



Application for a works approval

Division 3, Part V *Environmental Protection Act 1986*

Works approval number	W6873/2023/1
Works approval holder	Westpork Pty Ltd
ACN	009 148 789
DWER file number	DER2023/000672
Premises	Mindarra Farm Piggery 1340 Wannamal Road BOONANARRING
Date of report	9 September 2024
Status of report	Final

Application details

Westpork Pty Ltd has submitted an application for works approval for upgrade works at its existing piggery in Boonanarring, including the construction of additional infrastructure for the management of effluent.

This report sets out the delegated officer's assessment of potential risk events arising from emissions and discharges during construction and operation of infrastructure relating to the proposed upgrades.

In completing the assessment documented in this report, the department 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>.

Background

The licence holder operates a large scale 'farrow-to-finish' indoor piggery complex, 'Mindarra Farm', in the rural locality of Boonanarring, about 90 km north of Perth.

The piggery is currently licensed under L5724/1993/11 and has an assessed design capacity of 65,000 pigs, which comprises four separate piggery units, with each comprising separate housing and wastewater treatment systems (WWTS), except Mindarra 2, which comprises straw-based shelters:

- Mindarra 1: A sow breeder unit with a maximum holding capacity of 3,800 pigs, including suckers. The WWTS consists of a clay-lined anaerobic pond and a clay-lined evaporative pond.
- Mindarra 2: A grow out facility with a maximum holding capacity of 10,800 weaners and finishers, housed in straw-based shelters.
- Mindarra 3: A sow multiplier unit, with a maximum holding capacity of 6,500 pigs including finishers and suckers. The WWTS consists of one anaerobic and 2 evaporative ponds, all clay lined. There is no screening of solids prior discharge to the anaerobic pond.
- Mindarra 4: A grow-out facility with a maximum holding capacity of 55,000 pigs housed in conventional sheds. The WWTS consists of a mixing tank, 2 solid separation screw presses and 1 anaerobic pond, HDPE lined.

Proposal details

The proposed upgrade works are partly due to delays associated with commencing operation of the adjacent composting facility, Westpork's desire to reduce its carbon footprint from its operations, and to support an increase in the assessed design capacity of the premises – which is currently being operated at numbers significantly greater than the assessed capacity under the existing licence.

The application primarily seeks to increase the assessed design capacity of the premises by increasing the number of pigs that can be housed in Mindarra 4 from 55,000 to 65,000, which would increase the total number of animals for the premises from 65,000 to 86,100 pigs, or the equivalent of 90,488 standard pig units (SPU).

No changes are proposed to pig numbers for Mindarra 1, 2 or 3.

To facilitate the proposed increase in the assessed design capacity, the following changes to wastewater treatment infrastructure are proposed, due to the increase in the volume and concentration of effluent that will be generated and discharged to the WWTS:

- Construction of two covered anaerobic ponds (CAPs), including a digester and flare at Mindarra 4, and associated equipment and pipelines; and
- Generation, collection and treatment of biogas and power generation (refer to Appendix 1 for location).

Westpork's long term intention was that sludge from the existing ponds was to be progressively removed for processing at the adjacent composting facility – which was constructed in 2021 but is still not operational – and there has been a progressive build-up of sludge within the overall Mindarra Farm system. Westpork therefore propose to construct a new evaporation pond at Mindarra 4, which will allow individual ponds to be progressively taken offline and given time to dry before the solids are removed, relined, and then brought back into operation.

In addition, Westpork proposed to construct a new lined anaerobic pond at Mindarra 3, as part of reducing greenhouse gas emissions (GHG) at the premises.

Mindarra 4

Covered Anaerobic Ponds

Westpork propose to construct two covered anaerobic ponds (CAP) that will replace the two existing screw press separators and reduce odour and sludge, whilst generating biogas that can be captured and used for power generation at the premises.

The CAPs will be located at a higher elevation on the premises (about 205 AHD), to allow influent to be pumped from the existing concrete tank. The CAPs will be lined with 1.5 mm thick HDPE and covered with an air tight 2.0 mm thick HDPE cover. The effluent within the ponds will be mixed by stirrers to break up solids and heated to produce biogas. Liquid remaining after digestion will travel via gravity through pipelines to the existing anaerobic ponds (1a, 1b, 1c post de-sludging) and settle before flowing into the evaporation ponds 3 and 4 (when constructed).

The CAPs are expected to significantly reduce the volume of solids generated by piggery operations by up to 70%, and hence reduce the desludging frequency of the existing pond system.

Underground trenches will be constructed, to allow the installation of pipes and cables, for the transport of influent and effluent in and out of each CAP. Safety vents and gas pressure monitors will be installed on the CAP.

The CAPs will be constructed with a concrete floor, four mixer support blocks for stirrers in each with a minimum holding capacity of 29,867 m³ (including freeboard) and 23,858 m³ (excluding freeboard).

