



LEACH HIGHWAY WELSHPOOL ROAD INTERCHANGE: Project Annual Sustainability Report 2021/2022

Prepared by Leach Welshpool Alliance (LWA)



This annual report covers the period from 1/07/2021 to 30/06/2022. This is the second annual report to be prepared for the Project. Previous annual sustainability reports include [2020-2021]

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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
ASS	Acid Sulfate Soils
AMT	Alliance Management Team
BaU	Business as Usual
CAT	Cultural Awareness Training
CRC	Crushed Recycled Concrete
DOE	Department of Environment
DWER	Department of Water and Environmental Regulation
EMP	Environmental Management Plan
EPA	Environmental Protection Authority of Western Australia
GHG	Green House Gas
GRI	Global Reporting Initiative
ha	Hectare(s)
IS	Infrastructure Sustainability
ISC	Infrastructure Sustainability Council
kL	Kilolitre
km	Kilometre(s)
KRA	Key Result Area
LWA	Leach Welshpool Alliance
LCA	Lifecycle Assessment
LTIFR	Lost Time Injury Frequency Rate
m	Metre(s)
Main Roads	Main Roads Western Australia
GJ	Megajoule; Gigajoule: unit of energy which is equivalent to 1 billion Joules
NGA	National Greenhouse Accounts
OMTID	Office of Major Transport Infrastructure Delivery
OMC	Optimum Moisture Content
ORS	Original remnant shrubland
ORW	Original remnant woodland
OSOM	Oversized and Over Mass Loads
PTA	Perth Transport Authority of Western Australia
RAP	Reclaimed Asphalt Pavement
RCP	Representative Concentration Pathway
RtR	Roads to Reuse
SCM	Supplementary Cementitious Materials
SDGs	United Nations Sustainable Development Goals
tCO ₂ e	Tonnes of carbon dioxide equivalent
TEC	Threatened Ecological Community
UN	United Nations
WTC	Welshpool Trade Centre

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1 About this Report

1.1 Purpose

This report has been prepared for the Leach Highway Welshpool Road Interchange Project (herein 'the Project'). This report was compiled by the Leach Welshpool Alliance (LWA) on behalf of Main Roads Western Australia (herein after '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. This report summarises the sustainability initiatives and potential environmental, social, and economic impacts of the Project. Material topics reported in this report have been determined through a materiality process that adheres to the Infrastructure Sustainability (IS) Rating governed by the Infrastructure Sustainability Council (ISC).

1.2 Sustainability Statement

The intersection of Leach Highway and Welshpool Road serves two heavily congested areas, the Perth Airport precinct and the Welshpool industrial area (including the Kewdale Freight Terminal). More than 50,000 vehicles travel through the intersection each weekday. This intersection currently ranks on the city's top ten most dangerous intersections. The expected increase in traffic will worsen the severity of congestion and will further jeopardise the safety of road users. Due to this, Main Roads made the decision to build a new grade separated interchange at the intersection of the Leach Highway and Welshpool Road (refer to [Figure 1](#)), and duplicate the Leach Highway bridge over rail south of the interchange.

As a public sector agency, Main Roads has a responsibility to incorporate sustainability into its major projects and works. This is reflected in its current membership with the ISC and its desire to contribute towards sustainable outcomes. The construction industry is highly intensive in the use of materials and products and the Project created a perfect opportunity for creating lasting benefits through an integrated consideration of social, environmental, and economic aspects (during all development and delivery phases) meeting the needs of today without compromising the needs of future generations.

Economic and social improvements are expected resulting from reduced congestion and improved safety. The Project also aims to improve social aspects during the construction phase by improving the physical and mental wellbeing of all involved.

"The Leach Welshpool Alliance is committed to delivering a Project that delivers sustainable benefits both throughout construction, and throughout the future life of the Project" Naomi Clements, Project Manager.



Figure 1 Artist's Impression of New Bridge

1.3 Highlights

The following are highlights from the sustainability focus areas on the Project, as detailed in Section 3.3 of this report. These highlights have been linked to the United Nations Sustainable Development Goals (SDGs), the 17 global indicators of sustainable development.



Figure 2 Sustainability Highlights

2 Project Overview

The Project provides a fundamental safety and efficiency upgrade to the intersection of Leach Highway and Welshpool Road, which has previously been ranked the worst intersection across Western Australia for crash frequency. Delivery provides an important economic contribution to the Western Australian community, supporting employment and delivering an Industry-ready Training Program, Aboriginal Participation, and enhancing business capability and capacity. The Project was one of 24 Western Australian transport projects fast-tracked to support the Western Australian economy and local jobs following the impacts of COVID-19.

Commencing in February 2021, the Project is in the construction phase of delivery and due for completion in early 2023. For up-to-date project-related information, please visit the [Project webpage](#).

2.1 Locality and Scope

The Project is located in the heart of the Welshpool commercial area ([Figure 3](#)), surrounded by a variety of businesses and industry, and a small residential area to the south. The Leach Highway intersects with Welshpool Road, a major east-west arterial route which runs through the industrial area, adjacent to the Kewdale Freight Terminal. This intersection and surrounding area experiences heavily congested traffic during peak periods, with approximately 50,000 vehicles using this thoroughfare daily, travelling within the industrial area and passing through from the Mitchell Freeway and Freight Terminal.

These stakeholders have been considered throughout Project Development to ensure final design delivers shared outcomes, and construction activities do not disrupt businesses operations. Community and stakeholder engagement has as such been a vital component of delivery. Key Project stakeholders include Perth Transport Authority (PTA), Local Government Authority City of Canning, Milne Feeds and the Welshpool Trade Centre. A full list of stakeholders engaged can be found in Appendix 4.

Works being completed as part of the Project includes:

- Construction of a roundabout at the new intersection of Leach Highway and Welshpool Road.
- A new bridge carrying Leach Highway over Welshpool Road and new roundabout.
- A [Principal Shared Path \(PSP\)](#) along Leach Highway from Seven Oaks Street to Orrong Road.
- Construction of a new duplicated bridge along Leach Highway over the Armadale Rail line, to the east of the existing bridge.
- Upgrade of anti-throw screen on the existing bridge over the rail line.
- Rearrangement of vehicle lanes including a new shared path on the west side of the existing bridge over the rail line.

FIGURE 3: PROJECT AREA

LEACH HIGHWAY AND WELSHPOOL ROAD INTERSECTION UPGRADE



Australian Government



BUILDING OUR FUTURE



Indicative only and subject to change

2.2 Value and Funding

This major infrastructure Project has been jointly funded by the Federal (\$68 million) and State (\$68 million) governments.

2.3 Delivery

The Project is being delivered by an Alliance made up of Main Roads and local contractors Georgiou Group, BG&E and Golder Associates to make up the Leach Welshpool Alliance (LWA). The Alliance has developed KRAs for delivery, including the strategic capability development of Golder and Associates as an Alliance Participant Partner, and Westforce Construction progressing to Bridge Category 2 Level.

2.3.1 Alliance Purpose and Vision

This Purpose and Vision was developed by the Alliance Board as part of a facilitated Board Workshop. The Board proposed that the below statement was appropriate to be both the single purpose and vision for this Alliance.

"To create a safe and efficient transport link through the Welshpool industrial precinct."

2.3.2 Alliance Culture

A shared set of values, goals, attitudes and practices characterise how LWA goes about its work and interactions with stakeholders. Personnel from Georgiou, Golder, BG&E and Westforce attended a series of planning workshops with Alliance Coach, Dr Neil Preston. These workshops identified fluency, responsiveness, clarity and integration as important drivers for Alliance success and clarified the Alliance approach. This guided the development of our logo and proposed KRAs Performance Framework. Subsequent workshops involving Main Roads were conducted to finalise the Alliance Vision, Desired Behaviours, and KRAs Performance Framework.

2.3.3 Key Result Areas

The Alliance Board endorsed six KRAs as critical to the Project. These are:

1. Relationships with stakeholders and community.
2. Traffic management.
3. Aboriginal participation.
4. Alliance health (alliance values and overall employee health).
5. Supporting jobs.
6. Quality.

These KRAs guide decision making during delivery.

2.4 Project Timeline

The below infographic (Figure 4) summarises key dates associated with sustainability milestones of the Project. The Project formally commenced in February 2021, at the same time in which sustainability workshops commenced. During the design phase which followed from February 2021 through to late 2021, the LWA team conducted multiple sustainability workshops and meetings to ensure outcomes were achieved and implemented at the right time. The Project's Infrastructure Sustainability (IS) Design Self-Assessment was submitted to Main Roads by LWA following completion of all design packages, and LWA is currently preparing a second round IS Design submission to Main Roads for finalisation.

In the next financial year, LWA finalise the IS Design Rating, present on sustainability performance bi-annually, reach Project Completion and submit the IS As Built Self-Assessment to Main Roads. Pending the timeline of Project Completion and the IS As Built Self-Assessment, LWA will also prepare a Final Achievement Report summarising sustainability performance on the Project during delivery.

SUSTAINABILITY

PROJECT TIMELINE



3 Governance

3.1 Approach to Sustainability

The Alliance is committed to achieving genuine sustainability outcomes where environmental, social and economic opportunities are realised. To do so, the Alliance Management Team (AMT) has endorsed a sustainability culture and champions within the delivery team have been given a direct role in achieving sustainability targets. The Alliance's commitments to sustainability as set out in the Sustainability Policy ([Appendix 1](#)) have been implemented and the Alliance is pursuing alignment to the ISC ISv2.0 Design and As Built Rating scheme.

The pathway to achieve sustainability targets and contractual requirements has been set out within the Project's Sustainability Management Plan. A monthly Sustainability Leadership Committee meeting is held with various disciplinary leads ("champions") with direct responsibility of sustainability targets, within the environmental, design, construction, stakeholder engagement, procurement, health and safety, and management teams on the Alliance. This Committee discusses prevalent key actions, issues and opportunities to that stage of the sustainability timeline and has had a large role in facilitating a genuine sustainability culture.

The ISC ISv2.0 Rating is implemented to ensure sustainability is embedded throughout operations and a measurable framework is applied. This was a contractual requirement of the Project, alongside several IS Design and As Built credit targets that were identified as most important to the Project by Main Roads. The Project is required to achieve a total ISC ISv2.0 Design and As Built score of 40.

In measuring sustainability performance, the Project has engaged sustainability consultants Perspektiv to develop a Lifecycle Assessment (LCA) modelling energy, water, material impacts, and waste, at end of design and as built phases. This assessment utilises a 'base case' to set the baseline for all improvements to be measured against and is submitted to Main Roads for verification to ensure relativity. The Project's Design LCA performance is detailed in Section 3.3.

3.2 Material Sustainability Issues

Material sustainability issues were identified by Main Roads during the planning stage. These are determined by examining the Project context, stakeholder needs, and environmental aspects. These material issues were integrated into the Project's sustainability targets as detailed in [Table 1](#) below.

The Alliance determined the material sustainability issues within the ISC ISv2.0 Rating with a multidisciplinary representation from the Alliance, Main Roads, and participants from the Local Government Authority, City of Canning, and key stakeholder, PTA. The outcome of the materiality assessment is shown below in [Figure 5](#). Scores were determined by each personnel rating the Project's potential impacts and outcomes for each UN SDG on a five-point scale.

