



Application for Works Approval

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

Works Approval Number W6728/2022/1

Applicant Kimberley Cotton Company Limited

ACN 649 678 197

File number DER2022/000388

Premises Kimberley Cotton Gin
Lot 510 Mulligans Lagoon Road, Kununurra WA, 6743
Legal description
Lot 510 on Deposited Plan 421305
As defined by the premises maps attached to the issued works approval

Date of report 17 July 2023

Decision Works approval granted

Amine Fisher

A/MANAGER, PROCESS 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 a cotton gin at Lot 510 Mulligans Lagoon Road, Kununurra WA. As a result of this assessment, works approval W6728/2022/1 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

On 9 August 2022, Kimberley Cotton Company Limited (the applicant, Kimberley Cotton) 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 to establish a five-stand cotton gin with supporting infrastructure at Lot 510 Mulligans Lagoon Road, Kununurra, WA, (Lot 510 on Deposited Plan 421305) (the premises). The premises is approximately 10 km north of Kununurra.

The premises relates to category 26: textile operations with an assessed production capacity of 100,000 tonnes of raw cotton per year under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations), which are defined in works approval W6728/2022/1.

The premises will comprise a five-stand cotton gin and supporting infrastructure with a processing capacity of 90 cotton bales per hour, and a nominal daily production rate of 1,760 cotton bales per day. Kimberley Cotton proposes to operate 24 hours a day from June to December (seasonally dependent) to produce 150,000 cotton bales. The process will generate a waste vegetative material known as cotton trash. The scope of the assessment does not include the disposal of cotton trash off-site. The delegated officer notes the applicant intends for the cotton trash to be used as mulch and soil conditioner. This waste material will be stored on the premises before being transported back to farms for on-farm processing and use.

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 W6728/2022/1.

2.3 Overview of application/premises

2.3.1 Construction

The cotton gin and associated infrastructure will occupy an area of approximately 34 hectares and include the following key components that will be brought to site, assembled, and/or constructed.

- Enclosed cotton gin building, comprising of 5 cotton gins with a plate speed of 18 bales/hour each and associated processing equipment (process area), an open one side module feeder bay, and a bale bagging room with a flapped opening.
- Open sided bale shed to store lint cotton bales.
- Cotton seed storage hopper bin.

- Concrete hard stand for the gin building and lint bale storage shed.
- Gravel hardstands for the round bale or module storage areas, bulk storage area and internal roads.
- Cotton trash hopper bin.
- Weighbridge.
- Dust management system.
- Stormwater management system comprising open drainage channels and a detention dam.
- Pipes, conveyors, and pneumatic blowers.

The cotton gin will be constructed in two stages.

- **Stage 1** – installation of a three-stand cotton gin (with individual plate speeds of 18 bales/hr) with supporting infrastructure including, gin building (containing the cotton gin stands), a module feeder bay, a bale bagging room and dust management system, bale storage shed, cotton seed hopper, cotton trash hopper, round bale/module storage area, cotton trash yard, weighbridge, and stormwater management system. The stage 1 infrastructure will provide for a design capacity of 54 bales per hour of lint cotton.
- **Stage 2** – installation of two ginning stands (with individual plate speed of 18 bales /hour) and associated equipment within the gin building. The stage 2 infrastructure will provide for an additional 36 bales per hour production increasing the total design capacity of the premises to 90 bales per hour of lint cotton once installed and operational.

Construction of both stages is expected to occur over a five year period. Stage 1 is planned to occur within years 1 and 2 and stage 2 from years 3 to 5 depending on the cotton farming industry expansion and demand in the region.

2.3.2 Operation

The cotton ginning process separates seed cotton into cotton seed, cotton lint and gin motes (products), as well as cotton trash (waste). The cotton seed is proposed for use as high-quality cattle stock feed in the Kimberley region and can also be used for cotton seed oil. Cotton lint bales will be stored on-site and exported for further processing into yarn. Gin motes; small, broken, or immature seeds with fibres still attached; are further processed to extract fibres and separated organic material is moved to the cotton trash storage area. Cotton trash is vegetative/organic material removed during processing which can be used as mulch/soil conditioner.

The cotton ginning process which will be undertaken on the premises is summarised as follows:

Unloading:- Incoming seed cotton arrives at the premises in round bales. The bales are initially stored in the module storage yard and then carried into the module feeder bay for processing. The module feeder system removes the wrapping on the bales, then utilizes high speed spiked cylinders to separate the cotton bolls for processing. The automatic air suction control pulls the cotton bolls into the conveyance system for ginning.

Drying and pre-cleaning:- A multi-stage drying and pre-cleaning treatment process involves heated air drying the seed cotton. The cotton moves onto an inclined cleaner which further separates the cotton and cylinder spikes are used to remove smaller trash. A secondary cleaner removes larger trash such as sticks and leaves.

Distribution and overflow:- A specially designed trough conveyor delivers the cleaned and dried cotton to hoppers mounted above a feeding system into the gin saws. An overflow system captures any excess seed cotton and returns this back into the system.

Feeding and ginning (gin stands):- The gin stand is where the lint and seed are separated. The gin stand will comprise a bank of saws that rub against a bank of ribs to pull the lint away from the

seed. The bank allows the lint to fall through and separates the seed.

