercially, other waste materials such as plastics, can often fall between the gaps, either as a result of less significant volumes being produced or limited recycling potential.

Since late 2021, the Tonkin Gap Alliance have been sending rigid Polyvinyl chloride (PVC) and High Density Polyethylene (HDPE) plastic to Rainbow Plastics, waste resulting from work related to services such as lighting. They offer a specialised recycling service for waste PVC and HDPE plastic from mining and construction sites in WA and are committed to achieving a circular economy model for waste construction plastic. To date TGA have sent over 30 tonnes of waste plastic to Rainbow Plastic

to be processed into a plastic pellet product (Figure 20), which is then sold back to Australian pipe manufacturers to manufacture new plastic pipe products.

Earlier this year, TGA representatives has the opportunity to visit the facility in Wattleup and observe the stages of processing, as well as the significant stockpiles of product that Rainbow Plastic have collected from numerous sites across WA (Figure 19).



Figure 19 PVC and HDPE plastic pipes at Rainbow Plastics yard



Figure 20 Processed PVC and HDPE plastic pellets from recycled pipes

6 Social

Social parameters are used to assess the progress of the Project through the construction phase. A summary of key social aspects and performance for the Project is detailed in Table 12. Some social aspects are reflected in targets, for which progress is detailed in Appendix 2.

Table 12 Summary of Social Aspects

SOCIAL ASPECT	UNIT	TOTAL FOR THIS PERIOD	TOTAL FOR THE PROJECT
Stakeholders engaged	#	6000+	6000+
Stakeholder enquiries received	#	624	1795
Heritage sites in project vicinity*	#	2	2
Length of Principal Shared Path (Addition/Refurbished)	km	1.82	1.82
Women in Workforce	%	11.13	11.04
Indigenous People in Workforce	%	6	8.67
Total Recordable Injury Frequency Rate (TRIFR)	#	5.93	5.93
Hours of Training Undertaken	hrs	2079	9829
Development Employees and Apprentices on the Project	%	4.03	6.19

*Project vicinity is defined as 50 metres from the project boundary.

Note: Project Totals are based on the data available at time of report completion, the data is subject to change in subsequent reports.

6.0 Social Context

Consultation and partnership are material issues for the Project and engagement with the community and other stakeholders is key to the success of the Tonkin Gap Project. The Project area intersects three local government areas, being the cities of Belmont, Bayswater and Swan.

The City of Belmont is located 6km from Perth's central business district and has 11km of Derbarl Yerrigan frontage. The City is home to 44,000 people and is expected to grow to 65,659 by 2041. The City is a mix of residential, commercial, and light industrial properties and includes part of the Perth Airport. The City of Belmont connects to the City of Bayswater via the Redcliffe Bridge on Tonkin Highway across the Derbarl Yerrigan.

Known as the "Garden City", the City of Bayswater, located 8km northeast of Perth, covers 35 sq/km and has 10km of Derbarl Yerrigan foreshore. Parks and conservation areas within the City support abundant bird and other wildlife while key recreational and other facilities, business destinations, shopping and schools are established.

The City of Swan is a thriving hub of demographic and economic growth with some 159,000 residents living across 42 suburbs (City of Swan, 2016). The City has 74,200 employed residents and more than 10,000 actively trading businesses. A small portion of the most northern section of the Project intersects with the City of Swan.

Table 13 Social context statistics

Aspect	City of Belmont ¹	City of Bayswater	City of Swan
Size (sqkm)	40	35	1,044
Population	44,000	72,000	159,000
% born overseas	40%	45% ²	33%
% non-English language at home	30%	Unknown	21%
Employment	91%	93%	92%
Indigenous population %	2.5%	1.6%	0.03%

The Project is located on Whadjuk Noongar Boodjah and intersects with the Derbarl Yerrigan (Swan River), a site of significance in local Aboriginal culture (Figure 21).



Figure 21 Redcliffe Bridge linking the cities of Bayswater and Belmont via Tonkin Highway (over the Derbarl Yerrigan)

6.0.1 Social Outcomes

The Project is expected to generate substantial social outcomes for community and various stakeholders, providing local employment opportunities, improving efficiency and connectivity for vehicles and pedestrians/cyclists and enhancing recreational areas. Over the past year these activities have included:

- Finalising design of the heritage trail for the project

¹ 2016 Census QuickStats: Belmont (WA) (abs.gov.au)

² 2016 Census QuickStats: Bayswater (C) (abs.gov.au)

- Finalising design for the activation of public space under Redcliffe Bridge
- Ongoing consultation with the Project's Traditional Owner Advisory Group, including approval of proposed artworks
- Creation of local jobs
- Retired Engineers Group WA site tour
- Engagement of local Aboriginal artists to deliver landform art design and artwork for underpasses and abutments.
- UWA engineering students site tour

6.0.2 Priority Issues

Through review of Local Community Strategic Plans, common themes were identified for the ongoing community development in the LGAs intersecting with the Project. These have been summarised in a word cloud below based on priorities identified by community members and outlined as emerging themes in the plans (CoBe, 2020; CoBa, 2021; CoS, 2021).



Figure 22 LGA priority issue word cloud

6.1 Community and Stakeholder Engagement

The Project identified a comprehensive list of community stakeholders with relevance to the Project (Appendix 5). Community and stakeholder engagement is delivered in accordance with TGA's Community and Stakeholder Engagement Plan (CSEP), which was developed based off engagement commenced by Main Roads during the project development phase. TGA has prioritised the delivery of targeted and inclusive engagement to ensure the views of all demographics are represented in relation to the Project.

This has resulted in the development of several working groups to provide input on various aspects of the design and delivery. These groups are consulted on a range of issues that relate to the terms of reference and may include pedestrian and shared path design and detours, Selby Park impacts and design, environmental and ecological impacts and revegetation, and Aboriginal employment, procurement and heritage elements. Some of these have been dissolved as they had a design input focus, however in the last financial year, TGA continues meeting with the LGA working groups, including Bayswater on a monthly basis and Belmont and Swan on a more ad-hoc basis.

Engagement with the Whadjuk community has taken place through the establishment of a Traditional Owner Advisory Group (TOAG). The TOAG has provided advice and oversight of TGAs progress towards Aboriginal participation targets while also providing input into detailed engagement for relevant aspects of the Project, such as the activation of community spaces under Redcliffe Bridge and the heritage trail, which will both begin construction later this year. This group has met twice over the last financial year.

This dynamic and transparent approach to stakeholder engagement has resulted in positive responses to stakeholder and community sentiment surveys, which permitted the Project team to achieve its [Sustainability targets](#) for effective community engagement for the design phase of the Project. We are also on track to meet construction-related targets for community engagement (Table 2).