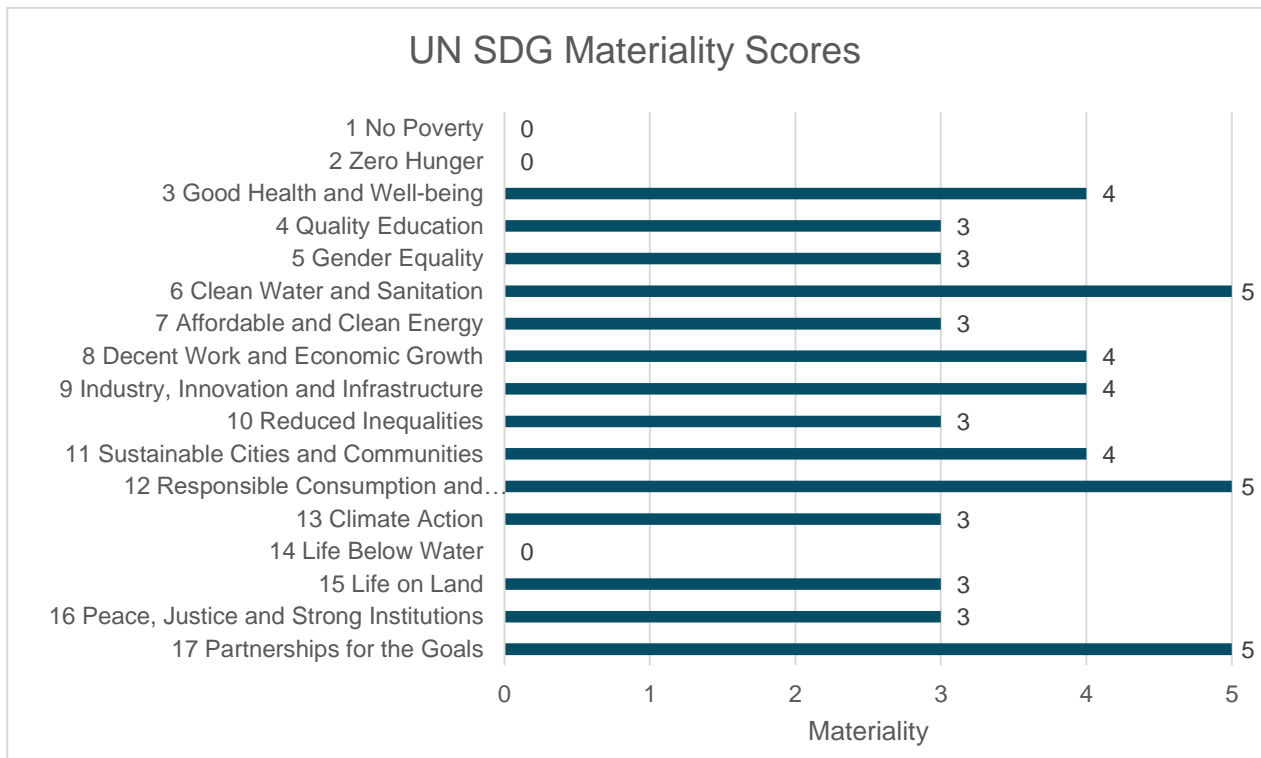







Figure 5 UN SDG Materiality Scores

Table 1 Material Aspects

Material Issue	Related Project Sustainability Objectives	Related UN SDGs
Network Connectivity	<ul style="list-style-type: none"> Increase pedestrian and cyclist connectivity. Maximise cyclability within Project boundaries. Explore opportunities to improve connectivity for cycling beyond Project boundaries. 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> </div> <div style="text-align: center;"> <p>3 GOOD HEALTH AND WELL-BEING</p> </div> </div>
Water Quality	<ul style="list-style-type: none"> Maintain water quality by treating water before discharging into Water Corporation basins. Maximise Water Sensitive Urban Design (WSUD) in the road and drainage solution. 	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> </div> <div style="text-align: center;"> <p>6 CLEAN WATER AND SANITATION</p> </div> </div>
Clearing Footprint and Urban Design Amenity	<ul style="list-style-type: none"> Maximise opportunities for retaining trees and soft landscaping. 	<div style="text-align: center;"> <p>15 LIFE ON LAND</p> </div>
Engagement and Partnership with Stakeholders	<ul style="list-style-type: none"> Resolve challenges and progress opportunities for more sustainable outcomes by actively seeking external stakeholder input. 	<div style="text-align: center;"> <p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> </div>
Materials Footprint	<ul style="list-style-type: none"> Implement circular economy principles on the Project to reduce overall materials lifecycle footprint. Reduce raw material consumption. Minimise the environmental footprint (embodied energy) of raw materials that are required (e.g. using alternatives). Maximise recycled content of materials used for the Project. Reuse as much existing material as possible. Recycle, preferably upcycle waste materials. 	<div style="text-align: center;"> <p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p> </div>

<p>Energy Footprint</p>	<ul style="list-style-type: none"> • Reduce whole of life energy use for the Project. 	<p>13 CLIMATE ACTION</p> 	
<p>Health and Wellbeing</p>	<ul style="list-style-type: none"> • Improve safety for vulnerable road users. • Address air quality and urban heat island affect through design and landscaping. 	<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> 	<p>3 GOOD HEALTH AND WELL-BEING</p> 
<p>Social Equity</p>	<ul style="list-style-type: none"> • Maximise capacity for Aboriginal Participation. 	<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> 	<p>10 REDUCED INEQUALITIES</p> 

3.3 Sustainability Targets

Sustainability targets were implemented during early design phase, following Main Roads' review of the ISC ISv2.0 materiality scores drafted following the materiality assessment. Targets incorporate the material issues identified by Main Roads during planning, the ISC ISv2.0 material issues and contractually bounded targets, and Alliance KRAs identified by the Alliance Board (Table 2).

Table 2 Sustainability Targets and Performance to date

FOCUS AREA	OBJECTIVES	TARGETS	PERFORMANCE
Relationships with Stakeholders and Community	Maximise sustainable outcomes through Project lifecycle for stakeholders by actively seeking external stakeholder input.	Affected businesses are highly satisfied with LWA engagement, receiving greater than 80% positive response in quarterly surveys.	On Track: Nov21 survey had 80% average positive response.
		Stakeholders are involved in the development of Project design packages and feedback is attained to confirm genuine consideration of stakeholder input.	Achieved: survey provided to the LGA, and received 90% score that input has been genuinely considered by the Project and/or influenced design.
		At least two sustainability opportunities are implemented to resolve social and/or environmental issues for the local community.	Achieved: improved accessibility to Welshpool Trade Centre (WTC), from reference design; and contributed to the City of Canning additional planting at Centre Street Basin to improve long-term water quality and local environment.
		Lessons learnt are collected and documented at the completion of each phase within the infrastructure lifecycle, to improve outcomes during next stages and pass on learnings to future projects.	On Track: this has been undertaken at the end of PAA and design phase. End of construction workshop outstanding, to be collated and provided to the operator.
Minimise Environmental Impacts	Maintain or Improve Water Quality through Stormwater Treatment.	All stormwater discharged into the Water Corporation Basins (3) is treated to maintain at minimum or improve water quality, compared to baseline levels	On Track: final design incorporates treatment mechanisms for all water discharges leading into Water Corporation Basins
	Maximise Water Sensitive Urban Design (WSUD) in the road and drainage solution.	At least one Water Sensitive Urban Design (WSUD) opportunity is implemented in the road and drainage solution.	Achieved: soft landscaping within Welshpool Road roundabout has been graded inwards to retain any runoff within the landscaped area; a section of the southbound carriageway will be drained by a medium swale instead of pit and pipe; permeable base pits used; and riparian vegetation used in landscaping design.
	Reduce Water Consumption during infrastructure lifecycle	Reduce water consumption over construction and operational life of the infrastructure, by $\geq 5\%$ from the base case, using a Life Cycle Assessment.	On track: as per Design LCA, the Project reduced water consumption by 24% from the base case.
	Reduce Energy and Greenhouse Gas Emissions Consumption during infrastructure lifecycle.	Reduce energy and greenhouse gas emissions over construction and operational life of the infrastructure, by $\geq 5\%$ from the base case, according to Life Cycle Assessment.	On track: as per Design LCA, the Project reduced energy and emissions consumption by 24% from the base case.
	Maximise Soft Landscaping and Tree Canopy Cover, and	Increase the total area of soft landscaping in final design, from concept design.	Achieved: based upon comparison of land areas from concept design to final design, soft landscaping has increased by 6%.

	reduce impacts of urban heat island affect	Plant a higher percentage of canopy species in the plant and seed mixes, than groundcover species (where the Main Roads setbacks permit). Revegetate utilising native tree species that have provenance to the site, are representative of local region biodiversity, and are suitable for the site conditions and changing climate.	Achieved: landscape architect has confirmed this is achieved and incorporated in final design.
		Opportunities are implemented (at least one) to reduce clearing extent from total area approved for clearing.	Achieved: landscape architect has confirmed revegetation species are based on remnant vegetation complexes.
	Maximise Revegetation and plant a greater number of trees than those removed.	For every tree cleared, at least 5 trees are replanted (including tube stock).	Achieved: revegetation commitment met through donation to the City of Canning where planting could not be allowed for within Project footprint.
	Sustainable Cities	Provide an urban design solution that improves urban amenity, enhances aesthetic value of the area, and is consistent with local community and Project context.	Opportunities implemented (at least one) to incorporate local context in landscaping and urban design, based upon the Project Urban and Landscape Design Framework. Opportunities implemented (at least one) to improve urban amenity through landscaping and/or public art design, confirmed through feedback attained for the Local Government Authority Feedback is attained from the Local Government Authority confirming satisfaction of urban design.
Increase pedestrian and cyclist connectivity		Additional pedestrian pathways (at least one) are included in final design to increase pedestrian connectivity within area, from concept design.	Achieved: shared paths from north Leach Highway PSP through to Welshpool Road South, and both sides of Welshpool Road; connection through to Division Street; pedestrian crossing on Welshpool Road; shared path entry from Leach Highway PSP into WTC; shared path on Sevenoaks Street; shared path on Ewing Street North through to Railway Parade; and PSP entry on to Star Street.
		Opportunities implemented (at least one) to improve business connectivity within Project footprint, from concept design	Achieved: entry to WTC where initially fenced off separating PSP from businesses; and footpath added on Welshpool Road improving access to storage facility.
	Additional cyclist paths (at least one) are included in final design to increase cyclist connectivity within area, from concept design.	Achieved: connections facilitated to Orrong Road, Railway Parade, Ewing Street, Welshpool Road and Star Street in final design.	
	Project design considers future connectivity improvements	Opportunities implemented (at least one) connecting the final design to the future (ultimate case) PSP and future projects.	Achieved: shared path added to Ewing St North to connect Railway Parade
Resource Efficiency	Generate less waste	Reduce raw material consumption by substituting at least 5% of virgin materials for materials with recycled waste content. Consideration of ultimate design in planning (at least 1 opportunity implemented) to minimise "wasted" works when future projects are undertaken (i.e. Albany Hwy Upgrade and Orrong Road Upgrade).	On track: currently 16% of materials used are recycled materials. Achieved: consideration of future path on Orrong Road, allowing for future connection and avoiding the need for future re-work.
	Recover more value and resources from waste	Recover >75% outputs.	On track: currently 85% of outputs have been recovered.