Water balance modelling

Water balance modelling for Mindarra 4 indicates the following:

- about 294,000 kL/yr (81,000 kL/d) of effluent is generated at current pig numbers (55,000), equating to about 13,700 kL/SPU/d; and
- an increase in pig numbers to 65,000 will increase effluent volumes by about 6% to 314,000 kL/yr (or 86,000 kL/d), which is an additional 19,500 kL/yr or 5,000 kL/d, assuming the volume of water used for flushing and hosing the sheds remains the same;

Based on the results, an additional evaporation pond with a holding capacity of 71,667 m³ would be required for the system to be capable of managing 314,000 kL/yr in both mean and 99th percentile rain years. This assumes 86,000 kL/d is extracted from the reactor lagoon for recycling through the sheds.

Wastewater treatment system infrastructure

The existing WWTS at Mindarra 4 is comprised of a concrete holding tank, two screw press separators, three anaerobic ponds connected in parallel, leading into one small reactor lagoon, followed by one facultative pond and two evaporation ponds. Proposed changes to existing infrastructure and new infrastructure are summarised in Table 1.

Table 1: Mindarra 4 – WWTS – existing and new infrastructure

Infrastructure	Description	Changes
Existing infrastructure		
Concrete tank	11 m diameter concrete tank 136 kL capacity	No changes, other than influent will now be piped to the CAPs rather than the screw press separators
Screw press separators (2)	Machine press in which a ram is driven back and forward with a screw	Removed – to be replaced by the CAPs
Anaerobic pond 1a	102.4 m x 47 m x 7.4 m 26,985 m ³ capacity (excluding freeboard) HDPE lined (1.5 mm)	Effluent will be diverted to the CAPs. This pond will be desludged and relined, then will be repurposed as a settlement trench
Anaerobic pond 1b	120 m x 45 m x 7 m 29,122 m ³ capacity (excluding freeboard) HDPE lined (1.0 mm)	Effluent will be diverted to the CAPs. This pond will be desludged and relined, then will be repurposed as a settlement trench
Anaerobic pond 1c	120 m x 45 m x 7 m 29,122 m ³ capacity (excluding freeboard) HDPE lined (1.0 mm)	Effluent will be diverted to the CAPs. This pond will be desludged and relined, then will be repurposed as a settlement trench
Reactor lagoon	41 m x 47 m x 6.5 m 5,774 m ³ capacity (excluding freeboard) HDPE lined (1.0 mm)	To be taken offline and desludged, then will be repurposed as an evaporation pond
Facultative lagoon	150 m x 66 m x 4.5 m 34,524 m ³ capacity (excluding freeboard) HDPE lined (1.0 mm)	To be taken offline and desludged, then will be repurposed as an evaporation pond
Evaporation pond 1	150 m x 125 m – 1.0 m to 4.5 m deep 32,736 m ³ capacity (excluding freeboard) HDPE lined (1.0 mm)	No change proposed
Evaporation pond 2	170 m x 120 m – 1.0 m to 4.5 m deep 35,766 m ³ capacity (excluding freeboard) HDPE lined (1.0 mm)	This pond is now part of the composting facility and will be removed from the piggery licence
Evaporation pond 3	L-shaped pond with a surface area of 57,600 m ² , depth of 2 m 84,258 m ³ capacity (excluding freeboard) HDPE lined (1.5 mm)	No change proposed
Proposed infrastructure		
CAPs (2)	80 m x 80 m x 8 m 23,858 m ³ capacity (excluding freeboard) Sides – HDPE lined (1.5 mm) Cover – HDPE lined (2.0 mm)	To be constructed

	Base – concrete floor with 4 mixer support blocks for stirrers Base, sides and cover will be gas tight	
Flare, generator, gas conditioning pad	Height – at least 3 m above as-built ground level Flare to have auto-ignition system Flaring of up to 8,000 m ³ /d	To be constructed
Evaporation pond 4	460 m x 70 m x 2.5 m 70,051 m ³ capacity (excluding freeboard) HDPE lined (1.5 mm)	To be constructed

Generation, collection and treatment of biogas and flaring

The flare, generator and gas conditioning pad will be located on a previously cleared area south of the CAP's at a similar elevation as the CAP's (205 m AHD to 208 m AHD).

The piggery does not generate GHG emissions at a level that currently requires regulatory controls, however, it is noted the collection and treatment of biogas and flaring will reduce the premises overall GHG emissions. Additionally, it is proposed to convert the captured biogas into a renewable energy source.

Captured biogas will be stored in a fully enclosed digester, then directed to either a 1,000 kW generator or to a flare. Biogas directed to the generator will be converted into useable energy for use as power generation at the piggery, whereas the flare system will undergo combustion reactions to convert highly potent GHG; methane (CH₄) (in the biogas), to carbon dioxide (CO₂); reducing odour and GHG emissions. The flare will be at least 3 m above the ground level (as built) and will include an auto ignition system.