Lint cleaning:- First stage lint cleaning is through a centrifugal cleaner which uses centrifugal force to spin away contaminants. The final stage is a gentle saw cleaner which combs out the lint.

Condensing and moisture restoration: - The condenser takes the fibres of lint and presses them into a blanket layer (batt). Moisture is reintroduced to the fibre to enhance the compressibility of the cotton fibre.

Pressing and bale handling:- Cleaned lint is compressed into rectangular cotton bales which are weighed and strapped before being moved into the bale storage shed for export.

Dust management system: Cotton ginning uses high speed air flow to move materials through the process. Exhaust air from the process collects dust and cotton particulates (cotton trash) and is directed through a system of extraction fans, cyclones and rotary drum filters designed to separate cotton trash from the process airflow prior to discharge. Cyclones primarily treat air from the pre-cleaning and separation stages, while exhaust air from the final cleaning processes is directed via fans to the dust house which contains rotary drum filters to remove remaining particulates prior to discharge. The filters are expected to reduce particulate emissions to 5 mg/m³ or less prior to discharge to atmosphere via discharge stack mounted into the roof of the dust house. Exhaust air from the cyclones is also directed to the dust house for further treatment. Cotton trash collected by the cyclones and rotary filters is pneumatically conveyed to a cotton trash hopper bin for temporary storage prior to loading into trucks and transport to an open compacted gravel pad, referred to as the cotton trash yard. The applicant proposes to return collected cotton trash to cotton farms for spreading on paddocks as organic matter to increase soil quality and soil carbon.

Stormwater: The premises stormwater management system is designed to capture the first flush of rainfall runoff, which is likely to contain the highest sediment load. The cotton trash yard, module storage yard, premises roads and hardstands drain to open channel stormwater drains which will transfer stormwater to a detention dam to capture and settle stormwater runoff potentially carrying organic matter and sediments. The detention dam is designed to slow or stop the water velocity to 0.01 metres per second to allow heavier sediments and organic fragments to settle to the bottom of the dam.

Water settled through the dam will be discharged via an earthen channel with control structures to the Ord River Irrigation Area (ORIA scheme) drainage channel present in the northeast corner of the premises. The discharge is expected to occur 8 – 16 times per year, rainfall dependent. The ORIA is proclaimed under the *Right to Water and Irrigation Act 1914* (RIWI Act). The Ord Irrigation Cooperative (OIC) hold licence SWL156287 and monitor and sample surface water within the ORIA scheme. Settled stormwater from the premises is considered suitable to meet the OIC water quality requirements for nutrients, organic carbon, suspended solids, electrical conductivity, pH, turbidity, dissolved oxygen, and herbicides.

Collected stormwater will also be used for dust suppression on the premises.

The operation of the premises is proposed to be in accordance with the operational summary provided in Table 1.

Table 1: Proposed hours of operation

Activity	Monday - Friday	Saturday	Sunday and Public Holidays
Ginning Operations	24 hours	24 Hours	24 hours (subject to weekly maintenance operations)
Weighbridge hours (receival and dispatch)	<ul style="list-style-type: none"> • 5am – 7pm during ginning season (June to December) • 7am – 4 pm outside of ginning season (Mon – Fri) • Extended weighbridge hours – 24 hours/7 days a week for initial receival of cotton modules until yard is filled (2-4 week period in June) 		
Maintenance of plant and equipment (non-ginning season)	7 am – 5 pm	7 am – 1 pm	Nil

2.3.3 Vegetation clearing approvals

Clearing permit CPS 942/2 was issued to the Kimberley Cotton Company Ltd on the 10 February 2023 under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* which authorises clearing of 65.33 hectares of native vegetation on Lot 510 on Deposited Plan 421305, Kununurra.

2.3.4 Planning approval

The Development Assessment Panel (DAP) approved development for the cotton ginning facilities and cotton modular laydown area at the premises location on 20 January 2023.

The land use was approved as a use not listed under Local Planning Scheme No. 9 (LPS 9) – ‘Industry – Rural’ by the Shire of Wyndham East Kimberley.

2.3.5 Traditional owner consultation

Kimberley Cotton consulted the traditional owners represented by the Yawoorroong Miriuwung Gajerrong Yirrgab Noong Dawang Aboriginal Corporation (Corporation), who attended the premises on 29 July 2022. The Corporation indicated via correspondence to Kimberley Cotton (dated 29 July 2022) that no heritage site impacts are expected to occur from the proposed development.

3. Noise impact assessment

The applicant engaged a consultant to undertake a Noise Impact Assessment (NIA) of potential noise and vibration impacts for operation of the premises using acoustic model SoundPLAN 8.2 with CONCAWE algorithms.

Primary noise sources from the operation of the premises are sound radiation from enclosed cotton ginning building walls and roof, external fan bay, external cyclone fans, seed shed fans, haulage trucks, and mobile plant. The nearest sensitive receptors were identified as 17 farms, rural residences, and small businesses, located on Mulligans Lagoon Road and Weaber Plain Road (refer to Table 4).

The premises is proposed to operate 24 hours (see Table 1) therefore the NIA considered relevant night-time criteria (as per the Environmental Protection (Noise) Regulations 1997 (Noise Regulations)) inclusive of a +5 dB tonality penalty for all industrial process noise sources (ginning and seed sheds). A tonality penalty was not applied to haulage truck movements.