		Divert >50% inert outputs from landfill.	On track: currently 86% of inert outputs have been diverted from landfill.
		Divert >50% of other resource outputs from landfill.	On track: currently 99% of all other outputs have been diverted from landfill.
		Divert >50% office outputs from landfill.	On track: currently 73% of all office waste has been diverted from landfill.
	Manage waste responsibly	Reduce life cycle environmental impacts of materials by $\geq 5\%$ from Business as Usual (BaU) according to the completed LCA (Rso-6).	On track: design LCA determined the Project has reduced material impact by 13% from the base case predicted impacts.
		>15% of all outputs to landfill	On track: currently 12.5% of all waste accumulated has been sent to landfill.
Industry Sustainability	Increase Aboriginal Employment	At least 10% of the total work hours are undertaken by Aboriginal Persons.	In progress: currently at 7%
	Increase Aboriginal Participation	Works and/or services to a value of at least 2% of the contract sum are undertaken by Aboriginal Businesses	On track: currently at 2%
	Increase Cultural Awareness	All long-term Alliance employees to undertake cultural awareness training (CAT).	In progress.
	Improve Alliance Health and Well-being	Greater than 70% positive response from LWA team in Alliance Health survey.	On track: 94% positive response in March 2022.
	Support Industry Training and Development	Run a Certificate II training program and engage participants on the Project.	Achieved: program completed and 8 participants received full-time employment on the Project.
	Support lower-tier subcontractors and suppliers' development in industry	At least 10% of direct cost target is awarded to Main Roads Prequalified Contractors.	On track: currently 11% cumulative performance.
Deliver Sustainable Infrastructure	Integrate sustainable practices	Feedback is attained from Local Government Authority confirming genuine incorporation of sustainability outcomes in the development of infrastructure.	Achieved: City of Canning responded to question in survey with a 90% performance.
		Achieve an ISC ISv2.0 Design and As Built Score of >40 (Self-Assessed by the Project and verified by Main Roads WA).	Undertaking first round verification process of design rating with Main Roads.
		Achieve ISv2.0 Credit Con-2 Urban and Landscape Design Context Level 1.	Undertaking first round verification process of design rating with Main Roads.
		Assess direct and indirect environmental, social, economic and governance risks and opportunities and achieve ISv2.0 Lea-1 Sustainability Strategy, Level 2. (C85/19 Mandatory Level 1)	Undertaking first round verification process of design rating with Main Roads.
		Achieve ISv2.0 Lea-2 Risks and Opportunities, Level 2 (C85/19 Mandatory Level 1)	Undertaking first round verification process of design rating with Main Roads.
		Achieve ISv2.0 Lea-3 Knowledge Sharing, Level 3 (C85/19 Mandatory Level 1)	Undertaking first round verification process of design rating with Main Roads.
		Implement sustainable procurement practices and achieve ISv2.0 Spr-1, Level 1	Undertaking first round verification process of design rating with Main Roads.
		Implement sustainable procurement practices and achieve ISv2.0 Spr-2, Level 1	Undertaking first round verification process of design rating with Main Roads.
		Implement sustainable procurement practices and achieve ISv2.0 Spr-3, Level 1	Undertaking first round verification process of design rating with Main Roads.
		Assess risks related to climate change and natural hazards within infrastructure design and achieve ISv2.0 Credit Res-2 Climate and Natural Hazards Level 2. (C85/19 Mandatory Level 2)	Undertaking first round verification process of design rating with Main Roads.

Incorporate environmental, social, economic and governance value in decision making and achieve ISv2.0 Credit Ecn-1 Options Assessment, Level 1. <i>(C85/19 Mandatory Level 1)</i>	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Credit Ene-1 Energy and Carbon Reduction Level 1 and achieve a reduction of up to 5% from the base case.	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Env-2 Noise, Level 2	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Env-3 Vibration, Level 2	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Env-4 Air Quality, Level 2	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Env-5 Light Pollution, Level 1	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Rso-1 Resource Strategy Development, Level 1 <i>(C85/19 Mandatory Level 1)</i>	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Rso-4 Resource Recovery, Level 2	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Rso-6 Material Lifecycle Impact Measure and Management, Level 1, and at least 5% material impacts reduced from the base case. <i>(C85/19 Mandatory Level 1.3)</i>	Undertaking first round verification process of design rating with Main Roads.
Implement at least one product with a sustainability label (aligned with ISv2.0 Credit Rso-7)	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Wat-1 Water Use Level 1, and at least 5% reduction in water consumption from the base case. <i>(C85/19 Mandatory Level 1.3)</i>	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Wat-2 Appropriate Use of Water	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Credit Sta-1, Level 2	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Credit Sta-2, Level 2	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Credit Leg-1 Leaving a Lasting Legacy Level 2 <i>(C85/19 Mandatory Level 1)</i>	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Credit Her-1 Level 1	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Credit Wfs-2 Jobs and Skills, Level 1	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Credit Wfs-3 Workforce Culture and Wellbeing, Level 2	Undertaking first round verification process of design rating with Main Roads.
Achieve ISv2.0 Credit Wfs-4 Diversity and Inclusion, Level 1	Undertaking first round verification process of design rating with Main Roads.

3.4 Climate Change Assessments

The Alliance appreciates the importance of building resilient road networks. A Climate Change Risk Assessment was undertaken during early stages of design to ensure the Project's final design and operational management addresses the needs of future climatic conditions due to climate change. The workshop assessed direct and indirect climate and natural hazard risks, and the Project has ensured all risks are mitigated with controls incorporated into final design and/or operational management plans, so that no residual high, very high or extreme rated risks are remaining.

Participants included representatives from key stakeholders City of Canning and Perth Transport Authority, and members of LWA including Main Roads, Georgiou Group, Golder Associates and BG&E. The workshop also included Main Roads Manager Network Management and Sustainability Advisor of the Office of Major Transport Infrastructure Delivery (OMTID). To enable the adequate evaluation of risks, representatives from within LWA were from different expertise areas including senior Project management representation, environment, community, design management and construction engineering.

This risk assessment process is informed by best available climate change analysis which addresses the region in which the asset is located and the asset's forecast useful life. Projections are based upon Representative Concentration Pathway (RCP) 8.5, 2030 and 2090, ensuring worst-case scenario is examined and mitigated. Climate change impacts of air temperature, rainfall, sea, storm and solar radiation are considered:

- In 2090, annual extreme maximum temperature is assumed to be 50.5 degrees in 2090 (based upon RCP8.5). This led to the review of increased temperatures impacting assets and ensuring components such as joints/bearings and pavements can allow for and appropriately plan for these temperatures. These actions mitigate disruptions to road users, reduce maintenance costs and ultimately decrease risks to safety of the road users.
- In 2090, maximum rainfall is assumed to be 165mm/24hrs (based upon RCP8.5). This led to the review of drainage capacity, to mitigate roadway flooding and potential traffic incidents.
- In 2090, fire 'severe' fire danger is assumed to occur 6.9 days per year (based upon RCP8.5). Fire risk within vegetation was considered based on this projection, and was mitigated due to controls implemented, including, maintenance of verge clear of vegetation, and a 3 m clearway between properties and major planting.

3.5 Technology and Innovation

The Project has encouraged innovation throughout design development, supporting the LWA team in considering alternatives to BaU. Fostering an innovation culture is a part of the Alliance Health Surveys that are sent out regularly to the team, demonstrating this is a valued aspect of the Alliance. The Project team has implemented the following opportunities considered innovative, as they are more efficient and achieve a measurable sustainable outcome:

- Use of screw piles for temporary wall support propping instead of conventional strip footing or concrete blocks. We were amongst the first projects to use screw piling in this application for deflection walls. Use of this compared to conventional methods saved approximately 40m³ waste/spoil and 40m³ concrete in the process of piling. This method also saved approximately 400m³ of construction water.
- Trial of Emulsion Prime, which is advantageous to the construction program and presents a significant environmental benefit due to the reduction of cutter content (kerosene) which evaporates during the curing period into the atmosphere. Emulsion-based-products are also

applied at lower temperatures, which reduces greenhouse gas emissions due to the lower energy required to heat the product. These products are not currently approved by Main Roads, as the SWTC requires the use of a cut-back prime used on crushed rock base. We are one of the first projects within the Perth Metropolitan area to trial this product. Thus far we have used the product on three pavement areas within the Project footprint.

These opportunities have been implemented and/or trialled by the Alliance, due to their ability to improve current operations. The Project team recognises the environmental, social and/or economic value of trialling these initiatives and realising efficiencies. Innovative opportunities are assumed to have positive impacts on the industry, and if successfully executed on the Project are able to be applied on other projects.

4 Economic

4.1 Key Economic Context

The Project footprint and the majority of the surrounding area is industrial, made up of numerous manufacturers, suppliers, storage facilities and commercial businesses (refer to [Figure 6](#)). Neighbouring stakeholders to Leach Highway and Welshpool Road include Bega Dairy & Drinks, Welshpool Trade Centre (WTC), Welshpool Self Storage, Milne Feeds, Bentley Health Services and the WA Museum Collections and Research Centre. A complete list of stakeholders can be found in Appendix 3. Leach Highway is also a part of Perth's Principal Road Freight Network, serving Perth Airport and Kewdale Freight Terminal. Presently, 50,000 vehicles use this intersection each day, upon completion of the works, peak travel times are forecasted to reduce by up to ten minutes.

As several stakeholder properties are accessed via Welshpool Road, the Project team was conscious of reducing economic impacts during construction and ensuring accessibility and visibility was maintained. Stakeholder engagement levels have been higher than a typical Project due to the active solicitation of feedback from nearby stakeholders by the LWA team.

The Project is one of 24 Western Australian transport projects fast-tracked to support the Western Australian economy and local jobs following the impacts of COVID-19. It is estimated that more than 2000 personnel have been engaged either directly or indirectly by the Project since commencement in February 2021.

The Project's procurement strategy requested suppliers and subcontractors to denote their business location and ownership, to support the procurement of local suppliers and subcontractors where feasible. These efforts equated to a Buy Local Spend of \$36M for the total Project duration (refer to [Table 3](#)). Due to the unprecedented nature of cost escalation and supply chain impacts through the duration of the Project, there have been some instances where Buy Local or other sustainability initiatives have not been feasible due to the prevailing market conditions. Often there has been limited availability for construction inputs and the construction schedule has dictated the procurement strategy.

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	\$	\$75.6m	\$84.2m
Indigenous Enterprises	#	16	19
Disability Enterprises	#	0	0
People Employed by Supply Chain	\$	2000+	2000+
Suppliers Engaged	#	287	324
Buy Local Spend	\$	\$24.8m	\$36.1m

4.2 Key Economic Outcomes

Current forecasts indicate traffic volumes will increase to approximately 80,000 vehicles by 2036 and 95,000 by 2041. The Project will provide urgent safety improvements, reducing risks for road users, and overall congestion and delay within the area.

The Perth Freight Network will benefit from a safer and more efficient network, able to withstand the projected traffic volume increase. More specifically, the Project will support the east-west freight link

connecting Fremantle with the Kewdale and Welshpool Industrial area.

As a foundation Alliance Principle, LWA will support economic development in WA through supporting local, small to medium sized businesses. LWA is committed to enhancing WA industry capability, capacity and opportunity throughout delivery.



Figure 6 Industrial Area Adjacent to the Project, photograph of Bridge 1882 over rail facing north.

4.3 Sustainable Procurement and Buy Local

LWA aspires to provide Western Australian companies with full, fair and reasonable opportunities to tender for work. LWA will actively seek opportunities to allow smaller local contracting companies and businesses to support its operations and enhance local business capabilities and capacities. This will be achieved through ongoing support of subcontractors and suppliers throughout engagement, providing mentoring and training where applicable to local businesses.

In line with the WA Government Buy Local Policy 2020, LWA will:

- Maximise opportunities for local, small and medium enterprise (SME) WA businesses (including Aboriginal businesses) to participate in the works.
- Provide full, fair and reasonable opportunity through transparency and accountability in the tendering and award process.
- Buy local to support development of WA Industry, particularly in regional WA.
- Support WA businesses to remain competitive in the changing economic conditions.
- Support development of industry workforce through fair employment opportunities and training.

LWA has developed an Industry Sustainability Plan to manage industry sustainability objectives

during delivery. Objectives include:

- Maximising engagement with WA located companies and suppliers;
- Awarding separate packages of works to a range of lower level pre-qualified contractors who are prequalified with Main Roads, to an aggregate value of 10 percent of the Direct Cost Target;
- Assisting Westforce Construction to progress to Main Roads Prequalification Bridge Category 2 Level;
- Aboriginal Employment Target – at least 10% of the total work hours are undertaken by Aboriginal Persons;
- Aboriginal Business Procurement Target – works and/or services to a value of at least 2% of the contract sum are undertaken by Aboriginal Businesses; and
- Increasing training and employment opportunities in WA.