The flare will be constructed on a biogas flare pad. It is estimated that under normal operating conditions it will flare up to 8,000 m³/day of gas. Biogas directed to the flare will be ignited and destroyed through an AGA Approved Type B Flare, at a temperature greater than 600°C.

The manufacturer of the generator and flare advise these appliances are designed to destroy 100% of all methane processed through them.

The flare system will also be used as a safety feature onsite, whereby excess gas can be burnt safely in the event of emergencies to prevent explosions. If excess gas is generated, the flare will only be used intermittently (not continuously) for safety.

In the event of an emergency where the gas engine and flare fail to work, the captured gas will be vented for a small period of time, through four emergency vents built into the CAP cover (vents only to be opened in the event of an emergency).

Greenhouse gas emissions reduction

The Average Annual Forward Abatement Estimate is Westpork's best estimate of the total amount of carbon abatement (removal of greenhouse gas from the atmosphere/ avoidance of greenhouse gas to the atmosphere), which is expected to be between 18,000 and 19,000 tonnes of CO₂, per year for Mindarra 4 and Mindarra 3 combined.

Westpork estimates the current open anaerobic system at Mindarra 4 produces 33,000 tonnes CO₂-e per year and that the proposed CAP emission reduction system will result in 0 tonnes CO₂-e emitted annually.

Desludging and relining of ponds

The introduction of the CAPs to the wastewater system is expected to reduce the volume of volatile solids entering the downstream treatment ponds by up to 70%, which will significantly reduce the frequency that these ponds will require desludging.

To integrate the CAPs into the wastewater system, Westpork proposes to desludge the existing treatment ponds, as previously done using built-in underground pipes connected to the base of the ponds. Sludge will be pumped to the concrete holding tank and then managed in accordance with existing licence conditions. The ponds will be desludged in a staged manner:

- anaerobic ponds 1a, 1b and 1c (one pond will remain operational as a settlement trench receiving effluent from the CAPs, and flow will continue onto evaporation ponds);
- reactor lagoon (recycled water for flushing the sheds is currently sourced from this pond – another evaporation pond will be used whilst this pond is desludged; and
- facultative lagoon.

Following desludging, the ponds will be re-lined with a 1.5 mm thick HDPE geomembrane liner and then repurposed – anaerobic ponds 1a, 1b and 1c will be used alternatively as settlement trenches, whilst the reactor lagoon and facultative lagoon will be used as additional evaporation ponds and a source of recycled water to flush the sheds.

Evaporation pond 4

A new evaporation pond is proposed to increase holding capacity for effluent, until the composting facility is operational. The new evaporation pond will be lined with a 1.5 mm HDPE geomembrane liner and be constructed at 194.05 m AHD, which will require the removal of 10 existing paddock trees which Westpork considers poses no ecological significance.

The proposed new pond will measure 460 m long by 70 m wide by 2.5 m deep, with a surface area of 65,228 m².

Increase in assessed pig numbers

The proposed changes to wastewater infrastructure are required at Mindarra 4, to demonstrate the volumes of wastes generated by an increase in the assessed number of pigs at the premises can be sufficiently managed.

No changes are proposed to the number of sheds at Mindarra 4 (currently 19 tunnel ventilated sheds); however, an increase in the assessed number of pigs changes the concentration of the effluent generated and being discharged to the WWTS.

An increase in the assessed number of pigs is only proposed at Mindarra 4, with all other units remaining unchanged, as per the existing licence (Table 2).

Table 2: Mindarra – Current and proposed pig numbers

Unit	Range (pigs)	Average (pigs)	Maximum (pigs)	Current licence	Proposed licence (pigs/SPU)	
				Pigs	Pigs	SPU
Mindarra 1	2,847 – 3,361	3,118	3,361	3,800	3,800	2,820
Mindarra 2	6,153 – 9,753	6,918	9,753	10,800	10,800	11,115
Mindarra 3	5,110 – 5,466	5,254	5,466	6,500	6,500	6,053
Mindarra 4	57,672 – 64,914	62,929	64,914	55,000	65,000	70,500
Total			83,494	86,100	86,100	90,488

Mindarra 3

New anaerobic pond

The existing wastewater system at Mindarra 3 comprises one anaerobic pond, one facultative pond and one evaporation pond. Westpork propose to construct a new anaerobic pond adjacent to, and to replace, the existing anaerobic pond, for the purpose of reducing the site's GHG emissions.

The existing anaerobic pond is proposed to be desludged and replaced by the new pond. The new pond will measure 60 m long by 60 m wide by 7 m deep and will be lined with a 1.5 mm thick HDPE geomembrane liner at an elevation of about 198 m AHD.

