



Licence Number L9134/2018/1

Licence Holder Brownes Food operations Pty Ltd
ACN 146 849 881

Registered business address 22 Geddes Street
BALCATTA WA 6021

File Number DER2018/000658

Duration 26 July 2018 to 31 July 2020

Date of issue 26 July 2018

Prescribed Premises Category 61

Premises Brownes Whey
172 Morrell Road
WEST ARTHUR

Legal description -

LOT 8 ON PLAN 24841, LOT 9 ON PLAN 24840, LOT 20 ON PLAN 410883, LOT 3273 ON PLAN 118395, LOT 3396 ON PLAN 119301, LOT 3274 ON PLAN 118394, LOT 3353 ON PLAN 119302, LOT 3551 ON PLAN 120595, LOT 5611 ON PLAN 133341, LOT 5612 ON PLAN 133343 and LOT 5777 ON PLAN 135892

This Licence is granted to the Licence Holder, subject to the following conditions, on 26 July 2018, by:

Date signed: 28 July 2018

STEPHEN CHECKER
MANAGER WASTE INDUSTRIES

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

Explanatory notes

These explanatory notes do not form part of this Licence.

Defined terms

Definition of terms used in this Licence can be found at the start of this Licence. Terms which are defined have the first letter of each word capitalised throughout this Licence.

Department of Water and Environmental Regulation

The Department of Water and Environmental Regulation (DWER) is established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the *Environmental Protection Act 1986* (WA) (EP Act). The Department also monitors and audits compliance with licences, takes enforcement action and develops and implements licensing and industry regulation policy.

Licence

Section 56 of the EP Act provides that an occupier of Prescribed Premises commits an offence if Emissions are caused or increased, or permitted to be caused or increased, or Waste, noise, odour or electromagnetic radiation is altered, or permitted to be altered, from Prescribed Premises, except in accordance with a works approval or licence.

Categories of Prescribed Premises are defined in Schedule 1 of the *Environment Protection Regulations 1987* (WA) (EP Regulations).

This Licence does not authorise any activity which may be a breach of the requirements of another statutory authority including, but not limited to the following:

- conditions imposed by the Minister for Environment under Part IV of the EP Act;
- conditions imposed by DWER for the clearing of native vegetation under Part V, Division 2 of the EP Act;
- any requirements under the *Waste Avoidance and Resource Recovery Act 2007*;
- any requirements under the *Environmental Protection (Controlled Waste) Regulations 2004*; and
- any other requirements specified through State legislation.

It is the responsibility of the Licence Holder to ensure that any action or activity referred to in this Licence is permitted by, and is carried out in compliance with, other statutory requirements.

The Licence Holder must comply with the Licence. Contravening a Licence Condition is an offence under s.58 of the EP Act.

Responsibilities of a Licence Holder

Separate to the requirements of this Licence, general obligations of Licence Holders are set out in the EP Act and the regulations made under the EP Act. For example, the Licence Holder must comply with the following provisions of the EP Act:

- the duties of an occupier under section 61; and
- restrictions on making certain changes to Prescribed Premises unless the changes are in accordance with a works approval, Licence, closure notice or environmental

protection notice (s.53).

Strict penalties apply for offences under the EP Act.

Reporting of incidents

The Licence Holder has a duty to report to DWER all discharges of waste that have caused or are likely to cause Pollution, Material Environmental Harm or Serious Environmental Harm, in accordance with s.72 of the EP Act.

Offences and defences

The EP Act and its regulations set out a number of offences, including:

- Offence of emitting an Unreasonable Emission from any Premises under s.49.
- Offence of causing Pollution under s.49.
- Offence of dumping Waste under s.49A.
- Offence of discharging Waste in circumstances likely to cause Pollution under s.50.
- Offence of causing Serious Environmental Harm (s.50A) or Material Environmental Harm (s.50B).
- Offence of causing Emissions which do not comply with prescribed standards (s.51).
- Offences relating to Emissions or Discharges under regulations prescribed under the EP Act, including materials discharged under the *Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA)*.
- Offences relating to noise under the *Environmental Protection (Noise) Regulations 1997 (WA)*.

Section 53 of the EP Act provides that a Licence Holder commits an offence if Emissions are caused, or altered from a Prescribed Premises unless done in accordance with a Works Approval, Licence or the requirements of a Closure Notice or an Environmental Protection Notice.

Defences to certain offences may be available to a Licence Holder and these are set out in the EP Act. Section 74A(b)(iv) provides that it is a defence to an offence for causing Pollution, in respect of an Emission, or for causing Serious Environmental Harm or Material Environmental Harm, or for discharging or abandoning Waste in water to which the public has access, if the Licence Holder can prove that an Emission or Discharge occurred in accordance with a Licence.

This Licence specifies the Emissions and Discharges, and the limits and Conditions which must be satisfied in respect of Specified Emissions and Discharges, in order for the defence to offence provision to be available.

Authorised Emissions and Discharges

The Specified and General Emissions and Discharges from Primary Activities conducted on the Prescribed Premises are authorised to be conducted in accordance with the Conditions of this Licence.

Emissions and Discharges caused from other activities not related to the Primary Activities at the Premises have not been Conditioned in this Licence. Emissions and Discharges from other activities at the Premises are subject to the general provisions of the EP Act.

Amendment of licence

The Licence Holder can apply to amend the Conditions of this Licence under s.59 of the EP Act. An application form for this purpose is available from DWER.

The CEO may also amend the Conditions of this Licence at any time on the initiative of the

CEO without an application being made.

Amendment Notices constitute written notice of the amendment in accordance with s.59B(9) of the EP Act.

Duration of Licence

The Licence will remain in force for the duration set out on the first page of this Licence or until it is surrendered, suspended or revoked in accordance with s.59A of the EP Act.

Suspension or revocation

The CEO may suspend or revoke this Licence in accordance with s.59A of the EP Act.

Fees

The Licence Holder must pay an annual licence fee. Late payment of annual licence fees may result in the licence ceasing to have effect.

Definitions and interpretation

Definitions

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

Table 1: Definitions

Term	Definition
ACN	Australian Company Number
Annual Period	means a 12 month period commencing from 1 August until 31 July.
Condition	means a condition to which this Licence is subject under s.62 of the EP Act.
Books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 33 Cloisters Square PERTH WA 6850 info@dwer.wa.gov.au
Compliance Report	means a report in a format approved by the CEO as presented by the Licence Holder or as specified by the CEO (guidelines and templates may be available on the Department's website).
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
Department Request	means a request for Books or other sources of information to be produced, made by an Inspector or the CEO to the Licence Holder in writing and sent to the Licence Holder's address for notifications, as described at the front of this Licence, in relation to: <ul style="list-style-type: none">(a) compliance with the EP Act or this Licence;(b) the Books or other sources of information maintained in accordance with this Licence; or(c) the Books or other sources of information relating to Emissions from the Premises.
Discharge	has the same meaning given to that term under the EP Act.
DWER	Department of Water and Environmental Regulation.

Emission	has the same meaning given to that term under the EP Act.
Environmental Harm	has the same meaning given to that term under the EP Act.
EP Act	means the <i>Environmental Protection Act 1986</i> (WA).
EP Regulations	means the <i>Environmental Protection Regulations 1987</i> (WA).
Implementation Agreement or Decision	has the same meaning given to that term under the EP Act.
Inspector	means an inspector appointed by the CEO in accordance with s.88 of the EP Act.
Licence	refers to this document, which evidences the grant of a Licence by the CEO under s.57 of the EP Act, subject to the Conditions.
Licence Holder	refers to the occupier of the premises being the person to whom this Licence has been granted, as specified at the front of this Licence.
Material Environmental Harm	has the same meaning given to that term under the EP Act.
Pollution	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Licence applies, as specified at the front of this Licence and as shown on the map in Schedule 1 to this Licence.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Primary Activities	refers to the Prescribed Premises activities listed on the front of this Licence as described in Schedule 2, at the locations shown in Schedule 1.
Serious Environmental Harm	has the same meaning given to that term under the EP Act.
Unreasonable Emission	has the same meaning given to that term under the EP Act.
Waste	has the same meaning given to that term under the EP Act.

Interpretation

In this Licence:

- (a) the words 'including', 'includes' and 'include' will be read as if followed by the words 'without limitation';
- (b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;
- (c) where tables are used in a Condition, each row in a table constitutes a separate Condition;
- (d) any reference to an Australian or other standard, guideline or code of practice in this Licence means the version of the standard, guideline or code of practice in force at the time of granting of this Licence and includes any amendments to the standard, guideline or code of practice which may occur from time to time during the course of the Licence; and
- (e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act.

Conditions

Emissions

1. The Licence Holder must not cause any Emissions from the Primary Activities on the Premises except for specified Emissions and general Emissions described in Column 1 of Table 2 subject to the exclusions, limitations or requirements specified in Column 2 of Table 2.

