ENVIRONMENTAL MONITORING REPORT
JBS CAROONA FEEDLOT

Environment Protection Licence Summary	
Licence (EPL) Number:	**3375**
Licensee's Name:	**JBS Australia Pty Limited**
Premises Address:	**Caroona Feedlot 'Weston' Caroona NSW 2343**
Reporting Year:	**January 2023 – December 2023**

EPA Monitoring Requirements – JBS Caroona

Point 1 & 3			
Pollutant	**Units of Measure**	**Frequency**	**Sampling Method**
Aggregate Stability	As appropriate	3 Years	Special Method 1
Available Phosphorus	mg/kg	Yearly	Special Method 1
Bulk density	Kg/cubic metre	3 Years	Special Method 1
Cation Exchange Capacity	centimoles of positive charge/Kg of soil	Yearly	Special Method 1
Chloride	mg/kg	Yearly	Special Method 1
Conductivity	microsiemens/cm	Yearly	Special Method 1
Exchangeable Calcium	centimoles of positive charge per Kg of soil	Yearly	Special Method 1
Exchangeable Magnesium	centimoles of positive charge/Kg of soil	Yearly	Special Method 1
Exchangeable potassium	centimoles of positive charge/Kg of soil	Yearly	Special Method 1
Exchangeable sodium	centimoles of positive charge per Kg of soil	Yearly	Special Method 1
Exchangeable sodium percentage	percent	Yearly	Special Method 1
Nitrate	Mg/Kg	Yearly	Special Method 1
Nitrogen (Total)	Mg/Kg	Yearly	Special Method 2

Point 1 & 3			
Organic Carbon	Percent	Yearly	Special Method 2
pH	pH	Yearly	Special Method 1
Phosphorus Sorption Capacity	phosphorus sorption capacity of soil	3 years	Special Method 1
Sodium Adsorption ration	Sodium adsorption ratio	Yearly	Special Method 1

Point 2,8,9,10,11, 12			
Pollutant	**Units of Measure**	**Frequency**	**Sampling Method**
Conductivity	Microsiemens per centimetres	Every 6 months	In situ
Nitrate	Milligrams per litre	Every 6 months	Representative Sample
Nitrogen (ammonia)	Milligrams per litre	Every 6 months	Representative Sample
Nitrogen (total)	Milligrams per litre	Every 6 months	Representative Sample
pH	pH	Every 6 months	Representative Sample
Phosphorus (total)	Milligrams per litre	Every 6 months	Representative Sample
Reactive Phosphorus	Milligrams per litre	Every 6 months	Representative Sample
Standing Water Level	metres	Every 6 months	In situ

Point 3			
Pollutant	**Units of Measure**	**Frequency**	**Sampling Method**
Calcium	Milligrams per litre	Every 6 months	Representative Sample
Chloride	Milligrams per litre	Every 6 months	Representative Sample
Conductivity	Microsiemens per centimetres	Special Frequency 1	In situ
Magnesium	Milligrams per litre	Every 6 months	Representative Sample
Nitrate	Milligrams per litre	Special Frequency 1	Representative Sample
Nitrate	milligrams per litre	Special Frequency 1	Representative sample
Nitrogen (ammonia)	milligrams per litre	Special Frequency 1	Representative sample
Nitrogen (total)	milligrams per litre	Special Frequency 1	Representative sample
pH	pH	Special Frequency 1	Representative sample
Phosphorus (total)	milligrams per litre	Special Frequency 1	Representative sample

Point 3			
Potassium	milligrams per litre	Every 6 months	Representative sample
Reactive Phosphorus	milligrams per litre	Special Frequency 1	Representative sample
Sodium	milligrams per litre	Every 6 months	Representative sample
Sodium Adsorption Ratio	sodium adsorption ratio	Every 6 months	Representative sample
Total Kjeldahl Nitrogen	milligrams per litre	Every 6 months	Representative sample
Total suspended solids	milligrams per litre	Each overflow event	Representative sample

For the purpose of the table(s) above Special Frequency 1 means the collection of samples shall occur: (a) at every overflow event; and (b) every six (6) months