There will be a gravitational flow of effluent through a new overland pipeline to the facultative pond, via the existing overland pipeline under gravity to the evaporation pond. The proposed new pond will have a surface area about 50% smaller than the existing pond and will also be deeper than the existing pond to decrease photosynthetic oxygen production at the lowest layer of the pond, facilitating a larger anaerobic zone for microbial treatment.

Water balance modelling for Mindarra 3 indicates current effluent volumes of about 39,000 kL/yr, with around 26,000 kL/yr extracted for reuse through the sheds. The existing wastewater system is a closed loop, with sufficient capacity for disposal via evaporation only. The model indicates the system will still have sufficient storage capacity for both the mean rainfall and 90th percentile annually adjusted rainfall scenarios.

Proposed changes to infrastructure at Mindarra 3 are summarised in Table 3.

Table 3: Mindarra 3 – WWTS – existing and new infrastructure

Infrastructure	Description	Changes
Existing infrastructure		
Anaerobic pond	91 m x 86 m x 4 m 6,872 m ² surface area Clay-lined	To be replaced by a new anaerobic pond Effluent will be pumped to the new pond Pond will be desludged and decommissioned
Facultative pond	120 m x 62 m x 2 m 9,837 m ³ capacity (excluding freeboard) Clay-lined	No changes
Evaporation pond	90 m x 90 m x 3 m 17,243 m ³ capacity (excluding freeboard) Clay-lined	No changes
Proposed infrastructure		
Anaerobic pond	60 m x 60 m x 7 m 9,292 m ³ capacity (excluding freeboard) HDPE lined (1.5 mm)	To be constructed

Other approvals

Westpork received development approval from the Shire of Gingin for the proposed works on 28 May 2024.

Construction schedule

The below table shows the applicant's schedule for the commissioning of infrastructure.

Table 4: Summary of commissioning schedule

Stage	Approximate time frame
1 – Mindarra 3 New Anaerobic Pond	3 months
2 – Mindarra 4 New CAPs	7 months
3 – Mindarra 4 New Evaporation pond 4	3 months
4 – Licence amendment	7 months

Consultation

The Shire of Gingin advised the landowner had not obtained development approval (DA) to expand the existing piggery and that DA is required to be obtained under Local Planning Scheme No.9. The assessment was suspended 14 March 2024, and the DA was provided to the department on 29 May 2024.

The Department of Primary Industries and Regional Development (DPIRD) advised that they support the piggery's expansion, however, raised concerns about how effluent will be managed, in addition to disposal methods for sludge and carcasses, and suggested Westpork be required to prepare a waste management plan.

The department evaluated DPIRD's comments, all solid waste is proposed to be transported to Mindarra's nearby composting facility and therefore information on disposal methods of solid waste and a WMP is not required. The licence holder is proposing they will no longer require the need to irrigate, given the proposed upgrades and works to the facility's wastewater treatment system, as part of this amendment.

Location and siting

Land use and sensitive receptors

Most of the land surrounding the premises is zoned as 'General rural', however, to the south is the Boonanarring Nature Reserve, which is zoned as 'Parks and recreation' under the shire's local planning scheme.

Below provides a summary of potential human and environmental receptors that may be impacted from activities upon or emission and discharges from the prescribed premises (Guideline: Environmental siting (DWER 2020)). In accordance with the *Guideline: Risk assessments* (DWER 2020)), the delegated officer has excluded employees, visitors and contractors from the assessment. Protection of these parties often involves different exposure risks and prevention strategies, which are provided under state legislation:

- The premises northern, eastern and western boundaries are surrounded by 'general rural' space and the nearest rural dwellings are identified as 3.4 km and 4.7 km from the proposed piggery site;
- There are few environmental receptors nearby at risk:
 - a) Boonanarring Nature Reserve located on the southern boundary of the premises across Wannamel road with identifications of conservation code 2, 4 and threatened fauna/flora about 600m south east and 1.2 km south and south west from the premises boundary;
 - b) A private landowner's property about 620 m north east from Mindarra 4's largest evaporation pond, contains remnant bush and an ESA (Conservation category wetland); and
 - c) Resource enhancement wetland located in the south east corner of the premises

Environmental and Heritage Considerations

- Has no known Aboriginal heritage significance within the site or surveys completed by the site
- Nearest sites are Chandala Brook, Gingin Brook Waggy Site and Moore River Waugal (DPLH, 2023) which are overlapping and located about 6 km west of the premises
- Prescribed premises is not a registered contaminated site;
- Prescribed activity is not located within an Environmentally Sensitive Area (ESA);
- Does not contain any Bush Forever sites, nor are there any Bush Forever sites in the immediate of the subject site;
- Prescribed premises area is not a known habitat for conservation significant flora or fauna.

Climate

The Shire of Gingin experiences a Mediterranean climate consisting of hot dry summers and mild wet winters with an annual mean rainfall of 628.3 mm from the years 1996 to 2024, with the heaviest rainfall period occurring during the winter months from June to August (BOM, 2024).