6.1.1 Methods of Engagement

Through assessing stakeholder profiles, anticipated project impacts and key issues associated with the construction program, the TGA community and stakeholder engagement team has designed a project-specific engagement program tailored to the interests of our stakeholder groups and program of work.

TGA attempts to maximise opportunities for stakeholders to provide input and have a genuine role to influence design and Project outcomes. This is done through the identification of Project negotiables and working with the relevant technical teams.

TGA shared the designs at 15%, 85% and 100% (design stages) at Open House events to ensure that community had the chance to provide feedback and suggestions. At Open House events we allow the public to talk and ask questions of the subject matter experts from the project team. The last open house event was held in July 2022 and it is unlikely another similar event will be held as they are predominantly design focussed. Engagement methods for the remaining months of construction will include monthly construction updates, LGA working group meetings, TOAG meeting (if required), community and key stakeholder surveys, face-to-face meetings (as required), letter box drops, social media posts and emails.

Our approach overlays the reactive and process-driven functions necessary for good quality project stakeholder engagement with a detailed program of proactive profiling opportunities which strengthen relationships and build a positive project profile. Our programs are IAP2 compliant, and we deliver methods of engagement which can be found across most aspects of the IAP2 Participation Spectrum. Examples of where these methods sit in the spectrum are provided in the overview of our planning and delivery approach below (Figure 23).

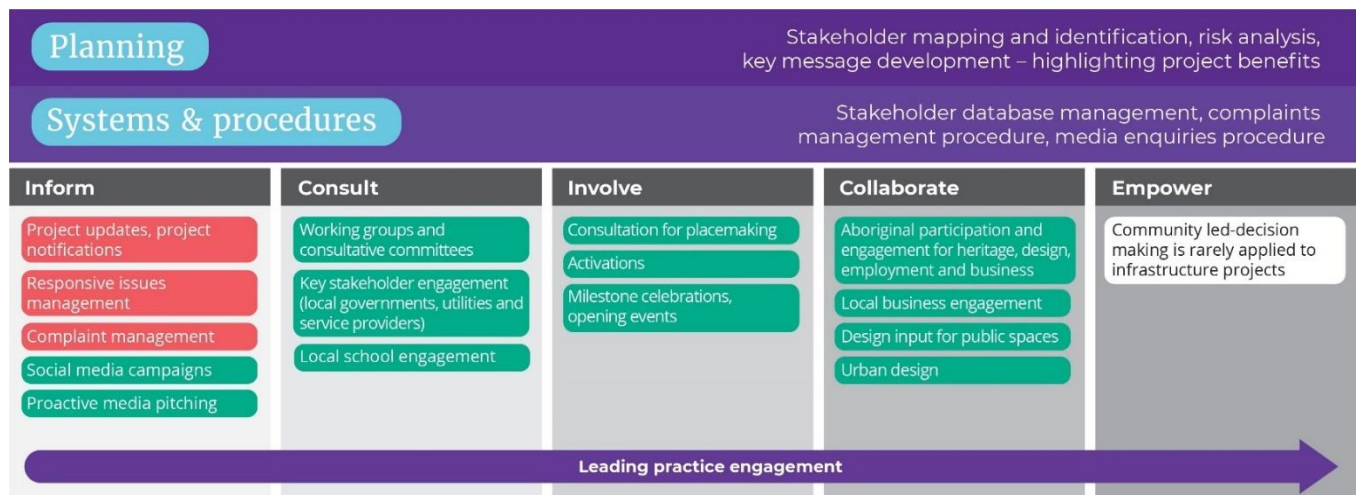


Figure 23 IAP2 Stakeholder Engagement Delivery Approach

Methods of engagement undertaken in the last financial year include:

- Targeted consultation with special interest groups including:
 - Selby Park, Environmental, Great Eastern Highway businesses, Ascot residents, Derbarl Yerrigan recreational users, Perth Airport, PSP users and industry bodies, Cherry Court residents, Traditional Owners and Local Government Authorities
- Community Open House events and drop in sessions
- Monthly construction updates - sent via EDM and letterbox drop
- Social media (Facebook posts, LinkedIn posts, Youtube videos)
- Face-to-face engagement with individual residents
- Email
- Letterbox drops
- Text updates when doing major works
- Community, client and stakeholder perception surveys
- Site tours
- Site walks

TGA has taken a fairly unique approach to engagement, engaging extensively through social media platforms and site tours for community and stakeholders. The community team have championed more than 23 site tours for different groups of community members, residents and key stakeholders to provide insights into program progress and foster relationships between our stakeholders and the TGA workforce.

6.1.2 Negotiables and Non-negotiables

Negotiables are elements of the Project where stakeholders are able to influence outcomes. The non-negotiable elements that cannot be influenced by stakeholders includes engineering and design requirements listed as part of the Project scope. The negotiables have been communicated to

stakeholders through numerous engagement methods, with opportunity provided to have input into various aspects of the design and construction of the Project. Negotiables identified in the CSEP are highlighted in Figure 24.



Figure 24 Project identified negotiables

Issues related to negotiables that have been raised by community members and other stakeholders are recorded in the Community Influence Register, and some examples of where input/consultation has led to changes in design or outcomes are noted below:

- Noise walls included on Redcliffe Bridge
- Change in design to retain vegetation
- Victoria Street footbridge design reviewed by working group
- Noise wall locations added due to community or stakeholder influence
- Basin location design changed to retain vegetation
- Community input into underbridge development design
- Pedestrian Shared Path access points amended due to community input
- Community and stakeholder input into Selby Park design
- Traditional Owner input into underpass artwork
- Provision of proposed cycling detours to WestCycle and community for review
- Privacy screening added on Broun Avenue Bridge
- Inclusion of Scar Tree node near the Swan River, in consultation with DBCA and TOAG

6.2 Community Satisfaction and Amenity

Reputation has been identified as one of eight key result areas for the project. Two of the four KPIs in the reputation KRA are the responsibility of the community and stakeholder engagement team. Community satisfaction for the project currently sits at 86%. This is the average of perception surveys undertaken annually by independent survey company, Painted Dog. The last survey was completed in November 2022, with the final survey expected to be rolled out around October 2023.

Community feedback is an important part of our strategy, and is encouraged through face-to-face consultation, email, phone call and surveys. Relationships were developed early during the planning stages with key stakeholders, including local government, government agencies, residents, industry, business, service providers and Traditional Owners, as well as highly impacted community members. These stakeholders were provided with a direct line of contact with the Project community team.