The applicant undertook three modelling scenarios:

- Scenario 1 – Initial design, no additional attenuation or building treatments.

- Scenario 2 – Detailed design including noise mitigation treatments.
- Scenario 3 – Scenario 2 with a 4-metre earth bund for noise mitigation.

Modelling was conducted using measured noise data from a comparable facility in Coleambally, NSW. The results for each modelled scenario are summarised below.

Scenario 1

L_{A10} night-time levels were predicted to be exceeded at 15 of the sensitive receptors. Major contributors to noise levels were the gin building façade and roof, external cyclones, cotton seed shed and fan bay. This was based on the operation of the gin building with no acoustic insulation properties, 21 cyclones with 21 stacks from the gin building, cotton seed shed, and unrestricted vehicle movements operating at 100% duty.

Scenario 2

Scenario 2 included the following noise mitigation treatments:

- Installation of sound attenuation insulation in the walls and roof of the cotton gin building, and doors closed during operation.
- All plant operating at 100% duty.
- Seed conveyor (high noise source) entirely enclosed in pit within the cotton gin building.
- Cotton seed shed and seed shed fans removed from the facility.
- Cyclone emission points capped with steel duct and routed to the dust house.
- Front end loaders (2) restricted to operate between bale pad and west facade of cotton gin building.
- Broadband reversing alarms in place of tonal reverse beepers on mobile plant.
- Haulage trucks (4) located simultaneously at outer extents of haulage routes and one truck at staging weighbridge.

For scenario 2 the predicted L_{A10} night-time levels were found to comply with the night time criteria for all 17 sensitive receptors. The highest L_{A10} night-time noise level from industrial processes (cotton ginning) was predicted to occur at receptor R4 with 29 dB, compared with an assigned level of 43. The L_{A1} assigned noise levels were considered for haulage truck and mobile plant operation rather than L_{A10} due to their infrequent operation. Receptors R1 to R4 were predicted to marginally comply with L_{A1} night-time levels associated with haulage truck and mobile plant noise being 1-2dB below the relevant L_{A1} night-time assigned level at these locations.

Scenario 3

Scenario 3 included 4-metre earth bunds as visual and acoustic screening to improve the margin of compliance with assigned noise levels at the nearest receivers, R1 – R4 during haulage truck pass-byes and front-end loader operations.

The model outcomes indicated the earth bunds had no effect at R1 and R2, to the south and south-east; and will have varying effect at sensitive receptor R4 (5.5 dB), to the north-east. Elsewhere, R15, 16 and 17 showed a 1 – 2 dB(A) difference.

3.1 DWER findings

The delegated officer reviewed the NIA and concluded that the operational noise modelling was technically sound in terms of referenced criteria, inputs, methodologies, and scenarios. The delegated officer noted that most high noise processes and plant will be located within the main cotton ginning building which is proposed to include noise mitigation treatment. Given predicted cotton ginning noise levels (excluding haulage) are significantly lower than the night-time assigned noise levels even with the 5dB adjustment for tonality, cumulative noise assessment was not

required. Implementation of the proposed noise mitigation treatments will be required to ensure the predicted compliance with assigned noise levels is achieved.

Predicted noise levels from haulage trucks and mobile plant will marginally comply with the night-time L_{A1} assigned noise levels at several (Receptors 1-4) of the 17 closest sensitive receiving locations. Based on the noise modelling outcomes, the applicant's proposed 4-metre high earth bund is expected to have limited noise reduction capacity. As night time noise associated with haulage truck and mobile plant operation is predicted to only marginally comply with the assigned levels at the closest receptors, implementation of a complaint management process is considered necessary to assist in enabling the applicant to respond to potential noise complaints.

4. Air quality impact assessment

The applicant engaged a consultant to complete an air quality impact assessment (AQIA) for particulate emissions from the premises.

A WRF-CALMET/CALPUFF modelling system was used to model the premises dust sources (detailed below) to predict worst case ground level concentration (GLC) of total suspended particulates (TSP), particulate matter with an aerodynamic diameter of $10\mu\text{m}$ or less (PM_{10}) and particulate matter with an aerodynamic diameter of $2.5\mu\text{m}$ or less ($\text{PM}_{2.5}$).

- Vehicle movements generating road dust and wind erosion from bare earth and gravel.
- Particulate emissions discharged from the dust house following treatment of via the dust management system comprising extraction fans, cyclones and rotary drum filters in the dust house.
- Particulate emissions from the seed bin discharged via a cyclone (this infrastructure will not be built as part of this works approval).

Emissions from the cotton gin building under normal operating conditions (90 bales/hour, operating 24 hours per day, with associated truck and loader movements) formed the basis of the modelling. The same 17 sensitive receptors outlined in the NIA were used within the modelling (see Table 4). A worst-case scenario was modelled for PM_{10} , $\text{PM}_{2.5}$, and TSP and predicted GLC were compared against ambient air quality guideline values (AGVs) detailed in the department's Draft *Guideline: Air Emissions*. AGVs are based on the *National Environment Protection Council (NEPC) National Environment Protection (Ambient Air Quality) Measure (NEPM)* (NEPC 2016) criteria for PM_{10} , $\text{PM}_{2.5}$ and the *Environmental Protection (Kwinana) (Atmospheric Wastes) Regulations 1992* for TSP. Relevant background particulate concentrations from the DWER Kalgoorlie air quality monitoring station (AQMS) was included in the assessment to consider both incremental and cumulative dust impact risk.

