Decision Report

Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number	W6292/2019/1
Applicant	Westpork Pty Ltd
ACN	009 148 789
File Number	DER2019/000480
Premises	Westpork Pinjarra Piggery Operations Lot 502 and 503 Sutters Lane WEST PINJARRA WA 6208 Lot 502 on Deposited Plan 54832 Certificate of Title Volume 2677 Folio 599 Lot 503 on Deposited Plan 54832 Certificate of Title Volume 2677 Folio 600
Date of Report	20/12/2019
Status of Report	Final

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1. Definitions of terms and acronyms

In this Decision Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CS Act	*Contaminated Sites Act 2003* (WA)
Decision Report	Refers to this document.
Delegated Officer	An officer under section 20 of the EP Act.
DWER	Department of Water and Environmental Regulation
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	Environmental Protection Regulations 1987 (WA)
Existing Licence	The Licence issued under Part V, Division 3 of the EP Act and in force prior to the commencement of, and during this Review
HDPE	High density polyethylene
kL	Kilolitre
m^3	cubic metres
Minister	the Minister responsible for the EP Act and associated regulations
ML	Megalitre
NEPM	National Environmental Protection Measure
NEGIP	National Environmental Guidelines for Indoor Piggeries (Australian Pork Limited, 2018)
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	Has the same meaning given to that term under the EP Act.
Peel Harvey EPP	*Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1998*
Prescribed Premises	Has the same meaning given to that term under the EP Act.
Risk Event	As described in *Guidance Statement: Risk Assessment*
SPU	Standard pig unit as defined in NEGIP
Works Approval Holder	Westpork Pty Ltd

2. Purpose and scope of assessment

2.1 Application details

On 15 August 2019 Westpork Pty Ltd (Westpork) submitted an application for a Works Approval for the construction of additional infrastructure at its piggery operations in Pinjarra. Table 2 lists the documents submitted during the assessment process. The cadastral boundaries of the Premises the subject of this application are shown in Figure 1.

Table 2: Documents and information submitted during the assessment process

Document/information description	Date received
Westpork Pty Ltd (Pinjarra Works Approval Application) (Aurora Environmental)	15 August 2019
Additional supporting information provided in response to a request for further information submitted by DWER to the applicant.	17 October 2019
Confirmation of the base height of the covered anaerobic digester.	26 November 2019
Confirmation of the base height of the settlement trenches.	4 December 2019

The scope of risk assessment includes potential impacts from emissions and discharges during construction and operation of a covered anaerobic digester, settlement ponds and a biogas power generation and flare system. This Decision Report documents the Delegated Officer's assessment and determination of the Application, consistent with DWER's Regulatory Framework.

2.2 Proposed Infrastructure

This Works Approval application is for a covered anaerobic digester, a biogas management system comprising a power generation unit and emergency flare system and two settlement trenches to facilitate the drying and removal of sludge from the Premises. This infrastructure will allow the handling and treatment of wastewater from the piggery operations to be improved from its current state and is anticipated to reduce the risk of the odour impacts from the Premises on surrounding land users.

The infrastructure proposed for construction at the piggery is detailed in Table 3. A site layout depicting the location of the proposed infrastructure is shown in Figure 2. Proposed infrastructure is discussed in more detail in other sections of this decision report.

Table 3: Proposed infrastructure

	Proposed Infrastructure	Proposed key infrastructure design and construction information	Reference
1	One covered anaerobic digester	50m by 50m with a vertical depth of 4.5m with sloped sides and a solid concrete base constructed to achieve a permeability less than 1 x 10^{-9} metres per second; The 2.5:1 sloped sides are sealed with 1.5 mm HDPE liner welded to the concrete base; The covered anaerobic digester is designed with a retention time of 45 days and a capacity of 5,475 kL; The digester is caped with a 2mm thick HDPE liner and is fully sealed; The cover contains four 100mm emergency vents; and Four strategically placed and angled mixers are located within the digester to ensure efficient circulation of the effluent.	Figure 2
2	Two settlement	Both settlement trenches are 70m in length, 12m in width and 1.3m in depth;	

	Proposed Infrastructure	Proposed key infrastructure design and construction information	Reference
	trenches	The effective treatment depth of the trenches will be 0.8m, with 0.5m of freeboard maintained at all times; and The settlement trenches will be constructed from clay liner material, with soils selected to ensure an effective water retaining structure is created.	
3	One biogas powered electricity and heat generator unit and flare system	An 85 KW/h combined heat and power unit; Two stage Hydrogen Sulphide (H_2S) scrubbing system which reduces the concentration of H_2S without the use of chemicals and carbon; and An enclosed flare.	