The Project uses the Main Roads CONNECT system to record community interactions. An example of when we have addressed concerns from community include receiving dust complaints and we relay this onto the construction team, who then implement dust mitigation strategies to address the dust.

The Project has aimed to improve local amenity through the integration of active and sustainable transport infrastructure into the Project design. This is reflected in the Project [Sustainability targets](#) which include objectives to maximise connectivity for multi-mode transport. As described above, the opportunity to improve the existing amenity within the recreational area under the Redcliffe Bridge has been investigated by the Project team with extensive engagement undertaken with various groups. Surveys, online polls and face-to-face consultation has contributed to the final design elements, which include a pump track and MTB skills area, yarning circle, canoe landing area, improved connectivity, and revegetation works. The final design was released in June 2023, along with a frequently asked questions fact sheet, which are available on the Project's website.

The [Sustainable Transport](#) section of this report addresses the permeability assessment undertaken for the Project. In addition to those opportunities pursued in relation to connectivity, the Project also aims to improve community amenity. These include the provision of increased rest stops along the shared path network, new and improved underpasses and pedestrian bridges, and the realignment of pedestrian crossings along Tonkin Highway to optimise accessibility to local primary schools and for users of Selby Park. The Project will also begin construction later this year on an Interpretive Heritage trail that will provide educational signage, artwork and other elements to reflect local Aboriginal and European heritage.

6.3 Heritage

6.3.1 Aboriginal Heritage

TGA recognises the Whadjuk community as the Traditional Owners of the land and their cultural and spiritual connection to the land grants them an entitlement to be actively engaged in the Project. Through multiple heritage surveys and consultation, two sites of cultural significance have been identified within the Project area. Approval to disturb areas of significance was obtained by Main Roads in 2019 for the two sites:

- Derbarl Yerrigan (Swan River ID 3536)
- River gum trees with cultural scar (ID 37868) (Figure 24)

TGA aims to avoid, minimise and reduce our negative impacts to Aboriginal heritage sites wherever practicable, in line with Main Roads' commitment to recognising Aboriginal heritage. The

management of cultural heritage is delivered in accordance with the Project Cultural Heritage Management Sub-plan. In addition to this management the entire Project team is educated about the sites and their significance through Project inductions. TGA also requires the presence of heritage monitors, appointed by the South West Aboriginal Land and Sea Council, during any works that may disturb the sites. The monitors have been used (and will continue to be engaged) for works in and near the Derbarl Yerrigan and significant earth movement. Other management and monitoring measures used have included weekly Environment and Sustainability Inspections, and visual checks during excavation works.

6.3.2 European Heritage

One site of European heritage significance, listed on the City of Bayswater Heritage List, was the Brady's Plasterworks. The Project required demolition of the building located on Railway Parade, to facilitate the construction of the southern dive structure. Prior to demolition an archival record was produced at the request of Department of Planning, Lands and Heritage in order to preserve information about this cultural site. The Heritage Council determined that, while the place may have some cultural heritage value, it is unlikely to have the cultural significance required to meet the conditions for entry into the State Register, under Section 38 of the *Heritage Act 2018*.

6.3.3 Interpretive Heritage Trail

Infrastructure projects that pass through Aboriginal and European heritage sites have the benefit of being able to create a greater awareness and connection with our history among visitors and residents. It allows for a greater appreciation and understanding of the history in that area, giving community a sense of pride and shared cultural heritage of the area. It can also deter anti-social behaviour including graffiti and damage to property.

An opportunity was identified through the design phase to include an interpretive heritage trail within the Project. This would link with the already established heritage trail that was completed as part of the Northlink and Gateway WA projects and focus on Aboriginal and European heritage.

In addition to enhancing heritage, we also aim to avoid, minimise and reduce our negative impacts to Aboriginal heritage sites wherever practicable, in line with Main Roads' commitment to recognising Aboriginal Heritage.

To start collecting stories from the area, the Project engaged an Anthropologist to interview local Aboriginal families in the area. In consultation with the TOWG and other relevant stakeholders, TGA will incorporate artwork and interpretive signage at various locations along the PSP from Selby park to Guildford Road. The heritage trail will include an interpretive node at the scar trees, interpretive signage based on stories told by local families, a yarning circle, local species planting response and artwork at the Great Eastern Highway underpass (Figure 25) and the two Guildford Road underpasses.



Figure 25 Artwork at Great Eastern Highway underpass

6.4 Road Safety

To improve the connectivity and safety of all road users utilising Tonkin Highway between Collier Road and Dunreath Road, the design has focused on achieving a network that will allow for greater anticipation of other driver movements. This involves creating a network that has sufficient sight distance around curves via the reduction in barrier heights, increased shoulder widths and the improvement in signage legibility to provide sufficient notice regarding highway exits and entry points. Due to the gap in infrastructure resulting from the adjacent Northlink and Gateway developments, the lane configuration has also been amended to reduce merge movements at the tie-in locations. This reduces the risk of rear-end crashes from start-stop movements that often occur during heavy traffic. Where merge movements are still required, minor signage and adequate merge lengths are provided to increase driver decision time and notice for oncoming vehicles.

Based on consultations with the community, an importance has been placed in improving the Crime Prevention through Environmental Design (CPTED) to ensure that the newly developed infrastructure will not cause detrimental impacts to the community. Emphasis on maintaining a visible corridor for PSPs and shared paths was achieved through adequate lighting and assessment of sight distance from the highway/road where a noise wall overlap exists. Where the path network was not visible, noise wall extents were re-positioned to remove any dead-zones, hence reducing crime areas. Furthermore, noise assessments were undertaken to improve the amenity of the community with wall heights further assessed to ensure that impacted properties were not visible from the adjacent road/path network.

Movements of cyclists and pedestrians were also material in the Project objectives, in particular the movements between the east and west sides of the Highway. In the existing condition, it has been assessed that the current path network is disconnected with insufficient path width to cater for both cyclists and pedestrians. Associated risks include increased cyclist-pedestrian accidents as the east-

west path network is frequently used by school children, elderly people and those with disabilities to access either side of the highway and does not have sufficient path width to cater for bidirectional movements. To minimise the risk of conflict, a 4 metre wide PSP with forgiving grades and fall protection was provided to cater for the elderly and disabled communities. At intersections, movement of heavy vehicles were also assessed to ensure that vehicles were not encroaching on the shared path. Consequently, the new path network will run parallel to Tonkin Highway to improve connectivity between schools, housing, shopping centres.