The results for receptors predicted to have the highest GLCs are summarised in Table 2.

Table 2: Predicted GLC of PM_{10} , $\text{PM}_{2.5}$ and TSP at select sensitive receptors.

Receptor	Scenario	24-hour		Annual		
		PM_{10} ($\mu\text{g}/\text{m}^3$) AGV – 50	$\text{PM}_{2.5}$ ($\mu\text{g}/\text{m}^3$) AGV – 25	PM_{10} ($\mu\text{g}/\text{m}^3$) AGV – 25	$\text{PM}_{2.5}$ ($\mu\text{g}/\text{m}^3$) AGV – 8	TSP ($\mu\text{g}/\text{m}^3$) AGV – N/A
Background ($\mu\text{g}/\text{m}^3$)		34.7	21.0	12.8	5.1	25.6
R3	No background	10.5	1.2	0.7	0.1	2.6
	With background (cumulative)	45.2	22.2	13.5	5.2	28.2
R4	No background	13.7	2.2	1.1	0.2	6.0
	With background	48.4	23.2	13.9	5.3	31.6

	(cumulative)					
R5	No background	7.4	0.9	0.7	0.1	3.1
	With background (cumulative)	42.1	21.9	13.5	5.2	28.7

The predicted contribution to GLC for PM₁₀ from the premises at sensitive receptors is between 0.4% and 4.4% of the annual AGV and 1.6% and 27.4% of the 24-hour AGV. The predicted contribution to GLC for PM_{2.5} from the premises is between 1.25% and 2.5% of the annual AGV and 0.4% to 8.8% of the 24-hour AGV.

4.1 DWER findings

The delegated officer considered the AQIA used an appropriate air quality modelling system WRF-CALMET/CALPUFF, and the model settings were appropriate. The modelling results indicate that particulate emissions from the premises are predicted to comply with relevant AGVs at the closest sensitive receptors, and the incremental contribution of the premises to GLC is reasonable.

There is however some uncertainty with the model inputs, specifically the emissions inventory and background concentrations, which have both conservative and potentially non-conservative elements. The applicant did not develop an emissions inventory based on individual processes rather considered overall cotton processing emissions based on estimated emissions from the dust house, seed bin cyclone and wheel generated dust. The applicant used measured emissions from a Queensland cotton facility and scaled these to estimate dust emissions for the cotton gin based on production rate. In the absence of site-specific data from the Queensland facility, there is a level of uncertainty on the representativeness of the emission rates used in the modeling.

Furthermore, the applicant did not consider a plant upset scenario such as the breakdown of the dust house thus intermittent emissions have not been considered. Kimberley Cotton has indicated that less than five malfunction events in a ginning season is projected for the dust control system equipment. In this event a scheduled ginning production stop for repairs and maintenance would be undertaken.

Considering the uncertainty associated with the estimated emissions used to predict air quality impact, the delegated officer considers an appropriate regulatory approach will include verification monitoring (TSP, PM₁₀, PM_{2.5}) at the source during time limited operations to allow comparison between actual and predicted emission rates. The outcomes of the comparison will inform the application of regulatory controls for dust emissions during ongoing operation of the premises.

Although the maximum predicted cumulative 24-hour PM₁₀ and PM_{2.5} GLCs are 97% and 93% of the relevant AGV for receptor 4, the delegated officer noted this was due to conservative background concentrations adopted by the applicant (second highest recorded value was adopted) and that the incremental contribution predicted for the premises is considered reasonable. When background concentrations are adjusted to use of 70th percentile, which is considered appropriate, GLC at receptor 4 are predicted to be less than 55% of the 24-hour AGV for PM₁₀ and less than 29 % for PM_{2.5}.

5. 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.

5.1 Source-pathways and receptors

5.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this decision report are detailed in Table 3 below. Table 3 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 3: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction of cotton gin shed and installation of equipment and hardstands including vehicle movements.	Air / windborne pathway	No controls
Noise			No controls
Sediment laden stormwater		Runoff over land	Install sediment control structures at end of drainage system during construction works occurring during a period where rainfall/storms are expected
Operation			
Dust from vehicle movements and outside storage areas	Operation of cotton gin facility - including loading and unloading activities, cyclone operation, electric processing equipment and vehicle and machinery movement and maintenance.	Air / windborne pathway	Water sprayers greater than 2 L/m ² /hour applied to internal trafficable areas as required during the ginning season. Maximum speed of 40 km/hr on internal haul roads. Areas where trucks are loaded including cotton bale shed and cotton seed storage hopper bin are concreted or bitumised. The cotton trash hopper bin will be located on a compacted gravel pad.
Air particulate emissions			Dust management system comprising 21 extraction fans, seven cyclones and 6 rotary drum filters within a dust house to separate dust and trash from exhaust discharge. Rotary drum filters to emission concentration performance is 5 mg/m ³ or less for total suspended particulates. Air from the extraction fans is directed to the dust house for further treatment via 6 rotary drum filters prior to discharge to air via a balancing fan, with the discharge stack height 4.5 magl. All cyclone air exhausts are capped with 2mm thick steel ducting and are vented into the dust house for treatment as above. Collected cotton trash is directed to an enclosed cotton trash hopper bin for storage prior to collect. Cotton trash hopper bin has doors that enclose behind and in front of loading vehicles to contain dust emissions during loading. Cyclone rack and dust house located on the north side

