



Application for Works Approval

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number W6783/2023/1

Applicant Matters Enterprises Pty Ltd Trading as RubberGem

ACN 090 053 384

File number DER2023/000137 and APP-0026098

Premises RubberGem
6 Lodge Drive, EAST ROCKINGHAM WA 6168
Legal description -
Lot 31 on Deposited Plan 425178
Certificate of Title Volume 4041 Folio 917
As defined by the premises map attached to the issued works approval

Date of report 12 December 2024

Decision Works approval granted

MANAGER WASTE INDUSTRIES

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W6783/2023/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

2.2 Application summary and overview of premises

On 17 February 2023, the applicant submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction works relating to a tyre recycling facility at the premises. The premises is located in the City of Rockingham.

The premises relates to the categories and assessed production / design capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6783/2023/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W6783/2023/1.

The applicant proposes to accept waste passenger and commercial tyres, off the road tyres and conveyor belts for processing into crumb, dairy flooring and matting. Tyres and conveyor belts will be accepted to the premises, unloaded and inspected prior to consolidation and storage in dedicated and purpose-built fire safety rated bunkers

Following acceptance, waste tyres will be processed shredded, with downsized rubber then either mixed with urethane and moulded or passed through a colouring plant. The granulated coloured crumb products and moulded logs (cut to thickness for market requirements) will be stored for market distribution.

The applicant also proposes to repurpose waste conveyor belts based on the outcomes of the assessment of incoming material. Medium condition conveyor belts will have the top layer removed and replaced with a recycled rubber layer to mend and repurpose the rubber. The waste conveyor belt is then grooved and cut for end markets.

The tyre recycling process flow is summarised in Figure 1.

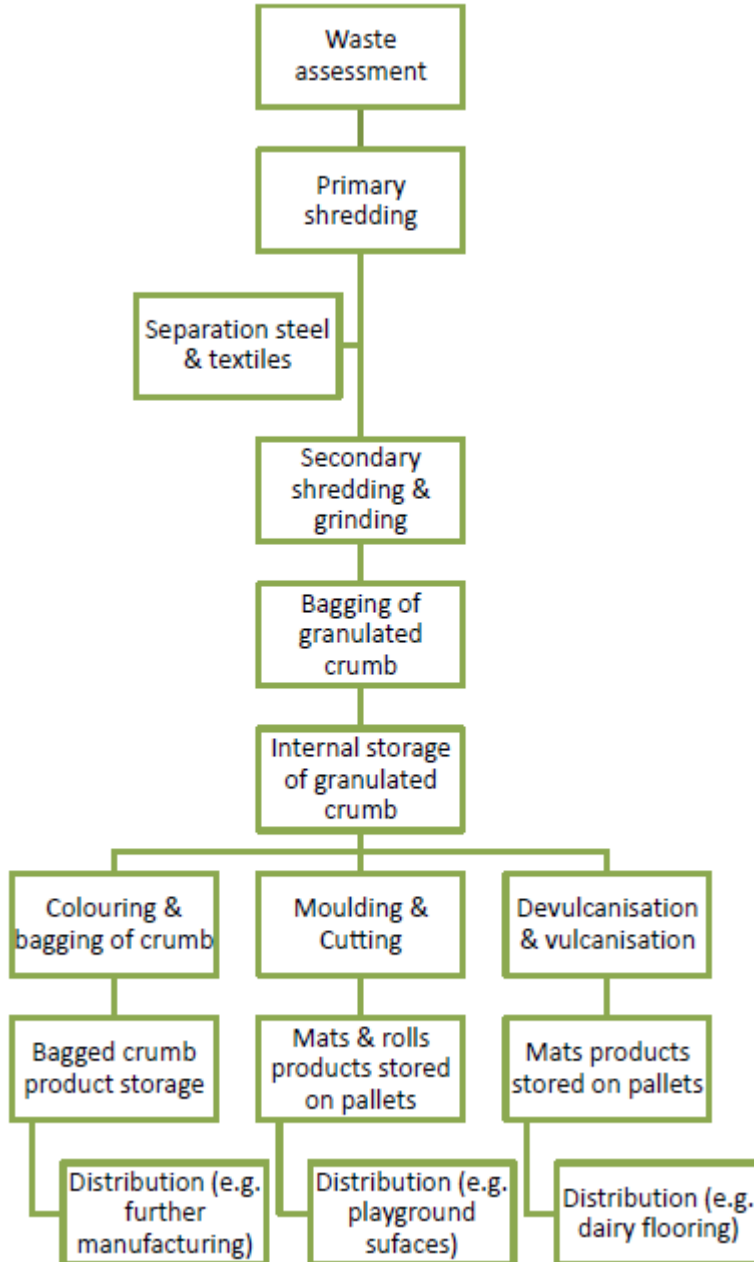


Figure 1. Tyre recycling process flowchart

2.3 Development Approval

A Development Assessment Panel (DAP) application was submitted to the City of Rockingham on 23 January 2023, which was considered by the Metro Outer Joint Development Assessment Panel (JDAP) at its meeting held on 9 May 2023. In accordance with the provisions of the City of Rockingham Local Planning Scheme No.2, it was resolved to approve the application as per the notice of determination.