It is crucial for Tonkin Highway to be maintained to ensure operational performance in the long term. Consequently, importance has been placed on the safety of maintenance personnel and the reduction of accidents associated with insufficient notice to oncoming vehicles and working widths. To minimise the risk of accidents, ITS infrastructure has been designed to ensure oncoming vehicles are aware of ongoing maintenance works. Furthermore, larger verge widths and pull-over areas have been designated to ensure that maintenance personnel can safely offboard the maintenance vehicle and undertake works.

6.5 Diversity & Inclusion

TGA is committed to developing and maintaining a positive, supportive and inclusive organisational culture throughout the construction phase. Workforce sustainability and employee development is a key component of this and contributes to ensuring appropriate workforce capacity and capability. TGA has therefore developed comprehensive programs to develop and support our team. The Employee Development Plan encompasses our culture, well-being programs and actions to promote diversity and inclusion in our workplace. TGA has also engaged external organisations to deliver training sessions for the entire Project team on topics of inclusion, diversity and cultural awareness.

The sustainability framework includes objectives to improve workforce diversity and well-being, and increase Aboriginal and female participation. Additionally, targets aimed at recruiting and retaining new entrants in the industry will see targeted programs and mentoring provided to team members with less than 5 years in the industry. The Project targets for inclusion and diversity include the following (see Table 12 and Appendix 2 for tracking against these targets):

- 10% of the workforce representing women.
- Engage 30 Aboriginal FTEs for the duration of the Project.
- 10% of the workforce to representing new entrants to workforce.

The Project team has developed a culture and well-being survey that is undertaken at 6-month intervals to gauge an understanding of the workforce's sentiment towards the Project team and its culture. Four surveys have been undertaken to date and have received overwhelmingly positive feedback, with an average satisfaction rate of 86.5%. Feedback received has been reviewed and developed into an action plan for continued improvement, which includes additional training for new engineers, upskilling blue collar workers, increased awareness around sustainability priorities and implementation, and increasing communications with the wider team around key milestones.

6.6 Traffic Management & Community Safety

Traffic Management is a significant component of the Project works. With such a large and diverse array of works to be completed, it is important that the traffic management is diligently planned, designed, implemented and managed.

A brief snapshot of statistics for the TGA sites are listed below to provide context for how the traffic has been managed to date, and will be managed moving forward.

- Works encompass Tonkin Highway north and southbound between Dunreath Drive to the south, and Hepburn Avenue to the north - approx. 12.5km in length.
- Works also require impact on: Reid Highway, Morley Drive, Collier Road, Guildford Road, Railway Parade, Dunstone Road, Great Eastern Highway and Dunreath Drive. This is inclusive of all respective on and off ramps for the crossroads.
- Tonkin Highway north and southbound carry 122,000 vehicles per day, with 14% of these vehicles being classed as heavy vehicles.
- Great Eastern Highway across Tonkin Highway carries approx. 45,000 vehicles per day, with 10% being classed as heavy vehicles.
- Guildford Road under Tonkin Highway carries approx. 40,000 vehicles per day.
- TGA has installed approx. 27km of temporary worksite traffic barriers across the project.
- TGA has installed over 90km of temporary line marking/temporary line marking tape on the project to date.

At the commencement of the project, TGA, in conjunction with the Main Roads operations team, agreed upon a methodology of tracking travel time through numerous nodes of the Project. This was completed using the traffic volumes mentioned above and various existing Main Roads Infrastructure such as Anonymous Bluetooth detection for vehicles travelling between existing, pre-determined areas of the Project footprint. Tracking travel time is used to gauge how the Project has impacted traffic flow through the site in comparison to a 'baseline' travel time taken prior to any works beginning. A performance spectrum matrix developed for the Project by Main Roads is below:

Table 14 Performance spectrum matrix developed by Main Roads

Good	ACOS	Poor	Very Poor
Travel time increase between 10% and 20%	Travel time increase by 20%	Travel time increase between 20% and 30%	Travel time increase greater than 30%

Main Roads has provided the TGA traffic team with access to their live metrics dashboard. This provides live data for travel time for all the available travel time nodes for the project. This data shows that between 9 July 2022 and 30 June 2023, there was an increase of less than 28 seconds travel time across the entire project. This attracts a rating of *Good* due to an increase of just 11.67%. Whilst this is a slight increase on the previously reported travel time period, the Project still maintains a *Good* rating per the matrix, which shows that the ongoing measures developed and implemented are still effective for road users in minimising their travel delays.

During the works, emphasis is placed on effective communication of all works to members of public who are potentially impacted by traffic changes or other construction activities. Therefore, all changes to the traffic environment are communicated via the TGA community team. The community team has a wide array of means to effectively communicate changes to the public, as described in earlier sections of this report.

In conjunction with the above, the traffic team also utilises the following means to effectively communicate messages to the travelling public through the site:

- Use of Variable Message Board advertising
- Use of Main Roads Gantry Variable Message Signage
- Installation of hard signage at important areas, such as principle shared path facilities

Effective communication of traffic management changes means that the travelling public are aware in advance of any possible works which may impact their regular travel patterns or behaviours and

ensures that it provides an opportunity for them to alter their travel behaviour or at least be aware.

In relation to ensuring the safety of both the travelling public and workers on the Project, TGA has adopted a policy of using temporary crash barriers at all locations where there is the potential for interface between workers and vehicles. This is especially critical on the Tonkin Highway section which experiences high volumes of traffic and high speeds. Use of temporary barriers is the safest method of protecting workers and public alike during the works. TGA primarily utilises steel barriers as they can be pinned to the pavement, but also concrete barriers where this is not possible.

The Project has also implemented a reduced speed limit of 80 km/h for Tonkin Highway through the works area and a new lane configuration to improve safety and reduce crash risk. Reduced speeds accommodate for the installation of barrier systems, modified road layouts and the access/egress of construction vehicles through the site. The new lane configuration of two through lanes at all times with dedicated lanes for off/on ramps reduces merging congestion and allows the travelling public to become accustomed to a standardised road layout regardless of travel direction. Travel time figures indicate this methodology has been effective.

6.7 Workforce Safety

Ensuring the utmost safety of our personnel is a paramount responsibility entrusted to the leadership team of TGA. Throughout the fiscal year, TGA have successfully completed over two million exposure hours on the Project, demonstrating an unwavering commitment to the well-being of our workforce. Through a strategic approach that encompasses both leading and lagging indicators, we have made significant progress in minimizing incidents and injuries, while fostering a culture of heightened awareness within our operational domains. Our leadership and supervision teams have taken charge at the forefront, exemplifying their dedication to this cause.