Gingin has an annual mean minimum and maximum temperature of 11.1 °C and 25.7 °C respectively. Gingin wind is characterized by easterly breezes during the morning and south-westerly breezes during the evening.

Soils and landscape

The premises is located within the Dandagaran Plateau Zone and consists of an undulating landscape with elevations ranging from about 194 AHD to 210 AHD. The Dangagaran plateau is made up of sandplain and laterite areas (Landgate, 2023; Table H). The southern end of the premises is mapped as having a high to extreme phosphorus export and waterlogging risk and a moderate to high flood risk (GIS, Geocortex, 2024).

A nearby soil profile at North gingin 21A bore had shown to have a 10m sandy top-soil, 10 m - 65 m thick clay, 55 m - 293 m sand, silt, sandy clay, clay and at 293 m to 329.8 m with shale to silty clay from the base of the bore.

Groundwater

The proposed site is located within the Gingin groundwater area and in the Cowalla Confined Groundwater subarea which is where the Leederville-Parmelia Aquifer is fully allocated in accordance with the *Gingin Groundwater Allocation Plan (DoW, 2015)*. Records of bores drilled onsite suggests the separation distance to groundwater is about 95mbgl at a minimum (Application documentation, 2023). The premises has 3 groundwater bores onsite (Min 4 Top Bore, Min 2 Bore and Min 4 Bottom Bore) and was issued groundwater licence, GWL60381 2 July 2023, with a licence allocation of 379,850 kL to extract from the Perth- Leederville - Parmelia Aquifer, expiring 2 July 2033 (Water register, 2024).

Surface water

The proposed site is located within the Gingin Brook (north of the premises) and Brockman River (south of the premises) sub-catchment (Geocortex, 2024). The proposed site is not located within a Public Drinking Water Source Area.

Separation distances

The applicant has calculated the minimum separation distances to nearby sensitive receptors using a readily applied formula (the 's-factor' formula) outlined in the *National Environmental Guidelines for Indoor Piggeries* (APL, 2018).

The s-factor method was originally devised in Queensland and allows for a rapid and simple assessment of potential air quality impacts (mainly odour) that does not require technically specialised and complex air quality modelling.

When considering the proposed piggery capacity of 90,488 SPU, the calculated separation distance to the nearest receptor from Mindarra 4 and Mindarra 3, being a single rural farm or dwelling, is 1.71 km and 0.88km (respectively), which is within the actual distance of 3.4 km and 4.7 km (respectively).

Risk assessment

Determination of emission, pathway and receptor

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.

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 identified potential source-pathway and receptor linkages. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls, 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 the below table.

Risk assessment

The table below describes the risk events associated with the amendments consistent with the *Guidance Statement: Risk Assessments* (DER 2017). The table identifies whether the risk events are acceptable and tolerated, or unacceptable and not tolerated, and the appropriate treatment and degree of regulatory control, where required.