2.4 Native vegetation clearing

In accordance with sections 51E and 51O of the EP Act, clearing permit CPS No: 9710/1 was granted on 10 August 2023 for the clearing 3.91 hectares of native vegetation within Lots 12 and 13 on Deposited Plan 23754.

The following management measures will be required as conditions on the clearing permit:

- weed and dieback management to minimise the risk of introduction and spread of weeds and dieback;
- fauna management to provide fauna an opportunity to move into adjacent native vegetation ahead of the clearing activity; and
- offsetting to counterbalance the significant residual impacts to black cockatoos.

2.5 EPBC Act

Notification of approval was granted by the Commonwealth Department of Climate Change, Energy, the Environment and Water on 17 April 2023 (EPBC referral 2021/9069) under section 133(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The controlling provision of the assessment was listed threatened species and communities (section 18 and section 18A), with the approval subject to conditions in Annexure A of the approval.

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020).

To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction/operation which have been considered in this decision report are detailed in Table 1 below. Table 1 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 1: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Placement of equipment, installation of containment infrastructure	Air / windborne pathway	- Construction environmental management plan to be developed. - Location of equipment installation activities within an enclosed building.

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Emission	Sources	Potential pathways	Proposed controls
Noise	Placement of equipment, installation of containment infrastructure	Air / windborne pathway	<ul style="list-style-type: none"> - Construction environmental management plan to be developed. - Location of equipment installation activities within an enclosed building.
Operation			
Fire (smoke)- Particulates and noxious gases from fire	Unloading and storage of used tyres Operation of equipment and machinery to process tyres Vehicle and equipment movements	Air / windborne pathway	<ul style="list-style-type: none"> - Waste tyres to be stored in bunkers designed with reference to DFES Guidance Note 02. - Concept fire safety strategy developed by Warrington Fire in consultation with DFES. - Bushfire Management Plan developed. - Waste is inspected prior to receipt and unloading to remove any contamination - Staff will be properly trained on how to operate the shredder and what to do in the event of a fire (i.e. 'shut down' procedure if safe to do so). - Equipment will be regularly maintained. - Appropriate firefighting equipment and infrastructure established in accordance with Concept fire safety strategy. - Product is to be stored in 'sprinklered warehouse' building section.
Wastewaters/ Leachate generated from extinguishing of a fire Contaminated stormwater	Unloading and storage of used tyres Operation of equipment and machinery to process tyres Vehicle and equipment movements	Overland flow and infiltration	<ul style="list-style-type: none"> - A fire water runoff containment system is to be provided for the site to capture the contaminated fire water in accordance with DFES guidance note GN02. - The containment system is proposed to be located at the west site of the building near the carpark. - Bunds are proposed to be designed to incorporate a slope towards the rear bund walls to recover water runoff during the firefighting operation.
Noise and vibration	Processing of used tyres	Air / windborne pathway	<ul style="list-style-type: none"> - Site is located in industrial zone and access by vehicles not in proximity to residential receptors. - Contractors / clients to be sent communications instructing them not to idle if the facility is not open, to adhere to relevant speed limits and to service and maintain vehicles to mitigate noise impacts - - Appropriate vehicle ingress / egress plans are in place that accommodate large waste vehicles.

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Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> - Scheduling of wastes to be booked in with Administration. No unauthorised deliveries to be managed except on occasional circumstances. - Contractors to adhere to site 15 km/hr speed limit (or lower). - Preference for contractors to use 'croakers' not 'beeping' when reversing. - Primary shredder is located whereby storage bunkers will serve to buffer noise. - Primary shredder will include a roof cover to mitigate noise. - Staff will be properly trained on how to operate the shredder. - Equipment will be regularly maintained. - Grinding plant is located inside the building to mitigate noise.
<p>Particulates and volatile organic compounds (VOCs)</p>	<p>Vulcanistaion and de-vulcanisation of waste tyres</p>	<p>Air / windborne pathway</p>	<ul style="list-style-type: none"> - Activated carbon filtration for the following processes: <ul style="list-style-type: none"> o Activator 1 o Activator 2 o Stage 2 Mill 1 o Stage 2 Mill 2 o Banbury
<p>Dust</p>	<p>Processing of used tyres</p>	<p>Air / windborne pathway</p>	<ul style="list-style-type: none"> - External and internal roads on sites will be sealed. - Scheduling of wastes to be booked in with Administration. No unauthorised deliveries to be managed except on occasional circumstances. - Contractors to adhere to site 15 km/hr speed limit (or lower). - Waste will be tipped as slowly as possible into dedicated bunkers. - Height of bunkers will mitigate any dust generation. - If necessary, waste tyres will be wetted down lightly to prevent dust. - Shredder will include extraction unit and filter baghouse whereby dust is captured. - Full height wall within the workshop to mitigate the movement and settling of any