The implementation of Multiple Safety Strategies throughout the fiscal year has provided a systematic framework aimed at fostering positive change and continuous improvement. By setting clear expectations and employing a targeted approach in the field, our leaders have played a pivotal role in the overall injury and incident rate on the Project. The FY22/23 had a Total Recordable Injury Frequency Rate (TRIFR) of 5.93.

Our steadfast focus on key performance indicators, such as behaviour-based observations and in-field inspections, has furnished a robust structure and framework for enhancing hazard identification and mitigating risks beyond predetermined benchmarks. By adhering to an Independent Certifier audit schedule, we have ensured accountability for results and instigated a process of continual improvement.

6.8 Legacy Commitments

Legacy initiatives can be social, environmental or economic in nature and have the biggest impact when they either solve an identified issue or implement an opportunity as identified by the local community or an environmental need. The TGA Legacy Framework outlines the legacy initiatives being pursued to create lasting benefits for the community and environment, documenting the expected benefits, implementation plan and any relevant monitoring actions. Some of these legacy commitments have been discussed throughout this report, including Aboriginal participation (Section 6.5) and the interpretative heritage trail (Section 6.3.3).

6.8.1 Derbarl Yerrigan Foreshore Reactivation

The enhancement of the Derbarl Yerrigan foreshore and crossing at the base of the Redcliffe Bridge has been identified as a priority due to the community benefits implicated by its development. As a

popular recreational area, the site holds a high level of community significance for its users and reactivation of this area will provide long term community benefit. Extensive consultation has been undertaken with community and key stakeholder, with design agreed and construction expected to begin in mid-2023. Elements that will be incorporated into the reactivation area includes a pump track, MTB skills area, canoe landing, significant revegetation and landscaping, with tie into the heritage trail aspects.

6.8.2 Redcliffe Bridge Noise Walls

Inclusion of noise walls on the Redcliffe Bridge were not part of the initial Project scope for two primary reasons. Firstly, noise modelling of operation emissions indicated noise levels would not be above State Planning Policy 5.4 maximums, and therefore a noise wall along the bridge was not deemed necessary. Secondly, initial investigations determined it was not possible to retrofit standard noise walls on the existing Redcliffe Bridge whilst maintaining structural integrity. Concerns were expressed by residents early during community consultation about the potential added disturbance from bridge traffic noise. Following extensive community and stakeholder engagement, further investigation into retrofitting noise walls was undertaken and the walls have now been constructed.

6.8.3 Southern Dive Remediation

As part of constructing the southern dive structure, forming part of the enabling works for the Morley-Ellenbrook Line, TGA identified historical contamination issues associated with fertilizer and chemical manufacturing that has resulted in presence of contaminated soil and water. The contamination posed ongoing risks to the local groundwater and downstream receptors, including the Derbarl Yerrigan (Swan River). Remediation activities have included lining of infiltration basins with alkaline materials, placement of acid neutralising materials in below groundwater table trenches, removal of acidic groundwater through dewatering works and treatment of acidic dewatering effluent to increase alkalinity and re-infiltrate up-gradient from the dives, neutralising and improving groundwater pH conditions.

6.9 Workforce Development

Workforce sustainability is fundamental to the success of the Project. The Employee Development Plan was prepared to support programs and strategies in staff management, recruitment and onboarding, training, culture and wellbeing, diversity and inclusion. All workforce related targets are detailed in Appendix 2.

Training opportunities will be based around the requirements of the Government Training and Management guidelines, as well as structured training in the form of traineeships and apprenticeships offered directly through TGA and subcontractors. TGA has aligned with the training rates outlined in the Priority Start Policy and has set a target for numbers of trainees and apprentices on the Project to be 6% of total workforce hours. Graduate programs are also available through each Alliance partner, designed to assist achievement of competencies for professional formation, and provide opportunities for continued professional development. Mentoring programs are in place to support young professionals, including an internal mentor/mentee program with TGA employees from various disciplines, and external programs including the Construction Contractors Federation (CCF) Women in Construction mentoring program.

Many employees working on the Project will be absent from their parent companies for extended periods of time, meaning they may miss opportunities to set development goals and review their performance with their managers. To aid with goal setting and facilitating growth and development, TGA has conducted annual professional development reviews for all Alliance employees. The plans are an opportunity for employees and their managers to review their performance and identify any

areas for improvement. The plans also provide an opportunity for employees to reflect on their professional development goals to be pursued beyond their time working on the Project. The plan was developed by reviewing the best practices from all constructor partners and is reflective of the Project core values.

6.10 Social Case Study – Site Tours

Site tours have been a fundamental part of TGA's dynamic and interactive stakeholder engagement during construction. They provide the opportunity for different groups to engage directly with the TGA team and observe the progress being made on site.

Within the last financial year, TGA have facilitated nine site tours, not including the many site visits made by members of government and client representatives. Some of these are highlighted below.

TGA hosted the Retired Engineers Group WA in June 2023. Multiple TGA representatives were involved in leading the tour to the Redcliffe Bridge and the southern dive, providing the retired engineers with an opportunity to learn about new construction methods and technology (Figure 26).



Figure 26 Retired Engineers Group Tour at the Southern Dive Structure – June 2023

The Main Roads Aboriginal Advisory Group advocates for positive change in the construction industry, coming together to discuss initiatives that will help Aboriginal businesses and people develop. The group is made up of Senior Executives from Main Roads, OMTID and Department of Transport, as well as well-respected Aboriginal business representatives from across the state. This group attended the site for a tour in March 2023, after TGA representatives provided a presentation at the Don Aitken Centre for Main Roads (Figure 27).



Figure 27 Aboriginal Advisory Group MRWA with TGA Representatives

In May 2023, TGA hosted 35 Civil Engineering students from UWA, along with some lecturers, for a tour of the northern dive. TGA representatives gave a presentation, followed by a site tour for the students to provide them with an understanding of being on a construction site and the practical application of engineering (



Figure 28). Students were required to prepare a report for submission as part of a practical Civil Engineering unit.



Figure 28 UWA Site Tour with TGA Representatives

7 Reference List

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8 Glossary

A glossary of terms used throughout this document is detailed in Table 15.