As outlined above LWA is committed to engaging with local businesses in line with the WA Buy Local Policy. Throughout the duration of procurement LWA has tracked the proximity of these businesses to the Project, to communicate our performance against this Buy Local objective. At this stage, LWA has spent \$36.1M with local suppliers within 20km of the Project. Examples of buying local at LWA include:

- Major electrical subcontractor Maali Group (Perth).
- Primary traffic management subcontractor Highways Traffic (Carlisle).
- Key civil and concrete subcontractor Dowsing Group (Maddington).

4.4 Sustainable Transport

Network connectivity was identified as a material issue during the preliminary materiality assessment undertaken during planning by Main Roads. LWA has developed a design which will improve connectivity for road users, pedestrians and cyclists. Connectivity improvements specifically related to pedestrians and cyclists have been considered within multiple sustainability workshops during design, with the intention to:

- increase pedestrian and cyclist connectivity;
- maximise cyclability within Project boundaries; and
- explore opportunities to improve connectivity for cycling beyond Project boundaries.

LWA has pursued connectivity improvements within the Project footprint, including working with Main Roads WA to consider an opportunity which goes beyond the BaU requirements. LWA has also actively engaged with stakeholders to determine the needs of cyclists on the local network and has made modifications to traffic management in response to their feedback. The following additions to pedestrian and cyclist connections have been included as part of the Project works, beyond the original scope of the Project:

- New shared path from North Leach Highway PSP through to Welshpool Road South.
- New shared path on both sides of Welshpool Road South.
- New pedestrian crossing on Welshpool Road South.
- New connection through to Division Street.
- New shared path entry from Leach Highway PSP through to Welshpool Trade Centre.
- New shared path entry from Leach Highway PSP through to Ewing Street.
- New shared path on Sevenoaks Street (under Bridge 1882 and Bridge 977).
- New shared path on Ewing Street North through to Railway Parade.

- New entry from Leach Highway PSP to Star Street.
- Provision of a design for the ultimate PSP bridge adjacent to existing Bridge 977 (for construction when Leach Highway northbound is widened to 3 lanes).
- Provision of a design for the ultimate grade separated PSP bridge adjacent to Bridge 1883 (for potential construction when Leach Highway northbound is widened to 3 lanes).
- Provision of a design for the connecting PSP from Sevenoaks St to Albany Highway, provided for future works by Department of Transport/Main Roads WA.

4.5 Economic Case Study – Dual Asphalt Subcontractors

Asphalting and bitumen seal is a critical subcontract trade at LWA, similar to a typical Main Roads project. LWA has taken the novel approach of engaging two separate asphalting subcontractors to:

- Mitigate resourcing issues due to tight market for asphalting;
- Distribute work across the industry;
- Create opportunities for continuous improvement and knowledge sharing with multiple subcontractors; and
- Have access to new proprietary products that improve sustainability outcomes in road construction (e.g. bitumen emulsion prime products).

LWA has committed to providing diverse opportunities for existing and emerging local businesses to participate in the works. This is just one example where the Alliance has awarded separate packages of works, to encourage and support industry involvement.

LWA has been better able to manage its construction sequencing and schedule with the added flexibility of having two asphalting subcontractors. 100% of critical asphalt dates within two weeks have been achieved through this scheduling advantage.

Having multiple subcontractors has also introduced the opportunity to trial new products including emulsion-based primes, as not all subcontractors in the market are able to produce and apply this product.

LWA has been able to respond quickly to any perceived or actual quality issues, by being able to replace works at its discretion by engaging the subcontractor that did not complete the defective works to replace them. In a typical sole-source model, these matters related to quality can often be protracted and result in significant wasted resources on a project.

Challenges experienced as a result of engaging with multiple asphalting subcontractors have included:

- Difficulty in managing and repairing defective works due to increased number of potentially liable parties and root causes for defects. If a surfacing layer is placed by one subcontractor on an underlying layer constructed by another there is an element of doubt as to the responsible party for repairing and indemnifying any actual or potential future defect.
- Commercial considerations as there is a balance required between schedule and quality performance while also making sure neither subcontractor perceives that it is not being given equal opportunity to perform the works. Subcontract pricing was set-up and agreed with vendors on a banded-rate schedule of rates basis so that each Subcontractor is fairly compensated for their work completed, regardless of whether the areas are larger or smaller than works that may have been awarded to the other Subcontractor. LWA is monitoring Subcontractor profitability as a KPI against estimated value of works let and the value of works for each subcontractor is currently tracking above these estimated values.

Overall, the non-traditional procurement method that has been employed at LWA has been a success. Program impacts have been mitigated and LWA has been better able to implement new paving technologies and sequencing of works to minimise down time, reworks, and delays to the construction schedule. LWA would recommend this procurement strategy to future projects.



Figure 7 Pavement Construction – Prime application Leach Highway Southbound, facing South, on crushed rock granular basecourse. This is the first step in the construction of the bituminous surfacing layer

5 Environmental

As the Project is located within a mostly industrialised area, there are limited environmental impacts related to flora and fauna. Only a small area of native vegetation was located within the Project footprint (Table 4) and required to be cleared. Significant environmental aspects of this Project include the prevalence of Acid Sulfate Soils (ASS) and a high groundwater table, requiring dewatering and careful drainage design.

Table 4 Summary of Environmental Aspects

ENVIRONMENTAL ASPECTS	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Native Vegetation Cleared	ha	0	0.28
Native Vegetation Retained (due to design)	ha	0	0
Revegetation/rehabilitation Undertaken	ha	0	0
Number of Trees Cleared	#	329	329
Number of Trees Retained (due to design)	#	122	122
Total Water Consumption	kL	57,235	64,231
Total Non-Potable Water Consumption	kL	56,808	63,421
Total Potable Water Consumption	kL	427	810
Non-Potable Water Replacement	%	99	99
Total Green House Gas emissions ^{^*}	t CO2-e	3,120	4,945.19
Total Energy Consumption	GJ	23,090.35	32,453.80
Renewable Energy Mix	%	0	0

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

^{*}based upon LCA completed at end of design by external consultants.

As the Project is in Welshpool, it is surrounded by various suppliers that have been contracted for various works. For example, WA Recycling is being used to supply recycled sand, and is also being provided material outputs to be recycled and reused by the company. Being located within an industrial area has led to several similar opportunities such as providing redundant concrete drainage, kerb and footpath to Capital Recycling to be crushed and re-used as track material, recycled drainage aggregate and CRC subbase. A summary of resource inputs and wastes for the Project are detailed in Table 5.

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	355,840	459,562
Total Quantity of Recycled Materials Used	t	17,442	74,573
Total Quantity of Reused Materials Used Onsite	t	10,950	10,950
Percentage of Recycled Material Used	%	5%	16%
Resource Outputs (Wastes)			
Waste Sent to Landfill	t	2,152.03	2,508.43
Waste Diverted from Landfill	t	17,635.48	17,636.28
Total Waste Generated by Project	t	19,787.51	20,144.71
Waste Diversion Rate	%	89%	88%

5.1 Environmental Context

The following Landform and Climatic Conditions are associated with the Project:

- The Project area is located approximately 6.5 km south-east of the Perth central business district, encompassing the intersection of Leach Highway and Welshpool Road.
- The Project area ([Appendix 4](#)) is approximately 26.20 hectares (ha) and is situated within the City of Canning.
- Within the Project area there was a recorded six vegetation types, totalling 11.26 ha. Of the six vegetations, two were considered to be original remnant vegetation and were recorded to be in small isolated pockets, totalling 0.29 ha. Perth receives moderate though highly seasonal, winter based rainfall. Summers are generally hot and dry, lasting from December to March, with February generally being the hottest month of the year. Winters are cool and wet, giving Perth a hot-summer Mediterranean climate.
- In terms of geology and soils, the Project area is situated on the Bassendean Dune and Pinjarra Systems.
- There are no significant surface water bodies in close enough proximity to the Project with the Swan River being situated approximately 4.7km to the northwest of the Project.

The Project will not impact on any flora or vegetation of conservation significance as confirmed within the Preliminary Clearing Impact Assessment Report (Barrett, A & Carey, M., 2019). The majority of the vegetated area within the Project footprint is revegetation, with only 0.29 ha considered native remnant vegetation. The condition of vegetation within the Project area is mostly 'Degraded – Completely Degraded' (Barrett, A & Carey, M., 2019).

The Project is unlikely to provide habitat for any conservation significant fauna species. Due to the disturbed nature of the Project Area, the site supports a highly modified habitat preferred by opportunistic fauna that are considered common and widespread.

5.2 Environmental Management

The Project has developed an Environmental Management Plan (EMP), which sets out to describe how environmental aspects are to be managed so the Project area and those engaged onsite will:

- comply with Georgiou Policy, Main Roads, legal and other obligations;

- minimise the impacts on the environment; and
- achieve the company, client and site objectives and targets.

The EMP is written in accordance with Georgiou's health, safety and environment management system which is third party certified to AS/NZS ISO 14001. LWA has also developed an 'Environmental Management Commitment Statement' which defines how the Project will endeavour to keep impacts generated by construction activities to a minimum, while delivering an asset that can be utilised and enjoyed by future generations.

A risk management approach has been used to determine the severity and likelihood of an activity's impact on the environment and to prioritise its significance. This process considers potential regulatory and legal risks as well as taking into consideration the concerns of community and other key stakeholders.

Environmental legislation and regulation compliance is detailed in [Table 6](#) and the Project's environmental approvals and allowances are summarised in [Table 7](#).

Table 6 Summary of Project Compliance Requirements to Environmental Legislation and Regulations

Legislation / Regulation	How will the Alliance comply with the requirement
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)	The EMP implements processes to minimise impact on the Environment
<i>Environmental Protection Act 1986</i> (WA)	The EMP implements processes to minimise impact on the Environment
Environmental Protection Regulations 1987 (WA)	The EMP implements processes to minimise impact on the Environment
Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)	Waste Management Environmental Sub Plan in EMP
<i>Aboriginal Heritage Act 1972</i> (WA)	Culture & Heritage Management Environmental Sub Plan in EMP
Aboriginal Heritage Regulations 1974 (WA)	Culture & Heritage Management Environmental Sub Plan in EMP
<i>Biodiversity Conservation Act 2016</i>	Flora & Fauna Management Environmental Sub Plan in EMP
Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (WA)	Adherence to the clearing permit (CPS 818/15)
<i>Rights in Water and Irrigation Act 1914</i> (RIWI Act) (WA)	Water Management Environmental Sub Plan in EMP
Environmental Protection (Controlled Waste) Regulations 2004 (WA)	Waste Management Environmental Sub Plan in EMP
Environmental Protection (Noise) Regulations 1997 (WA)	Noise & Vibration Management Environmental Sub Plan in EMP
<i>Aboriginal Heritage Act 1972</i> (WA) consent to disturb	The EMP implements processes to minimise impact on the Environment

Table 7 Environmental Allowances, Approvals and Permits

ENVIRONMENTAL ALLOWANCE TYPE	UNIT	PROJECT ALLOWANCE
Clearing Permit Allowance (CPS818/15)	ha	0.29 ha native vegetation and 10.97 ha non-native vegetation.
License to Construct and Alter a Well	N/A	Construct dewatering spears, excavation(s) or soak(s), from 3 December 2021 to 2 December 2023.
License to Take Water	kL	244,000kL annual water entitlement, from 1 December 2021 to 2 December 2023

5.3 Water Management

Water Management is outlined within the Project's formally approved EMP, within a Water Management Sub Plan. The Sub Plan reiterates the need for water to be conserved, reused and recycled where reasonably practical. The Project is pursuing the reduction of at least 5% construction and operational water consumption from business-as-usual practices. Water use to date on the Project can be found in [Table 8](#).