Point 4			
Pollutant	**Units of Measure**	**Frequency**	**Sampling Method**
Calcium	milligrams per kilogram	Special Frequency 2	Representative sample
Chloride	milligrams per kilogram	Special Frequency 2	Representative sample
Conductivity	microsiemens per centimetre	Special Frequency 2	Representative sample
Magnesium	milligrams per kilogram	Special Frequency 2	Representative sample
Moisture content	percent	Special Frequency 2	Representative sample
Nitrate	milligrams per kilogram	Special Frequency 2	Representative sample
Nitrogen (total)	milligrams per kilogram	Special Frequency 2	Representative sample
Organic carbon	percent	Special Frequency 2	Representative sample
pH	pH	Special Frequency 2	Representative sample
Phosphorus (total)	milligrams per kilogram	Special Frequency 2	Representative sample
Potassium	milligrams per kilogram	Special Frequency 2	Representative sample
Sodium	milligrams per kilogram	Special Frequency 2	Representative sample
Sodium Adsorption Ratio	sodium adsorption ratio	Special Frequency 2	Representative sample
Sulfur	milligrams per kilogram	Special Frequency 2	Representative sample

For the purposes of the table(s) above Special Frequency 2 means the collection of samples shall occur prior to the application of solids to the manure utilisation area and upon removal from the premises.

Point 5			
Pollutant	**Units of Measure**	**Frequency**	**Sampling Method**
Aggregate stability	As approp.	Special Frequency 3	Special Method 1
Available phosphorus	milligrams per kilogram	Special Frequency 3	Special Method 1
Bulk density	kilograms per cubic metre	Special Frequency 3	Special Method 1
Cation Exchange Capacity	centimoles of positive charge per kilogram of soil	Special Frequency 3	Special Method 1
Chloride	milligrams per kilogram	Special Frequency 3	Special Method 1
Conductivity	microsiemens per centimetre	Special Frequency 3	Special Method 1
Exchangeable calcium	centimoles of positive charge per kilogram of soil	Special Frequency 3	Special Method 1
Exchangeable magnesium	centimoles of positive charge per kilogram of soil	Special Frequency 3	Special Method 1
Exchangeable potassium	centimoles of positive charge per kilogram of soil	Special Frequency 3	Special Method 1
Exchangeable sodium	centimoles of positive charge per kilogram of soil	Special Frequency 3	Special Method 1
Exchangeable sodium percentage	percent	Special Frequency 3	Special Method 1
Nitrate	milligrams per kilogram	Special Frequency 3	Special Method 1
Nitrogen (total)	milligrams per kilogram	Special Frequency 3	Special Method 2
Organic carbon	percent	Special Frequency 3	Special Method 2
pH	pH	Special Frequency 3	Special Method 1
Phosphorus Sorption Capacity	phosphorus sorption capacity of soil	Special Frequency 3	Special Method 1
Sodium Adsorption Ratio	sodium adsorption ratio	Special Frequency 3	Special Method 1

For the purposes of the table(s) above Special Frequency 3 means the collection of samples shall occur prior to manure application and at least once every three (3) years.

Point 6			
Pollutant	**Units of Measure**	**Frequency**	**Sampling Method**
Conductivity	microsiemens per centimetre	Each overflow event	In situ
Nitrate	milligrams per litre	Each overflow event	Representative sample
Nitrogen (ammonia)	milligrams per litre	Each overflow event	Representative sample
Nitrogen (total)	milligrams per litre	Each overflow event	Representative sample
pH	pH	Each overflow event	In situ
Phosphorus (total)	milligrams per litre	Each overflow event	Representative sample
Reactive Phosphorus	milligrams per litre	Each overflow event	Representative sample
Total suspended solids	milligrams per litre	Each overflow event	Representative sample

Data Gaps During This Reporting Period

Licence Location	JBS Sampling Location	Frequency	Period data is missing	Reason for missing data
EPA 4	Manure Stockpile	Special Frequency 2	2023	Samples were misplaced in transit to the laboratory, repeat sampling has been undertaken, however the results were not available at the time of preparing this report