Table 15 Glossary of Terms

Term	Description	Link to Further Information
Material; Materiality	Relevant topics are those that may reasonably be considered important for reflecting the organisation's economic, environmental, and social impacts, or influencing the decisions of stakeholders.	Global Reporting
National Greenhouse Accounts Factors	The National Greenhouse Accounts (NGA) Factors has been prepared by the Department of Industry, Science, Energy and Resources and is designed for use by companies and individuals to estimate greenhouse gas emissions. The NGA Factors is not published for the purposes of reporting under the <i>National Greenhouse and Energy Reporting Act 2007</i> (the NGER Act). While drawing on the National Greenhouse and Energy Reporting (Measurement) Determination 2008, the methods described in the NGA Factors have a general application to the estimation of a broader range of greenhouse emissions inventories.	Australian National Greenhouse Account Factors <i>Ensure the most recent year copy is referred to.</i>
Roads to Reuse	The Roads to Reuse program is a State Government initiative administered by the Waste Authority. Its objective is to encourage State Government organisations, local governments, regional councils, and the private sector to use recycled C&D products in civil applications, such as road construction. It does this by supporting the supply of recycled C&D products to market that meet a product specification, to protect human health and the environment.	Waste Authority
Scope 1 Emissions	Scope 1 greenhouse gas emissions are the emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level. Scope 1 emissions are sometimes referred to as direct emissions.	Clean Energy Regulator
Scope 2 Emissions	Scope 2 greenhouse gas emissions are the emissions released to the atmosphere from the indirect consumption of an energy commodity. Scope 2 emissions from one facility are part of the scope 1 emissions from another facility.	
Scope 3 Emissions	Scope 3 emissions are indirect greenhouse gas emissions other than scope 2 emissions that are generated in the wider economy. They occur as a consequence of the activities of a facility, but from sources not owned or controlled by that facility's business. Some examples are extraction and production of purchased materials, transportation of purchased fuels, use of sold products and services, and flying on a commercial airline by a person from another business.	
Sustainable Development Goals (SDGs)	The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership.	United Nations Sustainable Development Goals 2030

9 Appendices

Appendix	Title
Appendix 1	UN SDG Mapping for Positive and Negative Impacts
Appendix 2	Project Sustainability Targets
Appendix 3	List of Project Stakeholders
Appendix 4	List of Protected Areas
Appendix 5	Protected/Conservation Significant Flora and Fauna Species and Habitat

Appendix 1 – UN SDG Mapping for Positive and Negative Impacts



Appendix 2 – Project Sustainability Targets

Objectives	Project Stage	Target	Responsibility	Progress	Progress
Enhance the Swan River Crossing and surrounding area	Construction	Implement at least two (2) opportunities to enhance the Swan River precinct identified during consultation with key external stakeholders	Construction Director	Complete	Detailed design has been finalised and approved, with construction commencing later in 2023. Stakeholders engaged on the foreshore reactivation works included City of Belmont, City of Bayswater, Traditional Owner Advisory Group and community members. Enhancements to this area will include pump track and MTB skills area, yarning circle, seating area, canoe landing area, scar tree interpretation node and various artwork forms.
Maximise connectivity for multi mode transport	Construction	Implement at least one (1) opportunity to improve user connectivity for each mode of transport identified for the project	Construction Director	Complete	User connectivity has been improved through the PSP connections along Tonkin Highway, tying into existing PSP networks, through improved pedestrian connections with underpasses and footbridges and with the kayak launching area at the Derbarl Yerrigan.
Preserve and enhance ecological values	Construction	Implement at least one (1) environmental enhancement opportunity, with a stretch target for two (2) opportunities	Environment Lead	Complete	Environmental enhancement has been achieved through the remediation works at the southern dive, to improve outcomes from historical contamination of the groundwater.
Preserve and enhance heritage values	Construction	Implement at least one (1) adopted heritage enhancement opportunity/project	Environment Lead/ Construction Director	Complete	The heritage trail design has been finalised and construction will commence later in 2023. The trail will include interpretation and wayfinding signage, local Aboriginal artwork at Guildford Road and Great Eastern Highway underpasses and Whadjuk planting response at the foreshore reactivation area.
Optimise the design and groundwater interface	Construction	Implement the three (3) adopted mitigation strategies for minimising the risk and challenges of the design and groundwater interface identified during design	Construction Director	Complete	Opportunities identified and implemented for Northern and Southern dive structures - initiatives to be captured in design reports. Other changes include raising of the rail design.
Minimising the impacts of groundwater contamination and acid sulfate soils	Construction	Implement the prepared ASSMP	Environment Lead	On track	Plans in use, implementation recorded in management plan Commitments Register.
		Implement the prepared SCMP	Environment Lead	On track	Plans in use, implementation recorded in management plan Commitments Register.
Minimise impacts and improve discharge quality to surface water	Construction	Implement the identified methods and management measures to minimise impacts on the Swan River water quality or use	Environment Lead	On track	Mitigation measures undertaken through construction: - Use of coffer dams and silt curtains during piling activities as per erosion and sediment sub-plan - Water testing undertaken daily
		Achieve no more than two (2) Class 2 incidents and zero (0) Class 1 incidents, as defined by the TGA Environmental Management Plan	Environment Lead	On track	No Class 1 incidents recorded to date. One Class 2 incident recorded when sediment was discharged into adjacent land.
		Implement monitoring of the Swan River and achieve the water quality criteria as specified in the management plan approved under the <i>Swan and Canning Rivers Management Act 2006</i> .	Environment Lead	On track	Water sampling and other measures detailed in the Swan River Construction Management Plan has been undertaken throughout construction. Works in the area are complete, excluding the foreshore reactivation which will commence later in 2023.
Optimise material selection and quantity	Construction	Achieve at least a 5% reduction in materials used on the project as measured by the IS Materials Calculator (i.e. based on environmental impacts)	Construction Director/ Sustainability Lead	On track	The design submission is being submitted with a claimed 12% reduction in materials (IS points) and 17% tCO2-e. At As Built (PC) the project will reevaluate this saving, it is anticipated the saving will be increased.