The Project has identified areas of construction which can utilise the use of non-potable water sources (groundwater). The Project area does not fall within a Public Drinking Water Source Area (DWER, 2019), but does fall within a proclaimed Perth Groundwater Area (DOE, 2004). As such, the Project has been issued a License to Construct and Alter a Well and License to Take Water ([Table 7](#)) by the Department of Water and Environmental Regulation (DWER). Part of this licensing involves tracking the usage of groundwater in accordance with the annual entitlement to take water under the License to Take Water. All water usage is metered as per DWER licensing requirements and reported monthly.

Groundwater bore locations across the Project area have been carefully selected to be utilised for the maximum duration of time due to scheduling of works without needing to unnecessarily re-drill bores. Spreading the draw allocation across multiple bores will also ensure draw down is spread out and not localised to one area.

The Project has been able to reduce water consumption through the application of dust suppressant in lieu of water where possible, and the use of an alternative mixing technique to achieve optimum moisture content (OMC) in basecourse. Two options were investigated, considering quality, application, water consumption and cost of each. As a result of the investigation the Project will be trialling Stabiliser Wet Mixing, utilising a Stabiliser machine that mixes the material and water on site to achieve better quality OMC and reduces the overall water used.

Table 8 Water Parameters

WATER PARAMETER	TOTAL THIS PERIOD		TOTAL FOR PROJECT	
	kL	%	kL	%
Potable Water				
Standpipe / Scheme Water Purchased	427	0.7	810	1.3
Non-Potable Water				
Bore Water	56,808	99.3	63,421	98.7
Surface Water	0	0	0	0
Recycled / Wastewater	0	0	0	0
Total Water Used	57,235	100.0	64,231	100.0

5.4 Vegetation

Within the Project area there were six vegetation types recorded, totalling 11.26 ha. Of the six vegetations. The recorded vegetation types and area covered are as follows:

- Original remnant woodland (ORW) (0.27 ha);
- Original remnant shrubland (ORS) (0.02);
- Revegetated shrubland (3.06);
- Revegetated woodland (6.63);
- Revegetated landscaping (1.12 ha); and
- Planted gardens (0.16).

Of these vegetation types only two units (ORW and ORS), represented by small, isolated pockets, are considered to be original remnant vegetation, and derivatives of the original woodlands or shrublands that might have occurred in the area (Barrett, A & Carey, M., 2019).

Findings from the Initial Environmental Impact Assessment confirmed three Black Cockatoo species are 'likely to or may occur' within the Project area (Barrett, A & Carey, M., 2019). Vegetation within the Project area is considered to be potential Black-Cockatoo habitat, and was assessed to determine if vegetation within the Project area falls into any of the following three types:

- Foraging habitat;
- Roosting habitat; and
- Breeding habitat.

Foraging habitat for Black Cockatoos occurs in the Project area totalling 12.90 ha, however, the Assessment found "due to the proximity of the Project area adjacent to noisy, busy roads and light industrial activity, combined with the relatively low quality of foraging habitat provided, the likelihood that Black Cockatoos regularly or preferentially forage within the Project area is considered low" (Barrett, A & Carey, M., 2019). No roosting sites were found within the Project area, however large trees within the area could potentially provide roosting habitat (Barrett, A & Carey, M., 2019). This Assessment also concluded "the Project area does not provide any habitat currently suitable for Black Cockatoo breeding and the likelihood that Black Cockatoos would occupy the Project area for breeding in the future, given the noisy and busy nature of the surrounding land-uses, is considered low" (Barrett, A & Carey, M., 2019).

Part of cleared vegetation on the Project was donated to local wildlife centres WA Wildlife and

Kaarakin Black Cockatoo Conservation Centre. The Project donated approximately two truck-loads of stumps and branches to WA Wildlife for reuse in their enclosures. The Project donated approximately three truckloads of branches to use as perches in Kaarakin aviaries, and approximately two truckloads of gum nuts and cape lilac berries to provide to the Black Cockatoos as feed. In addition, cones from two large banksia trees to be cleared were also donated to the Centre.

LWA organised a team visit (including family and friends) to Kaarakin's Centre in Martin ([Figure 8](#)). This visit engaged the Project team in the behaviours, habitat, and conservation of Black Cockatoos in Perth. Our tour guide also discussed preferred species for replanting in favour of Black Cockatoos, and the risks to consider related to planting near major roadways, based upon previous projects in the Perth metropolitan area.



Figure 8 Black Cockatoos at Kaarakin Black Cockatoo Conservation Centre During Team Visit.

5.4.1 Clearing

The Main Roads state clearing permit CPS818/15 provides the Project with approval to clear. The Project also submitted a Low Impact Screening Checklist (LISC) and attained approval from Main Roads to allow ten additional locations across the Project footprint to be cleared, in order to facilitate design requirements. No clearing of native vegetation was incorporated in this LISC.

A number of introduced (weed) species were identified within the Project footprint and marked during clearing works to be disposed of separately to green waste, which was marked for re-use.

5.4.2 Revegetation/Rehabilitation

The detailed design allows for the maximum quantity of soft landscaping as possible, where Main Roads specifications and safety requirements permit. Setbacks included not being able to plant within medians due to maintenance safety concerns. Based upon a comparison of the land areas from concept design to final design, LWA have increased soft landscaping areas by 6%.

5.4.3 Dieback

No areas infested with Dieback occur within the Project area (Barrett, A & Carey, M., 2019).

5.5 Carbon Emissions and Energy

LWA is pursuing a reduction of energy and greenhouse gas emissions over the lifecycle of the Project, as one of our sustainability targets ([Table 2](#)). A LCA was developed at the end of the detailed design, confirming the Project has reduced all energy and emissions by 24% from the base case. A target of 5% was set for the Project and has been realised due to the investigation and implementation of several opportunities. A breakdown of all energy and emissions sources on the Project is detailed in [Table 9](#) below.

An investigation was undertaken during early stages of design to identify reduction opportunities, including the implementation of hybrid permanent lighting and motion sensors which were unable to be realised. These were not implemented due to lack of funding and certainty in product. The largest reduction realised was due to the swap of HPS luminaires to LED luminaires, equivalent to 4,880 tonnes of greenhouse gas emissions saved, and a 22% emissions reduction. The Project pursued operational energy reduction opportunities appreciating this timeframe makes up the greatest portion of energy and emissions over the infrastructure lifecycle. Increasing waste recycled and reducing temporary lighting staging required, has also contributed to the 24% reduction in energy and emissions.

Table 9 Energy Parameters

ENERGY PARAMETERS	TOTAL THIS PERIOD				TOTAL FOR PROJECT			
	LITRES	KWH	GJ	% OF TOTAL USE	LITRES	KWH	GJ	% OF TOTAL USE
Unleaded (on and off road)	17,192.63	-	587.99	3%	18,268.19	-	624.77	2%
Diesel Used (on and off road)	422,351.00	-	16,302.76	71%	444,526.00	-	17,158.71	53%
Liquefied Petroleum Gas (LPG)	24.00	-	622.8	3%	34.00	-	881.8	3%
Biodiesel	0.00	-	0.00	0%	0.00	-	0.0	0%
Hydrogen	0.00	-	0.00	0%	0.00	-	0.0	0%
Oil	120.00	-	4632.00	20%	170.00	-	6562.00	20%
Other (Grease)	120.00	-	456.00	2%	170.00	-	6596.00	20%
Purchased Electricity from Grid	-	135,779.00	488.80	2%	-	184,790.00	630.52	2%
Green Power Mix	-	-	0.00	0%	-	-	0.0	0%
Generated from Renewable Energy Onsite and Used Onsite	-	0.00	0.00	0%	-	0.0	0.0	0%
Total Used	264.00	135,779.00	23,090.35	100.00	463,168.19	184,790.00	31,823.28	100.0

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

5.6 Materials and Recycling

LWA appreciates the importance of managing resources efficiently and reducing Construction & Demolition (C&D) waste. Our vision is aligned with the WA Waste Strategy Vision, that being, “to manage all works sustainably, supporting a low-waste, circular economy in which human health and the environment are protected from the impacts of waste” (Waste Authority, 2019). A Resource Efficiency Action Plan (REAP) was implemented to manage material use and implement resource efficiency targets (Table 2). All aspects of design and construction have applied the waste avoidance model, and several opportunities have been implemented where applicable with the contract and the approval of Main Roads:

- Use of 37,725 t Crushed Recycled Concrete (CRC); as a subbase material under Full Depth Asphalt (FDA).
- Use of 504 t Reclaimed Asphalt Pavement (RAP); as fill and track material within our embankment footprint. The asphalt component is also provided back to the asphalt contractors to be used in their RAP mixes.
- Use of 19,209 t recycled sand for embankment fill.
- Use of 15,000 t of blue metal crusher dust material as an alternative for embankment fill in tight areas, where approved by the landscape designer.

- Trial of Emulsion Prime; in an effort to reduce our bitumen use, and risk of run off whilst constructing pavements in the winter months. Approximately 13,000 L was used.
- Maximising granular pavements, reducing the use of FDA.
- Use of a recycled plastic geotextile; approx. 3,750 m² was used on the bridge abutments.
- Reusing approximately 30,472 t site-won material where feasible including existing pavements for use as track material and left in as fill material for embankment construction
- Use of crumbed rubber in the bridge deck seals. Approximately 30,000 L was used.

All materials and outputs on the Project are controlled through management mechanisms identified within the Project's EMP. To facilitate the efficient management of resources throughout the Project design and construction stages, the waste avoidance hierarchy has been applied for the management of inputs and outputs. Imported materials used are detailed in [Tables 9](#) and [10](#), and opportunities realised to reuse materials are quantified in [Table 11](#). The design and construction teams have investigated opportunities to reduce waste to landfill and reduce material lifecycle impacts:

- Position paper submitted for consideration to trial noise walls made from recycled plastic material, this was not realised. The cost of implementation in the current economic environment was not viable.
- Consideration recycled cold emulsion asphalt being trailed on the Project, not realised due to timing.
- Current investigation on the use of Food Organics Garden Organics (FOGO) material as mulch. The LWA has investigated the different types of FOGO materials, their associated manufacturing process, materials, particle size and risks, to understand application on the Project. This included visiting the Eastern Metropolitan Regional Council (EMRC) Red Hill Waste Management Facility to visually understand the risk of weed burden within this material (refer to [Figure 9](#)).



Figure 9 LWA team visit the EMRC Red Hill Waste Management Facility and witnesses green waste being processed to develop FOGO material

Waste education is fundamental to the achievement of diversion from landfill targets, as the entire team is involved in avoiding and reducing waste. During construction the Project team was invited to participate in an engaging 'Waste Busters' workshop, which was an interactive quiz based on correct recycling practices and waste management. The quiz included questions related to common recycling mistakes made within the Project offices and questions received from the Project team related to recycling (Figure 10). The Waste Busters workshop received positive feedback within the post-workshop engagement survey, with <75% of participants saying they learnt 'a lot' or 'a great deal' and 100% of responders saying they would like LWA to run another waste education quiz. This led to another workshop planned for Q42022 and additional educational resources published throughout the Project offices.