Emission	Sources	Potential pathways	Proposed controls
			<p>potential dust emissions.</p> <ul style="list-style-type: none"> - The central wall quarantines any potential dust from the grinder from the rest of the facility.
Odour	Vulcanistaion and de-vulcanisation of waste tyres	Air / windborne pathway	<ul style="list-style-type: none"> - The process is understood to thermally cleave sulphur-sulphur and carbon-sulphur bonds, with some carbon-carbon bonds being inevitably cleaved as side-reactions. As a result, the process may produce assorted reduced sulphur compounds including carbonyl sulphide, hydrogen sulphide and mercaptans. - Odour Analysis Report (Acor 2024) prepared in accordance with <i>Guideline: Odour emission (DWER 2019)</i>. - Processes are cooled with a chilled water jacket to ensure that temperatures of the units do not exceed 60°C. - Emissions from the equipment is via their dedicated vents, which are directed through activated carbon filters. - Additives are added to the process in sealed bags which melt in the process, minimising potential for fugitive emissions.
Spills of hazardous materials	Colouring, moulding, Devulcanisation and Vulcanisation	Overland flow and infiltration	<ul style="list-style-type: none"> - Accredited consultant engaged for preparation of a dangerous goods licence application. - An appropriately licensed contractor will collect hazardous waste and dispose of accordingly - DG store will contain separate hazardous waste cabinets to store any acid / caustic / flammable receptacles. - Visual aids and signage to be provided to ensure that the area works as intended from a DGs / hazardous waste storage requirement. - Relevant spill kit and associated equipment to be housed in DGs store area.

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment (DWER 2020)*, the Delegated Officer has excluded the applicant’s employees, visitors, and contractors from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation. Table 2 and Figure 2 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting (DWER 2020)*).

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Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Residential housing	Approximately 1 km south east of the premises.
East Rockingham Heritage Sites	Places located within 500 m north and south of the premises boundaries.
Rockingham Holiday Village (Caravan Park)	Approximately 600 m south east of the premises
Commercial / Industrial operations in warehouse building	East, west and south within 1 km and directly opposite the eastern premises boundary.
Environmental receptors	Distance from prescribed activity
Threatened Ecological Communities (TEC woodland)	Adjacent to the southern and northern boundaries of the premises.
Threatened and/or priority fauna (Carnaby's Black Cockatoo habitat)	Adjacent to the southern and northern boundaries of the premises.
Groundwater	Depth to groundwater approximately 2 mbgl (https://maps.water.wa.gov.au/Groundwater/)
Conservation sumpland	Within the premises
Green growth vegetation complexes commitments - Quindalup Complex	Within the premises
Green growth quenda commitments	Adjacent to premises
<i>Environmental Protection (Kwinana) (Atmospheric Wastes) Policy 1999</i>	Premises is within the Kwinana EPP
Threatened ecological communities - Woodlands over sedgeland in Holecene dune swales	Adjacent to premises