JBS Caroona Feedlot – Environmental Monitoring Points

JBS Caroona Feedlot - Monitoring Results

Discharges to Water and Applications to Land

Type: Groundwater Quality Monitoring

Frequency: 6 Monthly

				Pollutants							
EPA Licence Location	JBS Sampling Location	Date of Sampling	Sampled By	Conductivity (uS/cm)	Nitrate (mg/l)	Nitrogen Ammonia (mg/l)	Total Nitrogen (mg/l)	pH	Total Phosphorus (mg/l)	Reactive Phosphorus (mg/l)	Groundwater Level (m)
EPA 2	Piezo 2	6/06/2023	K. Brett	25,000	4.00	1.10	8.50	7.7	1.30	0.76	0.80
		21/12/2023	K. Brett	26,000	0.02	16.00	21.00	7.2	5.20	4.50	0.50
EPA 8	Piezo 8	6/06/2023	K. Brett	20,000	0.28	0.34	3.30	7.7	0.45	0.31	0.80
		21/12/2023	K. Brett	15,000	0.16	4.40	15.00	7.3	3.60	3.10	0.50
EPA 9	Piezo 9	6/06/2023	K. Brett	4,500	2.20	0.74	6.50	8.0	1.60	1.50	1.20
		21/12/2023	K. Brett	14,000	3.00	0.02	4.20	7.6	1.30	1.10	1.20
EPA 10	Piezo 10	6/06/2023	K. Brett	8,600	2.70	0.13	4.10	8.0	3.60	3.70	1.00
		21/12/2023	K. Brett	9,400	2.70	0.02	3.90	8.0	3.80	3.70	1.20
EPA 11	Piezo 11	6/06/2023	K. Brett	520	1.10	0.05	2.20	8.0	1.20	1.10	1.25
		21/12/2023	K. Brett	970	4.60	0.02	5.70	8.2	1.00	0.99	1.70
EPA 12	Piezo 12	6/06/2023	K. Brett	1,200	15.00	3.80	24.00	7.9	3.60	2.50	1.25
		21/12/2023	K. Brett	Bore Dry							

Type: Wet Weather Discharge Quality, Effluent Quality, Volume and Discharge to Utilisation Area Monitoring

Frequency: 6 Monthly & Special Frequency 1

				Pollutants														
EPA Licence Location	JBS Sampling Location	Date of Sampling	Sampled By	Calcium (mg/l)	Chloride (mg/l)	Conductivity (uS/cm)	Magnesium (mg/l)	Nitrate (mg/l)	Nitrogen Ammonia (mg/l)	Total Nitrogen (mg/l)	pH	Total Phosphorus (mg/l)	Potassium (mg/l)	Reactive Phosphorus (mg/l)	Sodium (mg/l)	Sodium Adsorption Ratio	Total Kjeldahl Nitrogen (mg/l)	Total Suspended Solids (mg/l)
EPA 3	Release from Holding Pond	15/06/2023	K. Brett	55	1,200	7,300	260	0.15	6	49	8.7	13	1,300	8.00	390	4.90	49	250
		21/12/2023	K. Brett	55	2,800	12,000	380	0.02	29	97	9.1	16	2,500	5.30	610	6.60	97	640

Note: For the purposes of the table(s) above Special Frequency 1 means the collection of samples shall occur: (a) at every overflow event; and (b) every six (6) months.

Type: Wet Weather Discharge Quality Monitoring

Frequency: Each overflow event

				Pollutants							
EPA Licence Location	**JBS Sampling Location**	**Date of Sampling**	**Sampled By**	**Conductivity (uS/cm)**	**Nitrate (mg/l)**	**Nitrogen Ammonia (mg/l)**	**Total Nitrogen (mg/l)**	**pH**	**Total Phosphorus (mg/l)**	**Reactive Phosphorus (mg/l)**	**Total Suspended Solids (mg/l)**
EPA 6	**Release Point**	**-**	**-**	No sampling required, no overflow event during reporting period							

Type: Soil Quality, Mass and Discharge to Utilisation Area Monitoring

Frequency: Yearly / 3 Yearly

EPA Licence Location	JBS Sampling Location	Site Description	Date of Sampling	Sampled By	Monitoring Frequency	Pollutant	Units of Measure	Number of samples collected and analysed	Sample Depth (cm)	N1	N7
EPA 1	N1 & N7	Quarry Paddock and Hockey Irrigation	30/11/2022	R. Banks	3 Years	Aggregate Stability	As appropriate	4	0-10	3	1
									40-50	1	3
			27/10/2023	J. Galloway	Yearly	Electrical Conductivity	deciSiemens/m	4	0-10	0.222	0.521
									40-50	0.278	2.553
						Exchangeable Sodium	centimoles of positive charge/kg of soil	4	0-10	0.31	2.2
									40-50	1.7	18
						Exchangeable Magnesium	centimoles of positive charge/kg of soil	4	0-10	7.1	27
									40-50	29	42
						Nitrate	mg/kg	4	0-10	22	32
									40-50	1.6	1.1
						Total Nitrogen	mg/kg	2	0-10	0.22	0.37
						Total Organic Carbon	percent	2	0-10	2.9	3.5
						pH	pH	4	0-10	6.48	7.15
									40-50	8.71	8.58
						Exchangeable Potassium	centimoles of positive charge/kg of soil	4	0-10	4.6	7.4
									40-50	5.3	1.5
			30/11/2022	R. Banks	3 Years	Bulk Density	kg/m3	4	15-25	1250	1250
									40-50	1280	1300
			27/10/2023	J. Galloway	Yearly	Sodium Adsorption Ratio	sodium adsorption ratio	4	0-10	0.11	0.45
									40-50	0.34	3.18
						Available Phosphorus	mg/kg	4	0-10	432	514
									40-50	77	106
						Cation Exchange Capacity	centimoles of positive charge/kg of soil	4	0-10	22	58
									40-50	57	81
						Chloride	mg/kg	4	0-10	114	336
									40-50	42	2841
			30/11/2022	R. Banks	3 Years	Phosphorus Sorption Capacity	As appropriate	4	0-10	170	260
									40-50	310	460
			27/10/2023	J. Galloway	Yearly	Exchangeable Calcium	centimoles of positive charge per Kg of soil	4	0-10	10	21
									40-50	21	19
						Exchangeable Sodium Percentage	Percent %	4	0-10	0.31	2.2
									40-50	1.7	18