Figure 10 LWA Participants in a waste education exercise

Table 10 Imported Raw/Traditional Materials for the Project

IMPORTED RAW/TRADITIONAL MATERIALS			
MATERIAL	UNIT	TOTAL THIS PERIOD	TOTAL FOR PROJECT
Aggregate	t	0	0
Aluminium	t	0	0
Asphalt	t	3931	4489
Ballast	t	0	0
Bedding Aggregate	t	446	446
Bitumen	L	37918	47397
Bitumen Cutter (MCC)	L	9106	9106
Bitumen Cutter (SCC)	t	0	0
Cement	t	0	0
Cement Additives	t	187	187
Cement Stabilised Backfill	m3	1485	4027
Clay	t	0	0
Concrete	m3	3393	9657
Crushed Dust (including Cracker Dust)	t	2064	2064
Crushed Limestone	t	23096	23096
Crushed Rock	t	0	0

Crushed Rock Base	t	28323	28323
Emulsion Based Prime (e.g. Ecoprime)	L	3600	3600
Ferricrete	t	0	0
Geofabric Polymers	t	0	0
Glass (including Glass Beads)	t	0	0
Gravel	t	0	0
Laterite	t	2302	2302
Lime	t	21	21
Lime Additives	t	0	0
Mechanically Stabilised Earth Backfill	t	0	0
Mulch	t	800	800
Paint (Waterborne, Thermoplastic, Cold Applied Plastics)	l	12326	15127
Perspex	t	0	0
Plastic	t	0	0
Precast Concrete	t	8237	104784366
Sand	t	257188	385328
Steel	t	14157	14157
Synthetic Binders	t	0	0
Topsoil	t	2000	2000
Other	t	0	0

Table 11 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	18015	37725
Crushed Recycled Glass	t	0	0
Eco-blocks	t	0	0
Geopolymer Concrete	t	0	0
Low Carbon Concrete	t	0	0
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	504	504
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	19209	19209
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	0
Warm Mix Asphalt	t	0	0

Other	t	0	0
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Table 12 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	3505	3505
Limestone	t	0	0
Mulch	t	540	540
Overburden	t	0	0
Road Base	t	0	0
Sand	t	15258	15258
Spoil	t	0	0
Topsoil	t	1800	1800
Other	t	0	0

5.7 Noise and Vibration

Noise and vibration is managed through the conditions set out in the EMP. Key personnel from the construction team meet monthly to review data collected, investigations undertaken, upcoming works and enquiries received. A vibration monitor sends alerts to key Project personnel, allowing the Project team to immediately respond to increased vibration levels, and effectively manage vibration generated by construction activities. Investigations are undertaken by the Project's Superintendent and corrective actions are logged.

The Project is stockpiling materials in a nearby location outside of the Project footprint, located within a residential area. To ensure noise levels are minimal and do not disturb these residents, the Project employed an acoustic engineer, conducted a report, and employed sound dampening measures including noise blankets, to appease nearby residents.

5.8 Air Quality

Air quality is monitored in real time through permanent monitors on site, selected with consideration of sensitive receivers and likelihood of works causing air quality impacts. Preventative measures are identified in the EMP and discussed at monthly environmental meetings with key personnel. Limited spoil was required to be excavated on the Project and traffic switches have been rapid, leading to limited exposure of fine materials and air quality impacts to surrounding sensitive receivers.

5.9 Light Spill

Light spill from construction activities and operational lighting impacts only one area within the Project footprint; the residential area near Albany Highway which is adjacent to Leach Highway. Most of the Project adjoins commercial and industrial properties, rather than residential, which are unoccupied during the evenings. To manage light spill during construction activities, the construction team monitors temporary lighting placement in comparison to sensitive receivers. Permanent lighting was assessed by the design team and additional measures have been included for installation to a limited number of street lights, to mitigate light spill and ensure compliance.

5.10 Contamination

A Contaminated Land Assessment was undertaken for the Project between March 2021 and April 2021, focusing on areas of potential environmental concern (APEC) as identified within the findings and recommendations of a desktop review undertaken by LWA during the development phase. Findings from this report provided recommendations implemented for the construction phase, included within the EMP and Dewatering Management Plan. Based on these assessments it is not expected that any known contaminated with be encountered during the construction phase of the Project.

Unexpected/unknown contamination – it is possible that potentially contaminating activities have occurred, and contamination is present within the Project area (Appendix 4). However, this uncertainty is managed through e detailed and approved Environmental Management Plan that has been developed for the Project.

5.11 Acid Sulfate Soils

An Acid Sulfate Soils Management Plan (ASSMP) has been developed for the Project. The objective of this ASSMP is to mitigate or control potential impacts relating to the disturbance of Acid Sulfate Soils (ASS) associated with construction earthworks (i.e., open trench excavations, piling, etc.) as part of the development of the Project. The Plan also outlined how treated ASS will be best reused on site where deemed geotechnically suitable.

Based on the results of the previous investigations, the following material has been/will be treated as ASS and managed in accordance with the ASSMP:

- Leach Highway / Welshpool Road Interchange – All material from approximately 2.50m below ground level (bgl) and below (above and below groundwater)
- Alexandra Place Compensating Basin – All material from 5.00m bgl and below (below the groundwater table)
- Welshpool Road Stormwater Drain Alignment – All material from approximately 3.75 m bgl and below (below the groundwater table)
- GWF Drainage Basin – All material from surface level and below
- All areas – encountered Coffee Rock, above and below the groundwater table.

5.12 Environmental Case Study – Use of Recycled Sand

Aligned with the Project's Resource Efficiency Targets, LWA is pursuing opportunities to avoid the use of virgin materials, reuse recycled materials and reduce outputs. The construction team have allowed for the use of over 19,000 tonnes of recycled sand, in lieu of forecast virgin material to be used as fill. This material is different to the reuse of site-won spoil/sand. Recycled sand is being supplied to the Project by WA Recycling, a local Construction and Demolition (C&D) recycler. WA Recycling is an approved supplier of this recycled material according to the State Government Roads to Reuse program (RtR). This material has important sustainability value as it is the by-product of C&D processing within WA, providing an alternative application for an otherwise waste product that would end up in landfill.

The construction team used as much recycled sand as possible, to meet daily material quotas. At present recycled sand makes up approximately 5% of the total sand used on the Project. Up to 5,000 tonnes of sand may be required in a day to meet the demands of the construction program, and a limiting factor of supply was that a maximum of 500 tonnes of recycled sand was available for turn-around in a single day. The team worked closely with WA Recycling to attain the maximum material quantities possible where unable to provide advanced notice. Additionally, due to the increased number of construction projects within WA, the Project experienced pressure on the availability of transport vehicles to provide supply. This limited availability drove up the cost of the virgin material and provided a competitive advantage for C&D recyclers to provide recycled products at a lower price point to virgin material.

Recycled sand has been used on the Project for the retaining wall backfill ([Figure 11](#)) and embankment construction LWA forecasts an additional 30,000 tonnes of recycled sand will be used during construction.



Figure 11 Retaining wall backfill with recycled sand

6 Social

The Project surrounds are predominantly commercial and industrial, with a small number of residents at the southern end of Leach Highway. Stakeholder engagement and traffic safety are fundamental aspects of the Project, included as KRAs. A summary of key social aspects and performance for the Project is detailed in Table 13.

A specific stakeholder engagement management plan was prepared to guide engagement during the construction phase, and to align with the Community and Stakeholder Engagement Strategy developed by Main Roads during development.

Table 13 Summary of Social Aspects

SOCIAL ASPECT	UNIT	TOTAL FOR THIS PERIOD	TOTAL FOR THE PROJECT
Stakeholders engaged	#	119	173
Stakeholder enquiries received	#	23	32
Heritage sites in Project footprint	#	0	0
Length of Principal Shared Path (Addition/Refurbished)	km	0.4	0.4
Women in Workforce	%	14%	14%
Indigenous People in Workforce	%	7.3%	7.5%
Lost Time Injury Frequency Rate (LTIFR)	#	0	0
Hours of Training Undertaken	hrs	706	706
Development Employees and Apprentices on the Project	#	20	20

6.1 Social Context

The Project is within the Welshpool industrial precinct - surrounded by a range of processing, fabrication, and retail trade businesses – as well as a small residential area.

The range of businesses is broad, each with different concerns and needs.

The most significant construction-related concerns relate to:

- Construction impacts, in particular vibration (such as effects on calibrated equipment, and possible damage to process equipment, as well as to residential and sensitive commercial buildings) and dust (such as effects on process equipment).
- Traffic management, in particular avoidance of the area because of congestion; and reduced/changed access to businesses.

Vibration impacts on adjacent historic structures at Milne Feeds and Bega's dairy processing plant were identified as a key risk. Separate risk management strategies were prepared. Further to the general property condition surveys offered to all properties within 100 m of Project works, additional surveys were conducted at Milne Feeds and Bega, including heritage masonry surveys, a laser verticality survey and electrical process surveys.

Ongoing engagement was conducted with the two local businesses using the intersection for the regular transport of oversized and over mass loads (OSOM). Traffic planning incorporated their needs through the congested site, and traffic management plans were discussed in advance to ensure suitability and make changes when necessary. Drawings were provided in advance to the businesses for the engineers' review of traffic management changes. Nine meetings were held to discuss traffic

management changes. The businesses altered the timing of some OSOM movements in response to early advice about planned traffic changes, and the Project team altered the location of bollards and traffic cones on occasions.

The team has focused on maintaining business continuity throughout works, keeping access ways open and setting up traffic controllers to guide traffic to businesses during road closures. When road closures prevented simple pedestrian detours, taxis were used to transport pedestrians across the affected area.



Figure 12 Ahead of a major traffic change which was to put traffic over the new Leach Highway bridge over Welshpool Road, a bridge walk was conducted for local businesses to learn about upcoming traffic changes, and to assess the visibility of their business from

6.2 Community and Stakeholder Engagement

An ongoing program of engagement with surrounding stakeholders focused on minimising disruption to businesses. This program was informed by extensive design phase engagement, allowing stakeholder relationships to grow and strengthen. The small number of adjacent residents were also engaged, with opportunities including briefings and home visits. For example, road construction activities were required at an adjacent retirement village. Residents were invited to a briefing at the LWA office (see [Figure 13](#)), and subsequently staff were invited to a morning tea at the village. During follow-up doorknocks and letter drops residents were kept informed of upcoming works and any concerns were dealt with one-to-one.

Ongoing consultation enabled stakeholders to inform construction planning and programming. Examples of stakeholder informed outcomes are as follows:

- In consultation with Western Power a planned power outage required for Project works was rescheduled to Sunday, to avoid impacting 39 businesses who would have to lose power during business hours.
- LWA worked closely with a busy parcel delivery business, CTI Xpress, to ensure their access was maintained during various works, including setting up a temporary driveway off a side street when their entrance was affected by road closures. Consultation with businesses ahead of major road closures enabled alternative routes and access to be identified.
- A 24-hour dairy processing facility, Bega, was particularly affected by the closure of Sevenoaks Street for bridge work closure, and LWA liaised with two local government authorities and Main Roads to have alternative heavy vehicle routes approved for road closures adjacent to their premises.
- In response to businesses, keep clear markings were placed on Welshpool Road at the intersection with Ewing Street North to facilitate traffic flow during extended lane closures.

Meetings are held with the local government authority, City of Canning, every three weeks. This has enabled issues to be discussed in advance and solutions identified. For example, with the City of Canning's support, the location of a gross pollutant trap was changed from the verge of Ewing Street North to Water Corporation land on the other side of the road. As a result, closing the Ewing Street North's southbound lane and entrance for three months to allow construction was not required. Such a long closure would have caused disruption to the businesses along this road, including a large bus operator Horizons West. Community Satisfaction and Amenity As a key result area for the Project, Relationships with Stakeholders and the Community was primed with two key performance indicators:

- Escalation of construction related complaints to Main Roads.
- Community sentiment of Project relationship.

To measure community sentiment and to follow on from Main Roads' initial survey in October 2020, Project surveys were conducted in November 2021 and March 2022. Both surveys returned stakeholder satisfaction levels above 80%. Another survey is planned for November 2022.

A major factor in these high satisfaction levels was the proactive approach to managing community and stakeholder concerns. When the WA Museum Collections and Research Centre contacted LWA to report they were experiencing levels of vibration, the team found anomalous vibration was being experienced in parts of the building some distance from the works. While construction activities were being undertaken with predicted vibration impacts the supervisor was in constant contact with the Museum's representative to check levels were not problematic. A single compaction vibration roller operator was used to ensure consistency.

Stakeholder engagement included group briefings (at the Project office, and virtually on Microsoft Teams), one on one liaison, as well as responses to direct contacts. The Project focused on proactive consultation with the aim to boost Project understanding to reduce complaints. Separate to consultation activities, the Project team conducted random "check-ins" to monitor stakeholder sentiment and provide the opportunity to raise concerns. A total of 59 proactive consultations were conducted, and 49 complaints received (of these 29 related to minor traffic matters). A total of 63 stakeholder check ins were also conducted.

