



DEPARTMENT OF WATER AND ENVIRONMENTAL REGULATION

2024 ANNUAL ENVIRONMENT REPORT (AER)

L9345/2022/1 – BROWNES WHEY MEEKING

LICENCE HOLDER

Brownes Food Operations
22 Geddes Street
BALCATTWA WA 6021

REPORTING PERIOD

1 August 2023 to 31 July 2024

MONITORING REQUIREMENTS

Whey Spreading Volume

A total of 3,478kL whey was spread on the property over the monitoring period, well below the 10,000kL limit for the premise. Monthly volumes are provided in Table 1.

TABLE 1. WHEY VOLUMES SPREAD IN MONITORING PERIOD

Month	Whey Volume (kL)
Aug-23	528
Sep-23	1,654
Oct-23	1,296
Nov-23	0
Dec-23	0
Jan-24	0
Feb-24	0
Mar-24	0
Apr-24	0
May-24	0
Jun-24	0
Jul-24	0
TOTAL	3,478

Whey Spreading Area

During the reporting period whey was spread over an approximately 150ha area as shown in Figure 1.

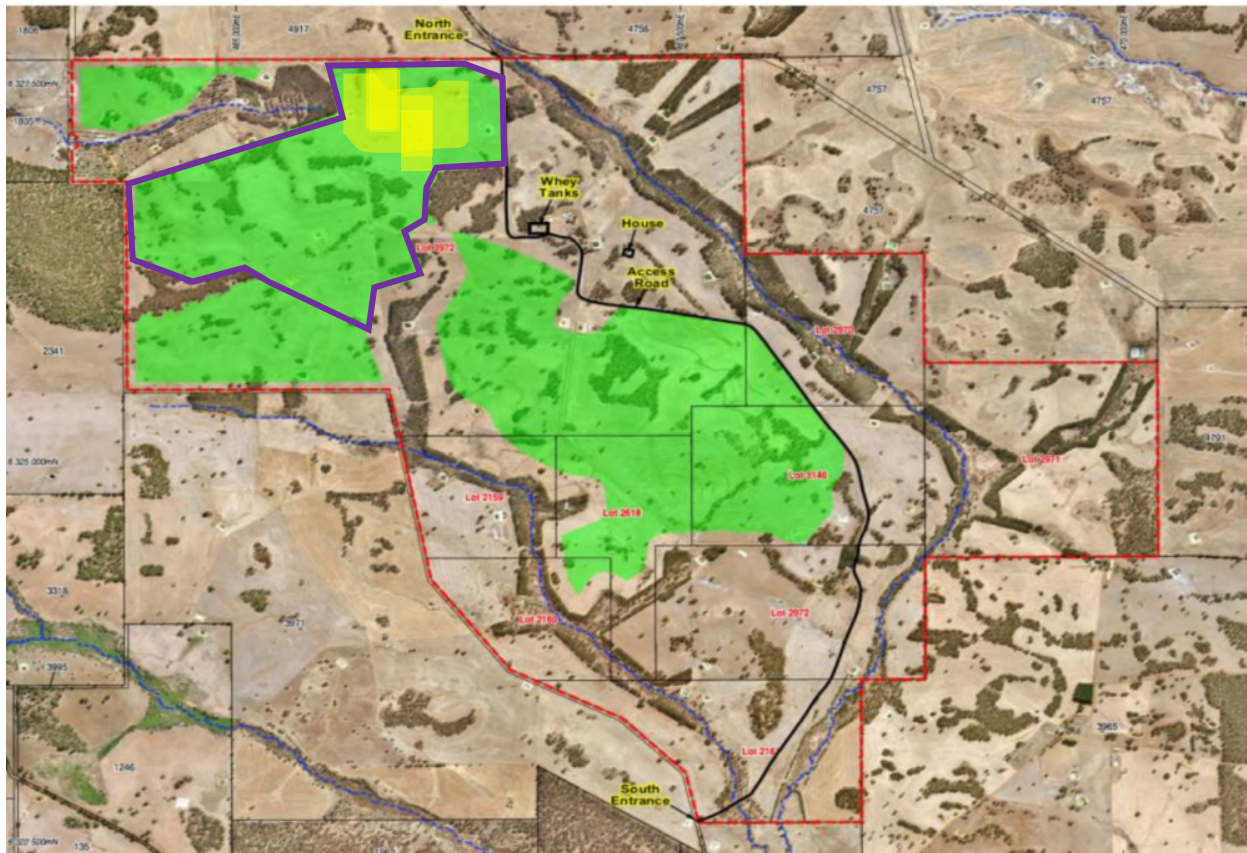


Figure 1: 2023/24 Reporting Period Whey Spreading Areas (purple)

Laboratory Analysis of Whey

Whey samples were collected monthly during spreading period from August to October 2023 and were sent to the Chem Centre, a NATA approved laboratory for analysis of pH, total phosphorus (TP), total nitrogen (TN) and biochemical oxygen demand (BOD). Whey sampling results are summarised in Table 2, and laboratory results are provided in Attachment 1.