Table 5: Risk assessment

Risk Event				Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls
Source/Activities	Potential emissions	Potential receptors, pathway and impact	Proposed controls					
Construction works								
Construction of wastewater treatment ponds, comprising: <ul style="list-style-type: none"> Anaerobic pond – Mindarra 3 Evaporation pond 4 – Mindarra 4 Covered Anaerobic Pond's (CAP's) – Mindarra 4 	Noise and fugitive dust associated with machinery movements, construction works and civil excavation earthworks, etc.	Unreasonable interference with the health, welfare, convenience, comfort, or amenity of nearby sensitive receptors (>3 km)	Construction activities are to be carried out between 7am and 7pm on all days, except Sundays and public holidays. All equipment and plant will be of modern design and well maintained, to minimise noise emissions. Exposed soil will be wetted down prior to and during, construction activities. In the event significant dust is generated, construction activities will cease until additional controls can be implemented or any unusual weather conditions abate. Adequate separation to nearby receptors (>3km)	Minimal impacts to amenity on local scale Slight	Likely to occur only in exceptional circumstances Rare	Low Acceptable, not subject to controls	The applicant's proposed controls during construction activities will ensure that dust is mitigated from the wetting down of soil and in case of significant dust that works will be postponed. Noise will result in minimal impact to off-site receptors due to it occurring mainly during daylight hours, 7am to 7pm, except on Sundays and public holidays where there will be no construction works. The delegated officer considers there is also sufficient separation in place (>3 km to nearest rural dwelling), and therefore does not reasonably foresee that noise and dust from construction works will impact on the amenity or health of off-site human receptors.	<u>Works approval controls:</u> None specified.
Operation								
Covered Anaerobic Pond's (CAP's) – Mindarra 4	Spills and overtopping of leachate contaminated waste(water and runoff (from effluent and manure, urine etc.)	Contamination of soil, and seepage/infiltration causing groundwater contamination	Designing the CAPs such that they are adequate for the capacity of wastewater produced by Mindarra 4. Monitoring salinity and pH of the CAPs, to ensure pond chemistry is suitable for treatment microorganisms. Dilute CAPs with freshwater if necessary. Dilute with freshwater if necessary. Large separation distance and thick clay layer exists (>55m) between pond bases and groundwater. CAPs will have concrete bases and will be quality controlled tested following construction, to confirm impermeability. The proposed CAP's will be covered and no odour is expected to be emitted from these ponds, unless in extreme circumstances. Base of each CAP is lined with compacted natural sand/clay and 1.5mm HDPE installed, in accordance with manufacturer's instructions which include a QA/QC program for all welded joints. Daily visual inspections of HDPE cover. Automated control system with inbuilt triggers, to detect changes in pressure levels and therefore indicate potential leaks. 27.1ML maximum storage capacity of the wastewater treatment system, and ponds completely dry out over most summer periods. No history of overtopping of ponds in the past.	Mid-level on-site impacts Low-level off-site impacts on local scale Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, subject to applicant controls being implemented	The CAP's liner, concrete base and underlying thick clay layer ensures the separation distance between the ponds and the groundwater is sufficient to reduce the likelihood of groundwater contamination. The design of the CAP's is sufficient to ensure they function to prevent the likelihood of spills and overtopping of wastewater. The CAP's will be constructed in accordance with manufacturer and engineering and design specifications, to ensure all wastewater is contained. The applicant's proposing to undergo daily visual inspections of the HDPE cover will ensure the management of wastewater to prevent harm to the environment and public health. The delegated officer considers that the CAP's can be maintained at an acceptable level of risk to mitigate environmental and public health risks.	<u>Works approval controls:</u> <ul style="list-style-type: none"> Ensure that the CAP's are constructed in accordance with design and manufacturer specifications Daily visual inspections of the CAP's and their liner 1.5mm HDPE liner is installed Monitoring of salinity and pH of the CAP's wastewater
	Hazardous gases	Uncontrolled discharge of gas resulting in odour	CAPs installed in accordance with manufacturer's instructions which include a Quality Assurance and Quality Control (QA/QC) program for all welded joints. Daily visual inspections of HDPE cover. CAPs will be maintained under negative pressure which minimises the possibility of odourous gases leaking. Automated control system with inbuilt triggers to detect	Minimal impacts to amenity on local scale Slight	Not likely to occur in most circumstances Unlikely	Low Acceptable, based on applicant controls being implemented	The CAP's are covered and therefore it is very unlikely odour will affect nearby receptors. In the case of an exceedingly rare circumstance, it is possible that odourous gases may leak from the CAP's cover, however based on the applicant implementing their proposed controls to ensure the cover are airtight it is unlikely this will occur. Therefore, the delegated officer considers that	<u>Works approval controls:</u> <ul style="list-style-type: none"> Flare to be installed and commissioned Daily visual inspections of the CAP's HDPE cover to ensure it is airtight and free from leaks