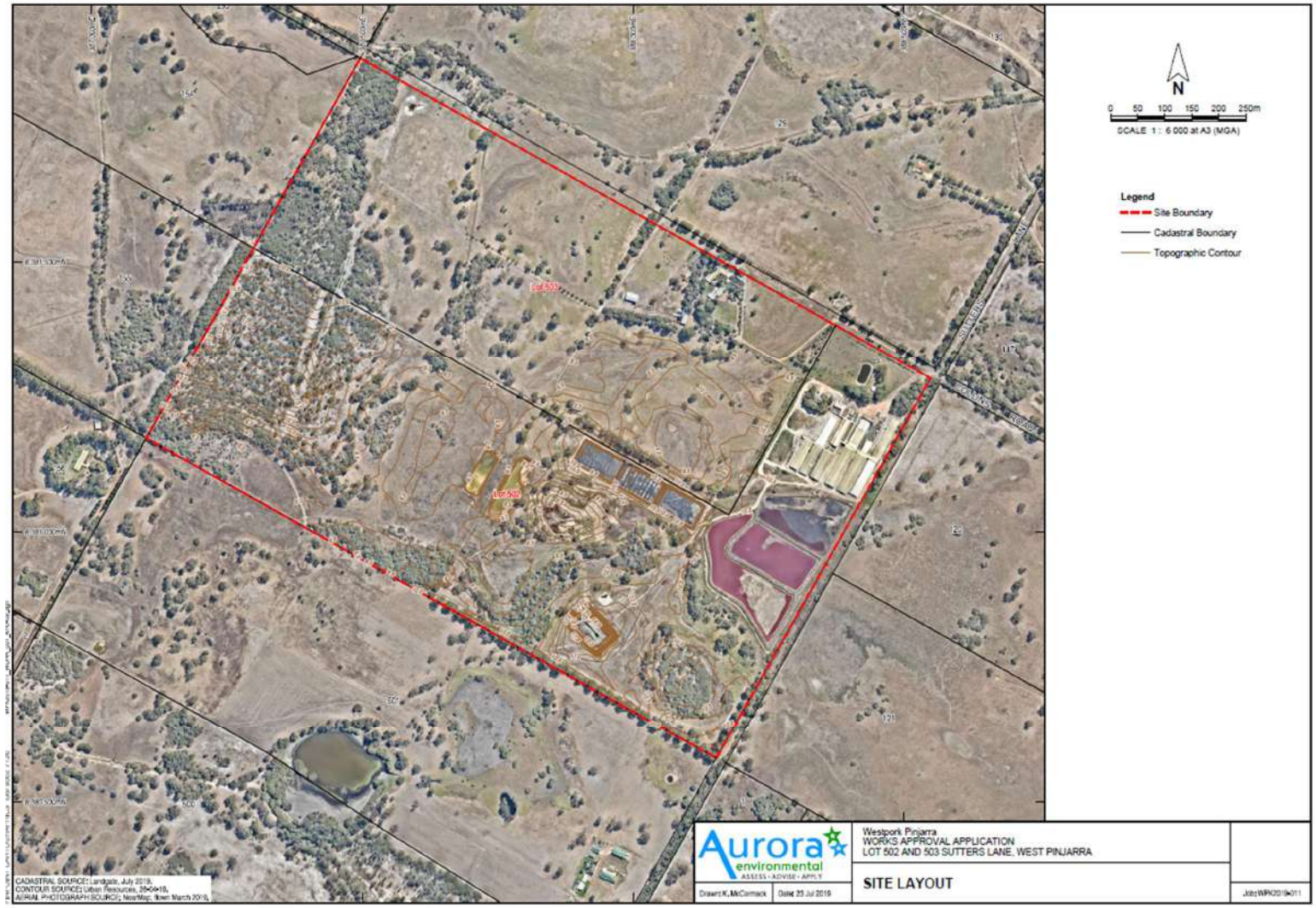

Figure 1: Cadastral and site boundaries of the current piggery operations

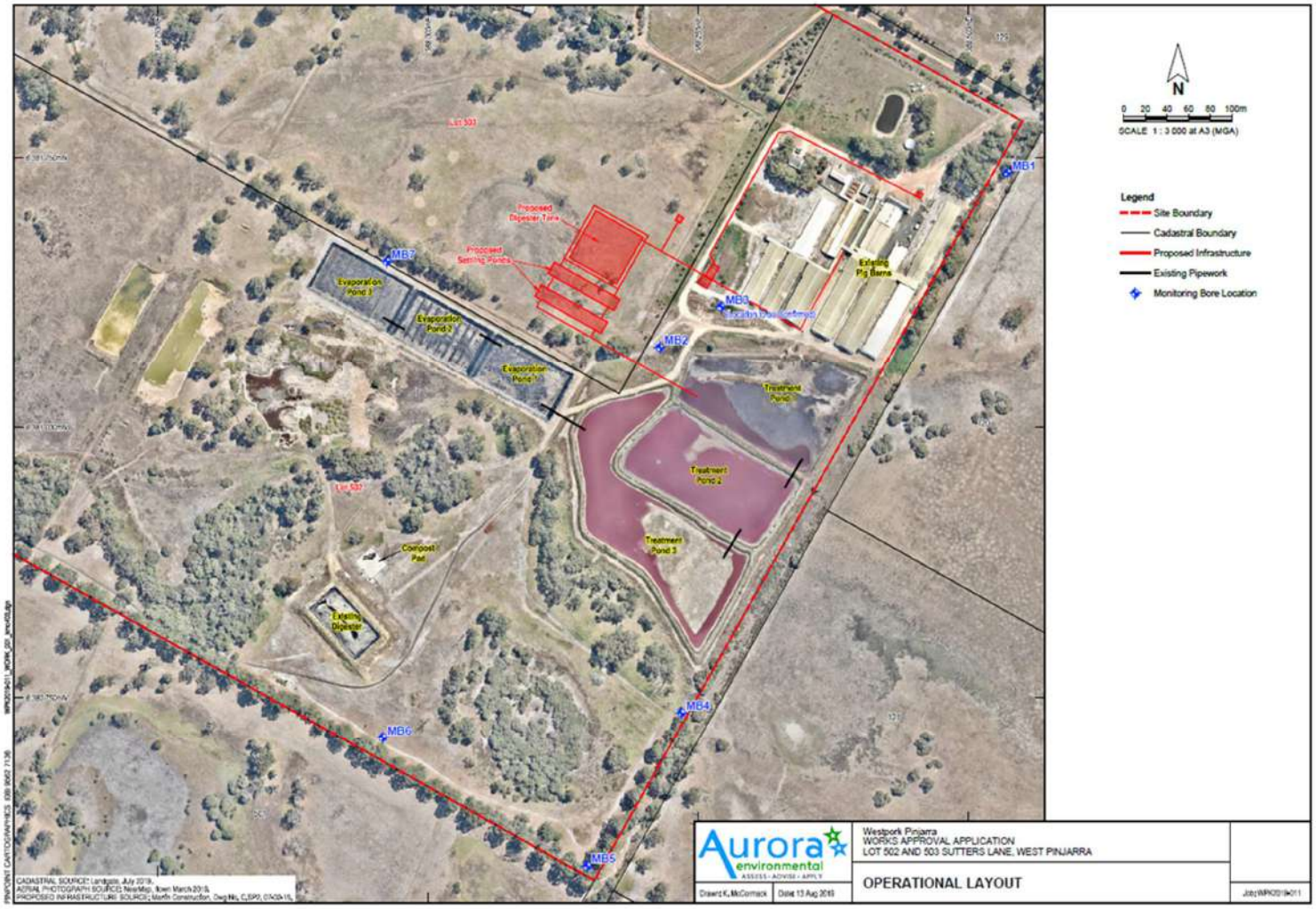

Figure 2: Projected layout of the proposed infrastructure

3. Background

In April 2019, Westpork became the occupier of the Premises from the previous occupier, GD Pork Pty Ltd (GD Pork), who went into administration. Licence L9142/2018/1 was transferred to Westpork in May 2019.

GD Pork undertook expansion works under Works Approval W5687/2014/1 (refer to section 3.2) to increase the design capacity from 3,121 SPU to 6,854 SPU. However, the Department formed the view that works were not completed according to that works approval and there were significant design and construction shortcomings with what was built. With the exception of new conventional sheds, new infrastructure including a covered anaerobic pond and new evaporation ponds has not been bought into operational service. As a result of this, odour and waste management have persisted with the existing pond effluent treatment system known to be a dominant source of odour emissions from the Premises.

Westpork has proposed a strategy to address issues associated with odour and waste management at the Premises. This includes desludging of the existing anaerobic and facultative ponds, which has begun and is expected to reduce odour emissions from the existing pond system once completed.

The scope of works (i.e. proposed covered anaerobic digester, settlement trenches and biogas management system) under assessment in this Decision Report forms part of that odour and waste management strategy.

In July 2019, an Environmental Protection Notice (EPN) was issue to Westpork to restrict animal numbers on the Premises. This was considered by the Department to be appropriate and necessary to reduce odour emissions from piggery operations if the proposed strategies to reduce odours and improve waste management were not carried out in a reasonable time.

Westpork has recently purchased the property neighbouring the piggery, Lot 503 on Deposited Plan 54832, which is the location of proposed works.

The piggery is located within the Peel region of Western Australia and the majority of the piggery infrastructure is situated on Lots 502 and 503 on Deposited Plan 54832 to which the existing licence applies. The piggery operations are situated approximately 8 km southwest of the Pinjarra town site in the Shire of Murray.

The land surrounding the Piggery is predominantly semi-rural and agricultural, with the general land use in the area comprising low density cattle, sheep and lifestyle lots. The piggery is situated within the *Environmental Protection Peel Inlet - Harvey Estuary Policy 1992* area and there are wetlands and drainage lines situated within the site boundary.