Table 2: Authorised Emissions table

Column 1	Column 2
Emission type	Exclusions/Limitations/Requirements
Specified Emissions	
Irrigation of whey	Subject to compliance with 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14.
General Emissions (excluding Specified Emissions)	
Emissions which: <ul style="list-style-type: none">• arise from the Primary Activities set out in Schedule 2; or• arise from a Material Change (except where Condition applies).	Emissions excluded from General Emissions are: <ul style="list-style-type: none">• Unreasonable Emissions; or• Emissions that result in, or are likely to result in, Pollution, Material Environmental Harm or Serious Environmental Harm; or• Discharges of Waste in circumstances likely to cause Pollution; or• Emissions that result, or are likely to result in, the Discharge or abandonment of Waste in water to which the public has access; or• Emissions or Discharges which do not comply with an Approved Policy; or• Emissions or Discharges which do not comply with a prescribed standard; or• Emissions or Discharges which do not comply with the conditions in an Implementation Agreement or Decision; or• Emissions or Discharges the subject

Column 1	Column 2
Emission type	Exclusions/Limitations/Requirements
	of offences under regulations prescribed under the EP Act, including materials discharged under the <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> .

Acceptance and management

2. The License Holder shall only accept waste on to the Premises if:
- it is of a type listed in Table 3;
 - the quantity accepted is below any quantity limit listed in Table 3; and
 - it meets any specification listed in Table 3.

Table 3: Waste acceptance			
Waste type	Waste Code	Quantity Limit	Specification ¹
Whey	N/A	<ul style="list-style-type: none"> 12,000kL per annual period 1 August 2018 to 31 July 2019; and 28,000kL per annual period 1 August 2019 to 31 July 2020 	Delivered into the premises and transferred into either of: <ul style="list-style-type: none"> 2 x 50,000L Storage tank.

Note 1: Additional requirements for the acceptance of controlled waste (including asbestos and tyres) are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

3. The Licence Holder shall ensure that where waste does not meet the waste acceptance criteria set out in Condition 2 it is removed from the Premises as soon as possible.

4. The Licence Holder shall ensure that the wastes accepted onto the Premises are only subjected to the process(es) set out in Table 4 and in accordance with any process requirements described in that table.

Table 4: Waste processing		
Waste type	Process	Process requirements
Whey	Physical storage	<ul style="list-style-type: none"> Only to be receipted, consolidated, stored, within an impervious (permeability of 1×10^{-9} m/s or less) 50,000L tank capable of preventing spillage. Whey is to be irrigated to one of the 400 ha irrigation areas onsite within 24 hours of receipt

5. The Licence Holder shall ensure that waste material is only stored and/or treated within vessels or compounds provided with the infrastructure detailed in Table 5.

Table 5: Containment infrastructure		
Vessel or compound reference [and location on Map]	Material	Requirements
T1- 50,000 litre tank	whey	Stored in a permanent self bunded tank which has a permeability of less than 10^{-9} m/s or equivalent.
T2- 50,000 litre tank	whey	Stored in a permanent self bunded tank which has a permeability of less than 10^{-9} m/s or equivalent.

Throughput restrictions

6. The Licence Holder is permitted to accept no more than 12,000kL of whey per annual period 1 August 2018 to 31 July 2019.
7. The Licence Holder is permitted to accept no more than 28,000kL of whey per annual period per annual period 1 August 2019 to 31 July 2020.
8. The Licence Holder must monitor and record the volumes of incoming and products at the Premises for the parameter stipulated in column 1 of Table 6, using the units specified in column 2 of Table 6 at the frequency specified in column 3 of Table 6.

Table 6: Monitoring of inputs

Column 1	Column 2	Column 3
Parameter	Units	Frequency
Waste Inputs – Whey	Litres	Continuous

9. The Licence Holder must provide to the CEO a summary of the volumes of waste input for the Premises with the Annual Audit Compliance Report required under condition 17.

Infrastructure and equipment

10. The Licence Holder must ensure that the infrastructure and equipment specified in Column 1 of Table 7 is maintained in good working order and operated in accordance with the requirements specified in Column 2 of Table 7.

Table 7: Infrastructure and equipment controls table

Column 1	Column 2
Site infrastructure and equipment	Operational requirements
Storage tank T1 and T2	<p>The storage tanks must operate to the following specifications:</p> <ul style="list-style-type: none">(a) be able to receive and store whey inflow of up to 28,000kL per annual period;(b) overtopping of the tanks does not occur; and(c) the integrity of the containment infrastructure is maintained.

Disposal requirements

11. The Licence Holder must:
- (a) during the annual period 1 August 2018 to 31 July 2019 irrigate no more than 70 kL/ha of whey to an irrigation area not more than 400 ha within the area shown in purple shading in Schedule 1: map of irrigation areas;
 - (b) during the annual period 1 August 2019 to 31 July 2020 irrigate no more than 70 kL/ha of whey to a separate 400 ha irrigation area from that irrigated under condition 11 (a) within the area shown in purple shading in Schedule 1: map of irrigation areas;
 - (c) irrigate whey such that ponding or pooling of whey does not occur;
 - (d) ensure that any whey-contaminated runoff does not leave the irrigation areas shown in purple shading in Schedule 1: map of irrigation areas;
 - (e) ensure that whey or whey-contaminated runoff does not enter any water course, water body or riparian zone;
 - (f) maintain buffers for the irrigation of whey as follows:
 - (i) 200 m from the Beaufort River;
 - (ii) 50 m from any other watercourse or water body; and
 - (iii) 25 m from any public road.
 - (g) keep accurate and auditable records relating to the annual irrigation of whey within each 400 ha irrigation area at the Premises; and

- (h) submit to the CEO a map of the 400 ha irrigation area at the Premises with the Annual Audit Compliance Report required under condition 17.

Monitoring Requirements

- 12. The Licence Holder must undertake monitoring of whey discharged from the premises in accordance with the requirements specified in schedule 3.
- 13. The Licence Holder must submit all water samples required in Schedule 3 to a laboratory with current NATA accreditation of the analyses of samples specified in Schedule 3.
- 14. The Licence Holder must submit to the CEO a whey monitoring report with the Annual Audit Compliance Report required under condition 17.

Record-keeping

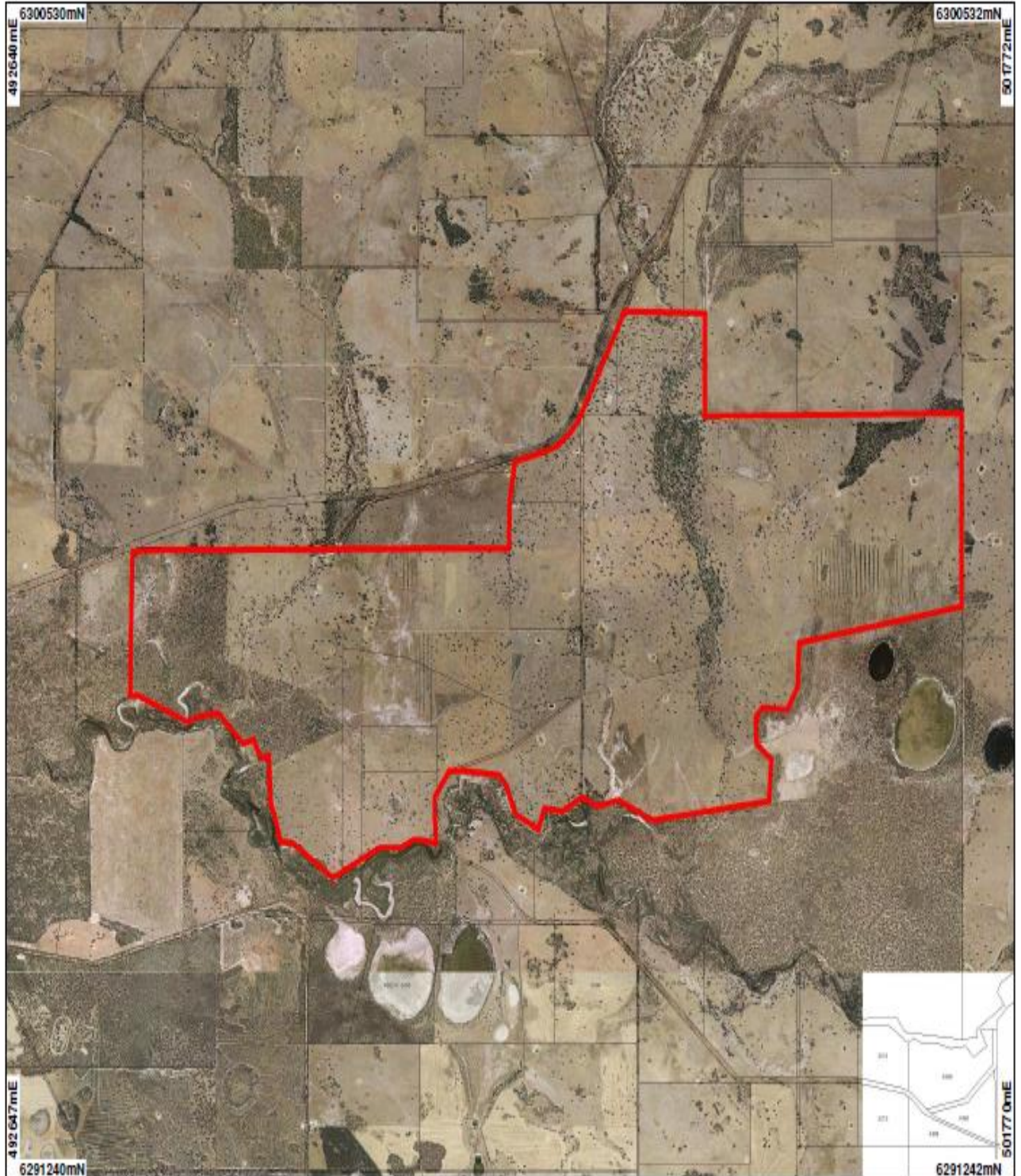
- 15. The Licence Holder must maintain accurate and auditable Books including the following records, information, reports and data required by this Licence:
 - (a) the calculation of fees payable in respect of this Licence;
 - (b) the maintenance of infrastructure required to ensure that it is kept in good working order in accordance with Condition 9 of this Licence;
 - (c) monitoring undertaken in accordance with Conditions 11 and 12 of this Licence;
 - (d) complaints received under Condition 15 of this Licence.In addition, the Books must:
 - (e) be legible;
 - (f) if amended, be amended in such a way that the original and subsequent amendments remain legible and are capable of retrieval;
 - (g) be retained for at least 3 years from the date the Books were made; and
 - (h) be available to be produced to an Inspector or the CEO.
- 16. The Licence Holder must record the number and details of any complaints received by the Licence Holder relating to its obligations under this Licence and its compliance with Part V of the EP Act at the Premises, and any action taken by the Licence Holder in response to the complaint. Details of complaints must include:
 - (a) an accurate record of the concerns or issues raised, for example a copy of any written complaint or a written note of any verbal complaints made;
 - (b) the name and contact details of the complainant, if provided by the complainant;
 - (c) the date of the complaint; and
 - (d) the details and dates of the actions taken by the Licence Holder in response to the complaints.
- 17. The Licence Holder must submit to the CEO, no later than 31 July, a Compliance Report indicating the extent to which the Licence Holder has complied with the Conditions in this Licence for the preceding Annual Period.
- 18. The Licence Holder must comply with a Department Request, within 14 days from the date of the Department Request or such other period as agreed to by the