Emission	Sources	Potential pathways	Proposed controls
			<p>of gin building to limit the effect of the adjoining building on prevailing winds and dispersal of emissions.</p> <p>Ginning infrastructure located in an enclosed shed with doors kept shut during operation.</p> <p>Gin shed swept daily to reduce dust levels.</p>
Light			<p>Downward pointing LED flood lights fitted to all building no greater than 8 magl.</p> <p>Downward pointing LED flood lights fitted within weighbridge and module bale storage areas on light towers no greater than 10.5 magl.</p>
Noise			<p>Ginning operation occurs in the enclosed ginning building installed with the following sound attenuation - S50 Ortech Durra Panel on 300 mm I-Beam with 50/25 Soundsorb internal perforated profile metal cassette and 75mm Anticon to underside of roof sheet, rated at Rw 51dB and radiating at Sound Power Level (SWL) 48 dB(A) per m², Acacia Strand HC 1000 – Roof Ventilator along ridge cap of main ginning building;</p> <p>All building apertures and doors in closed position during operation.</p> <p>Front End Loaders (2) restricted to operating between the bale pad and west facade of ginning building.</p> <p>No tonal reverse beepers on mobile plant.</p> <p>All plant are installed on anti-vibration mounts between plant and skid.</p> <p>All cyclone air exhausts capped with 2mm thick steel ducting.</p> <p>All personnel access (PA) door sets to be double skin steel outer with a solid core, in a well-fitted frame with acoustic seals; any vision panels to be a minimum 10mm toughened safety glass;</p> <p>Seed conveyor will be entirely enclosed in a concrete pit at ground level within the main ginning building.</p>
Organic solid wastes		Air / windborne pathway	<p>All plastic wrapping from the cotton modules to be stored, compressed, and hauled away at the end of each season.</p> <p>Cotton trash is conveyed from the cyclones in enclosed pipes to the enclosed cotton trash hopper bin.</p> <p>Cotton trash is loaded onto trucks and taken to the cotton trash yard from a hopper bin which has doors that enclose behind and in front of the loading vehicles to prevent escape of cotton trash during transfer.</p> <p>Cotton trash is stored in windrows and kept moist within the cotton trash yard and returned to local</p>

Emission	Sources	Potential pathways	Proposed controls
			<p>farms.</p> <p>Cotton seed is conveyed to an enclosed cotton seed hopper bin for storage prior to collection.</p>
Hydrocarbons and chemicals	Storage of hydrocarbons and chemicals including hydraulic oil, diesel fuel and minor quantities of herbicide.	Direct discharge to land.	<p>All drums and tanks storing hydrocarbons or chemicals are stored with impervious bunds pending use or offsite disposal via an authorised waste contractor.</p> <p>Diesel fuel – To be stored in above ground tanks with bunding in accordance with AS1940:2017. This may include self-bunded containerised fuel storages.</p> <p>All containers will be inspected weekly to monitor integrity.</p> <p>Spill equipment will be kept on site to clean up spills.</p>
Sediment and organic material laden stormwater	Stormwater treatment infrastructure	Over land runoff	<p>All internal drainage from the hardstands and roads around the cotton trash yard, module storage area, bale storage and ginning building will flow to stormwater drains and transfer to a detention dam.</p> <p>The detention dam will have capacity to capture a 10% annual exceedance probability (AEP) 30 minute design storm event with an expected volume of 16.42 megalitres.</p> <p>The preliminary detention dam design is 400m long and a width of 50m to allow for settlement of total suspended solids and batters not less than 3H:1V to ensure bank stability.</p> <p>Detention dam will be designed to ensure receiving stormwater is slowed to a velocity of 0.01 m/s to ensure sediments and organic debris are settled prior to discharge.</p> <p>Detention dam water will be recycled and used for road watering and dust suppression for internal roads.</p> <p>Stormwater settled in the detention dam will discharge to the ORIA drain present on the premises via an existing earthen channel with a control structure.</p> <p>Discharges to the ORIA drainage network will adhere to the existing water quality parameters required by the surface water licence held by Ord Irrigation Cooperative (OIC). This includes nutrients, organic carbon, suspended solids, electrical conductivity, pH, turbidity, dissolved oxygen and herbicides.</p> <p>Accumulated sediments will be removed from the detention dam to ensure storage volume is maintained.</p> <p>Regrade of stormwater drains on an annual basis to reform batters and beds to maximise laminar (smooth) flow in the drains to avoid scouring or turbulent flow.</p> <p>Stormwater drains will be shaped to enable access by a slasher for management of grass.</p>

Emission	Sources	Potential pathways	Proposed controls
			<p>Where design velocity in the drain may exceed 0.5 m/s, a gravel or rock layer may be applied to minimise erosion potential.</p> <p>Areas between roads and formed module pads will be maintained with a grass cover to stabilise the soil and minimise erosion.</p>

5.1.2 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 4 below provides a summary of potential human and environmental receptors that may be impacted because of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020)).