3.1 Current Operations

The piggery operates as a ‘breeder facility’ incorporating mating sheds, dry sow sheds, farrowing sheds and a workshop.

As discussed in Section 3, prior to entering into administration, GD Pork sought to expand the design capacity of the piggery operations by installing new conventional sheds and upgrading the wastewater treatment infrastructure at the Premises. Since this infrastructure could not be bought into surface, significant odour issues have originated from the Premises as the existing wastewater treatment infrastructure does not have sufficient capacity to manage with the waste water currently produced at the site.

Westpork proposes to upgrade the wastewater treatment infrastructure at the Premises through the installation of a covered anaerobic digester to undertake the primary treatment of the wastewater produced at the Premises. Solids from the covered anaerobic digester will be deposited within one of two proposed settlement trenches. These settlement trenches will be operated to maintain a freeboard of 500mm, after which the solids from the covered anaerobic

digester will be alternated to the other settlement trench. Solids within the trench will then be allowed to dry out and would be removed from the trench once they have reached a spadeable consistency. Biogas produced by the covered anaerobic digester will be sent to a biogas management facility to be used to generate power and heat, or flared, as appropriate. The installation of this infrastructure, along with the desludging of the existing anaerobic and facultative ponds, is expected to significantly reduce odour emissions from the Premises.

The piggery falls within Prescribed Premises Category 2 as described in Table 4. The anticipated design capacity of the piggery post expansion (i.e. the basis of this application) is shown in Table 4.

Table 4: Prescribed Premises Category

Classification of the Premises	Description	Design capacity Post-expansion (proposed in the Application)
Category 2	Intensive piggery: Premises on which pigs are fed, watered and housed in pens.	8,222 SPU

3.2 Works Approval W5687/2014/1

On 24 September 2015, DWER granted GD Pork Works Approval W5687/2014/1, which approved the construction of:

- Eight new conventional sheds with mechanical ventilation;
- A covered anaerobic pond with a capacity of 18.3 ML;
- An evaporation pond with three compartments and a total capacity of 30.7 ML. This evaporation pond infrastructure was to be lined with clay and HDPE liner; and
- A carcass compositing facility adjacent to the covered anaerobic pond;
- A biogas flare within the carcass composting facility compound.

The construction of this infrastructure was intended to allow the existing piggery operations to be expanded to 9,713 animals (6,854 SPU) from 3,121 SPU while also resulting in significant odour reductions. The existing wastewater treatment ponds were to be reshaped and decommissioned after the construction of a new covered anaerobic pond and evaporation ponds.

As noted above, the Department formed the view that works were not completed according to the works approval and there were significant design and construction shortcomings with what was built detailed. Consequently new infrastructure including the covered anaerobic pond, evaporation ponds, carcass composting facility and biogas flare constructed under that works approval were never bought into operation service and are not specified in the existing licence.

4. Waste management

4.1 Waste streams

There are several streams of waste generated from the existing piggery operations. The piggery currently houses pigs in conventional sheds with slated floors and a pull-plug effluent system. Wastewater comprising faeces, urine, spilt food and water falls through the slatted floors and collects in underfloor pits that are drained at least fortnightly using gravity release pipes in the center of these pits. Following complete drainage, the pit is partially refilled with clean water to prevent deposited manure from sticking to the pit floor.

Currently all wastewater from the sheds enters a concrete wastewater sump situated amongst

the conventional sheds. This wastewater sump uses a float switch to drain its contents to the existing clay-lined anaerobic pond. The treated effluent is then discharged to an adjacent clay-lined facultative pond where the treated effluent is evaporated and a third clay-lined pond provides contingency storage and evaporation capacity.

Table 5 outlines how each waste stream is to be handled, stored and treated by the proposed infrastructure

Table 5: Proposed waste stream management

Waste source	Waste handling / storage	Waste disposal / treatment
Conventional shed effluent.	Pull plug system draining to the wastewater sump, from where the wastewater will be pumped to the proposed covered anaerobic digester.	Anaerobic break down of volatile solids producing biogas and digestate.
Digestate from covered anaerobic digester	Pumped to settlement trenches	Solids settled out post anaerobic treatment for later removal from the site. Wastewater directed to the ponds.
Treated wastewater from the covered anaerobic digester and settlement ponds	Contained in the existing clay lined ponds situated on site.	Wastewater allowed to evaporate.
Biogas from the covered anaerobic digester	Biogas produced from the anaerobic digestion process directed to the biogas management facility.	Biogas burnt to power a generator which will supply electricity to the Premises, or flared in instances when the generator is offline.

4.2 The existing waste water treatment infrastructure

The existing wastewater treatment infrastructure comprises three existing clay-lined ponds (an anaerobic pond, facultative pond and an emergency pond) which are currently used onsite to treat the wastewater exiting the piggery (Figure 2). Westpork is currently in the process of desludging the anaerobic pond to both increase this ponds capacity and reduce the exposure of sludge above the ponds waterline, thereby reducing odour emissions originating from the Premises. When the desludging works have been completed it is anticipated that the anaerobic pond will have sufficient capacity for the anaerobic treatment of wastewater in the event a contingency is needed to bypass the proposed covered anaerobic digester.

Following construction of the wastewater treatment infrastructure proposed in this Works Approval, Westpork propose to utilize the three existing ponds as evaporation ponds as they provide surface area for the loss of treated effluent through evaporation. Should these ponds become full during severe rainfall events, Westpork proposes that excess effluent and intercepted rainfall will be transferred to the clay and HDPE lined evaporation ponds constructed under Works Approval W5687/2014/1 for evaporation. The use of these ponds for the containment of treated wastewater has not been specifically assessed in this Decision Report.

Due to the age and unknown liner integrity of the clay lined ponds Westpork commissioned Bioscience Pty Ltd to undertake a geotechnical investigation of these ponds and to determine the permeability of the ponds clay lining. As the emergency pond was dry at the time of Bioscience Pty Ltd's inspection, a full inspection of the emergency pond's internal perimeter was undertaken, along with an inspection of this ponds center. The outer wall of this pond was examined, with no evidence of damage or leakage found during this inspection.

Four pond liner samples were sent for laboratory-based permeability testing. These samples returned permeability results between 1.2×10^{-9} m/s and 7.3×10^{-11} m/s. Bioscience Pty Ltd advises that permeability of 1×10^{-9} m/s is considered impermeable for all practical purposes. Bioscience Pty Ltd concluded based on the results of the permeability testing, the intact nature

of the pond liner and in the absence of any evidence of leakage, that the sampled emergency pond is impermeable.

4.3 Proposed waste water treatment system components

4.3.1 Covered Anaerobic Digester

The covered anaerobic digester will be constructed to 50m in length and width, with sloped sides 4.5m in height. The covered anaerobic digester's concrete base will be situated at a minimum of 10m Australian Height Datum. The sides of the covered anaerobic digester are to be sealed with 1.5mm HDPE welded liner which imbeds into the concrete base. The concrete base of the anaerobic digester will be constructed to achieve a permeability of 1×10^{-9} m/s. The covered anaerobic digester is designed with a retention time of over 45 days and a capacity of 5,475 kL.