The Superintendent made himself available to key affected stakeholders, who contacted him directly with concerns. This expedited response times.

Discussions with the City of Canning lead to construction of a section of footpath (an addition to the original design) at the intersection of Ewing Street North and Railway Parade. This has improved the amenity of the road which previously had no footpaths, and will allow the City of Canning to build onto the footpath in future.

The design for Indigenous artwork on the railway bridge abutments was progressed through consultations with the local traditional landowners and Whadjuk Nyungar artist Justin Martin.



Figure 13 Retirement village residents at a briefing in the Project office

6.3 Heritage

An ethnographic assessment was undertaken for the Project in 2019. The assessment was undertaken in accordance with the Noongar Standard Heritage Agreement (NSHA) and was undertaken with participation of seven of the eight Whadjuk members nominated by the South West Aboriginal Land and Sea Council (SWALSC) and Whadjuk Working Party. Conclusion of the assessment confirmed there are no registered ethnographic Aboriginal sites or listed Other Heritage Places within or overlapping with the Project area. Further to this ethnographic assessment, an Aboriginal archaeological survey was also undertaken in 2019 and concluded no Aboriginal cultural material or archaeological sites were identified within the Project area.

A Culture and Heritage Sub-Plan sits within the EMP, containing details of this assessment, and an unexpected finds procedure. Implementation of the unexpected finds procedure is monitored as part of regular Environmental Daily Hazard Inspections and no unexpected finds have been recorded on the Project. The Project is pursuing a Level 1 in the ISC ISv2.0 Design and As Built Self-Assessment

credit target Her-1.

Cultural awareness training (CAT) is mandated for all long-term Project employees. Long-term employees are considered Project employees who have worked on the Project full-time for over 3 months. This Training provides invaluable knowledge and is fundamental to the Alliance's commitment to pursue an inclusive culture.

6.4 Road Safety

The Leach Highway and Welshpool Road Interchange is considered the most dangerous and second most congested intersection in WA. The Interchange has over 50,000 vehicles pass through every weekday, and with surrounding commercial activities in the Welshpool commercial area, Perth Airport, Kewdale Freight Terminal, and surrounding residential areas, this Interchange experiences dangerous rear-end collisions. Between 2015 and 2019, 224 crashes were recorded and 204 of these were rear-end collisions.

Leach Highway is a strategic freight and regional link connecting the industrial areas of O'Connor, Kewdale and Welshpool with Fremantle and the Inner Harbour. Current and predicted traffic demands for these roads create significant congestions and queues which highlights the requirement for robust controls and plans to ensure road safety. The Project staging consist of various stages and phases which requires closures of local roads and ramps to effectively construct the new road alignment and bridges. The multiple alignment shifts, and closures may cause confusion with road users of which LWA addresses these through a variety of strategies.

Traffic Guidance Schemes prior to implementation is reviewed by Road Planning Intervention and the Local Government, of which potential issues with road safety are raised and amended prior to implementation. Early notification such as Variable Messenger Sign (VMS) boards, displays advance warning for road closures and road disturbance, this allows for road users to plan their travel effectively reducing user confusion. In addition, road safety audits are performed post switch which identifies further improvements to be actioned to ensure safety of road users.

6.5 Diversity

LWA is committed to addressing the disadvantage and inequality which may be experienced by Aboriginal people. This will be pursued through employment and business procurement targets, partnerships within industry, and Project initiatives including training and development opportunities. It is our aim to understand and accept Aboriginal culture along with respecting the different values and beliefs. LWA is committed to working in partnership with Aboriginal communities, companies and people to help achieve these goals.

Aboriginal Participation Targets:

- At least 10% of the total work hours across the whole Project is to be undertaken by Aboriginal Persons. For the 21-22 period, the total work hours accounted for 7.5%.
- At least 2% of works and/or services to a value of the contract sum is to be undertaken by Aboriginal businesses. For the 21-22 period, the total work hours accounted for 2.6%.

During the early development phase, LWA had the vision to support opportunities for young high performing individuals to step into senior roles. As a result of this vision, the LWA team is made up of a balance of experienced and young professionals and has enhanced new opportunities. The Alliance encourages performance development and has implemented a program to support the development of relatively "new" professionals over the lifetime of the Project, which also provides a forum for these individuals to collaborate and share experiences.

Regular events are held supporting an inclusive working environment on LWA, and to recognise significant diversity and inclusion events. In the last year, the Alliance has celebrated Chinese New Year (Figure 14), Harmony Day and National Reconciliation Week.



Figure 14 LWA team members preparing food for the Chinese New Year morning tea

6.6 Traffic Management & Community Safety

Leach Welshpool Alliance acknowledge the increased safety risk to the road user and the potential delays the Project may cause to the travelling public. Therefore, a Traffic Management Plan has been developed to complement the Project Safety Management Plan to properly address the major hazards involving proximity to a traffic environment for both workers and the public. In addition, the plan has specific focus in mitigating adverse impacts to traffic flow and network performance.

A Risk Management process has been undertaken by LWA as part of our statutory duty obligations prescribed in the *Occupational Safety and Health Act 1984* and Regulations 1996. The process evaluates site hazards, likelihood, consequence, and treatment. Where risk associated with competent planning of traffic management and adverse traffic flow is addressed through implementation of Traffic Control Plans and specific Traffic Guidance Schemes. These plans are endorsed by suitably accredited Advanced Worksite Traffic Management (AWTM) and Roadworks Traffic Managers (RTM) as required by the proposed works. In addition, the plans are reviewed by Road Planning Intervention with emphasis on checking impacts to adjoining network and ensuring queue time is at an acceptable level.

The Traffic Control Plans and Traffic Guidance Schemes also outlines requirements for effective communication of the upcoming planned works to key stakeholders. As a base minimum Notification of Roadworks are sent out to key stakeholders which outlines intended traffic plans, works, and dates and times for implementation.

LWA also notifies general road users and local businesses in advance of scheduled works and associated detours via email and printed notices. Roadworks Updates which are sent via mass email to a list of 1000-plus subscribers who opt in via the Main Roads Project website and notices are hand-delivered to specific residential areas and groups of businesses. When a major road closure is scheduled, notices have been hand-delivered to 2000-plus businesses and residents within a 1.5 km radius of the intersection. These notices ensure road users can plan their route to avoid any congestion or extra hazards that may be caused by closures or detours. Particular attention is paid to businesses with high-traffic deliveries and pick-up, and those with over-size loads. Regular meetings are held with these businesses, backed-up up by check-ins with company owners and operations managers.

6.7 Workforce Safety

The Project has set a series of safety criteria with which it measures its safety performance against. Not in terms of statistics but in relation to a number of generic objectives and site-specific objectives. Objectives include; HSEQ Management System Application, Communication, Consultation & Participation of the Workforce, Effective Risk Management, Training & Innovation, Health & Wellbeing and Project Specific Objectives. Each month the Project assesses safety performance against these criteria and ascertains whether the requirement has been met or not met.

The Project has a high focus on critical risk with risk review workshops conducted in relation to high risk programmed activities. The Project has achieved a number of key objectives with incident free safety records achieved while undertaking these key high-risk activities.

The audit schedules for the Project are set via a Project-based requirement schedule and inspections are set via a periodical KPI weekly requirement which is monitored by senior management to ensure accountability.

LWA have adopted a safety culture program which focuses on the safety performance of each individual with a series of safety behaviours which each of the Project personnel should be achieving. These key requirements are based on how workmates are looked after, the reporting of hazards and incidents, the accountability of each individual and the ability of each individual to recognise and act on safety issues.

While the Project has a high focus on safety, by providing a work environment where the worker feels a valued and respected part of the Project, a stronger safety culture can be built to drive safety performance. This is achieved to a certain extent by ensuring the health and wellbeing of the Project workforce. This is done via several initiatives such as promoting individuals to join our offsite group exercise sessions which include box fit and bootcamp style exercises for white and blue-collar workers. A work/life balance focus has been implemented on site where early finish days are scheduled monthly to give employees the opportunity to spend more time with family and friends.

LWA have put together a schedule of global wellbeing days with scheduled toolboxes that deliver information around important issues such as men's health, mental health and other culturally important subjects. The Project has also engaged the services of industry leading professionals to deliver information sessions around these important issues that affect workers.

From a statistical standpoint, no lost time incidents have been reported, and a total of 62 work related incidents have been reported.

6.8 Legacy Commitments

The Alliance made a commitment that for every tree removed within the Project footprint, five would

be replanted. This target was unable to be met with replanting solely within the Project footprint, and so the City of Canning was consulted by LWA to understand if there was a need for any planting within the surrounding area. The City of Canning team identified a need to plant within the Centre Street Basin, to improve the water quality within the Basin itself and feeding through to the wider Canning Catchment. Through collaboration with the City of Canning, the Project donated native sedges and rushes to this project in lieu of trees to be planted, and was able to meet its replanting target.

LWA collaborated with members from the City of Canning to determine the required species to be planted and achieve optimal results. Once procured, the City of Canning engaged St Norbert College's volunteer environmental action group, the Climate Canons, to plant these in mid-June 2022 with members from LWA (Figure 15).

Planting these sedges will not only assist in improving water quality, it will also protect local wildlife and beautify the Queens Park wetlands. On the day of planting, members from the City of Canning team shared expert knowledge about local biodiversity, the challenges to flora and fauna and the role of these plants in improving water quality with the students.



Figure 15 Members from the City of Canning, LWA and St Norbert College's planting donated sedges and rushes at the Centre Street Basin

6.9 Social Case Study – Wellness Awareness

'Project Wellness' is one of the Alliance's KRA on the Project. Project Wellness was identified as a KRA by the Alliance Board so that the Project focuses on implementing procedures to improve employee wellbeing. A Wellbeing Awareness Management Plan was developed and implemented on the Project, outlining actions and targets to improve workforce wellbeing at all levels of the project. The Project Manager developed the Wellbeing Awareness Management Plan based upon learnings from a national working group as part of industry association Roads Australia, during 2019/2020. The following wellbeing target areas and implementation actions are detailed within the Plan to be actioned during delivery:

- Working Hours Management; working hours are a key indicator of work life balance, as a lead indicator of team health it is important to monitor and track this across the team. To manage working hours, the Alliance is instilling every effort to ensure works outside of the nominated working day hours are eliminated or mitigated:
 - The Project Manager developed a weekend work roster to balance the number of weekends worked by the workforce
 - The Alliance will ensure that no personnel are compelled to work no more than two weeks of night shift consecutively without having one week gap between commencing night shift works again.
 - Regular early finishes are planned during delivery on a Friday, for the entire workforce (including subcontractors). These posters are displayed across all site offices and regular emails are sent out to the project team by the Project Manager confirming these dates.
- Resourcing; resourcing on the Project provides an important basis for ensuring team members have enough peer support and can balance the workload throughout the project:
 - Every quarter the Project Manager convenes a meeting with senior members of the construction team to review the current workforce and workload being spread across the project. A monthly report is developed of turnover.
 - The Alliance encourages staff to take leave actively during the project, allowing team members to take time away from work to reduce mental and physical stress.
- Culture; creating a culture of wellness means fostering a workplace that encourages and promotes the well-being of employees:
 - Project-specific inductions are carried out and include wellbeing initiatives and support structures such as details of the Employee Assistance Program.
 - Wellbeing topics are selected every quarter for onsite toolboxes.
 - Team sentiment surveys are completed quarterly during the duration of delivery.
- Physical health; physical health and mental health are strongly connected. Taking care of your physical health is scientifically shown to improve mental wellbeing. The Alliance has supported physical health through the following:
 - Provision of fruit for project personnel
 - Providing information and training on the importance of nutrition, good sleeping habits and the elimination of alcohol, smoking and drug abuse.
 - Group fitness sessions and activities outside of work that promote physical wellbeing.