Inspector or the CEO.

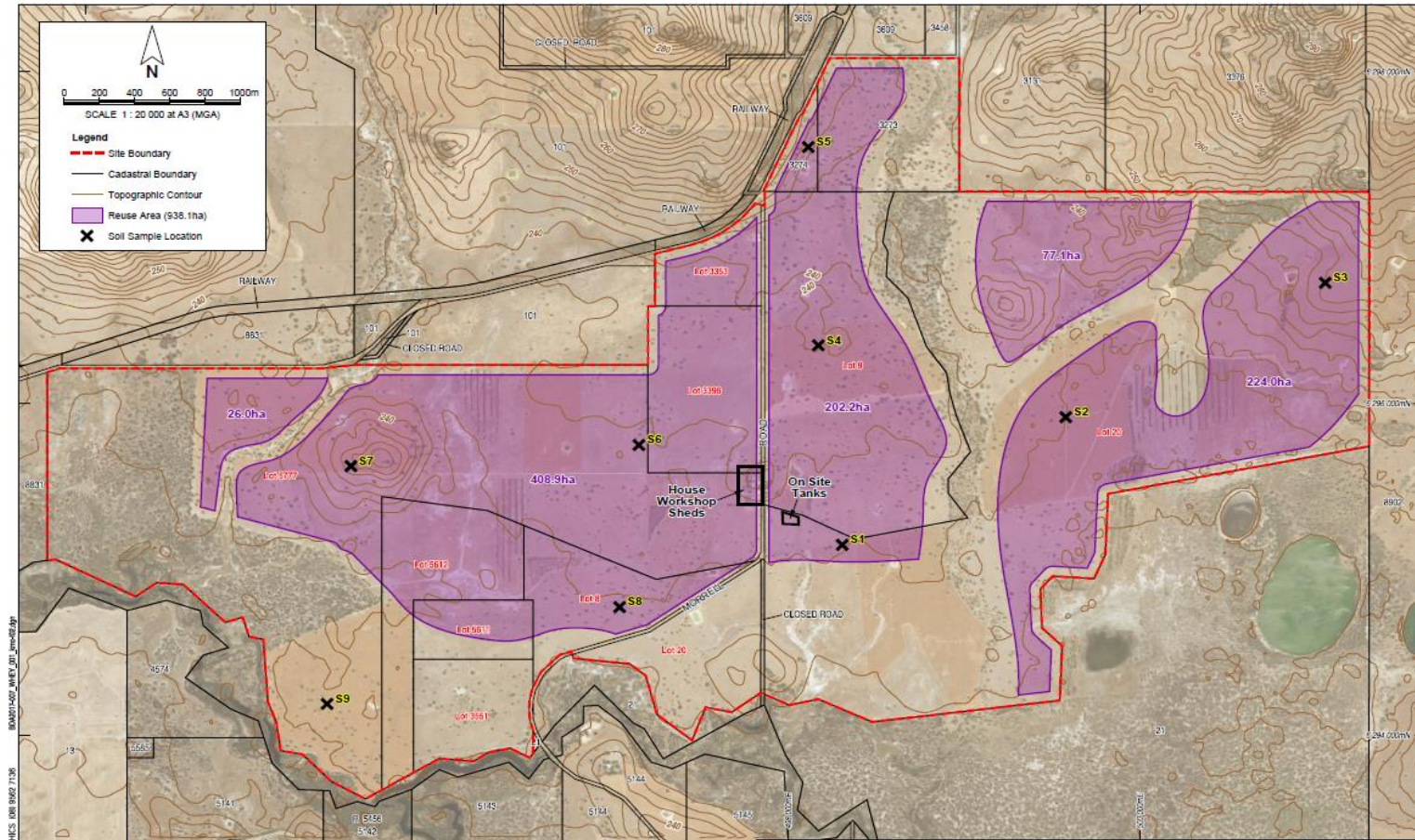
Schedule 1: Maps

Premises map

The Premises are shown in the map below. The red line depicts the Premises boundary.



Map of irrigation areas



Licence Number: L9134/2018/1
File Number: DER2018/000658

IR-T06 Licence Template v2.0 (July 2017)

Schedule 2: Primary Activities

At the time of assessment, Emissions and Discharges from the following Primary Activities were considered in the determination of the risk and related Conditions for the Premises.

The Primary Activities are listed in Table 8:

Table 8: Primary Activities

Primary Activity	Premises production or design capacity
Category 61 - Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated	28,000kL per annual period

Infrastructure and equipment

The Primary Activity infrastructure and equipment situated on the Premises is listed in Table 9.

Table 9: Infrastructure and equipment

Infrastructure and equipment	Plan reference
T1- 50,000 litre storage tank	Schedule 4 Site layout map
T2- 50,000 litre storage tank	Schedule 4 Site layout map

Site layout

The Primary Activity infrastructure and equipment is set out on the Premises in accordance with the site layout specified on the Site layout map in Schedule 4.

Schedule 3: Monitoring

Whey Monitoring

The Licence Holder must monitor the Emissions specified in Column 1 from the locations specified in Column 2 of Table 10. Emissions must be calculated as an average over the period specified in Column 3, at the frequency specified in Column 5, and in accordance with the method specified in Column 6.

Table 10: Whey monitoring table

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Emission	Location	Averaging period	Parameter	Frequency	Method
Whey	Outlet pipe of the processing plant prior to filling Tanker	Spot sample	<ul style="list-style-type: none">• pH;• Total Phosphorus;• Total Nitrogen;• Biochemical Oxygen Demand;	November	AS5667.10.1998
		Continual	Volume (L)	Continuous	Flow metering device

Schedule 4 Tank Location Map



Licence Number: L9134/2018/1
File Number: DER2018/000658

IR-T06 Licence Template v2.0 (July 2017)



Decision Report

Application for Licence

Division 3, Part V *Environmental Protection Act 1986*

Licence Number	L9134/2018/1
Applicant	Brownes Food operations Pty Ltd
ACN	146 849 881
File Number	DER2018/000658
Premises	<p>Brownes Whey</p> <p>172 Morrell Road</p> <p>WEST ARTHUR</p> <p>Legal description -</p> <p>LOT 8 ON PLAN 24841, LOT 9 ON PLAN 24840, LOT 20 ON PLAN 410883, LOT 3273 ON PLAN 118395, LOT 3396 ON PLAN 119301, LOT 3274 ON PLAN 118394, LOT 3353 ON PLAN 119302, LOT 3551 ON PLAN 120595, LOT 5611 ON PLAN 133341, LOT 5612 ON PLAN 133343 and LOT 5777 ON PLAN 135892</p>
Date of Report	26 July 2018
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
Annual period	means a 12 month period commencing from 1 August until 31 July.
Applicant	Brownes Food Operations Pty Ltd
AACR	Annual Audit Compliance Report
ACN	Australian Company Number
AER	Annual Environment Report
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council (ANZECC) 2000 Australian Guidelines for Fresh and Marine Water Quality
BOD	Biochemical Oxygen Demand
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CS Act	<i>Contaminated Sites Act 2003</i> (WA)
Decision Report	refers to this document.
Delegated Officer	an officer under section 20 of the EP Act.
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation As of 1 July 2017, the Department of Environment Regulation (DER), the Office of the Environmental Protection Authority (OEPA) and the Department of Water (DoW) amalgamated to form the Department of Water and Environmental Regulation (DWER). DWER was established under section 35 of the <i>Public Sector Management Act 1994</i> and is responsible for the administration of the <i>Environmental Protection Act 1986</i> along with other legislation.
EPA	Environmental Protection Authority

EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
m ³	cubic metres
Minister	the Minister responsible for the EP Act and associated regulations
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
NEPM	National Environmental Protection Measure
NSW DEC, 2004	Environmental Guidelines: Use of Effluent by Irrigation. Technical guidelines produced by the NSW Department of Environment and Conservation.
NSW EPA, 1998	Environment & Health Protection Guidelines. On-site Sewage Management for Single Households, January 1998.
NHx-N	Ammonical Nitrogen
NOx-N	Nitrous-Nitrogen
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report
Primary Activities	as defined in Schedule 2 of the Revised Licence
PBI	Phosphorus Buffering Indices
PRI	Phosphorus Retention Indices
Revised Licence	the amended Licence issued under Part V, Division 3 of the EP Act following the finalisation of this Review.
Risk Event	As described in <i>Guidance Statement: Risk Assessment</i>
SWA	Shire of West Arthur
TN	Total Nitrogen
TP	Total Phosphorus
TDS	Total Dissolved Solids

TSS	Total Suspended Solids
UDR	<i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> (WA)
US EPA 2006	US EPA Process Design Manual, Land Treatment of Municipal Effluents, EPA/625/R-06/016 September 2006
WMP	Whey Management Plan
WQPN 22	Department of Water's Water Quality Protection Note 22 Irrigation with Nutrient Rich Wastewater

2. Purpose and scope of assessment

The Applicant has applied for a licence to operate the Brownes Whey spreading operation at Lot 8 on Plan 24841, Lot 9 on Plan 24840, Lot 20 on Plan 410883, Lot 3273 on Plan 118395, Lot 3396 on Plan 119301, Lot 3274 on Plan 118394, Lot 3353 on Plan 119302, Lot 3551 on Plan 120595, Lot 5611 on Plan 133341, Lot 5612 on Plan 133343 and Lot 5777 on Plan 135892, 172 Morrell Road, Arthur River, Western Australia. The Applicant intends to undertake whey spreading operations as follows:

- Whey will be transported to the Premises in 48,000L tankers;
- Tankers will then unload into one of two 50,000L onsite storage tanks;
- Whey will be transferred into a 15,000L Spreader and irrigated to land; and
- The Applicant has dedicated a 938ha area of farmland on the Premises for irrigation – currently used as broad acre agriculture which includes cereal cropping and livestock (sheep). Within this 938ha area the Applicant has dedicated two separate 400ha areas for application of whey; thus each 400ha area will only receive one annual loading rate of whey during the 25 month licence period. Figure 2 provides the proposed irrigation areas in purple.

Due to a recent change of ownership at Brownes Food Operations Pty Ltd, new market opportunities have arisen for cheese. As such the Applicant has committed to developing a long term secondary reuse for whey which are expected to be operational within 24 months. As such, the Applicant only has a 25 month lease agreement with KLK Farms, the owners of the property, from 1 June 2018 to operate the Whey spreading proposal. There has been no irrigation of whey at this Premises to date.

The application is to allow for a Category 61 production and design capacity of 28ML. The Applicant wrote to DWER on 9 May 2018 advising that they had revised the whey volume to be disposed in the first 12 months annual period (2018-2019) of operation to a maximum of 12ML and for the disposal of whey in the preceding 12 month annual period (2019-2020) the production and design capacity will be the full 28ML. The Applicant requested that the assessment continue to be undertaken for the production and design capacity at 28ML and accordingly the Application has been verified at 12ML for the first annual period but then the subsequent annual period will operate at 28ML.

2.1 Application details

Table 2 lists the documents submitted during the assessment process.

Table 2: Documents and information submitted during the assessment process

Document/information description	Date received
Application form	13 April 2018
Licence Application Whey Management Plan, Morrell Road, Arthur River WA	13 April 2018

3. Background

The Applicant has applied for a Category 61 Liquid waste facility Lot 8 On Plan 24841, Lot 9 on Plan 24840, Lot 20 on Plan 410883, Lot 3273 on Plan 118395, Lot 3396 on Plan 119301, Lot 3274 on Plan 118394, Lot 3353 on Plan 119302, Lot 3551 on Plan 120595, Lot 5611 on Plan 133341, Lot 5612 on Plan 133343 and Lot 5777 on Plan 135892, 172 Morrell Road, Arthur River, Western Australia.

Table 3 lists the prescribed premises categories that have been applied for.

Table 3: Prescribed Premises Categories in the Existing Licence

Classification of Premises	Description	Approved Premises production or design capacity or throughput
Category 61	Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated.	28,000kL per annual period

4. Overview of Premises

4.1 Operational aspects

The Applicant currently owns and operates a milk processing facility in Brunswick, Western Australia, which is licensed to operate under Licence L4437/1998/12. Cheese is one of the dairy products produced at the facility. Cheese is generally produced to utilise an excess of fresh milk during high yield periods between August and January. As a by-product of the cheese making process, whey is produced from the processing facility. The Applicant has a 25 month lease (from 1 June 2018) to spread whey at the 172 Morrell Road Premises; refer to Figure 1 for the location.

Whey is a complex biological fluid consisting of nutrients, salts, lactose as well as trace elements. Whey will be transported to the Premises from the Brunswick facility in 48,000L tankers. The volume of whey is measured and recorded using a flow metre located at the Brunswick facility. Whey tankers will unload the whey into one of the two 50,000L onsite storage tanks at the Premises and whey will be spread around the farm using a tractor and spreader. The volume of the Spreader tank is 15,000L. Whey is transferred from the tanker to the onsite tank through secure milk transfer procedures. Spreading methodology will ensure an even spread over all parts of the irrigation area. Whey will be spread within 24 hours of delivery to reduce odour. Spreading of whey will occur within a dedicated 938ha area within the Premises with annual application over a 400ha area. A signed agreement is in place between the Applicant and KLK Farms which gives the Applicant the responsibility of timing and quantities of whey to be delivered to the Premises, storage, running costs, spreading of whey on the Premises and meeting sampling and management procedures as set out in the WMP. Figure 2 provides an overview of the Premises.

Whey volumes will vary throughout the annual period. Table 4 provides the Applicants expected volumes over the Annual period.

Table 4: Liquid waste whey volumes expected per annual period*

Month	% total annual whey	Volume whey (kL)
July	2	560
August	5	1400
September	15	4200
October	25	7000
November	25	7000
December	15	4200
January	5	1400
February	2	560
March	1	280
April	1	280
May	2	560
June	2	560
Total		28000

*volumes provided as Applicant has requested assessment at Production and Design Capacity of 28ML noting first annual period operation will be restricted to 12ML.

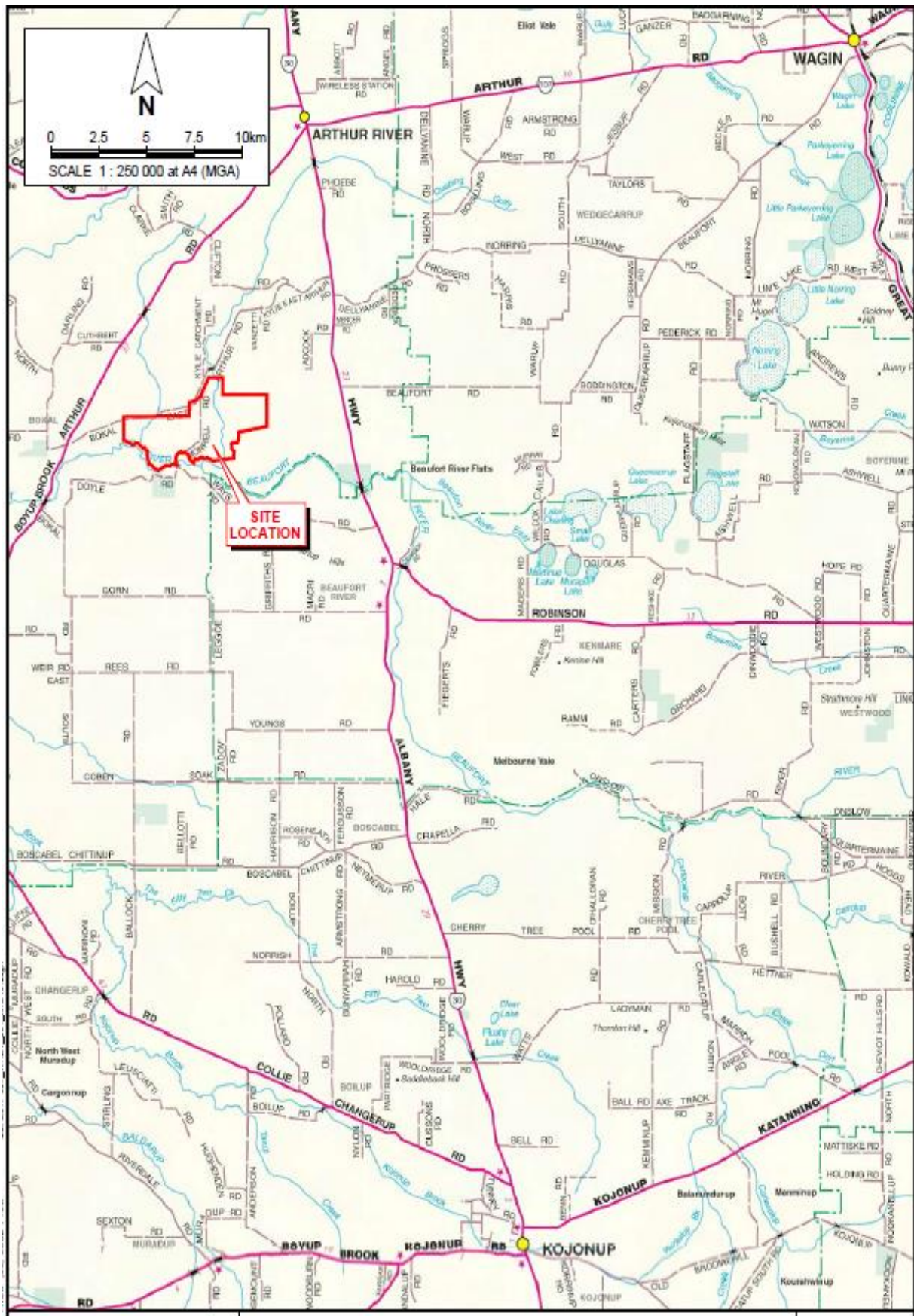


Figure 1 Premises location

4.2 Infrastructure

The liquid waste facility infrastructure, as it relates to Category 61 activities, is detailed in Table 5 and with reference to the Site Plan.