Four strategically placed and angled mixer systems are to be situated within the covered anaerobic digester. These will be anchored to the concrete base and positioned to ensure the efficient circulation of effluent within the anaerobic digester. The anaerobic digester will be operated to ensure the effluent is retained and subject to treatment for the correct retention time. The mixers also ensure that a high percentage of the sludge is suspended in the water column, promoting the optimal breakdown of volatile solids.

In order to maximize the reduction in volatile solids the anaerobic digester incorporates a heat exchanger to control the temperature of the digester to within optimum levels. This includes a hot water load bank and a small combined heat and power recovery system and effluent heat exchanger. A permeable drain with an automatic pump will be set in clean stone under the concrete base of the covered anaerobic digester. This will ensure ground water pressure does not build up between the earth and the covered anaerobic digester's concrete base.

The covered anaerobic digester will have a fully sealed HDPE cover to capture biogas generated during the anaerobic digestion of the effluent from the piggery operations. The captured gases are to be transferred through certified pipework to the biogas management system. The cover will contain four 100mm emergency vents.

The covered anaerobic digester systems can be accessed and operated remotely to provide 24/7 real time monitoring of all key components, allowing potential problems to be detected and addressed before they affect this system's biology.

4.3.2 Biogas management system

The biogas management system has been designed to facilitate the capture and reuse of biogas produced by the anaerobic digester process. This system includes an:

- Enclosed flare;
- 85 kilowatt hour (KW/h) combined heat and power unit; and
- Two stage Hydrogen Sulfide scrubbing system.

The 85 KW/h heat and power unit will be used in parallel with the existing diesel generator onsite and power sourced through the electricity grid to comprise a stable power supply for the piggery. The combustion of biogas produced by the covered anaerobic digester is also anticipated to reduce the potential odour emissions from the site.

The flare will be used to combust biogas in instances when the biogas powered generator is offline. Therefore, the emergency ventilation of biogas from the covered anaerobic digester is only anticipated to occur in exceptional circumstances.

4.3.3 Settlement trenches

Two clay lined settlement trenches 70m in length, 12m in width and 1.3m in depth will be constructed adjacent to the covered anaerobic digester. These settlement trenches will be constructed such that their base will be situated at ground level (10m AHD). The settlement trenches will maintain an effective treatment depth of 0.8m, with a 500mm freeboard maintained at all times. The settlement trenches will be used alternately for the retention of solids in the treated effluent discharged from the covered anaerobic digester. When a settlement trench is at capacity, this trench will be taken offline and allowed to dry until the sludge reaches a spade-able consistency. The sludge will be removed from the trench using an excavator and exported from the site.

The clay used for lining the settlement trenches will conform to the design specifications outlined in Table 6 to ensure it has an appropriate water retaining structure. In addition the soils used to compose the clay layer will be free from plant roots and reactive, soluble and organic matter. These soils will consist of an inert and insoluble blend of sand, clay and silt particles.

Table 6: Settlement trench clay lining soil attributes

Soil Characteristic	Acceptability criterion	Test method
Percentage fines	More than 25 per cent passing through a 75 micron sieve.	*Australian Standard (AS) 1289 3.6.1 – 2009: Methods of testing soils for engineering purposes. Soil classification tests - Determination of the particle size distribution of a soil - Standard method of analysis by sieving.*
	More than 15 per cent passing through a 2 micron sieve.	*Australian Standard (AS) 1289 3.6.3 – 2003 Soil classification tests – Determination of the particle size distribution of a soil – Standard method of fine analysis using a hydrometer*
Liquid limit	30 to 70 per cent	*AS 1289 3.1.2 – 2009: Methods of testing soils for engineering purposes. Soil classification tests - Determination of the liquid limit of a soil - One point Casagrande method (subsidiary method).*
Plasticity index	More than 15	*AS 1289 3.3.1 – 2009: Methods of testing soils for engineering purposes. Soil classification tests - Calculation of the plasticity index of a soil.*
Emerson Class Number	5 to 6	*AS 1289 3.8.1 – 2006: Methods of testing soils for engineering purposes. Soil classification tests - Dispersion - Determination of Emerson class number of a soil.*

4.4 Water balance

Westpork used the PigBal v4.094 software package to estimate the volume of wastewater generated by the piggery operations. This data was then used to undertake water balance modelling of the proposed wastewater treatment system. Two water balance scenarios were used to assess the proposed wastewater treatment system. These comprise:

- An annual water balance using the mean rainfall from the Mandurah BOM weather station (Weather Station No. 9977); and
- An annual water balance using the 90th percentile rainfall sourced from the Mandurah BOM weather station.

The following assumptions were used in the water balance calculations (Aurora Environmental 2019):

- All sludge has been removed from the surface of the existing clay lined evaporation ponds,

so as to not impact on the surface area available for evaporation;

- The first two clay lined evaporation ponds continue to be used and start at 100% and 90% capacity at the commencement of modelling;
- The three clay and HDPE lined evaporation ponds are available and start at 25% capacity at the commencement of modelling;
- Rainfall of 654 mm for a 'mean' year and 795 mm for a '90th percentile' year;
- An evaporation rate of 1877.9 mm per year; and
- The proposed settlement trenches are not included in the water balance calculations, however Aurora Environmental (2019) anticipate this additional surface area will result in a net increase in the wastewater treatment systems total losses through evaporation.

The water balance calculations assess the inflow and outflow through the wastewater treatment system and provide an expected water level in the final clay and HDPE lined pond. This water balance calculation determined that over two consecutive years, with mean rainfall and high rainfall respectively, the final clay and HDPE lined evaporation pond will not receive any overflow from the preceding evaporation pond.

The only water that will accumulate in the final evaporation pond is rainfall intercepted by this pond. This clay and HDPE evaporation pond will then completely dry out over the summer period. Therefore, the water balance model determined that the existing wastewater treatment infrastructure at the site has sufficient capacity to manage the anticipated effluent volumes and rainfall inflows, without requiring discharges to the environment.