Table 4: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
R1 Rural Residential Mulligans Lagoon Road	1.34 km south from the gin building
R2 Farm Residential Mulligans Lagoon Road	1.2 km east from the gin building
R3 Farm Residential Mulligans Lagoon Road	0.98 km km northeast from the gin building
R4 Farm Residential Weaber Plain Road	0.655 km north from the gin building
R5 Industrial Residence Weaber Plain Road	1.42 km southwest from the gin building
R6 Rural Residential Weaber Plain Road	1.5 km southwest from the gin building
R71 Rural Residential Mulligans Lagoon Road	1.71 km south from the gin building
R8 Rural Residential Mulligans Lagoon Road	1.76 km south from the gin building
R9 Rural Residential Mulligans Lagoon Road	1.8 km south from the gin building
R10 Rural Residential Mulligans Lagoon Road	1.88 km south from the gin building
R11 Rural Residential Weaber Plains Road	1.91 km southwest from the gin building
R12 Rural Residential Weaber Plain Road	2.1 km south southwest from the gin building
R13 Rural Residential Weaber Plain Road	2.2 km south southwest from the gin building
R14 Rural Residential Weaber Plain Road	2.38 km south southwest from the gin building
R15 Farm Residential Weaber Plain Road	2.42 km northwest from the gin building
R16 Rural Residential Weaber Plain Road	3.1 km northwest from the gin building

R17 Hoochery distillery tourist business Weaber Plain Road	3.47 km north from the gin building
Environmental receptors	Distance from prescribed activity
Ord River Irrigation Area (ORIA scheme) Ord Irrigation District (Proclaimed under <i>Rights to Water and Irrigation Act 1914</i>)	The premises is located within the area. A drainage channel which is part of the ORIA scheme is located within the north-east corner of the premises. The ORIA scheme comprises an open canal network that is used to distribute water diverted from the Ord River at Lake Kununurra for irrigated agriculture.
Two perennial waterways	Within premises flowing south to north to the ORIA scheme.

5.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and considers potential source-pathway and receptor linkages as identified in Section 5.1. 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 5.1), 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 5.

Works approval W6728/2022/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 5 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. cotton ginning 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 5: Risk assessment of potential emissions and discharges from the premises during construction, commissioning, and operation

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Reasoning	Conditions ² of works approval
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
Construction								
Construction of cotton gin shed and installation of equipment and hardstands including vehicle movement. Construction of stormwater channels and stormwater detention basin.	Dust	Air / windborne pathway causing impacts to health and amenity	17 rural residences and industrial premises from 0.65 km to 3.47 km in all directions from the ginning shed.	No controls Refer to Section 5.1	C – Minor: Low level offsite impact L = Possible: The risk event could occur at some time. Medium Risk Acceptable, generally subject to regulatory controls.	N	Ground disturbance and vehicle movements associated with the construction works are expected to generate dust emissions which, based on separation distance, may impact the air quality of nearby sensitive receptors. The applicant did not propose any controls to mitigate the risk of fugitive dust causing unacceptable impact to air quality at nearby sensitive receptors therefore the delegated officer determined to apply the following controls as conditions in the works approval to mitigate the risk of air quality impact to sensitive receptors. Water carts to operate onsite: <ul style="list-style-type: none"> when visible dust is generated; proactively subject to weather forecasts; and when visible dust is reported by personnel. 	Condition 4
	Noise			No controls Refer to Section 5.1	C – Minor: Low level impact to amenity L = Unlikely: The risk event will probably not occur in most circumstances. Medium Risk Acceptable, generally subject to regulatory controls.	NA	The delegated officer considers that although the separation distance between the premises construction activities and the closest receptor is potentially adequate to prevent impact from noise emissions from the installation of the infrastructure, the activities will introduce a new and distinguishable noise source into a typically quiet rural residential area therefore amenity impact from noise may occur. The delegated officer noted that the Noise Regulations 1997 regulate noise emissions associated with construction, and the applicant will be required to comply with these during the construction period therefore no additional regulation related to noise emissions has been specified in the works approval. .	No conditions
	Sediment laden stormwater	Overland runoff impacts the water quality of the ORIA scheme.	ORIA scheme is located within premises in the northeast area.	Install sediment control structures when rainfall storms are expected. Refer to Section 5.1	C = Minor: Low level offsite impact L = Unlikely: The risk event will probably not occur in most circumstances. Medium Risk Acceptable, generally subject to regulatory controls.	Y	Earth and construction work disturb ground cover and expose soil, allowing it to be exposed to erosion from heavy rainfall. The applicant has determined to install sediment control structures to slow runoff during storms which may occur during the construction of the premises. The applicant's controls are considered acceptable to mitigate the risk of sediment-laden stormwater runoff impacting the environment and ORIA scheme. The delegated officer applied the applicant's controls, which are considered appropriate to maintain an acceptable level of risk.	Condition 5
Operations (including time limited operations)								
Operation of cotton gin facility including loading and unloading activities, dust management, processing equipment, and vehicle and machinery movement and maintenance.	Dust including air particulate emissions	Air / windborne pathways causing impacts on health and amenity	17 rural residences and industrial premises from 0.65 km to 3.47 km in all directions from the premises ginning shed.	Water sprayers on roads, bitumen/concrete applied to loading areas, dust management system, activities occurring in enclosed buildings and the shed swept. Refer to Section 5.1	C = Moderate: Specific Consequence Criteria (for public health) are at risk of not being met L = Possible: The risk event could occur at some time. Medium Risk Acceptable, generally subject to regulatory controls.	N	The delegated officer considered the applicant's AQIA and determined that while the predicted contribution of the premises dust emissions to GLC is acceptable, there was uncertainty associated with the estimated emissions used within the modelling which was used to determine the contribution. Given the model predictions there is potential to exceed relevant AGVs if actual dust emissions significantly exceed the model inputs. The delegated officer therefore determined it appropriate to apply regulatory controls requiring verification monitoring of dust emissions during time limited operations (TLO). Verification monitoring will require a monitoring port to be installed on the dust house stack therefore this has also been applied as a control within the works approval. The delegated officer also considered the applicant's dust controls were critical to minimising dust and particulate emissions from the premises therefore applied these as infrastructure and operational controls within the works approval.	Condition 1 Condition 8 Condition 10-14
	Noise			Noise attenuation within the cotton gin building, no tonal reverse beepers on the mobile plant, ginning shed operates with closed roller doors and other apertures. The plant is installed on anti-vibration mounts. All cyclone air exhausts are capped for acoustic noises reduction and airflow directed to dust house. Refer to Section 5.1	C = Minor: low level impact to amenity L = Unlikely: The risk event will probably not occur in most circumstances. Medium Risk Acceptable, generally subject to regulatory controls.	N	The cotton gin is proposed to operate 24 hours a day from June to December. The applicant's noise assessment indicates night time noise levels will be within Noise Regulations assigned levels based on implementation of the applicant's proposed infrastructure and operational controls. These controls have therefore been conditioned in the works approval to ensure the risk of amenity impact from noise is suitably mitigated. Based on the information in the noise assessment the delegated officer considers haulage truck noise have the potential to cause complaints. The department's standard complaint recording condition applied in the works approval will ensure any complaints which arise are recorded and investigated and the delegated officer considers a similar condition will be necessary at the licensing stage for the premises.	Condition 1 Condition 8 Condition 16
	Light		Downward facing LED lights. Refer to Section	C – Slight: Minimal onsite impact L = Possible: The risk event could	Y	Noting the cotton gin will operate 24 hours a day from June to December light spill has the potential to impact the amenity of surrounding residences. The delegated officer considered the applicant's proposed controls to install downward-facing LED	Condition 1	