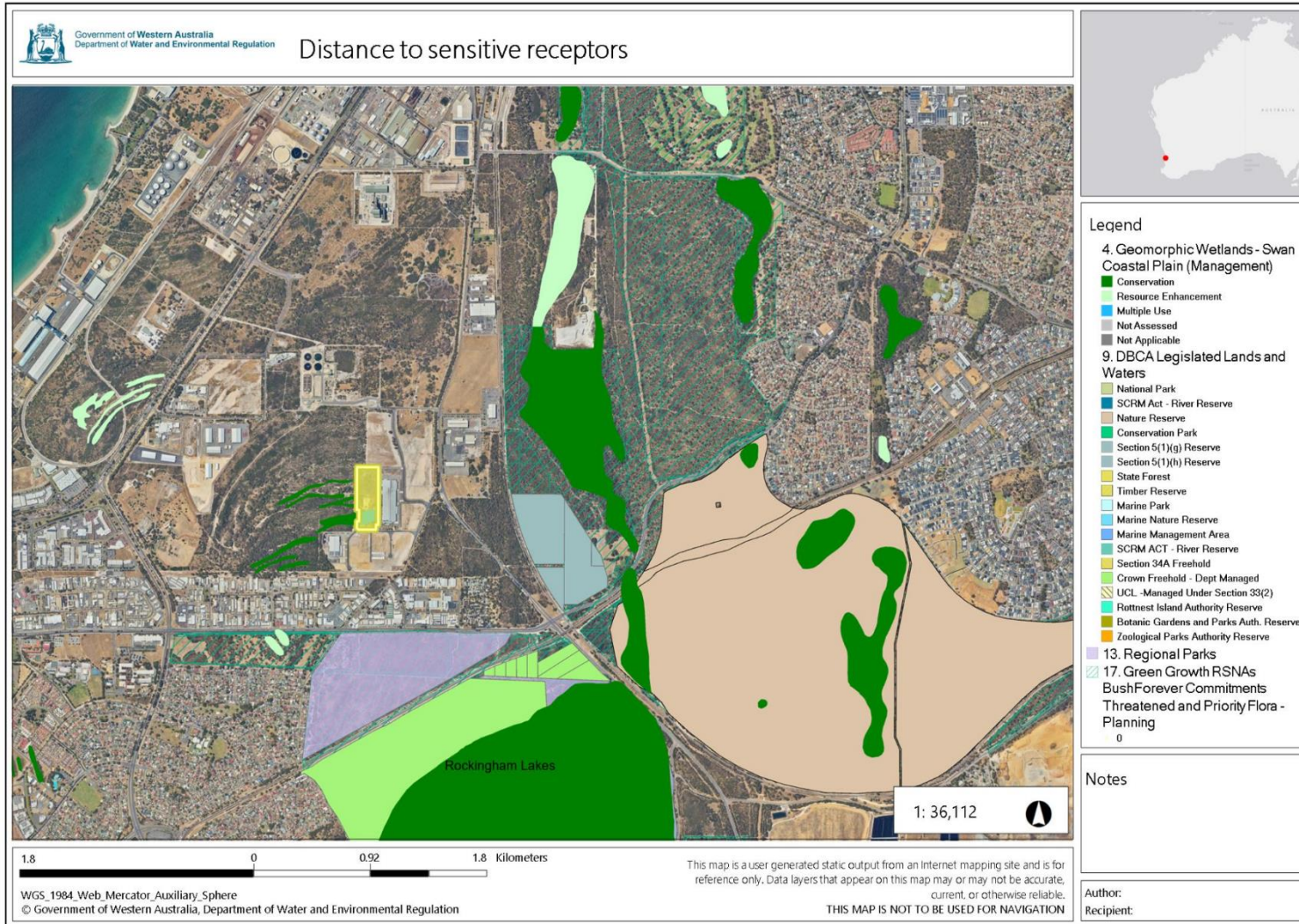


Figure 2: Distance to sensitive receptors

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3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 3.

Works approval W6783/2023/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 3 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. Category 57 and 61A activities. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 3: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Construction								
Placement of equipment, installation of containment infrastructure	Dust	Air / windborne pathway causing impacts to health and amenity	Residences approximately 1 km southeast of the premises	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	N/A	The Delegated Officer considers dust emissions associated with construction activities can be adequately regulated by the general provisions of the EP Act.
	Noise			Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	N/A	The Delegated Officer considers that noise emissions can be sufficiently managed through the <i>Environmental Protection (Noise) Regulations 1997</i> .
Operation (including time-limited-operations operations)								
Unloading and storage of used tyres Operation of equipment and machinery to process tyres Vehicle and equipment movements	Fire (smoke)-particulates and noxious gases from fire	Air/ windborne pathway causing impacts to health and amenity	Residences approximately 1 km southeast of the premises	Refer to Section 3.1	C = Major L = Possible High Risk	Y	Conditions 1, 8 and 12 <u>Conditions 4, 5, 9, 10 and 11</u>	Refer to section 3.3
	Wastewaters/ leachate generated from extinguishing of a fire Contaminated stormwater	Overland flow to stormwater infrastructure and infiltration to groundwater Seepage through hardstands Impacts to groundwater quality and ecosystem health Health and amenity impact to nearby residences	Underlying groundwater and beneficial users	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	Y	Conditions 1, 8 and 12 <u>Conditions 4 and 5</u>	Conditions 2 and 3 require the submission of an Environmental Compliance Report to verify the works have been constructed in accordance with the relevant requirements. Conditions have been added to the works approval to require the implementation of a Fire and Emergency Management Plan to prevent discharges of contaminated firewater into stormwater systems, documentation for which is to be lodged with the Licence application for assessment of effectiveness of the controls.

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Processing of used tyres	Noise and vibration	Air/windborne pathway and ground / adjoining walls causing impacts to health and amenity	Residences approximately 1 km southeast of the premises Adjacent light industrial and service commercial businesses	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	N	Conditions 1 and 8 <u>Conditions 4, 5 and 14-17</u>	Due to uncertainty in the expected noise emissions resulting from operational activities, noise monitoring is required to verify compliance with the <i>Environmental Protection (Noise) Regulations 1997</i> . Conditions 2 and 3 require the submission of an Environmental Compliance Report to verify the works have been constructed in accordance with the relevant requirements. As part of the potential licence application following time-limited operations, noise validation monitoring will be considered to verify the effectiveness of controls to mitigate noise during operation. Where necessary, additional controls may be imposed to mitigate noise emission risk.
	Dust	Air/windborne pathway causing impacts to health and amenity		Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	Conditions 1, 8 and 9 <u>Conditions 2, 3, 4 and 5</u>	The Delegated Officer considers that the controls proposed by the applicant will be sufficient to manage the risk associated with dust emissions during operational activities and has included these controls within the works approval as regulatory controls. The development of an Air and Dust Management Plan will support the subsequent licence application following time-limited operations.
Vulcanisation and de-vulcanisation of waste tyres	Particulates and volatile organic compounds (VOCs)	Air/windborne pathway causing impacts to health and amenity	Residences approximately 1 km southeast of the premises Adjacent light industrial and service commercial businesses	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	N	Conditions 1 and 8 <u>Conditions 2, 3, 4, 5, 18, 19, 20 and 21</u>	Refer to section 3.4