These targets and initiatives were developed in collaboration with the Alliance Management Team, including a senior representative from one of the Alliance Partners. Target performance is

measured monthly during delivery and reviewed by a Project-specific Wellbeing Committee. Target performance is captured within a Wellbeing Dashboard, presented monthly to the Alliance Board and displayed on boards around the site offices to be available to all employees. Quarterly surveys are also undertaken for the Project duration to confirm the monitored performance and satisfaction of the wellbeing program, which are reviewed as part of Wellbeing Committee meetings.

7 Reference List

Barrett, A & Carey, M (2019). *Leach Highway and Welshpool Road Grade Separation, Preliminary Clearing Impact Assessment and Vegetation Management Plan*. Spearwood, Western Australia.

Department of Environment (DOE) (2004). *Perth Groundwater Atlas, 2nd Edition*. Perth, Western Australia.

Department of Water and Environmental Regulation (DWER) (2019). *Public drinking water source areas (PDSWA) online mapping tool*.

<https://dow.maps.arcgis.com/apps/webappviewer/index.html?id=63ddb4ec2a6e463f84028aa3977bab2b> Accessed 3 May 2021.

Waste Authority (2019). *Waste Avoidance and Resource Recovery Strategy Action Plan (Western Australia's Waste Strategy)*.

8 Glossary

A glossary of terms used throughout this document is detailed in Table 14.

Table 14 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 (RtR) 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	Project Sustainability Policy
Appendix 2	Protected/Conservation Significant Flora and Fauna Species and Habitat
Appendix 3	List of Project Stakeholders

Appendix 1 – Project Sustainability Policy



LWA POLICY

SUSTAINABILITY



The Leach Welshpool Alliance (LWA) is committed to achieving sustainable growth by managing its operations to positively influence environmental, economic and social outcomes.

In order to achieve this commitment, LWA will:

- apply innovation, lifecycle thinking and effective planning to drive sustainable performance;
- be ethically responsible in managing project construction, materials procurement and companies employed;
- build long-term relationships with communities and stakeholders;
- support the workforce in being diverse, engaged, motivated and competent;
- engage with supply chain to achieve project sustainability objectives and targets;
- value a culture based on leadership, inclusiveness and personal development;
- facilitate the sharing of ideas, knowledge and innovation within the business and stakeholders;
- manage and minimise all environmental impacts;
- implement risk and hazard management principles to maintain the health and safety of its people, the surrounding community and the environment;
- create long-term sustainable outcomes for our clients aligned to their objectives; and
- deliver sustainable profitable growth while satisfying social, legal and contractual obligations.

All persons who work with LWA, have a personal responsibility for implementing this Policy.

Will Telfer
Alliance Director
Leach Welshpool Alliance
June 2021



Appendix 2 – Conservation Significant Flora and Fauna Species and Habitat

No Threatened or Priority flora listed under the *Biodiversity Conservation Act 2016* (BC Act) or under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) were recorded within the Project area (as per the Preliminary Clearing Impact Assessment). The Project intersects part of the Federally Listed Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC), however vegetation within the Project Area did not meet the key diagnostic characteristics of the TEC (as reported within the Preliminary Clearing Impact Assessment).

EN: Listed as Endangered

T: Listed as Threatened

SPECIES	CONSERVATION SIGNIFANCE CODE		IMPACT
	FEDERAL	STATE	
Flora			
-	-	-	-
Fauna			
<i>Calyptorhynchus latirostris</i> (Carnaby's Black Cockatoo)	EN	T	Clearing of 12.9 ha foraging habitat.
<i>Calyptorhynchus baudinii</i> (Baudin's Black-cockatoo)	EN	T	Clearing of 12.9 ha foraging habitat.
<i>Calyptorhynchus banksia naso</i> (Forest Red-tailed Black-cockatoo)	EN	T	Clearing of 12.9 ha foraging habitat.

Appendix 3 – List of Project Stakeholders

STAKEHOLDER GROUP	SPECIFIC STAKEHOLDERS	ENGAGEMENT TYPE
Aboriginal Land Council	<ul style="list-style-type: none"> • South West Aboriginal Land and Sea Council (SWALSC) 	Provided information
Client	<ul style="list-style-type: none"> • Main Roads WA 	Close liaison with MR staff within the Alliance
Community Groups	<ul style="list-style-type: none"> • Queens Park Primary School • Sister Kate's • St Norbert College 	Information regarding roadworks and detours, plant donations, featured in Construction Updates sent to wider community.
Contractors	<ul style="list-style-type: none"> • Brajkovich Demolition Salvage • Pulse Locating • Encompass Construction Risk Services • Highways Traffic Pty Ltd • Alliance Surveying Unit Trust • Parry & Rosenthal Architects • Crossland & Hardy Pty Ltd • Best Consultants • SafeTech Consulting • Shawmac Pty Ltd • Landscape Planners • Donald Veal Consultants • Aurecon Australia Pty Ltd • Lloyd George Acoustic Pty Ltd • Elite Overhead Wiring Solutions • Downer EDI Works Pty Ltd • Eence Electrical Hire • Coffey Services Australia • WSP Australia • GTA Consultants (WA) Pty Ltd • Design and Analysis • Western Geotechnical & Laboratory Services • FSC Civils 	Local employment; involvement in briefings including pre-start meetings to address safety and community issues

	<ul style="list-style-type: none">• Kee Hire Pty Ltd• Australian Civil Haulage• Coastal Tip Truck Hire• Urban Cranes Pty Ltd• H. I. Plant Services• Mark Atkins Earthmoving• Kee Bundu Pty Ltd• Indigenous Managed Services• Odell Resources Pty Ltd• Ret Co Pty Ltd• Workforce Road Services• Mayday Services• Coates Hire• Muldrew Heavy Haulage Pty Ltd• Downer EDI Works Pty Ltd• All Forklifts and Equipment• Kee Transport Pty Ltd• EON Protection Pty Ltd• ARRA Group• Protech Personnel – WA• Welltech• Tilt Trans Hire• Mr Pothole• R & L Hiab Services• Midn Marr Plant Hire Pty Ltd• Rowland Contractors• Enviro Sweep• Environmental Site Services• Sitevisuals• WGA WA• Altona Plumbing and Civil	
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- DWS Unit Trust T/A Dewatering Solutions
- WA Limestone Co.
- EXP Resources
- BMC Grout Injection Spec Pty Ltd
- Stonecivil Pty Ltd
- Reinforced Earth Company
- RMD Australia
- Infrabuild Construction Solutions
- Capricorn Contracting Pty Ltd
- WA Sand Supply & Haulage Pty Ltd
- Onsite Rental Group Operations Pty Ltd
- Unique Cutting Trust
- Fulton Hogan Industries
- Permacast
- Urban Cranes Pty Ltd
- Holcim (Aust) Pty Ltd
- Fourie Electrical
- ATF Services
- West Force Construction
- Great Sand Supplies
- Urban Resources Pty Ltd
- C & S Drainage Contractors
- Early AJH Transport
- Dowsing Group Pty Ltd
- McDowall Affleck Pty Ltd
- WA Recycling Pty Ltd
- BGC Precast
- Coates Hire
- Wyche Consulting
- QSM Fabrication
- ABM Landscaping

	<ul style="list-style-type: none">• WA Stoneworks Pty Ltd• CMW Geosciences – WA• Freyssinet Australia Pty Ltd• Tracklink WA• Acorn Industries• Hazrad Australia Pty Ltd• DVH Industries Pty Ltd• Tiltpro• Classic Hire• Avopiling (WA) Pty Ltd• Road Rile & Mine Products Pty Ltd• Dimitrious Georgiou Pty Ltd• Nanokote WA• Solofin Pty Ltd• WA Universal Crane Hire Pty Ltd• Dig Assist• Fulton Hogan Industries Pty Ltd• Diamond Precast• Flex Contracting• Boral Resources (WA)• C & S Drainage Contractors• Excel Kerbing• Novatec WA• STATS Australia Pty Ltd• KPC Civil• Kennards Hire• KR Survey• Tetra Tech Coffey• Stantec Australia Pty Ltd• Caledonia Scaffolding• Glenview Civil	
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	<ul style="list-style-type: none"> • Humes, Granor Rubber & Engineering • Maxali Steel • Programmed Skilled Workforce • Statewest Civil • OJG Engineering Pty Ltd • Maali Group Pty Ltd • Corsign WA • WA Specialised Transport • QSM Fabrication • Atlas Technical Services • GHEMS Holdings Pty Ltd • Southern Wire Industrial • Dowsing Group Pty Ltd • Kevin's Water Cartage • Ingals EPS • ENVIRO Infrastructure Pty Ltd • Boom Logistics • Pilewest Pty Ltd • FT Workforce Pty Ltd • National Pump & Energy (QLD) • Alltype Engineering Services • Tutt Bryant Heavy Lift & Shift • AHD • Elite (OLE) • Mass Consultant WA • L & K Concrete Pumping Pty Ltd • Allwest Plant Hire Australia • P O'Donnell Contracts Pty Ltd • Ellis Cranes Hire • Middendorp Electric Co Pty Ltd • ETS 	
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Emergency Services	<ul style="list-style-type: none"> • St John Ambulance • WA Police • DFES 	Information regarding roadworks and detours
Government - Local	<ul style="list-style-type: none"> • City of Canning 	Regular briefings, liaison with Project traffic team
Government - State	<ul style="list-style-type: none"> • Minister for Transport Rita Saffioti • Hon Bill Johnston (Cannington MLA) • Hannah Beazley (Victoria Park MLA) 	No direct engagement – handled by MR communications
Government - Federal	<ul style="list-style-type: none"> • Zaneta Mascarenhas, Member for Swan 	No direct engagement – handled by MR communications
Media	<ul style="list-style-type: none"> • Handled by client 	No direct engagement – handled by MR communications
Neighbours	<ul style="list-style-type: none"> • Bentley Villas • Bentley Hospital • Queens Park Primary School • WA Safety + WA Air Springs • Dolphin Scuba • WA Whitegoods • Quikleen • Ice Works • Perth Wood School • Insight Training • Power Equipment Centre • Minuteman Press • Welshpool Trade Centre • The Redeemed Christian Church of God • Vic Park Flooring • Whitelaw's Ceilings • AutoMasters • Motorrad • Kartmart • Toolmart Australia • Veale Auto Parts • Line-X Welshpool 	Information regarding roadworks and detours, check-in visits, invited to face-to-face and Teams briefings, follow-up phone calls, meetings held as needed to address specific issues, regular email contact.

	<ul style="list-style-type: none">• Cloud 9• Subway• Sea Lavender• Signarama• Waynes• Windowscreens• SMS Mining• Rise Distributors• McLeish & Matthews Pty Ltd• Wesbar Vanquip• Tower Crane Co• BYE Performance• BWS (Better Wear Solutions)• Guz Engineering• WA Fuel• Eco Go Pack• Veolia• Horizons West• Kempe Engineering• Diamond Recovery Services• Claymore Mines• CTI Logistics Ltd• Milne Feeds Mill• Welshpool Storage Units• Vibe Fuel Station• Hertz Truck Rental• WA Museum Storage Centre• Westrac• RCR Mining Technologies• Bega• John Holland	
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	<ul style="list-style-type: none"> • Keller Piling Contractors • Aussie Car Carriers • AirGroup • Coates Hire. 	
Operator	<ul style="list-style-type: none"> • Main Roads Western Australia • Public Transport Authority 	Ongoing liaison
Regulators	<ul style="list-style-type: none"> • Department of Water and Environmental Regulation • Department of Biodiversity • Conservation and Attractions • Water Corporation. 	Ongoing liaison
Utilities	<ul style="list-style-type: none"> • Water Corporation • Western Power • Telstra 	Ongoing liaison

Appendix 4 – Project Area