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Reasoning	Conditions ² of works approval
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
				5.1	occur at some time. Low Risk Acceptable, generally not subject to regulatory controls.		lights sufficiently mitigate the risk of amenity impacts from light spill therefore applied these as infrastructure controls in the works approval.	
	Organic solid waste			Trash is stored in windows and kept moist, and the plastic bale wrapping is compressed and stored. Transfer of cotton trash is via a hopper with doors that enclose the receiving vehicle. Refer to Section 5.1	C = Minor: low level impact to amenity/minimal offsite impact L = Unlikely: The risk event will probably not occur in most circumstances. Medium Risk Acceptable, generally subject to regulatory controls.	Y	The cotton gin operations produce a range of solid waste including plastic bale wraps, sediments, cotton trash, and organic plant material. The applicant's controls were assessed and were considered acceptable to mitigate the risk of solid waste being discharged into the surrounding environment. The delegated officer applied the applicant's operational controls and infrastructure requirements to mitigate the likelihood of windblown solid waste.	Condition 1 Condition 8
	Spills and leaks of hydrocarbons and chemicals (herbicide)	Direct discharge to land causing contamination of soil, and potentially impacting the surface water quality of the ORIA scheme	ORIA scheme is located within premises in the northeast area.	Hydrocarbons stored within bunding meeting AS1940:2017. Refer to Section 5.1	C = Minor: low level onsite impact/minimal offsite impact L = Unlikely: The risk event will probably not occur in most circumstances. Medium Risk Acceptable, generally subject to regulatory controls.	Y	The delegated officer considered the applicant's proposed controls to store hydrocarbon and chemicals within suitable bunding were sufficient to minimise the risk of hydrocarbons, chemicals or chemical-contaminated water discharging from the cotton gin facility and causing contamination, therefore conditioned these as construction and operational controls within the works approval.	Condition 1 Condition 8
	Sediment and organic material-laden stormwater	Overland runoff potentially impacting the surface water quality of the ORIA scheme	ORIA scheme is located within premises in the northeast area.	Premises will have an internal drainage system to collect and drain runoff to a detention dam. Overflow to ORIA will adhere to the scheme's existing water quality parameters. Refer to Section 5.1	C = Moderate: low level offsite impacts. L = Possible: The risk event could occur at some time Medium Risk Acceptable, generally subject to regulatory controls.	N	The delegated officer considered the applicant's proposed stormwater management infrastructure to be suitably designed to capture and contain potentially contaminated water (primarily sediment and organics) on the premises prior to discharge. The primary contaminant in stormwater is likely to be sediment and organic particulate matter. The delegated officer noted the applicant proposes to remove accumulated sediments from the dam but has not specified a frequency or maintenance schedule. The delegated officer also considered that given the cotton gin is only proposed to operate during the dry period, actions will be required to prevent sediment and trash build up in the system as this reduces its capacity, potentially resulting in sediment laden runoff, particularly during the wet season. Based on this the delegated officer considered the following additional operational controls appropriate to prevent sediment and trash build up in the stormwater management system: <ul style="list-style-type: none">Removal of all cotton trash by 31 December each year (prior to wet season).A maintenance requirement for stormwater drains to ensure runoff can flow to the detention dam.Clearing of the detention dam every 3-5 years to ensure that the volume is maintained (not required for works approval but dam clearing/maintenance requirements should be considered for ongoing operation). To confirm the detention dam operates effectively to remove sediments and organics the delegated officer also considered it appropriate to include a requirement to sample the discharge to the ORIA scheme, within the first 12 hours of discharge occurring during the time limited operation period. Key design features of the applicant's stormwater management infrastructure have been included as infrastructure controls to ensure the as constructed infrastructure appropriately mitigates the risk of sediment laden water discharging to the ORIA scheme.	Condition 1 Condition 8 Condition 10-12 Condition 15