Table 5 lists infrastructure associated with each prescribed premises category.

Table 5: Liquid waste facility Category 61 infrastructure

	Infrastructure	Site Plan Reference
	Prescribed Activity Category 61	
Spreading of Whey		
1	50,000L storage tank	Attachment 1 Site Plan
2	50,000L storage tank	

5. Legislative context

5.1 Other relevant approvals

5.1.1 Planning approvals

The Applicant has provided correspondence in Appendix 1 of the Application of correspondence from the Shire of West Arthur advising that as the proposal is compatible with the premises use for agricultural purposes, no planning approval for the spreading of whey is required.

5.2 Part V of the EP Act

5.2.1 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: Land Use Planning (February 2017)*
- *Guidance Statement: Licence Duration (August 2016)*
- *Guidance Statement: Publication of Annual Audit Compliance Reports (May 2016)*
- *Guidance Statement: Decision Making (February 2017)*
- *Guidance Statement: Risk Assessments (February 2017)*
- *Guidance Statement: Environmental Siting (November 2016)*

6. Modelling and monitoring data

6.1 Monitoring of discharges to land

Whey quality is typically high in nutrient, BOD, TN, TP, salt – TDS, TSS and oil and grease concentrations. It is also acidic with a pH of between 4.0 and 4.4. The Applicant has sampled whey periodically since 2012 from the Brunswick facility. Table 6 provides the results for Whey sampling.

Table 6: Whey quality parameters

Date	TN (mg/L)	TP (mg/L)	pH (mg/L)	TSS (mg/L)	BOD (mg/L)	TDS(mg/L)	Oil and grease (mg/L)
22/10/2012	1,700	420	4.0	3,600	40,000	50,000	160
17/01/2013	1,300	220	4.2	5,700	44,000	47,000	230
12/11/2013	200	200	4.2	1,300	40,000	59,000	42
12/03/2014	1,400	230	4.4	6,400	38,000	38,000	200
12/11/2014	1,400	220	4.2	3,000	38,000	59,000	32
Average	1,140	258	4.2	4,000	40,000	50,600	133
Design water quality	1,500	250	4.2	6,000	42,000	54,000	200

Results show pH and BOD as constant over time while nutrients, TSS and oil and grease are more variable. Water quality characteristics are used to determine the nutrient, BOD and salt loadings for irrigation. The design water quality to be used in the WMP are shown in Table 6. Applicant advises in the Application that the assumptions are conservative to ensure specified loading limits are not exceeded. In addition, the style of cheese to be made in the future is to be different to that made currently. As such TDS concentrations are likely to be lower than what has previously been found in whey samples.

Key finding:

The Delegated Officer has reviewed the information regarding Monitoring and has found:

- 1. The Applicant only proposes to irrigate whey for a period of 25 months and accordingly only has a lease agreement for 25 months starting on 1 June 2018 and terminating on 31 July 2020.*
- 2. The production and design capacity for the liquid waste facility is 28ML per annual period but the Applicant will only discharge up to 12ML of whey in the first annual period and the subsequent annual period will be up to 28ML.*
- 3. The spreading of whey per annual period will occur within a dedicated 938ha area of farmland on the Premises– currently used as broad acre agriculture*

which includes cereal cropping and livestock (sheep). Within this 938ha area the Applicant has dedicated two separate 400ha areas for application of whey; thus each 400ha area will only receive one annual loading rate of whey during the 25 month licence period.

4. *With the exception of TP, all other whey quality parameters are less than design water quality. TP is only slightly higher.*
5. *Both TN and TP concentrations in whey (Table 6) exceed ANZECC 2000 guidelines trigger values for agricultural irrigation for short term (up to 20 years) irrigation (refer to section 4.2.7 and Table 4.2.11).*
6. *BOD concentration is normal for whey, which is very high for an irrigated effluent – this can lead to soil permeability issues over longer term irrigation. However only a single application each 400ha area of land proposed.*

7. Consultation

The Application was advertised on 8 June 2018 seeking any public comment with submissions due 2 July 2018. No submissions or comments were received.

8. Location and siting

8.1 Siting context

The Premises is located on Lot 8 On Plan 24841, Lot 9 on Plan 24840, Lot 20 on Plan 410883, Lot 3273 on Plan 118395, Lot 3396 on Plan 119301, Lot 3274 on Plan 118394, Lot 3353 on Plan 119302, Lot 3551 on Plan 120595, Lot 5611 on Plan 133341, Lot 5612 on Plan 133343 and Lot 5777 on Plan 135892, 172 Morrell Road, Arthur River, Western Australia. The land surrounding the Premises is zoned a Rural excluding a small area zoned conservation (Dead Man's Swamp Nature Reserve) to the south. The majority of the Premises is flat with elevations between 233mAHD and 240mAHD. Two elevated area exist; one in the north east corner with an elevation of 260mAHD and one small hill in the central part of Lot 5777, rising to 260mAHD.

8.2 Residential and sensitive Premises

The distances to residential and sensitive receptors are detailed in Table 7.

Table 7: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Residential Premises	1750m south west of tanks 407m south of Premises boundary 807m south of Irrigation area.
	4402m north west of Tanks 1180m north west of Premises boundary 1190m north west of Irrigation area.

	5890m north east of Tanks 2050m north east of Premises boundary 2100m north east of Irrigation area

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 8. Table 8 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 8: Environmental values

Specified ecosystems	Distance from the Premises
Geomorphic Wetlands	Swamp: adjoins south east Premises boundary 1550m south east of Tanks 620m south west of Irrigation area. Lake: 2980 east of Tanks 400m south of Premises 450m south of Irrigation area Area subject to Undulation: 2470m south west of Tanks 400m south of Premises 450m south Irrigation area
Biological component	Distance from the Premises
Threatened/Priority Flora	3030m south west of Tanks 325m south of Premises 725m south of Irrigation area
Threatened/Priority Fauna	Mammals P4: 3690m south west of Tanks 550m south west of Premises 1600m south of Irrigation area Birds P4: 3160m south west of Tanks

	750m south west of Premises 1150m south of Irrigation area
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8.4 Groundwater and water sources

The distances to groundwater and water sources are shown in Table 9.

Table 9: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental value
Major watercourses/waterbodies	1. Major non- perennial Minor non-perennial Area subject to Inundation Adjacent and majority flank southern and western Premises boundary. 1340m south of Tanks 400m south of Irrigation area.	Recreation and aesthetic
Groundwater	Depth to groundwater unknown Three bores located within 1km of Premises (based on available GIS dataset –WIN Groundwater Sites). 2 x 3500m north of Tanks, 690m north of Premises and 700m north Irrigation area. 1 x 3900m north west of Tanks, 810 north west of Premises and 820m north of Irrigation area.	Water use not known but given location is could be either potable for north west bore and livestock for northern bores.

8.5 Soil type

DWER's GIS identifies the soil class at the Premises as:

Va 64 - Plains--shallow flat-bottomed valley plains in which some salinity is usually evident: chief soils are hard alkaline and neutral yellow mottled soils (Dy3.43 and Dy3.42). Associated are small areas of many soils including occasional terraces of (Dr2.4) soils.

Ub90 – Generally rolling to hilly country with tors; lateritic mesas and buttes on some interfluvial areas: chief soils are hard neutral and acidic yellow mottled soils (Dy3.42 and Dy3.41) sometimes containing ironstone gravels. Associated are variable areas of hard acidic and neutral red soils (Dr2.31), (Dr2.21), (Dr2.32), and (Dr2.22) on slopes; (Dy3.82 and Dy3.81) soils containing moderate to large amounts of ironstone gravels on ridges, crests of hills, and upper slopes; and many small areas of other soils.

Ub95 - Valley plains with some sandhills, dunes, lateritic gravel areas, and swamps: chief soils are hard neutral and sandy neutral yellow mottled soils (Dy3.42) and (Dy5.42). Associated are leached sands (Uc2.21) and siliceous sands (Uc1.21) of the sandhills and dunes; some (KS-Uc) gravels on residual knolls and ridges; areas of the soils of units Ub96 and Va64; and

undescribed swamp soils. As mapped, areas of adjoining units may be included. There are similarities with unit Ca22.