TABLE 2. WHEY SAMPLING RESULTS

DATE	pH	TSS (mg/L)	TDS (mg/L)	BOD (mg/L)	TN (mg/L)	TP (mg/L)	Oil and Grease (mg/L)
10-Aug-23	4.4	6500	31000	56000	1600	381	0.53
4-Sep-23	4.2	5200	31000	56000	1400	425	0.35
2-Oct-23	5.1	240	32000	55000	1400	423	0.37

Nutrient Loading to Spreading

Whey sampling results were used to determine the annual and monthly nutrient loadings over the 150ha spreading areas, with the results provided in Table 2. Loadings included 33 kg/ha of TN and 9.7 kg/ha of TP which are well within the normal agronomic nutrient application rates for managed pasture.

TABLE 3. NUTRIENT LOADING OF WHEY SPREADING

Brownes Dairy - Wastewater Irrigation Nutrient Balance 2023-24

Whey Spreading Area
Total Area (ha) 150

	No Days	Irr. Volume kL	Nitrogen Loading			Phosphorus Loading			BOD Loading			
			MP1 TN mg/L	TN Applied kg	TN Loading kg/day	MP1 TP mg/L	TP Applied kg	TP Loading kg/day	MP1 BOD mg/L	OD Applied kg	OD Loading kg/day	OD Loading kg/ha/day
Aug-23	31	528	1600	845	27.3	381	201.2	6.5	56000	29,568	954	6
Sep-23	29	1,654	1400	2316	79.8	425	703.0	24.2	56000	92,624	3,194	21
Oct-23	31	1,296	1400	1814	58.5	423	548.2	17.7	55000	71,280	2,299	15
Nov-23	30	0	0	0	0	0	0	0	0	0	0	0
Dec-23	31	0	0	0	0	0	0	0	0	0	0	0
Jan-24	30	0	0	0	0	0	0	0	0	0	0	0
Feb-24	31	0	0	0	0	0	0	0	0	0	0	0
Mar-24	31	0	0	0	0	0	0	0	0	0	0	0
Apr-24	30	0	0	0	0	0	0	0	0	0	0	0
May-24	31	0	0	0	0	0	0	0	0	0	0	0
Jun-24	30	0	0	0	0	0	0	0	0	0	0	0
Jul-24	31	0	0	0	0	0	0	0	0	0	0	0
Total		3,478										
			Annual Total (kg)	4975		1452			193472			
			Annual Loading (kg/ha)	33.2		9.7			1289.8			

COMPLAINTS

Brownes maintains a complaints register onsite. No complaints were received during the monitoring period.

ANNUAL AUDIT COMPLIANCE

The Annual Audit Compliance Report (AACR) is provided separately to this report. No non-compliance issues occurred during the reporting period with respect to volume of whey discharged over the sampling period.



Attachment 1: Laboratory Certificates



ChemCentre
Scientific Services Division
Report of Examination



Purchase Order: 519715
ChemCentre Reference: 23S0518 R0

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ABN 40 991 885 705

Attention: Chris Parsons

Report on: 1 sample received on 10/08/2023

LAB ID 23S0518 / 001
Material Whey
Client ID and Description WHEY

LAB ID 001
Client ID WHEY

Sampled 09/08/2023

Analyte	Method	Unit	
Biochemical Oxygen Demand	iBOD1WR	mg/L	56000
Electrical Conductivity	iALK2WATI	mS/m	617
Nitrogen, nitrate + nitrite	iNTAN1WFIA	mg/L	0.06
Phosphorus, sol. reactive	iP1WTFIA	mg/L	320
pH	iALK2WATI		4.4
Phosphorus	iMET1BTICP	mg/kg	381
Total dissolved solids(grav)	iSOL1WDGR	mg/L	31000
Nitrogen, total kjeldahl	iAMMH1CODA	mg/L	1600
Nitrogen, total	iNP1CALC6	mg/L	1600
Total suspended solids	iSOL1WPGR	mg/L	6500
Fat by Mojonnier tube*	ORG164	g/100g	0.53
Date Analysed	iALK2WATI		15/08/2023
	iAMMH1CODA		21/08/2023
	iBOD1WR		11/08/2023
	iMET1BTICP		18/08/2023
	iNP1CALC6		21/08/2023
	iNTAN1WFIA		17/08/2023
	iP1WTFIA		14/08/2023
	iSOL1WDGR		18/08/2023
	iSOL1WPGR		18/08/2023
	ORG164		16/08/2023
Sample Condition			Cold

Method	Method Description
iALK2WATI	Alkalinity, Bicarbonate, Carbonate, Hydroxide and Total Carbon Dioxide by acid titration. pH and Conductivity in water (compensated to 25C) by meter.
iAMMH1CODA	Kjeldahl Nitrogen, Total Nitrogen, Protein and Ammonia in water by digest and colorimetric method.
iBOD1WR	Biochemical Oxygen Demand.
iMET1BTICP	Metals in biota as received, by microwave digestion and ICPAES.