Objectives	Project Stage	Target	Responsibility	Progress	Progress
Reduce energy requirements and emissions	Construction	Achieve at least a 5% reduction in energy used or emissions (Scope 1 and 2) created during project lifetime (construction and operation)	Construction Director/ Sustainability Lead	On track	Modelling for the design submission has demonstrated a reduction of 4% for Scope 1 and 2 emissions, based on current designs/implementation. Changes to lighting (LED path lighting) will contribute to reducing this further and further fuel and energy reduction opportunities have been implemented through construction.
Reduce water requirements	Construction	Achieve at least a 5% reduction in total water used on the project (construction and operation)	Construction Director/ Sustainability Lead	On track	Modelling for design submission has demonstrated a 6% reduction in water use for construction and operation. Other opportunities implemented in construction will be modelled for the As Built submission and the saving reevaluated.
Reduce waste and maximise onsite reuse and recycling	Construction	Divert at least 85% of clean/inert excavation spoil from landfill and reuse at least 50% onsite	Construction Director	On track	Spoil diversion from landfill currently at 100% and onsite reuse is at 92%.
		Divert at least 60% of office resource outputs from landfill	Construction Director	At risk	Regular bin audits are conducted as part of environmental inspections and this has been considered in the reporting. The Project is currently tracking at 58% diversion from landfill for office waste.
		Divert at least 70% of other inert resource outputs from landfill	Construction Director	On track	Inert construction resources are at 100% diversion from landfill with 71% onsite reuse.
		Re-use/retain at least 65% of contaminated soil on site, and dispose of not greater than 10% to landfill (excludes asbestos).	Construction Director	On track	The tracking of contamination reuse/retention is reflective of the cinders material that was found and treated before reuse on site. To date, the only identified contamination has been asbestos (which this target excludes) and cinders.
		Re-use/retain at least 50% of acid sulfate soils on site, and dispose of not greater than 15% to landfill	Construction Director	On track	ASS material reuse onsite is at 87% and 100% diversion from landfill. Some treated ASS material from the northern dive has been shared with MELConnx.
Integration of offsite recycled products and materials	Construction	Implement at least two (2) opportunities, with a stretch target for four (4) opportunities	Construction Director/ Sustainability Lead	Complete	Material sourced from Roe/Kal project. Significant volumes of crushed recycled concrete have been imported to date.
Improve workforce diversity and wellbeing	Construction	Achieve 75% satisfaction on the cultural and wellness survey of team cohesion	Alliance Director/ Wellness Champion	On track	- March 2021 achieved an 87% satisfaction rate. - November 2021 achieved 81% satisfaction rate. - July 2022 achieved a 88% satisfaction rate. - March 2023 achieved a 90% satisfaction rate.
		Attract and retain at least 10% of new entrants into the workforce (new employees with less than 5 years' experience)	Project Controls Manager (Industry Sustainability Champion)	On track	21% of employees are employees with less than 5 years' experience.
		Fundraise for 1 event supporting people living with disabilities such as City to Surf for Activ (host a team etc.)	Human Resource Manager	Not yet commenced	2021 & 2022 CtS events have been cancelled due to COVID-19 restrictions and safety risks. Being considered as fundraiser event for 2023.
		Celebrate 1 event during Pride Month or throughout the year	Human Resource Manager	Complete	Pride related Toolboxes and events have been held for the last few years across the sites.
		Develop a Flexible Working Arrangements Policy	Human Resource Manager	Complete	Flexible Arrangement Working Policy was prepared in early 2021 and is in use.
		Investigate engagement through the Infrastructure Ready Program	Alliance Director	Abandoned	Unlikely to engage with the Infrastructure Ready program due to where Project was in timeline when the program was introduced. Other programs are in place to support people returning to work and engagement of young people in the workforce.
		Celebrate 1 event for Harmony Week	Human Resource Manager	Complete	Harmony week information has been shared through Toolboxes and events in 2022 and 2023.

Objectives	Project Stage	Target	Responsibility	Progress	Progress
		Achieve at least 10% of the workforce representing women	Project Controls Manager (Industry Sustainability Champion)	On track	Female participation is currently tracking at 10.4%.
Develop capability and capacity in small subcontractors	Construction	Prepare at least three discrete packages of work to enable to WA Limestone to achieve a Main Roads prequalification level R2, and two other small subcontractors have intent to submit for B1/R1.	Project Controls Manager (Industry Sustainability Champion)	On track	GRC have been certified as pre-qualification level B1. WAL has submitted pre-qualification for R2. Work ongoing to identify final subcontractor for B1/R1.
Increase Aboriginal participation	Construction	Engage at least 30 FTEs for the entire project duration	Construction Interface Manager (Aboriginal Participation Champion)	At risk	Rolling average FTEs at 26.22 . Equivalent to 5.27% participation. Based on modelling, not expected to achieve the FTE target, focus has been on extending Aboriginal business spend.
		Award at least \$10M of contracts to Aboriginal businesses	Construction Interface Manager (Aboriginal Participation Champion)	Complete	New stretch target of \$30M. Committed spend to date: \$25.8M.
		Provide at least 1 mentor to Aboriginal employees for project duration	Construction Interface Manager (Aboriginal Participation Champion)	On track	Nudge has been engaged as organisational training support and mentorship provider for Aboriginal employees working on the project. 1 participant has succesfully completed the program to date. Second Technical Officer trainee commenced through Nudge.
		Establish a Project Working Group and implement at least two (2) initiatives	Construction Interface Manager (Aboriginal Participation Champion)	Complete	Project Working Group is considered informal and made up of members of senior management team. Initiatives to date include incentivising/disincentivising achievement against Aboriginal participation targets, and engagement of Nudge as training and mentorship providers to support Aboriginal workers on the project.
		An Aboriginal Coordinator was appointed for the project and was available for at least 20%-30% of the project	Construction Interface Manager (Aboriginal Participation Champion)	On track	Target reviewed in consideration of the Aboriginal Coordinator role being supported by the Key Result Area (KRA) champion. Aboriginal Coordinator has been engaged at least 1 day a week for duration of Project.
Effective community engagement	Construction	Maintain communication channels and maintain dust mitigation strategies and monitoring	Stakeholder & Community Engagement Lead/ Environment Lead	On track	Community notices relating to upcoming works include commentary on potential dust impacts and how they will be managed by the project.
		Maintain communication channels and maintain noise mitigation strategies and monitoring	Stakeholder & Community Engagement Lead/ Environment Lead	On track	Community notices relating to upcoming works include commentary on potential noise impacts and how they will be managed by the project. Out of hours noise plans also submitted to LGAs for approval. Notices sent out to impacted residents for expected noisy works.
		Maintain communication channels and maintain vibration mitigation strategies and monitoring	Stakeholder & Community Engagement Lead/ Environment Lead	On track	Community notices relating to upcoming works include commentary on potential vibration impacts and how they will be managed by the project
		Complete stakeholder satisfaction surveys every 6 months and achieve at least a 60% rate for stakeholder satisfaction	Stakeholder & Community Engagement Lead	Complete	Survey conducted in April 2021, with average satisfaction rate of 84% achieved. July 2022 stakeholder feedback also showed satisfaction rate of 84%. Final survey in Feb-23 showed 85% satisfaction.
		Complete community perception surveys every 6 months and achieve at least a 50% rate for community sentiment	Stakeholder & Community Engagement Lead	On track	Surveys conducted by an external organisation, and to occur 6-monthly ongoing. The final consultation report demonstrating 86% of community surveyed has positive sentiment towards project.
		Stakeholder input influences more than one (1) priority project negotiable (as defined in the CSEP)	Stakeholder & Community Engagement Lead	Complete	Influence on Project negotiables being tracked and recorded. One example is the Noise Walls on Redcliffe Bridge however there are many other initiatives being pursued and detailed through this report.