As part of the Application a geotechnical investigation was conducted at the Premises in February 2018. The investigation included nine test pits (S1-S9) over the Premises with samples collected from two depths at each site. Figure 2 provides an overview of the test pit locations.

To aid assessing the suitability of the whey irrigation and appropriate nutrient loadings, the existing nutrient status in the soil was considered. Nitrogen in all samples and particularly the subsoil samples with all sites recording a combined nitrate nitrogen and ammonium nitrogen level of less than 5mg/kg in the subsoil. Nitrate nitrogen levels in the top soils ranged from 2mg/kg to 60mg/kg which is typical of broad acre farming operations.

In contrast the phosphorus concentrations varied across the Premises. PBI provide a measure of the soils ability to bind and release phosphorus for plant uptake. Accordingly, high PBI scores then indicate a high nutrient retention capability. Colwell P is a measure of the phosphorus that is available for plant uptake.

Table 10 provides the PBI values in the nine test pits and also shows the P (Colwell) results and the relevant 95% Optimum P absorption values given the PBI of each soil type. Test pits S1, S2, S3, S4 and S6 indicate there is sufficient capacity to absorb phosphorus applied to land vis spreading irrigation while test pits S5, S7 and S9 indicate phosphorus should be absorbed at depth (0.4 - 0.5m) but that test pit 8 already contains sufficient quantities of phosphorus in the soil so the application of whey will not be beneficial and will likely desorb at depth to 0.5m.

Table 10 Phosphorus capacity of soil

Site	Depth (m)	PBI	PBI Class (DPIRD)	95% Optimum P Absorption (mg/kg)	Colwell P Results (mg/kg)
S1	0 – 0.1	14.1	Extremely low	23	15
	0.4 – 0.5	39	Very very low	26	7
S2	0 – 0.1	20.5	Very very low	26	24
	0.4 – 0.5	12.3	Very very low	23	2
S3	0 – 0.1	51.5	Very low	29	26
	0.4 – 0.5	31.3	Very very low	29	2
S4	0 – 0.1	8.7	Extremely low	23	15
	0.4 – 0.5	5.7	Extremely low	23	4
S5	0 – 0.1	20	Very very low	26	41
	0.4 – 0.5	38.5	Very very low	26	5
S6	0 – 0.1	4.7	Extremely low	23	19
	0.4 – 0.5	6.7	Extremely low	23	8
S7	0 – 0.1	63.9	Very low	29	120
	0.4 – 0.5	67.3	Very low	29	7

S8	0 – 0.1	27	Very very low	26	41
	0.4 – 0.5	149.7	Moderate	40	45
S9	0 – 0.1	63.6	Very low	29	66
	0.4 – 0.5	104.2	Low	34	24

*Highlighted numbers show phosphorus deficiency

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 11.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Tables 11.

Table 11: Identification of emissions, pathway and receptors during operation

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Whey irrigation	Operation of Tanker truck and Spreader/Tractor	Noise from operation and movement of heavy vehicles	Residential premises: 1750m south west of tanks, 407m south of Premises boundary and 807m south of Irrigation area. 4402m north west of Tanks, 1180m north west of Premises boundary and 1190m north west of Irrigation area. 5890m north east of Tanks, 2050m north east of Premises boundary and 2100m north east of Irrigation	Air / wind dispersion	Amenity impacts causing nuisance	No	The use of the Spreader and Tractor is a normal agricultural activity and proposed operation is not significantly in excess of normal farming practice. The Tanker speed will be reduced when irrigating which will limit additional noise. The Applicant has a 25 month lease which equates to two annual periods. The first annual period will only discharge 12ML of whey and the second annual period will discharge 28ML of whey. The Delegated Officer considers the separation distance between the source and receptors as adequate to inform the risk of noise emissions as not foreseeable.

Risk Events					Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
			area			Noise can be adequately regulated by the EP Noise Regs.
		Dust from movement of vehicles	Residential premises: 1750m south west of tanks, 407m south of Premises boundary and 807m south of Irrigation area. 4402m north west of Tanks, 1180m north west of Premises boundary and 1190m north west of Irrigation area. 5890m north east of Tanks, 2050m north east of Premises boundary and 2100m north east of Irrigation area	Air / wind dispersion	Health and amenity impacts - Potential suppression of photosynthetic and respiratory functions	No The use of the Spreader and Tractor is a normal agricultural activity and proposed operation is not significantly in excess of normal farming practice. The Tanker speed will be reduced when irrigating which will limit dust lift off. The Applicant has a 25 month lease which equates to two annual periods. The first annual period will only discharge 12ML of whey and the second annual period will discharge 28ML of whey. The Delegated Officer considers the separation distance between the source and receptors as adequate to inform the risk of dust emissions as not foreseeable. Dust can be adequately regulated by section 49 of the EP Act.
	Seepage	Spills from unloading / loading activities	Groundwater dependent ecosystems, subterranean fauna Depth to potable groundwater encountered at approximately >2mbgl	Direct discharge	Groundwater contamination	No All unloading and loading operations will occur with secured milk transfer procedures and the activity will require personal attendance at all times. If a spill or leak occurs it can be switched off immediately. The Applicant has a 25 month lease which equates to two annual periods. The first annual period will only discharge 12ML of whey and the second annual period will discharge 28ML of whey. The Delegated Officer considers that as whey is approved for discharge to land, the risk of seepage/spillage emissions to land is negligible. Spillage can be adequately regulated by the

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
							UDR if required.
	Irrigation of whey	Odour	Residential premises: 1750m south west of tanks, 407m south of Premises boundary and 807m south of Irrigation area. 4402m north west of Tanks, 1180m north west of Premises boundary and 1190m north west of Irrigation area. 5890m north east of Tanks, 2050m north east of Premises boundary and 2100m north east of Irrigation area	Air / wind dispersion	Amenity impacts causing nuisance	No	<p>Whey will be stored in one of two onsite 50,000L tanks. Fresh whey is not generally associated with odour issues. Whey will not be stored for more than 24 hours prior to irrigation. This timeframe will be incorporated into licence conditions to mitigate any odour generation.</p> <p>The Applicant has a 25 month lease which equates to two annual periods. The first annual period will only discharge 12ML of whey and the second annual period will discharge 28ML of whey.</p> <p>The Delegated Officer considers the separation distance between the source and receptors as adequate to inform the risk of odour emissions as not foreseeable.</p> <p>Odour can be adequately regulated by section 49 of the EP Act.</p>
	Irrigation of whey	Discharge to land via irrigation of whey	Vegetation adjacent to discharge area	Direct discharge land and surface waters	Soil contamination inhibiting vegetation growth and survival Surface water contamination	Yes	See section 9.4

9.2 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 12 below.

Table 12: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 13 below.

Table 13: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> onsite impacts: catastrophic offsite impacts local scale: high level or above offsite impacts wider scale: mid-level or above Mid to long-term or permanent impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are significantly exceeded 	<ul style="list-style-type: none"> Loss of life Adverse health effects: high level or ongoing medical treatment Specific Consequence Criteria (for public health) are significantly exceeded Local scale impacts: permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> onsite impacts: high level offsite impacts local scale: mid-level offsite impacts wider scale: low level Short-term impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are exceeded 	<ul style="list-style-type: none"> Adverse health effects: mid-level or frequent medical treatment Specific Consequence Criteria (for public health) are exceeded Local scale impacts: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> onsite impacts: mid-level offsite impacts local scale: low level offsite impacts wider scale: minimal Specific Consequence Criteria (for environment) are at risk of not being met 	<ul style="list-style-type: none"> Adverse health effects: low level or occasional medical treatment Specific Consequence Criteria (for public health) are at risk of not being met Local scale impacts: mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> onsite impacts: low level offsite impacts local scale: minimal offsite impacts wider scale: not detectable Specific Consequence Criteria (for environment) likely to be met 	<ul style="list-style-type: none"> Specific Consequence Criteria (for public health) are likely to be met Local scale impacts: low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> onsite impact: minimal Specific Consequence Criteria (for environment) met 	<ul style="list-style-type: none"> Local scale: minimal to amenity Specific Consequence Criteria (for public health) met

[^] Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*.

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*.
 "onsite" means within the Prescribed Premises boundary.

9.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 14 below:

Table 14: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

9.4 Risk Assessment – Irrigation of whey

9.4.1 Description of Irrigation of whey

Whey is to be irrigated to land (crops and livestock pasture) over a 25 month period to a dedicated 938ha of the Premises with annual irrigation rates applied over a 400ha area; refer to figure 2 for locations. Whey will be irrigated via a Spreader evenly over land. The Applicant has a 25 month lease which equates to two annual periods. The first annual period will only discharge 12ML of whey and the second annual period will discharge 28ML of whey.

9.4.2 Identification and general characterisation of emission

Whey quality is typically high in nutrient, BOD, TN, TP, salt – TDS, TSS and oil and grease concentrations. It is also acidic with a pH of between 4.0 and 4.4; refer to Table 6. If the soil subject to irrigation already exhibits high concentrations of P the soils ability to adsorb P will be diminished and P may desorb into the environment and groundwater causing eutrophication. The anticipated volume is 12ML during the first annual period over a 400ha area and 28ML for the subsequent second annual period over a separate 400ha area. The total dedicated irrigation area within the Premises is 938ha.