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Vulcanistaion and de-vulcanisation of waste tyres	Odour	Air/windborne pathway causing impacts to health and amenity	Residences approximately 1 km southeast of the premises Adjacent light industrial and service commercial businesses	Refer to Section 3.1	C = Moderate L = Possible Medium Risk	N	Conditions 1, 8 and 26 <u>Conditions 4, 5, 22 and 23</u>	<p>Due to uncertainty in the expected odour emissions resulting from operational activities, odour field assessments will be required to confirm expected emissions.</p> <p>The separation distance between the site boundary (approximately 700 m) and residential sensitive receptors is greater than the screening distance of 500 m which suggests that the likelihood of unreasonable odour impacts at these receptors is low. This screening result should be treated with some caution owing to the unusual nature of the proposed operations compared to the industries that more commonly fall under solid waste facility classification (e.g., waste transfer stations). However, the presence of activated carbon filters at equipment vents provides some confidence that odour emissions will not be greater than more common types of solid waste facility for which the odour guideline's screening distance was developed.</p> <p>However, the applicants screening analysis did not analyse the potential for odour emissions to impact neighbouring light industrial receptors.</p> <p>It should be noted that, overall, little information is available regarding the odour generating potential of this type of operation, as it is new to Western Australia. The effectiveness of the proposed controls will depend on proper implementation, regular maintenance (especially of the activated carbon filters) and effective management practices.</p> <p>Odour field assessments will be undertaken during time-limited operations verify the effectiveness of controls to mitigate odour during</p>

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
								operation. As part of the potential licence application following time-limited operations, the odour field assessments will be assessed and may be considered to further verify any uncertainties during operation. Conditions 2 and 3 require the submission of an Environmental Compliance Report to verify the works have been constructed in accordance with the relevant requirements.
Colouring, moulding, Devulcanisation and Vulcanisation	Hazardous materials	Overland flow to stormwater infrastructure and infiltration to groundwater Seepage through hardstands Impacts to groundwater quality and ecosystem health	Underlying groundwater and beneficial users	Refer to Section 3.1	C = Moderate L = Unlikely Medium Risk	Y	Conditions 1 and 8 <u>Conditions 4 and 5</u>	The storage and handling of all chemicals at the Premises is regulated by the <i>Dangerous Goods and Safety Act 2004</i> . This regulates the packaging, the method of storage to prevent spills, cross contamination and adverse chemical reactions. Any discharges of hydrocarbons or other chemicals may be subject to the provisions of the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> . Conditions 2 and 3 require the submission of an Environmental Compliance Report to verify the works have been constructed in accordance with the relevant requirements.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk Assessments* (DWER 2020).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

3.3 Detailed risk assessment for fire events

Tyres are considered a Special Hazard under the provisions of the National Construction Code (Australian Building Codes Board) Volume 1 Part E1.10, whereby when burning, the high calorific value stored in tyres is released during combustion as heat and smoke and typically results in a very hot fire with enormous volumes of black smoke being generated.

The Department of Fire and Emergency Services (DFES) published *Guidance Note: GN02 Bulk Storage of Rubber Tyres Including Shredded and Crumbed Tyres* (GN02) in 2020 to set the minimum fire safety recommendations for the storage of rubber tyres, including those in open yards (external) or stored within buildings and structures (internal).

The applicant liaised with DFES prior to submission of the works approval application with reference to GN02, with a Concept Fire Safety Strategy (20 January 2023, Warrington Fire) developed detailing the fire safety engineering, and identifying and documenting the fire safety measures likely to be required for the facility.

Fire safety measures within the document include:

External tyre storage areas

- Each bund has a maximum floor area of 1,280 m²;
- The bunds are to be located at least 18 m from the main processing building;
- A separation distance of 18 m from the northern site boundary, and a cleared zone of at least 18 m at the western site boundary are to be provided;
- The bund walls area to be constructed with non-combustible concrete and achieve an FRL of 240/240/240;
- The bund walls are to achieve a minimum of 7 m in height;
- Bunds are to be separated from each other by a distance of 1.5 m;
- The pile within each bund is to be arranged in a truncated pyramid shape with a maximum height of 3.7 m. The pile is proposed to have a width of 36 m and a length of 35 m;
- The bund areas are to be provided with radiometric thermal cameras to monitor the temperature of the tyre piles within the bunds;
- The radiometric thermal cameras are to be connected to an alarm system and activate if the temperature of the pile reach the critical temperature 267 °C;
- The alarm system is to be connected to the Direct Brigade Alarm system at the Fire Detection Control and Indicating Equipment.

Indoor storage

- The post-processed granule products are to be stored in the warehouse of the main processing building are to be packed in bulk bags and stored in pallets not exceeding two stacks.

Firefighting equipment

- The proposed tyre recycling facility must be provided with a fire hydrant system in accordance with clause E1.3 of the NCC, DFES guidance note GN02, and AS 2419.1:2005, with the exception that six fire hydrants outlets and a fire hydrant monitoring system are to be provided instead of five fire hydrant outlets;
- A sprinkler system must be installed throughout the building in accordance with

specification E1.5 of the NCC and AS 2118.1:2017. Sprinklers provided throughout the warehouse part of the building and any associated in-rack, solid-piled, palletised, shelf, or bin-box storage arrangements are to comply with AS 2118.1:2017 with regards to hazard category of storage.