			changes in pressure levels and therefore indicate potential leaks. No residences within 1 km of the piggery No odour complaints have been received				odour from hazardous gases from the CAP's poses minimal risks.	
Generation, collection and treatment of biogas and flaring	Odour associated with hazardous gases	Unreasonable interference with the health, welfare, convenience, comfort, or amenity of nearby sensitive receptors (>3 km)	Ensuring all biogas is burnt/flare working efficiently. This is a new odour source that is an essential safety feature, so excess gas can be safely burnt, automatic controls on the gas management system will direct the gas to the alternators or flare, as required. This method will be used in the event of emergencies to prevent explosion and therefore the applicant will ensure it always working efficiently to prevent unreasonable interferences during potential emergencies. The flare will only be used intermittently (not continuously) for safety purposes if excess gas is generated to prevent explosion.	Minimal impacts to amenity on local scale Slight	Not likely to occur in most circumstances Unlikely	Low Acceptable, based on applicant controls being implemented	The flare will be used as a contingency measure if excess gas is generated, and therefore it is expected odour and noise emissions from the flare may only occur in the event of an emergency. It is expected that in the event of an emergency, there will be minimal impacts to nearby receptors due to the delegated officer considering there is sufficient separation (>3 km to nearest rural dwelling) from the CAP's to nearby receptors. As a result, it is unlikely that odour and noise from the operation of flare, will significantly impact on the amenity or health of off-site human receptors.	<u>Works approval controls:</u> <ul style="list-style-type: none"> The flare will only be used intermittently as a safety feature, in the case of an emergency to prevent explosion
	Noise from flaring of gas		The flare will be designed to ensure noise levels at the nearest residence are below assigned noise levels. The design specification for the flare will be a sound power level of approximately 120dB(A). At a distance of 3.4km, and light westerly winds, the sound received at the nearest residence should be below background levels	Low-level on-site impacts Minimal off-site impacts on local scale Minor	Likely to occur only in exceptional circumstances Rare	Low Acceptable, based on applicant controls being implemented		
Increased assessed design capacity	Noise from piggery operation, animals and machinery movements	Unreasonable interference with the health, welfare, convenience, comfort, or amenity of nearby sensitive receptors (>3 km)	Routine observations and inspections will be undertaken with regard to noise. Noise complaints will be investigated, and mitigation measures implemented as needed. No noise complaints have been reported from existing operations. Adequate separation to nearby receptors (>3km)	Minimal impacts to amenity on local scale Slight	Could occur at some time Possible	Low Acceptable, based on applicant controls being implemented	It is expected that with the proposed increase in pig numbers at the farm, there will be increased noise emissions from pigs squealing and machinery operations. The applicant proposes to undergo routine inspections and investigations if noise complaints are received. This will ensure that noise levels are monitored and mitigation measures can be implemented where needed. Given that the farm is located greater than 3km from nearby residences and no noise complaints have been received from the existing operations, the delegated officer has determined there will be minimal noise impacts to nearby receptors.	<u>Works approval controls:</u> <ul style="list-style-type: none"> Noise complaints will be reported to the department Investigation will occur into any noise complaints received by the premises
	Odour		Westpork will be compliant with the required separation distance of 1.93km from the nearest rural residence, as all residences are greater than 3km from the piggery. Pigs will be kept clean and dry. Maintaining pig health to minimise loose stools and providing clean and hygienic conditions within the sheds. No odour complaints have been received regarding existing operations, no impacts to amenity are expected. Regular cleaning of flooring and surfaces. Regularly flushing sheds. Use of sufficient water to clean pits and remove manure solids. Collecting mortalities, afterbirth, and foreign materials promptly. Facultative and evaporation ponds are adequately sized, to avoid overloading and generation of odours. All solid waste taken offsite CAPs will remove the majority (approximately 70%) of solids from influent and capture biogas.	Mid-level on-site impacts Moderate	Could occur at some time Possible	Medium Acceptable, based on applicant controls being implemented		
Wastewater treatment ponds, comprising:	Spills and overtopping of leachate contaminated waste(water) and runoff	Contamination of soil, and seepage/infiltration causing	Large separation distance and thick clay layer exists (>55m) between pond bases and groundwater. The ponds will maintain a 0.5m freeboard at all times. Figure 5 of the water balance modelling indicated	Mid-level on-site impacts Low-level off-site	Not likely to occur in most circumstances	Medium Acceptable, subject to applicant controls	The premises underlying hydrogeology of a thick clay layer and large separation distance to groundwater, provides the delegated officer confidence that it is unlikely leachate from infiltration/soil contamination will cause harm to	<u>Works approval controls:</u> <ul style="list-style-type: none"> Regular inspections and monitoring of the ponds Maintenance of 0.5 m

Anaerobic pond – Mindarra 3 Evaporation pond 4 – Mindarra 4	(from effluent and manure, urine etc.) from operation of WWTS and de-sludging	groundwater contamination	>25,000kL of freeboard storage is available in the system. The wastewater treatment systems will be regularly monitored, at least every second day to ensure any pipe blockages are detected and cleared. Facultative ponds and evaporation ponds are either clay-lined or lined with a 1.5mm HDPE liner. The wastewater treatment system and pipelines will be regularly monitored, at least every second day. 27.1ML maximum storage capacity of the wastewater treatment system, and ponds completely dry out over most summer periods. No history of overtopping of ponds in the past. Regular monitoring and inspections	impacts on local scale Moderate	Unlikely	being implemented	the environment. The applicant conducting regular monitoring and inspections of the WWTS will ensure that pond's are free from leaks, spills and overtopping and freeboard's are maintained. The applicant's pond modelling also provides verification to the department that the WWTS is large enough to operate without spills and overtopping. Given this information the delegated officer considers there are sufficient controls in place to ensure that the operation of the new ponds will unlikely impact nearby environmental receptors.	freeboard <ul style="list-style-type: none"> Ensure ponds are free from leaks and spills
	Uncontrolled discharge/runoff, causing soil, groundwater, or surface water contamination	No odour complaints have been received regarding existing operations. Removal of solid waste off-site as controlled waste by a licensed waste carrier or to the licensed composting facility (L9317, see Premises Map 2). There will be no discharges of the solid waste to land on the premises. The wastewater treatment system and pipelines will be regularly monitored, at least every second day. 27.1ML maximum storage capacity of the wastewater treatment system, and ponds completely dry out over most summer periods. The ponds will maintain a 0.5 m freeboard at all times. Figure 5 of the water balance modelling indicated >25,000kL of freeboard storage is available in the system. Regular monitoring and inspections	Mid-level on-site impacts Low-level off-site impacts on local scale Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, subject to applicant controls being implemented	The delegated officer acknowledges there will be a new anaerobic pond at Mindarra 3, however it will be replacing the existing anaerobic pond with a reduced surface area, which suggests odour from the complex is unlikely to increase. The new evaporation pond at Mindarra 4 will result in a greater amount of wastewater held and is expected to result in an increased amount of odour from the Mindarra 4 complex. However, the applicant implementing their proposed controls to ensure regular inspections/monitoring of the WWTS and that the ponds maintain their minimum freeboard, will ensure it is unlikely odour will significantly impact receptors. The delegated officer considers there is also sufficient separation in place (>3 km to nearest rural dwelling), and therefore considers that it is unlikely that odour from the operation of the new ponds, will impact on the amenity or health of off-site human receptors.	<u>Works approval controls:</u> <ul style="list-style-type: none"> Regular inspections and monitoring of the ponds Maintenance of 0.5 m freeboard Ensure ponds are free from leaks and spills Ensure ponds are maintained and managed to prevent odour emissions 	
	Odour from the wastewater ponds	Unreasonable interference with the health, welfare, convenience, comfort, or amenity of nearby sensitive receptors (>3 km)						