9.4.3 Description of potential adverse impact from the emission

Wastewater discharges produced from sewage treatment, from food-based industries, or from agricultural waste products have the potential to be a useful resource for irrigating a wide range of crops on a sustainable basis. Wastewater discharges from these sources typically contain high concentrations of nutrients that can help sustain plant growth, and natural biogeochemical

processes that take place in soils can help decompose or immobilise other contaminants present in these discharges. Potential environmental impacts from wastewater irrigation schemes are generally minimised when the following nationally-recognised management principles are applied to a given scheme:

- Evapotranspiration by plants in the irrigated area should drive both the volume and timing of wastewater applications to land. Wherever possible, nutrients and the applied water should be utilised within the crop root-zone and there should be minimal seepage of nutrients and other chemical constituents from the wastewater past the root-zone into groundwater;
- Applications of wastewater should not exceed the soil's capacity to provide suitable growing conditions for the irrigated plants, or cause long-term changes to soil structure that may adversely affect the capacity of the soil to continue to support plant growth and a healthy soil-fauna; and
- Whey should not be applied to soils which are unsuitable for organic waste and where there is a higher risk of issues such as nitrate leaching in area prone to flooding, have excess drainage, high water tables and shallow depths to rocks.

Therefore, the principal components of a sustainable wastewater irrigation scheme are:

- The annual loads of nitrogen and phosphorus applied in wastewater do not exceed the uptake of these nutrients by vegetation in the irrigated area. This generally means that wastewater is irrigated to a sufficiently large land area such that nutrients are taken up by the crop and removed from the area in harvested biomass;
- The irrigated area should be sufficiently large to enable the applied wastewater to be fully utilised by the crop. This generally means that irrigation does not take place in the southern part of the State during winter months when rainfall exceeds the rate of evapotranspiration and when there is a significant risk that nutrients will be leached into groundwater. Wastewater produced during winter is often stored for use during warmer months, and sufficient land area should be available to enable both the stored and ongoing production of wastewater to be discharged; and
- The chemical composition of the wastewater will not cause adverse effects on soil quality and structure in the irrigated area.

Information provided in the NSW DEC 2004 wastewater disposal guidelines suggests that the whey should be considered to be a high-strength effluent on the basis of its nutrient, BOD and salt content (Table 3.1 page 19 from the Guideline) and therefore its disposal needs to be carefully managed to prevent damage to the soil profile in the irrigation areas and to prevent groundwater contamination by nutrients and salts.

The US EPA 2006 guidelines for the land application of wastewater suggest that the ongoing application of wastewater with a comparable N, P and BOD levels to whey can cause clogging of soil pore spaces with biofilms and the development of anaerobic conditions in soils, limiting both plant growth and the infiltration of water. It is important that sufficient drying periods are allowed between each application of wastewater to allow organic matter to be removed by soil microorganisms and to allow aerobic conditions to be maintained. Anaerobic conditions in the soil are also likely to increase the mobilisation of P due to the reductive dissolution of iron oxide minerals in the soil which generally bind most of the P in the soil profile.

9.4.4 Criteria for assessment

Relevant land and groundwater quality criteria include:

- National Environment Protection (Assessment of Site Contamination) Measure 1999;

- ANZECC & ARMCANZ (2000) – freshwater and marine waters criteria; and
- NSW EPA 1998 *On-site Sewage Management for Single Households: Environment & Health Protection Guidelines*;
- NSW DEC 2004 *Environmental Guidelines: Use of Effluent by Irrigation*. Technical guidelines produced by the NSW Department of Environment and Conservation;
- US EPA 2006 Process Design Manual, Land Treatment of Municipal Wastewater Effluents. *US EPA Technical Report EPA 625/R-06/016*; and
- Department of Water's Water Quality Protection Note 22 Irrigation with Nutrient Rich Wastewater

9.4.5 Applicant controls

The Applicant has prepared a WMP for the spreading of whey at the premises, which discusses how spreading will be managed to minimise environmental impact.

The Applicant has a lease agreement for only 25 months for the spreading of whey at the Premises. The production and design capacity for the Premises is 28ML per annual period, however the Applicant will only discharge 12ML of whey in the first annual period; refer to Table 8. The Premises has allocated a 938ha parcel of land for irrigation. Within this 938ha area two (2) separate 400ha areas will be allocated for irrigation with one 400ha area receiving a single year's annual irrigation loading rate of 12ML while the other 400ha area will receive 28ML during the annual period. This means that within the 25 month irrigation period the irrigated pasture will only receive one 12ML and one 28ML annual load application of whey, but at separate locations. The Premises has not been irrigated with whey previously.

Whey quality samples provided in Table 6 with a production and design capacity of 28ML per annual period provide annual nutrient loads in Table 15.

Table 15: Annual Nutrient loads for 28ML per annual period

Parameter	Annual Application (kg/year)
TN	42,000
TP	7,000
BOD	1,176,000

WQPN 22 provides an overview to determine the vulnerability categories of the properties and corresponding maximum recommended nutrient application rates. Under this guidance, vulnerability categories for the Premises are both A and B. The applicable WQPN nutrient application criteria for receiving environment risk categories is provided in Table 16.

Table 16: WQPN 22 Nutrient application criteria

RISK CATEGORY	MAXIMUM INORGANIC NITROGEN (AS N)	MAXIMUM REACTIVE PHOSPHORUS (AS P)
	APPLICATION RATE (KG/HA/YR)	APPLICATION RATE (KG/HA/YR)
A	140	10
B	180	20
C	300	50
D	480	120

A preliminary estimate of the land area required to ensure that a particular crop takes up all of the nutrients applied in a disposal area is given by the following formula (NSW EPA, 1998; Appendix 6):

$$A = \frac{C \times Q}{L_x}$$

Where

A	=	land area (m ²)
C	=	concentration of N or P in wastewater (mg/L)
Q	=	treated wastewater flow rate (L/d)
L _x	=	critical loading rate (uptake rate) for N or P for a specific crop (mg/m ² /d)

It is understood from Table 6 above that the target design whey quality concentrations in the whey are 1500 mg/L for N and 250 mg/L for P. It is also understood that 28,000 kL/year is proposed to be disposed over ha (Noting that the Applicant has advised to draft the assessment for 28ML although the first annual load will only be 12ML).

A plant critical loading uptake rate of 36 mg/m²/day for nitrogen has been assumed for N, and a value 4 mg/m²/day was assumed for P (NSW EPA, 1998; Appendix 6). Applying these values in the above equation gives the required land areas for the uptake of N and P from the applied whey for at the Premises as 319ha and 479ha respectively. That is, assuming the target N and P concentrations apply for the whey, there should be enough land area for the pasture to uptake the nutrient N provided that plant biomass is removed from the irrigation areas while the area required for nutrient P is slightly smaller than required (i.e. 479ha is required but only 400ha has been allocated for irrigation).

As identified in Table 10 there is sufficient P absorption ability in the soils across the Premises, except for test pit site 8, in which the irrigation (application) of whey should be beneficial to crop and pasture.

The Applicant commissioned a Consultant (Soil Dynamics, December 2017) to prepare a report recommending suitable whey applications using data from the Applicant. A full copy of the report is provided in Appendix 8 of the Application. Some of the recommendations from the report are summarised below:

- According to the Applicants sample nutrient concentrations a sustainable application

rate annually to most soils is 80kL/ha/year (8mm).

- If reapplication is undertaken on the same area the following year these rates should be decreased by $\frac{3}{4}$ of initial application rates.
- According to previous studies which considered the leaching of nitrates a safe annual application rate should not exceed 320kL/ha or 32mm.
- According to previous studies undertaken in the US, keeping individual application rates below 93.5kL/ha (9.35mm) will keep most soils from becoming anaerobic.
- Whey should only be applied to sandy loam, sandy clay loam, loam, silt loam, silt, sandy clay and clay loam soils.

The recommended application rate of 80kL/ha corresponds to 108.8kg/ha of N and 22.4kg/ha of P as sustainable nutrient application loads. These applications are only applicable for one year and the rates must then be reduced by 25% in subsequent applications.

The Applicant proposes the following target application rates in Table 17 at the Premises – compared against guidelines.

Table 17: Target Application rates

	TN	TP	BOD
WQPN Category A	140kg/ha/year	10kg/ha/year	30kg/ha/day
WQPN Category B	180kg/ha/year	20kg/ha/year	30kg/ha/day
Soil Dynamics	108.8 kg/ha/year	22.4kg/ha/year	n/a
US EPA 2006	n/a	n/a	560kg/ha/day
DWER loading rates (internal calculator)	105kg/ha/year 115 kg/day	17.5 kg/ha/year 19.2 kg/day	2940 kg/ha/day 3222 Kg/day
Target Loading	105kg/ha/year	17.5 kg/ha/year	24.5kg/ha/day

The Applicant has provided an annual nutrient loading rate for BOD as 1,176,000 kg/year as referenced in Table 15 and the BOD quality of 42,000mg/L as per Table 6. This equates to 3,222 kg/day and 2940 kg/ha/day of BOD irrigated to land. The BOD loading rate exceeds the US EPA 2006 recommended rate by a factor of 10. This indicates the area proposed for irrigation is too small for repeat applications and that continued application may cause soil clogging and anaerobic conditions.