Firewater containment

- Bunds are proposed to incorporate a slope towards the rear bund walls to recover water runoff during the firefighting operation.
- Firefighting water demand for the open storage yard was calculated for 6 hydrants at 10 L/s for a duration of 2 hours, totaling 432 m³. The open storage yard has a capacity of 960 m³ based on bunding and contouring of the hardstand.

Key findings:

1. The controls proposed by the applicant conform to the *Guidance Note: GN02 Bulk Storage of Rubber Tyres Including Shredded and Crumbed Tyres* (DFES, 2020).
2. Aspects of the applicant controls and GN02 will be applied as conditions within the works approval to ensure the risk of fire events are mitigated, and in the case of a fire event, that the fire can be effectively contained and extinguished. These conditions also include containment requirements to ensure firewater is contained in the premises within the capacity of hardstand and low permeability infrastructure, and must not escape to the stormwater system.
3. Conditions have also been added to the works approval to require the implementation of a Fire and Emergency Management Plan to adequately manage emergency events, documentation for which is to be lodged with the time limited operations compliance report to assess the effectiveness of controls.

3.4 Detailed risk assessment for air emissions

As a component of the operations at the premises, tyre crumb will be vulcanised to produce mats for dairy flooring, whereby the vulcanisation process involves the addition of sulphur and other accelerators to the tyre crumb prior to heating.

To the department's knowledge, the use of a vulcanisation process in the waste tyre recycling industry is unique in Western Australia, with limited opportunity to compare potential air emissions associated with the vulcanisation process to other facilities.

An Air Quality Screening Analysis Report (Acor Consultants 2024) was submitted to the department on 29 August 2024. Air emissions testing was undertaken by SGS (Malaysia) SDN BHD in May and June 2024 to determine the anticipated rate of discharge of identified air contaminants at laboratory scale.

Upon review by the department's Air Quality Branch, it was determined that inconsistencies in the sampling events rendered the data invalid.

As such, a subsequent Air Emission Monitoring Program (Ektimo 2024) was proposed by the applicant.

Ektimo was advised by the applicant that there are six emission points for consideration, being:

- Dust extraction system;

- Activator 1;
- Activator 2;
- Stage 2 Mill 1;
- Stage 2 Mill 2; and
- Banbury

The submitted monitoring program identified that total particulate matter, reduced sulphur compounds, volatile organic compounds (VOCs) and carbonyls are the targets of the sampling program. Reduced sulphides are present due to the thermal energy generated during shearing of bonds in an oxygen reduced atmosphere.

As suggested by the applicant, the vulcanisation process is not likely to generate oxidized air emissions. Organic sulphides were indicated as the most likely emissions due to the pyrolytic reduced organic decomposition products from natural rubber, butadiene and styrene.

In general, the department considered the proposed monitoring program to be sufficient to provide information about the emission sources and their characteristics. However, there were some limitations in the approach, which are addressed through conditions of the works approval.

Once completed, the emission monitoring program results will provide the stack parameters and emission rates of six point emission sources. However, this information alone is insufficient to assess potential pollutant concentrations at sensitive receptors. Therefore, the works approval will require the applicant to use the results to conduct a screening analysis against Australian ambient guideline values.

On recommendation from Department of Health, the department will also include a condition relating to the development of an Air and Dust Management Plan, which will support the subsequent licence application following time-limited operations.

The need for ongoing air emission monitoring during ongoing operations, under the future licence, will be informed from the results of the initial monitoring undertaken in accordance with the works approval.

The Air and Dust Management Plan will provide further details relating to the identification of all chemical inputs to the devulcanisation and vulcanisation processes and the potential emissions subsequently generated.

Due to these factors, inherent uncertainties in predictive emissions impact assessments in WA regarding tyre vulcanisation air emissions potential, it is not possible to predict with certainty if the proposed controls will be sufficient to mitigate the risk of impacts to acceptable levels at the nearest receptors.

However, these uncertainties can be validated through regulatory controls within the works approval, through the monitoring and reporting of complaints data, requirements for the operator to undertake air emissions monitoring and odour field assessments under the time-limited operations phase and via DWER site investigations and/ or compliance inspections.

The subsequent licence application assessment following time-limited operations will necessitate the review of all monitoring undertaken as specified in the works approval. As such, additional regulatory control measures may be implemented in the subsequent licence following assessment of information obtained through time-limited operations in the works approval. It is noted that the subsequent licence application will be contingent on the data provided through time-limited operations, as a licence must ensure that there are no unacceptable impacts to the environment or human health. The department may only accept a licence application once it is satisfied all relevant conditions of the works approval have been

complied with.

Key findings:

4. The proposed monitoring program identified that total particulate matter, reduced sulphur compounds, volatile organic compounds (VOCs) and carbonyls are the targets of the sampling program.
5. Once completed, the works approval will require that the emission monitoring program results be used to conduct a screening analysis against Australian ambient guideline values.
6. The works approval will require the development of an Air and Dust Management Plan will provide further details relating to the identification of all chemical inputs to the devulcanisation and vulcanisation processes and the potential emissions subsequently generated.
7. Due to inherent uncertainties in the emissions impact assessments in WA regarding tyre vulcanisation air emissions potential, it is not possible to predict with certainty if the proposed controls will be sufficient to mitigate the risk of impacts to acceptable levels at the nearest receptors. However, these uncertainties can be validated through regulatory controls within the works approval, through the monitoring and reporting of complaints data, requirements for the operator to undertake air emissions monitoring and odour field assessments under the time-limited operations phase and via DWER site investigations and/ or compliance inspections. Specifically, air quality monitoring data will be required to be undertaken and reported to DWER within the first 100 days of time limited operations.
8. A potential subsequent licence application will be contingent on the data provided through time-limited operations, as a licence must ensure that there are no unacceptable impacts to the environment or human health.