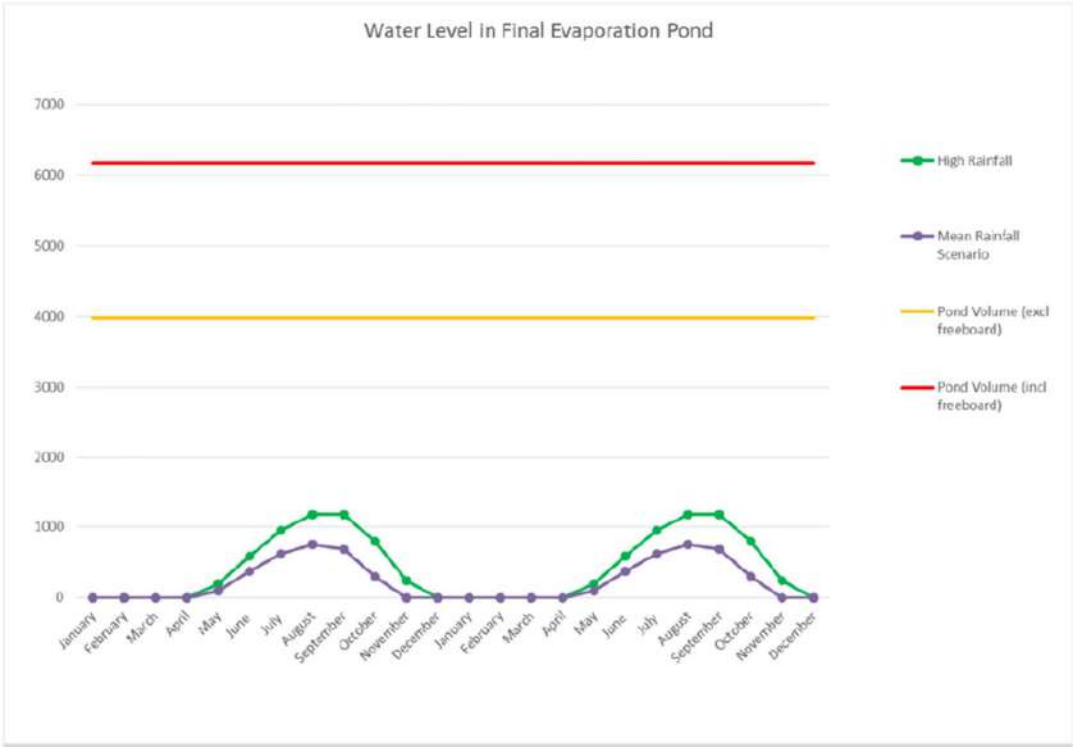

Figure 3: Water balance model showing water level in the final evaporation pond in kilolitres

5. Legislative context

Table 7 summarises approvals relevant to the assessment.

Table 7: Relevant approvals

Legislation	Number	Subsidiary	Approval
Rights in Water and Irrigation Act 1914	GWL165135(4)	Westpork Pty Ltd	An annual water entitlement of 70,000 kL sourced from the Murray, Perth - Superficial Swan water resource. Location of the water source is Lot 502 on Deposited Plan 54832. Licence duration is from 16 September 2019 to 25 June 2029.

5.1.1 Contaminated sites

The Department is aware of elevated nutrient levels (nitrogen and phosphorous) detected during groundwater monitoring campaigns undertaken at the Premises situated on Lot 502 on Deposited Plan 54832. The site has consequently been reported under the *Contaminated Sites Act 2003* (CS Act) and was classified as 'possibly contaminated – investigation required' on 15 April 2015. Elevated nutrient levels are known to occur in both up-gradient and downgradient monitoring bores. This may indicate the elevated nutrient levels identified during groundwater monitoring relate to migration from sources up-gradient of the Premises, sources within the Premises or a combination of both.

While it is possible that similar groundwater quality is present of Lot 503 on Deposited Plan 54832, due to the close proximity of this cadastral area to Lot 502, this is yet to be confirmed through groundwater monitoring. Consequently, Lot 503 has not been reported under the CS Act at this time.

6. Other relevant approvals

6.1 Rights in Water and Irrigation Act 1914

The piggery is within the Murray Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). The abstraction of groundwater within this proclaimed groundwater area therefore is subject to a Licence granted pursuant to the RIWI Act.

Aurora Environmental (2019) advises that Westpork had applied to have the groundwater allocation approved under the existing groundwater license for the site increased from 24,900 kilolitres (kL) per annum to 45,000 kL per annum. The applicant was issued license GWL165135(4) on 16 September 2019, which approved an annual water entitlement of 70,000 kL for the site. This license expires on 25 June 2029.

6.2 Part V of the EP Act

6.2.1 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements which inform this assessment are:

- *Guidance Statement: Regulatory Principles (July 2015)*;
- *Guidance Statement: Setting Conditions (October 2015)*;
- *Guidance Statement: Environmental Siting (September 2016)*;
- *Guidance Statement: Land Use Planning (February 2017)*;

- *Guidance Statement: Risk Assessments (February 2017)*;
- *Guideline*: *Industry Regulation Guide to Licensing (June 2017)* and
- *Guideline: Decision Making (June 2019)*.

The fact sheets which inform this assessment are:

- *Industry Regulation Fact Sheet: Intensive Piggery.*

The guidelines which inform this assessment are:

- *Australian Pork Limited: Code of practice for on-farm biogas production and use (Piggeries) April 2015*; and
- *Australian Pork Limited: National Environmental Guidelines for Indoor Piggeries (NEGIP) May 2018.*

6.2.2 Works Approval and Licence history

Table 8 summarises the recent history of works approvals and licences for the Premises.

Table 8: Works Approval and Licence history

Instrument	Issued	Nature and extent of Works Approval, Licence or amendment
W6292/2019/1	20/12/2019	The construction and time limited operation of a covered anaerobic digester, a biogas management system comprising a power generation unit and emergency flare system and two settlement trenches to facilitate the drying and removal of sludge from the Premises
L9142/2018/1	17/05/2019	Transfer of the Licence to the new occupier of the Premises, Westpork Pty Ltd. This amendment also consolidated Amendment Notice 1 and other administrative matters. The transfer and amendment was issued in the form of a revised Licence.
L9142/2018/1	23/09/19	Licence amended to extend the Licence duration to 15 June 2020.
W5687/2014/1	24/09/15	Approved the construction works necessary to expand the piggery operations to a herd size equivalent to 6,854 SPU. This Works Approval expired on 27 September 2018.

6.2.3 Environmental Protection Notice

On 25 July 2019 DWER issued Westpork Pty Ltd Environmental Protection Notice (EPN) DWERDG401/19 in response to the suspected emission of odours from the Premises. This EPN noted:

- The Premises is operating at 7,890 SPU, in exceedance of the Licence design capacity of 3,121 SPU;
- The current wastewater treatment system is significantly overloaded due to the accumulation of sludge, with insufficient capacity to treat the effluent effectively;
- The volume of sludge in the anaerobic pond is sufficient that sludge is exposed above the surface of the pond, resulting in a significant risk of odour emissions; and
- Between 1 January 2019 and 10 July 2019, DWER received 70 complaints of odour and noise impacting the amenity of members of the local community.

This EPN required that by 15 June 2020, the licensee reduce the number of animals at the Premises to not more than 3,121 SPU, unless operation of the Premises at a higher number of animals is authorized by a Licence or Works Approval issued by DWER.

7. Consultation

Aurora Environmental (2019) advises that Westpork undertook community consultation with local residents in early 2019. These consultations included phone correspondence, site visits and meetings between Westpork personnel and local residents.

A community engagement meeting was also held on 12 August 2019 in Pinjarra with DWER and Westpork staff in attendance. During this meeting, Westpork's approach to managing the issues at the site was described to members of the local community.

8. Location and siting

8.1 Siting context

The piggery is located within the Peel region of Western Australia, approximately 8 km southwest of the Pinjarra town site in the Shire of Murray. The surrounding general land use is predominantly rural and agricultural. Wetlands are located within and in proximity to the piggery and the site is situated within the Peel Estuary - Murray River Catchment.

8.2 Residential and sensitive Premises

The distances between the piggery operations and the closest rural dwellings are depicted on Figure 4. The distance between the proposed infrastructure and these receptors are detailed in Table 9. The distances specified in Table 9 were determined using DWER's spatial viewer.