An application of 28ML over a 400ha area equates to a hydraulic loading rate of 70Kl/ha or 7mm per year. This application rate will occur in at least two passes over the irrigation period of 400ha.

9.4.6 Key findings

The Delegated Officer has reviewed the information regarding irrigation of whey and has found:

1. *The Applicant only proposes to irrigate whey for a period of 25 months and accordingly only has a lease agreement for 25 months starting on 1 June 2018 and terminating on 31 July 2020.*
2. *The Premises has not been irrigated with whey previously.*

3. *The Applicant is proposing to irrigate whey over a 938ha area and a maximum of two annual period loading rate applications of whey will only occur within the Premises at separate 400ha areas during the licence timeframe – 25 months; that is, each 400ha area will only receive one annual period loading rate in 25 months.*
4. *Only 12ML of whey will be discharged in the first annual period noting the assessment is for a production and design capacity of 28ML. 28ML of whey will be irrigated in the subsequent and last year of irrigation.*
5. *An application of 28ML over a 400ha area equates to a hydraulic loading rate of 70KL/ha or 7mm per year. This application rate will occur in at least two passes over the irrigation area of 400ha.*
6. *Both TN and TP concentrations in whey (Table 6) exceed ANZECC 2000 guidelines trigger values for agricultural irrigation for short term (up to 20 years) irrigation (refer to section 4.2.7 and Table 4.2.11).*
7. *The soil is classed a Category A and B under WQPN 22. Table 17 target loading rates data indicates TP loading rate (17.5kg/ha/year) is greater than Category A loading rate (10kg/ha/year).*
8. *NSW EPA 1998 loading rate criteria for whey quality (Table 6) requires 319ha and 479ha for TN and TP respectively. Given the proposed 400ha spreading area there is enough land to irrigate TN but slightly insufficient for TP.*
9. *Soil samples (Table 10) indicates eight test pits from nine display sufficient P absorption capacity for irrigation. One test pit displays sufficient P capacity such that any irrigation in this area may not absorb by crop/pasture.*
10. *The BOD loading rate exceeds the US EPA 2006 recommended rate by a factor of 10. This indicates the area proposed for irrigation is too small for continued applications. However, the proposal is for a single irrigation only over each irrigation area -first year of irrigation will be 12ML followed by a subsequent and final year of irrigation at 28ML over separate irrigation areas.*

9.4.7 Consequence

When irrigation of whey (high concentration of BOD, TN and TP) occurs, the Delegated Officer has determined that the impact of irrigation will be mid level on-site impacts, low level off-site impacts, minimal off-site wider scale impacts with Specific Consequence Criteria (for Environment) are at risk of not being met. Therefore, the Delegated Officer considers the consequence of irrigation to be **Moderate**.

9.4.8 Likelihood of Risk Event

The Delegated Officer has determined that the likelihood of irrigation could occur at some time. Therefore, the Delegated Officer considers the likelihood of Risk Event to be **Possible**.

9.4.9 Overall rating of irrigation of whey

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 14) and determined that the overall rating for the risk of irrigation is **Medium**.

9.5 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 18 below. Controls are described further in section 11.

Table 18: Risk assessment summary

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	Source	Pathway/ Receptor (Impact)			
1.	Irrigation of whey – discharge of TP, TN and BOD	Irrigation over 400ha area	Directed discharge, plants, soil and groundwater.	Infrastructure and application area and frequency	Moderate consequence Possible Medium risk	Acceptable subject to proponent controls conditioned / outcomes based controls

10. Regulatory controls

A summary of regulatory controls determined to be appropriate for the Risk Event is set out in Table 19. The risks are set out in the assessment in section 10 and the controls are detailed in this section. DWER will determine controls having regard to the adequacy of controls proposed by the Applicant. The conditions of the Licence will be set to give effect to the determined regulatory controls.

Table 19: Summary of regulatory controls to be applied

Risk Items (see risk analysis in section 9)	1. Irrigation of whey to pasture	Controls (references are to sections below, setting out details of controls)					
		10.1.1 Acceptance and Management	10.1.2 Throughput restrictions	10.1.3 Infrastructure and equipment	10.1.4 Disposal requirements	10.1.5 Monitoring	10.1.6 Reports
		•	•	•	•	•	•

10.1 Licence controls

Due to the risk assessment above and outcomes from Table 19, Licence conditions will be drafted onto the Licence.

10.1.1 Acceptance and Management

Only whey will be authorised on the Premises with a specific production and design capacity limit of 12ML for the first annual period of operation (1 August 2018 – 31 July 2019) and then 28ML per subsequent (and final) annual period (1 August 2019 – 31 July 2020) consistent with condition 2. Condition 3 will ensure that any waste that does not meet the waste acceptance criteria set out in Condition 2 it is removed from the Premises as soon as possible.

Storage of whey will only be authorised within one of the two 50,000L onsite tanks and whey will be subject to process and containment requirements while stored in the 50,000L storage tanks consistent with conditions 4 and 5.

10.1.2 Throughput restrictions

Condition 6 and 7 will ensure the Applicant will only be authorised to accept a limit of 12ML for the first annual period (1 August 2018 – 31 July 2019) and 28ML of whey for the subsequent and final annual period (1 August 2019 – 31 July 2020) respectively. The Licence Holder must monitor the volume of whey delivered to the Premises and this volume is to be presented to the CEO as part of the AACR consistent with condition 8 and 9.

10.1.3 Infrastructure and equipment

Condition 10 requires the Storage tanks must be kept in good working order.

10.1.4 Disposal requirements

Condition 11 ensures that the whey will only be irrigated to a single 400ha irrigation area per annual period, ensure no ponding occurs when irrigating, ensure runoff does not leave the irrigation area and enter any water course and ensure adequate buffer areas are maintained. The Licence Holder will maintain records and submit a map of each irrigation area with the AACR under condition 17.

10.1.5 Monitoring requirements

Condition 12, 13 and 14 are the monitoring requirements for the Premises. The Applicant will be required to monitor whey parameters pH, TN, TP and BOD in November each year (peak volumes) according to Schedule 3. Collected samples will be required to be submitted to a NATA accredited laboratory consistent with condition 12. The sample data will be required to be submit in the AACR under condition 17.

11. Determination of Licence conditions

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

The *Guidance Statement: Licence Duration* has been applied and the issued licence expires on 31 July 2020.

Table 20 provides a summary of the conditions to be applied to this Licence.

Table 2: Summary of conditions to be applied

Condition Ref	Grounds
Emissions Condition 1	Emissions is a valid, risk-based condition to ensure appropriate linkage between the licence and the EP Act.
Acceptance and management 2, 3, 4 and 5	These conditions are valid, risk-based and enable flexibility in operations.
Throughput restrictions 6, 7, 8 and 9	These conditions are valid, risk-based and contain appropriate controls.
Infrastructure and Equipment 10	These conditions are valid, risk-based and consistent with the EP Act.
Disposal requirements 11	These conditions are valid, risk-based and consistent with the EP Act.

Monitoring requirements 12, 13 and 14	This condition is valid, risk-based and consistent with the EP Act.
Information 15, 16, 17, and 18	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DWER 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 Licence under the EP Act.

12. Applicant's comments

The Applicant was provided with the draft Decision Report and draft issued Licence on 16 June 2018. The Applicant provided comments on 19 July 2018; refer to Appendix 2 for a summary.

13. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

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

Stephen Checker
MANAGER WASTE INDUSTRIES

Delegated Officer
under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Licence Application Whey Management Plan, Morrell Road, Arthur River WA	Application	DWER records (A1653283 and A1680866)
2.	DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	DER 2015a	accessed at www.dwer.wa.gov.au
3.	DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	DER 2015b	
4.	DER, August 2016. <i>Guidance Statement: Licence duration</i> . Department of Environment Regulation, Perth.	DER 2016a	
5.	DER, November 2016. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	DER 2016b	
6.	DER, November 2016. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	DER 2016c	

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

Condition	Summary of Licence Holder comment	DWER response
2	<ul style="list-style-type: none"> Table 3 specifies the Quantity Limit as 12,000 and 20,000 tonnes rather than kilolitres (kL). As the density of whey is above 1L to 1kg these limits are slightly low. If the limit could be changed to litres then the table would be consistent with the units of monitoring noted in Table 10. Table 3 notes dates of spreading from June to May, could this be changed to 1 August 2018 to 31 July 2019 and 1 August 2019 to 31 July 2020. 	<ul style="list-style-type: none"> Changed as requested Changed as requested
6	Suggested change to 12,000kL of whey per annual period 1 August 2018 to 31 July 2019.	Changed as requested
7	Suggested change to 28,000kL of whey per annual period 1 August 2018 to 31 July 2020.	Changed as requested
10	Suggested Table 7 should read 28,000kL per annual period.	Changed as requested
		<p>Noting Applicant comments regarding date changes, further changes have been made:</p> <ul style="list-style-type: none"> Annual period definition has been changed to correspond to annual period date changes. Condition 11 (a) and (b) have changed to correspond with this annual period date change. Condition 17 AACR and AER submission date changed to 31 July each year. Table 8 production and design capacity changed to 28,000kL.

Attachment 1: Site Plan