4. Consultation

Table 4 provides a summary of the consultation undertaken by the department.

Table 4: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website	<p>The Conservation Council of WA provided comments on 7 June 2023. They noted the following:</p> <ul style="list-style-type: none"> - The Proposal will involve clearing native vegetation comprising a Threatened Ecological Community (TEC) - Sedgeland in Holocene dune swales of the southern Swan Coastal Plain and associated wetlands. - The Proposal is located in a bushfire prone area. - Fire management plan is yet to be established and presented for public comment. 	<p>Clearing of native vegetation has been assessed and managed under clearing permit CPS No: 9710/1. Notification of approval was granted by the Commonwealth Department of Climate Change, Energy, the Environment and Water on 17 April 2023 (EPBC referral 2021/9069) under section 133(1) of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act).</p> <p>The controlling provision of the assessment was listed threatened species and communities (section 18 and section 18A), with the</p>

	<ul style="list-style-type: none"> - The Proposal will produce unacceptable environmental risks from leachate. - The Proposal will produce hazardous emissions and should include an air toxics risk management plan and air quality monitoring. - The Proposal does not discuss the risks from moulded and extruded rubber production. 	<p>approval subject to conditions in Annexure A of the approval.</p> <p>The Department of Fire and Emergency Services (DFES) published Guidance Note: GN02 Bulk Storage of Rubber Tyres Including Shredded and Crumbed Tyres (GN02) in 2020 to set the minimum fire safety recommendations for the storage of rubber tyres, including those in open yards (external) or stored within buildings and structures (internal).</p> <p>The applicant liaised with DFES prior to submission of the works approval application with reference to GN02, with a Concept Fire Safety Strategy (20 January 2023, Warrington Fire) developed detailing the fire safety engineering, and identifying and documenting the fire safety measures likely to be required for the facility.</p> <p>Conditions have also been added to the works approval to require the implementation of a Fire and Emergency Management Plan to adequately manage emergency events, documentation for which is to be lodged with the Licence application for assessment of effectiveness of the controls.</p> <p>Potential leachate from premises operations will be captured in containment collection pits constructed of concrete, with no discharge to the environment.</p> <p>The proposed monitoring program identified that total particulate matter, reduced sulphur compounds, volatile organic compounds (VOCs) and carbonyls are the targets of the sampling program.</p> <p>Once completed, the works approval will require that the emission monitoring program results be used to conduct a screening analysis against Australian ambient guideline values.</p> <p>The works approval will require the development of an Air and Dust Management Plan which will</p>
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		<p>provide further details relating to the identification of all chemical inputs to the devulcanisation and vulcanisation processes and the potential emissions subsequently generated.</p> <p>Due to inherent uncertainties in the emissions impact assessments in WA regarding tyre vulcanisation air emissions potential, it is not possible to predict with certainty if the proposed controls will be sufficient to mitigate the risk of impacts to acceptable levels at the nearest receptors. However, these uncertainties can be validated through regulatory controls within the works approval, through the monitoring and reporting of complaints data, requirements for the operator to undertake air emissions monitoring and odour field assessments under the time-limited operations phase and via DWER site investigations and/ or compliance inspections.</p>
Local Government Authority advised of proposal on 18 May 2023	<p>The City of Rockingham replied on 26 May 2023 confirming that development approval was granted on 9 May 2023 by the Metro Outer Joint Development Assessment Panel (Meeting MOJDAP/245).</p> <p>No further comments were provided.</p>	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal on 18 May 2023	No comments were provided.	N/A
Department of Fire and Emergency Services (DFES) advised of proposal on 18 May 2023	No comments were provided.	N/A
Department of Health (DoH) advised of proposal on 24 September 2024	<p>DoH replied on 30 September 2024 with the following comments:</p> <ul style="list-style-type: none"> - We note that air quality specialists within DWER have identified critical deficiencies in some of the documentation and DWER is currently seeking to resolve these with the applicant. 	<p>The proposed monitoring program identified that total particulate matter, reduced sulphur compounds, volatile organic compounds (VOCs) and carbonyls are the targets of the sampling program.</p> <p>Once completed, the works approval will require that the emission monitoring program</p>