Table 9: Distance between the proposed infrastructure and sensitive receptors

Sensitive Land Uses	Approximate distance from prescribed activity infrastructure
Rural dwellings	• Approximately 540 metres to the north of the proposed infrastructure at its closest point; • Approximately 680 metres south of the proposed infrastructure at its closest point; • Approximately 700 metres to the north of the proposed infrastructure at its closest point; • Approximately 920 metres south of the proposed infrastructure at its closest point; and • Approximately 1040 metres south of the proposed infrastructure at its closest point.
Town (Pinjarra)	Approximately 8 kilometres northeast of the proposed infrastructure.

Figure 4: Dwellings and their separation distances from the piggery operations.

8.3 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at, or emissions and discharges from, the Premises. The distances to specified ecosystems are shown in Table 10. Table 10 also identifies the distances to other relevant ecosystem values which do not fit the definition of a specified ecosystem.

The table has also been modified to align with the *Guidance Statement: Environmental Siting.*

Table 10: Specified ecosystems

Specified ecosystems	Distance from the piggery
Geomorphic Wetlands - Swan Coastal Plain (management)	A multiple use wetland area is situated within the Premises boundary. This multiple use wetland is part of a broader multiple use wetland which covers the surrounding areas. The mapped multiple use wetland area intercepts the southernmost settlement trench associated with the proposed infrastructure. A resource enhancement wetland is located within the Premises boundary approximately 300 metres south of the proposed infrastructure at its closest point. Another resource enhancement wetland is situated within the Premises, approximately 840 metres to the west of the proposed infrastructure at its closest point. Resource enhancement wetlands outside the Premises boundary are situated the following distances from the proposed infrastructure: • Approximately 520 metres south of proposed infrastructure at its closest point; • Approximately 570 metres northeast of proposed infrastructure at its closest point; • Approximately 870 metres northwest of proposed infrastructure at its closest point; • Approximately 850 metres south of the proposed infrastructure at its closest point and • Approximately 1.2 kilometres southwest of the proposed infrastructure at its closest point. Two conservation category wetlands are situated approximately 1.3 kilometres south west of the proposed infrastructure at its closest point.
RAMSAR wetland– Peel Yalgorup System	The Peel Yalgorup System is approximately 8 kilometres west and 7 kilometres north west of the proposed infrastructure at its closest point. The Peel Yalgorup System includes the Peel Inlet and Harvey Estuary that are Conservation Category wetlands.
Peel Harvey EPP	The proposed infrastructure is located within the policy area.
Threatened Ecological Community (TEC)	Nearest occurrence of a TEC is situated approximately 2.7 kilometres south east of the proposed infrastructure at its closest point.
Hydrography	Three drains are mapped as commencing approximately 30 metres south, 520 metres to the north and 1 kilometre to the southwest of the proposed infrastructure at its closest point. All of which flow in a north-west direction. These drains connect to the Coolup Main Drain (approximately 670 metres northwest of the proposed infrastructure), which connects to the Peel Inlet.
Waterways Conservation Act 1976 – Peel Inlet Management Area	The Peel Inlet Management Area commences approximately 5.8 kilometres north west of the proposed infrastructure location at its closest point.
ANCA Wetland – Peel-Harvey Estuary	Approximately 6.7 kilometres north west of the proposed infrastructure location at its closest point. Intersects with the Peel Inlet, Peel Yalgorup System and Coolup Main Drain. Wetland Type – A6, A7 and A8. Wetland Criteria – 1,2,3,4,5 and 6.
ANCA Wetland – Lake McLarty	Approximately 8.4 kilometres northwest of the proposed infrastructure location

Specified ecosystems	Distance from the piggery
System	at its closet point. Wetland Type – B12, B13 and B14 . Wetland Criteria – 1,2,3,4 and 6.
Department of Biodiversity, Conservation and Attractions Managed Lands and Waters – Nature Reserve (un-named).	Approximately 5.5 kilometres north west of the proposed infrastructure location at its closest point, adjacent to the Coolup Main Drain.
Department of Biodiversity, Conservation and Attractions Managed Lands and Waters – Nine Mile Lake Nature Reserve	Approximately 4.2 kilometres south west of the proposed infrastructure location at its closest point.

8.4 Groundwater and surface water sources

The distances to groundwater and surface water sources situated in the vicinity of the Premises are depicted in Table 11.

Table 11: Local groundwater and surface water sources

Groundwater and surface water sources	Distance from Premises	Environmental value
Watercourses and waterbodies	The Coolup drain is situated approximately 670 metres north of the proposed infrastructure at its closest point. The Coolup drain drains into the Peel Harvey Estuary.	The Coolup drain is recognised as a significant stream by DWER.
	The Mealup Main Drain is situated approximately 3.8 kilometres west south west of the proposed infrastructure at its closest point. The Mealup Main Drain drains into the Peel Harvey Estuary.	The Mealup drain is recognised as a major tributary by DWER.
	The Caris Drain is situated approximately 2.7 kilometres north of the proposed infrastructure at its closest point. The Caris Drain drains into the Peel Harvey Estuary.	The Caris drain is recognised as a significant stream by DWER.
	The Murray River is situated approximately 6.8 kilometres east northeast of proposed infrastructure at its closest point. The Murray River drains into the Peel Harvey Estuary.	The Murray River is recognised as a major river by DWER.
Groundwater Resources	Superficial Swan groundwater resource, proclaimed under the *Rights in Water and Irrigation Act 1914*.	Groundwater allocated for mining and industry, agriculture, parks and conservation, commercial - including public water supply and self-supply, under the Murray groundwater allocation plan. Aurora Environmental (2019) advise that the recent July 2019 groundwater sampling program undertaken at the Premises recorded groundwater depths of between 0.5 and 1.7 metres below ground level.
	Upper Leederville groundwater resource, proclaimed under the *Rights in Water and Irrigation Act 1914*.	
	Cattamarra Coal Measures groundwater resource, proclaimed under the *Rights in Water and Irrigation Act 1914*.	
	Lower Leederville groundwater resource, proclaimed under the *Rights in Water and Irrigation Act 1914*.	

8.5 Meteorology

The Premises is situated within a region that experiences a warm Mediterranean climate with hot dry summers and cool wet winters. Rainfall data sourced from the Halls Head BOM weather station (number 9572) for the years 1889 to 2017 shows an annual mean rainfall of 874. 9 mm. The Halls Head weather station is situated approximately 19.1 km from the Premises. The majority of the rainfall is expected to occur between May and September. Aurora Environmental cite the average rainfall from the Halls Head weather station as 544.4 mm (Aurora Environmental 2019).

While Bureau of Meteorology (BoM) weather stations at Dwellingup and Mandurah are situated closer to the Premises, wind speed and direction observation data has been sourced from the Jandakot Airport weather monitoring station due to comparable distances from the coast to the west and Darling Scarp to the east.