Method	Method Description
iNP1CALC6	Total nitrogen calculated from TKN and TON
iNTAN1WFIA	Nitrate+Nitrite expressed as Nitrogen by FIA.
iP1WTFIA	Phosphorus soluble reactive as P in water by FIA.
iSOL1WDGR	Total dissolved solids (TDS) by gravimetry, dried at 178 - 182 C.
iSOL1WPGR	Suspended Solids dried at 103 -105 C and Volatile Suspended Solids ignited at 550C.
ORG164	Gravimetric Fat Determination by acid/base hydrolysis extraction

Analysis of the pH was outside the holding time of six hours. The results should be used as reference only.

The BOD / cBOD should be analysed within 48 hours of sample collection (APHA Method 5210 B, 2017). The sample(s) was analysed outside this timeframe and results may be impacted by the delay.

These results apply only to the sample(s) as received. Unless arrangements are made to the contrary, these samples will be disposed of after 30 days of the issue of this report.

This report may only be reproduced in full.

*Analysis not covered by scope of ChemCentre's NATA accreditation.



Tavish Shankar
Chemist
SSD Inorganic Chemistry
24-Aug-2023



Alex Martin
Team Leader
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Chris May
Team Leader
SSD Organic Chemistry

Purchase Order:

ChemCentre Reference: 23S0866 R0

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Attention: Chris Parsons

Report on: 1 sample received on 07/09/2023

<u>LAB ID</u>	<u>Material</u>	<u>Client ID and Description</u>
23S0866 / 001	Whey	Whey

LAB ID	001
Client ID	Whey

Sampled	04/09/2023
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Analyte	Method	Unit	
Biochemical Oxygen Demand	iBOD1WR	mg/L	56000
Electrical Conductivity	iALK2WATI	mS/m	646
Nitrogen, nitrate + nitrite	iNTAN1WFIA	mg/L	0.02
Phosphorus, sol. reactive	iP1WTFIA	mg/L	360
pH	iALK2WATI		4.2
Phosphorus	iMET1BTICP	mg/kg	425
Total dissolved solids(grav)	iSOL1WDGR	mg/L	31000
Nitrogen, total kjeldahl	iAMMH1CODA	mg/L	1400
Nitrogen, total	iNP1CALC6	mg/L	1400
Total suspended solids	iSOL1WPGR	mg/L	5200
Fat by Mojonnier tube*	ORG164	g/100g	0.35
Date Analysed	iALK2WATI		08/09/2023
	iAMMH1CODA		14/09/2023
	iBOD1WR		08/09/2023
	iMET1BTICP		14/09/2023
	iNP1CALC6		15/09/2023
	iNTAN1WFIA		11/09/2023
	iP1WTFIA		11/09/2023
	iSOL1WDGR		15/09/2023
	iSOL1WPGR		14/09/2023
	ORG164		18/09/2023
Sample Condition			Cold

Method	Method Description
iALK2WATI	Alkalinity, Bicarbonate, Carbonate, Hydroxide and Total Carbon Dioxide by acid titration. pH and Conductivity in water (compensated to 25C) by meter.
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Tavish Shankar
Chemist
SSD Inorganic Chemistry
20-Sep-2023



Ashley Tai
Chemist & Research Officer
SSD Organic Chemistry



ChemCentre
Scientific Services Division
Report of Examination



Purchase Order:

ChemCentre Reference: 23S1242 R0

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Attention: Chris Parsons

Report on: 1 sample received on 05/10/2023

<u>LAB ID</u>	<u>Material</u>	<u>Client ID and Description</u>
23S1242 / 001	Whey	Whey

LAB ID	001
Client ID	Whey

Sampled	02/10/2023
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Analyte	Method	Unit	
Biochemical Oxygen Demand	iBOD1WR	mg/L	55000
Electrical Conductivity	iALK2WATI	mS/m	703
Nitrogen, nitrate + nitrite	iNTAN1WFIA	mg/L	0.05
Phosphorus, sol. reactive	iP1WTFIA	mg/L	380
pH	iALK2WATI		5.1
Phosphorus	iMET1BTICP	mg/kg	423
Total dissolved solids(grav)	iSOL1WDGR	mg/L	32000
Nitrogen, total kjeldahl	iAMMH1CODA	mg/L	1400
Nitrogen, total	iNP1CALC6	mg/L	1400
Total suspended solids	iSOL1WPGR	mg/L	240
Fat by Mojonnier tube*	ORG164	g/100g	0.37
Date Analysed	iALK2WATI		09/10/2023
	iAMMH1CODA		12/10/2023
	iBOD1WR		06/10/2023
	iMET1BTICP		20/10/2023
	iNP1CALC6		13/10/2023
	iNTAN1WFIA		11/10/2023
	iP1WTFIA		11/10/2023
	iSOL1WDGR		12/10/2023
	iSOL1WPGR		12/10/2023
	ORG164		18/10/2023
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20-Oct-2023



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