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	<p>- DoH considers that the assessment provided by Rubbergem about the character and potential impact of emissions from the proposed facility, in particular of dust and some toxic substances, is deficient. Both the devulcanization and vulcanisation processes are not adequately described in relation to any dangerous chemicals used and what chemical emissions may result and be managed.</p> <p>- The emissions considered were TSP, PM10, PM2.5 and reduced sulfides (estimated as hydrogen sulfide). There was no discussion about any other dangerous potential emissions or if carbon disulfide (more toxic than hydrogen sulfide) was one of the reduced sulfide compounds.</p> <p>- It would also appear that dust will be generated from many steps in the recycling process. It is unclear how this will be managed adequately both on an activity specific or whole of site basis. It is recommended that a detailed Dust Management Plan be developed for this purpose and its adequacy be part of the Works Approval procedure and of any subsequent licence application.</p> <p>- Depending on what other air emissions are determined to need proper management, for instance hydrogen sulfide, these might be addressed in a combined Dust and Air Emissions Management Plan.</p>	<p>results be used to conduct a screening analysis against Australian ambient guideline values.</p> <p>The works approval will require the development of an Air and Dust Management Plan will provide further details relating to the identification of all chemical inputs to the devulcanisation and vulcanisation processes and the potential emissions subsequently generated.</p> <p>Due to inherent uncertainties in the emissions impact assessments in WA regarding tyre vulcanisation air emissions potential, it is not possible to predict with certainty if the proposed controls will be sufficient to mitigate the risk of impacts to acceptable levels at the nearest receptors. However, these uncertainties can be validated through regulatory controls within the works approval, through the monitoring and reporting of complaints data, requirements for the operator to undertake air emissions monitoring and odour field assessments under the time-limited operations phase and via DWER site investigations and/ or compliance inspections.</p>
<p>Applicant was provided with draft documents on 6 December 2024</p>	<p>Refer to Appendix 1</p>	<p>Refer to Appendix 1</p>

5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

References

1. Department of Environment Regulation (DER) 2016, *Guidance Statement: Environmental Siting*, Perth, Western Australia.
2. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
3. DER 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2019, *Guideline: Decision Making*, Perth, Western Australia
5. DWER 2019, *Guideline: Industry Regulation Guide to Licensing*, Perth, Western Australia
6. Department of Fire and Emergency Services (DFES) 2020, *Guidance Note (GN02) Bulk storage of rubber tyres including shredded and crumbed tyres Version 1. 2020*, November 2019, Perth, Australia.

Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
4	A longer timeframe of 90 days is requested to allow for installation, construction and commissioning of plant and equipment, as infrastructure may not be constructed simultaneously.	The department accepts the 90 day timeframe for submission of the Environmental Compliance Report (ECR), noting that time-limited operations cannot commence until the ECR has been submitted.
5	'As-constructed plans' represent significant intellectual property for the applicant and may present a potential competitive risk in the provision of these plans. It is requested that detailed site plans and layout of plant and equipment be provided instead.	The department considers that the submission of 'as-constructed' plans are essential to determine compliance with the works approval and appropriately verify the infrastructure that has been constructed. The submission of the ECR is for the department's use only and is not shared publicly or to other government agencies. At time of submission of the ECR, these plans can be explicitly noted as commercial in confidence to provide additional reassurance. As such, the requirement remains unchanged.
8, Table 2, Item 3(g)	The applicant may provide shelving units to store bagged products and / or bagged products on pallets giving more flexibility and storage space. Products will be stacked in accordance with WHS protocols and to ensure the safety of workers on site.	The specification has been removed, with the existing requirement that all product must be stored in accordance with <i>Guidance Note:GN02 Bulk Storage of Rubber Tyres Including Shredded and Crumbed Tyres</i> being applicable.
8, Table 2, Item 5(a)	It is noted that some processing equipment will be housed outside of the enclosed shed i.e. primary shredding will occur externally.	The conditions have been amended to align with Figure 2: Proposed infrastructure layout, such that the primary shredder is located beneath the roof canopy of the warehouse.
11, Table 3, Item 2(b), part (i)	The applicant engaged TESH Pty Ltd to undertake a fire assessment and develop the site to facilitate containment of firewater with reference to AS2419.1 and from the outcomes of discussions with the Department of Fire and Emergency Services (DFES), and requests that the condition be amended to reflect this.	The department considers that the provisions of AS2419.1 are appropriate, and condition working making reference to ongoing discussions with DFES is unenforceable and cannot be conditioned with the works approval. Should discussions with DFES result in controls that deviate from AS2419.1, specific details along with evidence of support from DFES may be included in a works approval amendment or with supporting documentation in a future licence application.
14	Engagement of specialist services may take longer than 30 days given the current demand for these services. It is requested that 60 days is allowed.	The department accepts the 60 day timeframe for the retainment of an environmental noise expert following time-limited operations, noting that the submission date of the noise assessment report is unchanged.

Condition	Summary of applicant's comment	Department's response
22(a), part (iii)	It is noted that the same material will be processed on site i.e. processing of rubber, this material type will not change. On advice from an odour specialist, we would propose conducting 3 odour field assessments (OFAs) early morning and late afternoon with the investigation zone in the west-southwest and south zones mainly. It is requested that part (iii) be removed.	The requirement for 3 separate odour field assessments (OFAs) with each OFA conducted at least 2 weeks apart remains, on advice from DWER's internal Air Quality Branch to ensure that any potential variability in the process and conditions is obtained through multiple OFAs, regardless of consistency with source material. This will ensure adequate assessment is conducted prior to the licence application to verify odour mitigation controls.