EPA Licence Location	JBS Sampling Location	Site Description	Monitoring Frequency	Date of Sampling	Sampled By	Pollutant	Units of Measure	Number of samples required	Number of samples collected and analysed	Sample Depth (cm)	N16	C1
EPA 13	N16 & C1	Hill Paddock and Compound Paddock	3 Yearly	30/11/2022	B. Stuart	Aggregate Stability	as appropriate	4	4	0-10	3	3
										40-50	1	1
			Yearly	27/10/2023	J. Galloway	Electrical Conductivity	deciSiemens/m	4	4	0-10	0.69	0.731
										40-50	0.219	0.168
						Exchangeable Sodium	centimoles of positive charge per kg of soil	4	4	0-10	0.69	0.37
										40-50	0.31	0.22
						Exchangeable Magnesium	centimoles of positive charge/kg of soil	4	4	0-10	5.9	3.8
										40-50	5.5	2.6
						Nitrate	mg/kg	4	4	0-10	132	163
										40-50	6.3	13
						Total Nitrogen	percent %	2	2	0-10	0.6	0.58
						Total Organic Carbon	percent %	2	2	0-10	5.3	4
						pH	pH	4	4	0-10	5.41	5.38
										40-50	6.9	6.32
						Exchangeable Potassium	centimoles of positive charge/kg of soil	4	4	0-10	6.4	4
										40-50	3.1	1.9
			3 Yearly	30/11/2022	B. Stuart	Bulk Density	kg/m3	4	4	15-25	1430	1450
										40-50	1610	1670
			Yearly	27/10/2023	J. Galloway	Sodium Adsorption Ratio	sodium adsorption ratio	4	4	0-10	0.23	0.15
										40-50	0.1	0.11
						Available Phosphorus	mg/kg	4	4	0-10	1120	491
										40-50	399	357
						Cation Exchange Capacity	centimoles of positive charge/kg of soil	4	4	0-10	25	17
										40-50	21	10
						Chloride	mg/kg	4	4	0-10	473	302
										40-50	119	63
			3 Yearly	30/11/2022	B. Stuart	Phosphorus Sorption Capacity	as appropriate	4	4	0-10	200	4
										40-50	300	270
			Yearly	27/10/2023	J. Galloway	Exchangeable Calcium	centimoles of positive charge per Kg of soil	4	4	0-10	12	9
										40-50	12	5.3
						Exchangeable Sodium	percent %	4	4	0-10	0.69	0.37
										40-50	0.31	0.22

Type: Manure Quality & Mass Monitoring

Frequency: Special Frequency 2

EPA Licence Location	JBS Sampling Location	Monitoring Frequency	Date of Sampling	Sampled By	Pollutant	Units of Measure	Number of samples required	Value
EPA 4	Manure Stockpile	Special Frequency 2	30/11/2022	Dr. Robert Banks	Electrical Conductivity	microsiemens/cm	1	2,200
					Sodium	mg/kg	1	490
					Magnesium	mg/kg	1	3,400
					Moisture	percent %	1	4
					Nitrate	mg/kg	1	2
					Total Nitrogen	mg/kg	1	10,000
					Total Organic Carbon	percent %	1	16
					pH	pH	1	8
					Potassium	mg/kg	1	7,200
					Sodium Adsorption Ratio	sodium adsorption ratio	1	0.54
					Total Phosphorus	mg/kg	1	4,000
					Chloride	mg/kg	1	2,200
					Calcium	mg/kg	1	13,000

Note: For the purposes of the table(s) above Special Frequency 2 means the collection of samples shall occur prior to the application of solids to the manure utilisation area and upon removal from the premises. The 2023 manure samples were misplaced in transit to the laboratory, repeat sampling has been undertaken, however the results were not available at the time of preparing this report.