Objectives	Project Stage	Target	Responsibility	Progress	Progress
Improve outcomes for the Swan River and other key precincts through consultation	Construction	Maintain consultation channels with key external stakeholders during implementation of opportunities	Stakeholder & Community Engagement Lead	On track	Stakeholders engaged include City of Bayswater, City of Belmont, DBCA, Traditional Owner Advisory Group and community members. Detailed design has been finalised and construction is commencing later in 2023.
Effective decision making through collaboration with Metronet	Construction	Complete bi-monthly meetings with Metronet to establish progress and obtain feedback for integration with the project	PTA Interface Manager	On track	Regular and ongoing consultation occurring between TGA and MEL construction teams involves: <ul style="list-style-type: none">• Weekly interface meetings ongoing SEM dashboard updates• Ad-hoc technical sessions as required

Appendix 3 – Project Stakeholders

STAKEHOLDER GROUP	SPECIFIC STAKEHOLDERS
Government	Federal <ul style="list-style-type: none"> • Federal Minister for Population, Cities and Urban Infrastructure • Member for Swan • Member for Perth • Shadow Minister for Infrastructure, Transport and Regional Development
	State <ul style="list-style-type: none"> • WA Premier • Minister for Transport and Planning • Member for Belmont • Member for Maylands • Member for Bassendean • Minister for Finance, Aboriginal Affairs, and Lands • Minister for Police, Road Safety
	Local <ul style="list-style-type: none"> • City of Belmont Mayor • City of Bayswater Mayor • City of Swan Mayor
Government Departments and Agencies	Federal <ul style="list-style-type: none"> • Infrastructure Australia • Treasury • Department of Infrastructure and Regional Development • Department of Agriculture, Water and Environment • Australian Communications and Media Authority
	State <ul style="list-style-type: none"> • Department of Transport • METRONET • Public Transport Authority • Transperth • Department of Biodiversity, Conservation and Attractions • Department of Water and Environmental Regulation • Department of Planning, Lands and Heritage • Road Safety Commission • Department of Premier and Cabinet • Department of Aboriginal Affairs • Botanic Gardens and Parks Authority • Department of Fire and Emergency Services • Department of Local Government and Communities • Department of Parks and Wildlife • Development WA • Tourism WA • Main Roads Heavy Vehicles Operating Section • Racing and Wagering Western Australia (RWWA)

	Local <ul style="list-style-type: none"> • City of Belmont • City of Bayswater • City of Swan • Town of Bassendean • The Eastern Metropolitan Regional Council • WA Local Government Association
Asset owners	<ul style="list-style-type: none"> • Main Roads Western Australia • Public Transport Authority
Service Providers and Customers	<ul style="list-style-type: none"> • Western Power • Water Corporation • Atco • All telephone carriers • NBN • Alinta • Nextgen Networks
Motorists and road users	<ul style="list-style-type: none"> • Transport Forum WA Inc • WA Road Transport Association • Freight and Logistics Council WA • WA Farmers Federation • Livestock and Rural Transport Association • Royal Automotive Club of WA • WA Pilot Drivers Association • WA Road Transport Association • Planning and Transport Research Centre • Heavy vehicle operators • Taxi and similar operators
Cyclists and pedestrians	<ul style="list-style-type: none"> • WestCycle • Bicycling WA • Cyclesport WA • Visibility • Department of Transport Network Planning • Belmont City Cycling Crew
Businesses, clubs and groups	Business and associations <ul style="list-style-type: none"> • Bayswater Village Retailers Trade Association • Chamber of Commerce and Industry WA (CCI) • Local Business Enterprise Centre/s (BEC) • Local Business Advisory Group/s • Directly affected commercial properties • DFO • Perth Airport Pty Ltd • WA Racehorse Owners' Association Inc • WA Trainers' Association • Perth Racing • The Avon Descent committee • Costco • Tonkin Highway Industrial Estate

Aboriginal stakeholders	<ul style="list-style-type: none"> • South West Aboriginal Land and Sea Council (SWALSC) • Whadjuk Working Party • Traditional Owners Advisory Group (established for this project) • Noongar Chamber of Commerce and Industry (NCCI)
Community	<ul style="list-style-type: none"> • Residents within 100m of project works • Residents within 500m of project works • Residents within 1km of project works • Residents and businesses from surrounding communities • Horse trainer's (specialty group)
Media	<ul style="list-style-type: none"> • Print • TV • Social • Radio

Appendix 4 – List of Protected Areas

PROTECTED AREA	DETAILS	LOCALITY/ PROXIMITY	IMPACT
Environmental			
Swan Canning Riverpark and Development Control Area	Department of Biodiversity, Conservation and Attractions – Development Control Area	Intersects directly with the Project	0.25 ha directly cleared, river bank directly impacted where the coffer dams are installed and will be subject to rehabilitation, adjacent area indirectly impacted by dust and noise. Managed in the EMP and Swan River CEMP and subject to regular inspections.
Heritage			
Modified Tree – site ID 37868	Registered Aboriginal Heritage Site	Adjacent to the Project	Indirect impacts of dust and vibration are monitored monthly. Managed in EMP. Subject to regular inspections.
Swan River – Mythological, site ID 3536	Registered Aboriginal Heritage Site	Intersects directly with the Project	River bank directly impacted where the coffer dams are installed and will be subject to rehabilitation. Adjacent area indirectly impacted by dust, noise and vibration. Managed in the EMP and subject to regular inspections.

Appendix 5 – Conservation Significant Flora and Fauna Species and Habitat

Detail the conservation codes here. VU - Vulnerable; T – Threatened; EN – Endangered; P3 – Priority 3.

SPECIES	CONSERVATION SIGNIFANCE CODE		IMPACT
	FEDERAL	STATE	
Flora			
Banksia Woodlands of the Swan Coastal Plan Threatened Ecological Community	EN	P3	Clearing of 3.95 ha. Retained habitat adjacent to the east of the Project. Management detailed in the EMP.
Fauna			
Calyptrorhynchus banksii naso (Forest Red-tailed Black Cockatoo)	VU	T	Clearing of 23.72 ha of black cockatoo foraging habitat and 66 potential breeding trees of which none had hollows suitable for breeding.
Calyptrorhynchus baudinii (Baudin's Black Cockatoo)	EN	T	
Calyptrorhynchus latirostris (Carnaby's Black Cockatoo)	EN	T	