Annual wind roses from BoM (2017) for Jandakot Airport provide an indication of likely wind direction, strength and frequency for the Premises. The prevailing winds are easterly winds in the morning and southwesterly winds in the afternoon. Observations taken from the station indicate that wind blows most commonly between 10 and 20 km/h in the morning with calm conditions occurring for 6% of the time. Winds between 20 and 30 km/h occur most commonly in the afternoon with calm conditions in less than 0.5% of recorded observations.

9. Risk assessment

9.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

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. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Table 12.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 12.

Table 12. Identification of emissions, pathway and receptors during construction and operation

Emission/ environmental factor	Source	Pathway	Receptor	Impacts	Westpork Controls	Change to risk	Reasoning
Groundwater Protection	New Covered anaerobic digester Two sludge settlement ponds. Existing Anaerobic pond, facultative pond and emergency pond	Seepage through the liners and containment measures applied to these structures	Local groundwater bodies	Currently: -elevated nutrient concentrations (nitrogen and phosphorous) identified on Lot 502. Lot 502 classified as 'Contaminated – further investigation required'. Predicted -no additional impacts to groundwater quality and an improvement of effluent treatment prior to disposal within the ponds, thereby reducing the existing impacts to groundwater quality.	Covered anaerobic digester sloped sides with HDPE liner. Covered anaerobic digester floor constructed out of concrete to a hydraulic conductivity of less than 1 x 10^{-9} m/s. Clay lined evaporation ponds (formerly the anaerobic, facultative and emergency ponds) feature a clay liner as part of their structure. Clay lining of the existing emergency pond tested and confirmed the hydraulic conductivity of less than 1 x 10^{-9} m/s.	No increased risk to groundwater quality. The Proposed works do not increase the risk posed by the operation of the Premises to groundwater quality.	The Delegated Officer has determined that: • The proposed works will be required to meet the appropriate standards for construction and installation of pond liners to ensure groundwater will be protected; • The proposed controls for the new infrastructure are considered appropriate to mitigate the risk to groundwater impacts; • Localised groundwater contamination has been identified at the piggery by the groundwater monitoring program; and • The groundwater monitoring network is considered appropriate to detect any emissions from the new infrastructure, with a review of the full network to be undertaken as a part of the Licence assessment.
Surface water Protection	No sources				Settlement trenches will be operated to maintain a freeboard of 500mm. The pond network has sufficient capacity to contain the anticipated effluent volume and the rainfall intercepted during two consecutive wet winters.	No increased risk to surface water quality. The Proposed works do not increase the risk posed by the operation of the Premises to surface water.	The Delegated Officer has determined that: • The clay lined evaporation ponds are currently containing the wastewater volumes produced from the Premises: • This assessment has not considered the use of the new evaporation ponds. These evaporation ponds were not completed according to works approval requirements and there were design and construction shortcomings with what was built. Use of the new evaporation ponds requires additional assessment and consideration of management controls required to address the risk of impacts to groundwater relating to the lack of separation to (and interception with) groundwater • Notwithstanding the point above, the new infrastructure and water balance has been considered in the context of construction and time limited operations under the works approval without the short term availability of the new evaporation ponds. As Westpork will need to separately apply for amendments to the licence (e.g. inclusion of new infrastructure, amend to design capacity), assessment of the new evaporation ponds can be considered through that process. • The settlement trenches will be taken offline for drying when they reach the minimum freeboard of 500mm; and • The proposed controls applied to the existing infrastructure are considered appropriate to mitigate the risk of surface water impacts.
Odour	New Covered anaerobic digester Two settlement trenches Biogas management system Continuing Conventional piggery sheds Existing clay lined evaporation ponds (formerly the anaerobic, facultative and emergency ponds)	Air / wind	Rural dwellings – nearest residence approximately 540 metres to the north of the proposed infrastructure at its closest point	As at 2018: Unacceptable As at June 2019: Marginal Predicted June 2020: Acceptable	Additional treatment of wastewater. Biogas capture and combustion under normal operating conditions. During adverse operating conditions, the former anaerobic pond is anticipated to have sufficient capacity to undertake anaerobic treatment of the wastewater. Settlement trenches will be taken offline when they reach a minimum freeboard of 500mm. They will be allowed to dry out and desludged as soon as a spadeable consistency is achieved. Sludge will be removed from site as soon as possible.	No increased risk of odour impacts, with a likely significant reduction in odour impacts.	The Delegated Officer has determined that: • The additional infrastructure will improve wastewater treatment on site and will reduce the odour emissions to an acceptable level with little to no off site odour impacts during normal operations; • The biogas generated by the anaerobic treatment of wastewater will be captured and combusted during normal operations and not released to the atmosphere; and • The existing anaerobic pond will provide contingency anaerobic wastewater treatment capacity during outages of the covered anaerobic digester.
Noise	No new significant sources of noise.	Air	No receptors likely to be impacted by noise emissions.	No impacts to residential receptors expected	Separation distance to receptors	No increased risk of noise impacts.	The Delegated Officer has determined that the separation distance is sufficient to ensure noise impacts are mitigated. The Noise Regulations apply.
Dust	No sources of dust from the new infrastructure	Air	No receptors likely to be impacted by dust emissions.	Dust impacts not likely to occur.	Separation distance to receptors	No increased risk of dust impacts. There have been no complaints received about dust from the Premises.	The Delegated Officer has determined that the separation distance is sufficient to ensure dust impacts are mitigated.

10. Regulatory controls

DWER will determine regulatory controls having regard to the adequacy of controls proposed by the applicant. The conditions of the Works Approval will give effect to the determined regulatory controls.

10.1 Works Approval controls

10.1.1 Design of infrastructure and equipment

The Works Approval will include design and construction / installation requirements for the:

(a) Covered anaerobic digester including HDPE lining of the sides and cover;

(b) Settlement trenches including engineered clay lining;

(c) Biogas management system.

The requirements reflect controls proposed by Westpork for the control of risks associated with groundwater impacts, surface water impacts and odour. The Applicant's proposed controls were assessed as reasonable and appropriate based on the risks assessment outcomes in Table 12. The Works Approval holder will also be required to submit an Environmental Compliance Report to report on compliance with infrastructure specifications, including certification on HDPE liner installation and testing.

10.1.2 Time limited operations

The Works Approval will authorise up to 180 days of time limited operations, subject to the lodgement of the Environmental Compliance Report demonstrating compliance with infrastructure construction / installation requirements.

11. Determination of Works Approval conditions

The conditions in the Works Approval have been determined in accordance with the *Guidance Statement: Setting Conditions*.

Table 13 provides a summary of the conditions to be applied to this Works Approval.

Table 13: Summary of conditions to be applied

Condition Reference	Grounds
Infrastructure and equipment (design and construction): 1 and 2.	These conditions govern the infrastructure which can be constructed / installed under this Works Approval. In this instance these conditions control the construction and design of the following infrastructure: • Covered anaerobic digester; • Settlement Trenches; and • Biogas management system The conditions are based on the Works Approval Holders controls proposed in the application and relate to the size, and design specification of the infrastructure to ensure waste produced by the piggery is adequately treated and managed.
Pre and post installation testing of HDPE liners and cover for the covered anaerobic digester: 3	Requires HDPE liners to be installed on the anaerobic digester to undergo visual inspections prior to their use to ensure these liners have the necessary integrity. The liners will also require testing to ensure compliance with GRI-GM13 and GRI-GM19a Standard Specification's pre and post installation, respectively.
Compliance audit and reporting: 4 and 5.	These conditions require the Works Approval Holder to undertake an audit of their compliance with Conditions 1, 2 and 3 for the constructed / installed infrastructure and to submit a report documenting their compliance to the CEO of DWER.