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.

Note 3: Conditions 2-3, 6-7 and 14-18 are all department imposed conditions required for compliance reporting, authorising time limited operation and associated emissions, and general complaint and record keeping requirements

6. Decision

Based on the assessment in this report, the delegated officer has determined the proposal to construct and operate a new cotton ginning facility at Lot 510 Mulligans Lagoon Road, Kununurra, with an assessed operational throughput of 100,000 tpa of raw cotton, does not pose an unacceptable risk of impacts to off-site receptors. This determination is based on the following:

- processing occurring within an enclosed building with an appropriate dust management system being installed and operated comprising extraction fans, cyclones and rotary drum filters;
- establishment of surface water drainage and a retention dam to capture runoff for sediment removal, prior to use for dust suppression or discharge to the ORIA scheme drainage network;
- air quality modelling indicating the premises activities will contribute less than 27.4% of the relevant 24-hour AGVs to GLCs of PM₁₀ and PM_{2.5} at all surrounding receptors and cumulative assessment indicating AGVs are also expected to be met; and
- noise modelling indicating noise emissions from the premises will comply with the Noise Regulations during operation, subject to the installation of proposed acoustic controls.

Conditions have been imposed on the works approval based on the controls described above as they are considered reasonable and appropriate to maintaining an acceptable level of risk.

The delegated officer determined to apply some additional controls in the works approval to confirm the accuracy of predicted ambient air quality impacts associated with dust emissions and ensure stormwater management infrastructure is appropriately managed. These include:

- installation of an emission monitoring port in accordance with the relevant Australia Standard on the dust house exhaust stack to enable air emission monitoring to be undertaken during time-limited operations to validate the emission rate used for cotton gin emissions in the AQIA; and
- stormwater drain maintenance, clearing of the cotton trash pad at the end of the annual operational period (July to December) and monitoring of the first discharge from the detention dam to the ORIA scheme drainage to confirm the infrastructure suitably reduces contaminants (sediment and organics) in runoff prior to discharge.

7. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 10 March 2023	None received	N/A
Shire of Wyndham-East Kimberley advised of proposal on 10 March 2023	The Shire of Wyndham and East Kimberley replied on 15 March 2023 confirming that a development approval has been granted.	The delegated officer notes this information
Applicant was provided with draft documents on 2 June 2023.	Refer to Appendix 1	Refer to Appendix 1

8. 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) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. DWER 2021, *Draft Guideline: Dust emissions*, Perth Western Australia
5. Kimberley Cotton Limited, *2022 Application for a works approval and supporting documents*, Kununura, Western Australia

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

Condition	Summary of applicant's comment	Department's response
Comments received on the 9 June 2023 and 10 July 2023		
Works Approval		
Condition 1 Table 1 Item 1 and 13	The applicant provided the plate speed and the design capacity of the gin stands.	This information was updated within the works approval .
Condition 1 Table 1 Item 3(d) and 15(e)	The applicant provided details on the number of drum filters in the dust house and dust house filter specifications.	This information was updated within the works approval.
Condition 1 Table 1, 3(e)	The applicant provided exhaust stack height.	This information was updated within the works approval.
Condition 1, Table 1, 10(a)	The applicant deemed that the earth levees do not provide practical noise reduction and requested that the bunds be removed.	The delegated officer considered the information on the Noise Assessment and agreed that the bunds do not provide practical noise reduction and agree to remove the bund from the works approval.
Condition 1 Table 1, Item 13(iv)	The applicant provided details on the discharge point, discharge channel and control structures and capacity of the dam.	This information was updated within the works approval.
Condition 8 Table 4, 10(b)	The applicant provided details on the discharge maintenance and operation.	This information was updated within the works approval.
Decision Report		
Section 2.2 Application summary	The applicant provided the plate speed, and the design capacity of the gin stands.	This information was updated within the decision report.
Section 2.3.2 operation - stormwater	The applicant provided details of the water quality stormwater discharge concentrations expected, the frequency of discharge and that the Ord Irrigation Cooperative water licence water quality parameters would be met.	This information was updated within the works approval.
Section 2.3.2 operation – dust management	The applicant provided details of the stack height, and filter specifications.	This information was updated within the works approval.