Type: Soil Quality & Mass Monitoring

Frequency: Special Frequency 3

EPA Licence Location	JBS Sampling Location	Site Description	Monitoring Frequency	Date of Sampling	Sampled By	Pollutant	Units of Measure	Number of samples required	Number of samples collected and analysed	Sample Depth (cm)		N19	N6	A4	B6	B8	H2	P1
EPA Point 5	N19, N6, A4, B6, B8, H2 & P1	Hockey North Paddock, Hockey South Paddock, Airstrip, Bakers East Paddock, Bakers West Paddock, Horse Paddock, Plain Paddock	Special Frequency 3	30/11/2022	Brendan Stuart	Aggregate Stability	as appropriate	14	14	Topsoil	0-10	3	1	3	3	3	3	3
										Subsoil	40-50	1	3	3	3	1	2	1
				27/10/2023	Brendan Stuart	Electrical Conductivity	deciSiemens/m	14	14	Topsoil	0-10	0.236	1.069	0.491	0.06	0.093	0.142	0.182
										Subsoil	40-50	2.819	2.471	0.079	0.165	0.086	0.04	0.403
						Exchangeable Sodium	centimoles of positive charge per kg of soil	14	14	Topsoil	0-10	1.1	3.9	1.1	0.27	0.25	0.13	0.96
										Subsoil	40-50	14	12	0.34	1.4	0.52	0.065	6.5
						Exchangeable Magnesium	centimoles of positive charge/kg of soil	14	14	Topsoil	0-10	16	30	1.5	7.6	2.3	2.7	23
										Subsoil	40-50	41	38	3.7	23	1.7	3.5	26
						Nitrate	mg/kg	14	14	Topsoil	0-10	18	65	13	0.84	3	5.5	25
										Subsoil	40-50	27	1.7	2.8	0.38	0.65	0.38	4.3
						Nitrogen Total	mg/kg	14	14	Topsoil	0-10	0.33	0.28	0.22	0.27	0.23	0.39	0.28
						Total Organic Carbon	percent %	14	14	Topsoil	0-10	3	2.3	1.4	2.4	1.5	3.5	2.3
						pH	pH	14	14	Topsoil	0-10	6.3	7.25	5.81	6.43	6.25	6.93	8.29
										Subsoil	40-50	8.62	8.14	7.41	8.34	7.36	7.82	9.4
						Exchangeable Potassium	centimoles of positive charge/kg of soil	14	14	Topsoil	0-10	4.5	3.1	0.72	2.7	1.1	3	2.9
										Subsoil	40-50	1.8	1.4	0.47	1.6	0.25	1.7	0.61
				30/11/2022	Brendan Stuart	Bulk Density	kg/m3	14	14	Topsoil	15-25	1590	1430	1720	1820	1820	1470	1430
										Subsoil	40-50	1350	1430	1820	1920	1790	1520	1430
				27/10/2023	Brendan Stuart	Sodium Adsorption Ratio	sodium adsorption ratio	14	14	Topsoil	0-10	0.3	0.72	0.72	0.09	0.13	0.05	0.16
										Subsoil	40-50	2.54	1.99	0.16	0.33	0.35		1.3
						Available Phosphorus	mg/kg	14	14	Topsoil	0-10	452	311	213	136	327	340	221
										Subsoil	40-50	100	78	17	5.9	71	61	46
						Cation Exchange Capacity	centimoles of positive charge/kg of soil	14	14	Topsoil	0-10	35	64	7	20	8.8	17	73
										Subsoil	40-50	76	81	10	41	5.2	11	57
						Chloride	mg/kg	14	14	Topsoil	0-10	186	1207	130	19	51	90	16
										Subsoil	40-50	3241	3407	15	76	34	12	15
				30/11/2022	Brendan Stuart	Phosphorus Sorption Capacity	as appropriate	14	14	Topsoil	0-10	140	470	230	130	110	150	490
										Subsoil	40-50	480	610	160	130	150	470	530
				27/10/2023	Brendan Stuart	Exchangeable Calcium	centimoles of positive charge per Kg of soil	14	14	Topsoil	0-10	13	27	3.6	9.2	5.1	11	45
										Subsoil	40-50	19	30	5.6	15	2.8	5.9	24
						Exchangeable Sodium Percentage	percent %	14	14	Topsoil	0-10	1.1	3.9	1.1	0.27	0.25	0.13	0.96
										Subsoil	40-50	14	12	0.34	1.4	0.52	0.065	6.5

Note: For the purposes of the table(s) above Special Frequency 3 means the collection of samples shall occur prior to manure application and at least once every three (3) years.