Condition Reference	Grounds
Operation of infrastructure and equipment: 6 and 7	This condition allows time limited operation (maximum of 180 days) of the infrastructure to occur under the Works Approval, while an amendment to Licence L9142/2018/1 is sought. This is subject to compliance with Works Approval requirements, including submission of audit reports.
Record Keeping: 8, 9 and 10.	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

The Delegated Officer notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the Works Approval under the EP Act.

12. New evaporation ponds

As noted in this Decision Report, the Department formed the view that works were not completed according to Works Approval W5687/2014/1 and there were significant design and construction shortcomings with what was built, including the new evaporation ponds.

In its review of works approval compliance, the Department considered the design and construction of the as built evaporation ponds noting evidence that the ponds did not meet the required 2m separation to groundwater and information to date had not sufficiently address proposed controls for the risk of impacts to groundwater and surface water. At the conclusion of consecutive wet seasons, the Department had also observed large bubbles had formed beneath at least two of the three evaporation ponds and there was a lack of information on actions to prevent damage or failures of respective liners.

The Department's review of the as built evaporation ponds referred to guidance provided by the US Department of Agriculture on the construction and management of wastewater ponds (USDA 2009) indicating that the effects of hydrostatic uplift are more likely to damage the liner on the margins of a pond rather than beneath the base of the pond as indicated by an analysis provided in a licence amendment application lodged by the former occupier, GD Pork. The hydraulic uplift forces can cause damage to the compacted clay that underlies the geomembrane line of ponds which may also increase the tension on seams in the liner and increase leakage from the pond.

USDA 2009 recommends a Factor of Safety (FS) of at least 1.1 is achieved during the construction of lay-lined ponds. In the case of the evaporation ponds, this equates to water level height in the ponds of at least 0.4m above the height of the water table. The Department was of the view that provided this height was maintained, the risk of hydrostatic uplift causing damage to the liner would be low, even if the water table is above the base of the pond

However, in situations where the water table elevation is much higher than the base of a pond, groundwater inflow through the liner into the pond would increase the volume of water in the pond that would need to be managed by evaporation (or irrigation). Additionally, if the water table is very high, the pond may have insufficient capacity to maintain the water level in the pond sufficiently above the elevation of the water table to prevent hydraulic uplift issues. The Department considered that options exist such as constructing drains around the ponds to maintain the water table below the base of the ponds throughput the year.

Lowering the water table to maintain a 2m separation distance to the base of the pond is likely to be problematic at the Premises in the context of water management challenges. However, maintaining the water table at least 0.5m beneath the base is likely to suitably minimise the risk of groundwater ingress to the pond and the hydraulic liner taking place. This also minimises the volume of groundwater drainage requiring management from around the ponds. Options to undertake an annual water balance to identify the presence of unaccounted water inputs should also be considered along with site specific measurement of pan evaporation rates and rainfall

to support ongoing water balance development

Further actions are required to be required to manage the risk of evaporation pond lining system damage through hydrostatic uplift. The liner bubbles also have the potential to cause damage to the respective HDPE liners if allowed to continue to expand unabated. At a minimum, actions should be considered to monitor the bubbles with proposed contingencies for addressing bubbles as required

The works approval is limited to the construction of proposed works and time limited operation of those works in the context of the existing piggery operations subject to Licence L9142/2018/1. This does not currently include use of the new evaporation ponds in part due to the reasons outlined above which remain unresolved.

13. Amendment to Licence L9142/2018/1

Westpork will need to supply the relevant compliance documentation required by the works approval demonstrating compliance with works approval to enable transition to time limited operation of the new infrastructure. Westpork should also apply for apply for a licence amendment at the time of completing construction to enable the Department to consider amendments to the licence in the context of new infrastructure. Should Westpork wish to commence use of the new evaporation ponds, this should be addressed in a licence amendment application taking into consideration points raised in Section 12 of this Decision Report. Amendments to the licence will also need to consider:

- new infrastructure (i.e. covered anaerobic digester, settlement trenches and biogas management facility);
- amendment of the Premises boundary to include Lot 503 on Deposited Plan 54832;
- review of the assessed design capacity of the Premises;
- changes to the wastewater management system.

14. Consultation

The Works Approval Holder was provided with the draft decision report and draft Works Approval on 19 December 2019 for comment. Two minor comments were provided on 20 December 2019. The comments and response to them is shown in Appendix 2.

15. Conclusion

The Works Approval contains conditions that relate to the application of proposed controls. The conditions also ensure that the proposed works are constructed and installed as described in the Application and to the applicable Australian Standards, including testing of the liners to standardised test methods.

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

Caron Goodbourn
MANAGER, PROCESS INDUSTRIES

Delegated Officer under section 20 of the Environmental Protection Act 1986

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Licence L9142/2018/1 – Westpork Pty Ltd	L9142/2018/1	accessed at www.der.wa.gov.au
2.	Works Approval W5687/2014/1 – GD Pork Pty Ltd.	W5687/2014/1	DWER records (A977278)
3.	Aurora Environmental: Westpork Pty Ltd, Pinjarra Works Approval Application. Report Version: V1. Report Date: 11 August 2019.	Aurora Environmental (2019)	DWER records (DWERDT199252)
4.	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.		accessed at www.dwer.wa.gov.au
5.	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.		
6.	DER, May 2016. *Guidance Statement: Publication of Annual Audit Compliance Reports*. Department of Environment Regulation, Perth.		
7.	DER, August 2016. *Guidance Statement: Licence Duration.* Department of Environment Regulation, Perth.		
8.	DER, November 2016, *Guidance Statement: Environmental Siting*. Department of Environment Regulation, Perth,		
9.	DER, February 2017. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.		
10.	DWER, 2018, *Industry Regulation Fact Sheet: Intensive Piggery*. Department of Water and Environmental Regulation		
11.	DWER, June 2019. *Guideline: Decision Making*. Department of Water and Environmental Regulation, Perth.		
12.	APL, April 2015, *Code of practice for on-farm biogas production and use (Piggeries)*. Australian Pork Limited.	Accessed at www.australianpork.com.au	
13.	APL, May 2018, *National Environmental Guidelines for Indoor Piggeries (NEGIP)*. Australian Pork Limited. Victoria	Accessed at www.australianpork.com.au	

Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

Condition/Section	Summary of Licence Holder comment	DWER response
Works Approval Cover page	Can the clause state that the 4,835 animals excludes suckers (i.e. piglets under 21 days old) or can the design capacity be specified only in SPUs.	Works approval updated to reflect number of animals does not include suckers. As per Category 2 Fact Sheet DWER will determine the total number of pigs for design capacity using SPU.
Works Approval Table 3 and decision report Table 3.	The digester depth is 4.5m, not the length of the sloped sides (at 1:2.5 they will be 11.25m)	DWER understands that the 4.5m refers to vertical depth. Works approval and decision report updated for clarity.