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Guidance Statement: Risk Assessments (DER 2017).

Decision

The delegated officer has determined the proposal to construct additional, and upgraded, wastewater treatment infrastructure at Mindarra 4, to facilitate an increase in the assessed capacity of the premises, does not pose an unacceptable risk of impacts to on- and off-site receptors. This determination is based on:

- the construction of two new CAPs (that will replace the existing conventional anaerobic ponds) is considered industry best practice and is expected to result in a significant reduction in the amount of manure/pond solids generated from operations at Mindarra 4, in addition to reducing the risk of off-site odour impacts from operations at the premises;
- the CAPs will be constructed to an appropriate standard, with an appropriate lining and covering system, including the required flaring system and additional infrastructure to capture and utilise biogas for power generation, which will reduce the premises' overall GHG emissions;
- the existing anaerobic ponds being desludged and appropriately relined in a staged manner, prior to being repurposed as settlement trenches as part of the upgraded WWTS for Mindarra 4, in addition to construction of an additional appropriately lined evaporation pond that will provide additional storage capacity;
- water balance modelling for the proposed increase in pig numbers at Mindarra 4 indicating the new and upgraded infrastructure being capable of managing the expected volumes of effluent that will be generated with evaporation only (no on-site discharges); and
- the replacement of the existing clay lined anaerobic pond at Mindarra 3 with a new HDPE-lined pond that is deeper will result in a better environmental outcome and reduced GHG emissions.

With the proposed new and upgraded wastewater treatment infrastructure in place, the delegated officer is satisfied Westpork has demonstrated the premises will be capable of managing the volumes of waste that will be generated at an assessed capacity of 90,488 SPUs. The delegated officer has also assessed the design and construction standard of the proposed infrastructure to be acceptable and is critical for ensuring an acceptable level of risk of environmental impacts; as such, these requirements will be imposed on the works approval as infrastructure controls.

Works approval and licence amendments

Works Approval W6873/2023/1 that accompanies this report authorises construction of the proposed new and upgraded infrastructure only. The conditions in the issued works approval, as outlined in the above risk table have been determined in accordance with the *Guidance Statement: Setting Conditions* (DER 2015).

An amendment to the existing licence L5724/1993/11 is required following construction, to authorise the ongoing operation of the new and upgraded infrastructure. A risk assessment for the operational phase of this infrastructure has been included in this report, however, changes to the licence will not be finalised until the department is satisfied the works have been completed in accordance with the conditions of the works approval.

Conditions will be imposed to ensure day-to-day operations do not pose an unacceptable risk of impacts to on- and off-site receptors. The licence will also require amendment to authorise the increase in the assessed capacity of the premises to 90,488 SPUs.

Applicant comments on draft decision

The applicant was provided with drafts of the works approval and this report on 15 August 2024 and sought only minor comments and clarifications.

Conclusion

Based on this assessment, it has been determined the issued works approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

The works approval has been issued with a duration of 3 years.

References

1. Australian Pork Limited (2018) National Environmental Guidelines for Indoor Piggeries, available at: https://australianpork.com.au/environmental-practices/environmental-guidelines#guidelines_for_indoor_and_outdoor_piggeries.
2. Bureau of Meteorology (BOM) (2023) Climate Data Online, viewed 10 February 2023 <http://www.bom.gov.au/climate/data>
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. DER 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2019, *Guideline: Decision Making*, Perth, Western Australia.
6. DWER 2019, Odour Emissions Guideline, available at: <https://www.der.wa.gov.au/our-work/licences-and-works-approvals/541-guideline-odour-emissions>
7. DWER 2023, Water Information Reporting, viewed 13 February 2013 <http://wir.water.wa.gov.au/Pages/Water-Information-Reporting.aspx>
8. DWER 2024, Geocortex Map Viewer, Mindarra Farm Piggery, Perth, Western Australia.

Appendix – Maps







